U.S. Environmental Protection Agency
2008 Final Issuance of

National Pollutant Discharge Elimination System (NPDES) Vessel General Permit (VGP) for Discharges Incidental to the Normal Operation of Vessels

Fact Sheet

Agency: Environmental Protection Agency (EPA)
Action: Notice of NPDES General Permit

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1. GENERAL INFORMATION

1.1 DOES THIS ACTION APPLY TO ME?

This action applies to all vessels operating in a capacity as a means of transportation, except recreational vessels as defined in CWA §502(25), P.L. 110-288, that have discharges incidental to their normal operations into waters subject to this permit. With respect to (1) commercial fishing vessels of any size as defined in 46 U.S.C. § 2101 and (2) those non-recreational vessels that are less than 79 feet in length, the coverage under this permit is limited to ballast water discharges only and these vessels generally do not require permit coverage for other discharges. Unless otherwise excluded from coverage by Part 6 of the permit, waters subject to this permit, means waters of the U.S. as defined in 40 CFR§122.2. That provision defines "waters of the U.S." as certain inland waters and the territorial sea, which extends three miles from the baseline (as used in this document, mile means nautical mile, i.e., 6076 feet).[1] Note that the Clean Water Act (CWA) does not require NPDES permits for vessels or other floating craft operating as a means of transportation beyond the territorial seas, i.e., in the contiguous zone or ocean as defined by the CWA §§ 502(9), (10). See CWA §502(12) and 40 CFR §122.2 (definition of "discharge of a pollutant"). This permit, therefore, does not apply in such waters.

1.2 PUBLIC COMMENT

EPA received over 170 comments and attachments on the proposed permit. EPA has prepared a response to comments document which is available in the docket for this permit. Comments were used to inform decision making in finalizing this final permit and EPA's responses are reflected in the response to comment document available in today's docket.

Supporting information and materials for this permit are included in Docket ID No. EPA-HQ-OW-2008-0055 available at: www.regulations.gov.

1.3 FURTHER INFORMATION

For further information on the final VGP, please send an email to commercialvesselpermit@epa.gov or contact Ryan Albert at (202) 564-0763 or Juhi Saxena at (202) 564-0719.

[1] More specifically, CWA section 502(8) defines "territorial seas" as "the belt of the seas measured from the line of the ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles."

2. BACKGROUND

2.1 THE CLEAN WATER ACT

Section 301(a) of the Clean Water Act (CWA) provides that "the discharge of any pollutant by any person shall be unlawful" unless the discharge is in compliance with certain other sections of the Act. 33 U.S.C. 1311(a). The CWA defines "discharge of a pollutant" as "(A) any addition of any pollutant to navigable waters from any point source, (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft." 33 U.S.C. 1362(12). A "point source" is a "discernible, confined and discrete conveyance" and includes a "vessel or other floating craft." 33 U.S.C. 1362(14)."

The term "pollutant" includes, among other things, "garbage… chemical wastes …and industrial, municipal, and agricultural waste discharged into water." The Act's definition of "pollutant" specifically excludes "sewage from vessels or a discharge incidental to the normal operation of a vessel of the Armed Forces" within the meaning of CWA §312. 33 U.S.C. 1362(6).

One way a person may discharge a pollutant without violating the section 301 prohibition is by obtaining authorization to discharge (referred to herein as "coverage") under a section 402 National Pollutant Discharge Elimination System (NPDES) permit (33 U.S.C. 1342). Under section 402(a), EPA may "issue a permit for the discharge of any pollutant, or combination of pollutants, notwithstanding section 1311(a)" upon certain conditions required by the Act.

2.2 HISTORY OF THE EXCLUSION OF VESSELS FROM THE NPDES PERMITTING PROGRAM

Less than one year after the CWA was enacted, EPA promulgated a regulation that excluded discharges incidental to the normal operation of vessels from NPDES permitting. 38 FR 13528, May 22, 1973. After Congress re-authorized and amended the CWA in 1977, EPA invited another round of public comment on the regulation. 43 FR 37078, August 21, 1978. In 1979, EPA promulgated the final revision that established the regulation largely in its current form. 44 FR 32854, June 7, 1979. That regulation identifies several types of vessel discharges as being subject to NPDES permitting, but specifically excludes discharges incidental to the normal operation of a vessel. The exclusion reads:

The following discharges do not require NPDES permits:

(a) Any discharge of sewage from vessels, effluent from properly functioning marine engines, laundry, shower, and galley sink wastes, or any other discharge incidental to the normal operation of a vessel. This exclusion does not apply to rubbish, trash, garbage, or other such materials discharged overboard; nor to other discharges when the vessel is operating in a capacity other than as a means of transportation such as when used as an energy or mining facility, a storage facility or a seafood processing facility, or when secured to a storage facility or a seafood processing facility, or when secured to the bed of the ocean, contiguous zone or waters of the United States for the purpose of mineral or oil exploration or development. 40 CFR 122.3(a).

Although other subsections of 40 CFR 122.3 and its predecessor were the subject of legal challenges (See *NRDC v. Costle*, 568 F.2d 1369 (D.C. Cir. 1977)), following its promulgation, the regulatory text relevant to discharges incidental to the normal operation of vessels went unchallenged, and has been in effect ever since.

2.3 LEGAL CHALLENGE TO THE EXCLUSION OF VESSELS

In December 2003, the long-standing exclusion of discharges incidental to the normal operation of vessels from the NPDES program became the subject of a lawsuit in the U.S. District Court for the Northern District of California. The lawsuit arose from a January 13, 1999, rulemaking petition submitted to EPA by a number of parties concerned about the effects of ballast water discharges. The petition asked the Agency to repeal its regulation at 40 CFR 122.3(a) that excludes certain discharges incidental to the normal operation of vessels from the requirement to obtain an NPDES permit. The petition asserted that vessels are "point sources" requiring NPDES permits for discharges to U.S. waters; that EPA lacks authority to exclude point source discharges from vessels from the NPDES program; that ballast water must be regulated under the NPDES program because it contains invasive plant and animal species as well as other materials of concern (e.g., oil, chipped paint, sediment and toxins in ballast water sediment) and; that enactment of CWA section 312(n) (Uniform National Discharge Standards, also known as the UNDS program) demonstrated Congress' rejection of the exclusion.

In response to the 1999 petition, EPA first prepared a detailed report for public comment, *Aquatic Nuisance Species in Ballast Water Discharges: Issues and Options* (September 10, 2001). See 66 FR 49381, September 27, 2001. After considering the comments received, EPA declined to reopen the exclusion for additional rulemaking, and denied the petition on September 2, 2003. EPA explained that since enactment of the CWA, EPA has consistently interpreted the Act to provide for NPDES regulation of discharges from industrial operations that incidentally occur onboard vessels (e.g., seafood processing facilities or oil exploration operations at sea) and of discharges overboard of materials such as trash, but not of discharges incidental to the normal operation of a vessel (e.g., ballast water) subject to the 40 CFR 122.3(a) exclusion. EPA further explained that Congress had expressly considered and accepted the Agency's regulation in the years since its promulgation, and that Congress chose to regulate discharges incidental to the normal operation of vessels through programs other than CWA section 402 permitting. Thus, it was EPA's understanding that Congress had acquiesced to EPA's long-standing interpretation of how the CWA applies to vessels.

Denial of the petition did not reflect EPA's dismissal of the significant impacts of aquatic invasive species, but rather the understanding that other programs had been enacted to specifically address the issue and that the CWA does not currently provide an appropriate framework for addressing ballast water and other discharges incidental to the normal operation of non-military vessels.

In the denial of the petition, EPA noted that when Congress specifically focused on the problem of aquatic nuisance species in ballast water, it did not look to or endorse the NPDES program as the means to address the problem. Instead, Congress enacted new statutes which directed and authorized the U.S. Coast Guard, rather than EPA, to establish a regulatory program for discharges incidental to the normal operation of vessels, including ballast water (e.g.,

Nonindigenous Aquatic Nuisance Prevention and Control Act as amended, 16 U.S.C. 4701 et seq.; Act to Prevent Pollution from Ships, 33 U.S.C. 1901 et seq.) Furthermore, Congress made no effort to legislatively repeal EPA's interpretation of the NPDES program or to expressly mandate that discharges incidental to the normal operation of vessels be addressed through the NPDES permitting program. EPA reasoned that this Congressional action and inaction in light of Congress' awareness of the regulatory exclusion confirmed that Congress accepted EPA's interpretation and chose the Coast Guard as the lead agency under other statutes.

In addition, EPA found significant practical and policy reasons not to re-open the longstanding CWA regulatory exclusion, reasoning that there are a number of ongoing activities within the Federal government related to control of invasive species in ballast water, many of which are likely to be more effective and efficient than use of NPDES permits under the CWA. EPA also noted that nothing in the CWA prevents states from independently regulating ballast water discharges under State law, should they choose to do so, pursuant to CWA section 510.

After EPA's September 2003 denial of the petition, a number of groups filed a complaint in the U.S. District Court for the Northern District of California. *Northwest Envtl. Advocates et al. v. United States EPA*, 2005 U.S. Dist. LEXIS 5373 (N.D. Cal2005). The complaint was brought pursuant to the Administrative Procedure Act (APA), 5 U.S.C. 701 et seq., and set out two causes of action. First, the complaint challenged EPA's promulgation of 40 CFR 122.3(a), an action the Agency took in 1973. The second cause of action challenged EPA's September 2003 denial of their petition to repeal the Section 122.3(a) exclusion.

2.4 COURT DECISIONS

On March 30, 2005, the U.S. District Court for the Northern District of California determined that the exclusion exceeded the Agency's authority under the CWA. Specifically, the District Court granted summary judgment to the plaintiffs:

> The Court DECLARES that EPA's exclusion from NPDES permit requirements for discharges incidental to the normal operation of a vessel at 40 CFR 122.3(a) is in excess of the Agency's authority under the Clean Water Act . . .

Northwest Envtl. Advocates et al. v. United States EPA, 2005 U.S. Dist. LEXIS 5373 (N.D. Cal2005)

After this ruling, the Court granted motions to intervene on behalf of the Plaintiffs by the States of Illinois, New York, Michigan, Minnesota, Pennsylvania, and Wisconsin, and on behalf of the Government-Defendant by the Shipping Industry Ballast Water Coalition.

Following submission of briefs and oral argument by the parties and intervenors on the issue of a proper remedy, the District Court issued a final order in September 2006 providing that:

> The blanket exemption for discharges incidental to the normal operation of a vessel, contained in 40 CFR 122.3(a), shall be vacated as of September 30, 2008.

Northwest Envtl. Advocates et al. v. United States EPA, 2006 U.S. Dist. LEXIS 69476 (N.D. Cal. 2006)

EPA appealed the District Court's decision to the Ninth Circuit, and on July 23, 2008, the Court upheld the decision. Northwest Envtl. Advocates v. EPA, 537 F.3d 1006 (9th Cir. 2008). EPA subsequently petitioned the District Court to extend the date for vacatur of the 40 CFR 122.3(a) exclusion to December 19, 2008; on August 31, 2008 the District Court granted this request. Northwest Envtl. Advocates et al. v. United States EPA, 2008 U.S. Dist. LEXIS 66738 (N.D. Cal. August 31, 2008).

This means that, effective December 19, 2008, except for those vessels exempted from NPDES permitting by Congressional legislation (see Part 2.5 of this Fact Sheet), discharges incidental to the normal operation of vessels currently excluded from NPDES permitting by 40 CFR 122.3(a), will be subject to CWA section 301's prohibition against discharging, unless covered under an NPDES permit. The CWA authorizes civil and criminal enforcement for violations of that prohibition and also allows for citizen suits against violators.

2.5 CONGRESSIONAL LEGISLATION

In late July 2008, Congress enacted two pieces of legislation to exempt discharges incidental to the normal operation of certain types of vessels from the need to obtain an NPDES permit.

The first of these, entitled the Clean Boating Act of 2008, amends the CWA to provide that discharges incidental to the normal operation of recreational vessels are not subject to NPDES permitting, and instead, creates a new regulatory regime to be implemented by EPA and the U.S. Coast Guard under new 312(o) of the CWA. S. 2766, Pub. L. 110-188 (July 29, 2008). As defined in § 3 of that law, recreational vessels subject to its NPDES exclusion are any vessel that is manufactured or used primarily for pleasure or leased, rented, or chartered to a person for the pleasure of that person, but do not include a vessel that is subject to Coast Guard inspection and that is engaged in commercial use or carries paying passengers. As a result of this legislation, discharges incidental to the normal operation of recreational vessels are not subject to NPDES permitting and are not included in the VGP.

The second piece of legislation provides for a temporary moratorium on NPDES permitting for discharges subject to the 40 CFR 122.3(a) exclusion from (1) commercial fishing vessels (as defined in 46 U.S.C. § 2101 and regardless of size) and (2) from those other non-recreational vessels less than 79 feet in length. S. 3298, Pub. L. 110-299 (July 31, 2008). The statute's NPDES permitting moratorium runs for a two year period beginning on its July 31, 2008 enactment date, during which time EPA is to study the relevant discharges and submit a report to Congress. In addition, the statute's NPDES permitting moratorium does not extend to ballast water discharges. That moratorium also does not extend to other discharges, which on case-by-case basis, EPA or the State, as appropriate, determine contribute to a violation of water quality standards or pose an unacceptable risk to human health or the environment. As a result of this legislation, except for any ballast water discharges, discharges incidental to the normal operation of commercial fishing vessels (regardless of size) and those other non-recreational vessels less than 79 feet in length are not currently subject to the VGP.

2.6 GENERAL PERMITS

An NPDES permit authorizes the discharge of a specified amount of a pollutant or pollutants into a receiving water under certain conditions. The two basic types of NPDES permits are individual and general permits. Typically dischargers seeking coverage under a general permit are required to submit a notice of intent (NOI) to be covered by the permit. Section III(e) of this fact sheet discusses the NOI requirements of the permit in more detail.

An individual permit is a permit specifically tailored for an individual discharger. Upon receiving the appropriate application(s), the permitting authority generally develops a draft permit for public comment for that particular discharger based on the information contained in the permit application (e.g., type of activity, nature of discharge, receiving water quality). Following consideration of public comments, a final permit may then be issued to the discharger for a specific time period (not to exceed 5 years), with a provision for reapplying for further permit coverage prior to the expiration date.

A general permit is also subject to public comment and is developed and issued by a permitting authority (in this case, EPA). A general permit covers multiple facilities within a specific category for a specific period of time (not to exceed 5 years), after which the permit expires. Like individual permits, general permits may be re-issued. Under 40 CFR 122.28, general permits may be written to cover categories of point sources having common elements, such as facilities that involve the same or substantially similar types of operations, that discharge the same types of wastes, or that are more appropriately regulated by a general permit. Given the vast number of vessels requiring NPDES permit coverage and the discharges common to these vessels, EPA believes that it makes administrative sense to issue the general permit, rather than issuing individual permits to each vessel. Courts have approved of the use of general permits. See e.g., *Natural Res. Def. Council v. Costle*, 568 F.2d 1369 (D.C. Cir. 1977); *EDC v. US EPA*, 344 F.3d 832, 853 (9th Cir. 2003). The general permit approach allows EPA to allocate resources in a more efficient manner and to provide more timely coverage, particularly in light of the time constraints imposed by the Court's vacatur. As with any permit, the CWA requires the general permit to contain technology-based effluent limits, as well as any more stringent limits when necessary to meet applicable state water quality standards. State water quality standards apply in the territorial seas, defined in section 502(8) of the CWA as extending three miles from the baseline. *Pacific Legal Foundation v. Costle*, 586 F.2d 650, 655-656 (9th Cir. 1978); *Natural Resources Defense Council, Inc. v. U.S. EPA*, 863 F.2d 1420, 1435 (9th Cir. 1988). In addition, discharges to the territorial seas are required to meet requirements to comply with section 403(c) of the CWA Ocean Discharge Criteria (40 CFR Part 125 Subpart M). As discussed in III(a)(v) of this fact sheet, the owner/operator of a vessel, after being covered by the permit, may request to be excluded from such coverage by applying for an individual permit. In addition, EPA may subsequently require a vessel to obtain an individual permit instead of receiving coverage under the general permit.

2.7 EPA'S FEDERAL REGISTER NOTICE SOLICITING INFORMATION ON VESSEL DISCHARGES

On June 21, 2007, EPA issued a Federal Register notice to provide the public with early notice of EPA's intent to begin development of NPDES permits under section 402 of the CWA for discharges incidental to the normal operation of vessels. The notice sought relevant

information from the public to further help the Agency in the timely development of an NPDES permitting framework, which the Agency had not gathered to date for discharges incidental to the normal operation of vessels. The notice requested information and technical input from the public on matters associated with the development of such permits, such as existing public and private data sources available for use in identifying, categorizing, and describing the numbers and various types of commercial and recreational vessels currently operating in waters of the U.S. and that may have discharges incidental to their normal operation. Desirable information included either citations to databases or documents where such information is available, or, the submission of actual information on vessel numbers and categories together with supporting citations to the underlying source. See the Fact Sheet for the proposed permit for a detailed discussion of comments received in response to this notice.

2.8 COMMENTS RECEIVED ON THIS PROPOSED PERMIT

EPA announced the availability of this proposed permit in the Federal Register on June 17, 2008. In that notice, EPA established a 45-day comment period, ending August 1, 2008. EPA's Docket registered more than 170 comment submissions, totaling 3102 pages (including attachments) on the draft VGP. Comments were received from numerous stakeholders, including states, local governments, industry groups, environmental groups, and private citizens. Commenters raised a wide range of technical, policy, legal, and implementation issues which were considered in finalization of this permit. EPA has prepared a response to comments document which is available in the docket for this permit.

2.9 ECONOMIC IMPACTS

Pursuant to EPA's commitment to operate in accordance with the Regulatory Flexibility Act (RFA) framework and requirements during the Agency's issuance of Clean Water Act general permits,[2] EPA performed an economic assessment of this general permit, including an examination of the economic impact this permit may have on small businesses. This economic analysis is included in the docket for this permit. Based on this assessment, EPA concludes that despite a minimal economic impact on all entities, including small businesses, this permit is not likely to have a significant economic impact on a substantial number of small entities. Including the ballast water and other discharge requirements, the economic impact analysis indicates that the best management practices in this permit would cost between $ 6.7 million and $16.7 million annually. Including paperwork requirements, the permit is estimated to cost between $7.7 and $21.9 million dollars annually for domestic vessels. Including estimates of ballast water costs for foreign vessels, the permit is expected to cost between $8.9 and $23.0 million dollars annually. Depending upon sector (vessel type), median costs per firm range from $1 to $795 in the low end assumptions and from $5 to $1,967 in the high end assumptions (excluding median values from commercial fishing vessels which are expected to be $0). Costs for the 95th percentile range from $7 for the Deep Sea Coastal and Great Lakes Passenger Vessels to $20,355 for marine cargo handling under low end cost estimates and from $88 to $35,190 for the same vessel classes for high end cost estimates (see table 7.1 of the economic assessment cost estimates across vessel classes). EPA applied a cost-to-revenue test which calculates annualized pre-tax compliance cost

[2] For more information, see the RFA section of the Federal Register notice announcing the availability of today's final permit.

as a percentage of total revenues and used a threshold of 1 and 3 % to identify entities that would be significantly impacted as a result of this Permit. The total number of entities expected to exceed a 1% cost ratio ranges from 213 under low cost assumptions to 308 under high cost assumptions. Of this universe, the total number of entities expected to exceed a 3 % cost ratio ranges from 55 under low cost assumptions to 73 under high cost assumptions. The total domestic flagged vessel universe that would be affected by this permit includes approximately 61,000 vessels. Accordingly, EPA concludes that this permit is unlikely to result in a significant economic impact on any businesses, and in particular, small businesses.

3. THE PERMIT

Today's permit is being issued pursuant to EPA's authority to issue permits under Clean Water Act Section 402. Clean Water Act Section 402 and its implementing regulations contain standards that govern EPA's imposition of NPDES permit conditions. See e.g., 40 CFR Part 122 ("EPA Administered Permit Programs: The National Pollutant Discharge Elimination System"). The provisions of today's permit are established under these authorities.

3.1 GEOGRAPHIC SCOPE OF THE PERMIT

This permit is applicable to discharges incidental to the normal operation of a vessel identified in Part 1.2 of the permit and Part 3.5 of this fact sheet into waters subject to the permit, which means "waters of the U.S." as defined in 40 CFR 122.2, except as otherwise excluded by Part 6 of the permit. This includes the territorial seas, defined in section 502(8) of the CWA, extending to three miles from the baseline. *Pacific Legal Foundation v. Costle*, 586 F.2d 650, 655-656 (9th Cir. 1978); *Natural Resources Defense Council, Inc. v. U.S. EPA*, 863 F.2d 1420, 1435 (9th Cir. 1988).

The general permit will cover vessel discharges into the waters of the U.S. in all states and territories, regardless of whether a state is authorized to implement other aspects of the NPDES permit program within its jurisdiction, except as otherwise excluded by Part 6 of the permit. While, pursuant to CWA section 402(c), EPA typically is required to suspend permit issuance in authorized states, EPA may issue NPDES permits in authorized states for discharges incidental to the normal operation of a vessel because 402(c)(1) of the Clean Water Act prohibits EPA from issuing permits in authorized states only for "those discharges subject to [the state's authorized] program." Discharges excluded under 40 CFR 122.3 are not "subject to" authorized state programs. The vessel discharges that will be covered by the permit are discharges excluded from NPDES permitting programs under 40 CFR 122.3. Therefore the discharges at issue are not considered a part of any currently authorized state NPDES program. See 40 CFR 123.1(i)(2) (where state programs have a greater scope of coverage than "required" under the federal program, that additional coverage is not part of the authorized program) and 40 CFR 123.1(g)(1) (authorized state programs are not required to prohibit point source discharges exempted under 40 CFR122.3).

EPA will continue to work with state CWA permitting authorities on authorization issues associated with discharges incidental to the normal operation of vessels and plans to provide guidance on such issues in the near future. . EPA plans to outline how states may obtain approval to implement NPDES permitting for vessel discharges within their jurisdictions. In addition, EPA plans, to the extent permitted by the CWA, to provide states with the opportunity to decline to regulate these discharges by obtaining status as a partial NPDES program under CWA 402(n).

3.2 STRUCTURE OF THE PERMIT (PART 1.1)[3]

This general permit addresses all vessels operating in a capacity as a means of transportation, except recreational vessels, that have discharges incidental to their normal operations into waters subject to this permit. With respect to (1) commercial fishing vessels of any size as defined in 46 U.S.C. § 2101 a and (2) those non-recreational vessels that are less than 79 feet in length, the coverage under this permit is limited to ballast water discharges only. This is because, as explained in Part 2.5 of this Fact Sheet, non-ballast water incidental discharges from these two types of vessels are subject to a moratorium on NPDES permitting.

Many characteristics of vessels and vessel discharges generally apply to all vessel classes. Hence, general requirements that apply to all eligible vessels are found in Parts 1 through 4 of the permit. Part 1 of the permit contains general conditions, authorized and ineligible discharges, and explains who must file a notice of intent to receive permit coverage. Part 2 of the permit discusses effluent limits applicable to vessels. Part 3 of the permit lists required corrective actions that permittees must take to remedy deficiencies and violations. Part 4 of the permit lists visual monitoring, self-inspection, and recordkeeping and reporting requirements. Due to specific concerns arising from certain types of vessels, in Part 5 of the permit, EPA has identified select categories of vessel types that have supplemental requirements. States, territories, and certain Tribes have the authority to require additional requirements under Section 401 of the CWA. These additional requirements have been incorporated into Part 6 of the permit (see also Part 12 of the Fact Sheet "Other Legal Requirements").

The Appendices, listed in this permit as Parts 7 through 15, include definitions, the notice of intent form, the notice of termination form, and the one-time report form.

3.3 WHAT IS THE VESSEL UNIVERSE AFFECTED BY THIS PERMIT?

A short summary of the vessel universe requiring permit coverage and common locations of those vessels follows.

According to data published by the U.S. Army Corps of Engineers in their annual Waterborne Transportation Lines of the United States (WTLUS) report (USACE, 2005a), a total of 41,028 U.S.-flagged cargo and passenger commercial vessels were operating in U.S. waters as of the end of 2005. The vast majority (78%) of these vessels primarily operate in the Mississippi River System and the Gulf Intracoastal Waterway. Twenty-one percent operate along the Atlantic, Pacific, and Gulf Coasts, and just over 1% mainly ply the waters of the Great Lakes. These data include both self-propelled (e.g., tankers, towboats, dry cargo) and non-self-propelled (e.g., barges) vessels. Volume 2 of the WTLUS report states that a total of 2,732 Transportation Series Operator (TSO) companies owned these 41,028 vessels (USACE, 2005b).

An additional source of commercial vessel data is the U.S. Coast Guard's Merchant Vessels of the United States (VESDOC) database, which contains information on all domestic merchant vessels with a valid Certificate of Documentation (COD) (USCG, 2007). Updated

[3] Throughout this fact sheet, parenthetical citations in headings refer to parts of the proposed permit to serve as an aid to the reader.

through May 2007, VESDOC breaks vessels down into more types than WTLUS, making a direct comparison of the data difficult. However, VESDOC provides information on vessels that WTLUS does not. According to the VESDOC data, there are 33,550 U.S.-owned commercial fishing vessels with a COD in U.S. waters (any vessel owned by a U.S. citizen that commercially fishes in U.S. waters must have a COD). Other vessel types that are included in the VESDOC data, but not in the WTLUS data, include industrial (e.g., cable layer, dredge, crane barge) (823 vessels); mobile offshore drilling units (118 vessels); research vessels (234 vessels); and oil recovery (372 vessels) (USCG, 2007).

Data on foreign commercial vessels is more limited, but was approximated by consulting the U.S. Customs and Border Patrol (CBP) records on vessels entering the U.S. CBP records contain the flag of every vessel entering U.S. waters (U.S. CBP, 2007). The flag flown by a vessel represents only the vessel's registration and not the country which that vessel last visited. In 2005, 7,726 unique (different) vessels entered U.S. waters, and approximately 90% (6,982) of these flew a non-U.S. flag. These foreign-flagged vessels represented 83 different countries. The three foreign countries with the most vessel entrances in 2005 were Panama, the Bahamas, and Liberia (U.S. CBP, 2007).

The U.S. Maritime Administration (MARAD) documents the number of vessel calls (i.e., visits) to U.S. ports by self-propelled vessels greater than 10,000 tons deadweight (MARAD, 2006). In 2005, 61,047 vessel calls were made to U.S. ports, the majority (31% or 18,683) to ports in the Gulf of Mexico region (this region includes ports from Key West, FL to Brownsville, TX). In the Gulf region, the following ports had the greatest number of calls in 2005 (in descending order): Houston, TX; New Orleans, LA; Port Arthur, TX; Texas City, TX and; Tampa, FL. The South Atlantic region (from Alexandria, VA to Miami, FL) had the next greatest number of calls with 11,709, with the ports getting the most calls including Virginia Ports, VA, Savannah, GA, Miami, FL, Jacksonville, FL, and Port Everglades, FL. On the Pacific coast, Los Angeles/Long Beach, CA and San Francisco, CA had the most calls, followed by Columbia River, OR, Tacoma, WA, and Seattle, WA. Finally, in the North Atlantic, New York, NY and Philadelphia, PA received the most calls, followed by Baltimore, MD.

The U.S. CBP vessel entrances records document the last port a vessel visited before entering U.S. waters, whether foreign or domestic (U.S. CBP, 2007). In 2005, 94% of the vessels calling at Seattle, WA cited their previous port as "foreign," the most of any U.S. port (the most often cited foreign "port" was Canada). Nearly 87% of the vessels calling at San Juan, Puerto Rico, and over 85% of the vessels calling at Port Everglades, FL, cited their last ports as foreign (most often cited "ports" were the U.S. Virgin Islands and the Bahamas, respectively) (U.S. CBP, 2007).

All told, EPA currently estimates that there will be approximately 61,000 U.S. flagged vessels that may be eligible for coverage under this permit. Additionally, EPA estimates that there are up to 8,000 additional foreign flagged vessels that may need coverage under this permit.

3.4 REGULATION OF CONSTITUENTS IN THE DISCHARGES UNDER THE PERMIT

In today's permit, EPA is establishing effluent limitations to control a variety of materials, which, for the purposes of this fact sheet, have been classified into 7 major groups: Aquatic Nuisance Species (ANS), nutrients, pathogens (including E. Coli & fecal coliform), oil and grease, metals, most conventional pollutants (Biochemical Oxygen Demand, pH, Total Suspended Solids), and other toxic and non-conventional pollutants with toxic effects. EPA is establishing effluent limitations to control these materials, because such materials are constituents in the, depending on the particular vessel, industrial waste, chemical waste and/or garbage "pollutant" discharge resulting from the activities of these vessels. "Industrial waste," "chemical waste" and "garbage" are expressly included in the CWA's definition of "pollutant," which governs, among other things, which discharges are properly subject to CWA permitting. See CWA § 402(a) (allowing EPA to issue permits for a "discharge of any pollutant"); CWA § 502(12) (defining "discharge of a pollutant" to include "any addition of any pollutant to navigable waters from any point source"); and CWA § 502(6) (defining "pollutant" as "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal and agricultural waste discharged into water" [emphasis added]). The discharge from vessels addressed in today's permit – a worthless or useless flow discharged during a vessel's normal operations – falls within those broad pollutant categories. See, e.g., Webster's II New Riverside University Dictionary (1988) (defining "waste" as "a worthless or useless by-product" or "something, such as steam, that escapes without being used"; "industrial" as "of, relating to, or derived from industry" and "industry as "the commercial production and sale of goods and services"; "chemical" as "of or relating to the action of chemicals"; and "garbage" as "worthless matter, trash").[4]

EPA understands that a lot of attention has been paid to whether, under various circumstances, ANS are properly considered "pollutants" under CWA §502(6). Today's permit controls ANS because such ANS are one constituent of concern in the waste stream that constitutes the "pollutant" subject to today's permit. See CWA § 402(a)(1)(A) and 301(b)(1) (requiring permits to include "effluent limitations") and CWA §502(11) (defining "effluent limitations" to include "restrictions established by . . . the Administrator on . . . chemical, physical, biological, and other constituents which are discharged from point sources . . ." [emphasis added]). Under these circumstances, there is no need to address the question of whether ANS in and of themselves may be considered "pollutants" under CWA section 502(6). In addition, EPA's conclusion that ANS are properly controlled in today's vessel permit does not speak as to how ANS are regulated by the CWA under any other circumstances.

Short summaries of each of the constituent types regulated in today's permit follow.

[4] The Agency's view on what is considered "industrial waste," "chemical waste" or "garbage" as discussed in this fact sheet is limited to use of those terms in the definition of "pollutant" in the Clean Water Act and should not be considered in interpreting those or similar terms in any other statute or regulation.

3.4.1 Aquatic Nuisance Species

Aquatic Nuisance Species (ANS), also known as invasive species, are a persistent problem in U.S. coastal and inland waters. ANS may be introduced through a variety of vectors, including ballast water and sediment from ballast tanks, chain lockers, anchor chains, and vessel hulls. These vectors have been associated with introductions of highly damaging species in the past. Though no reliable and comprehensive estimates of total ANS introductions nationwide exist, case studies of several major bodies of water across the country, as summarized in Table 1, provide a sense of the extent of the problem.

Table 1: Estimates of Invasive Species in Several Major Water Systems

Region	Estimated Rate of Invasion[1]	Estimated Total Invasions to Date[2]
Great Lakes	Once every 28 weeks[3]	162
Mississippi River System	Unknown	100
San Francisco Bay	Once every 24 weeks[4]	212
Lower Columbia River Basin	Once every 5 months[5]	81
Gulf of Mexico	Unknown	579

[1] Ruiz and Reid (2007) suggest that these figures may not reliably represent the true rate of introduction, as they are based on discovery data, which may not always track with the underlying rate of introduction.
[2] All figures in this column are taken from USCG 2004.
[3] NOAA (2007).
[4] Cohen and Carlton (1995).
[5] Sytsma et al. (2004).

ANS pose several dangers to aquatic ecosystems, including outcompeting native species, threatening endangered species, damaging habitat, changing food webs, and altering the chemical and physical aquatic environment. Furthermore, ANS have been documented to damage recreational and commercial fisheries, infrastructure, and water based recreation and tourism.

One of the most well-known examples of ANS is the Zebra Mussel. Zebra Mussels are native to Eurasia, near the Black and Caspian Seas, and were first discovered in U.S. waters in 1988. Populations of Zebra Mussels were established in the Great Lakes and are now found throughout most of the Eastern United States and in some Western States. Zebra Mussels are filter feeders and can remove algae from the water column that other native species depend on as a food source and, therefore, Zebra Mussels outcompete native (and sometimes endangered) mollusks and other filter feeders. Zebra Mussels also damage public infrastructure and have been estimated to cause tens to hundreds of millions of dollars in losses per year to the Great Lakes alone.

EPA recommends the following sources for additional information on aquatic invasive species and the vectors (pathways) by which they are spread:

Barnes, D.K.A. (2002) Invasions by marine life on plastic debris. *Nature*, 416, 808-809.

Carlton, J.T. (1996) Pattern, process, and prediction in marine invasion ecology. *Invasion Biology*, 78, 97-106.

Carlton, J.T. (2001) Introduced species in U.S. coastal waters: environmental impact and management priorities. Pew Oceans Commission, Arlington, Virginia. 28 pp.

Cohen, A.N. & Carlton, J.T. (1995). Nonindigenous aquatic species in a United States estuary: a case study of the biological invasions of the San Francisco Bay and Delta. Rep. No. NOAA Grant Number NA36RG0467.

Doblin, M., Coyne, K., Rinta-Kanto, J., Wilhelm, S., & Dobbs, F. (2007) Dynamics and short-term survival of toxic cyanobacteria species in ballast water from NOBOB vessels transiting the Great Lakes-implications for HAB invasions. *Harmful Algae*, 6, 519-530.

Drake, J.M. & Lodge, D.M. (2007) Rate of species introductions in the Great Lakes via ships' ballast water and sediments. *Canadian Journal of Fisheries and Aquatic Sciences*, 64, 530-538.

Drake, L., Doblin, M., & Dobbs, F. (2007) Potential microbial bioinvasions via ships' ballast water, sediment, and biofilm. *Marine Pollution Bulletin*, 55, 333-341.

Endresen, Ø., Behrens, H.L., Brynestad, S., Andersen, A.B., & Skjong, R. (2004) Challenges in global ballast water management. *Marine Pollution Bulletin*, 48, 615-623.

Fountain, A.N.C.J.T.C.M.C. (1995) Introduction, dispersal and potential impacts of the green crab Carcinus maenas in San Francisco Bay, California. *Marine Biology*, 122, 225-237.

Julie L. Lockwood, P.C., Tim Blackburn (2005) The role of propagule pressure in explaining species invasions. *Invasions, guest edited by Michael E. Hochberg and Nicholas J. Gotelli*, 20, 223-228.

Lovell, S.J. & Stone, S.F. (2005) The Economic Impacts of Aquatic Invasive Species. Working Paper #05-02. U.S. Environmental Protection Agency.

M.G.G., F., C.D., L., M.R., T., & M.R., L. (2003) Dispersion of discharged ship ballast water in Vancouver Harbour, Juan De Fuca Strait, and offshore of the Washington Coast. *Journal of Environmental Engineering and Science*, 2, 163-176.

Roman, J. (2006) Diluting the founder effect: cryptic invasions expand a marine invader's range. *Proceedings of the Royal Society of London, Series B: Biological Sciences*, 273, 2453-2459.

