

Status of Ballast Water Discharge Regulations in the Great Lakes Region

Prepared by the Great Lakes Commission

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I. Introduction

Ballast water discharge from vessels as a vector for the introduction and movement of aquatic invasive species (AIS) in the Great Lakes and St. Lawrence River has been an important concern for the region. Regulatory regimes at the international, national and state levels are in place to require treatment of ballast water prior to discharge in the future. Until recently, these regimes have required ballast water exchange and saltwater flushing for oceangoing vessels entering the Great Lakes-St. Lawrence River system. Agencies are moving toward adopting numeric standards for the concentration of living organisms in ballast water discharge that will require installation of treatment technology on most ships within the next five years.

The International Maritime Organization (IMO) adopted the *International Convention for the Control and Management of Ships' Ballast Water and Sediments* in 2004. The Convention includes numeric standards for ballast water discharge. The Convention will enter into force 12 months after it has been ratified by 30 member states, representing at least 35 percent of the world's merchant shipping tonnage. Canada ratified the IMO Convention in 2010 although the Convention is currently not in force having not yet reached the 35 percent mark. More recently, the U.S. federal agencies responsible for regulating ballast water discharges have moved toward adopting IMO standards and requirements. Although the U.S. has not ratified the IMO Convention, both the U.S. Coast Guard (USCG) final rule and the U.S. Environmental Protection Agency (USEPA) 2013 Vessel General Permit (VGP) use the IMO discharge standards as the basis of their respective regulatory regimes. Great Lakes states have also taken action through enactment of individual laws and permit requirements that in some cases vary from the federal requirements.

The IMO discharge standards have been determined to be a technologically achievable and practicable standard by some federal and state agencies; however, some have questioned whether they are sufficient to protect the unique fresh waters of the Great Lakes and St. Lawrence River. In efforts to provide an added level of protection, some of the regulatory approaches have retained the ballast water exchange/saltwater flushing requirements in addition to the numeric standards. There is also debate over how to address "laker" vessels, i.e., vessels that remain within the Great Lakes and St. Lawrence River system. This document summarizes the current state of international, national and state rules in the Great Lakes-St. Lawrence River region.

II. Terminology

Definitions

Ballast water: any water and suspended matter taken on board a vessel to control or maintain, trim, draft, stability, or stresses of the vessel, regardless of how it is carried

Ballast water capacity: the total volumetric capacity of any tanks, spaces, or compartments for carrying, loading, or discharging ballast water, including any multi-use tanks, space or compartment designed to allow carriage of ballast water

International Maritime Organization: the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships

Ballast water exchange: to replace the water in a ballast tank, using one of the following methods:

- “Empty/refill exchange” means to pump out the “ballast water” taken on in ports, estuarine, or territorial waters until the tank is empty, then refilling it with water
- “Flow through exchange” means to flush out “ballast water” by pumping in water into the bottom of the tank and continuously overflowing the tank from the top until three full volumes of water has been changed to minimize the number of original organisms remaining in the tank (USCG and USEPA)

Laker vessel: vessels that operate exclusively in Lake Ontario, Lake Erie, Lake Huron (including Lake St. Clair), Lake Michigan, Lake Superior, and the connecting channels (St. Marys River, St. Clair River, Detroit River, Niagara River, and St. Lawrence River), including all other bodies of water within the drainage basin of such lakes and connecting channels (USEPA)

Existing vs. new vessel: vessels are differentiated as “existing” or “new” in ballast water regulations using their date of construction; vessels constructed before the specified date are considered “existing” and vessels built after the specified date are considered “new”

- The USCG and USEPA and the states of Indiana and Wisconsin define existing vs. new vessels using the date December 1, 2013
- The state of Minnesota defines existing vs. new vessels using the date January 1, 2012

Oceangoing vessel: a vessel that operates beyond the U.S. boundary line established by 46 CFR part 7 (USCG)

Saltwater flushing: the addition of ocean water to empty ballast water tanks (e.g., vessels declaring “no ballast on board”); 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 reaches a specified salinity (USEPA)

Abbreviations

BW	ballast water	NAS	National Academies of Science
BWE	ballast water exchange	NISA	National Invasive Species Act of 1996
BWM	ballast water management	NPDES	National Pollutant Discharge Elimination System
BWTS	ballast water treatment system	NOBOB	No ballast on board
CWA	Clean Water Act	NANPCA	Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990
USCG	U.S. Coast Guard	SAB	Science Advisory Board
cfu	colony forming unit(s)	SF	saltwater flushing
USEPA	U.S. Environmental Protection Agency	TBEL	technology based effluent limit
EEZ	Exclusive Economic Zone	VGP	Vessel General Permit
GLSLS	Great Lakes-St. Lawrence Seaway	WQBEL	water quality based effluent limit
GLWQA	Great Lakes Water Quality Agreement		
IMO	International Maritime Organization		

