Invasive Species Mitigation Measures in EPA's 2013 Vessel General Permit (VGP)

29 March 2016

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Presentation Overview

- Vessel Permitting Brief History
- 2015 2nd Circuit Court Decision on 2013 VGP
- Permit Implementation
- 2013 VGP Annual Report Results
- Biofouling
- Questions

Vessel Permitting: Brief History

- **1972:** Clean Water Act (CWA) enacted, requires among other things, permits for discharges of pollutants to waters of the United States – EPA interpreted this to not apply to vessel incidental discharges.
- **2006:** U.S. District Court decides CWA does require discharge permits for vessel incidental discharges.
- **2008** – First VGP issued (5 years).
- **2013** – VGP reissued (5 more years).
- **Oct. 2015** – U.S. Appeals Court determines certain aspects of 2013 VGP are arbitrary and capricious but leaves 2013 VGP in effect.
- **Dec. 2018** – Third VGP expected to be issued.

2013 Final VGP – Overview

- Jurisdiction of the permit
  - Inland waters, territorial sea up to 3 nautical miles (nm)
- Discharge coverage
  - 27 discharge types incidental to the normal operation of a non-recreational and non military vessels 79 feet or longer, except commercial fishing vessels, and all ballast water discharges, regardless of size
  - Additional vessel class-specific conditions for 8 classes of vessels
- Certain vessel discharges not eligible for coverage (e.g., sewage)
- Most vessel operators must submit a Notice of Intent (NOI) to obtain permit coverage.

Key Ballast Water Management Requirements

- Training (2.2.3.1)
- Ballast Water Management Plan (2.2.3.2)
- Mandatory Measures (2.2.3.3)
  - Avoid/Minimize discharge/uptake in sensitive areas
  - Clean tanks regularly (but don't discharge sediment)
  - Use high sea suction for intake and ballast water pumps for discharging, when feasible
  - Minimize ballast water discharge
- Ballast water numeric discharge limitations (2.2.3.5)

Ballast Water – Implementation

- Four possible options to meet limits:
  - Use a treatment device (i.e., USCG-type approved system or an AMS)
  - Use onshore treatment
  - Use public water supply water (from US and Canada only)
  - No discharge
- Implementation schedule:

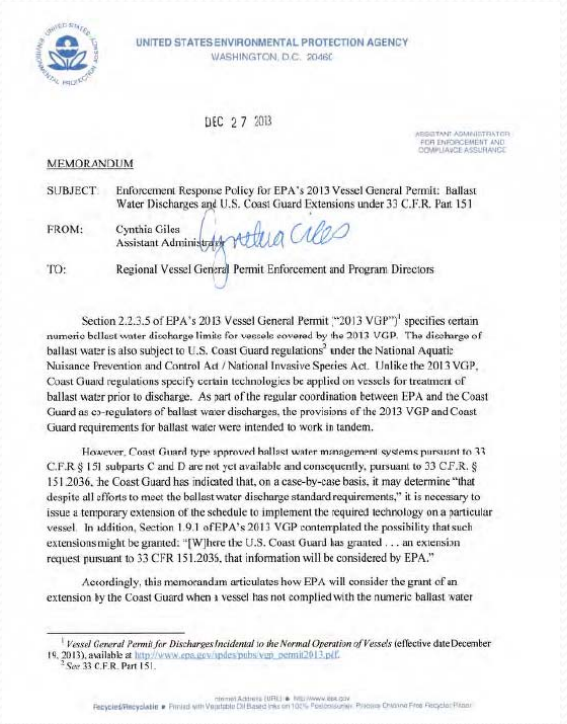
	Vessel's Ballast Water Capacity	**Date Constructed**	**Vessel's Compliance Date**
New vessels		After December 1, 2013	On delivery
Existing vessels	Less than 1500 m^3	Before December 1, 2013	First scheduled drydocking after January 1, 2016
	1500-5000 m^3	Before December 1, 2013	First scheduled drydocking after January 1, 2014
	Greater than 5000 m^3	Before December 1, 2013	First scheduled drydocking after January 1, 2016