Ruiz, G.M., Rawlings, T.K., Dobbs, F.C., Drake, L.A., Mullady, T., Huq, A., & Colwell, R.R. (2000) Global spread of microorganisms by ships. *Nature,* 408, 49-50.

Sytsma, M.D., J.R. Cordell, J.W. Chapman, and R.C. Draheim. Lower Columbia River Aquatic Nonindigenous Species Survey 2001-2004: Final Technical Report. Prepared for the U.S. Coast Guard and U.S. Fish and Wildlife Service. Available at: http://www.clr.pdx.edu/docs/LCRANSFinalReport.pdf. Accessed December 31, 2007.

3.4.2 Nutrients

Nutrients, including nitrogen, phosphorus, and numerous micro-nutrients are constituents of vessel discharges. Though traditionally associated with discharges from sewage treatment facilities and runoff from agricultural and urban stormwater sources, nutrients resulting from vessels are also thought to be discharged from deck runoff, vessel graywater, and vessel

bilgewater, among other sources. Increased nutrient discharges from human sources are a major source of water quality degradation throughout the United States (USGS 1999).

Nutrients are associated with a variety of negative environmental impacts, the most notable of which is eutrophication, which can lead to reduced levels of dissolved oxygen due to increased demand (sometimes to the extremes of hypoxia), reduced levels of light penetration and increased turbidity, and changes in the composition of aquatic flora and fauna, and helps to fuel harmful algal blooms (HABs), which can have devastating impacts on both aquatic life and human health (National Research Council 2000, WHOI 2007). The National Research Council (2000) found that:

- Nutrient over-enrichment of coastal ecosystems generally triggers ecological changes that decrease the biological diversity of bays and estuaries.
- While moderate nitrogen enrichment of some coastal waters may increase fish production, over-enrichment generally degrades the marine food web that supports commercially valuable fish.
- The marked increase in nutrient pollution of coastal waters has been accompanied by an increase in harmful algal blooms, and in at least some cases, pollution has triggered these blooms.
- High nutrient levels and the changes they cause in water quality and the makeup of the algal community are detrimental to the health of coral reefs and the diversity of animal life supported by seagrass and kelp communities.
- Nitrogen is the chief culprit in eutrophication and other impacts of nutrient over-enrichment in temperate coastal waters, while phosphorus is most problematic in eutrophication of freshwater lakes.
- Human conversion of atmospheric nitrogen into biologically useable forms, principally synthetic inorganic fertilizers, now matches the natural rate of biological nitrogen fixation from all the land surfaces of the earth.

EPA recommends the following sources for additional information on nutrient pollution and impacts on waters:

Correll, D.L. (1987) Nutrients in the Chesapeake Bay. In Contaminant Problems and Management of Living Chesapeake Bay Resources. (eds. S.K. Majumdar, W. Hall Jr. & H.M. Austin), pp. 298-320. The Pennsylvania Academy of Science. Horne, A.J. & Goldman, C.R. (1994). *Limnology*, 2nd ed. McGraw-Hill, Inc., New York.

Mississippi River/Gulf of Mexico Watershed Nutrient Task Force (2007). Gulf hypoxia action plan 2008: draft version for public review, Washington DC.

National Research Council (2000) Clean Coastal Waters: Understanding and Reducing the Effects of Nutrient Pollution, Ocean Studies Board and Water Science and Technology Board.

US EPA (2004) National Coastal Condition Report II, Washington DC.

Woods Hole Oceanographic Institute (WHOI) (2007) Harmful Algae: What are Harmful Algal Blooms (HABS).

US EPA (2007) Draft cruise ship discharge assessment report. Office of Water. Washington D.C.

US EPA (1986) Quality criteria for Water Washington DC. Available at: http://www.epa.gov/waterscience/criteria/goldbook.pdf.

3.4.3 Pathogens

Pathogens are another important constituent of discharges from vessels, particularly in graywater and potentially from ballast water discharges. Though fecal coliform is considered a conventional pollutant, it is discussed here since it shares characteristics with many other pathogens potentially discharged from vessels.

EPA's study of graywater discharges from cruise ships found that levels of pathogen indicator bacteria exceeded enterococci standards for marine water bathing and fecal coliform standards for harvesting shellfish 66% and over 80% of the time, respectively (EPA 2007c). Specific pathogens of concern found in sewage include *Salmonella* spp*., E. coli*, enteroviruses, hepatitis and pathogenic protists (National Research Council 1993), but there are multiple sources for such pathogens. Elevated levels of these pathogens have increasingly resulted in beach closures in recent years, primarily from on-shore sources such as urban stormwater runoff and sewage overflows, which in turn has reduced the recreational value of impacted beaches. Additional pathogens have been associated with ballast water discharges, including *E. coli*, *enterococci*, *Vibrio cholerae*, *Clostridium perfingens*, *Salmonella* spp. *Cryptosporidium* spp., and *Giardia* spp., as well as a variety of viruses (Knight et al. 1999; Reynolds et al. 1999; Zo et al. 1999). Johengen et al. (2005) show the potential for pathogens to be transported in ballast water tanks, even when they are not filled. The study found that virus-like particle (VLP) concentrations in sampled ballast tanks ranged from 107 to 109 per ml in residual unpumpable ballast water and from 107 to 1011 per ml in sediment porewater. Bacteria concentrations under the same conditions were 105 to 109 per ml and 104 to 108 per ml, respectively.

Though it is difficult to determine the contribution of vessel discharges to infections by these organisms it is likely that they are not a primary source. Epidemiologists have attempted to quantify the proportion of total infections that are waterborne. For example, waterborne infection may account for as many as 60 % of Giardia infections and 75 % of pathogenic E. coli infections (National Research Council 1993). Graywater discharges may be a significant source of pathogenic microorganisms within some regulated waters, and reducing graywater discharges may provide some human health benefits.

For additional information on the environmental impact of pathogens, or their affiliation with vessel discharges, the following sources are recommended:

Dobbs, F., Doblin, M., & Drake, L. (2006) Pathogens in ships' ballast tanks. *EOS, Transactions, American Geophysical Union*, 87.

Knight, I.T., Wells, C.S., Wiggins, B., Russell, H., Reynolds, K.A., & Huq., A. (1999) Detection and enumeration of fecal indicators and pathogens in the ballast water of transoceanic

cargo vessels entering the Great Lakes. In General Meeting of the American Society for Microbiology, pp. 546, Chicago, IL, Abstract Q71.

National Research Council (1993) Managing Wastewater in Coastal Urban Areas, Water Science and Technology Board.

Reynolds, K., Knight, I., Wells, C., Pepper, I., & Gerba, C. (1999) Detection of human pathogenic protozoa and viruses in ballast water using conventional and molecular methods. In General Meeting of the American Society for Microbiology, pp. 594, Chicago, IL, Abstract Q318.

U.S. EPA (2007) Draft cruise ship discharge assessment report. Office of Water. Washington DC.

Zo, Y., Grimm, C., Matte, M., Matte, G., Knight, I.T., Huq, A., & Colwell, R.R. (1999) Detection and Enumeration of Pathogenic Bacteria in Ballast Water of Transoceanic Vessels Entering the Great Lakes and Resistance to Common Antibiotics. In General Meeting of the American Society for Microbiology, Chicago, IL, Abstract Q317.

3.4.4 Oil and Grease

Oil and grease are another known component of vessel discharges with potentially harmful impacts to humans and to aquatic life. Vessels discharge oil in every day operation, including lubricating oils, hydraulic oils, and vegetable or organic oils. Oil concentrations in vessel discharges must not exceed quantities that are harmful, and as a result, may not cause a film, sheen, discoloration, sludge, emulsion or violation of water quality standards. However, vessel discharges may still contain enough oil to do ecological damage in confined areas or where vessels are concentrated, even if they meet these requirements. Oils are highly toxic and carcinogenic, and can also taint organisms that are consumed by humans, which is a potential source of adverse health impacts. Oil and grease measured by Method 1664A constitutes a conventional pollutant. Oil and grease that is commingled with other toxic pollutants may be controlled as a toxic pollutant under this permit.

The following sources provide additional information on oil discharges from vessels:

Australian Maritime Safety Authority (AMSA) (2003) Effects of Oil on Wildlife. Available at: http://www.amsa.gov.au/Marine_Environment_Protection/Educational_resources_and_information/Teachers/The_Effects_of_Oil_on_Wildlife.asp. Last accessed on 2/5/2008.

DeCola, E. (2000) International Oil Spill Statistics: 2000. Cutter Information Corporation, Arlington, MA.

GESAMP (1993) Impact of oil and related chemicals and wastes on the marine environment. International Maritime Organization, London.

GESAMP (2007) Estimates of oil entering the marine environment from sea-based activities International Maritime Organization, London.

Lucas, Z. & MacGregor, C. (2006) Characterization and source of oil contamination on the beaches and seabird corpses, Sable Island, Nova Scotia, 1996-2005. *Marine Pollution Bulletin*, 52, 778-789.

NOAA (2008) Frequently Asked Questions (FAQs) about Oil and Chemical Spills. http://response.restoration.noaa.gov/topic_subtopic_entry.php?RECORD_KEY%28entry_subtopic_topic%29=entry_id,subtopic_id,topic_id&entry_id(entry_subtopic_topic)=359&subtopic_id(entry_subtopic_topic)=9&topic_id(entry_subtopic_topic)=2. Accessed on February 5, 2008.

Rützler, K. & Sterrer, W. (1970) Oil pollution. Damage observed in tropical communities along the Atlantic seaboard of Panama. *BioScience*, 20, 222-224.

Shaw, D.G., Hogan, T.E., & McIntosh, D.J. (1985) Hydrocarbons in the sediments of Port Valdez, Alaska: Consequences of five years' permitted discharge. *Estuarine, Coastal and Shelf Science*, 21, 131-144.

Stekoll, M.S., Clement, L.E., & Shaw, D.G. (1980) Sublethal effects of chronic oil exposure on the intertidal clam Macoma balthica. *Marine Biology*, 57, 51-60.

Suchanek, T.H. (1993) Oil impacts on marine invertebrate populations and communities. *American Zoologist*, 33, 510-533.

Wiese, F.K. & Ryan, P.C. (2003) The extent of chronic marine oil pollution in southeastern Newfoundland waters assessed through beached bird surveys 1984-1999. *Marine Pollution Bulletin*, 46, 1090-1101.

3.4.5 Metals

Metals are a diverse group of pollutants, many of which are toxic to aquatic life and humans. Vessel discharges can contain a variety of metal constituents which can come from a variety of on-board sources. For example, EPA's study of cruise ship graywater found a total of 13 different metals in at least 10% of samples, with copper, nickel and zinc detected in 100% of samples (EPA 2007c). Bilgewater has also been shown to contain numerous metals, the exact constituents of which vary dependent upon onboard activities on the vessel and the materials used in the construction of the vessel. Other metals, such as copper, are known to leach from vessel hulls and can cause exceedances of water quality standards. For example, Srinivasan and Swain (2007) found significant leaching of copper from the hulls of sailboats, powerboats, and cruise ships.

While some metals, including copper, nickel and zinc, are known to be essential to organism function, many others, including thallium and arsenic, are non-essential and/or are known to have only adverse impacts. Even essential metals can do serious damage to organism function in sufficiently elevated concentrations. Adverse impacts can include impaired organ function, impaired reproduction and birth defects, and, at extreme concentrations, acute mortality. For example, Katranitsasa et al. (2003) noted that the copper released from copper anti-fouling paints are toxic to non-targeted aquatic organisms. Additionally, through a process known as bioaccumulation, metals may not be fully eliminated from blood and tissues by natural processes, and may accumulate in predator organisms further up the food chain, including commercially harvested fish species (U.S. EPA 2007e).

The following sources provide additional information describing metals in aquatic environments and their discharges from vessels:

Bentivegna, C.S. & Piatkowski, T. (1998) Effects of tributyltin on medaka (Oryzias latipes) embryos at different stages of development. *Aquatic Toxicology*, 44, 117-128

Haynes, D. & Loong, D. (2002) Antifoulant (butyltin and copper) concentrations in sediments from the Great Barrier Reef World Heritage Area, Australia. 120, 391-396.

Katranitsasa, A., Castritsi-Catharios, J., & Persoone, G. (2003) The effects of a copper-based antifouling paint on mortality and enzymatic activity of a non-target marine organism. *Marine Pollution Bulletin*, 46, 1491-1494.

Negri, A.P., Hales, L.T., Battershill, C., Wolff, C., & Webster, N.S. (2004) TBT contamination identified in Antarctic marine sediments. *Marine Pollution Bulletin*, 48, 1142-1144.

Negri, A.P. & Heyward, A.J. (2001) Inhibition of coral fertilization and larval metamorphosis by tributyltin and copper. *Marine Environmental Research*, 51, 17-27.

Orange County Coastkeeper (2007). Lower Newport Bay copper/metals marina study, Newport Beach.

Ruiz, J.M., Bryan, G.W., & Gibbs, P.E. (1995) Effects of tributyltin (TBT) exposure on the veliger larvae development of the bivalve Scrobicularia plana (da Costa). *Journal of Experimental Marine Biology and Ecology*, 186, 53-63.

Schiff, K., Diehl, D., & Valkirs, A. (2004) Copper emissions from antifouling paint on recreational vessels. *Marine Pollution Bulletin* 48, 371-377.

Srinivasan, M. & Swain, G.W. (2007) Managing the Use of Copper-Based Antifouling Paints. *Environmental Management*, 39, 423-441.

Trocine, R.P. & Trefry, J.H. (1996) Metal concentrations in sediment, water and clams from the Indian River Lagoon, Florida. *Marine Pollution Bulletin*, 32, 754-759.

U.S. EPA (2007) Draft cruise ship discharge assessment report. Office of Water. Washington DC.

V. Axiak, Sammut, M., Chircop, P., Vella, A., & Mintoff, B. (1995) Laboratory and field investigations on the effects of organotin (tributyltin) on the oyster, Ostrea edulis. Environmental Toxicology: Hazards to the Environment and Man in the Mediterranean Region, 171, 117-120.

3.4.6 Toxic and Non-Conventional Pollutants with Toxic Effects

The term "toxic and non-conventional pollutants with toxic effects," as it applies to constituents of vessel discharges, encompasses a variety of chemical compounds known to have a broad array of adverse impacts on aquatic species and human health. For example, EPA's study of cruise ship graywater found a total of 16 different volatile and semi-volatile organic compounds in at least 10% of samples, for which the most significant rates and levels of detection were phthalates, phenol, and tetrachloroethylene. Other notable toxics detected included free residual chlorine and chlorides and perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) found in some firefighting foam (AFFF).

These compounds can cause a variety of adverse impacts on ecosystems and living marine resources, including fisheries. Phthalates are known to interfere with reproductive health, liver and kidney function in both animals and humans (Sekizawa et al. 2003, DiGangi et al. 2002). Chlorine, though toxic to humans at high concentrations, is of much greater concern to aquatic

species, which can experience respiratory problems, hemorrhaging, and acute mortality even at relatively low concentrations (U.S. EPA 2007c). PFOS and PFOA, potentially found in AFFF discharges, are persistent, bioaccumulative, toxic and carcinogenic chemical compounds. The health impacts of PFOA and its telomers are not entirely understood, particularly in aquatic environments, but EPA's Science Advisory Board has concluded that PFOA "is likely to be carcinogenic in humans" (SAB 2006).

The following sources provide additional information describing other toxic pollutants in aquatic environments:

DiGangi, J., Schettler, T., Cobbing, M., & Rossi, M. (2002) Aggregate exposures to phthalate in humans. Health care without harm.

Horne, A.J. & Goldman, C.R. (1994) *Limnology*, 2nd ed. McGraw-Hill, Inc., New York.

U.S. EPA (2008) Disinfection byproduct health effects. Available at: http://www.epa.gov/enviro/html/icr/dbp_health.html. Accessed on June 21, 2007

U.S. EPA (2004). National Coastal Condition Report II, Washington DC.

U.S. EPA (2002a) National Water Quality Inventory. EPA-841-R-02-001, Washington, D.C.

U.S. EPA (2007) Draft cruise ship discharge assessment report. Office of Water. Washington DC.

U.S. EPA (1986). Quality criteria for Water Washington DC. Available at: http://www.epa.gov/waterscience/criteria/goldbook.pdf.

3.4.7 Other Non-Conventional and Conventional Pollutants (Except Fecal Coliform)

The category "other non-conventional and conventional pollutants" as applied to vessel discharges also consists of multiple pollutants with disparate impacts. Discharges of graywater, bilgewater, seawater cooling overboard, and other vessel waste streams or effluent can include pollutants that affect pH, add heat, and/or increase turbidity or discharge suspended sediment.

Some vessel discharges are more acidic or basic than the receiving waters, which can have a localized effect on pH (ADEC 2007). Though no research has been done linking vessel pollution specifically to pH impacts on aquatic ecosystems, extensive literature on the impacts of pH changes in the contexts of aquaculture and acid rain does exist. For nearly all fish populations, pH more acidic than 5 or more basic than 10 will cause rapid mortality. In addition, many individual species are sensitive to more moderate changes in pH (Wurts and Durborrow 1992).

Some vessel discharges may also affect temperature locally (Battelle 2007). Thermal impacts of vessel discharges are generally much smaller than those from better known sources such as dams, power plant cooling water, and runoff. However, even small temperature changes can impact some sensitive organisms' growth, reproduction, and even survival, which implies that some vessel discharges may have localized adverse impacts on aquatic organisms (Abbaspour et al. 2005, Cairns 1972, Govorushko 2007).

Some vessel discharges, such as those from ballast water and bilgewater, can contain suspended sediments and have elevated turbidity. Loadings of sediment from vessel discharges

are likely much smaller than from other sources such as construction, urban stormwater, and agriculture. The most significant sources of sediment from vessel discharges likely come from areas in the vessel where water is held, sediment settles out of solution and accumulates over time, and then is later periodically resuspended before discharging.

Designated uses such as navigation, drinking water, recreation, and agriculture are impaired by excess suspended sediments (U.S. EPA 2003). When sediments diminish water quality to support aquatic life, other human uses of the same waterbodies such as recreational or commercial fishing may also be diminished. Furthermore, there is evidence that aquatic life uses are one of the most sensitive endpoints to alterations in sediment loading. Direct effects on invertebrates and fish are complex, ranging from behavioral to physiological to toxicological. Suspended sediments have been documented to have a negative affect on the survival of fish, freshwater mussels, and other benthic organisms. In a frequently cited review paper prepared by Newcombe and Jensen (1996), sublethal effects (e.g. increased respiration rate) were observed in eggs and larvae of salmonids and nonsalmonids, as well as in adult estuarine and freshwater nonsalmonids, when exposed to Total Suspended Solids concentrations as low as 55 mg/L for one hour. Mussels compensate for increased levels of suspended sediment by increasing filtration rates, increasing the proportion of filtered material that is rejected, and increasing the selection efficiency for organic matter. Excess sediment smothers benthic organisms and the surface layer of the benthos can be heavily impacted and altered. Increased turbidity associated with suspended sediments can reduce primary productivity of algae as well as growth and reproduction of submerged vegetation (Jha, 2003). In addition, once in the system, resuspension and deposition can "recycle" sediments so that they exert water column and benthic effects repeatedly over time and in multiple locations.

The following sources provide additional information describing other non-conventional and conventional pollutants:

Abbaspour, M., Javid, A.H., Moghimi, P., & Kayhan, K. (2005) Modeling of thermal pollution in coastal areas and its economical and environmental assessment. *International Journal of Environmental Science and Technology*, 2, 13-26.

Horne, A.J. & Goldman, C.R. (1994) *Limnology*, 2nd ed. McGraw-Hill, Inc., New York.

Jha, M. (2003) Ecological and toxicological effects of suspended and bedded sediments on aquatic habitats - a concise review for developing water quality criteria for suspended and bedded sediments (SABS) (Office of Water, U.S. EPA, August 2003.).

National Research Council (1993). Managing Wastewater in Coastal Urban Areas, Water Science and Technology Board.

Newcombe, C.P. & Jensen, J.O.T. (1996) Channel suspended sediment and fisheries: a synthesis for quantitative assessment of risk and impact. *North American Journal of Fisheries Managemen*t 16, 693-727.

US EPA (1986). Quality criteria for Water Washington DC. Available at: http://www.epa.gov/waterscience/criteria/goldbook.pdf

3.5 COVERAGE UNDER THE PERMIT

3.5.1 Eligibility (Part 1.2)

Vessels Not Eligible for Coverage

Recreational vessels and vessels of the United States Armed Forces are not eligible for coverage under this permit. All other vessels, less than 79 feet in length and all commercial fishing vessels (regardless of size) are excluded from this permit, except for discharges of ballast water. If auxiliary vessels or craft, such as lifeboats or rescue boats onboard larger vessels require permit coverage (i.e. they are greater than 79 feet in length), they are eligible for coverage under this permit and are covered by submission of the Notice of Intent for the larger vessels.

Vessel Discharges Eligible for Coverage

The discharges eligible for coverage under the permit are those discharges incidental to the normal operation of a vessel covered by the exclusion in 40 CFR 122.3(a) prior to any vacatur of that exclusion (see discussion above in Parts 2.2 and 2.4). Discharges incidental to normal operation include deck runoff from routine deck cleaning, bilgewater from properly functioning oily water separators, and ballast water. Some potential discharges are not incidental to the normal operation of a vessel. For example, intentionally adding used motor oil to the bilge tank will result in a discharge that is not incidental to the normal operation of a vessel. Furthermore, any discharge that results from a failure to properly maintain the vessel and equipment, even if the discharge is of a type that is otherwise covered by the permit, is not eligible for permit coverage. Discharges that are neither covered by this permit nor exempt from section 402 of the Clean Water Act must be covered under a separate individual or general permit.

Information on vessel discharges and ship operations was gathered from UNDS, MARAD, public comments solicited from the June 21, 2007, Federal Register notice available in the docket for the permit, and comments submitted in response to the proposed VGP. The discharges that were selected for coverage under the permit have been identified by EPA, in consultation with other Federal agencies, as discharges incidental to the normal operation of a vessel. EPA did not have a sufficient amount of time to independently investigate vessel operations and resulting discharges extensively. However, EPA has relied on the most accurate and up-to-date information available.

The following list identifies and describes each effluent stream eligible for coverage under the permit. The summaries are based on the Uniform National Discharge Standards technical development document for Phase I (UNDS), the technical analysis prepared by Battelle for the permit (the "Battelle Report"), and public comment. The Battelle Report is a technical report that examines the nature of vessel discharges, vessel discharges' effect on the environment, and describes some Best Management Practices that are available (Battelle, 2007). Both the UNDS technical development document and the Battelle report are available in the docket for this permit. The public comments are available in docket number EPA-HQ-OW-2008-0055. The docket is available at www.regulations.gov.

3.5.1.1 Deck Washdown and Runoff and Above Water Line Hull Cleaning

Deck runoff occurs from all vessels as a result of precipitation or deck cleaning. Above water line hull cleaning discharges occur when areas of the hull or other exterior portions of the vessel undergo regular cleaning. The constituents can include detergent, soap, and residues from any on-deck or above water line hull cleaning activity. Constituents and volumes of deck runoff vary widely and are highly dependent on a vessel's purpose, service, and practices. Deck runoff and above water line hull cleaning discharges eligible for coverage under the permit include those from all deck and bulkhead areas, associated equipment, and areas of the hull and exterior of the vessel above the water line.

3.5.1.2 Bilgewater

Bilgewater consists of water and other residue that accumulates in a compartment of the vessel's hull. The source of bilgewater is typically drainage from interior machinery, engine rooms, and from deck drainage. Constituents of bilgewater include seawater, oil, grease, volatile and semi-volatile organic compounds, inorganic salts, and metals.

3.5.1.3 Ballast Water

Ballast water is water taken onboard into ballast water tanks, and assists with vessel draft, buoyancy, and stability. Ballast water tanks are typically found only on commercial vessels. Discharge volumes and rates vary by vessel type, ballast tank capacity, and type of deballasting equipment. Typical cruise ships have a ballast capacity of 1,000 cubic meters (approximately 264,000 gallons) of water and can discharge at 250-300 cubic meters per hour. Cargo ships carry anywhere from 2,900 cubic meters (approximately 766,000 gallons) to 93,000 cubic meters (approximately 24,568,000 gallons) of water. Ballast water may contain rust inhibitors, flocculent compounds, epoxy coating materials, zinc or aluminum (from anodes), iron, nickel, copper, bronze, silver, and other material or sediment from inside the tank, pipes, or other machinery. Ballast water may also contain marine organisms that originate where the water is collected. When transported to non-native waters, these organisms may upset the environment or food web as "invasive species."

3.5.1.4 Anti-Fouling Leachate from Anti-Fouling Hull Coatings

Vessel hulls are often coated with antifouling compounds to prohibit the attachment and growth of aquatic life. Coatings are formulated for different conditions and purposes and many contain biocides. Those that contain biocides prevent the attachment of aquatic organisms to the hull by continuously leaching substances that are toxic to aquatic life into the surrounding water. While a variety of different ingredients may be used in these compounds, the most commonly used is copper. Copper can inhibit photosynthesis in plants and interfere with enzyme function in both plants and animals in concentrations as low as 4 µg/l. Additional releases of these substances are caused by hull cleaning activities, particularly if hulls are cleaned within the first 90 days following application.

A second metal-based biocide is organotin based, typically tributyltin (TBT), which was historically applied to vessel hulls. Due to its acute toxicity, there will be a zero discharge standard for TBT or any other organotin compound under this permit. TBT and other organotins

cause deformities in aquatic life, including deformities that disrupt or prevent reproduction. Numerous studies and several peer reviewed publications (Bentivegna & Piatkowski, 1998; Haynes & Loong, 2002; Negri et al., 2004; Negri & Heyward, 2001; Ruiz et al., 1995; V. Axiak et al., 1995) examine the environmental impacts of anti-foulant paint leachate containing tributyltin (TBT). TBT and other organotins are also stable and persistent, resisting natural degradation in water bodies.

3.5.1.5 Aqueous Film Forming Foam (AFFF)

AFFF is a synthetic firefighting agent consisting of fluorosurfactants and/or fluoroproteins. It serves as an effective firefighting agent by forming an oxygen-excluding barrier over an area. In order to produce AFFF, a concentrated solution of the foam forming agent is injected into the water stream of a fire hose. Vessels equipped with AFFF equipment must periodically (annually or semi-annually) test the equipment for maintenance, certification, or training purposes resulting in discharge overboard or onto the deck.

3.5.1.6 Boiler/Economizer Blowdown

Boiler blowdown occurs on vessels with steam propulsion or a steam generator to control anti-corrosion and anti-scaling treatment concentrations and to remove sludge from boiler systems. The blowdown involves releasing a volume of 1% – 10% of water from the boiler system, usually below the waterline.

3.5.1.7 Cathodic Protection

Vessels use cathodic protection systems to prevent steel hull or metal structure corrosion. The two types of cathodic protection are sacrificial anodes and impressed current cathodic protection (ICCP). Using the first method, anodes of zinc or aluminum are "sacrificed" to the corrosive forces of the seawater, which creates a flow of electrons to the cathode, thereby preventing the cathode from corroding. These sacrificial metals are then released to the aquatic environment. Using ICCP, a DC electrical current is passed through the hull such that the electrochemical potential of the hull is sufficiently high enough to prevent corrosion.

3.5.1.8 Chain Locker Effluent

Chain locker effluent is water that collects in the below-deck storage area during anchor retrieval. A sump collects the liquids and materials that enter the chain locker and discharges it overboard or into the bilge tank. Chain locker effluent can contain marine organisms and residue such as rust, paint chips, grease, and zinc.

3.5.1.9 Controllable Pitch Propeller and Thruster Hydraulic Fluid and other Oil to Sea Interfaces including Lubrication discharges from Paddle Wheel Propulsion, Stern Tubes, Thruster Bearings, Stabilizers, Rudder Bearings, Azimuth Thrusters, Propulsion Pod Lubrication, and Wire Rope and Mechanical Equipment Subject to Immersion.

Oil to Sea interfaces include any mechanical or other equipment where seals or surfaces may release small quantities of oil to the sea. Examples include controllable pitch propellers

(CPPs). CPPs are variably-pitched propeller blades used to change the speed or direction of a vessel and are used in addition to the main propulsion system. Hydraulic oil can leak from the CPP if the protective seals are worn or defective and large amounts may be discharged during maintenance and repair. Another example includes rudder bearings, which allow a vessel's rudder to turn freely and can be either grease-, oil-, or water-lubricated. An additional example is the stern tube. The stern tube is the casing or hole through the hull of the vessel through which the propeller shaft connects the engine of the vessel to the propeller. The propeller shaft and its supporting bearings require lubrication oil. Discharges can occur if the protective seals or bearings are not maintained and develop leaks or if they are damaged. Yet another example would be wire ropes and cables that have lubricated surfaces which contact the sea.

3.5.1.10 Distillation and Reverse Osmosis Brine

Discharges of brine can occur from onboard plants that distill seawater or utilize reverse osmosis (RO) to generate fresh water. Distillation effluent may be at elevated temperatures and may contain anti-scaling treatment, acidic cleaning compounds, or metals. RO effluent is concentrated brine.

3.5.1.11 Elevator Pit Effluent

Large vessels with multiple decks are equipped with elevators to facilitate the transportation of maintenance equipment, people, and cargo between decks. A pit at the bottom of the elevator shaft collects liquids and debris from elevator operations, and may include oil and hydraulic fluid. Pits can be emptied by gravity draining, discharge using the firemain, transfer to bilgewater systems, or containerized for onshore disposal.

3.5.1.12 Firemain Systems

Firemain systems draw in water through the sea chest to supply water for fire hose stations, sprinkler systems, or AFFF distribution stations. Firemain stations can be pressurized or non-pressurized and are often used for secondary purposes onboard vessels (e.g., deck and equipment washdowns, machinery cooling water, ballast tank filling). However, when used for secondary purposes that result in other incidental discharges listed in the permit, that discharge is regulated by the relevant effluent limitation associated with that activity (e.g., rinsing off the anchor chain).

3.5.1.13 Freshwater Layup

Seawater cooling systems condense low pressure steam from propulsion plant or generator turbines on some vessels. When a vessel is pierside or in port for more than a few days, the main steam plant is shut down and the condensers do not circulate. This can cause an accumulation of biological growth within the system; consequently, a freshwater layup is carried-out by replacing the seawater in the system with potable or surrounding freshwater (e.g. lake water). The freshwater remains stagnant for two hours before being blown overboard using pressurized air. After this, the condensers are considered flushed and are then refilled for the actual layup. After 21 days this fillwater is discharged and replaced and this is done on a 30-day cycle thereafter. Freshwater layup discharges residual saltwater, freshwater, tap water, and metals leached from the pipes or machinery into the environment.

3.5.1.14 Gas Turbine Water Wash

Gas turbines are used for propulsion and electricity generation. Occasionally, they must be cleaned to remove byproducts that can accumulate and affect their operation. These byproducts include salts, lubricants, and combustion residuals. The wastewater from the cleaning process may include cleaning compounds as well.

3.5.1.15 Graywater

Graywater is water from showers, baths, sinks, and laundry facilities. Graywater can contain high levels of pathogens, nutrients, soaps and detergents, and organics. Untreated graywater is much more likely to cause environmental impact when it is generated in large volumes (i.e., from cruise ships). Some vessels have the capacity to collect and store graywater for later treatment and disposal. Those that do not have graywater holding capacity continuously discharge it. For commercial vessels operating on the Great Lakes, graywater is included in the definition of sewage under CWA §312. Section 502(6)(A) of the CWA excludes sewage within the meaning of CWA section 312 from the definition of "pollutant." Hence, graywater discharges from commercial vessels on the Great Lakes are not regulated by this permit.

3.5.1.16 Motor Gasoline and Compensating Discharge

Motor gasoline is transported on vessels to operate vehicles and other machinery. As the fuel is used, ambient water is added to the fuel tanks to replace the weight. This ambient water is discharged when the vessel refills the tanks with gasoline or when performing maintenance and can contain residual oils. Most vessels are designed not to have motor gasoline and compensating discharge.

3.5.1.17 Non-Oily Machinery Wastewater

Non-oily machinery wastewater systems are intended to keep wastewater from machinery that contains no oil separate from wastewater that has oil content. Vessels can have numerous sources of non-oily machinery wastewater, including distilling plants start-up discharge, chilled water condensate drains, fresh and saltwater pump drains, potable water tank overflows, and leaks from propulsion shaft seals.

3.5.1.18 Refrigeration and Air Condensate Discharge

Condensation from cold refrigeration or evaporator coils of air conditioning systems drips from the coils and collects in drip troughs which typically channel to a drainage system. Condensate discharge may contain detergents, seawater, food residue, and trace metals.

3.5.1.19 Seawater Cooling Overboard Discharge (Including Non-Contact Engine Cooling Water, Hydraulic System Cooling Water, Refrigeration Cooling Water)

Seawater cooling systems use ambient water to absorb the heat from heat exchangers, propulsion systems, and mechanical auxiliary systems. The water is typically circulated through an enclosed system that does not come in direct contact with machinery, but still may contain sediment from water intake, traces of hydraulic or lubricating oils, and trace metals leached or

eroded from the pipes within the system. Additionally, because it is used for cooling, the effluent will have an increased temperature.

3.5.1.20 Seawater Piping Biofouling Prevention

Vessels that utilize seawater cooling systems introduce anti-fouling compounds (e.g., sodium hypochlorite) in their interior piping and component surfaces to inhibit the growth of fouling organisms. These anti-fouling compounds are then typically discharged overboard.

3.5.1.21 Boat Engine Wet Exhaust

Large vessels covered by the permit often have several small boats onboard. Small boat engines use ambient water that is injected into the exhaust for cooling and noise reduction purposes. This wet engine exhaust can contain numerous pollutants when discharged.

3.5.1.22 Sonar Dome Discharge

Water is used to maintain the shape and pressure of domes that house sonar detection, navigation, and ranging equipment. Discharges occur when the water must be drained for maintenance or repair or from the exterior of the sonar dome.

3.5.1.23 Underwater Ship Husbandry Discharges

Underwater ship husbandry is grooming, maintenance, and repair activities of hulls or hull appendages completed while the vessel is located in the water, including hull cleaning, hull repair, fiberglass repair, welding, sonar dome repair, non-destructive testing, masker belt repairs, and painting operations. Underwater ship husbandry discharges are considered incidental to the normal operation of a vessel when ships are maintained in proper operating order and the cleaning is done on a reasonable schedule. For drydock and other large cleaning activities, once every few years may be considered a reasonable schedule.

3.5.1.24 Welldeck Discharges

The welldeck is a floodable platform used for launching or loading small satellite vessels, vehicles, and cargo. Welldeck discharges may include water from precipitation, welldeck and storage area washdowns, equipment and engine washdowns, and leaks and spills from stored machinery.

3.5.1.25 Graywater Mixed with Sewage from Vessels

Depending on how the vessel is designed, graywater and sewage may be combined into one effluent stream. Discharges of graywater that contain sewage are eligible for coverage under this permit (except for commercial vessels in the Great Lakes) and must meet the discharge limitation requirements under Part 2, as well as any requirements applicable to sewage, although these are not contained in this permit.

3.5.1.26 Exhaust Gas Scrubber Washwater Discharge

Exhaust gas scrubber washwater discharge (EGS washwater discharge) occurs as a result of operating or cleaning the exhaust gas cleaning systems (e.g. scrubbers) for marine diesel engines. After the washing solution is returned from the scrubber, the washwater can be either treated and discharged overboard, or alternatively, it can be piped to a clean bilge water tank or other suitable holding tanks. While many of the captured contaminants (sludge) are transferred to the vessel's sludge tank, the constituents of EGS washwater discharge can include residues of nitrogen oxides (NOx), sulfur oxides (SOx) and particulate matter (PM) emissions captured by the scrubbers. EGS washwater discharge can also contain traces of oil, polycyclic aromatic hydrocarbons (PAHs), heavy metals and nitrogen. Depending on the geographic location of the EGS washwater discharge, the pH level and turbidity of the receiving water may be altered.