III. International and Federal Ballast Water Discharge Regulations

International Maritime Organization

The International Maritime Organization (IMO) adopted the *International Convention for the Control and Management of Ships' Ballast Water and Sediments* in 2004. The IMO Convention "aims to prevent the spread of harmful aquatic organisms from one region to another, by establishing standards and procedures for the management and control of ships' ballast water and sediments." The Convention applies to oceangoing ships and requires a ship-specific ballast water management plan, record book and international ballast water management certificate. The Convention also establishes ballast water standards to be phased in over a period of time. These standards include both a ballast water exchange standard (Regulation D-1) and a ballast water performance standard (Regulation D-2). The D-1 exchange standard is required only until the D-2 performance standard goes into effect. The Convention requires a review of the D-2 performance standard considering several criteria and including a determination of whether technology is available to meet the standard. The Convention will enter into force 12 months after it has been ratified by 30 member states, representing at least 35 percent of the world's merchant shipping tonnage. As of January 2, 2013, the Convention was ratified by 36 states representing 29 percent of the world's merchant shipping tonnage. The U.S. has not ratified the Convention; Canada ratified the Convention in 2010.

More Information

- IMO Ballast Water Management:
<http://www.imo.org/OurWork/Environment/BallastWaterManagement/Pages/Default.aspx>
- IMO Ballast Water Convention:
<http://www.imo.org/About/Conventions/listofconventions/pages/international-convention-for-the-control-and-management-of-ships%27-ballast-water-and-sediments-%28bwm%29.aspx>

U.S. Coast Guard

Under authority provided through the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA), the U.S. Coast Guard (USCG) began requiring ballast water exchange for vessels entering the Great Lakes in 1993. This requirement was expanded nationwide in 2004 pursuant to requirements in the 1996 reauthorization of NANPCA, the National Invasive Species Act (NISA). Vessels declaring 'no ballast on board' (NOBOB) were exempt from these requirements. In 2009, USCG issued a "Notice of Proposed Rulemaking" proposing standards for the allowable concentration of living organisms in ships' ballast water discharged in U.S. waters. This rulemaking was finalized in March 2012 and went into effect in June 2012. The final rule requires all ocean-going vessels, including NOBOBs, to install an approved treatment technology that meets a numeric discharge standard that is the same as the IMO performance standard. This will require that existing ships install treatment technology by their first scheduled dry-docking after January 1, 2016 (or January 1, 2014 for ships with a certain ballast water capacity). The rule does not require lakers to meet the discharge standard and it does not require BWE/SF once the standard goes into effect. The rule also requires that USCG conduct a practicability review to determine if more stringent requirements can be met.

The USCG website states that the "numerical limits set by the discharge standard in this Final Rule were supported by reports from the National Academy of Science and the U.S. Environmental Protection Agency Science Advisory Board in 2011 as the most stringent that vessels can practicably implement and that the Coast Guard can enforce at this time."¹ USCG findings published in the final rule also state that existing BWE requirements are not a desirable long-term approach because "results from several studies have shown the effectiveness of BWE varies considerably and is dependent on vessel type (design), exchange method, ballasting system configuration, exchange location, and method of study" and "a significant number of vessels

¹ <http://www.uscg.mil/hq/cg5/cg522/cg5224/bwm.asp>

are constrained by design or route from conducting BWE in compliance with existing regulations prior to their arrival into waters of the United States.”²

More Information

- USCG Ballast Water Management: <http://www.uscg.mil/hq/cg5/cg522/cg5224/bwm.asp>

U.S. Environmental Protection Agency

In 2006, a U.S. District Court ruled that the U.S. Environmental Protection Agency (USEPA) must regulate ballast water discharges, along with other vessel discharges, under the Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES) and develop a program by September 30, 2008. This ruling was upheld despite an appeal process and in December 2008 the USEPA issued the first Vessel General Permit (VGP). The 2008 permit essentially adopted the existing USCG mandatory ballast water management and exchange standards and some additional ballast water management practices. However, under Section 401 of the CWA, states are allowed to protect water quality by applying state specific conditions on federal permits (including the VGP). A number of Great Lakes states acted on this authority and imposed more stringent requirements such as the IMO performance standard.

The 2008 VGP was issued for a five-year period, expiring in December 2013. In March 2013, the USEPA issued the 2013 VGP to replace the 2008 permit after it expires. The 2013 permit requires ocean-going vessels to meet a discharge standard equivalent to the IMO performance standard by their first scheduled dry-docking after January 1, 2016 (or January 1, 2014 for ships with a certain ballast water capacity) for existing vessels. The VGP retains the BWE/SF requirement for ships entering the Great Lakes-St. Lawrence River system. A number of Great Lakes states have also imposed state-specific requirements on the 2013 VGP under the 401 certification. The 2013 permit will expire in December 2018. Lakers are exempt from the meeting the discharge standard but are required to conduct best management practices.