Ballast Water – Interim Requirements

- Interim requirements must be met until numeric limits apply
  - Requirements fundamentally the same as the 2008 VGP
- Interim requirements include:
  - Incorporating existing U.S. Coast Guard mandatory management and exchange requirements
  - Mandatory saltwater flushing for all vessels with residual ballast water and sediment (NOBOBs) coming from outside the US EEZ and 200 nm from shore
  - Mandatory exchange and flushing for vessels engaged in Pacific nearshore voyages
  - Conducting exchange as early as practicable

EPA Ballast Water Enforcement Response Policy

- On December 27, 2013 EPA issued an Enforcement Response Policy (ERP).
- The ERP states that vessels that don't meet the VGP's numeric ballast water limits and have received an extension from the USCG and are otherwise in compliance with all other VGP requirements, including submission of a valid NOI, are considered a low enforcement priority.
- EPA and the USCG developed a joint package that is sent to vessel owners/operators that have received an extension from the USCG.
  - This package includes the USCG extension, the ERP and a joint cover letter signed by both Agencies.
- We believe the ERP addresses the primary concerns of industry regarding non-alignment of requirements of the USCG and EPA.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 27 2013

ASSISTANT ADMINISTRATOR FOR ENFORCEMENT AND COMPLIANCE ASSURANCE

MEMORANDUM

SUBJECT: Enforcement Response Policy for EPA's 2013 Vessel General Permit: Ballast Water Discharges and U.S. Coast Guard Extensions under 33 C.F.R. Part 151

FROM: Cynthia Giles
Assistant Administrator

TO: Regional Vessel General Permit Enforcement and Program Directors

Section 2.2.3.5 of EPA's 2013 Vessel General Permit "2013 VGP"[1] specifies certain numeric ballast water discharge limits for vessels covered by the 2013 VGP. The discharge of ballast water is also subject to U.S. Coast Guard regulations[2] under the National Aquatic Nuisance Prevention and Control Act / National Invasive Species Act. Unlike the 2013 VGP, Coast Guard regulations specify certain technologies be applied on vessels for treatment of ballast water prior to discharge. As part of the regular coordination between EPA and the Coast Guard as co-regulators of ballast water discharges, the provisions of the 2013 VGP and Coast Guard requirements for ballast water were intended to work in tandem.

However, Coast Guard type approved ballast water management systems pursuant to 33 C.F.R § 151 subparts C and D are not yet available and consequently, pursuant to 33 C.F.R. § 151.2036, the Coast Guard has indicated that, on a case-by-case basis, it may determine "that despite all efforts to meet the ballast water discharge standard requirements," it is necessary to issue a temporary extension of the schedule to implement the required technology on a particular vessel. In addition, Section 1.9.1 of EPA's 2013 VGP contemplated the possibility that such extensions might be granted: "[W]here the U.S. Coast Guard has granted . . . an extension request pursuant to 33 CFR 151.2036, that information will be considered by EPA."

Accordingly, this memorandum articulates how EPA will consider the grant of an extension by the Coast Guard when a vessel has not complied with the numeric ballast water

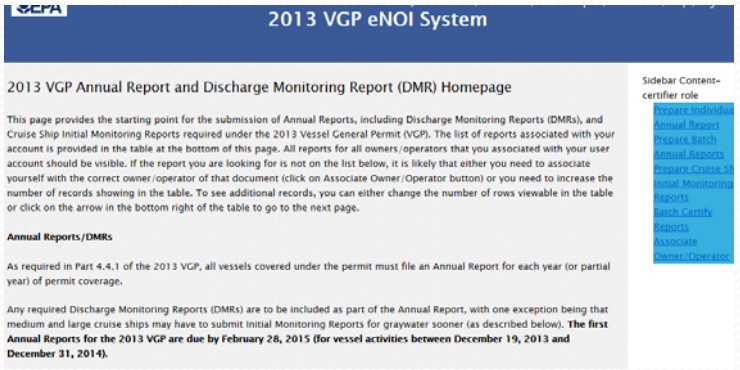
[1] *Vessel General Permit for Discharges Incidental to the Normal Operation of Vessels* (effective date December 19, 2013), available at http://www.epa.gov/npdes/pubs/vgp_permit2013.pdf.
[2] *See* 33 C.F.R. Part 151.