3.5.2 Discharge Types Specifically Not Authorized By This Permit

EPA has identified several discharge types that would not be authorized by this permit because, among other things, the discharge is not within the scope of the current 40 CFR 122.3(a) exclusion or not within the scope of EPA's NPDES permitting authority.

3.5.2.1 Discharges not Subject to Former NPDES Permit Exclusion including Vessels Being Operated in a Capacity other than as a Means of Transportation

This permit is in response to the vacatur of the NPDES permit exclusion set out in 40 CFR 122.3(a). Any discharge that was not subject to that exclusion as of December 18, 2008, would not be authorized under the permit. The date of December 18, 2008 is the day before the date of the vacatur of the regulatory exclusion.

The regulatory exclusion does not apply when the vessel is operating in a capacity other than as a means of transportation. Vessels that are not being operated in the capacity of a means of transportation include vessels being used as energy or mining facilities, storage facilities, seafood processing facilities, or vessels that are secured to a storage facility or a seafood processing facility, or when secured to the bed of the ocean, contiguous zone, or water of the United States for the purpose of mineral or oil exploration or development. Similarly, vessels, when in drydock, also do not operate in a capacity as a means of transportation. Vessels that operate in a capacity other than as a means of transportation generally have not been excluded from NPDES permitting under 40 CFR Part 122.3(a).

"Floating" craft that are permanently moored to their piers, such as "floating" casinos, hotels, restaurants, bars, etc. are not covered by the current vessel exclusion and thus would not be covered by the vessel permit. These structures are outside the scope of the 40 CFR Part 122.3(a) exclusion because they operate "in a capacity other than as a means of transportation." They are best characterized as casinos, hotels, restaurants, bars, etc. that happen to be located on water instead of land, much like, for example, the water-based storage facilities mentioned in 122.3(a) as being outside the scope of the exclusion.

With respect to vessels under construction, when the vessel is engaged in sea trials which result in operational discharges, because testing is a critical part of vessel operation, such discharges would be incidental to the normal operation of a vessel, and thus eligible for coverage

under this VGP. However, any discharges resulting from construction activities are not covered by the VGP as they are incidental to vessel construction, not vessel operation. With respect to vessels engaged in dredging operations, the resulting discharges of dredged or fill material generated by their dredging activity is covered by a CWA § 404 permit or MPRSA ocean dumping permit, and such discharges are excluded from CWA § 402 permitting. The incidental discharges (e.g. graywater, bilgewater) coming from the dredging vessels themselves are eligible for coverage under this permit (because they move as they dredge and thus are still operating as a means of transportation), but, the industrial-like activity from these vessels is covered by a CWA § 404 permit or MRPSA ocean dumping permit and by statute is not subject to the requirement for a § 402 permit.

3.5.2.2 Sewage from Vessels

The definition of "pollutant" in the Clean Water Act 502(6)(A) specifically excludes "'sewage from vessels' within the meaning of [Section 312 of the Clean Water Act]." These discharges are instead regulated under section 312 of the CWA.

3.5.2.3 Used or Spent Oil

The discharge of used or spent oil no longer being used for its intended purpose is not eligible for coverage under the permit. This also prohibits the discharge of used or spent oil by adding it to a discharge stream that is otherwise eligible for coverage under the permit.

Discharges of small amounts of oil incidental to the normal operation of a vessel are permissible provided appropriate effluent limits are met, including that oil is not discharged in quantities that are harmful, pursuant to 40 CFR Part 110.3. See the discussion of limitations for specific waste streams in Part 4 of this fact sheet below.

3.5.2.4 Rubbish, Trash, Garbage or Other Materials Discharged Overboard

Rubbish, trash, garbage or other materials discharged overboard are not eligible for coverage under the permit because such materials are not subject to the 40 CFR 122.3(a) exclusion. As stated in VGP Part 1.2.3.4, "garbage" includes bulk dry cargo residues, as defined by USCG regulations (33 C.F.R. 151.66 (see, 73 Fed. Reg. 56492 (September 29, 2008)) and agricultural cargo residues (e.g., residue from agricultural cargo carried in bulk, such as corn, wheat, rice, soybeans, and grains (see, H. Rept. 107-777 at pg 90 (November 13, 2002)), Thus discharges of such residues are outside the scope of this permit.

3.5.2.5 Photo Processing Waste

Photo processing waste includes a wide variety of compounds, such as ammonia, sulfuric acid, and silver. It is not eligible for coverage under the permit; it is generated in small quantities and can be held for proper disposal onshore.

3.5.2.6 Effluent from Dry Cleaning Operations

Tetrachloroethylene, also known as TCE, perchloroethylene, or PERC, is a highly toxic substance primarily used by the dry cleaning industry. When humans are exposed to TCE it can

cause dizziness, headache, nausea, nervous system problems, unconsciousness, and death. It is a probable human carcinogen. TCE is toxic at low levels and can contaminate soil and water. TCE discharges associated with dry-cleaning activities on vessels are not eligible for coverage under the permit because they are not incidental to the normal operation of a vessel.

3.5.2.7 Discharges of Medical Waste and Related Materials

The discharge of medical waste as defined in 33 U.S.C. 1362(20), spent or unused pharmaceuticals, formaldehyde or other biohazards no longer being used for their intended purposes are not eligible for coverage under this permit. EPA considers these discharges as not being subject to the NPDES permit exclusion. For purposes of this permit, the liquid produced by dialysis treatment of humans is not deemed to be "medical waste," and, like other human body waste (i.e., sewage), is exempt from NPDES permitting under 33 U.S.C. 1362(6). Like other sewage, this liquid is regulated, however, under VGP Part 2.2.6 if added to a blackwater system combined with a graywater system and is otherwise subject to the requirements of 33 U.S.C 1322 and its implementing regulations. . The direct overboard discharge of such liquid without treatment is not authorized by the VGP.

3.5.2.8 Discharges of Noxious Liquid Substance (NLS) Residues

The permit does not authorize the discharges of noxious liquid substance (NLS) residues subject to 46 CFR 153.1102. Under 46 CFR 153.1102, discharges of NLS residues are either prohibited or, if allowable, may only take place at sea at least 12 nautical miles from the nearest shore. In light of this, the permit does not authorize such discharges within waters subject to the permit (i.e., inland waters and the waters of the 3 mile territorial sea). The relevant Coast Guard definition of the term "noxious liquid substance" (see 46 CFR 153.2) is set out in the definition section of the permit.

3.5.2.9 Tetrachloroethylene (perchloroethylene) degreasers

Any degreasers containing TCE are not authorized for discharge into waters subject to this permit. For the proposed permit, EPA specifically solicited comments on whether uses of TCE other than from dry cleaning operations should be explicitly included or excluded from permit coverage. TCE can also be found in cleaning and degreasing products. Several comments received in the public comment period supported EPA not authorizing the discharge of tetrachloroethylene because of its highly toxic nature. EPA has compared the cost of TCE degreasers to products not containing TCE and determined that other viable products are available and use of those products is economically practicable and achievable. This analysis is available in the economic analysis found in the docket for this permit.

3.5.2.10 Discharges Currently or Previously Covered by Another Permit

Any vessel discharge that is currently or has previously been covered by either an individual NPDES permit or another general NPDES permit is not eligible for coverage under the permit. The vessel general permit is not intended to supplant or replace any current or previous NPDES permit.

3.6 PERMIT COMPLIANCE (PART 1.4)

Part 1.4 of the permit is intended to inform the permittee of the potential consequences of failure to comply with the conditions of the permit. Part 1.4 explains that any failure to comply with the conditions of the permit constitutes a violation of the Clean Water Act. Also applicable to all permittees is the standard NPDES permit condition for the "duty to comply" (see 40 CFR 122.41(a)). Where requirements and schedules for taking corrective actions are included, the time intervals are not grace periods, but are schedules considered reasonable for making repairs and improvements. For provisions specifying a time period to remedy noncompliance, the initial failure, such as a violation of a numeric or non-numeric effluent limit, constitutes a violation of the VGP and the Clean Water Act (unless specifically otherwise stipulated), and subsequent failure to remedy such deficiencies within the specified time periods constitutes an independent, additional violation of the permit and the CWA.

As provided in Part 1.1 of the VGP, the permit allows additional time (60 days) for permittees to come into compliance with inspection, training, recordkeeping, and reporting requirements to address concerns by the regulated community that such time was necessary to put compliance procedures in place. Note that this provision does not apply to inspection, training, recordkeeping and reporting conditions that are required to be in all NPDES permits under 40 CFR 122.41 (see Part 1.13 of the permit), and does not apply to any such conditions resulting from state 401 certifications or CZMA review contained in Part 6 of the Permit.

3.7 AUTHORIZATION UNDER THE PERMIT (PART 1.5)

3.7.1 No Requirement to Submit a Notice of Intent (NOI) for Certain Vessels

Under 40 CFR § 122.28 (b)(2)(v), some dischargers may, at the discretion of the Director, "be authorized to discharge under a general permit without submitting a notice of intent where the Director finds that a notice of intent requirement would be inappropriate." In making such a determination, the Director must consider: the type of discharge; the expected nature of the discharge; the potential for toxic and conventional pollutants in the discharges; the expected volume of the discharges; other means of identifying discharges covered by the permit; and the estimated number of discharges to be covered by the permit. Based on consideration of these regulatory factors, EPA is exercising its discretion and not requiring operators of certain vessels to submit NOIs: namely, those that are smaller than 300 gross tons, and do not have the capacity to carry more than 8 cubic meters (2113 gallons) of ballast water. The reasons for this approach are explained below:

EPA estimates that there are approximately 69,000 vessels that may be covered by the permit. The size of the permitted universe means that this permit will cover one of the highest numbers of dischargers among any of the general NPDES permits issued by either EPA or any State. To require all these vessels to submit an NOI would be an extremely large administrative burden. In general, the use of NOIs for most point sources provides permitting authorities with useful information to assist in oversight and enforcement of permittees, such as the specific location of the facility and its discharge. However, because vessels are mobile point sources that

do not operate from a fixed location and may discharge to multiple receiving waters, the usefulness of requiring the entire universe of point sources covered by this general permit to submit NOIs is questionable.

In order to determine which vessels would appropriately be required to submit NOIs, EPA looked at the universe of vessels that would be covered by this permit and found a logical break between larger and smaller vessels, based on the types of discharges from these vessels, the variety of discharges containing conventional and toxic pollutants, and the volume and nature of those discharges. The volume of the discharges incidental to the normal operation of the vessel is expected to vary proportionately to the size of the vessel. Larger vessels will each individually have a greater volume of discharge and are more likely to have greater volume of discharges of concern (i.e., graywater and antifoulant leachate). The expected volume of discharges for large vessels is significant for each individual vessel. For instance, a container ship can discharge thousands of cubic meters (millions of gallons) of ballast water; pounds of anti-foulant leachate, and significant quantities of bilgewater. Cruise ships have the potential to discharge large volumes of graywater due to the sizeable on-board ship populations, in addition to other discharges typical of such large vessels (for example, ballast water, bilge water, etc.). Therefore, larger vessels are far more likely to discharge larger quantities of toxic and conventional pollutants than smaller vessels due to a number of factors including the range of constituents in the discharge. EPA expects that smaller commercial vessels will have a smaller range of discharge types than larger commercial vessels. Some of the typical discharges eligible for coverage under the permit are nearly ubiquitous for most vessels, including deck runoff, bilge water, and leachate from anti-foulant hull coatings. However, larger commercial vessels have a greater range of discharges which will be of greater volume. Thus, the limited range of discharge types from smaller vessels and the reduced likelihood for the introduction of significant quantities of toxic and conventional pollutants make requiring an NOI for these vessels to be of little value at this time. In addition, EPA has access to other sources of data available for identifying discharges from vessels covered by the permit, including state registration information, MARAD vessel calls, U.S. Coast Guard registration and customs records, and data from the National Ballast Water Information Clearinghouse (NBIC). From these sources, EPA can obtain information from which we can deduce the nature of ship and boat discharges from these smaller vessels.

Based on the analysis outlined above, EPA has determined that it would be inappropriate to require smaller commercial vessels to provide information about their discharges through submission of an NOI. The cutoff for submission of an NOI of 300 or more gross tons is consistent with U.S. Coast Guard requirements, including those for environmental pollution control (33 CFR 155.320), Automatic Identification System (AIS) carriage requirements (33 CFR 164.46), port security requirements, fuel oil and bulk lubricating oil discharge containment requirements (33 CFR 155.320), and requirements for radar observers and chief engineers (33 CFR 15.820 and 33 CFR 15.820).

The criterion of vessels equipped to hold or discharge more than 8 cubic meters of ballast water was established for two reasons. First, as of this time, there is not a method by which EPA can predict invasions from any vessel source. However, the greater the number of viable organisms released into the receiving water, the greater the propagule pressure, which increases the risk for a successful invasion by an aquatic nuisance species. The volume of water discharged

likely correlates to the number of organisms discharged; hence, lower volumes of water should contain fewer potential organisms which can successfully establish themselves. A vessel that carries and discharges 2500 cubic meters of ballast water poses a greater risk to receiving waters than the vessel that carries 5 cubic meters. Therefore, the greater the volume of ballast water discharge, the greater the likelihood of creating enough propagule pressure to result in an enhanced risk of the spread of aquatic nuisance species. Secondly, the 8 cubic meter threshold is generally consistent with provisions in the recent International Convention for the Control and Management of Ships' Ballast Water and Sediments (2004) providing for an "equivalent compliance regime" for certain vessels in lieu of compliance with all provisions of the treaty. Hence, this is a recognized standard among mariners.

In addition, because of the large number of vessels that will be required to submit NOIs and the number of discharges from those vessels, the permit includes provisions that delay submission of an NOI for a six to nine month period after the permit is issued for those vessels for which an NOI is required. This will provide EPA with time to develop an appropriate and effective electronic system to receive and process NOIs for this new universe of NPDES permittees. Prior to submitting NOIs, these vessels will automatically be covered under this permit and will be required to comply with all of the applicable terms and conditions of the permit. This authorization will expire after the time period to submit NOIs has expired (see Part 3.8.2 of this Fact Sheet, entitled "How to Obtain Authorization") if the operator has not submitted a valid NOI.

3.7.2 How to Obtain Authorization (Part 1.5.1)

To obtain authorization under the permit, operators must meet the Part 1.2 eligibility requirements and, if required by Part 1.5.1.1 of the permit, submit a complete and accurate NOI according to the requirements in Appendix E (Part 10 in the Permit), no later than 9 months after the permit effective date.

Part 1.5.1.1 describes which operators of a vessel are required to submit an NOI, and Table 1 sets out the timeframes within which an NOI must be submitted. An operator is required to submit an NOI for its vessel if the vessel meets either of the following two criteria:

- The vessel is greater than or equal to 300 gross tons, or
- The vessel has the capacity to hold or discharge more than 8 cubic meters (2113 gallons) of ballast water.

3.7.2.1 Owner/Operators Required to Submit NOIs (Part 1.5.1.1)

Owner/operators required to submit an NOI for their vessel must submit an NOI in accordance with Table 1 of the permit. When completing the NOI form, the owner/operator is asked to select which discharge types the vessel is likely to produce. All discharges covered by the permit will be covered for the vessel, even if the owner/operator does not select all discharges. The form will allow EPA to better understand which vessel types typically produce which discharges, but will not limit permit coverage for the vessel owner/operator as long as the vessel is in compliance with the permit requirements. Table 1 specifies applicable deadlines for different categories of operators to submit NOIs. For vessels delivered to the owner/operator on

or before September 19, 2009, an NOI must be submitted between six months and nine months after the effective date of this permit. Upon permit issuance, these vessels are covered, but this coverage will not extend beyond September 19, 2009, unless owner/operators of these vessels submit NOIs prior to that time. for review of the NOI after posting on EPA's website for these existing vessels. A 30-day delay could allow EPA the option to review submitted NOIs for completeness and compliance with the permit before long-term coverage was granted and would be a logical time for EPA to require an individual permit application where necessary. However, for the initial issuance of the permit, EPA is anticipating that tens of thousands of NOIs will be submitted immediately upon completion of the eNOI system. Currently, it is infeasible for EPA to review such a large number of NOIs in such a limited timeframe. Making long-term coverage effective on the date the NOI is received will ensure that vessels are provided with continuous permit coverage once NOI submission is required. All NOIs will be made available for public review through posting on the internet. EPA may request that the owner/operator seek coverage under Part 1.8 of the permit (Alternative Permits) if appropriate.

When the ownership or operation of a vessel that is already covered under this permit is transferred, the new owner/operator must submit to EPA an NOI for the vessel by the date of transfer. The new NOI then becomes effective on the date the transfer takes place, or on the date EPA receives the NOI, whichever is later.

For new vessels delivered to the owner/operator after September 19, 2009, the deadline for submission of an NOI is no later than 30 days before the vessel will discharge into waters subject to this permit. Because this is likely to include a limited number of vessels, the discharge authorization date for these vessels is 30 days after the complete NOI is received by EPA, in order to give EPA time to review those NOIs, as discussed above.

For existing vessels delivered to the owner/operator after September 19, 2009, that were not previously covered under this permit, the deadline for submission of an NOI is no later than 30 days before the vessel will discharge into waters subject to this permit. The discharge authorization date for these vessels is 30 days after the complete NOI is received by EPA, in order to give EPA time to review those NOIs, as discussed above.

Based on a review of the NOI or other information, EPA may delay the authorization of the owner/operator's discharge or may deny coverage under the permit and require submission of an application for an individual NPDES permit, as detailed in Part 3.10.1. EPA will notify the owner/operator in writing of any such delay or the request for submission of an individual NPDES permit application. For existing vessels covered under this general permit at the time it is issued, EPA will allow a reasonable time period to obtain alternate permit coverage before coverage under this permit is terminated.

3.7.2.2 Owner/Operators Not Required to Submit NOIs (Part 1.5.1.2)

An operator of a vessel is not required to submit an NOI pursuant to Part 1.5.1.2 of the permit if the vessel is less than 300 tons and does not have the capacity to hold or discharge more than 8 cubic meters of ballast water. Owner/operators that are not required to submit an NOI would automatically receive coverage under the permit for their vessel and would be authorized to discharge in accordance with the permit requirements. Nonetheless, EPA emphasizes that

these owner/operators would still be subject to all applicable requirements contained within the permit. If an owner/operator not required to submit an NOI wishes EPA to consider alternative permit requirements for the vessel, he or she must apply to EPA for a substitute permit applicable to his or her vessel as required by Part 1.8 of the permit (Alternative Permits).

3.7.3 Continuation of the Permit (Part 1.5.2)

If the permit is not reissued or replaced prior to its expiration date, existing dischargers will continue to be covered under an administrative continuance, in accordance with section 558(c) of the APA and 40 CFR 122.6. The current permit will remain in effect for discharges that were covered prior to expiration until EPA acts on a permit renewal. If coverage is provided to a permittee prior to the expiration date of the permit, the permittee would automatically be covered by the permit until the earliest of: (1) the authorization for coverage under a reissuance or replacement of the permit, following timely and appropriate submittal of a complete NOI, if required; (2) submittal of a Notice of Termination; (3) issuance or denial of an individual permit for the permittee's discharges; or (4) formal permit decision by EPA not to reissue the general permit, at which time EPA will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit.

EPA has followed this approach in order to extend coverage for these permittees under a permit vehicle until re-issuance of the permit or coverage under some other permit. For more information, see 40 CFR 122.6. EPA does not have the authority to provide coverage to "new" vessels seeking coverage under an expired permit (i.e., vessels that were not covered under the permit prior to expiration).

3.8 TERMINATING COVERAGE (PART 1.6)

3.8.1 Submitting a Notice of Termination (NOT) (Part 1.6.1.1)

Part 1.6.1 of the permit encourages those permittees that are required to submit NOIs to use the eNOI system to file NOTs. If a permittee who is required to submit an NOI wishes to terminate coverage under the proposed permit, he/she must submit a NOT in accordance with Appendix F. The permittee's authorization to discharge under the permit terminates at 11:59 pm on the day that a complete NOT is processed and posted on EPA's website (www.epa.gov/npdes/vessels/eNOI). However, the NOT is invalid and the permittee must continue to comply with the permit if none of the conditions identified in Part 1.6.2 are met. The permittee has a continuing responsibility for the discharges from its vessel until the NOT is submitted and processed by EPA. See below for a more detailed discussion of Part 1.6.2.

3.8.2 When to Submit a Notice of Termination (Part 1.6.1.2 and Part 1.6.2)

3.8.2.1 Terminating Coverage for Vessels Required to Submit an NOI

If a permittee was required to submit an NOI, and subsequently meets one of the conditions identified in Part 1.6.1.2, he/she must submit an NOT, preferably to the eNOI system. An NOT is required to be submitted within 30 days after one or more of the following conditions has been met: (1) a new owner or operator has assumed responsibility for the vessel; (2)

operation of the vessel has permanently ceased in waters subject to this permit and there are no longer vessel discharges; or (3) permit coverage has been obtained under an individual or alternative general permit for all discharges requiring NPDES permit coverage, unless the permittee is directed by EPA to obtain this coverage. EPA uses the term 'permanently ceased' in this context to mean that the vessel owner/operator does not intend to resume operations in waters subject to this permit during the permit term. A vessel owner is not required to submit an NOT every time the vessel leaves waters subject to this permit if the vessel may return to waters subject to this permit during the permit term. This allows a vessel to maintain coverage under the permit, as long as the permit's terms and conditions continue to be met when the vessel is operating in waters subject to this permit.

The permittee's authorization to discharge under the permit terminates at 11:59 pm on the day that a complete NOT is posted on EPA's website (www.epa.gov/npdes/vessels/enoi). However, even if the NOT has been posted on the website, the NOT is invalid and the permittee must continue to comply with the permit if none of the conditions identified in Part 1.6.2 are met. The permittee has a continuing responsibility for the discharges from its vessel until a compliant NOT is submitted to EPA and posted on EPA's website.

3.8.2.2 Terminating Coverage for Vessels not Required to Submit an NOI

If a vessel owner/operator is not required to submit an NOI, the vessel's permit coverage is automatically terminated if: (1) a new owner or operator has assumed responsibility for the vessel; (2) operation of the vessel has permanently ceased in waters subject to this permit and there are no longer vessel discharges; or (3) permit coverage has been obtained under an individual or alternative general permit for all discharges requiring NPDES permit coverage.

3.9 CERTIFICATION (PART 1.7)

Today's permit contains a requirement that any person signing the NOI, NOT, and any reports (including any monitoring data) submitted to EPA, in accordance with the permit must include the certification statement available in Part 1.7. This certification statement includes an additional sentence than has not been included in previous EPA issued NPDES general permits. The sentence reads: "I have no personal knowledge that the information submitted is other than true, accurate, and complete." EPA believes this addition to the certification language is necessitated by the recent decision in *U.S. v. Robison*, 505 F.3d 1208 (11th Cir. 2007). In *Robison*, the Court of Appeals struck down the defendant's conviction for a false statement on the grounds that the certification language did not require him to have personal knowledge regarding the truth or falsity of the information submitted to EPA. Rather, the court reasoned that EPA's certification required the defendant to certify, in part, that he made an inquiry of the persons who prepared and submitted the information and based on that inquiry, the information was accurate to the best of his knowledge. The court further reasoned that there is no requirement in the certification that the person attest to his personal knowledge regarding the information submitted. The government had argued at trial that the defendant had personal knowledge that the facility had committed violations. As a result, EPA feels it is necessary to include language which clarifies that the signatory is certifying that he or she has no personal knowledge that the information submitted is other than true, accurate, and complete.

3.10 ALTERNATIVE PERMITS (PART 1.8)

3.10.1 EPA Requiring Coverage under an Alternative Permit (Part 1.8.1)

Pursuant to 40 CFR 122.28(b)(3), EPA may require a discharger to apply for and obtain an individual permit instead of obtaining coverage under the general permit. These regulations also provide that any interested party may petition EPA to take such an action. The issuance of an individual permit will be in accordance with 40 CFR Part 124 and provide for public comment and appeal of any final permit decision. The circumstances in which such an action would be taken are set forth at 40 CFR 122.28(b)(3).

3.10.2 Permittee Requesting Coverage under an Alternative Permit (Part 1.8.2)

After issuance of the permit, the permittee may request to be excluded from such coverage by applying for an individual permit. In such a case, the permittee must submit an individual permit application, no later than 90 days after the date of publication of final permit in the Federal Register, in accordance with 40 CFR 122.28(b)(3)(iii), along with a statement of reasons supporting the request, to the applicable EPA Regional Office listed in Part 7 of this permit. The request may be granted by issuance of an individual permit or authorization of coverage under an alternative general permit if the reasons are adequate to support the request. Under this scenario, if an individual permit is issued, or authorization to discharge under an alternative NPDES permit is granted, your authorization to discharge under this permit is automatically terminated under 40 CFR 122.28(b)(3)(iv) on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit.

3.11 PERMIT REOPENER CLAUSE (PART 1.9)

This permit contains a re-opener clause allowing the permit to be re-opened and modified during the term of the permit, consistent with the Federal regulations at 40 CFR sections 122.62, 122.63, 122.64, and 124.5. Among other things, under 40 CFR 122.62 permit modification may result if new information, not available at the time of permit issuance, is received that would have justified the application of different permit conditions at the time of issuance. As discussed elsewhere in this fact sheet (section 4.4.3.5), due to the current unavailability of reliable and demonstrated ballast water treatment technologies for use on ships, the requirements for ballast water discharges in this permit primarily rely on use of ballast water exchange and/or saltwater flushing of ballast tanks. Although ballast water treatment technologies are still in the developmental stage, some of these technologies might become available for installation on board vessels during the term of the permit. EPA will continue to consider the availability of ballast water treatment technologies over the life of this permit, including consideration of ballast water technology reviews conducted under the auspices of the International Maritime Organization and activities by the U.S. Coast Guard, National Oceanic and Atmospheric Administration, and others in the evaluation or demonstration of ballast water technologies. Should such new information show that ballast water treatment technologies, which are at least as effective as ballast water exchange, have become commercially available for installation on ships, EPA may determine this to be new information justifying modification of the permit under 40 CFR 122.62(a)(2).

3.12 OCEAN DISCHARGE CRITERIA

The Ocean Discharge Criteria (40 CFR Part 125, Subpart M) establish regulations for issuance of NPDES permits for discharges into the territorial seas, the contiguous zone and the ocean as these terms are defined in the CWA. The permit includes coverage of vessels operating as a means of transportation when within the territorial seas. It thus is subject to the Ocean Discharge Criteria regulation with respect to discharges incidental to the normal operation of such vessels into the territorial seas. For purposes of this evaluation, the territorial seas means the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles (33 U.S.C. 1362(8)).

Under 40 CFR 125.123(a), if EPA, on the basis of available information determines prior to permit issuance that the discharges authorized will not cause unreasonable degradation of the marine environment, EPA may issue an NPDES permit, which may be conditioned as necessary to assure that the discharge will not cause unreasonable degradation. The regulations (40 CFR 125.121(e)) define unreasonable degradation of the marine environment as meaning:

1. Significant adverse changes in ecosystem diversity, productivity and stability of the biological community within the area of discharge and surrounding biological communities,

2. Threat to human health through direct exposure to pollutants or through consumption of exposed aquatic organisms, or

3. Loss of aesthetic, recreational, scientific or economic values which is unreasonable in relation to the benefit derived from the discharge.

The Ocean Discharge Criteria require that EPA consider a number of factors in the determination of the degree of degradation to the marine environment. These factors include the amount and nature of the pollutants, the potential transport of the pollutants, the character and uses of the receiving water and its biological communities, the existence of special aquatic sites (including parks, refuges, etc.), any applicable requirements of an approved Coastal Zone Management plan, and potential impacts on water quality, ecological health and human health and any other factors the Administrator deems appropriate. 40 C.F.R. 125.122(a). In addition, the Ocean Discharge Criteria establish a presumption that discharges in compliance with state water quality standards will not cause unreasonable degradation with respect to the pollutants subject to those standards. 40 C.F.R. 125.122(b). After consideration of the Ocean Discharge Criteria, EPA has determined that the discharges authorized by the NPDES permit into the territorial seas in accordance with permit requirements will not cause unreasonable degradation of the receiving waters.

The discharges authorized by the permit are limited to those discharges incidental to the normal operation the vessel, and except for ballast water and graywater from cruise ships, typically will be of limited volumes. In addition, because vessels in the territorial seas are likely to be underway as part of their voyage, any discharges incidental to their normal operation would typically be well-mixed upon discharge before they are subject to further dispersal and transport beyond the area of the vessel's operation.

In the case of ballast water, the permit contains conditions (Part 2.2.3 of the permit) related to exchange of ballast water and saltwater flushing of empty ballast tanks beyond the outer limits of the territorial seas to reduce the risk of introduction of invasive species resulting from vessel discharges to waters of the United States within the territorial seas. EPA believes that these controls will prevent unreasonable degradation of the marine environment. With respect to graywater from cruise ships, the permit also includes (Parts 5.1 and 5.2 of the permit) additional conditions to reduce the impacts of graywater discharges to acceptable levels. EPA believes that these provisions will prevent unreasonable degradation of the marine environment.

In developing the permit, the Agency has taken into consideration that discharges incidental to the normal operation of vessels are subject to the permit have the potential to be contaminated with oil or other potentially persistent or bioaccumulative pollutants. The permit therefore contains a number of best management practices intended to avoid or reduce the potential for such contamination (e.g., section 2.1). In addition, the permit requires (section 2.1.5) compliance with all federal environmental laws that establish controls on oily or hazardous discharges, including among others, CWA section 311 (33 U.S.C. 1321), the Act to Prevent Pollution from Ships (33 U.S.C. 190-1915), the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 *et seq.*), and the Oil Pollution Control Act , 33 U.S.C. 2701-2761. EPA believes that these controls will prevent unreasonable degradation of the marine environment.

The Agency also has taken into account the biological communities and receiving waters that would be exposed to the discharges incidental to the normal operation of vessels that will be authorized by the permit. This consideration has necessarily been complicated by the fact that vessels have the potential to traverse vast distances in the territorial sea while discharging. The Agency has taken an approach of identifying potentially sensitive areas in which vessels may operate and providing for additional controls when discharges occur in such areas. In addition to requiring compliance with marine sanctuaries provisions of the National Marine Sanctuaries Act (16 U.S.C. 1431 et seq.) and implementing regulations found at 15 C.F.R. Part 922 and 50 C.F.R. Part 404 (Part 2.1.5), the permit includes other conditions to impose additional controls and requirements on covered discharges in sensitive receiving waters (Part 2.3 of the permit). EPA has also determined that issuance of this permit will not adversely affect essential fish habitat (see 12.3 of this Fact Sheet).

Finally, this permit applies to discharges to the outer limit of the three mile territorial sea. State water quality standards also apply within these waters and the permit thus contains effluent limitations as necessary to meet those applicable water quality standards (Parts 2.3 and 6 of the Permit). In addition, EPA has requested states' certifications under section 401 of the Clean Water Act, and requested concurrence on EPA's consistency determination for this permit from state coastal management agencies, in accordance with section 307(c) of the Coastal Zone Management Act (CZMA). Additional conditions have been incorporated into Part 6 of the permit, pursuant to CWA section 401, CZMA section 307(c), and implementing regulations. Under 40 C.F.R. 125.122(b), EPA presumes that discharges in compliance with state water quality standards will not to cause unreasonable degradation of the marine environment with respect to specific pollutants or conditions specified in such standards.

In light of the foregoing, EPA has determined that issuance of the permit will not cause:

1. Significant adverse changes in ecosystem diversity, productivity and stability of the biological community within the area of discharge and surrounding biological communities,
2. Threat to human health through direct exposure to pollutants or through consumption of exposed aquatic organisms, or
3. Loss of aesthetic, recreational, scientific or economic values which is unreasonable in relation to the benefit derived from the discharge.

Accordingly, in accordance with 40 CFR 125.123(a), the Agency has determined that issuance of the permit with the controls included will not cause unreasonable degradation of the marine environment.

3.13 OTHER CONDITIONS (PARTS 1.11, 1.12, AND 1.13)

This permit contains savings clauses which state that nothing in the permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by section 510 of the Clean Water Act or applicable requirements or prohibitions under other provisions of Federal law or regulations. In addition, Federal regulations require that the standard permit conditions provided at 40 CFR 122.41 be applied to all NPDES permits As provided by the introductory text of 40 CFR 122.41 and the regulation at 40 CFR 122.43(c), all of the standard permit conditions published in federal regulations at 40 CFR 122.41 (2008) are incorporated into the permit by reference. The permit requires permittees to comply with all applicable standard conditions.

4. EFFLUENT LIMITATIONS

4.1 BACKGROUND

The Clean Water Act (CWA) requires that all point source discharges must meet technology-based effluent limitations representing the applicable levels of technology-based control. Water quality-based effluent limitations (WQBELs) are required as necessary where the technology-based limitations are not sufficient to meet applicable water quality standards (WQS). See *P.U.D. No. 1 of Jefferson County et al. v. Washington Dept. of Ecology*, 511 U.S. 700, 704 (1994). Water quality-based requirements will be discussed in greater depth in Section 4.3. Both technology-based and water quality-based effluent limitations are implemented through NPDES permits containing such limitations issued to point sources. CWA sections 301(a) and (b).

4.1.1 The Clean Water Act Requires EPA to Develop Effluent Limitations that Represent the Following:

4.1.1.1 Best Practicable Control Technology Currently Available (BPT)

The CWA requires BPT effluent limitations for conventional, toxic, and non-conventional pollutants. Section 304(a)(4) designates the following as conventional pollutants: biochemical oxygen demand (BOD5), total suspended solids, fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. The Administrator designated oil and grease as an additional conventional pollutant on July 30, 1979. 40 CFR 401.16. EPA has identified 65 pollutants and classes of pollutants as toxic pollutants, of which 126 specific substances have been designated priority toxic pollutants. 40 CFR 401.15 and 40 CFR Part 423 Appendix A. All other pollutants are considered to be non-conventional.

In specifying BPT, under CWA section 301(b)(1)(A); 304(b)(1)(B); 40 CFR 125.3(d)(1), EPA looks at a number of factors. EPA first considers the total cost of applying the control technology in relation to the effluent reduction benefits. The Agency also considers the age of the equipment and facilities, the processes employed, and any required process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate. Traditionally, EPA establishes BPT effluent limitations based on the average of the best performance of facilities within the industry of various ages, sizes, processes, or other common characteristics. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the Agency determines that the technology can be practically applied.

4.1.1.2 Best Conventional Pollutant Control Technology (BCT)

The 1977 amendments to the CWA required EPA to identify effluent reduction levels for conventional pollutants associated with BCT for discharges from existing industrial point sources. CWA section 301(b)(2)(E); 304(b)(4)(B); 40 CFR 125.3(d)(2). In addition to considering the other factors specified in section 304(b)(4)(B) to establish BCT limitations, EPA

also considers a two part "cost-reasonableness" test. EPA explained its methodology for the development of BCT limitations in 1986. 51 FR 24974 (July 9, 1986).