To inform the development of the 2013 VGP standards, the USEPA reviewed the National Research Council of the National Academies of Science (NAS) report “Assessing the Relationship Between Propagule Pressure and Invasion Risk in Ballast Water,” released in June 2011. The EPA used this report as the justification for relying on a technology-based effluent limit for ballast water and not developing a numeric water-quality based effluent limit as it would be “infeasible to calculate” at this time given “available data and information.”³ USEPA also used the NAS report and a suite of other studies to justify its decision to apply the IMO D-2 discharge standard. USEPA’s stated purpose for retaining the ballast water exchange requirement is to “add another measure of protection against invasive species to reduce the compatibility of source and recipient regions when freshwater or brackish water is transported via ballast tanks into the Great Lakes.”⁴ USEPA also believes that “requiring BWE in addition to the application of effluent limits that reflect available treatment technologies... will achieve applicable water quality standards, as we expect continued BWE to further decrease the probability that non-native organisms will be introduced into and establish themselves in the Great Lakes.”⁵ Research cited documenting the effectiveness of BWE included

- Reid, D.F. (2012). The Role of Osmotic Stress (Salinity Shock) in Protecting the Great Lakes from Ballast-Associated Aquatic Invaders. Technical Report.
- Briski, E., Allinger, L. E., Balcer, M., Cangelosi, A., Fanberg, L., Markee, T. P., Mays, N., Polkinghorne, C. N., Prihoda, K. R., Reavie, E. D., Regan, D. H., Reid, D. M., Saillard, H. J., Schwerdt, T., Schaefer, H.,

² U.S. Coast Guard. Standards for Living Organisms in Ships’ Ballast Water Discharged in U.S. Waters; Final Rule. Federal Register, Vol. 77, No. 57. March 23, 2012. <http://www.gpo.gov/fdsys/pkg/FR-2012-03-23/pdf/2012-6579.pdf>.

³ U.S. Environmental Protection Agency. 2013 Final Issuance of National Pollutant Discharge Elimination System (NPDES) Vessel General Permit (VGP) for Discharges Incidental to the Normal Operation of Vessels Fact Sheet. http://www.epa.gov/npdes/pubs/vgp_fact_sheet2013.pdf.

⁴ Ibid.

⁵ Ibid.

TenEyck, M., Wiley, C. J., and Bailey, S. A. (2013). "Multidimensional Approach to Invasive Species Prevention." *Environmental Science & Technology*, 47(3), 1216-1221.

Finally, in addition to harmonization with existing regulations, the USEPA retains the saltwater flushing requirement because it has been shown has an effective method of reducing AIS invasion risks from vessels with residual ballast water and/or sediment, such as NOBOB vessels, citing the following technical memorandum⁶:

- Ruiz, G.M., & Reid, D.F. (Ed.). (2007). Current state of understanding about the effectiveness of ballast water exchange (BWE) in reducing aquatic Nonindigenous species (ANS) introductions to the Great Lakes Basin and Chesapeake Bay, USA: synthesis and analysis of existing information (NOAA Technical Memorandum GLERL-142). Ann Arbor, MI: NOAA.

More Information

- USEPA Vessel General Permit: <http://cfpub.epa.gov/npdes/vessels/vgpermit.cfm>

Transport Canada

In 1989, Canada issued guidelines for voluntary BWE for vessels entering the Great Lakes. In 2000, these guidelines were expanded to cover all Canadian waters and were renamed the *Guidelines for the Control of Ballast Water Discharge from Ships in Waters under Canadian Jurisdiction, TP 13617*. In 2006, under the Canada Shipping Act 2001, all vessels entering Canada were required to manage their ballast water. The regulations required BWE meeting the IMO D-1 standard as well as saltwater flushing for vessels entering the Great Lakes. The regulations also adopted the IMO D-2 performance standard for ballast water treatment; however treatment is not currently required. Canada ratified the IMO Convention in 2010 and the treatment requirement will go into effect when the convention enters into force. Canada expects that the Convention will come into force and, accordingly, is currently preparing to implement the Convention. Transport Canada has issued a preliminary discussion paper outlining regulatory changes that would be needed to implement the Convention. **It is unclear if Canada will pursue the proposed regulatory changes if the Convention is not sufficiently ratified in the near future.** In addition to requiring the IMO performance standard, the proposed changes retains BWE/SF requirements for vessels entering Canadian fresh waters. Their justification for retaining this requirement is that scientific research has shown that "residual ballast water and sediment is an important vector for introduction of ship-mediated non-native species" and "that exposure to high salinity is extremely effective in killing high-risk freshwater and estuarine organisms contained in residual ballast water and sediments."⁷ The research cited for this justification is:

- Bailey, S.A., Deneau, M.G., Jean, L., Wiley, C.J., Leung, B. and MacIsaac, H.J. (2011) Evaluating efficacy of an environmental policy to prevent biological invasions. *Environmental Science and Technology* 45, 2554-2561.
- Duggan, I.C., van Overdijk, C.D.A., Bailey, S.A., Jenkins, P.T., Limén, H. and MacIsaac, H.J. (2005) Invertebrates associated with residual ballast water and sediments of cargo-carrying ships entering the Great Lakes. *Canadian Journal of Fisheries and Aquatic Science* 62, 2463-2474.