Ballast Water Monitoring

- Monitoring requirements if using a treatment device and discharge to U.S. waters
  - **Functional**
    - Goal is to test if the system functioning as designed (e.g., applying chlorine dose, filtering water)
  - **Biological**
    - *E. coli*, enterococci, and total heterotrophic bacteria
  - **Active substance (biocides) and residuals**
    - Numeric limits for systems using chlorine, chlorine dioxide, ozone, and peracetic acid
    - Other parameters set at National Water Quality Criteria or in consultation with EPA

Reporting

- Annual Report
  - Due by February 28 for previous year
  - Submit electronically through VGP eNOI system
  - Includes information such as:
    - Inspections
    - Treatment technologies
    - Discharges
    - Monitoring results
    - Noncompliance



State Water Quality Certifications

- Under Section 401 of the Clean Water Act, States have the authority to add additional requirements to any EPA permit as necessary to protect water quality in that state.

- States with Additional Ballast Water Requirements in Part 6 of the 2013 VGP:

  - 7 Great Lakes States (IL, IN, MI, MN, NY, OH, WI)
  - 7 Other States (AZ, CA, CT, HI, ME, RI, WA)

2013 VGP Lawsuit

- Petitioners:
  - National Resource Defense Council (NRDC)
  - Northwest Environmental Advocates (NWEA)
  - National Wildlife Federation (NWF)
  - Center for Biological Diversity (CBD)
  - Lake Carriers' Association (LCA) - Intervenors
  - Canadian Shipowners (CSA) – Intervenors

- Were EPA's actions:

  - Arbitrary and capricious, or
  - Abuse of discretion, or
  - Not in accordance with law

October, 5 2015 2nd Circuit Court Decision

Findings For EPA

Technically-Based Limits

- Appropriate to not include numeric limits for viruses and protists
- Monitoring and reporting approach to demonstrate compliance with limits is appropriate

October 5, 2015 2nd Circuit Court Decision

Findings Against EPA

Technically Based Limits

- Improper reliance on IMO Standard
- Failure to adequately consider onshore treatment
- Inappropriate exemption of 2009 Lakers from numeric limits

Water-Quality

- Insufficient water quality based limits
- Failure to establish water quality based monitoring

- Permit remains unchanged until reissuance.

Current Implementation and Enforcement Approach

- EPA – Implements and administers the VGP
- USCG – Inspect vessels for compliance with the VGP
- EPA – Conducts enforcement actions (and limited inspections) for the VGP

Notice of Intent (NOI) Data for 2013 VGP

Vessel Type	No. NOIs	Non-US Flagged	% Non-US	Total Number w/ BWTS
Bulk Carrier	7,922	7,869	99%	427
Container Ship	2,735	2,654	97%	109
Cargo/Reefer	1,915	1,881	98%	86
Med./Lg Cruise Ship	299	235	79%	16
Oil/Gas/Chemical Tanker	5,498	5,421	99%	316
RORO/PCC/PCTC	856	784	92%	75
Other	35,043	719	2%	56
Total	**54,268**	**19,563**	**36%**	**1,085**

2013 VGP Annual Report Data

2015 Annual Reports	# Vessels	BWTS
# Reports	41,806	
No Discharge in US Waters	6,986	
Operated in US Waters	34,820	815
Discharge Ballast Water in US Waters	5,996	520
Operated in Pacific Waters	3,201	376
Discharge Ballast Water in Pacific Waters	1,661	213
2014 Annual Reports	**# Vessels**	**BWTS**
# Reports	42,293	
No Discharge in US Waters	6,977	
Operated in US Waters	35,316	
Discharge Ballast Water	6,280	244

Ballast Water Discharges (2014 Annual Reports)

Vessel Type	Operated in US	Discharged Ballast Water in US	BWTS	BW Monitoring Data
Bulk Carrier	3,297	2,954 (90%)	138	9
Container Ship	1,155	307 (27%)	64	1
General Cargo, Reefer	802	483 (60%)	48	5
Med./Lg Cruise Ship	201	49 (24%)	22	11
Oil/Gas/Chemical Tanker	2,228	1,642 (74%)	76	10
RORO/PCC/PCTC	489	71 (15%)	56	0
Other	27,143	774 (3%)	22	1
Total	**35,315**	**6,280 (18%)**	**426**	**37**