4.1.1.3 Best Available Technology Economically Achievable (BAT)

For toxic pollutants and non-conventional pollutants, EPA promulgates effluent limitations based on BAT. CWA section 301(b)(2)(A); 304(b)(2)(B); 40 CFR 125.3(d)(3). In establishing BAT, the technology must be technologically "available" and "economically achievable." The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the process employed, potential process changes, non-water quality environmental impacts, including energy requirements, and other such factors as the EPA Administrator deems appropriate. The Agency retains considerable discretion in assigning the weight accorded to these factors. BAT limitations may be based on effluent reductions attainable through changes in a facility's processes and operations. Where existing performance is uniformly inadequate, BAT may reflect a higher level of performance than is currently being achieved within a particular subcategory based on technology transferred from a different subcategory or category. BAT may be based upon process changes or internal controls, even when these technologies are not common industry practice.

This permit contains effluent limits that correspond to required levels of technology-based control (BPT, BCT, BAT) for various discharges under the CWA. Some effluent limits have been established by examining other existing laws and requirements. Where these laws already exist, it was deemed feasible for the operators to implement these practices as effluent limits in this permit. Because these are demonstrated practices, EPA has found that they are technologically available and economically practicable (BPT) or achievable (BAT). In some cases, such as with discharges of oils, including oily mixtures and graywater discharges from cruise ships (under certain circumstances), numeric effluent limits have been established.

4.1.2 Numeric Limitations Are Infeasible

Because of the nature of vessel discharges, it is not practicable to rely on numeric effluent limits to achieve these levels of control for the large majority discharge types until greater information is available. Constituents in properly controlled discharges may vary widely based upon vessel type, size, and activities occurring on board the vessel. In such situations, the CWA authorizes EPA to include non-numeric effluent limits in NPDES permits.[5] 40 CFR 122.44(k)(3). The VGP includes such non-numeric effluent limits developed for discharges for which developing numeric effluent limits are infeasible to calculate at this time. Many of these non-numeric effluent limits require permittees to engage in specific behaviors or best management practices (BMPs).

For example, some permittees must conduct saltwater flushing to minimize the discharge of living organisms. Several other BMPs require vessels to "minimize" pollutant discharges. For purposes of this permit and consistent with the technology-based requirements of the CWA,

[5] Refer to more detailed discussion below under "EPA's Authority To Include Non-Numeric Technology-Based Effluent Limits In NPDES Permits," "EPA's Decision To Include Non-Numeric Technology-Based Effluent Limits In This Permit" and 40 CFR 122.44(k)(3).

EPA is clarifying that the term "minimize" means to reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best marine practice.

This permit defines the term "minimize" in order to provide a reasonable approach by which EPA, permittees, and the public can determine/evaluate appropriate control measures for vessels to control specific discharges. EPA believes that for some vessel discharges, minimization of pollutants in those discharges can be achieved without using highly engineered, complex treatment systems. For other vessel discharges, highly engineered, complex, treatments systems that are reliable and approved for use on vessels are not currently available. The specific limits included in Part 2 of the permit emphasize effective pollution prevention controls, such as requiring phosphorus free soap, storing chemicals in protected areas of the vessel, and minimizing production of graywater in port. In other cases, they require more complex behavioral practices such as saltwater flushing or ballast water exchange. In yet other cases, more advanced treatment may be necessary, such as that needed to meet water quality-based effluent limits.

4.2 TECHNOLOGY-BASED EFFLUENT LIMITS

EPA has determined that the technology-based numeric and non-numeric effluent limits in this permit, taken as a whole, constitute the first level of control (BPT for all pollutants) and the second level of control (BAT for toxic and non-conventional pollutants and/or BCT for conventional pollutants) for discharges from vessels. For all of the discharges in this permit, the technology-based limits are based on best professional judgment, as authorized under CWA section 402(a)(1) and 40 CFR 125.3.

4.2.1 Types of Technology-Based Effluent Limits

As stated above, the CWA establishes two levels of technology-based controls. The first level of control, "best practicable control technology currently available," or "BPT" applies to all pollutants. CWA section 304(b)(1)(B); 33 U.S.C. 1314(b)(1)(B). BPT represents the initial stage of pollutant discharge reduction, designed to bring all sources in an industrial category up to the level of the average of the best source in that category. See *EPA v. National Crushed Stone Association*, 449 U.S. 64, 75-76 (1980). In the second level of control, all point sources are required to meet effluent limitations based on "best conventional pollutant control technology," or "BCT" CWA section 304(b)(4)(B); 33 U.S.C. 1314(b)(4)(B) or "best available technology economically achievable," or "BAT" CWA section 301(b)(2)(A); 33 U.S.C. 1311(b)(2)(A), depending on the types of pollutants discharged. BCT applies to conventional pollutants, listed at 40 CFR 401.16 (biological oxygen demand (BOD), pH, fecal coliform, TSS, and oil and grease). BAT applies to toxic and non-conventional pollutants. Technology-based limits are to be applied throughout industry without regard to receiving water quality. *Appalachian Power Co. v. EPA*, 671 F.2d 801 (4th Cir. 1982).

4.2.2 Inclusion of Non-Numeric Technology-Based Limits in NPDES Permits

NPDES permits are required to contain technology-based limitations. CWA sections 301(b)(1)(A)(BPT); 301(b)(2)(A)(BAT), 301(b)(2)(E) (BCT); 40 CFR 122.44(a)(1). Technology-based limits in the permit represent the BPT (for conventional, toxic, and non-conventional pollutants), BCT (for conventional pollutants), and BAT (for toxic and non-conventional pollutants) level of control for the applicable pollutants. Where EPA has not promulgated ELGs for an industry, or if an operator is discharging a pollutant not covered by the effluent guideline, permit limitations may be based on the best professional judgment (BPJ, sometimes also referred to as best engineering judgment) of the permit writer. 33 U.S.C. 1342(a)(1); 40 CFR 125.3. See *Student Public Interest Group v. Fritzsche, Dodge & Olcott*, 759 F.2d 1131, 1134 (3d Cir. 1985); *American Petroleum Inst. v. EPA*, 787 F.2d 965, 971 (5th Cir. 1986). For this general permit, all of the technology-based limits are based on BPJ decision-making because no ELGs apply.

Most of the BPJ limits in the permit are in the form of non-numeric control measures, commonly referred to as best management practices (BMPs). Non-numeric limits are employed under limited circumstances, as described in 40 CFR 122.44(k). As far back as 1977, courts have recognized that there are circumstances when numerical effluent limitations are infeasible and have held that EPA may issue permits with conditions (e.g., BMPs) designed to reduce the level of effluent discharges to acceptable levels. *Natural Res. Def. Council, Inc. v. Costle*, 568 F.2d 1369 (D.C. Cir.1977).

Through the Agency's NPDES permit regulations, EPA interpreted the CWA to allow BMPs to take the place of numeric effluent limitations under certain circumstances. 40 CFR §122.44(k), entitled "Establishing limitations, standards, and other permit conditions (applicable to State NPDES programs ...)," provides that permits may include BMPs to control or abate the discharge of pollutants when: (1) "[a]uthorized under section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities"; (2) "[a]uthorized under section 402(p) of the CWA for the control of stormwater discharges"; (3) "[n]umeric effluent limitations are infeasible"; or (4) "[t]he practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA." 40 CFR 122.44(k).

And, as recently as 2006, courts have held that the CWA does not require the EPA to set numeric limits where such limits are infeasible. *Citizens Coal Council v. EPA*, 447 F.3d 879, 895-96 (6th Cir. 2006). The Sixth Circuit cited to *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486, 502 (2d Cir. 2005), stating "site-specific BMPs are effluent limitations under the CWA."

Additionally, the Sixth Circuit cited to *Natural Res. Def. Council, Inc. v. EPA*, 673 F.2d 400, 403 (D.C. Cir.1982), noting that "section 502(11) defines 'effluent limitation' as '*any* restriction' on the amounts of pollutants discharged, not just a numerical restriction."

4.2.3 EPA's Decision to Include Non-Numeric Technology-Based Effluent Limits in This Permit and Rationale for Why the Limits Represent the Appropriate (BPT, BCT or BAT) Level of Control

Non-numeric limits

With the exception of graywater and pool and spa discharges from cruise ships, oily discharges, including oily mixtures, and residual biocide limits from vessels utilizing experimental ballast water treatment systems, numeric effluent limitations are not feasible to calculate for vessel discharges in this permit iteration. EPA may develop numeric effluent limits for certain discharge types for the next permit iteration, if applicable. Vessels vary widely by type and/or class, size, and activity. Furthermore, most vessel designs are unique, onboard space is highly limited, and information on the characteristics of all discharges from these vessels is limited. Hence, vessels can discharge a wide variety of waste streams, whose volume will vary dependent upon seas, cargo carried, and age of the vessel. Additionally, vessel operators cannot install equipment onboard their vessels until that equipment has been approved by the Coast Guard and, in some cases, their class societies. Hence, EPA could not require experimental equipment or technologies in development that would conflict with the requirements of these organizations without fully understanding the implications of these requirements.

These factors create a situation where, at this time, it is generally not feasible for EPA to calculate numeric effluent limitations to effectively regulate vessel discharges, with the limited exceptions noted above (graywater and pool and spa water discharges from cruise ships, some oil discharges, including oily mixtures for vessels, and residual biocide limits). EPA is able to calculate numeric effluent limits for these groups because extensive research has been conducted and effective pollution control technologies are widely commercially available. For other non-numeric effluent limits, such as standards for ballast water exchange, the variability of the effectiveness of the exchange, combined with the impossibility of being able to successfully predict invasions, have prevented EPA from establishing numeric limits expressed as the number of living organisms in the discharge. Instead, vessel owner/operators must exchange a specified volume of water which should increase the effectiveness of the exchange. In other cases, such as establishing ballast water living organism discharge limits where standards have been proposed by other entities, EPA could not identify technologies that are available as of December 19, 2008, using a BAT approach to meet those limits (see section 4.4.3.5 for more detailed discussion). Therefore, in light of these considerations, EPA has determined that it is not feasible for the Agency to calculate numeric, technology-based limits for most of the discharges covered under this permit, and, based on the authority of 40 CFR 122.44(k)(3), has chosen to adopt non-numeric effluent limits.

Rationale for finding that the limits in this permit represent the BPT, BCT or BAT level of control

The BAT/BCT/BPT non-numeric effluent limits in this permit are expressed as:

- Specific pollution prevention practices for minimizing or eliminating the pollutants or constituent of concern in the discharge.

- Specific behavioral practices for minimizing or eliminating the pollutants or constituent of concern in the discharge.
- Narrative requirements to minimize pollutants or constituents of concern in discharges or the discharges themselves[6]
- Limiting or eliminating discharges at certain times for discharge types that can be limited or eliminated for short periods due to technology available on board the vessel and the vessel design (i.e. if the vessel can hold the discharge type for limited periods or reduce production of the effluent).

In the context of this general permit, EPA has determined these non-numeric effluent limits represent the best practicable technology (BPT) for all pollutants, the best conventional pollutant control technology for conventional pollutants (BCT) and the best available technology economically achievable (BAT) for toxic and non-conventional pollutants. EPA has determined that the combination of pollution prevention approaches and structural management practices described above are the most environmentally sound way to control the discharge of pollutants from vessels.

Requirements are technologically available

EPA has found that the requirements of this permit represent the appropriate level of control representing BPT, BCT, and BAT. For example, many class societies require that vessels have coamings or drip pans underneath machinery as a way to keep oil from entering the bilge, being discharged to surrounding waters, or creating hazardous conditions on the vessel deck. The majority of vessels already have these available measures in place to eliminate the discharge of oil from their vessels and many frequently clean oil from the drip pans if present. Hence, EPA believes this requirement represents BPT and this permit requires that all vessels follow this common sense approach if feasible. As an example of an effluent limit that meets BPT and BAT standards, EPA is requiring vessel operators to comply with additional ballast water management requirements such as mandatory saltwater flushing for vessels with empty ballast water tanks (see section 4.4.3.2 of this fact sheet for additional discussion). These requirements are available because of the U.S. Coast Guard's voluntary policy for such vessels and the Saint Lawrence Seaway Corporation's mandatory requirements for vessels entering through the Seaway (33 CFR Part 401.30), and many U.S.-bound vessels with empty ballast tanks already perform saltwater flushing. Furthermore, because reliable treatment technology is not yet currently available for removing residual living organisms in empty ballast water tanks under the BAT standard, saltwater flushing represents BAT since it is the best approach currently available for these vessels under this standard.

EPA has found that it is technologically possible to prohibit discharges in certain waters, and therefore such a limit is technologically available. However, it is not possible to prohibit these discharge categories under all circumstances. EPA decided which discharge types to prohibit in certain waters based on the environmental impacts of discharges and technical information as to whether vessels had the capacity to hold certain discharge types. These sources of information included technical experts and publications cited in this fact sheet including US

[6] These types of effluent limits allow owner/operators to use control measures appropriate for their vessels to meet those limits.

EPA 1999, Alaska Department of Environmental Conservation (ADEC) and Science Advisory Panel 2002, Lamb 2004, and US EPA 2007.

As an example, some vessels such as cruise ships have the ability to hold graywater for a time from hours to days. Likewise, large vessels can retain treated Bilgewater on board in the bilge for prolonged periods; however, it must periodically be discharged or emptied. Yet another example is the discharge of AFFF for maintenance purposes. Vessel owner/operators may elect where they conduct the maintenance, thereby limiting where they will discharge. Since vessels are mobile and can move from water to water, EPA has determined that vessels have the technology to limit their discharges in select waters. Therefore, under the authority to consider "other factors the Administrator deems appropriate," EPA has determined that the requirement to limit discharges to specific waters is technologically available. However, as mentioned, EPA finds that it is not technologically available to limit all discharge types in certain waters. For instance, in the case of deck runoff, vessel operators have little control as to when water may runoff from the deck into surrounding waters without potentially creating major safety concerns. Hence, EPA is not prohibiting the discharge of certain discharge types into waters of greater concern where methods to do so are not technologically available.

Requirements meet the BPT and BAT economic tests set forth in the CWA

There are different economic considerations under BPT, BCT and BAT. EPA finds that the limits in this permit meet the BPT and BAT economic tests. Because the types of controls under consideration minimize toxic, nonconventional, and conventional pollutants, conventional pollutants are controlled by the same practices that control toxic and nonconventional pollutants. Hence, EPA is evaluating effluent limits using a BPT and a BAT standard, but since conventional pollutants will also be adequately controlled by these same effluent limits for which EPA applied the BPT and BAT tests, EPA has determined that it is not necessary to conduct BCT economic tests.

Under BPT, EPA has determined that the requirements of this permit are economically practicable. To make this determination, EPA has considered the reasonableness of the relationship between the costs of application of technology in relation to the effluent reduction benefit derived. CWA section 301(b)(1)(B); 40 CFR 125.3(d)(1). EPA has examined the cost of these requirements and found that the average annual cost per domestic vessel ranged from an average of approximately $125 using low end assumptions to $359 using high end assumptions. At the same time, EPA expects the permit requirements to reduce the risk of invasive species spread, to minimize production of effluent in high quality waters, to reduce nutrient loading, and to minimize the risk of other constituents entering vessel waste streams.

EPA has determined that the requirements of this permit are economically achievable. In determining "economic achievability" under BAT, EPA has considered whether the costs of the controls can reasonably be borne by the industry. EPA typically evaluates "closures," whereby the costs of requirements are evaluated to see whether they would cause a facility to go out of business. EPA has assessed the costs of the requirements in this permit and finds that this permit will result in no "closures" in that the costs of the rule are small compared to all operating costs. EPA has assessed the costs of the requirements and finds that except in rare cases, the cost of implementing this permit is estimated to be below 1% of the total operating costs of almost all

entities for any given year. The total domestic flagged vessel universe that would be affected by this permit includes approximately 61,000 vessels. Including the ballast water and other discharge requirements, the economic impact analysis indicates that the best management practices in this permit would cost between $ 6.7 million and $16.7 million annually. Including paperwork requirements, the permit is estimated to cost between $7.7 and $21.9 million dollars annually for domestic vessels. Including estimates of ballast water costs for foreign vessels, the permit is expected to cost between $8.9 and $23.0 million dollars annually. Depending upon sector (vessel type), median costs per firm range from $1 to $795 in the low end assumptions and from $5 to $1,967 in the high end assumptions (excluding median values from commercial fishing vessels which are expected to be $0). Costs for the 95th percentile range from $7 for the Deep Sea Coastal and Great Lakes Passenger Vessels to $20,355 for marine cargo handling under low end cost estimates and from $88 to $35,190 for the same vessel classes for high end cost estimates (see table 7.1 of the economic assessment cost estimates across vessel classes). EPA applied a cost-to-revenue test which calculates annualized pre-tax compliance cost as a percentage of total revenues and used a threshold of 1 and 3 % to identify entities that would be significantly impacted as a result of this Permit. The total number of entities expected to exceed a 1% cost ratio ranges from 213 under low cost assumptions to 308 under high cost assumptions. Of this universe, the total number of entities expected to exceed a 3 % cost ratio ranges from 55 under low cost assumptions to 73 under high cost assumptions. Based on this analysis, EPA concludes that the BAT limits in this permit are unlikely to result in a substantial economic impact on all businesses, and, in particular, small businesses. Hence, EPA interprets this analysis to indicate that the BAT limits are economically achievable. The economic analysis is available on EPA's webpage at www.epa.gov/npdes/vessels and in the docket for this permit.

Additionally, the discharge location limitation is economically practical and achievable, since discharging in one location versus another will add no or little additional cost. The only potential costs are an increase in fuel consumption from carrying additional volumes of effluent rather than discharging the effluent immediately when generated. EPA expects these incremental costs associated with this permit to be negligible. EPA's information in the record does indicate, however, that it is possible and economically practicable and achievable to minimize graywater and some additional discharges in waters federally protected wholly or in part for conservation purposes. Therefore, under EPA's authority to consider "other factors the Administrator deems appropriate," it is reasonable to focus the limitations on certain discharge types that would have the most environmental significance. In addition, this restriction is alternatively and independently based on EPA's authority under CWA section 403(c).

Requirements have acceptable non-water quality environmental impacts

In addition, EPA has considered the non-water quality environmental impacts, including energy impacts, of the controls required under this permit and finds that they are acceptable. EPA anticipates that the requirements of this permit may result in marginal increase in fuel usage for vessels that must conduct ballast water exchange or saltwater flushing, must treat graywater to standards in Part 5 of the permit, or must limit the discharge location of certain waste streams and transport them into a different receiving water or hold them for discharge onshore. Additionally, owner/operators of vessels may generate more sludge or other waste that may need to be disposed of properly onshore. EPA expects that most permit requirements will result in few

non-water quality impacts because, in many cases, the permit is reflective of practices currently being implemented by owner/operators.

Data sources and request for comment

EPA finds that establishing technology-based controls that can be required of all commercial vessels over a certain size, in many different waters, under many different weather and operational situations, to be a very challenging task. EPA expressly solicited comment on whether the controls in this permit represent the BPT, BCT and BAT levels of control. Following EPA's consideration of comments received and information used in formulation of the proposed permit, EPA finds that today's final permit contains technology-based controls that represent the BPT, BCT or BAT levels of control.

In developing these non-numeric effluent limits, EPA considered data from numerous peer reviewed publications, literature produced by the federal government, other technical reports and publications, public comments, and comments from experts working in the field (Dobroski et al., 2007; Endresen et al., 2004; Environmental Law Institute, 2004; Gracki et al., 2002; Gray et al., 2007; Gregg & Hallegraeff, 2007; Lamb, 2004; Lloyds Register, 2007; Locke et al., 1993; McCollin et al., 2007; Orange County Coastkeeper, 2007; Quilez-Badia et al., 2008; Raikow et al., 2007; Schiff et al., 2004; Tamburri et al., 2002; US EPA, 1999, 2001a, b, 2007). The data sources from which EPA derived information for decision-making purposes are included in the docket for the final permit. These data sources discuss vessel discharge types, BMPs available for these discharge types, and the effectiveness of given BMPs or behavioral practices.

EPA considered these data and how to design a permit that was environmentally protective and included the best practicable technology and best available technology economically achievable in formulating the permit.

4.3 TECHNOLOGY-BASED EFFLUENT LIMITS AND RELATED REQUIREMENTS IN THE PERMIT

4.3.1 General Effluent Limits (Part 2.1)

The general effluent limits are designed to apply to all covered vessels for all covered discharge types present on a particular vessel. These effluent limits are generally preventative in nature, and are designed to minimize the discharge of pollutants from a vessel. Owner/operators are ultimately responsible for ensuring that all required effluent limits are implemented.

As discussed above, these technology-based effluent limits apply to all covered vessels and were developed using BPJ. These general technology-based effluent limits were established based on available and relevant information, including available technical data, existing statutes and regulations, statistical industry information, and research studies cited in the references section of this permit.

4.3.1.1 Material Storage (Part 2.1.1)

Any materials, whether cargo or for use onboard the vessel, that may be exposed to precipitation, surface water spray, or wind can potentially be discharged on their own or become part of other waste streams. Materials that may not be considered toxic in small concentrations

could pose an environmental threat if significant amounts are washed overboard, particularly in shallow or impaired waters.

Therefore, the permit requires that all vessel operators practice good environmental stewardship by minimizing any exposure of cargo or onboard materials that may result in releases of contaminants to the environment. This can be accomplished by containerizing or tarping materials, and generally limiting any exposure of these materials to wind, rain, or spray. In addition, if water draining from the storage area comes into contact with any oily materials, the permit requires measures to prevent the oil from being discharged in harmful quantities (pursuant to Part 2.3.1.1).

EPA believes that while specific numeric limitations on toxic substances are not feasible for this potential source of pollutants, sound marine practices should be sufficient to reduce most accidental or incidental discharges of cargo or stored materials. EPA also believes that emphasis on training and educating vessel crew on the use and environmental benefits of these practices should be standard practice.

4.3.1.2 Toxic and Hazardous Materials (Part 2.1.2)

The presence or use of toxic and hazardous materials may be necessary for the operation of vessels. As part of the permit's requirements, these materials must be properly contained to avoid contamination of the discharges covered by this permit. EPA has recommended human health and marine aquatic life criteria for a few toxic pollutants, but requiring numeric effluent limitations and corresponding sampling and analysis of discharges for all potentially harmful contaminants is not a reasonable option for this permit since discharges would be accidental in nature and the preventive requirements are just as effective as numeric limits at controlling such discharges. These provisions should effectively prevent the discharge of these toxic and hazardous materials from storage, spills, and containment. EPA believes that preventing the release of these substances to the environment is the appropriate environmental protection strategy. Vessel owner/operators are required to ensure that toxic and hazardous substances are treated in a manner that prevents releases due to precipitation or surface water spray. Just as EPA requires of land-based industries, vessels must store, label, and secure toxic and hazardous materials in suitable, sealed containers.

4.3.1.3 Fuel Spills/Overflows (Part 2.1.3)

Even small amounts of spilled fuel can contaminate large areas of water, making it uninhabitable for plants and animals. Most small spills can be prevented by taking basic precautions when filling fuel tanks. The permit requires vessel operators to implement these precautions that will prevent or, in the case of a spill, contain any fuel that is released to surface waters (e.g. use of booms). The discharge of any fuel spill or overflow may not result in a discharge that may be harmful as defined by 40 CFR Part 110, which includes those discharges that cause a visible sheen. In addition, any larger scale fuel spill or overflow is not incidental to the normal operation of a vessel and therefore, not authorized by this permit. Through proper fueling operations and training on spill treatment, vessel operators may reduce impacts caused by human error or improper equipment use. EPA recognizes that fueling operations for large vessels are very different from fueling operations on small boats, and often large vessels will

carry onboard several smaller vessels used as lifeboats, tenders, or rescue boats. Therefore, there are additional requirements for fueling of auxiliary vessels such as lifeboats, tenders, or rescue boats that are deployed from "host" vessels subject to the permit. These requirements include examining the surrounding area for the presence of a visible sheen during fueling, if a sheen is observed as a result of the permittee's fueling operations it must be cleaned up immediately, and using an oil absorbent material or other appropriate device while fueling to catch drips from vent overflow and fuel intake. These simple steps can prevent fuel spills and overflows that would lead to a discharge. These requirements have been adapted from EPA's previously proposed Recreational Vessel General Permit.

4.3.1.4 Discharges of Oil, Including Oily Mixtures (Part 2.1.4)

Discharges of oil, including oily mixtures, can significantly impact aquatic and terrestrial organisms and their ecosystems. When oil, including oily mixtures, is discharged in small quantities, aquatic ecosystems have limited ability to assimilate, oxidize, degrade, and destroy many of the hydrocarbons present in oil. However, when discharged in significant quantities from a single vessel, or in moderate quantities from numerous vessels, oil releases have been documented to create severe environmental impacts.

The permit requires that any oil, including oily mixtures, other than those exempted in 40 CFR 110.5, may not be discharged in quantities that may be harmful. These requirements are consistent with section 311 of the CWA and reinforce the requirement that discharges from the internal portions of vessels may not result in discharges of oil in quantities likely to impact aquatic ecosystems. The visible sheen test, rather than a discharge concentration standard requiring analytical monitoring, was chosen as an approach to determine whether oil is being discharged in quantities that may be harmful, because the visible sheet test is easy to use and is consistent with existing CWA requirements.

4.3.1.5 Compliance with Other Statutes and Regulations Applicable to Vessel Discharges (Part 2.1.5)

These effluent limits contain the requirement to comply with other applicable statutes and regulations dealing with vessel discharges. Reliance on other statutes and regulations to develop the permit requirements is a reasonable exercise of BPJ because these statutes and regulations have gone through an extensive process of evaluation and analysis by federal agencies and international organizations that have considerable expertise in vessel management. Furthermore, many of the BMPs considered by EPA were covered by these other authorities. These statutes and regulations are currently being implemented and therefore are technologically and economically practicable (BPT) and achievable (BAT) in light of best marine practice. Rather than reiterate the provisions of these statutes and regulations in their entirety for the permit's general effluent limits, EPA has determined, based on BPJ, that incorporation of these statutes and regulations by reference is reasonable.

Some of the statutes and regulations that were examined to inform the Agency's BPJ decision and which are incorporated by reference into the provisions of the permit follow. These summaries are not meant to be legally comprehensive reiterations; rather, they are short summaries designed to inform owner/operators of the existence of these authorities. The actual

statutes and regulations implementing these authorities are the legally binding conditions for the permit.

MARPOL, APPS, and Implementing Regulations

The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) is an international treaty that regulates certain discharges from vessels. It is primarily implemented in the U.S. by the Act to Prevent Pollution from Ships (APPS), 33 U.S.C.1901 et seq. The U.S. Coast Guard is the lead agency for APPS implementation and has issued implementing regulations primarily found at 33 CFR Part 151. Those requirements already apply to many of the vessels covered by the permit.

APPS regulates the discharge of oil and oily mixtures, noxious liquid substances, and garbage, including food wastes and plastic.

With respect to oil and oily mixtures, Coast Guard regulations at 33 CFR 151.10 prohibit "any discharge of oil or oily mixtures into the sea from a ship" except when certain conditions are met, including a discharge oil content of less than 15 parts per million (ppm) and that the ship has in operation oily-water separating equipment, an oil content monitor, a bilge alarm, or a combination thereof. These requirements have been in place for a significant length of time, and the equipment necessary to meet these standards is widely available and already in use on ships subject to these regulations.

Substances regulated as "noxious liquid substances" (NLS) under APPS are divided into 4 categories based on their potential to harm marine resources and human health. See 33 CFR 151.47 and 151.49; 46 CFR Part 153, Table 1. Under 46 CFR 153.1128, discharges of NLS residues at sea may only take place at least 12 nautical miles from the nearest land. In light of this, the permit does not authorize such discharges within waters subject to the permit (i.e. inland waters and the waters of the 3 mile territorial sea).

Another provision of MARPOL, Annex III, addresses harmful substances in packaged form and is implemented in the U.S. by the Hazardous Materials Transportation Authorization Act of 1994, as amended (49 U.S.C. 5901 et seq.) and regulations appearing at 46 CFR Part 148 and 49 CFR Part 176. That regulatory scheme establishes labeling, packaging, and stowage requirements for such materials so as to help avoid their accidental loss or spillage during transport. 40 CFR 122.44(p) provides that when an NPDES permit is issued to a vessel operating as a means of transportation, the permit is to require compliance with any applicable Coast Guard regulations that establish specifications for safe transportation, handling, carriage, and storage of pollutants. The permit incorporates this requirement in Parts 1.13 and 2.1.5.

Oil Pollution Control Act (33 U.S.C. 2701 *et seq.)*

Additional requirements also affect vessel discharges, in particular, the Oil Pollution Act of 1990 and the associated U.S. Coast Guard implementing regulations at 33 CFR Parts 155 and 157. These regulations establish and reinforce the APPS 15 ppm discharge standard for oil and oily mixtures for oceangoing ships and require most vessels to have an oily water separator. Oceangoing vessels less than 400 gross tons must either have an approved oily water separator or retain oily water mixtures on board for disposal to an approved reception facility onshore.

Oceangoing vessels more than 400 gross tons except vessels that carry ballast water in their fuel oil tanks, must be fitted with "approved 15 parts per million (ppm) oily-water separating equipment for the processing of oily mixtures from bilges or fuel oil tank ballast." 33 CFR 155.360. The maximum oily discharge standard is included as a binding requirement in this permit because it is the most appropriate standard for oil and oily discharges and maintains current national and international standards. 33 CFR Part 155 was also referenced for oil containment and cleanup equipment and procedures. This section provides information on both equipment and procedures that are required for preventing and reacting to oil spills and discharges.

Clean Water Act Section 311 (33 U.S.C. 1321)

Clean Water Act Section 311, Oil and Hazardous Substances Liability Act, states that it is the United States' policy that there should be no discharges of oil or hazardous substances into waters of the U.S., adjoining shorelines, and certain specified areas, except where permitted under Federal regulations (e.g., the NPDES program). As such, the Act prohibits the discharge of oil or hazardous substances into these areas in such quantities as may be harmful. Further, the Act states that the President shall, by regulation, determine those quantities of oil and any hazardous substances that may be harmful if discharged.

EPA has defined oil quantities that "may be harmful" as those that violate applicable water quality standards or "cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoin shorelines." 40 CFR 110.3. Sheen is clarified to mean an iridescent appearance on the surface of the water.

In the permit, oil, including oily mixtures, may not be discharged in quantities that may be harmful. This goal has proven to be achievable using available treatment technologies such as oil-water separators or oil absorbent materials. For other discharges that can potentially be contaminated by oils but may not easily be collected and treated, the Agency requires the operator to observe the surface of the receiving water to determine whether a sheen is visible. This would indicate that oils are present at concentrations that may be harmful and discharge must cease.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. 136 *et seq.*).

FIFRA regulates the distribution, sale, and use of pesticides. One of the primary components of FIFRA requires the registration and labeling of all pesticides sold or distributed in the U.S. ensuring that if pesticides are used in accordance with the specifications on the label, they will not cause adverse effects on humans or the environment. It is a requirement of the permit that any registered pesticide must be used in accordance with its FIFRA label. This is included as a binding permit requirement because FIFRA label requirements are established after research, approved by the EPA Office of Prevention, Pesticides and Toxic Substances, and ensure that the pesticide, when used according to the label, can be used so that it will not cause unreasonable adverse effects on humans or the environment.

National Marine Sanctuaries Act (16 U.S.C. section 1431 *et seq.* and implementing regulations found at 15 CFR Part 922 and 50 CFR Part 404 (NMSA))

NMSA authorizes the designation and management of National Marine Sanctuaries to protect marine resources with conservation, education, historical, scientific, and other special qualities. Additional restrictions and requirements may be imposed on vessel owner/operators who boat in and around National Marine Sanctuaries. For more information, please see the NOAA National Marine Sanctuaries Program website at http://sanctuaries.noaa.gov/welcome.html.

4.4 Effluent Limits and related requirements for Specific Discharge Categories (Part 2.2)

4.4.1 Deck Washdown and Runoff including Above Water Line Hull Cleaning (Part 2.2.1)

Constituents of deck runoff and above water line hull cleaning may include oil, grease, cleaner or detergent residue, paint chips, paint droplets, and general debris (e.g., paper, wire). Discharge rates for deck runoff vary from vessel to vessel and depend on weather, deck machinery, deck operations, and frequency of deck washdowns. It is infeasible to set specific numeric effluent limits for discharges of deck runoff due to variation in vessel size and associated deck surface area, types of equipment operated on the deck, and limitations on space for treatment equipment. Instead, the permit requires that vessel operators minimize discharges from deck runoff and implement BMPs to reduce their potential impact.

BMPs for controlling deck runoff and above water line hull cleaning are associated with (a) containing potential contaminants to keep them from entering the waste stream, (b) properly maintaining the deck and bulkhead areas to prevent excess corrosion, leaks, and metal discharges, and (c) using environmentally safe products for cleaning deck areas. Because it would be extremely difficult if not impossible to safely hold or treat all deck runoff for all vessel designs at all times, EPA is not requiring deck runoff to be collected and treated before discharge from all vessels. Requiring vessel owner/operators to collect deck runoff could either require major vessel modification of the ship's structure and machinery or could compromise the safety and stability of the vessel. Many vessels are designed to quickly discharge deck runoff as an operational necessity.

EPA is requiring that deck runoff be collected during certain times such as during or after fueling operations, when spills occur, or when required by a vessel's class society.[7] EPA is also requiring that vessel operators minimize contamination of deck runoff discharges by debris, garbage, and chemical spills (e.g., grease, fuel, hydraulic fluid, caustics, detergents). EPA is also requiring that the vessel owner/operator maintain the topside surface of the deck in a manner consistent with good marine practice that prevents excess discharge of metals and oils from eroding metals and deteriorating pipes, coamings, and other topside infrastructure. When machinery is located on deck, the use of drip pans when feasible will collect spilled oil and allow the vessel owner/operator to prevent its discharge. When required by their class societies (e.g., tank barges), vessels must be fitted with and use perimeter spill rails and scuppers to collect the

[7] A vessel's class society establishes technical standards related to the design, construction, and survey of a vessel.

runoff for treatment. In addition, if washing down the deck will result in a discharge, the washdown must be conducted with non-toxic and phosphate-free cleaners and detergents. The purpose of this requirement is to minimize the discharge of caustic and potentially toxic detergents and solvents into waters subject to this permit. Phosphorus is one of the drivers of eutrophication or hypereutrophication, which is one of the major causes of impairment to waters of the United States. Toxic materials interfere with aquatic organisms and can contribute to chronic or acute effects, including death. Additionally, EPA is requiring that permittees must minimize residual paint droplets from entering waters subject to this permit whenever they are conducting maintenance painting. EPA is also requiring that discharges of deck runoff are consistent with all other relevant laws. EPA believes that adhering to these requirements will reduce the discharge of these potentially environmentally harmful substances.

4.4.2 Bilgewater (Part 2.2.2)

Bilgewater is an accumulation of water from various sources across the entire vessel. Constituents include oil, grease, volatile and semi-volatile organic compounds, inorganic salts, and metals. Volumes vary with the size of the vessel, and discharges typically occur several times per week. Cruise ship volumes have been estimated at 25,000 gallons per week for a 3,000 passenger/crew vessel (US EPA, 2007).

Vessel operators are required to minimize bilgewater generation by practicing proper maintenance of vessels and equipment. Routine cleaning and maintenance activities associated with vessel equipment and structures are considered to be normal operation of a vessel. However, EPA notes that the addition of substances associated with the normal operation of a vessel to the bilgewater is not allowed.

EPA believes this reduction in the volume of waste will reduce the need for vessels to discharge treated bilgewater to waters of the U.S. EPA also recognizes that onshore disposal is not always a feasible alternative for larger vessels. As part of the permit, bilgewater discharges must adhere to all requirements under 40 CFR Parts110, 113, 116, and 117 and 33 CFR Part 151.10. These limitations are achievable with use of oily-water separators or use of a segregated bilge system. EPA believes vessels large enough to require discharge of bilgewater should have onboard oily-water separation capabilities. Smaller vessels must also demonstrate that the discharge of bilgewater is sufficiently clean by conducting a visual sheen observation prior to and at the time of discharge. EPA has utilized the visual sheen test as a reliable indicator as to whether oil, including oily mixtures, is not being discharged in quantities that may be harmful.