The proposed regulatory changes would also apply to laker vessels, i.e., laker vessels would be required to meet the IMO D-2 standard. However, Transport Canada proposes granting an extension in the timeline for treatment systems to be installed on laker vessels.

⁶ Ibid.

⁷ Transport Canada. *Discussion Paper: Canadian Implementation of the Ballast Water Convention*. Oct. 26, 2012 (Revised December 21, 2012).

http://www.tc.gc.ca/media/documents/marinesafety/Canada_Ballast_Water_Implementation_Discussion_Paper_Revision_d.pdf

More Information

- Transport Canada, A Guide to Canada's Ballast Water Control and Management Regulations: <http://www.tc.gc.ca/eng/marinesafety/tp-tp13617-menu-2138.htm>

Great Lakes-St. Lawrence Seaway

The U.S. and Canadian St. Lawrence Seaway agencies enacted saltwater flushing requirements for NOBOB vessels in 2008. In addition, "lakers" must agree to comply with voluntary best management practices.

More Information

- Great Lakes-St. Lawrence Seaway System, Ballast Water: <http://www.greatlakes-seaway.com/en/environment/ballast-water/index.html>

Great Lakes Water Quality Agreement

The newly renegotiated Great Lakes Water Quality Agreement (GLWQA), signed by the U.S. and Canada in September 2012, requires the two federal governments to work together to "establish and implement programs and measures that protect the Great Lakes Basin Ecosystem from the discharge of Aquatic Invasive Species in Ballast Water."

More Information

- USEPA, Great Lakes Water Quality Agreement: <http://www.epa.gov/glnpo/glwqa/>
- Environment Canada, Great Lakes Water Quality Agreement: <http://www.ec.gc.ca/grandslacs-greatlakes/default.asp?lang=En&n=45B79BF9-1>

Table 1. Summary of IMO and U.S. Federal Ballast Water Regulations

	IMO Convention⁸ (February 2004)	USCG Rules (March 2012)	EPA 2013 Vessel General Permit (March 2013)
General Applicability	Ocean-going vessels	Ocean-going vessels Lakers are exempt from the discharge standard	Ocean-going vessels Lakers are exempt from the discharge standard but best management practices are required
Requirements	Requires vessels to meet the D-1 ballast water exchange standard until the D-2 ballast water performance standard is phased in	BWE/SF until a vessel is required to meet the discharge standard with an approved ballast water management system (BWMS) An alternative management system ⁹ (AMS) may be used if it was installed prior to the date the discharge standard goes into effect; the AMS may be used for up to 5 years after the discharge standard goes into effect	Verified ballast water treatment system (BWTS) that meets the discharge standard Maintains the requirement for BWE/SF for vessels entering the Great Lakes (in addition to meeting the discharge standard)
Discharge Standard (SAME)	D-2 performance standard: <ul style="list-style-type: none"> Organisms > or = 50 micrometers: <10 living organisms per cubic meter Organisms < 50 micrometers and > or = 10 micrometers: <10 living organisms per milliliter (mL) Indicator microorganisms: <ul style="list-style-type: none"> <i>Vibrio cholerae</i>: < 1 colony forming unit (cfu) per 100 mL (or < 1 cfu per 1 gram (wet weight) zooplankton samples) E. coli: < 250 cfu per 100 mL Intestinal enterococci: < 100 cfu per 100 mL 	<ul style="list-style-type: none"> Organisms > or = 50 micrometers: <10 living organisms per cubic meter Organisms < 50 micrometers and > or = 10 micrometers: <10 living organisms per milliliter (mL) Indicator microorganisms: <ul style="list-style-type: none"> <i>Vibrio cholerae</i>: < 1 colony forming unit (cfu) per 100 mL E. coli: < 250 cfu per 100 mL Intestinal enterococci: < 100 cfu per 100 mL 	<ul style="list-style-type: none"> Organisms > or = 50 micrometers: <10 living organism per cubic meter Organisms < 50 micrometers and > or = 10 micrometers: <10 living organisms per milliliter (mL) Indicator microorganisms: <ul style="list-style-type: none"> <i>Vibrio cholerae</i>: < 1 colony forming unit (cfu) per 100 mL E. coli: < 250 cfu per 100 mL Intestinal enterococci: < 100 cfu per 100 mL
Practicability Review	IMO is required to review the D-2 standard, taking into account a number of criteria. The review should include a determination of whether appropriate technologies are available to achieve the standard, an assessment of the specified criteria, and an assessment of the socio-economic effect(s).	No later January 1, 2016 to determine (1) whether a more stringent standard can be met and (2) whether testing protocols can be implemented that can accurately measure treatment efficacy to meet a more stringent standard. If it is determined that a more stringent standard is possible, USCG must initiate a rulemaking by Jan. 1, 2017. USCG has the authority to delay the review schedule.	EPA does not have a practicability review process, however, permits are issued for a five-year period after which time EPA generally issues revised permits based on updated information.
Implementation Schedule	For the Performance Standard: <ul style="list-style-type: none"> Existing vessels constructed before 2009: <ul style="list-style-type: none"> BW capacity 1500-5000 cubic meters: Jan. 1, 2014 BW capacity <1500 or >5000 cubic meters: Jan. 1, 2016 New vessels constructed in or after 2009: <ul style="list-style-type: none"> BW capacity of <5000 cubic meters: On delivery New vessels constructed in or after 2009 & before 2012: <ul style="list-style-type: none"> BW capacity of ≥ 5000 cubic meters: Jan. 1, 2016 New vessels constructed in or after 2012: <ul style="list-style-type: none"> BW capacity of ≥ 5000 cubic meters: On delivery 	For vessels using a USCG approved BWMS: <ul style="list-style-type: none"> New vessels constructed on or after Dec. 1, 2013: On delivery Existing vessels constructed before Dec. 1, 2013: <ul style="list-style-type: none"> BW capacity <1500 cubic meters: first drydocking after Jan. 1, 2016 BW capacity 1500-5000 cubic meters: first drydocking after Jan. 1, 2014 BW capacity > 5000 cubic meters: first drydocking after Jan. 1, 2016 	For vessels using a USEPA approved BWTS: <ul style="list-style-type: none"> New vessels constructed after Dec. 1, 2013: On delivery Existing vessels constructed before Dec. 1, 2013: <ul style="list-style-type: none"> BW capacity <1500 cubic meters: first drydocking after Jan. 1, 2016 BW capacity 1500-5000 cubic meters: first drydocking after Jan. 1, 2014 BW capacity > 5000 cubic meters: first drydocking after Jan. 1, 2016

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⁸ The Convention will only enter into force 12 months after it has been ratified by 30 member states, representing at least 35 percent of the world's merchant shipping tonnage

⁹ Alternative management system: a BWMS approved by a foreign administration that meets IMO standards and all applicable U.S. law requirements

IV. Current U.S. Great Lakes State Ballast Water Discharge Regulations¹⁰

Illinois

The Illinois Environmental Protection Agency found that the 2013 USEPA VGP would comply with state water quality standards and issued a series of conditions on the permit. These conditions do not change the numeric ballast water discharge standard or implementation scheduled required by the VGP.

Indiana

The Indiana Department of Environmental Management certified the 2013 USEPA VGP with additional conditions including a requirement that oceangoing vessels entering the GLSLS from beyond the EEZ to perform BWE/SF before entering the GLSLS. In addition, the state conditions reiterate the timeline for meeting VGP discharge standards for existing vessels (those constructed prior to December 1, 2013) as the first scheduled drydocking after January 1, 2016 and new vessels (those constructed after December 1, 2013) prior to operation in Indiana state waters.

Michigan

Michigan passed legislation in 2005 requiring all oceangoing vessels engaging in port operations in the state to obtain a permit from the Michigan Department of Environmental Quality (MDEQ) beginning January 1, 2007. This legislation also prohibits the discharge of any ballast water from oceangoing vessels in Michigan waters without a permit. Michigan's general permit applies to oceangoing vessels that: a) engage in port operations in Michigan and do not discharge ballast water into state waters; b) discharge ballast water treated by one or more of the ballast water treatment methods specified in the permit; or c) have not otherwise been determined to need an individual permit. The permit allows for four types of ballast water treatment: (1) hypochlorite treatment; (2) chlorine dioxide treatment; (3) ultra violet light radiation treatment preceded by suspended solids removal; and (4) deoxygenation treatment. Any oceangoing vessel that discharges ballast water must use one of the approved treatment types. Permit applicants may propose and receive approval under an individual permit to use an alternate treatment method upon demonstration of effectiveness and environmental soundness. The general permit was first issued in 2006 and, following its expiration, was reissued in 2012 with minimal modifications. The current permit will expire in 2017.

The MDEQ has also issued conditions on the 2013 USEPA VGP. These conditions require oceangoing vessels engaging in port operations or discharging ballast water to obtain the aforementioned state permit. In addition, oceangoing vessels entering Michigan waters with ballast on board must perform BWE/SF in waters outside the EEZ and at least 200 nautical miles from shore. The state conditions also provides that vessels using a treatment system consistent with the state permit requirements by December 31, 2014 would not be required to meet any future effluent limits until the functional life of the treatment system or the life of the vessel has expired (whichever comes first).