If the vessel operator does not treat bilgewater with an oily-water separator or it cannot be assured that the bilgewater will not cause a sheen on the surface of the receiving water, the bilgewater must be held onboard for onshore disposal. Vessel operators may not use dispersants, detergents, emulsifiers, chemicals, or any other substances to remove the appearance of a visible sheen.

The permit has additional BMPs for bilgewater that focus on where vessels may or may not discharge bilgewater. For instance, vessels that regularly leave waters subject to the permit (at least once per month) and are more than 400 gross tons, may not discharge treated bilgewater within 1 nm of shore is technologically feasible. For instance, vessels that regularly leave waters

subject to the permit (at least once per month) and are more than 400 gross tons, may not discharge treated bilgewater within 1 nm of shore if technologically feasible. In this context, technological feasibility includes consideration of operational constraints. It is EPA's understanding that most large vessels do not generate significant quantities of bilgewater and should have sufficient holding capacity so that when they are within 1 nm of shore, they need not discharge, particularly in cases where vessels enter and remain in waters subject to this permit for short periods. In those cases where a vessel does not have the capacity to hold bilgewater generated in waters subject to this permit or where bilgewater is causing a general safety or stability concern or could enter a hold and contaminate cargo, or otherwise interfere with essential operations of the vessel, EPA would not consider holding the bilgewater to be technologically feasible. The cumulative impact of numerous vessels releasing bilgewater in nearshore, estuarine environments or in waters with limited circulation can be of concern. Hence, this provision is included to limit the discharge of pollutants in areas where vessels are more likely to be concentrated, where the cumulative impact of discharges is likely to be higher, and in ecosystems that are already stressed and unlikely to have additional assimilative capacity. Vessels can then discharge the bilgewater, provided it meets all applicable laws, in waters that are likely to have greater assimilative capacity or where vessel traffic is not as concentrated, or the vessel can hold the bilgewater for proper onshore disposal. Other provisions limiting the location or manner in which bilgewater is discharged are based on a similar rationale.

4.4.3 Ballast Water (Part 2.2.3)

Ballast water is typically ambient water taken onboard to assist with vessel draft, buoyancy, and stability. Large commercial vessels (e.g., container ships, bulk carriers, other cargo vessels, tankers, and passenger vessels) normally have ballast tanks dedicated to this purpose and some vessels may also ballast empty cargo holds. The discharge rate and constituent concentrations of ballast water from vessels will vary by vessel type, ballast tank capacity, and type of deballasting equipment. Volumes of ballast water discharged are significant and can be several hundred or thousand cubic meters of water. For instance, passenger vessels have an average ballast capacity of about 2,600 cubic meters (about 686,850 gallons) while ultra large crude carriers (ULCCs) have an average ballast capacity of about 93,000 cubic meters (about 24,568,000 gallons).

Ballast water discharge has been cited as one of the primary sources or vectors for the spread of invasive species, also known as aquatic nuisance species (ANS These species may be discharged when the vessel operator discharges full ballast tanks. These organisms may also be released when vessel operators load ballast water into ballast tanks with residual water or sediment, mixing the new ballast water with these residuals, then later discharge this ballast. These residuals may contain viable living organisms and organisms in resting stages. When species in ballast tanks are transported between waterbodies and discharged, they have the potential for establishing new populations in waterbodies to which they are not native. Potentially, this can cause severe economic and ecological dangers. The spread of ANS can be mitigated if either their introduction to the receiving water is prevented or they are not able to establish populations. The provisions in the permit focus on reducing the number of organisms that are potentially viable from being released into potentially receptive aquatic habitats. For additional information, refer to some of the numerous studies and reports that have been completed on the impacts of ballast water discharge (Bolch & Salas, 2007; Dobbs et al., 2006;

Doblin et al., 2007; Drake & Lodge, 2007; Drake et al., 2007; Endresen et al., 2004; Knight et al., 1999; M.G.G. et al., 2003; Reynolds et al., 1999; Roman, 2006; Ruiz et al., 2000a; Ruiz et al., 2000b; Smayda, 2007; US EPA, 2001; Zo et al., 1999).

ANS cause substantial environmental and economic harm to the United States. Well known examples of ANS or pathogens that have been introduced to U.S. waters include Hydrilla, European Loosestrife, Eurasian water milfoil, melaluca, salt cedar, Viral Hemorrhagic Septicemia (VHS), and Zebra Mussels. For additional information on the impact of aquatic nuisance species, refer to Part 3.4 of this fact sheet and the economic analysis available in the record for the permit, located in the water docket.

In the United States, the U.S. Coast Guard has requirements for the management of ballast water listed in 33 CFR Part 151, Subparts C and D. These regulations require vessels transiting to U.S. waters with ballast water that was taken on within 200 nautical miles of any shore into waters of the United States after operating beyond the U.S. EEZ to conduct one of the following ballast water management practices :

- Conduct mid-ocean ballast water exchange prior to entering U.S. waters;
- Retain the ballast water on board while in U.S. waters; or
- Use a Coast Guard approved alternative environmentally sound method to manage the ballast water. 33 CFR 151.1510(a) and 151.2035(b).

The regulations also contain a safety exception, providing that the master of a vessel will not be prohibited from discharging unmanaged ballast water, in areas other than the Great Lakes and the Hudson River, if the master decides the practices would be unsafe for the vessel. 33 CFR 151.2030(b). In addition, the Coast Guard regulations provide vessels will not be required to deviate from, or delay, their voyage in order to conduct exchange. 33 CFR 151.2036. Vessels that operate solely within one COTP zone are exempt from certain requirements, as described in 33 CFR 151.2010(b). Because there are currently no Coast Guard-approved alternative methods, the *de facto* management practice most often used today is ballast water exchange.

In addition, the regulations establish other ballast water management requirements for all vessels equipped with ballast water tanks that enter or operate within U.S. waters, such as avoiding or minimizing ballast water uptake in areas with a high potential to contain harmful organisms, only discharging the minimal amounts of ballast water necessary in coastal and internal waters, and regularly cleaning ballast water tanks to remove sediment. 33 CFR 151.2035(a).). Sediment removed from tanks by cleaning operations, including sediments suspended as a result of ballast tank cleaning, are not eligible for coverage under this permit and must be disposed of in accordance with applicable local, State, and Federal regulations. . The regulations also establish mandatory ballast water reporting and record keeping requirements (33 CFR 151.2041 and 151.2043), and also require vessels to have a ballast water management plan that is specific for that vessel and assigns responsibility to the master or appropriate official to understand and execute the ballast water management strategy for that vessel (33 CFR 151.2035(a)(7)). In addition to these regulatory requirements, the Coast Guard has also developed a policy with respect to saltwater flushing for vessels entering the Great Lakes after

operating beyond the U.S. Exclusive Economic Zone (US EEZ) which declare "No Ballast on Board" (NOBOB). 70 FR 51831 (August 31, 2005).

EPA is including most of these Coast Guard requirements in this permit as technology-based effluent limits. For example, the requirement to avoid or minimize ballast water uptake in areas with a high potential to contain harmful aquatic organisms is a common sense Best Management Practice to mitigate the spread of organisms harmful to humans, animals, and ecosystems. EPA recognizes that some waters, including significant areas of the Great Lakes (except Lake Superior) could be considered to have low level infestations of a disease such as viral hemorrhagic septicemia (VHS). When achievable, vessel operators should not take up any ballast water in any of these waters and instead use internal ballasting. When the uptake of ballast water is required in these waters, the vessel owner/operator should take on ballast in those waters that have the lowest known risk factors for these harmful organisms. EPA is most concerned with waters where there are known areas of localized outbreaks of harmful organisms such as Pfiesteria blooms. In these areas, it may be achievable for vessel owner/operators to minimize or avoid the uptake of water and use other ballasting options temporarily.

In addition to the Coast Guard management practices, the permit contains several requirements that will reduce discharges of pollutants and constituents of concern, are widely available, and are currently practicable and economically achievable for vessel owner/operators to implement. Hence, these practices represent the BPT, BCT and BAT levels of control. These include:

- Mandatory exchange for vessels engaged in Pacific nearshore voyages that will discharge ballast water into waters subject to this permit, if they travel more than 50 miles from shore.
- Mandatory saltwater flushing for all vessels with unpumpable ballast water and residual sediment that leave the US EEZ, travel more than 200 nm from any shore, and that will discharge ballast water to waters subject to this permit.
- Mandatory saltwater flushing for all vessels engaged in Pacific nearshore voyages that travel through more than one COTP zone and travel at least 50 miles from shore.
- A requirement that all vessels that leave the US EEZ, travel more than 200 nm from any shore, and will discharge to waters subject to this permit must complete a ballast water exchange as early as practicable to increase mortality of living organisms in ballast water tanks. This requirement also applies to vessels engaged in Pacific nearshore voyages.
- Requirements for tankers engaged in the coastwise trade.
- Requirement to use onshore treatment for vessels whose design and construction safely allows for the transfer of ballast water to shore, if compatible onshore treatment for ballast water is available and economically practicable and achievable, (unless they use an onboard ballast water treatment system approved by the Commandant of the Coast Guard).

The rationale for each of these additional requirements is described below.

4.4.3.1 Mandatory Exchange for Vessels Engaged in Pacific Nearshore Voyages

Vessels engaged in Pacific nearshore voyages include:

- Vessels engaged in the Pacific Coastwise trade that cross more than one Captain of the Port Zone that will discharge ballast water into waters subject to this permit.
- All other vessels that sail from foreign, Atlantic, or Gulf of Mexico ports, which do not sail further than 200 nm from any shore, and that discharge or will discharge ballast water into the territorial sea or inland waters of Alaska or of the west coast of the continental United States.

Numerous studies and reports by NOAA and others have shown that mid-ocean ballast water exchange significantly reduces the presence of living organisms adapted to surviving in coastal, estuarine, and freshwater environments (Gray et al., 2007; Locke et al., 1993; McCollin et al., 2007; Ruiz & Reid, 2007). In a NOAA technical memorandum authored by Ruiz and Reid (2007), the authors made seven recommendations, one of which is that "B[allast] W[ater] E[xchange] should be considered a useful and beneficial ballast management practice to reduce species transfers and invasion risk. It is a valuable measure, especially because it is available now for immediate use on many vessels and shipping routes, in the absence of proven alternative treatment methods." Hence, ballast water exchange is an appropriate interim step toward mitigating the risk from the spread of ANS until effective treatment technology is available. There has also been considerable discussion about establishing alternate ballast water exchange areas (ABWEA) within areas closer to the coast. Participants in a 2006 workshop (Phillips, 2006) on establishing alternate exchange zones on the Pacific coast made three recommendations, two of which are applicable for the permit:

- In general, ABWEA's should be established no closer than 50 nm from shore and in waters at least 1000 m in depth.
- Establishment of ABWEA's should avoid major estuary and oceanic river plumes, subsurface physical features (e.g. seamounts), and known fishery habitats.

For the most part, the continental shelf along the Pacific coast is narrow along both North and South America. Deep water environments beyond the continental shelf typically support ecosystems that are quite different than those which exist closer to shore. Due in part to this short width of the continental shelf, high relative depth of waters greater than 50 nm from the Pacific shore, and existing and pending regulation and statutes in California, Oregon, and Washington that require ballast water exchange for vessels engaged in the coastwise trade, EPA is requiring ballast water exchange under the proposed permit for vessels engaged in Pacific nearshore voyages that will discharge ballast water into waters subject to this permit. If these vessels travel more than 50 miles from shore, they must conduct ballast water exchange while:

- In the Pacific Ocean,
- As early as practicable in the voyage,
- More than 50 nm from shore, and
- Preferably where the vessel is not near major estuary and oceanic river plumes, subsurface physical features (e.g. seamounts), and known fishery habitats.

These requirements are technologically practicable and achievable, can be widely implemented, and will reduce the discharge of constituents in ballast water streams. Furthermore, with implementation of existing and pending state regulation requiring similar practices, the incremental economic costs are relatively low (see the economic analysis prepared for this permit). However, EPA does not believe that vessels engaged in voyages that take them further than 200 nm from any shore should be allowed to exchange ballast water between 50 and 200 nm from the Pacific shore for the following reasons:

- This provision would not be consistent with existing U.S. Coast Guard regulations.
- Ballast water exchange 200 nm or more from shore generally is more likely to mitigate the risk for the spread of ANS than ballast water exchange closer to shore.

In the proposed VGP "EPA [wa]s specifically seeking comment on whether similar requirements should be imposed on vessels engaged in the coastwise trade on the Atlantic or Gulf Coasts." After considering the range of public comment on the issue, which both supported and opposed inclusion of Atlantic and Gulf ballast water exchange, EPA has not included Atlantic and Gulf nearshore ballast water exchange and saltwater flushing requirements. None of the commenters provided directly applicable data to support their views and EPA will continue to investigate whether Atlantic and Gulf coast ballast water exchange is an appropriate best management practice for vessel owner/operators engaged in nearshore voyages. This exploration may include several elements including examining vessel traffic and operation patterns along the Eastern and Gulf seaboards, the volume of ballast water transported and released, and the number of miles traveled by the average Atlantic and Gulf nearshore voyage. The Agency believes that additional information needs to be gathered before making this regulatory decision. EPA may exercise its authority under Part 1.9 of the VGP to reopen the permit to include these requirements as appropriate.

4.4.3.2 Mandatory Saltwater Flushing

Mandatory saltwater flushing is required by this permit for all vessels carrying unpumpable ballast water and residual sediment that leave the US EEZ, travel more than 200 nm from shore, and will subsequently discharge ballast water to waters subject to this permit and for vessels that engage in Pacific nearshore voyages that will discharge ballast water in waters subject to this permit. The permit states that "saltwater flushing means the addition of mid-ocean water to empty ballast water tanks; the mixing of the added water with residual ballast water and sediment through the motion of the vessel; and the discharge of the mixed water until loss of suction, such that the resulting residual water remaining in the tank has either a salinity greater than or equal to 30 parts per thousand (ppt) or a salinity concentration equal to the ambient salinity of the location where the uptake of the added water took place" (see Parts 2.2.3.7 and Part 7 of the permit). This process of rinsing out empty ballast water tanks with mid-ocean saltwater is commonly referred to as "swish and spit". The vessels subject to this requirement are either those which have any ballast water tank that is empty or contains unpumpable residual water or those that certify, consistent with the Coast Guard's regulations, that they have "No Ballast on Board" ("NOBOB" vessels). As previously noted, the Coast Guard currently has a voluntary saltwater flushing policy in place for all vessels entering the Great Lakes, and defines NOBOB vessels as "those vessels that have discharged ballast water in order to carry cargo, and

as a result, have only unpumpable residual water and sediment remaining in tanks." 70 FR 51832 (August 31, 2005). The purpose of mandatory saltwater flushing is to prevent the spread of ANS in ballast water tanks that appear empty, but often have unpumpable ballast water and/or residual sediment at the bottom of the tanks that may contain organisms which can become ANS.

Saltwater flushing has been shown to be effective in preventing the introduction of ANS from vessels with residual ballast water and sediment in their ballast water tanks. In a NOAA technical memorandum, another of Ruiz and Ried's (2007) concluding recommendations is that "[t]he use of high-salinity water to flush NOBOB ballast tanks should be considered a useful and beneficial management practice to reduce species transfers and invasion risks associated with NOBOB ships entering the Great Lakes. In the absence of proven alternatives, this practice provides some level of protection against some adult and larval life stages." Additionally, saltwater flushing reduces the concentrations of sediment, a conventional pollutant, in ballast water discharge and, therefore, generally improves the quality of the ballast water discharge.

Environment Canada has mandatory saltwater flushing requirements in its regulations for all vessels that discharge ballast water in Canadian Great Lakes Ports. Furthermore, the Saint Lawrence Seaway Development Corporation (SLSDC) recently published a final rule amending joint regulations at 33 CFR Part 401.30. The amendment is an effort to harmonize the ballast water requirements for vessels transiting the U.S. waters of the Saint Lawrence Seaway System with the saltwater flushing requirements already in place for vessels entering the Canadian waters of the Seaway System. The amendment, which went into effect on March 26, 2008, requires vessels that operate outside the EEZ to conduct saltwater flushing of ballast water tanks containing residual amounts of ballast water and sediment at least 200 nautical miles from any shore. The saltwater flushing must occur prior to entering either the U.S. or Canadian waters of the Seaway System. See 73 FR 9950 (February 25, 2008). Hence, all vessels entering the Great Lakes must already use saltwater flushing for their tanks with unpumpable ballast water and residual sediment, and this permit reinforces these requirements.

The permit extends saltwater flushing requirements to all waters subject to this permit (for vessels that travel more than 200 nm from shore and vessels engaged in Pacific nearshore voyages) because EPA believes saltwater flushing is a low-cost approach that minimizes the risk that ANS will be successfully introduced from unpumpable ballast water and residual sediment. Saltwater flushing is most effective at eliminating organisms adapted to freshwater and low salinity environments due to the impacts of saltwater shock. However, saltwater flushing should also reduce viable living organisms adapted to estuarine, coastal and marine environments. First, saltwater flushing may reduce viable living organisms in residual ballast water. Secondly, saltwater flushing reduces the number of viable living organisms and organisms in resting stages in the residual sediment. Resting stages of ANS often inhabit the sediment in ballast water tanks: reducing the numbers of these organisms with both physical flushing and saltwater shock when applicable will likely reduce the propagule pressure of these potential invaders. Hence, the requirements for mandatory saltwater flushing are available, practicable and achievable. Additionally, the permit applies saltwater flushing on a tank-by-tank basis, and does not just limit this practice to vessels that declare they carry only unpumpable residual ballast water. This is because the empty ballast water tanks in vessels that have a mixture of empty tanks and tanks containing pumpable ballast water still pose a risk of introducing ANS when the empty tanks are subsequently filled and discharged, and saltwater flushing of those tanks will help reduce this

potential. However, vessels that seal empty tanks and will not use them to discharge ballast water in waters subject to this permit do not need to conduct saltwater flushing.

4.4.3.3 Vessels that Complete Ballast Water Exchange Must Do So as Early as Practicable

For those vessels that carry ballast water that was taken on in areas less than 200 nautical miles from any shore and will discharge into the waters subject to this permit after operating beyond the EEZ, EPA has included a requirement that all vessels that conduct ballast water exchange must do so as early as practicable, so long as the exchange occurs more than 200 nm from shore. This requirement will directly contribute to increased mortality of remaining living organisms in ballast water tanks. Increased mortality will result in the discharge of fewer viable living organisms, which will consequently reduce the likelihood of the risk of the establishment of ANS.

4.4.3.4 Requirements for Tankers Engaged in the Coastwise Trade

Section 1101(c)(2)(L) of the National Invasive Species Act of 1996 (16 U.S.C. 4711) generally exempts crude oil tankers engaged in the coastwise trade from ballast water management requirements. There is no counterpart exemption for such vessels in the CWA, nor does it appear that such vessels are inherently unable to perform the ballast water exchange and other ANS management practices that their non-exempt vessel counterparts can and do routinely carry out. Hence, the NPDES permit would not exempt crude oil tankers in the Coastwise trade from its ballast water management requirements, and such tankers must either seek coverage under the permit and comply with its applicable terms or seek alternative NPDES permit coverage as discussed under the alternative permits section in Part 1.8 of the permit.

4.4.3.5 Development of a Living Organism Discharge Standard

EPA is not requiring any numeric treatment standards for the discharge of living organisms as part of this permit issuance and is instead requiring management practices (e.g. ballast water exchange) that decrease the risk of ANS introduction[8]. EPA is proposing this approach because treatment technologies that effectively reduce viable living organisms in a manner that is safe, reliable, and demonstrated to work onboard vessels are not yet commercially available. Several studies and publications are available that discuss current treatment technologies, their efficacy and performance, and whether they are commercially available for shipboard installation (see e.g., Dobroski et al., 2007; Gracki et al., 2002; Gregg & Hallegraeff, 2007; Lloyds Register, 2007; McCollin et al., 2007; Perrins et al., 2006; Quilez-Badia et al., 2008; Raikow et al., 2007; Tamburri et al., 2002). Based on an evaluation of such studies, requiring a numeric effluent limit for the discharge of living organisms is not practicable, achievable, or available at this time. Because such technology is rapidly being developed, we fully intend to take these developments into account when developing future permits or reopening this permit consistent with Part 1.9 of the VGP. Ruiz and Reid (2007) recommend that "research and development to produce alternative ballast treatment methods and technology based ballast treatment systems should continue as a high priority, in order to improve the efficacy of treatment and expand application

[8] EPA notes, however, that some vessel owner/operators may have to meet ballast water treatment standards if required by State 401 certification requirements if discharging in some state waters, as listed in Part 6 of the VGP.

of treatment to most vessels and routes." EPA agrees with this recommendation and will continue working with the United States Coast Guard, the National Oceanic and Atmospheric Administration, the Naval Research Laboratories, and others to promote development and testing of technologies that are capable of reaching treatment standards to neutralize the continued spread of invasive species via ballast water sources.

While ballast water exchange helps reduce the risk of introducing ANS, we also recognize that exchange has variable effectiveness. Thus, EPA will consider establishing treatment requirements in the next generation of permits that will provide for compliance with treatment standards that will be expressed as units of living or viable organisms per unit of volume in ballast water discharge. In setting such standards, we would take into account progress in technology development, the outcome of the US Coast Guard rulemaking on ballast water treatment standards, and activity within the IMO to determine what is best available technology at the time of the next permit issuance.

Hence, for either the next required permit (2013), the subsequent required permit (2018), and appropriate other CWA regulation as applicable, EPA will evaluate the availability of technologies that are able to meet appropriate living organism limitations. Once technologies are commercially available and economically achievable, EPA would require that these standards be met as a BAT effluent limit for ballast water discharges under subsequent iterations of this permit or for reopening this permit consistent with Part 1.9 of the VGP.

4.4.3.6 Onshore Treatment

For those vessels whose design and construction safely allows for the transfer of ballast water to shore, if compatible onshore treatment for ballast water is available and economically practicable and achievable, the vessel owner/operator must use this treatment for any ballast water discharges, unless they use an onboard ballast water treatment system approved by the Commandant of the Coast Guard. Though EPA believes that ship-based treatment of ballast water will be an essential part of the solution to ballast water management, use of land-based treatment systems, if available and compatible with the vessel, could be a valid and effective form of ballast water treatment for the removal of living organisms for vessels while in port. EPA is also aware of at least one land based treatment facility (the Valdez Marine Terminal) for ballast water which is in commercial use and for which treatment may be available and economically practicable and achievable, although the Agency notes that facility is designed for hydrocarbon removal and not for the removal of living organisms. The facility is designed for oil recovery and wastewater treatment and utilizes gravity separation, dissolved air flotation, biological treatment and an/off air strippers. These sorts of treatment have been shown to reduce the viability of living organisms in traditional wastewater contexts. EPA is also aware that some existing ports are actively considering building these facilities and included the permit provisions on use of such facilities both to better protect receiving waters and to provide an incentive for use of these facilities once they are built.

However, EPA also notes that land-based treatment alone cannot be the only answer, as there are several instances where vessels must discharge ballast water while underway, such as discharging ballast water taken up while underway to clear low bridges or discharging ballast water to clear sand bars or while operating in shallow draft channels. Additionally, there are

limitations on space at many ports for the construction and operation of effective ballast water treatment facilities. Finally, various vessels do not have standard sized fittings or otherwise may not be capable of delivering ballast water to land-based facilities due to ship configuration and design. Installing such capabilities may not be economically or technologically achievable, and EPA has written this provision to take that into account. EPA believes that the VGP provisions regarding shore-based treatment could help decrease the risk for introducing aquatic nuisance species from ballast water to receiving waters for vessels in port until such time that all vessels have effective ballast water treatment systems.

4.4.4 Antifouling Hull Coating Leachate (Part 2.2.4)

The primary constituent of concern in most antifouling coatings is copper, although zinc may also be used as an ingredient. While the rate at which the metals leach from coatings is relatively slow (4 – 17 µg/cm2/day), these coatings can account for significant accumulations of metals in receiving waters of ports where numerous vessels are present. Tributyltin (TBT), a metal based biocide, was historically applied to vessel hulls as an antifouling hull coating. TBT causes deformities in aquatic life, including deformities that disrupt or prevent reproduction. Numerous studies and several peer reviewed publications ((Bentivegna & Piatkowski, 1998; Haynes & Loong, 2002; Negri et al., 2004; Negri & Heyward, 2001; Ruiz et al., 1995; V. Axiak et al., 1995) examine the environmental impacts of anti-foulant paint leachate containing TBT. TBT is also stable and persistent, resisting natural degradation in water bodies. Thus, due to its acute toxicity, TBT is a pollutant of concern to be addressed in this permit. There is a zero discharge standard for TBT and all other organotin compounds under this permit. Furthermore, if there are any vessels with existing exposed TBT coatings, those vessels must either seek individual NPDES permit coverage consistent with Part 1.8 of the permit or overcoat the existing TBT coating. EPA expects that few, if any, vessels have exposed TBT coatings on their hulls. EPA believes that a zero discharge standard for all organotin compounds, including TBT is technologically available based on the availability of other anti-foulant coating options (e.g. copper and silicon) and feasible and economically achievable because few, if any, vessels still utilize TBT as an anti-foulant.

The zero discharge standard for TBT is consistent with the requirements of the 1988 Organotin Anti-Foulant Paint Control Act, 33 U.S.C. 2403(a), which generally prohibits application of anti-fouling coating containing TBT on vessels less than 25 meters in length. A zero discharge standard is also consistent with the Convention on the Control of Harmful Anti-fouling Systems on Ships. The treaty, adopted at the International Maritime Organization (IMO) in October 2001, prohibits the use of organotins, like TBT, in anti-fouling paints. The treaty entered into force on September 17, 2008. The treaty has been forwarded to the United States Senate for ratification. In addition, the last TBT antifouling paint registration in the United States was voluntarily cancelled in 2005. Furthermore, the use of TBT antifouling paints or entry to port of vessels with TBT coatings is already prohibited by a large number of other countries, including many countries in Europe (see Regulation (EC) No 782/2003 of the European Parliament and the Council of 14 April 2003 on the prohibition of organotin compounds on ships).

EPA has identified three types of BMPs for control of other antifouling hull coating leachate. The first type of BMP addresses the contents and application of the coating. EPA

recognizes that different coatings options are available and believes that the types of and active agents in hull coatings should be selected to minimize potential effects. The practice of applying coatings according to the instructions on the coating's FIFRA label should currently be a BMP for all vessels. This assures that excess amounts of toxins are not applied, that they are not applied too frequently, and that ships are not reintroduced to the aquatic environment before the manufacturer has recommended, ensuring adequate environmental protection.

In addition, should a vessel operator choose to use a hull coating that does not have a FIFRA label, they must ensure that the coating that does not contain biocides or toxic materials that are banned in the U.S. Vessel operators are always encouraged to select the least environmentally harmful coating possible (e.g., use of lower biocide content coatings, lower biocide release rate, non-persistent biocides, or non-biocidal alternatives).

The second type of BMP addresses the need for particular coatings and selection of the type of coating to apply. The permit requires that vessel operators minimize the use of more toxic coatings than may be needed on some vessels. The selection of an antifouling system for a particular vessel must be made in consideration of the vessel's operational profile, including operating speed, drydocking requirements, and the waters in which the vessel will be traveling, because such factors affect the fouling rate of the hull and other underwater areas of the vessel. Fouling on vessels that typically operate at high speeds may be effectively managed with non-stick, low surface energy, antifouling coatings. Vessels traveling in waters with lower fouling pressure (i.e., reproduction and growth of hard- and soft-fouling organisms) and those that spend less time at dock are expected to have a lower fouling rate; consequently, such vessels should be able to use either non-biocidal coating or antifouling coatings with lower biocide release rates. EPA believes these options should be used where feasible rather than opting for more environmentally damaging coatings.

The third type of BMP is accomplished by matching the coating's abilities or strength to drydock cycles. Larger vessels, particularly those used in trade and cargo transport, must adhere to requirements for safety inspections and maintenance activities that dictate how frequently they must be drydocked. The major manufacturers of hull coatings for this industry will guarantee the effectiveness of their products for a certain period of time based on ship and operational characteristics, so the owner/operator should match the hull coating choice to the appropriate drydocking interval. By factoring this schedule into the hull coating selection, EPA believes that vessel operators will make better decisions regarding the use of coatings that will sufficiently protect the vessel for the period of time needed without creating additional leachate or wastes.

4.4.5 Aqueous Film-Forming Foam (AFFF) (Part 2.2.5)

The constituents of AFFF can vary by manufacturer, but can include ingredients that are persistent, bioaccumulative, and nonbiodegradable. However, EPA recognizes the desirability of using this type of fire fighting agent for certain classes of fires. Therefore, the permit requirements for AFFF do not apply when the discharge occurs during a fire emergency. If such an emergency discharge occurs, an explanation of the emergency and the need to discharge AFFF must be written in the ship's log or other recordkeeping documentation, as long as it is consistent with Part 4.2 of this permit.

While EPA recognizes that the ability to properly maintain and train personnel on firefighting equipment is an important safety requirement for vessels, EPA believes that there are available practices for maintenance and training which can be conducted in a fashion that is not deleterious to the environment. In addition, vessel owner/operators may decide where they conduct the maintenance, and thus, have the ability to limit where they will discharge. Therefore, BMPs for reducing AFFF discharges focus on maintenance- and training-related discharges of AFFF. EPA believes BMPs that result in any reduction in discharges of AFFF have environmental benefits. For vessels that do not regularly leave waters subject to the permit, EPA has determined that due to the potential environmental effects caused by certain AFFF constituents, maintenance and training discharges must be minimized and should be collected and disposed of onshore. Furthermore, EPA also has found that a less toxic (non-fluorinated), substitute foam is available for use for training purposes. Owner/operators must use these non-fluorinated substitutes for training when practicable and achievable. Because these activities are planned and occur on an infrequent basis (annually or semi-annually), vessel operators can arrange to conduct the activities according to the BMPs required in the permit and in a location that poses the least environmental threat. Hence, if these vessel owner/operators will be using these substances in waters subject to this permit, AFFF must be collected and stored for onshore disposal if technologically feasible unless the vessel uses non-fluorinated or alternative foaming agent. For those vessels for which it is not technologically feasible to collect and store the fluorinated AFFF foam, vessel owner/operators must limit the discharge to that amount necessary to conduct legally required tests. Lastly, if a vessel will discharge, they should do so as far from shore as practicable.

For vessels that regularly leave the territorial sea, discharge of fluorinated AFFF for maintenance and training purposes into waters subject to this permit is prohibited. EPA has determined that the most effective BMP is to conduct maintenance and training activities as far from shore as possible. Discharge amounts for regulatory certification and inspection should still be minimized; and within waters subject to this permit, a non-fluorinated foaming agent must be substituted, if possible, for the regular foaming agent found in the AFFF. To meet this goal, permittees should use an alternative AFFF formulation that does not contain perfluorinated surfactants.

For all vessels, discharges of AFFF may not occur in or within 1 nm of waters subject to this permit referenced in Part 12.1 of the permit, unless they are discharged for emergency purposes, by rescue vessels for firefighting purposes, or by vessels owned or under contract to do business exclusively in or within 1 nm of these waters. If an emergency discharge occurs in these waters, an explanation of the emergency and the need to discharge AFFF must be written in the ship's log or other recordkeeping documentation, consistent with Part 4.2 of this permit. Those vessels owned or under contract to do business exclusively in or within 1 nm of areas protected either federally, or by a state, must use non-fluorinated AFFF or collect it and dispose of it onshore to the extent feasible.

EPA provided these exceptions to discharges of AFFF to waters listed in 12.1 so that this permit would not interfere with essential emergency management operations. The provision for vessels that are owned or under contract to do business exclusively in or within 1 nm of these waters was provided so that vessels will not have to divert in order to conduct necessary training and maintenance, which would result in additional cost for these vessels and cause other

environmental impacts (increased fuel usage and air emissions). However, in order to protect these higher quality waters, these vessel owner/operators must use less environmentally damaging non-fluorinated AFFF.

4.4.6 Boiler/Economizer Blowdown (Part 2.2.6)

The constituents of boiler blowdown discharge vary according to the types of feedwater treatment used, but may include priority pollutants such as antimony, arsenic, cadmium, copper, chromium, lead, nickel, selenium, thallium, zinc, and bis (2-ethylhexyl) phthlate. Discharge volumes are typically less than 300 gallons but the discharge, which consists of steam, water, and sludge, occurs under high pressure (≤1200 psi) and at a high temperature (>325º F) below the water line.

BMPs to reduce impacts from boiler/economizer blowdown additives are based on minimization of their discharge to nearshore or port receiving waters, thus allowing for more mixing. To further mitigate potential impacts, EPA has specified that vessels greater than 400 gross tons that leave the territorial seas at least once per week cannot discharge within 3 nm of shore, except when the vessel remains in waters subject to this permit for longer than the necessary duration between blowdowns, the vessel needs to conduct blowdown immediately before entering drydock, or for safety purposes. EPA selected once per week as the threshold because the necessary frequency of boiler blowdown can vary from approximately once in two weeks to once in a couple of months for many vessels. For these vessels, it is therefore practical and achievable for these vessels to only discharge boiler blowdown further than 3 nm from shore. EPA included the caveat that vessels which remain in waters subject to this permit for more than a week can discharge if a week is longer than the necessary duration between blowdown cycles because the Agency became aware that some vessels need to discharge boiler blowdown more often than once a week. In all cases, boiler/economizer blowdown should be discharged as far from shore as practical. No vessel may discharge boiler/economizer blowdown in waters listed in Part 12.1 of the permit, except for safety purposes.

4.4.7 Cathodic Protection (Part 2.2.7)

The constituents of cathodic protection discharges include ionized zinc, magnesium, or aluminum. As an alternative method, Impressed Current Cathodic Protection (ICCP) systems use direct current from a ship-based source in lieu of current supplied from an oxidizing anode (i.e., sacrificial anode). The discharge from either method of cathodic protection is continuous whenever the vessel is waterborne.

EPA believes that ICCP systems are the environmentally preferable method because these systems eliminate or reduce the need for sacrificial anodes. EPA recommends the use of Impressed Current Cathodic Protection (ICCP) in place of or to reduce the use of sacrificial electrodes when technologically feasible (e.g. adequate power sources, appropriate for vessel hull size and design), safe, and adequate to protect against corrosion, particularly for new vessels. Cathodic protection may be considered technologically feasible if there is an adequate onboard power supply and the vessel hull size and design can be adequately protected by ICCP.

For sacrificial anode systems, EPA believes that requiring vessel operators to utilize the BMP of selecting the least toxic anode material that is practicable, in the order of preference of magnesium, aluminum, then zinc, represents a practicable and achievable approach to reducing impacts from this necessary hull protection operation. Additionally, sacrificial anodes should be used in conjunction with corrosion control coatings to minimize the release of dissolved metals. Furthermore, sacrificial anodes must not be used more than is necessary to adequately prevent corrosion of the vessel's hull, sea chest, rudder, and other exposed vessel areas.

In addition, EPA is specifying that vessel operators utilize proper BMPs for cleaning and replacing anodes during drydock to reduce excessive flaking or releases from the oxidizing anodes or the dialectic coating from ICCP systems.