In February 2012, MDEQ provided comments to USEPA on the draft VGP raising concerns that the IMO D-2 standard would "not provide an adequate degree of water quality protection for the Great Lakes and other waters of the United states" and suggesting a water-quality based effluent limit for ballast water discharge at least two orders of magnitude more stringent than the IMO D-2 standard be included in the VGP.¹¹ The comments site the following studies in support of the development of a water-quality based limit:

- Lee II, H., et al., 2010. Density Matters: Review of Approaches to Setting Organism-Based Ballast Water Discharge Standards. U.S. EPA, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Western Ecological Division.

¹⁰ This summary reflects the most recent state regulations and state 401 certification conditions on the 2013 USEPA VGP. It does *not* reflect state 401 certification conditions on the 2008 VGP which will expire in December 2013.

¹¹ Michigan Department of Environmental Quality. February 21, 2012. Comments on USEPA's Draft Vessel General Permit and Draft Small Vessel General Permit. Docket I.D. Nos. EPA-HQ-OW-2011-0141 and EPA-HQ-OW-2011-0150.

- Bailey, S.A., L.A. Velez-Espino, O.E. Johannsson, M.A. Koops, C.J. Wiley. 2009. Estimating establishment probabilities of Cladocera introduced at low density: an evaluation of the proposed ballast water discharge standards. *Can. J. Fish. Aquat. Sci.* 66:261-276.

The comments also note that a more stringent standard will serve to “eliminate patchwork regulations in the Great Lakes” by removing the need for states to include more restrictive requirements in their 401 certifications.¹²

Minnesota

The Minnesota State Legislature passed legislation in 2008 establishing ballast water management requirements. In response, the Minnesota Pollution Control Agency (MPCA) developed a ballast water discharge general permit which was issued in September 2008. The permit covers all commercial vessels, ocean-going and lakers, that transit the Minnesota waters of Lake Superior. The state permit requires the installation of BWTS that meet a standard equivalent to the IMO D-2 standard. The schedule for implementation is January 1, 2016 for vessels built prior to January 1, 2012 and prior to commencement of operation in Minnesota waters of Lake Superior for vessels constructed after January 1, 2012. The permit expires in September 2013 and the MPCA has initiated a regulatory review process to “review federal ballast water regulations and current industry practices to determine what, if any, additional regulatory controls are needed to protect Minnesota waters.”¹³ The MPCA also notes that “uncertainty surrounding the efficacy of ballast water treatment systems and the Coast Guard treatment system approval process, shipping owner/operators are reluctant or unable to install treatment devices at this time. Thus, treatment systems may not be able to be implemented under the current general permit timelines.”¹⁴

The MPCA also issued state conditions on the 2013 USEPA VGP. These conditions require vessels to obtain a state permit **and** perform BWE/SF before entering Minnesota waters. The state conditions also specify best management practices for lakers and allow for emergency treatment of “high risk” ballast water.

In its 401 certification letter to USEPA, MPCA states in regards to the discharge standard “MPCA is unable to conclusively determine a numeric standard which would definitely protect water quality and an unaltered species composition of the ecosystem.”¹⁵ Further, in regards to maintaining the BWE/SF requirement in addition to meeting the treatment standard, MPCA says “This requirement... effectively serves as an interim WQBEL prior to a numeric WQBEL calculation that will be protective of state water quality until the numeric WQBEL is fully implemented.”¹⁶ MPCA cites S.A. Bailey et al. (2011) as part of its justification for this requirement, as well as recent but unpublished land-based testing at the Great Ships Initiative facility. Further, in MPCA’s comments to USEPA on the draft VGP, it is noted that exempting lakers from the numeric discharge standard will allow dispersion of invasive species “between water bodies within the Great Lakes System” to go “unchecked for the duration of the permit,” citing the report *Non-Native Species of Concern and Dispersal Risk for the Great Lakes and Mississippi River Interbasin Study*.¹⁷

New York

The New York Department of Environmental Conservation (NYDEC) issued several state conditions on the 2013 USEPA VGP. NYDEC conditions state that the numeric discharge standard in the VGP cannot be made less stringent without violating state water quality standards. In addition, state conditions require oceangoing vessels to perform BWE/SF before entering New York state waters in addition to meeting the ballast water treatment requirements. The conditions also require a set of best management practices for laker vessels and a set of recommended BMPs to reduce the risk that VHS will be spread.

¹² Ibid.

¹³ Minnesota Pollution Control Agency. October 2012. MPCA Staff Begins State Ballast Water General Permit (MNG30) Review.

¹⁴ Ibid.

¹⁵ Minnesota Pollution Control Agency. February 19, 2013. Letter to U.S. Environmental Protection Agency.

¹⁶ Ibid.

¹⁷ Minnesota Pollution Control Agency. February 21, 2012. Comments regarding Draft 2013 NPDES Vessel General Permit (VGP2).

NYDEC states the state conditions “combine water quality protection with operational flexibility. They provide flexibility to the industry by allowing further development of a treatment technology and test protocols.”¹⁸ The NYDEC fact sheet on the VGP provides additional clarification and justification for the NYDEC 401 certification conditions and states “the IMO D-2 standard may not adequately treat all AIS” and “numeric WQBELs more stringent than IMO D-2 are justified, and can be developed in the future based on additional data collection, analysis, and modeling.”¹⁹ However, because USEPA did not include a more stringent standard in the VGP, NYDEC included in its certification the requirement that vessels conduct BWE/SF in addition to meeting the IMO D-2 standard as a “an interim WQBEL that will be protective of state water quality until a numeric WQBEL is developed and implemented.”²⁰ NYDEC includes the following citations to support its findings:

- M.S. Minton et al., “Reducing propagule supply and coastal invasions via ships: Effects of emerging strategies,” *Front. Ecol. Environ.* 3(6), 304-308 (2005).
- S.A. Bailey et al., “Evaluating Efficacy of an Environmental Policy to Prevent Biological Invasions,” *Environ. Sci. Technol.* 45, 2554–61 (2011)
- E. Briski et al., Efficacy of ‘saltwater flushing’ in protecting the Great Lakes from biological invasions by invertebrate eggs in ships’ ballast sediment, *Freshwater Biology* 55, 2414-2424 (2010)
- S. Ellis and H. MacIsaac, Salinity tolerance of Great Lakes invaders, *Freshwater Biology* 54, 77-89 (2009)
- S. Santagata et al., Effects of osmotic shock as a management strategy to reduce transfers of non-indigenous species among low-salinity ports by ships, *Aquatic Invasions* 3, 61-76 (2008)
- D.F. Reid et al., Identifying, Verifying, and Establishing Options for Best Management Practices for NOBOB Vessels, Final Report, NOAA (June 2007).

In comments submitted to USEPA on the draft VGP, the NYDEC states “a WQBEL of at least 100 x the IMO D2 standard is needed to protect water quality, and this WQBEL should be included as a goal in the VGP.” NYDEC cited the California State Lands Commission report *2011 Update: Ballast Water Treatment Systems for use in California Waters* (September 2011) and its own (NYDEC) evaluation of BWTS which found that treatment systems are available that meet standards greater than IMO.²¹

Ohio

The Ohio Environmental Protection Agency (OEPA) found that the 2013 USEPA VGP would comply with state water quality standards and issued a series of conditions on the permit. These conditions do not change the numeric ballast water discharge standard or implementation scheduled required by the VGP. The state conditions reiterate the VGP requirement that vessels entering the GLSLS from beyond the EEZ to perform BWE/SF before entering the GLSLS, in addition to the VGP treatment requirements.

In its certification letter, the OEPA states “Ohio EPA is certifying IMO standards because they are the most widely accepted and tested standards in the world” and that “IMO certification combined with ballast water flushing and exchange is sufficient demonstration that these treatment standards are “practical and possible” methods for meeting ballast water treatment standards for ocean-going ships.”²² In addition, “Ohio EPA also believes that there are reasons to treat existing vessels that operate exclusively within the Great Lakes differently than those that operate outside the Lakes” and “IMO treatment standards are not “practical and possible” at this time for existing vessels operating exclusively within the Great Lakes, as defined in the VGP.”²³

¹⁸ New York State Department of Environmental Conservation. September 26, 2012. Clean Water Act Section 401 Certification for 2013 Commercial and Large Recreational VGP and sVGP.

¹⁹ New York State Department of Environmental Conservation. September 26, 2012. Fact Sheet supporting the Vessel General Permit (VGP) Certification Letter.

²⁰ Ibid.

²¹ New York State Department of Environmental Conservation. February 21, 2012. New York’s Comments on EPA’s Proposed 2013 Vessel General Permit.

²² Ohio Environmental Protection Agency. September 20, 2012. Statewide Grant of Section 401 Water Quality Certification.

²³ Ibid.

Pennsylvania

The Pennsylvania Dept. of Environmental Protection found the 2013 USEPA VGP to be consistent with state water quality standards and did not issue any state conditions.