4.4.8 Chain Locker Effluent (Part 2.2.8)

When an anchor is onboard and not in use, the anchor chain is stored in the chain locker, which is often equipped with a sump that can accumulate marine organisms as well as residue from the inside of the locker itself, such as rust, paint chips, grease, and zinc. The chain locker sump is emptied either directly overboard or is drained into the bilge tank for later disposal.

BMPs to reduce or eliminate chain locker effluent discharge require the vessel operator to ensure the chain itself is properly cleaned when brought out of the water to reduce the likelihood of transporting marine organisms and sediment. This practice is currently performed by vessels, using their firemain system, to remove sediments and other material. However, EPA believes vessel operators should use this practice routinely and be advised to perform more thorough wash downs to effectively prevent the transport of marine organisms between water bodies.

Additionally, EPA is requiring ocean-going vessels to clean out, rinse, or pump out chain lockers in open waters (greater than 50 nm from shore), if technically feasible, to reduce the chances of transporting organisms to other water bodies where they may cause potential harm. Vessels that leave waters subject to this permit at least once per month are not allowed to rinse or pump chain lockers in waters subject to this permit, unless not doing so would compromise safety. Because these practices are or can be implemented easily by these vessels, EPA believes this BMP is reasonable for this general permit. The requirement to clean chain lockers as part of scheduled drydock maintenance provides additional protection from discharges resulting from chipped paint or oily leaks from machinery.

4.4.9 Controllable Pitch Propeller (CPP) and Thruster Hydraulic Fluid and other Oil to Sea Interfaces including Lubrication Discharges from Paddle Wheel Propulsion, Stern Tubes, Thruster Bearings, Stabilizers Rudder Bearings, Azimuth Thrusters, and Propulsion Pod Lubrication and Wire Rope and Mechanical Equipment Subject to Immersion (Part 2.2.9).

Vessel owner/operators often use lubricants to maintain the functionality and structure of equipment such as wire rope and other mechanical equipment. As a requirement of this permit, vessel owner/operators must apply lubricants and maintain all seals so that discharges do not result in a visible sheen or are otherwise harmful. Furthermore, before being placed in service,

and after periodic lubrication, wire ropes or cables and other equipment must be thoroughly wiped down to remove excess lubricant.

Constituents of the hydraulic oil will vary by manufacturer but may include copper, tin, aluminum, nickel, and lead. Up to 20 ounces of oil may be released for every CPP blade that is replaced, with blade replacement occurring several times per month on average. When the blade replacement includes removal of the blade port cover (generally occurring infrequently, less than once per month), it is possible that, in a worst case scenario, five gallons of oil might be discharged into surrounding waters. Normal blade replacement is typically done in drydock unless the blade has been damaged.

BMPs to reduce or eliminate CPP hydraulic fluid discharge require that the seals be maintained in good working order to reduce leakage and maintenance activities should be conducted while the vessel is in drydock to prevent accidental spillage of oil.

BMPs to reduce or eliminate stern tube oily discharge require that the seals or fittings be maintained in good working order to prevent leakage. Furthermore, except in emergency situations, major maintenance should occur in dry dock where oils cannot be released to the environment. If emergency maintenance must occur in the water, the permittee must use an oil boom, or other appropriate spill response resource, to contain any potential oil discharge and must have appropriate spill cleanup materials on hand.

Depending on the type of rudder bearings in use, this discharge can cause oil or grease to be released into the water column. Oil-lubricated bearings are kept at a slightly positive pressure in relation to the outside ambient water pressure and will only discharge into the surrounding water if a leak occurs around the rudder mechanism. Vessels can install hull seals where the rudder penetrates the hull to prevent the type of leaks that could lead to oil discharges. Grease-lubricated rudder bearings on Armed Forces vessels discharge grease directly to the bilge tank.

EPA has determined that discharges of lubricants should not occur if vessels are properly maintained. Vessel operators should employ all necessary control measures such as regular maintenance and inspections to ensure that leaks do not occur.

Though all oils have the potential to result in significant environmental impact, owner/operators should use an environmentally preferable lubricant, including vegetable oil, synthetic ester, or polyalkylene glycol as a base for these applications when feasible. Use of an environmentally preferable lubricant does not authorize the discharge of any lubricant in a quantity that may be harmful as defined in 40 CFR Part 110 or cause a visible sheen as these oils still cause many undesirable environmental impacts, though these impacts are potentially less severe than those caused from petroleum based oils.

Lastly, any discharge of oil, including oily materials, from any of these oil sea interfaces may not result in a discharge that may be harmful as defined by 40 CFR Part 110 or result in the production of a visible sheen.

4.4.10 Distillation and Reverse Osmosis Brine (Part 2.2.10)

Onboard distillation and RO systems discharge brine is essentially concentrated seawater with the same constituents of seawater, including dissolved and suspended solids and metals. Anti-scaling treatments and anti-foaming and acidic cleaning compounds may be injected into the distillation system. The effluent constituents from distillation and RO discharge were found to exceed water quality criteria for several metals, nitrogen, and phosphorus but did not exceed thermal mixing zone standards. These constituents are generally present in the receiving water used in the distillation or reverse osmosis process and are merely concentrated in the distillation or osmosis process.

The BMPs EPA has included in the permit require vessel operators to keep the reject water from coming into contact with materials, products, or wastes which may contaminate the discharge with potentially environmentally harmful substances. The Agency believes that returning the concentrated seawater back to the marine environment should not cause environmental harm if done in areas where the brine can be appropriately diluted by the receiving water.

4.4.11 Elevator Pit Effluent (Part 2.2.11)

Elevator pit discharge will have constituents similar to those found in deck runoff and firemain water, which may include lubricants, cleaning solvents, soot, and paint chips. Tests conducted by EPA and DOD (EPA, 1999) on Armed Forces vessels discovered that some detected constituents from elevator pit effluent exceeded the most stringent state water quality standards, including total nitrogen, bis(2-ethylhexyl) phthalate, copper, iron, and nickel.

The permit does not authorize the discharge of untreated elevator pit effluent except in emergency situations. The emergency situation must be documented in the ship's log or other recordkeeping documentation consistent with Part 4.2. The information in today's permit demonstrates that the discharge of untreated elevator pit effluent is not essential to the safe operation of a vessel and that it can easily be held for proper disposal or treated with the vessel's bilgewater. Further, the Agency feels that the limited amount of effluent generated and the high likelihood of its contamination at harmful levels can best be addressed by storage of the effluent for treatment and disposal onshore. However, if elevator pit effluent must be managed with the ship's bilgewater, it may be discharged provided the bilgewater/elevator pit effluent meets the requirements of Part 2.2.2.

4.4.12 Firemain Systems (Part 2.2.12)

Firemain water can contain a variety of constituents, including copper, zinc, nickel, aluminum, tin, silver, iron, titanium, and chromium. Many of these constituents can be traced to the corrosion and erosion of the firemain piping system, valves, or pumps. Discharges from the firemain system are allowed under the permit in case of emergency, when necessary to ensure the safety of the vessel and crew, as well as for testing purposes to ensure the system will be operational in an emergency. However, when feasible, the maintenance and training discharges of the firemain should occur outside ports or other shallow waters and outside waters subject to this permit. In addition, EPA believes that the use of firemain systems for anchor chain

washdowns is likely to result in benefits by reducing the potential transport of invasive species. Therefore, the discharge of firemain systems is allowed under the permit when pulling the anchor and anchor chain from protected waters in accordance with the anchor washdown requirements of the permit.

4.4.13 Freshwater Layup (Part 2.2.13)

Discharges of freshwater layup effluent include the constituents of the potable water along with residual seawater, any residue that may leach from the condenser while the water is being held, and disinfectants like chlorine or chloramine. The Agency recognizes that disinfectants are necessary to reduce aquatic growth within the condenser system. Therefore, the permit requires that vessel operators reduce the potential for harmful impacts by minimizing the use of these treatment chemicals to the lowest effective level that will meet the needs of the system. EPA believes that this can be accomplished by following the application rate suggestions provided by the treatment manufacturers to keep the discharge of the disinfectants as low as possible.

4.4.14 Gas Turbine Wash Water (Part 2.2.14)

Rates and concentrations of gas turbine wash water discharge vary according to the frequency of washdown with some Navy vessels conducting washdowns as frequently as every 48 hours with over 100 gallons of washwater being generated. Discharges resulting from gas turbine washdown may include cleaning solvents and substances such as naphthalene and other hydrocarbons. Furthermore, due to the nature of the materials being cleaned, there is a higher probability of heavy metal concentrations. Washdown water from gas turbines may not be discharged into waters subject to this permit unless it is infeasible to separately collect this washwater or only conduct washes outside 3 nm. If it is infeasible to separately collect the water, the washwater must be treated by an oily water separator before discharge. Under most circumstances, EPA believes the water generated is of small enough volume that either 1) it can be collected and held for onshore disposal or disposal in waters not subject to this permit provided the discharge meets all other applicable law or 2) vessel operators can wash down gas turbines when they are not in waters subject to this permit.

4.4.15 Graywater (Part 2.2.15)

The volume of graywater generated by a vessel is dependent on the number of passengers and crew. It is estimated that, in general, 30 – 85 gallons of graywater is generated per person per day (Copeland, 2007). Cruise ship estimates for approximately 3,000 passengers and crew range in volume from 96,000 to 272,000 gallons of graywater per day or 1,000,000 gallons per week. Navy designers use a generation standard of 50 gallons per person per day when constructing graywater collection systems.

Graywater discharges can contain bacteria, pathogens, oil and grease, detergent and soap residue, metals (e.g., cadmium, chromium, lead, copper, zinc, silver, nickel, mercury), solids, and nutrients. Of these constituents EPA has found ammonia, copper, lead, mercury, nickel, silver, and zinc concentrations that exceed water quality criteria in the discharge.

Several BMPs are practicable and available for control of graywater impacts. First, vessel operators are required to minimize the production and discharge of graywater while in port.

Producing less graywater while in port will result in less volume of graywater discharge in those areas. Secondly, for large vessels that regularly leave waters subject to the permit with the capacity to store graywater for a sufficient period, graywater must be discharged greater than 1 nm from shore while the vessel is underway unless the vessel meets the treatment standards and other requirements contained under Parts 5.1.1 and 5.1.2 or 5.2.1 and 5.2.2 of the permit along with any vessel specific requirements. Releasing large volumes of untreated graywater in nearshore environments, estuarine environments, or in waters with limited circulation is more likely to cause negative environmental impacts. This is because these environments are likely to have higher vessel traffic and, therefore, greater graywater generation and discharge, are more likely to be stressed by other anthropogenic forces, and are likely to have less ability for dilution and assimilative capacity. The provision limiting the discharge of untreated graywater within 1 nm of shore when the vessel has holding capacity is a limit that will help protect these ecosystems. Additional conditions apply to vessels which do not travel more than 1 nm from shore in order to help reduce the discharge of untreated graywater to these environments. EPA does not expect existing vessel owner/operators to install graywater treatment storage capacity. Vessels which have sufficient graywater storage capacity but do not currently treat their graywater to the standards listed in the permit, must utilize onshore treatment when available and economically practicable and achievable. These requirements will reduce their discharges of untreated graywater.

Additionally, soaps and detergents used in any capacity that will be discharged as graywater must be non-toxic and phosphate-free, and should be biodegradable where possible unless there is evidence that they would be harmful to the aquatic environment. Not all biodegradable soaps are appropriate for all aquatic environments, but EPA believes that non-harmful varieties will be available in most situations and should be used when they are available. Non-toxic soaps are those that do not exhibit potentially harmful characteristics as defined by the Consumer Product Safety Commission regulations found at 16 CFR Chapter II, Subchapter C, Part 1500 and are not required to be labeled Toxic or Highly Toxic. Phosphate free soap is considered to contain 0.5% by weight or less of phosphates or derivatives of phosphates. Reducing use of these products will reduce acute and chronic impacts of vessels that generate graywater on aquatic waterbodies and will limit eutrophication in all waters that are phosphorus limited ecosystems. Products meeting these standards are currently commercially available. Changes in cost associated with using these products are estimated in the economic analysis.

Vessels that do not travel more than 1 nm from shore shall minimize the discharge of graywater and, provided the vessel has available graywater storage capacity, must dispose of graywater on shore if appropriate facilities are available and such disposal is economically practicable and achievable unless the vessel meets the treatment standards and other requirements contained under Parts 5.1.1 and 5.1.2 or 5.2.1 and 5.2.2 of this permit. Minimize the discharge of graywater when the vessel is not underway.

4.4.16 Motor Gasoline and Compensating Discharge (Part 2.2.16)

Ambient water is added to fuel tanks as the fuel is used. When gasoline is reloaded to the tanks while in port, the water is discharged. The discharged ambient water may contain traces of gasoline constituents, which generally will contain alkanes, alkenes, aromatics (e.g., benzene, toluene, ethylbenzene, phenol, and naphthalene), metals, and additives. Analyses of

compensating discharge have shown that benzene, toluene, ethylbenzene, phenol, and naphthalene may exceed water quality criteria in the discharge.

EPA has included BMP limitations in the permit based on a vessel's ability to treat the compensating discharge using an oil water separator to meet oil limitations of less than 15 ppm. The permit also requires that this discharge be minimized while the vessel is in port, which can be accomplished by disposing of the wastewater onshore.

4.4.17 Non-Oily Machinery Wastewater (Part 2.2.17)

Non-oily machinery wastewater discharge rates vary by vessel size and operation type, ranging from less than 100 gallons per hour (gph) to over 4,000 gph. Constituents of non-oily machinery wastewater discharge include a suite of conventional pollutants, metals, and organics. Many of the specific constituents in the discharge can exceed water quality criteria, including copper, nickel, silver, zinc and a collection of nutrients. Mercury also may be present, but reported concentrations did not exceed the standards.

EPA has determined that non-oily machinery wastewater can be discharged if control measures are instituted to keep the waste stream free of oils and additives that are toxic and bioaccumulative. Alternatively, non-oily machinery wastewater can drain to the bilge.

4.4.18 Refrigeration and Air Condensate Discharge (Part 2.2.18)

This discharge may contain metals from the refrigeration/air conditioning coils and drainage systems, including aluminum, copper, iron, lead, nickel, silver, tin, and zinc. Traces of detergent also may be found in this discharge from the cleaning of refrigerated spaces, as can seawater and freshwater. This waste stream can easily be kept segregated from oily wastes and safely discharged, channeled and collected for temporary holding until disposed of onshore, or drained to the bilge. The permit prohibits refrigeration and air condensate from coming into contact with oily or toxic materials if it is discharged directly overboard. However, if the condensate is collected for internal recycling, it may be subsequently commingled with other oily discharges provided that the combined discharge meets the requirements of Part 2.1.4 and, if applicable, Part 2.2.2.

4.4.19 Seawater Cooling Overboard Discharge (Including Non-Contact Engine Cooling Water; Hydraulic System Cooling Water, Refrigeration Cooling Water) (Part 2.2.19)

The potential constituents of seawater cooling overboard discharge include entrained or dissolved materials from the system itself, including copper, iron, aluminum, zinc, nickel, tin, titanium, arsenic, manganese, chromium, lead, and oil and grease. Based on existing research conducted for the UNDS program, seawater cooling discharge rates can reach as much as 170,000 gallons per minute (gpm) for an in-transit aircraft carrier with copper, nickel, and silver concentrations in the discharge that exceed water quality criteria.

Cooling water also can reach high temperatures with the thermal difference between seawater intake and discharge typically ranging from 5°C to 25°C, with maximum temperatures reaching 140°C. EPA has not prohibited the discharge of the heated seawater because it is

infeasible with existing vessel design to prohibit their discharge. However, the Agency believes if vessel operators institute the BMP of reducing discharges to ports or enclosed water bodies, impacts from the heated waters will be reduced. Discharges of seawater can be reduced by using shore based power when electrical systems on board vessels are compatible with the available shore power.

In addition, mud, biota, and other debris can stick to the strainer plates and require periodic clearing. The permit requires that vessel operators incorporate the regular removal of fouling organisms from seawater piping and cooling systems to prevent possible transport of species to other water bodies. The risk of introducing invasive species is reduced considerably when vessel owner/operators remove fouling organisms while at sea (greater than 50 nm from any shore). Hence, vessel owner/operators should clean piping while at sea in lieu of cleaning these systems in waters subject to this permit if they frequently sail far from the coast.

4.4.20 Seawater Piping Biofouling Prevention (Part 2.2.20)

To prevent biofouling of seawater cooling systems, small amounts of biocidal substances are sometimes injected near the seawater intakes to prevent biofouling by any organisms that may have been drawn in along with the cooling water. Seawater that has been discharged after being treated with chlorinating substances will contain free chlorine and reaction products (halamines, free bromine, and halogenated organics).

The requirements of the permit reinforce current environmental regulations established under FIFRA. Under the permit, biofouling chemicals for seawater piping must be used according to their FIFRA label and are prohibited from discharge if they are banned for use in the U.S.

Vessel owner/operators must use the minimum amount of biocide needed to keep fouling under control. Using visual observations, vessel operators can determine if they are achieving the desired level of biofouling prevention with lower concentrations of biocide. If an organic biocide is used, it should have a short half-life. If an oxidizing biocide is being used, the total residual oxidant concentration of the effluent should be monitored periodically to ensure that excessive amounts of biocide are not being released into the environment.

4.4.21 Boat Wet Engine Exhaust (Part 2.2.21)

Large vessels may have one or many smaller vessels onboard that serve purposes ranging from lifeboats to landing craft. These auxiliary vessels may have engines which produce wet exhaust. Wet exhaust can contain nitrogen oxides, sulfur dioxide, hydrocarbons and other organic compounds, carbon monoxide, and particulates. For naval vessels, EPA estimates that outboard engines discharge wet exhaust at a rate of 20 gpm while inboard diesel engines have an estimated discharge rate of 150 gpm. The constituents discharged by outboard engines differ from those discharged by inboard engines, due to the different fuel and engine types. For these outboard engines, a handful of organic constituents are estimated to exceed water quality criteria in the discharge. Inboard engines may produce discharges that exceed water quality criteria for polycyclic aromatic hydrocarbons (PAHs). EPA believes that well maintained engines are less likely to cause these exceedances, and is therefore, requiring operators to implement control

measures to ensure their engines are maintained in proper working order. Furthermore, vessel owner/operators should use low sulfur or alternative fuels for their vessels to reduce the concentration of pollutants in their discharge.

Vessels that generate wet exhaust must be maintained in good operating condition and functioning according to manufacturer specifications. Vessel operators are encouraged to consider four-stroke engines in lieu of two-stroke engines to minimize the discharge of pollutants to waters subject to this permit.

4.4.22 Sonar Dome Discharge (Part 2.2.22)

Sonar domes are typically found on research vessels and may sporadically be found on other vessels covered by this permit. Maintenance on the sonar dome, while typically (but not always) done while a vessel is in dry dock, can involve the release of the inner sonar dome water. In addition, the components of the outside of the sonar dome can leach into the surrounding waters, including antifouling agents, plastic, iron, and rubber. Along with these materials, tin, zinc, copper, nickel, and epoxy paints may be found on the inside of sonar domes. Some of the discharge concentrations of these components can exceed water quality criteria. Discharge rates are estimated at as little as 300 gallons and as much as 74,000 gallons from inside the sonar dome with every repair event.

Because EPA has not identified any available BMP or feasible treatment technology other than zero discharge, this permit requires that water from inside the sonar dome may not be discharged. In addition, vessel operators should not use bioaccumulative biocides on the exterior of sonar domes when other viable alternatives are available.

4.4.23 Underwater Ship Husbandry Discharges (Part 2.2.23)

Extensive hull repair that requires the use of significant raw materials or other potentially toxic chemicals should be conducted while the vessel is in drydock when feasible. Owner/operators must take all precautions to minimize the discharge of raw, toxic, or oily materials while doing any underwater vessel repairs, and these discharges must comply with all applicable federal laws.

EPA recommends that extensive hull cleaning be conducted when the vessel is in drydock or when the byproducts of the cleaning can be contained and disposed of properly, especially when cleaning hulls using water pressure based systems. This BMP encourages all waste to be collected and disposed of properly to ensure that they are not washed into nearby waters. While these practices do not specifically address the release of antifouling materials from hulls during vessel operations (i.e., hull coating leachate), they are critical to controlling levels of contaminants that result in the same type of environmental degradation. In addition, these same practices will reduce the potential for release of introduced species during hull cleaning and paint preparation activities.

Many vessels are too large to be regularly removed from the water and any repair or maintenance required on the hull or hull appendages must occur while the vessel is pier-side between drydockings. Hull cleaning and repair activities can cause the release of a wide range of constituents, including elements of the vessel hull; hull coatings; cleaning agents; and species

that are attached to and are associated with the hull and other submerged areas of the vessel and were transported to non-native waters. Use of non-toxic anti-foulant paints such as silicon based paints will reduce the discharge of toxic materials into the water column during any cleaning.

EPA has not identified an alternative to underwater ship husbandry, a viable treatment technology, or specific practices that will eliminate all releases of contamination. However, the Agency is requiring that vessel operators employ removal and cleaning methods that reduce the environmental impacts due to releases of biocides, hull coating materials, and invasive species. EPA has determined that use of soft brushes when cleaning hulls helps eliminate the release of paints and hull materials; hence, you must use the softest brush practicable to effectively remove living organisms from the vessel hull. Secondly, when available, EPA recommends vacuum cleaning technologies be employed in conjunction with mechanical scrubbing. Vacuum cleaning allows the materials scrubbed from the vessel hulls to be collected and disposed of onshore. Though promising, these approaches are not widely commercially available; hence, EPA has not required that they must be used in this permit. Dry dock cleaning is the preferred alternative to underwater ship husbandry whenever possible.

In addition, vessel hulls and hull appendages are a potential source for the spread of aquatic nuisance species. Vessel owner/operators must minimize the transport of attached living organisms when they travel into waters subject to this permit from outside the U.S. economic zone or when traveling between COTP zones. Minimization techniques include preventing the hull from fouling using appropriate anti-foulant paint (see 4.4.4 of this fact sheet) and frequently removing fouling organisms from the hull.

4.4.24 Welldeck Discharges (Part 2.2.24)

Potential constituents of welldeck discharges include fresh water, distilled water, firemain water, graywater, air-conditioning condensate, sea-salt residues, paint chips, wood splinters, dirt, sand, organic debris and marine organisms, oil, grease, fuel, detergents, combustion by-products, and lumber treatment chemicals. EPA has determined that control measures can reduce some of the potential impacts from welldeck discharges. The permit, therefore, distinguishes what types of waste may be discharged as welldeck discharges.

Further, EPA is requiring that vessel operators practice good housekeeping to ensure that no garbage or wastes that can cause a visible sheen are discharged. Should these wastes be present, the vessel operator must retain the discharge for onshore disposal.

4.4.25 Discharges of Graywater Containing Sewage (Part 2.2.25)

Some vessel operators mix graywater with sewage discharges. Once these two discharge types are commingled, it is impossible to separate out which constituents within the effluent are from which discharge type. Therefore, although discharges of sewage from vessels are exempt from permitting under CWA Section 502(6), all graywater discharges containing sewage are required to meet the relevant standards contained within this permit for graywater including discharge minimization requirements, prohibitions, standards, and other requirements applicable to graywater in Part 2 and Part 5 as appropriate are also required for graywater containing sewage. While not a requirement of this permit, vessel operators should be aware that CWA

Section 312 and its implementing regulations contain requirements for discharges of sewage from vessels which also apply to sewage mixed with graywater.

4.4.26 Exhaust Gas Scrubber Washwater Discharge (Part 2.2.26)

On October 9th, 2008, the 168 member States of the International Maritime Organization (IMO) adopted stringent new standards to control harmful exhaust emissions from the engines that power ocean going vessels. These engine and fuel standards are included in amendments to Annex VI of MARPOL. As a component of their analyses, the IMO also set out scrubber washwater criteria in section 10 of the guidelines for Exhaust Gas Cleaning Systems (Resolution MEPC.170(57)). Those washwater criteria include recommended limits for pH, polycyclic aromatic hydrocarbons (PAHs), turbidity, nitrates and washwater additives.

A byproduct of some exhaust gas cleaning technology is that the water used to scrub the exhaust gases may be discharged overboard. This washwater may include suspended solids, heavy metals, and hydrocarbons. Before the washwater is discharged, it may be processed to remove solid particles. Vessel owner/operators must follow all existing regulations, including the prohibition against the discharge of oil, including oily mixtures, in quantities that may be harmful as defined in 40 CFR Part 110. In addition, sludge generated from exhaust gas scrubber washwater may not be discharged in waters subject to this permit. EPA believes that these requirements are reasonable for this general permit because the current volume of EGS washwater discharge is low due to the limited number of vessels utilizing exhaust gas cleaning systems. At this time, EPA is aware of one vessel which sails in U.S. waters and uses this technology. EPA also notes that the Agency will be in a better position to establish appropriate standards and BMPs for this waste stream after promulgation of its rule establishing tier 2 standards for Category 3 diesel marine engines, or when use of the exhaust gas cleaning systems becomes more commonplace. In the interim, EPA recommends that owner/operators of vessels with exhaust gas cleaning systems that result in washwater discharges should follow the guidelines set out in section 10 for Exhaust Gas Cleaning Systems (resolution MEPC.170(57)).

On February 28, 2003, EPA promulgated a final rule regulating NOx emissions from new Category 3 diesel marine engines using a two-tier approach. See 68 FR 9746. Under this approach, EPA first adopted a near-term standard, effective in 2004, that was equivalent to the MARPOL Annex VI NOx limits, and could be achieved through existing engine-based emissions-control technology. EPA also adopted a regulation that set a schedule for future rulemaking to assess and adopt an appropriate second tier of NOx standards.

In December 2007, EPA published an Advance Notice of Proposed Rulemaking (ANPRM) inviting comment on a plan to propose additional emission standards for Category 3 marine engines. See 72 FR 69522 (December 7, 2007). The program being considered by EPA in the ANPRM is similar to the program finalized by the International Maritime Organization. . The EPA ANPRM describes in greater detail the program contained in the United States Government Submittal.

The NOx limits for new engines described in the ANPRM consist of Tier 2 standards that would reduce NOx 15 to 25 % below the current Tier 1 emission levels, which could be effective as early as 2011. The Tier 3 NOx standards would reduce NOx by up to 80 % below the Tier 2

level, which could be effective as early as 2016. The Tier 3 standards would be geographically based, meaning they would apply only while ships are operating in specially designated areas. Reductions in SOx and PM emissions would be achieved through performance standards that could begin as early as 2011. These limits are expected to be achievable through the use of low-sulfur distillate fuels, exhaust gas cleaning technology, or a combination of both. These limits could potentially achieve SOx reductions as high as 95 %, as well as substantial PM reductions. Also under consideration are controls for certain existing engines that could begin as early as 2012. The standards proposed in that ANPRM are similar to those finalized by the IMO discussed at the start of this section.

4.5 WATER QUALITY-BASED EFFLUENT LIMITS (PART 2.3)

This permit includes water quality-based effluent limits (WQBELs) to control discharges as stringently as necessary to meet applicable water quality standards. The provisions of Part 2.3 of the permit constitute the WQBELs for this permit, and supplement the permit's technology-based effluent limits in Parts 2.1, 2.2, and 5 (where applicable). Where the implementation of the technology-based requirements in this permit are not sufficient to meet the applicable receiving water's water quality standards, the permittee may be subject to further WQBELs. Prior to or after permit issuance and authorization to discharge, EPA may require additional WQBELs on a site-specific basis, or require the permittee to obtain coverage under an individual permit, if information in the NOI, required reports, or from other sources indicates that, after meeting the technology-based limits in Parts 2.1, 2.2, and 5 (where applicable) and the WQBELs in Part 2.3, the facility is causing or contributing to an excursion above water quality standards[9].

Part 2.3 includes the permit limits that are as stringent as necessary to achieve water quality standards, consistent with CWA section 301(b)(1)(C) and 122.44(d)(1).). EPA generally expects that vessels that achieve the permit's technology-based limits through the careful implementation of effective pollution control measures and BMPs are likely to already be controlling their vessel discharges to a degree that would make additional water quality-based controls unnecessary. However, to ensure that this is the case, the permit contains additional conditions, which, in combination with the BAT/BPT/BCT limits in this permit, EPA expects to be as stringent as necessary to achieve water quality standards. EPA notes that the WQBELs included in this permit are non-numeric. EPA relies on a narrative expression of the need to control discharges as necessary to meet applicable water quality standards, and to employ additional controls where necessary to be consistent with applicable WLAs in an approved or established TMDL or to comply with a State or Tribe's antidegradation policies. This is a reasonable approach for this permit because EPA has determined that it is infeasible to calculate numeric water quality based effluent limits for vessels at this time. EPA reached this determination primarily based on the mobile nature of vessels used in a capacity of transportation. With thousands of water bodies across the country, and the potential for any vessel to discharge into almost any water, it is infeasible for EPA to calculate numeric limits for each vessel for each water body at this time. Furthermore, as explained in Part 4.1.4 of this fact

[9] In using the phrase "excursion above," the permit tracks the language in 40 CFR 122.44(d)(1). There are some instances, however, where pollutants would cause nonattainment of the applicable criterion by lowering the water quality *below* the criterion, as with dissolved oxygen. In such situations, such lowering would be considered an "excursion above" within the meaning of the proposed permit condition.

sheet, establishing numeric water quality based limits poses many of the same challenges that EPA faced in setting technology-based discharge limits.

As mentioned, this permit requires that each permittee must control its discharge as necessary to meet applicable water quality standards. EPA generally expects that compliance with the other conditions in this permit (e.g., the technology-based limits, corrective actions, etc.) will result in discharges that are controlled as necessary to meet applicable water quality standards. If the permittee becomes aware, or EPA determines, that the discharge causes or contributes to a standards exceedance, corrective actions and EPA notification are required. In addition, at any time EPA may impose additional, more stringent WQBELs on a site-specific basis, or require an individual permit, if information suggests that the discharge is not controlled as necessary to meet applicable water quality standards. The language in Part 2.3 affirms the permittee's requirement to control its discharges as stringently as necessary to meet applicable water quality standards. EPA reserves the authority to require more stringent requirements where necessary to meet applicable standards, or, alternatively, to require the permittee to apply for an individual permit.

The purpose of Part 2.3.2 is to include a definition for "impaired waters" so that the scope of the requirements in 2.3.2 can be more readily understood by permittees. Part 2.3.2 defines "impaired waters" as those which have been identified by a State or EPA pursuant to Section 303(d) of the Clean Water Act as not meeting applicable State water quality standards. This may include both waters with approved or established TMDLs, and those for which a TMDL has not yet been approved or established. The permit contains additional provisions for vessels discharging pollutants that have the reasonable potential to cause or contribute to an impairment of those specified waters.

Part 2.3.2.1 reiterates that if a vessel discharges to an impaired water without an EPA-approved or established TMDL, EPA can provide the permittee with additional requirements with which to comply. EPA can also impose additional requirements on discharges that are not directly to an impaired water if they cause or contribute to an exceedance in another water body affected by the discharge.

Part 2.3.2.2 outlines the process for imposing additional requirements on permittees when they discharge into waters that have a waste load allocation (WLA) assigned to vessels. During the term of the permit, EPA may inform the owner/operator if such a WLA has been established that applies to their vessel discharges. In addition to requiring permittees to comply with the conditions of the WLA, EPA will also assess whether any more stringent requirements are necessary to comply with the WLA, whether compliance with the permit's existing requirements is sufficient to comply with the WLA, or whether the owner/operator must apply for individual permit coverage (see part 1.8.1).

EPA believes that the permit's provisions are consistent with EPA's antidegradation policy. EPA does not believe that a vessel covered under this permit should be considered a new or increased point source discharge that would forseeably lower water quality under EPA's antidegradation regulation, located at 40 CFR 131.12, the typical trigger for antidegradation review (See EPA Water Quality Standards Handbook, p. 4-10, available at: http://www.epa.gov/waterscience/standards/handbook/);

http://www.epa.gov/waterscience/standards/handbook/see also EPA's Response to Comments for Oregon Water Quality Standards 2004 approval, page 31). Generally speaking, the vessels covered under this permit and their discharges existed before EPA's issuance of the VGP and submission of those vessels' notices of intent to be covered under the VGP. Such existing discharges do not constitute "new or increased point source discharges" that would forseeably lower water quality within the meaning of 40 CFR § 131.12, and thus do not trigger antidegradation review. As stated in EPA's Water Quality Standards Handbook, antidegradation review requirements "are triggered by any action that would result in the lowering of water quality in a high-quality water. Such activities as new discharges or expansion of existing facilities would presumably lower water quality and would not be permissible unless the State conducts a review consistent with" the State's antidegradation requirements. EPA Water Quality Standards Handbook, p. 4-7, available at: http://www.epa.gov/waterscience/standards/handbook/. EPA's issuance of the VGP and vessels' applications for coverage under the VGP will not forseeably result in the lowering of water quality because those vessels and their discharges existed before the permit was issued and coverage was granted. If anything, EPA's issuance of the VGP will improve water quality as vessels carry out the permit's technology-based requirements. Further, as stated by EPA in its July 7, 1998 Advance Notice of Proposed Rulemaking, antidegradation "specifies the framework to be used in making decisions regarding changes in water quality." 63 Fed. Reg. 36779-80. Again, in the context of the VGP there are no expected "changes in water quality", at least no negative changes. Finally, as stated in EPA's Response to Comments for Oregon Water Quality Standards 2004 approval, antidegradation "would require the permit authority and applicant to undergo an antidegradation review if the discharge would lower water quality as compared to the prior discharge." Again, vessels covered under the VGP will not typically "lower water quality as compared to the prior discharge" since the very same vessels that are being permitted under the VGP constituted the prior unregulated discharges that existed before issuance of the permit. The VGP merely authorizes point source discharges that previously existed but were unregulated by EPA's NPDES regulations. Such existing discharges are not what EPA's antidegradation regulation intends to cover, as evidenced by the statements cited above. As a result, EPA does not consider vessels covered by this permit to be new or increased point source discharges that would forseeably lower water quality for antidegradation purposes, and thus antidegradation review is not triggered.

5. CORRECTIVE ACTIONS (PART 3)

5.1 PURPOSE OF CORRECTIVE ACTION SCHEDULES

The purpose of including a corrective action section in this permit is to assist this new universe of NPDES permittees with effectively meeting effluent limits and implementing the best management practices in this permit. Corrective actions in this permit are follow-up actions a permittee must take to correct problems identified in an inspection; they are a requirement to review and revise control measures and vessel operations to ensure that any problems are eliminated and will not be repeated in the future. The permit makes clear that the permittee is expected to assess why a specific problem has occurred, and document what steps were taken to eliminate the problem. EPA believes this approach will aid vessel owner/operators in reaching compliance with the requirements of the permit quickly. Compliance with many of the permit's requirements, for instance, those related to good housekeeping, reporting, recordkeeping, and some of those related to operation and maintenance requirements can be accomplished immediately, and therefore, are not considered problems that trigger corrective actions.

The permit requires that a corrective action assessment be completed as soon as any of the listed problems are identified. Pursuant to provisions of the permit found in Part 4.2, any problems that constitute violations of permit requirements (instances of noncompliance) must be either noted as part of the vessel's records or reported to EPA. As part of the corrective action assessment found in Part 3.2 of the permit, the owner/operator must give a detailed account of the problem(s) identified, take steps to discover the causes of the problem(s), and outline a schedule for addressing the problem(s). The specific contents of the corrective action assessment are detailed in the permit. This corrective action assessment must be kept with the other recordkeeping documentation required by this permit.