Wisconsin

The Wisconsin Department of Natural Resources (WDNR) issued a general permit for ballast water discharge under Wis. Stat. §283.31 which provides the state the authority to regulate discharges of pollutants of the waters of the state. The Wisconsin permit went into effect on February 1, 2010. Starting on that date all vessels, oceangoing and lakers, were required to adopt best management practices. The permit also requires oceangoing ships to conduct BWE/SF and to meet a discharge standard equivalent to the IMO D-2 standard following a specified schedule for implementation. In November 2012, WDNR modified its permit to reflect the implementation schedule outlined in the 2013 USEPA VGP: the effective date for new oceangoing vessels is December 1, 2013 and existing oceangoing vessels (those constructed prior to December 1, 2013) is the first dry-docking after January 1, 2016. The permit also states that a BWTS “must work in freshwater.” The permit will expire in January 2015. It should also be noted that the original permit set a more stringent standard at 100 times the IMO D-2 standard which was subsequently changed to the IMO D-2 standard following a feasibility review and determination that treatment technologies are not available and not yet feasible to install that would meet the more stringent standard.²⁴

The WDNR also issued state conditions on the 2013 USEPA VGP. These conditions require vessels to obtain a state permit and perform BWE/SF before entering the GLSLS. The state conditions also allow for emergency treatment of “high risk” ballast water and indicate that lakers will be addressed in the next Wisconsin permit expected in 2015.

A fact sheet on the WDNR permit states “It is the Department’s belief that exchange or flushing, in addition to treatment, is a necessary practice for better protection of the waters of the Great Lakes from AIS.”²⁵ Further, in comments submitted to USEPA on the draft VGP, WDNR recommended that “national numeric water quality based effluent limits (WQBELs) for live organisms in ballast water discharges that are protective of water quality in the entire Great Lakes basin be adopted and imposed.”²⁶

²⁴ Wisconsin Department of Natural Resources. 2010. Wisconsin Ballast Water Treatment Feasibility Determination.

²⁵ Wisconsin Department of Natural Resources. March 6, 2013. Permit Modification Fact Sheet.

²⁶ Wisconsin Department of Natural Resources. February 17, 2012. Letter to U.S. Environmental Protection Agency.

Table 2. Summary of Great Lakes State Ballast Water Regulations (as of May 2013)

State (Agency)	Regulatory Vehicle	Existing oceangoing	New oceangoing	Existing lakera	New lakera	Comments
Illinois (IL Environmental Protection Agency)	401 Certification	- (VGP requirements)	- (VGP requirements)	- (VGP requirements)	- (VGP requirements)	State conditions on the VGP do not impact standards or implementation schedules
Indiana (IN Dept. of Environmental Management)	401 Certification	State conditions repeat VGP requirements	State conditions repeat VGP requirements	- (VGP requirements)	- (VGP requirements)	State conditions on the VGP require oceangoing vessels to perform BWE/SF before entering the GLSLS
Michigan (MI Dept. of Environmental Quality)	State Permit 401 Certification	State permit -Approved treatment technology or no discharge effective 1/1/2007	State permit -Approved treatment technology or no discharge effective 1/1/2007	- (VGP requirements)	- (VGP requirements)	State conditions on the VGP require oceangoing vessels engaging in port operations or discharging ballast to obtain the state permit; oceangoing vessels must perform BWE/SF before entering Michigan waters
Minnesota (MN Pollution Control Agency)	State Permit 401 Certification	State permit - Vessels constructed prior to 1/1/2012 State permit – IMO standards by 1/1/2016	State permit - Vessels constructed after 1/1/2012 State permit – IMO standards prior to operation in Minnesota waters of Lake Superior	State permit - Vessels constructed prior to 1/1/2012 State permit – IMO standards by 1/1/2016 401 Certification – best management practices	State permit - Vessels constructed after 1/1/2012 State permit – IMO standards prior to operation in Minnesota waters of Lake Superior 401 Certification – best management practices	State conditions on the VGP require vessels to obtain a state permit and perform BWE/SF before entering Minnesota waters, and allow for emergency treatment
New York (NY Dept. of Environmental Conservation)	401 Certification	- (VGP requirements)	- (VGP requirements)	Best management practices	Best management practices	State conditions on the VGP require oceangoing vessels to perform BWE/SF before entering New York waters
Ohio (OH Environmental Protection Agency)	401 Certification	- (VGP requirements)	- (VGP requirements)	- (VGP requirements)	- (VGP requirements)	State conditions on the VGP require oceangoing vessels to perform BWE/SF before entering the GLSLS
Pennsylvania (PA Dept. of Environmental Protection)	401 Certification	- (VGP requirements)	- (VGP requirements)	- (VGP requirements)	- (VGP requirements)	No state conditions were added to the VGP
Wisconsin (WI Dept. of Natural Resources)	State Permit 401 Certification	State permit and 401 certification - Vessels constructed prior to 12/1/2013 IMO standards by first dry-docking after 1/1/2016 (state permit) and VGP deadline (401 certification)	State permit and 401 certification - Vessels constructed after 12/1/2013 IMO standards prior to operation in Wisconsin waters by VGP deadline	State permit –Best management practices	State permit –Best management practices	State conditions on the VGP require vessels to obtain a state permit and perform BWE/SF before entering the GLSLS, and allow for emergency treatment; state permit also requires BWE/SF