Part 3.3 of the permit outlines types of problems that trigger the need for corrective action, and stipulates time periods for implementing actions to remedy deficiencies and violations. EPA emphasizes that these time frames are not grace periods within which an operator is relieved of any liability for a permit violation. When any of the listed problems are identified, such as discovery that effluent limits are being violated, the owner/operator must take steps to ensure the problems causing the violations are eliminated. If the original inadequacy constitutes a permit violation, then that violation is not excused by the time frame EPA has allotted for corrective action. EPA assumes that vessel owner/operators will need less time to make minor repairs or change shipboard practices than to make substantial renovation or repair. Time limits are included specifically so that problems are not allowed to persist indefinitely. Failure to take the necessary corrective action within the stipulated time limit constitutes an additional and independent permit violation. The three deadlines for corrective actions are based on how extensive the corrections are. For example:

- A minor adjustment may include altering practices for material or equipment storage that cause contamination during a precipitation or high wave event. Corrective actions to prevent these effluent violations in the future must be implemented as soon as possible but no more than 2 weeks after the discovery of the problem. For example, if materials caused contamination of the deck washdown water, or bilgewater containing emulsifiers, detergents, or other additives was discharged, then violations

have occurred. For a vessel that will leave waters subject to this permit within 2 weeks of discovering the problem, corrective actions must be taken either within 2 weeks after the discovery of the problem, or prior to re-entering waters subject to this permit, whichever is later.

- A major adjustment may include drips or spills from leaky infrastructure, or operations that cause violations, but can be repaired or corrected without the vessel being put into dry dock. These adjustments or repairs could include fixing leaking pipe connections or seals that allow oil or other contaminants to reach discharges; installation of drip pans to prevent equipment spills or machinery area runoff from reaching deck washdown effluent; or requiring additional training of crew on correct compliance procedures if vessel activities are not in compliance with the permit.

  Major adjustments must be made within 3 months. EPA believes that this allows sufficient time to locate the parts or personnel to make the repair or complete the correction. During the period immediately following the initial violation and before the corrective action has been completed, the vessel operator must make every effort to reduce potential environmental harm. If longer than 3 months is required, the appropriate EPA regional office must be notified of why the additional time is needed and a date when the correction is anticipated to be completed. This information must be recorded in the vessel's recordkeeping documentation. For a vessel that will leave waters subject to this permit within 3 months of discovering the problem, corrective actions must be taken either within 3 months after the discovery of the problem, or prior to re-entering waters subject to this permit, whichever is later.

- A major renovation is one that can only be performed in dry dock. This may include such modifications as replumbing waste lines, rerouting drains, or installation of additional holding capacity for select discharge types; or overcoating or removal of TBT on vessels previously coated with this anti-fouling hull coating.

  Major renovations must be accomplished during the next available or scheduled opportunity for dry dock renovations. An owner/operator that has a vessel that is in dry dock after incurring a violation that does not take corrective action to alleviate the identified problem will be in violation of the corrective actions section of the permit for every occurrence or discharge after re-launching the vessel (in addition to any original violations prior to going into drydock). All vessels will need to begin complying with its terms on December 19, 2009; hence vessel operators should consider implementing plans as soon as possible to make necessary renovations or repairs part of their current dry dock scheduling.

EPA will consider the appropriateness and promptness of corrective action in determining enforcement responses to permit violations.

6. INSPECTIONS, MONITORING, REPORTING, RECORDKEEPING (PART 4)

Pursuant to CWA section 308 and 402(a)(2), 40 CFR 122.43(a), and other applicable implementing regulations, the following requirements have been included in the permit, as discussed below.

6.1 SELF-INSPECTIONS AND MONITORING (PART 4.1)

Vessel self-inspections are required as a means of identifying, for example, sources of spills, broken pollution prevention equipment, or other situations that are or might lead to permit violations and allow the owner/operator to correct the situation as soon as possible. The permit requires self-inspections so that the owner or operator can diagnose and fix problems to remain compliant with the permit. These self-inspections can and must be conducted while the vessel is underway as well as while in port, and are designed to fit easily into other, already established vessel routines. For instance, the permit allows the routine visual inspections to be conducted as part of an existing (or updated) international safety management (ISM) code safety management system (SMS) plan, as long as all the permit requirements are met.

The routine visual inspections required by the permit are reasonable measures of good marine practice that the prudent mariner is already employing to ensure vessel, crew, and environmental health and safety. Inspections must be conducted at least once per week or once per voyage, whichever is more frequent, except that vessels that engage in multiple voyages per day are required to inspect daily, rather than on every voyage. If the vessel hull is not readily visible, it should be inspected when feasible, particularly the portions of the hull above the water line at any given time. Effluent streams that are not readily visible, such as those discharged below the waterline, require, at a minimum, quarterly visual sampling or viewing, and visual inspection of the sample. Examination of these discharges ensures that all effluent streams are examined on a regular basis for indicator substances prohibited from entering any effluent stream without imposing complicated sampling and testing requirements on vessel owner/operators. For sample streams that can be easily collected, the owner/operator should use a clear bottle or other appropriate device to remove a portion of the discharge. Samples can be collected from sampling ports or the inspector can also remove sample streams from small draincocks. This sample should be visually examined. The examiner must look for signs of any obvious constituents of concern such as sheens or unexpected discoloration. If these visual indicators of constituents of concern are noted, the owner/operator must initiate the corrective action process. If the sample stream is not easily obtainable, then the inspector must examine the discharge at the last point before the effluent stream is discharged overboard if feasible. If this is not feasible, the owner/operator must document in their recordkeeping documentation that such visual sampling is not feasible.

Vessels with an oily water separator are not exempt from visual inspection of the bilgewater because visual inspection is a simple, quick, and easy inspection to make which also indicates the effectiveness and operational status of the oily water separator. The appearance of oil in the bilgewater discharge signals to the owner or operator that oily water separator repairs or maintenance may be necessary. Each routine visual inspection must be noted in the official

logbook or other recordkeeping documentation, signed by the person conducting the inspection, and include basic information relating to the inspection. This establishes a record of inspections conducted for both the owner/operator and EPA to track compliance with the permit. The record can help the owner/operator track which areas of the vessel cause more permit violations or hold the most potential pollution problems. By being aware of and focusing on these areas, the owner or operator can change or establish onboard procedures to make permit compliance easier.

The comprehensive annual inspection requirements include a more detailed, thorough inspection of areas of the vessel that are difficult to inspect on a more regular basis, such as the vessel hull. However, the annual inspection does not require the vessel be placed into drydock. Areas of the vessel that can not be inspected without placing the vessel in drydock should be inspected and documented during the next scheduled drydocking period. The owner/operator should note in the annual inspection report which areas are able to be inspected during drydock only. Annual inspection of these areas ensures they are inspected frequently enough to identify and correct problems. In addition, the annual review of all inspection and monitoring data highlights problem areas of the vessel that may need additional attention. This allows the Master, owner, or operator to establish and implement additional procedures applicable to problem areas to reduce future problems. Additionally, the annual inspection requires that all pollution control equipment be inspected to ensure it is functioning properly. This requirement provides a reminder and opportunity to complete maintenance activities on onboard equipment.

Owner/operators may use applicable portions of the results from the annual inspections conducted by the Coast Guard or the classification society to meet some requirements of the annual inspection. For example, if the Coast Guard examines the oily water separator, then the owner may note in their inspection report that the Coast Guard had completed the inspection and they would not be required to inspect it again. However, for portions of the vessel that are not inspected by the Coast Guard or classification society for environmental performance, the owner/operator must conduct an inspection to be sure that the vessel is meeting requirements of this permit. Regardless of who conducts the inspections, the owner/operator is responsible for a thorough inspection being conducted and taking corrective actions based on that inspection. If the owner/operator is unsure of the quality of inspections that they will use as part of their annual inspection, EPA strongly recommends they use their own personnel to conduct the full inspection. The owner/operator is ultimately responsible for completion of this requirement.

Each annual inspection must be recorded in the official logbook or other recordkeeping documentation, signed by the person conducting the inspection, and must include basic information relating to the inspection and any corrective actions taken as a result of inspection findings.

6.2 DRYDOCKING INSPECTION REPORTS (PART 4.1.4)

Many class societies and the United States Coast Guard require that the vessel operator conduct drydock inspections before relaunching the vessel. Based on discussion with technical experts, EPA assumes most, if not all vessels currently must undergo drydock inspections. When a vessel is in drydock, it is much easier to access a wide range of areas on the vessel that are not easily accessible while the vessel is in water. The thorough examination of the vessel that occurs while it is in drydock provides owner/operators with an additional opportunity to implement the

permit's requirements. For example, cleaning the vessel hull of attached organisms is much easier in drydock, and is safer for the environment because any attached organisms can be properly disposed of away from water, minimizing the risk of an introduction of ANS. For any drydock report, the permit requires that it include confirmation that the chain locker, hull, and cathodic protection have been inspected and cleaned, that anti-fouling hull coatings are maintained and applied in accordance with the permit's requirements, and that all pollution control equipment is maintained and properly functioning. In instances where vessel owner/operators have drydock reports conducted by the applicable class society or the Coast Guard, or where the vessel operators prepare another drydock inspection report, the permit requires the owner/operator to make such reports available to EPA or an authorized representative of EPA upon request.

6.3 RECORDKEEPING REQUIREMENTS (PARTS 4.2 AND 4.3)

Written records are useful tools for both the vessel owner or operator and EPA. They allow an owner or operator to assess their own permit compliance by providing an easy way to reference permit requirements that have been met, as well as a way to identify troublesome areas of the vessel that cause more pollution-related issues. They also allow EPA to assess permit compliance. By identifying which areas consistently require more cleaning or repair work, the owner or operator can establish and implement procedures specifically designed to minimize pollution and streamline cleaning and maintenance efforts in those areas.

Much of the information that must be recorded under the permit is the same as the information that is required of vessels equipped with ballast tanks bound for a port or place in the United States by the Coast Guard Regulations at 33 CFR §151.2045. This basic information allows the identification of the vessel, the vessel's travels and itineraries, and responsible parties. While the Coast Guard regulation applies only to vessels with ballast tanks, the requirements of the permit apply to all vessels covered by the permit, whether they have ballast water tanks or not. By using the existing vessel recordkeeping requirements as a framework into which the recordkeeping requirements of the permit fit, EPA has attempted to streamline the requirements, make compliance with the permit simple, and do so without imposing significant additional paperwork on vessel owners and operators. Streamlining the paperwork and recordkeeping requirements (for vessels also covered under Coast Guard regulations) increases compliance and allows EPA to achieve both permit enforcement and environmental protection goals.

The information to be recorded is intended to be simple, basic, and straightforward. There are no specific forms to fill out or file; a permittee need only keep one brief record of each inspection, noting when and how it was completed and any relevant information discovered during the inspection. Inspection records must be kept on the vessel or accompanying tug and may be kept in any form provided they can be made available to the EPA. Examples include the ship's official logbook or other official vessel recordkeeping documentation. There do not need to be multiple copies of the records. Additional requirements include a record of maintenance of specific pieces of equipment that cause discharges covered under the permit and a record of each incidence where a discharge occurs pursuant to a safety or emergency exception (e.g., bilge water 2.2.2, ballast water exemptions 2.2.3.10, AFFF 2.2.5, boiler blowdown 2.2.6, elevator pit 2.2.11, firemain 2.2.12). This can assist in troubleshooting any future pollution problems by

showing how often maintenance was performed, what maintenance or repairs were completed, and how often and under what circumstances emergency exceptions were invoked.

This permit contains provisions reinforcing reportable release requirements. The permit specifically does not allow the discharge of hazardous substances or oil in excess of reportable quantities, even if they are associated with the normal operation of a vessel. This provision has been included to clarify that the permit is not authorizing any reportable quantity releases of any material that were not authorized before issuance of this permit. These spills must be reported as required under 40 CFR Part 110 and 40 CFR Part 117.

Vessels equipped with ballast water tanks are required by the permit to meet the requirements of 33 CFR 151.2045. This requirement applies both to vessels that are already subject to these Coast Guard regulations and to vessels that are not. The USCG regulations establish a recordkeeping system to collect information related to ballast water capacity, uptakes, exchanges, and discharges. In addition, the permit expands the ballast water exchange and saltwater flushing requirements for vessels with ballast water tanks. These vessels that conduct saltwater flushing must note that fact on the Ballast Water Reporting Form, which is found in the Appendix to 33 CFR Part 151, Subpart D.

6.4 REPORTING (PART 4.4)

EPA emphasizes that failure to meet any requirement of the permit would constitute an enforceable permit violation. EPA has added emphasis and explanation about what constitutes a permit violation in several places in the permit in order to avoid any ambiguity. However, provisions where this emphasis has not been included are also enforceable requirements.

EPA has included reporting requirements in the VGP that ensure that EPA, and other parties as necessary, are made aware of potential permit violations. For all vessels equipped with ballast tanks that operate in waters of the United States and are bound for ports or places in the United States, you must meet the reporting requirements of 33 CFR 151.2041 and recordkeeping requirements of 33 CFR 151.2045.

All NOBOB vessels that conduct saltwater flushing should indicate that they have done so in the Ballast Water Reporting Form in Section 4, Ballast Water Management, by checking off the “Underwent Alternative Management” box and indicating that the vessel underwent saltwater flushing in the “specify alternative method” line. NOBOB vessels that conducted saltwater flushing should also fill out Section 5, Ballast Water History.

EPA also requires reports of spills and other unauthorized discharges. In addition, VGP 2008 clarifies that spills and other unauthorized discharges must be reported to EPA. In the case where discharges may affect drinking water supplies, recreational waters, elicit fish kills, or may otherwise endanger human health or the environment, the discharge must be reported orally to the appropriate EPA regional office within 24 hours from the time or discovery, followed by an electronic or written report (per the requirements of Appendix B, section 12(F)) within 5 days. The release of a reportable quantity of any hazardous substance or oil must be reported to the National Response Center dial 800-424-8802 or 202-426-2675 in the Washington, DC area. The NRC is staffed 24 hours a day by U.S. Coast Guard personnel, who will ask you to provide as

much information about the incident as possible, including: your name, location, organization, and telephone number; name and address of the party responsible for the incident; date and time of the incident; location of the incident; source and cause of the release or spill; types of material(s) released or spilled; medium (e.g. land, water) affected by release or spill; danger or threat posed by the release or spill; number and types of injuries or fatalities (if any); weather conditions at the incident location; name of the carrier vessel, or other identifying information; whether an evacuation has occurred; other agencies notified or about to be notified; any other information that may help emergency personnel respond to the incident. EPA also encourages operators to report the releases that may have human health ramifications to the appropriate local authorities, e.g., public water supply operator, health department. Follow-up monitoring results should be reported via the electronic system (when available) or in writing to the appropriate EPA Regional Office (Part 3.7) within 30 days of receiving the results. The report should include the permit identification number; vessel name, address and location; receiving water; monitoring data from this and the preceding monitoring event(s); an explanation of the situation; what has been done and shall be done to further reduce pollutants in the discharge; and an appropriate contact name and phone number.

Vessel owner/operators must report any instances of noncompliance with the permit at least once per year to the regional offices listed in Part 13. This is a requirement under the standard permit conditions at 40 CFR 122.41. Vessel operators must report the noncompliance to the regional office responsible for the waters in which the noncompliance occurred. If vessels have multiple occurrences of noncompliance, they must report the noncompliance to the regional office where either 1) the greatest number of noncompliance events occurred, or 2) if the same number of noncompliance events occurred, to the regional office responsible for waters where the vessel spent the most time.

Vessel owner/operators under Parts 5.1, 5.2, and 5.8 of this permit have additional reporting requirements. They must report their monitoring data for their graywater treatment systems (5.1 and 5.2) or monitoring data on biocides or derivates of those biocides from ballast water treatment systems (5.8).

The permit requires owner/operators to submit a one-time report that contains basic information about the vessel after the 30th month of permit coverage. EPA is requiring this report in lieu of an annual report. Specifically, the report must include the owner and operator name(s) and addresses, the name of the vessel, the flag of the vessel, the size of the vessel, whether or not the monitoring conditions of the permit have been met, and the date of submission of the report. It is estimated that this report will take no more than 30 minutes to generate. EPA is requiring this information to assure that permittees are complying with the provisions of this permit, to learn how vessels are implementing the permit, and to gain a better understanding about the universe of permittees covered by this general permit. In addition to studying the effects of this permit issuance, EPA may also use this information to assist in developing the next iteration of this general permit. Owner/operators are required to submit this one-time report between 30 months and 36 months after obtaining permit coverage (i.e., between 2 ½ and 3 years after receiving authorization to discharge under this general permit).

7. ADDITIONAL TECHNOLOGY BASED AND RELATED PERMIT REQUIREMENTS BASED ON CLASS OF VESSEL (VESSEL CLASS-SPECIFIC REQUIREMENTS) (PART 5)

7.1 LARGE CRUISE SHIPS (PART 5.1)

Large cruise ships are those ships that provide overnight accommodations and are licensed to carry 500 or more passengers for hire. Requirements for cruise ships authorized to carry 500 or more passengers apply regardless of the actual number of passengers onboard. EPA selected this threshold defining large cruise ships to be consistent with the requirements of "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) (commonly referred to as Title XIV) passed on December 12, 2000. Title XIV set discharge standards for sewage and graywater from certain cruise ships (those authorized to carry 500 or more passengers for hire) while operating in the Alexander Archipelago and the navigable waters of the United States in the State of Alaska and within the Kachemak Bay National Estuarine Research Reserve (referred to here as "Alaskan waters").While most cruise ship vessel discharges are similar to those of other similarly sized vessels, cruise ships have several unique characteristics and discharges for which they require additional permit requirements. Cruise ships provide accommodations and extensive amenities to a large number of passengers. These extensive onboard services provided for guests contribute to the increase in the volume of cruise ship discharges. For example, because these vessels carry a large number of people onboard, they generate considerably more graywater discharges than a container or cargo ship. Other amenities provided, such as photo developing, dry cleaning, and day spas, use and produce chemicals that are toxic to the aquatic environment. Discharges of these substances are not authorized by the permit.

7.1.1 Graywater Management

As previously mentioned, the amount of graywater produced by large cruise ships is many times greater than what is produced by a cargo vessel of similar size. Graywater, especially in such large quantities, can cause environmental harm. The graywater produced by cruise ships may contain high levels of nutrients, pathogens, residual levels of organic material, and cleaning chemicals.

EPA established the numeric effluent limits for graywater found in Part 5.2.1.1.2 (discussed below) because data gathered by EPA demonstrate that technologies are available, as well as economically practicable and achievable, and therefore, would represent BPT and BAT. The treatment technologies that remove non-conventional pollutants also treat conventional pollutants; hence, EPA applied the BAT standard to all pollutants for which the permit proposes standards for graywater. For additional discussion of BAT, BCT, and the requirements of each, please see Part 4.2.3 of the Fact Sheet.

The technology to meet the effluent limits found in Part 5.2.1.1.2 of the permit is currently in use and already required for many large cruise ships operating in Alaskan waters which discharge within the territorial seas. EPA anticipates no major physical impediments to installing such technology on large cruise ships, and in fact, many cruise ships are already capable of meeting these standards. There are two systems available that cruise ships can use to treat

graywater: marine sanitation devices (MSDs) and advanced wastewater treatment systems (AWTs). An in depth discussion of how each system works can be found in the EPA Draft Cruise Ship Assessment Report, Part 2.3, which is available in the docket for this permit. In general, AWTs are capable of treating graywater to more stringent standards than traditional MSDs, and EPA has therefore based the effluent limits in this permit on the AWTs technology. AWTs on board cruise ships have been shown to reduce ammonia, total Kjeldahl nitrogen, and total phosphorus by moderate amounts and conventional pollutants such as TSS and fecal coliform substantially. In monitoring conducted by EPA in 2004 and 2005, nitrate/nitrite levels were low and remained relatively unchanged by treatment. Nitrogen and phosphorus are likely taken up by microorganisms in the bioreactor and removed from the system in the waste sludge. Table 2 shows the influent and effluent concentrations for these systems for Cruise Ships in Alaska (adapted from EPA, 2007).

Table 2: AWT Effluent Concentrations and Removals for Nutrients

Analyte	Unit	Average Concentration in Cruise Ship AWT Influent1	Average Conc. (± SE) in Cruise Ship AWT Effluent2	Percent Removal Ranges1
Ammonia As Nitrogen	mg/L	78.6 (35 detects out of 35 samples)	36.6* (±5.50) (136 detects out of 138 samples)	58 to 74
Nitrate/Nitrite as Nitrogen	mg/L	0.325* (26 detects out of 50 samples)	3.32* (±0.653) (66 detects out of 152 samples)	NC
Total Kjeldahl Nitrogen	mg/L	111 (50 detects out of 50 samples)	32.5* (±3.27) (169 detects out of 170 samples)	70 to 76
Total Phosphorus	mg/L	18.1 (25 detects out of 25 samples)	5.05* (±0.460) (146 detects out of 154 samples)	41 to 98

[1]Based on data collected by EPA in 2004 and 2005.
[2] Based on data collected by ADEC/Coast Guard from 2003 to 2005; data collected by EPA in 2004 and 2005; and data collected through EPA's 2004 cruise ship survey.
"NC" indicates that percent removal not calculated because the effluent concentration was greater than the influent concentration or the analyte was not detected in the influent samples from one or more sampled ships.
* Average includes at least one nondetect value; this calculation uses detection limits for nondetected results.

One recent estimate by the cruise industry is that roughly 40% of the International Council of Cruise Lines members' 130 ships (which make up two-thirds of the world fleet) have installed AWTs, with 10 to 15 more systems added each year (Choi, 2007). In 2006, 23 of 28 large cruise ships that operated in Alaskan waters had AWTs in order to meet the more stringent discharge requirements required under Title XIV (see subsection 2.2.3 of EPA Draft Cruise Ship Discharge Assessment Report for additional information). The remainder operated traditional Type II MSDs and held the treated sewage and untreated graywater in double-bottom ballast tanks for discharge outside Alaskan waters. For additional information on Title XIV and cruise ship discharges, please see Part 2 of the EPA Draft Cruise Ship Discharge Assessment Report.

The standards that EPA has included are also economically practicable and achievable. EPA estimates that the cost of maintaining a graywater treatment system is $7.09 per passenger (including crew) berth per season. For more information, please see the Economic Analysis accompanying this permit. In addition, EPA considered other impacts that would be caused by the imposition of these standards, such as increased energy use onboard the cruise ships, and found those impacts to be negligible. Cruise ships can expect to expend additional fuel when operating the AWTs, to generate solid sludge or other waste from these systems, and/or to have additional cost in transporting treated or untreated Graywater out of specific waters; however all of these effects are relatively small.

7.1.1.1 Pierside Limits

While pierside, cruise ship operators are required to use graywater reception facilities if they are reasonably available unless the vessel treats graywater with a device to meet the standards found in Part 5.1.1.1.2 of the permit. If not available, graywater must be held for later discharge beyond 1 nm. These requirements will minimize the volume of pollutants discharged while the cruise ship is pierside. These restrictions will also reduce the discharge of chemicals, nutrients, and pathogens into marinas and ports, which can be located in ecologically sensitive estuaries, and where there are large numbers of vessels discharging in close proximity. Hence, the cumulative impact of numerous untreated graywater discharges in port may be significant. Furthermore, based on responses to surveys with vessel operators and industry representatives conducted as part of the economic analysis, most cruise ship operators have voluntarily agreed not to discharge graywater within 4 nautical miles of shore (CLIA Voluntary Guidelines). Though the standards specified in the permit do not include numeric limits for nutrients, the systems capable of meeting the other standards in this permit (listed in Part 5.1.1.1.2) have been shown to remove considerable amounts of nutrients and successfully achieve pathogen standards as shown above in Table 2 (EPA 2007). For the reasons discussed above, approaches to meet these requirements are technologically available and economically practicable and achievable.

7.1.1.2 Operational Limits

Operational limits in the permit prohibit the discharge of graywater within 1 nautical mile of shore unless the graywater has been treated to treatment standards in Part 5.2.1.1.2 of the permit. Discharges between 1 nm and 3 nm of shore have to either meet the effluent limits outlined in this permit under Part 5.1.1.1.2 or be discharged while the vessel is moving at a speed of at least 6 knots, and can not be discharged to a waterbody listed in Part 12.1 of the permit. EPA included the six knot requirement for untreated graywater discharges between 1 and 3 nm from shore because an independent Science Advisory Panel for the Alaska Cruise Ship Initiative has found that significant dilution occurs when cruise ships discharge while moving over six knots. Based on measured values and calculated values from EPA dye studies, the Panel recommends the following formula to calculate the dilution factor of large cruise ship effluent:

*Dilution Factor=4(Ship length*Ship Draft*Ship Speed)/Volume Discharge rate)*

Using this formula, a cruise ship moving at six knots will achieve a dilution factor of over 1:50,000. Conservative estimates of further mixing before the effluent travels one nautical mile to shore are a dilution factor of 100 to 1000.

Additionally, the graywater discharge standards in this permit are consistent with those for large cruise ships underway in Alaskan waters required under Title XIV. As mentioned, industry information shows that many cruise ships are already meeting the operational standards required by the permit. Furthermore, these permit requirements are generally consistent with Cruise Line International Association (CLIA) Waste Management Practices and Procedures for member lines. Hence, the technologies to meet these standards are currently available, as well as economically practicable and achievable.

7.1.1.3 Limits Applicable to Operation in Nutrient Impaired Waters

Nutrients are a pollutant of concern addressed by this permit. EPA found it not to be economically practicable and achievable to require discharges of graywater to be prohibited in all cases, however, a partial restriction on such discharges would represent the BPT and BAT levels of control. Because discharges of graywater are of particular concern in nutrient impaired waters; the permit contains limits designed to minimize the discharge of graywater in those waters. Under this permit, graywater discharges are not authorized in nutrient impaired waters, unless the length of the voyage through those waters exceeds the ship's holding capacity. If the voyage length does exceed the holding capacity, the cruise ship operator has two options: treat the excess graywater (above the holding capacity) to meet the standards of 5.1.1.1.2 prior to discharging it or dispose of graywater properly onshore (before exceeding capacity). These measures will limit the amount of graywater and the amount of chemicals, nutrients, and pathogens discharged into nutrient impaired waters. The average holding capacity for graywater, based on EPA's 2004 cruise ship study, is 56 hours. Hence, most cruise ship owner/operators would be able to meet the requirements to hold their graywater as required in the permit.

7.1.1.4 Graywater Treatment Standards

The permit requires the discharge of treated graywater to meet the following requirements: the minimum level of effluent quality specified in 40 CFR 133.102; the geometric mean of the samples during any 30-day period may not exceed 20 fecal coliform/100ml and not more than 10 % of the samples could exceed 40 fecal coliform/100 ml; and concentrations of total residual chlorine may not exceed 10.0 micrograms per liter (μg/l). These graywater treatment standards are based on the Title XIV standards that are published in Coast Guard regulations at 33 CFR 159.309. EPA expects owners of large cruise ships to incur some cost, although these costs are considered affordable, would cause no closures, and should not cause any cruise ship owner/operators to exceed a 1% revenue threshold.

7.1.1.5 Sculleries and Galleys

The permit requires cruise ship operators to use phosphate free detergents in the scullery and galley. Additionally, it requires any degreaser used to be non-toxic if the degreaser or its residue otherwise would be discharged as part of any waste stream. The use of phosphate free soaps and cleaners is a simple step toward reducing the amount of nutrients, namely phosphorus, present in graywater discharge. Phosphate free detergents and non-toxic detergents are readily available for purchase, are comparably priced, and are an affordable management measure for reducing phosphates and toxic compounds in waste streams. Based on the economic analysis prepared for this permit, the purchase of phosphorus free soaps will result in negligible

additional costs for any owner or operator. Hence, use of these more environmentally friendly products is technologically available and economically practicable and achievable.

7.1.1.6 Other Materials

Many of the services provided to cruise ship passengers use toxic chemicals that can end up in the graywater discharge (EPA, 2007). These include dry cleaning operations, photo developing, medical services, and spa and salon services. The permit requires that other materials, including waste from mercury containing products, dry cleaners or dry cleaner condensate, photo processing labs, medical sinks or floor drains, salon floor drains, chemical storage areas, and print shops using traditional or non-soy based inks and chlorinated solvents be prevented from entering the ship's graywater, blackwater, or bilge systems. Discharges of these materials are not eligible for coverage under this permit. There are several ways that ship owner/operators can prevent these materials from entering the graywater, blackwater, or bilge systems, including plugging any drains that lead to the graywater, blackwater, or bilge systems in areas where these wastes are produced, creating alternative waste receptacle, or replumbing drains to appropriate holding tanks. Drain plugging, alternative waste receptacles, and/or re-plumbing would allow the chemicals to be stored and properly treated. . Also, in order to prevent the addition of known toxic materials to waters subject to this permit, the permit prohibits addition of toxic or hazardous materials, including products containing acetone, benzene, or formaldehyde, into spa or salon sinks or floor drains if those sinks or drains lead to any system which will ever discharge into waters subject to this permit. Due to the highly toxic nature of these materials, they must be sent to an alternative waste receptacle or holding tank and can not be discharged into waters subject to this permit or allowed to enter any discharge stream which later discharges into waters subject to this permit.

Based on information collected as part of the economic analysis, all cruise ship owners and operators are already taking these measures. For any vessels that have not yet taken these measures, EPA expects these preventive measures to be technologically available and economically practicable and achievable.

7.1.1.7 Pool and Spa Discharges

Pool and spa water may also be added to the graywater treatment systems, however it must still be de-chlorinated and/or debrominated prior to discharge subject to this permit. In addition, the effluent discharged from the graywater treatment system must meet all treatment standards found in Part 5.1.1.1.

Discharges from pools and spas are authorized under this permit, provided that if they use chlorination or debromination, they are dechlorinated and/or debrominated. To be considered dechlorinated, the total residual chlorine in the pool or spa effluent must be less than 100µg/l if the pool or spa water is discharged without going through an advanced wastewater treatment system . To be considered debrominated, the total residual oxidant in the pool or spa effluent must be below 25µg/l if the pool or spa water is discharged without going through an advanced wastewater treatment system. EPA determined the dechlorination limits by using those established for ballast water treatment systems and evaluating comments submitted by public commenters which indicated such limits are achievable. Furthermore, this limit is consistent with

common dechlorination limits from shore based sewage treatment facilities. In addition, the permit provides that vessel owner/operators may only discharge pool or spa water while the vessel is underway; hence, EPA anticipates that this discharge will be significantly diluted.

7.1.2 Monitoring Requirements (Part 5.1.2)

Cruise ship operators must complete specific monitoring steps to document compliance with graywater treatment and discharge requirements under the permit. The monitoring requirements for large cruise ships are similar to those required by the Coast Guard regulations implementing Title XIV published at 33 CFR 159.309. These monitoring requirements are required by the US Coast Guard for Alaskan cruise ship operators that discharge graywater and sewage within nearshore Alaskan waters. EPA evaluated these monitoring requirements and elected to use the same standards to remain consistent with the Coast Guard. The monitoring regime selected is sufficient to show that the systems are properly functioning before large cruise ships enter domestic territorial seas and that the systems are properly maintained.

The monitoring requirements in this permit delineate a specific schedule for sampling, testing, and reporting, in compliance with the requirements of 40 CFR 122.44 and 122.48. Permittees need to use test methods that are listed in 40 CFR Part 136 for all constituents sampled. The monitoring requirements will yield data representative of the discharge being monitored, allowing both EPA and permittees to accurately evaluate both compliance and the effectiveness of the permit requirements. The requirements include monitoring, sampling, and testing for specific parameters likely to be present in the effluent. These measurements characterize treatment efficacy and enable documentation of permit compliance. Monitoring results need to be reported annually, following reporting of initial monitoring to establish the efficacy of the treatment system (see below).

7.1.2.1 Untreated Graywater

Along with other recordkeeping requirements established by this permit, the vessel owner/operator must keep records estimating all discharges of untreated graywater into waters subject to the permit, including date, location, and volume discharged. In order to streamline recordkeeping and reporting requirements, this information may be kept in the sewage and graywater discharge record book otherwise required by 33 CFR §159.315 for those vessels that keep these records. Alternatively, cruise ship operators could record these data in the ship's log or other recordkeeping documentation, as long as the location of the information is clearly known and can be made available to EPA or any EPA representative immediately on request. EPA may use this information, in part, to monitor compliance with and effectiveness of the permit requirements.

7.1.2.2 Treated Graywater

Prior to entering domestic territorial seas, or within 90 days of obtaining permit coverage, cruise ship operators are required to demonstrate that the vessel has the ability to treat graywater to the applicable standards found in Part 5.1.1.2 if the vessel will be discharging graywater within 1 nm of shore, within 3 nm of shore while traveling at less than 6 knots, or into nutrient

impaired waters subject to this permit. These data must be reported to EPA consistent with the requirements discussed below.

Furthermore, as with untreated graywater, the permit requires the owner/operator to maintain records estimating the volume of all discharges of treated graywater into waters subject to the permit. These records would consist of the date, location, and volume discharged and could be maintained as part of the sewage and graywater discharge record book required under 33 CFR §159.315.

7.1.2.3 Initial Monitoring

Within 90 days of obtaining permit coverage, large cruise ship operators are required to demonstrate that the vessel has the ability to treat graywater to the applicable standards if the ship will be discharging graywater within 1 nm of shore, within 3 nm of shore while traveling at less than 6 knots, or into nutrient-impaired waters subject to this permit. Cruise ship operators are required to initially demonstrate the effectiveness of the graywater treatment system by taking at least five (5) samples over 30 days. Samples are required to meet standards for BOD5, fecal coliform, suspended solids, pH, and total residual chlorine. The requirement for five initial samples is consistent with the Title XIV requirements for large cruise ships operating in Alaska. The permit requires records of monitoring information be kept, including the date, exact place noted in latitude and longitude, and time of sampling or measurements; the individual(s) who performed the sampling or measurements; the date(s) analyses were performed; the individual(s) who performed the analyses; the analytical techniques or methods used; and the results of such analyses. The permit requires records be kept for 3 years.

For chlorine monitoring, analytical results that are below the method detection limit are considered in compliance with the permit effluent limits, as long as the testing method used had a detection limit no higher than 10 µg/l under ideal conditions. EPA has found that method SM4500-CL G (DPD Colorimetric Method) is able to reach 10 µg/l under ideal conditions. SM4500-Cl G is typically the method that ADEC/USCG uses for compliance monitoring.

In addition, testing and reporting for total residual chlorine is not required if chlorine is not used as the disinfectant in the wastewater treatment process and no water to which chlorine has been added (swimming pools, spas, etc.) is drained to the graywater system.

7.1.2.4 Maintenance Monitoring

After initially demonstrating the effectiveness of the treatment system, operators must conduct the same sampling and testing at least once per quarter to show continued effectiveness of the system and compliance with the permit. This requirement includes keeping all required records of the sampling and testing results for at least 3 years.

7.1.2.5 Treated Pool and Spa Discharges (5.1.2.3)

Vessel owner/operators must monitor chlorine or bromine (as total residual oxidant) concentrations (as applicable) in pool and spa water before discharging such water into waters subject to this permit. Such monitoring for chlorine must use Part 136 methods in order to ensure the dechlorination process is complete. Such monitoring for bromine must use Part 136 methods

or may also use colorimetric methods, including with test kits, (for pool and spa discharges only), provided that test kit has method detection limit no higher than 50 µg/L. In addition, vessel records must include the location, estimated volume, and concentration of chlorine or bromine in the discharge.

As with monitoring for chlorine in graywater, analytical results that are below the method detection limit are considered in compliance with the permit effluent limits, as long as the testing method used had a detection limit no higher than 10 µg/l under ideal conditions. EPA has found that method SM4500-CL G (DPD Colorimetric Method) is able to reach 10 µg/l under ideal conditions and so meets these requirements.. SM4500-Cl G is typically the method that ADEC/USCG uses for compliance monitoring. For bromine, analytical results below the method detection limit shall be deemed compliant with the effluent limits, provided the permittee uses a testing method with a detection limit no higher than 50.0 µg/L.

7.1.2.6 Monitoring Reporting

In addition to the other reporting requirements established by this permit, vessel operators must submit the initial sampling and testing information to EPA Headquarters at least seven days before entering waters subject to this permit or within 90 days of obtaining permit coverage, whichever is later. Alternatively, owner/operators could submit monitoring data to EPA via the e-reporting system. Once the e-reporting system is established, it will be available at www.epa.gov/npdes/vessels/enoi. EPA anticipates the e-reporting system will be available within 2 years after permit finalization. Maintenance sampling and testing information must be submitted at least once a year, and no more than 30 days after the fourth testing period. Vessels that operate in Alaskan waters and already submit sampling and testing information to the Captain of the Port (COTP) to meet the requirements of Title XIV do not need to submit the information to EPA. EPA will request these data from the Alaskan COTP on a regular basis, not to be less than once per year. EPA has chosen to request the information from the COTP to reduce the reporting burden on cruise ships by minimizing duplicate reporting requirements.

The appropriate EPA HQ address for submitting these reports is:

United States Environmental Protection Agency
Mail Code 4203M
ATTN: VGP - Cruise Ship Graywater Monitoring Data
1200 Pennsylvania Ave., Washington, DC 20460

7.1.2.7 Reserved Authority

Meeting the monitoring requirements would not shield the vessel operator from liability if EPA or Coast Guard tests the graywater discharge and finds it is not in compliance with the treatment standards. Non-compliance with any effluent limit would be a violation of the permit.

7.1.3 Education and Training Requirements [Part 5.1.3]

Pursuant to CWA section 402(a)(2), and 40 CFR 122.43(a), and other implementing regulations, EPA is imposing the following education and training requirements.

Crew training is extremely important because the vessel's crew plays a significant role in increasing or decreasing the volume and quality of vessel discharges. The permit requires the cruise ship owner/operator to train the crew members who actively take part in the management of a discharge, or who may affect a discharge, in environmental procedures sufficiently so that the crew could demonstrate proficiency in implementing the procedures; provide advanced training in environmental management procedures to any crew members directly involved in the management of a specific discharge, such that the crew could demonstrate proficiency in implementing the procedures; and establish and enforce sufficient reprimand procedures for any crew member whose actions lead to a violation of any of the effluent limits in this permit, or a violation of other procedures established by the cruise ship operator to minimize the discharge of pollutants.

In addition, the permit requires the cruise ship operator to educate passengers about potential environmental impacts and steps the passengers can take to minimize those impacts. Proper education of crew and passengers plays an important role in meeting environmental protection goals because they are often in the best position to minimize vessel discharges. Graywater is one example. Passengers can minimize the amount of graywater produced onboard if they are made aware of water conservation practices such as reusing sheets and towels. Passengers can control the constituents added to graywater discharge, such as through proper disposal of unused pharmaceuticals which would prevent their ultimate introduction into the aquatic environment. The permit allows flexibility in how these goals are accomplished, and allows the passenger education to take place via posting or distribution of signage, flyers, or other handouts, incorporating environmental information into passenger orientation presentations, holding lectures or seminars, or making announcements over the ship's public address system.

Most cruise ship operators have already incorporated environmental training into established training and education requirements. Some of these education requirements included in the permit are based in part on industry literature created by the industry trade group Cruise Lines International Association (CLIA). The steps required by the permit are already being employed by many cruise ship operators in the industry and thus are available as well as economically practicable and achievable. Inclusion of education requirements in the permit is designed to elevate the standard of conduct to the level of the most responsible operators. Most cruise ship operators are already meeting the permit requirements. For more information on cruise ship operators voluntary actions, please see the CLIA Voluntary Guidelines, available in the docket associated with this permit.

7.2 MEDIUM CRUISE SHIPS [PART 5.2]

Medium cruise ships are those ships authorized to carry 100 to 499 passengers for hire and provide overnight accommodation to those passengers. EPA selected a threshold of 100 people as the lower end of the range to capture vessels where the volume of graywater generated gradually increases. The discharges of untreated graywater from cruise ships in this size range has been shown to contain similar pollutants to those in untreated graywater discharges from large cruise ships (ADEC, 2002). Therefore, these discharges also have a similar negative impact on water quality. As discussed above, cruise ships have unique characteristics that require additional discharge management requirements. While medium cruise ships carry a smaller

number of passengers than large cruise ships, the volume of graywater generated is still significantly higher than what is generated by a cargo ship carrying crew only. See Part 7.1 for a discussion on the nature of cruise ship discharges, the reason effluent limits were established, and how these limits represent BPT/BAT.

7.2.1 Differences between the Requirements for Large Cruise Ships and Medium Cruise Ships

The permit requirements for medium cruise ships are identical to those for large cruise ships, with three exceptions. These are:

- An additional option for discharging while operating in Nutrient Impaired Estuaries
- Differences in annual reporting requirements to EPA.
- Differences for existing medium cruise ships unable to voyage more than 1 nm from shore and any new medium cruise ship.

7.2.1.1 Different Requirements in Nutrient Impaired Estuaries

In nutrient impaired estuaries, this permit allows for medium sized cruise ships unable to retain graywater on board to discharge untreated graywater while moving at a speed of at least 6 knots. This difference was included because, at this time, EPA expects fewer of these size vessels to have treatment capacity to meet the more stringent standards in Part 5.2.1.1.2. Hence, owner/operators may not be able to adjust their fleet positions to assure that vessels are available that have either sufficient holding capacity or the ability to treat to the standards in Part 5.2.1.1.2 of the permit to meet the nutrient impaired estuary requirements. Though EPA fully expects most medium cruise ships to have the ability to hold the graywater until they get further than 1 nm offshore, it may be difficult to hold the graywater for prolonged periods in large nutrient impaired estuaries (in which the channel can be more than 1 nm from any shore). Though treatment technologies to meet the standards in part 5.2.1.1.2 are available, EPA has not concluded that requiring all medium cruise ship owner/operators to install these systems prior to coverage under this permit is economically achievable. This extra flexibility for medium cruise ships allows owner/operators to comply with the requirements of the permit, while offering a more environmentally protective approach than allowing the discharge of graywater into nutrient-impaired estuaries while stationary. Hence, these requirements, taken as a whole, are technologically available and economically practicable and achievable.

7.2.1.2 Differences in Annual Reporting Requirements to EPA.

In Alaskan waters covered by Section 1411(b) of Title XIV, Pub. L. 106-554 (Dec. 31, 2000, 114 Stat. 2763) [Certain Alaska Cruise Ship Operations] (codified at 33 U.S.C. 1901 note), referred to as Title XIV, large cruise ships must submit sampling data to the Captain of the Port Zone (COTP) if they will discharge graywater within 1 nm. Title XIV applies only to cruise ships authorized to carry 500 or more passengers, which are considered large cruise ships for purposes of this permit. Under this permit, these cruise ships are not required to also submit this information to EPA if they have already submitted the data to the COTP. Instead, EPA will request the required information annually from the Alaskan COTP. This will cut down on the

paperwork burden imposed on large cruise ship operators and streamline permit compliance for those vessels. All medium cruise ship owner/operators who will discharge graywater within 1 nm must submit the information to EPA because it would otherwise not be available via the COTP.

7.2.1.3 Differences for Existing Medium Cruise Ships Unable to Voyage more than 1 nm from Shore and Any New Medium Cruise Ship

Some medium cruise ships that operate on rivers or lakes, are not authorized to go beyond 1 nm (e.g., are restricted by their operational certificate to operating only within 1nm of shore), or otherwise never go beyond 1nm from shore. A Medium Cruise Ship in operation as of the effective date of this permit is not required to meet the graywater requirements found in Part 5.2.1.1.1 if the ship is unable to voyage 1 nm from shore, unless the ship undergoes a major conversion subsequent to the VGP effective date. Vessels constructed on or after the effective date of this permit are required to meet the graywater standards found in Part 5.2.1.1.1. If, during the permit term, a vessel that is in operation on the effective date of this permit undergoes a major conversion as defined in Part 7 of the permit, the discharge from such a ship must meet the treatment standards found in Part 5.2.1.1.1 of the permit.

Unlike large cruise ships, which by their operational necessities are ocean going, some medium cruise ships are unable to regularly voyage 1 nm from shore. For instance, river boats such as the Delta Queen or Mississippi Queen are confined to inland waters for the entire duration of its cruise. If onshore treatment is not readily available in river port towns for treatment of graywater, then the ship would be unable to meet these graywater treatment standards immediately. Furthermore, vessels such as the Delta Queen were originally built in the 1920's, and installation of advanced graywater treatment systems may be more complicated than on newer vessels. Hence, based on the comments submitted and further economic analysis (included in the economic analysis for this permit) and unlike with larger cruise ships, many medium cruise ships may not be able to immediately achieve these treatment standards without installation of equipment that could require a major overhaul of the vessel. This type of vessel repair or conversion could be extensive, require dry-docking, and in some cases, re-design of major structural components of the vessel. For these reasons, EPA determines that it is not economically practicable or achievable to require all existing medium cruise ships which are unable to travel outside 1nm to meet the requirements of Part 5.2.1.1.1 at this time. However, EPA notes that it may yet become economically achievable to include this requirement for all medium cruise ships in future iterations of this permit and owner/operators are so advised should they upgrade existing graywater vessel treatment capacity. For additional information on economic achievability and BAT, please see the economic analysis for this permit.

7.3 LARGE FERRIES [PART 5.3]

Ferries are vessels for hire that are designed to carry passengers and/or vehicles between two ports, usually in inland, coastal, or nearshore waters. They usually travel the same route several times a day and do not provide overnight accommodations to their passengers. They have discharges unique to their industry because of the potentially high volume of both pedestrian and vehicular traffic that they carry, usually on inland or coastal waters. These waters usually carry a relatively high volume of vessel traffic and also can contain highly valuable and ecologically sensitive mating and nesting grounds for birds, fish, and mammals. The permit provisions apply

to large ferries. For purposes of the permit, large ferries are those ferries authorized to carry a) more than 100 tons of cars, trucks, trains, or other land-based transportation or b) 250 or more people.

EPA could not find a preexisting definition of large ferry. Hence, the Agency reviewed the number of ferries captured at different weight thresholds using data including all steel hulled, self-propelled vessels classified by the WTLUS/VESDOC as Passenger Vessels, Combination Passenger/Cargo ships, and by Ferries Data DOC as Passenger Vessels, Combination Passenger/Cargo ships, and Ferries. EPA considered the relative increase in the discharge of pollutants, particularly those pollutants generated from land-based transportation on board vessels, as ferry size increased when establishing this threshold. For this permit, EPA has stated that a "Large Ferry" means a "ferry" that: a) has a capacity greater than or equal to 100 tons of cargo, e.g., for cars, trucks, trains, or other land-based transportation or b) is authorized by the Coast Guard to carry 250 or more people.

In order to minimize the harmful effects of discharges from large ferries, this permit imposes specific requirements with respect to the potential spills, drips, and leaks associated with carrying of vehicles. These requirements include treatment of runoff from below deck (e.g. areas not exposed to the elements) parking and storage areas with an oily water separator or other similar device, and require that this discharge not be released into waters listed in Part 12.1. In addition, pursuant to CWA sections 402(a)(2), and 40 CFR 122.43(a), and other implementing regulations, the permit sets out requirements for all large ferries with respect to educating the crew and passengers about environmental procedures. It is the crew that will implement the environmental requirements found in the permit, and because of that, they must be taught what to do, how to do it, and why they are doing it. Large ferry owner/operators also are required to educate passengers on their potential environmental impacts and how those can be mitigated. This education must address eliminating the discharge of trash into any waste stream, minimizing the production of trash from parking areas and storage areas, eliminating the addition of unused soaps, detergents and pharmaceuticals to the graywater or blackwater systems, and minimizing the production of graywater. There are many ways that a ferry operator can accomplish passenger education, including posted signage, distribution of informational materials, incorporating environmental material in orientation presentations, and broadcasting environmental information over loudspeakers or the public address system.

Some of these education requirements included in the permit are based in part on industry literature created by the industry trade group Cruise Lines International Association (CLIA). EPA anticipates that educating crew and passengers on cruise ships is similar to educating the crew and passengers of large ferries. The educational requirements in the permit are already being employed by many cruise ship owner/operators in the industry.

For those large ferries which are authorized by the Coast Guard to carry 250 or more people, the permit also requires use of shoreside graywater reception facilities if they are reasonably available. If not available, such large ferries are required to hold their graywater while in port if the vessel has the holding capacity and to discharge the effluent while the vessel is underway under the operational conditions set out in section 5.3.1.2 of the permit.

The technologies upon which the permit's graywater requirements are based are technologically available and economically practicable and achievable. These requirements are intended to reduce the volume of graywater discharged while large ferries are pierside so as to reduce the discharge of chemicals, nutrients, and pathogens into marinas and ports, which can be located in ecologically sensitive estuaries, and where large numbers of vessels may be discharging in close proximity. The cumulative impact of numerous graywater discharges in port may be significant. In addition, these requirements will help reduce potential impacts if graywater needs to be discharged while underway by setting out operational limits on such discharges, as further explained in the Fact Sheet discussions for graywater from cruise ships.

EPA has also included requirements for large ferries which discharge coal ash slurry as a result of their propulsion systems. EPA has specifically limited this discharge and applicable effluent limits to ferries because, to the best of the Agency's understanding, this discharge is only applicable to ferries run by coal fired propulsion system. The permit contains numerous effluent limits intended to minimize the volume and potential impacts of this ash. In addition, permit coverage for this discharge terminates on December 19, 2012, as available information indicates it no longer needs to be authorized after this date. Please see responses to comments in the Proposed VGP: Response to Comments Document for further discussion regarding these requirements.

7.4 BARGES (INCLUDING HOPPER BARGES, CHEMICAL BARGES, FUEL BARGES, CRANE BARGES, DRY BULK CARGO BARGES) [PART 5.4]

Barges are large flat-bottomed boats typically used to move cargo in inland waterways. Barges are usually not powered vessels, but are instead pushed or pulled by tugboats. Due to the way they carry cargo, the permit imposes additional measures in order to prevent and minimize the discharge of pollutants from barges. Specifically, the permit requires additional measures to prevent the contamination of condensation with oily or toxic materials. Based on information provided in comments received in response to the June 21, 2007 Federal Register notice, it is a technologically available and economically achievable and practicable practice for barge owner/operators to prevent the contamination of condensation. This permit also prohibits any discharge that has or causes a visible sheen or is otherwise discharged in a quantity that may be harmful.

The permit also requires barges to conduct an additional inspection. Every time water is pumped from any area below deck, the vessel operator must conduct a visual sheen test by conducting a visual inspection of the discharge and the water around the barge to check the water for a visual sheen. EPA is imposing this requirement due to our understanding that this is current good marine practice and that pumping water from below deck (where water may have come into contact with cargoes) is more likely to result in a discharge that may be harmful. Under 40 CFR 110 or 40 CFR 302, if a visible sheen is detected, you must report the discharge immediately to the National Response Center at 1-800-424-8802 or on the Center's website at www.nrc.uscg.mil. Furthermore, appropriate corrective actions must be taken according to the corrective actions section in Part 3 of the permit and the event must be recorded according to Part 4.2 of the permit.

7.5 OIL AND PETROLEUM TANKERS [PART 5.5]

Oil tankers are designed to carry oil and other petroleum products in bulk tanks. Due to the cargo they carry and how they carry their cargo, they are prone to environmentally harmful discharges of oil, particularly during cargo loading and unloading operations. To mitigate these risks, the permit requires that scuppers be blocked during cargo operations to prevent oil from contaminating discharges authorized by this permit. Any oil that is spilled must be cleaned up with oil absorbent cloths or other device to minimize contamination of any authorized discharge. The discharges of water from deck seals are authorized when such deck seals are installed as an integral part of an inert gas scrubber system. These requirements represent existing good marine practice for these vessels.

A visual sheen test must be conducted after cargo loading operations, cargo unloading operations, and deck washing. The visual sheen test detects the presence of free oil on the surface of the water surrounding the vessel. That free oil is visible on the water's surface as an oily sheen. Under 40 CFR 110 or 40 CFR 302, if a visible sheen is detected, you must report the discharge immediately to the National Response Center at 1-800-424-8802 or on the Center's website at www.nrc.uscg.mil. Furthermore, appropriate corrective actions must be taken according to the corrective actions section in Part 3 of the permit and the event must be recorded according to Part 4.2 of the permit.

Oil spill management measures are carried out by the tanker's crew. Pursuant to CWA sections 402(a)(2), and 40 CFR 122.43(a), and implementing regulations, EPA is requiring that all crew members who actively take part in management of a discharge or who may affect a discharge receive training so they are aware of what they must do, when to do it, and why to do it in order to minimize the discharge of oil and other toxic pollutants. In addition, reprimand procedures must in place to hold crew accountable for any failure to follow established pollution prevention procedures.

7.6 RESEARCH VESSELS [PART 5.6]

Research vessels are those that are engaged in investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted scientific theories or laws in the light of new facts, or practical application of such new or revised theories or laws. They typically include State, Federal, non-profit, educational, and occasionally corporate vessels conducting scientific research and experiments. They are not engaged in commercial activity that results in the direct production of or harvesting for sale of mineral or living resources collected during their voyages. This permit lists the following materials that research vessels are authorized to discharge: tracers (dyes, fluorescent beads, SF6), drifters, tracking devices and the like, and expendable bathythermograph (XBT) probes. The permit's provisions limit these discharges to the minimal amount that is necessary to conduct the research. In addition, these discharges are only authorized for the sole purpose of conducting research on the aquatic environment or its natural resources in accordance with generally recognized scientific methods, principles, or techniques. EPA expects research vessels to employ responsible research practices at all times. EPA believes that these practices allow for productive research while minimizing the discharge of materials, and that they are technologically available and economically practicable and achievable.

7.7 EMERGENCY VESSELS [PART 5.7]

Emergency vessels include firefighting boats, police boats, and other boats with a public safety mission. These vessels have supplemental permit provisions in Part 5.7 of this permit that specifically allow discharges incidental to their public safety responsibilities. The permit allows the discharge of substances necessary for securing and saving lives at sea. In addition, it allows discharges for training, testing and maintenance purposes, as long as those discharges comply with any additional requirements of the CWA, including Section 311, which imposes conditions on the discharge of oil. Furthermore, when these discharges include the use of foaming agents for oil or chemical fire response, they must be in accordance with the National Contingency Plan, pursuant to 40 CFR 300. The National Contingency Plan contains procedures for preparing for and responding to discharges of oil and hazardous substances.

EPA notes that the most commonly used aquatic firefighting substance, AFFF, has the potential for significant environmental impact. In addition to requirements of Part 2.2.5 of this permit, EPA encourages operators of emergency and fire boats to use AFFF formulations that contain low concentrations of perfluorinated surfactants or contain non-fluorinated surfactants that maintain emergency operations effectiveness. Use of alternative formulations of AFFF is strongly recommended for those vessels that operate in areas near active commercial or recreational fisheries, near swimmable waters, or in high traffic areas. EPA encourages emergency vessel owner/operators to use common sense to minimize unnecessary discharges of these toxic firefighting substances. Furthermore, EPA encourages emergency vessel owner/operators to use less persistent (non-fluorinated) substitute foam for training purposes.

7.8 VESSELS EMPLOYING EXPERIMENTAL BALLAST WATER TREATMENT SYSTEMS [PART 5.8]

For the purposes of this first-iteration permit only, any vessel employing a ballast treatment system which uses biocides to treat organisms in the ballast water is considered experimental.

The requirements in Part 5.8 of the permit apply to ballast water discharges from vessels employing ballast water treatment systems that make use of biocides. These systems produce or use biocides as an agent to kill organisms present in ballast water discharges. The definition section of the permit contains a definition of biocides subject to these provisions. EPA notes that this permit does not authorize the use of dispersants in the vessel owner/operators' ballast tanks which may remove the appearance of a visible sheen from the discharge.

As explained in section 4.4.3.5 of this fact sheet, treatment technologies that effectively reduce viable living organisms in a manner that is safe, reliable, and demonstrated to work onboard vessels are not yet commercially available. Such systems are actively being developed, however, and have been or are being installed, on an experimental basis, onboard vessels in order to evaluate their effectiveness in a shipboard environment. For example, ballast water treatment systems making use of biocides are being evaluated under the auspices of the International Maritime Organization (IMO), and have included a variety of biocides as part of the treatment process. Such evaluation involves both land-based and shipboard testing of the systems. More specific information on systems using biocides that are being reviewed by IMO can be found in

the applicants' non-confidential submissions to the IMO's Marine Environment Protection Committee, which are included in the docket for the permit. Additional experimental treatment systems are also being evaluated in the United States.

The concern with respect to the aquatic environment is that if the treated ballast water contains biocides or their derivatives at levels that are still toxic at the time of discharge, then organisms in the receiving water may be harmed. Section 5.8.1 of the permit thus contains specific limitations with respect to discharges of biocides or their derivatives. The permit contains a requirement that any ballast water technology must not discharge (and therefore, must not use) use any "pesticide" within the meaning of FIFRA unless the pesticide has been registered for use in ballast water treatment under such Act, or unless the pesticide is generated solely by the use of a "device," within the meaning of the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C.136 et seq. ("FIFRA"), on board the same vessel as the ballast water to be treated. In addition, because chlorination is a commonly used disinfection technology and is known to be proposed for use in ballast water treatment systems, the permit provides that Total Residual Chlorine (TRC) may not exceed 100 micrograms per liter (µg/l) as an instantaneous maximum. Routine methods for de-chlorination of treated water are well demonstrated, and in selecting this limit EPA considered existing TRC limits found in a number of NPDES permits for publicly owned treatment works, with the TRC limit for this permit reflecting the median limit for the permits reviewed.

The permit further provides that in order to be eligible for coverage under the general permit, any other discharged biocides or derivatives may not exceed any recommended acute water quality criteria listed in EPA's 1986 Quality Criteria for Water [the Gold Book] and subsequent revisions published prior to issuance of today's permit. The Gold Book and updates can be found at www.epa.gov/waterscience/criteria/library/goldbook.pdf. Those numeric criteria were developed by EPA under authority of section 304(a) of the CWA based on the latest scientific information on the relationship that the effect of a constituent concentration has on particular aquatic species and/or human health. Normally, the section CWA 304(a) criteria are not regulations and do not impose binding requirements, but rather are information that EPA provides periodically to the states as guidance for use in developing numeric criteria for inclusion in State water quality standards under section 303 of the CWA. See 40 CFR 131.3(c). In this permit, however, EPA is using the CWA section 304(a) criteria as an end of pipe limitation because a variety of biocides might be proposed for use in ballast water treatments systems, and the section 304(a) criteria address a wide variety of chemicals, identifying numeric criteria intended to safeguard aquatic life and human health. Because the ballast water treatment systems subject to such limits are using biocides, which by definition are intended to be applied at levels that are toxic to organisms (in ballast water), EPA believes that such compliance is appropriate for use as permit condition for coverage under this general permit. In the proposal for this general permit, EPA specifically requested comment on whether whole effluent toxicity ("WET") tests should be used in addition to, or in lieu of, analytical monitoring of residual biocides and derivatives and if so, what appropriate toxicity-based endpoints might be used for this purpose. Based on public comment, the final VGP establishes WET testing, as a requirement for VGP coverage for ballast water treatment systems using biocides, or which have derivatives from such biocides, for which there are not acute water quality criteria. This approach is based on existing EPA WET methods and WET testing for ballast water discharges adopted by the State of Washington, and relies primarily on the methods specified in 40 C.F.R. Part 136. The

principal public comment on WET referenced the Washington State WET testing provisions for ballast water, which can be found at http://www.ecy.wa.gov/pubs/9580.pdf, appendix H. EPA used this manual as a reference in addition to WET tests consistent with past Agency practice (including Denton et al. 2007).

The WET testing provisions in the final VGP are used to assess the potential environmental effects of the resulting ballast water discharges. The WET testing end-points adopted in the final VGP are deliberately conservative in nature (e.g., applied as end-of-pipe limits without allowance for mixing) because the WET test results are to be used as a screening mechanism to determine initial and continuing eligibility for VGP coverage. Discharges of ballast water that are subject to WET testing under this VGP and that do not meet the end-points specified in the VGP would still remain eligible to secure coverage for that discharge through an individual NPDES permit from EPA. EPA cautions that WET testing should be conducted by laboratories familiar with such testing procedures.

EPA has established chronic toxicity effluent limits for this discharge. The chronic WET permit limits are any one test result greater than 1.6 TUc (during the monthly reporting period), or any one or more test results with a calculated median value greater than 1.0 TUc (during the monthly reporting period). Results shall be reported in TUc, where TUc = 100/EC25. EC25 is a point estimate of the toxicant concentration that would cause an observable adverse effect in the 25% of the test organisms. .

WET testing under the VGP is not applicable to systems for which EPA acute water quality criteria exist with respect to the biocides used and also for all derivatives of such biocides. In addition, ballast water treatment systems using solely physical ballast water treatment methods such as filtration, centrifugation, ultraviolet irradiation, or inert gas oxygen stripping methods are not subject to WET testing or the other requirements of Part 5.8 of the VGP.

Detailed specifications on how to conduct the WET testing and use the WET test results are included in Part 15 (Appendix J) of the permit. EPA expects that only limited numbers of vessels will be subject WET testing under this provision, and in addition, vessels with ballast water treatment systems subject to the VGP WET testing provisions may opt not to conduct such testing and evaluation under the VGP WET test end-points but instead apply for an individual NPDES permit for such ballast water treatment system discharges.

As noted in the permit, if a system cannot meet the limitations discussed above, coverage under an individual permit can still be sought, which would allow for a more case-by-case evaluation.

Sections 5.8.2 and 5.8.3 of the permit address residual biocide monitoring and recordkeeping and reporting. These provisions were included so to ensure that the vessel owner/operator complies with the limits previously discussed for section 5.8.1. Under these provisions, standard test methods as specified in 40 CFR Part 136 must be used. In addition, the permit would require at least five (5) samples taken from the vessel ballast water discharge on different days over a 90-day period that are representative of the treated ballast water at the point of discharge, with each sample to be tested independently, and the individual results must be

reported and not averaged. EPA is also requiring maintenance sampling quarterly to ensure that ballast water treatment systems continue to function correctly and ensure they do not discharge excess biocides or derivatives for prolonged periods. EPA has included a requirement that if any of the initial or maintenance samples exceed the standards specified in Part 5.8.1.1, then the owner/operator must immediately undertake steps necessary to achieve compliance and take and submit samples demonstrating such compliance. Furthermore, EPA may require the owner/operator to cease discharging from the treatment system and seek coverage under an individual permit under Part 1.8 of this permit.

Because an exceedance of the effluent limits in Part 5.8.1.1 of the permit is a permit violation, if vessel owner/operators are concerned that that their discharges from vessel discharges might exceed these limits, they are encouraged to first conduct land-based testing before installation on a vessel.

8. STATE OR TRIBAL REQUIREMENTS [PART 6]

Part 6 of the final VGP identifies provisions provided to EPA by States and Tribes in their CWA § 401 certifications that the States and Tribes deemed necessary to assure compliance with applicable provisions of the CWA and any other appropriate requirements of State and Tribal law. *See* 33 U.S.C. 1341(d); 40 C.F.R. § 124.53(e)(1). Pursuant to CWA § 401(d), EPA has attached those State and Tribal provisions to the final VGP; those that constitute effluent or other limitations or monitoring requirements are enforceable conditions of the federal permit. *American Rivers, Inc. v. FERC*, 129 F.3d 99, 107 (2nd Cir. 1997). These conditions are subject to review in State and Tribal administrative and judicial tribunals with appropriate jurisdiction. 40 C.F.R. § 124.55(e); *American Rivers, Inc. v. FERC*, 129 F.3d 99, 102 (2nd Cir. 1997); *Roosevelt Campobello Int'l Park Comm'n v. EPA*, 684 F.2d 1041, 1056 (1st Cir. 1982). Part 6 of the permit also includes conditions provided by states as part of their concurrence with this permit for CZMA purposes if applicable (see Part 12.1 of this fact sheet).

9. DEFINITIONS [PART 7]

Part 7 (Appendix A) of the Permit provides permit-specific definitions of statutory, regulatory, and other terms important for understanding this permit and its requirements. Any terms that are not listed in this definitions section have the meaning given to the terms by 40 CFR Part 122.2 (the definitions section of the NPDES regulations). To develop these definitions, EPA has, where possible, relied on existing definitions in other laws and regulations applicable to this universe of permittees in order to provide consistency with those laws and provide permittees with a familiar framework. For those definitions that were developed based on another source, the citation to that law or regulation is included in brackets after the definition.

10. NOTICE OF INTENT AND NOTICE OF TERMINATION [PARTS 10 AND 11]

Part 10/Appendix E of the permit gives those owners and operators who will be required to submit an NOI form an explanation of the process and requirements. This Part reiterates who must file an NOI, pursuant to 1.5.1 of this permit ("How to Obtain Authorization"), and includes a table that outlines the deadlines for submission of an NOI, and corresponding discharge authorization dates. This table provides the same information as Table 1 of this permit. In addition, Part 10.2 provides the actual NOI form, and gives section-by-section instructions on how to fill out the form. The website address for submitting the NOI form is www.epa.gov/npdes/vessels eNOI. The NOI form for vessel discharges will be available on the website approximately 6 months after permit issuance.

Part 11/Appendix F of the permit discusses how and when to terminate permit coverage using a Notice of Termination (NOT) form, pursuant to the permit's requirements in 1.6. Like the NOI form in Part 10, Part 11 provides the web address for submission of the NOT form, a section-by-section explanation about each section of the NOT form, and the actual NOT form.

11. WATERS FEDERALLY PROTECTED WHOLLY OR IN PART FOR CONSERVATION PURPOSES [PART 12]

Part 12 of this permit lists "waters federally protected in whole or in part for conservation purposes," and several of the permit's technology-based effluent limits prohibit or limit various discharges in these waters to the extent they are within waters subject to this permit. As discussed in section 4.2.3 of this fact sheet, EPA has found that the prescribed limits are technologically available and economically practicable and achievable for certain discharges. Because it possible to limit discharges to certain times, but not to limit those discharges indefinitely, EPA focused on imposing these limitations for waters federally protected in whole or in part for conservation purposes. To develop this list of waters, EPA reviewed several federal authorities that protect waters that are known to be of particular high value or sensitive to environmental impacts. These waters are comprised of areas that are important to EPA, our federal partners, and the public at large, as evidenced by the waters' special status or designation by the Federal government as National Marine Sanctuaries, Marine National Monuments, National Parks, National Wildlife Refuges, National Wilderness Areas, or parts of the National Wild and Scenic Rivers System. As mentioned, these waters are likely to be of high quality and consist of unique ecosystems which may include distinctive species of aquatic animals and plants. Furthermore, as protected areas, these waters are more likely to have a greater abundance of sensitive species of plants and animals that may have trouble surviving in areas with greater anthropogenic impact.

12. OTHER LEGAL REQUIREMENTS

12.1 COASTAL ZONE MANAGEMENT ACT (CZMA)

The Coastal Zone Management Act (CZMA) and its implementing regulations (15 CFR Part 930) require that any Federal agency activity or Federally licensed or permitted activity occurring within (or outside but affecting) the coastal zone) of a state with an approved coastal zone management program (CZMP) be consistent with the enforceable policies of that approved program to the maximum extent practicable. Agency general permits that do not involve case-by-case or individualized determinations by the Agency are federal activities for the purposes of CZMA section 307(c)(1). Following proposal of the draft VGP, EPA provided the relevant state coastal zone management agencies with its national consistency determination regarding the enforceable policies in approved state CZM programs for the coastal zones including state waters where the VGP would authorize discharges. 15 CFR 930.31(d). Consistent with the maximum extent practicable standard in 15 CFR 930.32, the final VGP either incorporates state conditions (see VGP Part 6), or if not incorporated or if a state coastal zone management agency objected to the VGP, Part 6 of the VGP notifies potential users of the permit that the VGP is not available for use in that State unless vessel owner/operators wanting to use the VGP in that State provide the State agency with an individual consistency certification under 15 CFR Part 930 subpart D and the State agency concurs.

12.2 ESSENTIAL FISH HABITAT CONSULTATION

Pursuant to section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), Federal agencies must consult with National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect Essential Fish Habitat (EFH). Upon review, EPA has determined that issuance of this final permit will have no adverse effect on EFH because the VGP will impose, for the first time, CWA effluent limitations on discharges incidental to the normal operation of vessels. These discharges have occurred prior to enactment of either the CWA or the Magnuson-Stevens Act, and have continued to occur thereafter, without such controls.

12.3 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT

Title I of the Marine Protection, Research and Sanctuaries Act (MPRSA) (also known as the Ocean Dumping Act) generally prohibits, unless authorized by a permit issued under the Act, (1) transportation of material from the US for the purpose of ocean dumping; (2) transportation of material from anywhere for the purpose of ocean dumping by US agencies or US-flagged vessels; and (3) dumping of material transported from outside the US into the US territorial sea. MPRSA section 101.

Most permits are issued for the purpose of disposing dredged materials (issued by the Corps of Engineers with EPA concurrence). Dumping under the MPRSA means "a disposition of material: Provided, that it does not mean a disposition of … a routine discharge of effluent incidental to the propulsion of, or operation of motor-driven equipment on, vessels," nor "a

disposition of any effluent from any outfall structure to the extent that such disposition is regulated under the [CWA]." MPRSA 3(f), 33 U.S.C. 1402(f). The VGP addresses discharges incidental to the normal operation of vessels that, in the absence of an NPDES permit, would be subject to the prohibition against discharge in CWA section 301(a). The VGP does not authorize dumping activities regulated by the MPRSA.

12.4 OIL SPILL REQUIREMENTS

Section 311 of the CWA prohibits the discharge of hazardous substances in harmful quantities. Discharges incidental to the normal operation of a vessel specifically controlled by the permit are excluded from the provisions of Section 311. However, this permit does not preclude the institution of legal action or relieve the permittee from any responsibilities, liabilities, or penalties for other unauthorized discharges of hazardous substances which are covered by Section 311 of the CWA.

12.5 PAPERWORK REDUCTION ACT

The information collection requirements in this permit have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. as part of the NPDES Consolidated ICR. On September 28, 2008 EPA published the first public notice of this ICR under the OMB number 2040-0004 and on December 17, 2008, EPA published the final public notice for a 30 day comment period. The information collection requirements for this permit are not enforceable until OMB approves the ICR.

This information must be collected in order to appropriately administer and enforce the terms and conditions of the Vessel General Permit. This information collection is mandatory as authorized by Clean Water Act Section 308 and all information collected will be treated as Confidential Business Information (CBI).

The information collection burden for the paperwork collection requirements of this permit is estimated to be 135,693 hours per year, which represents a burden of 0.64 hours per response per year, multiplied by a total of 210,759 responses per year from 65,625 respondents (note: to ensure that an adequate number of burden hours are requested, the number of respondents is slightly higher than the estimated 61,000 domestically flagged vessels identified in the economic analysis that would be affected by this permit). The frequency of responses varies, but includes every five years, annual, quarterly, and occasionally/as needed, depending on the specific reporting requirements. No reporting and record keeping costs beyond labor costs are estimated for this permit.

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 numbers for EPA's regulations in 40 CFR are listed in 40 CFR Part 9. When this ICR is approved by OMB, the Agency will publish a technical amendment to 40 CFR Part 9 in the Federal Register to display the OMB control number for the approved information collection requirements contained in this final permit.

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