Ballast Water Treatment (2014 Annual Report)

Treatment System	No Discharge to US Waters	Discharge to US Waters	Total	USCG AMS?
Techcross (Electro-Cleen)	21	72	93	Yes
Panasia (GloEn-Patrol)	10	40	50	Yes
JFE (BallastAce)	8	18	26	Yes
Alfa Laval Tumba (Pure Ballast)	47	17	64	Yes
Hyde Marine (Hyde Guardian)	24	17	41	Yes
NK (Blue Ballast)	5	17	22	Yes
Hyundai Heavy Industries (EcoBallast)	2	11	13	Yes
Headway Technologies (OceanGuard)	2	9	11	Yes
Optimarin (Optimarin)	24	8	32	Yes
Kuraray (Microfade)	0	8	8	Yes
Ocean Saver (Ocean Saver)	4	5	9	Yes
SunRui Marine (Balclor)	7	4	11	Yes
COSCO (Blue Ocean Shield)	2	3	5	Yes
Samsung Heavy Industries (Purimar)	1	3	4	Yes
RWO Marine (CleanBallast)	5	2	7	Yes
Wuxi Brightsk (BSKY)	6	1	7	Yes
Ecochlor (Ecochlor)	1	1	2	Yes
Severn Trent (BalPure)	0	1	1	Yes
Sumitomo Electric (Ecomarine)	0	1	1	Yes
Trojan & Wartsila (Marinex)	0	1	1	Yes
Mahle (Ocean Protection System)	4	0	4	Yes
Evoqua (Seacure)	1	0	1	Yes
Jiujiang Precision (OceanDoctor)	1	0	1	Yes
Wartsila (Aquarius UV)	1	0	1	Yes

Ballast Water Treatment Technologies (2014)

Technology	# Vessels Reported Using
Filtration	224
Ultraviolet	201
Chlorine Add./Electrochlor.	98
Electric Pulse	32
Ozone	29
Other: Electrolysis	28
Other: Advanced Oxidation	24
Other: Chemical Addition	18
Chlorine Dioxide	13
Ultrasound	12
Other: Other	19

Monitoring Data Submitted

Type of Monitoring Data Submitted	# Vessels (2014)	# Vessels (2015)
Functionality Monitoring	33	72
Biological Monitoring	16	62
Residual Biocide Monitoring	4	14
Total No. Vessels	**43**	**81**

Biological Monitoring Results (2014)

Analyte	Units	No. of Samples	No. Detects	Max. Value	BWTS	Med. Det. Value	Mean Det. Value
THB	cfu	20	18	70,000		158	7,620
THB	MPN	11	4	141		37	55
E. coli *(limit: 250)*	cfu	18	4	2,420 *(3 exc)*	*UV, O_3*	1,084	1,148
E. coli	MPN	13	4	24,196		1	6,052
Entero. *(limit 100)*	cfu	27	7	2,420 *(2 exc)*	*UV*	76	728
Entero.	MPN	4	2	24,000		12,006	6,003

Biological Monitoring Results (2015)

Analyte	Units	No. of Samples	No. Detects	Max. Value	BWTS	Med. Det. Value	Mean Det. Value
THB	cfu	72	37	224,800		370	9,716
THB	MPN	10	6	23,900		24.5	4,027
E. coli *(limit: 250)*	cfu	49	10	114 *(0 exc)*		11.5	27
E. coli	MPN	35	11	20		1	4.5
Entero. *(limit 100)*	cfu	63	17	152 *(1 exc)*	*UV*	2	19
Entero.	MPN	19	4	55		7	18

Residual Biocide Monitoring (2014)

Analyte	Units	No. of Vessels	No. of Samples	No. Detects	Max. Value	Limit
Chlorine Dioxide	µg/L	1	1	0		200
Chlorine (as TRO)	µg/L	2	22	16	100	100
Total Trihalomethanes	µg/L	1	3	3	21	
Haloacetic Acids	µg/L	1	3	3	5	
Bromate	µg/L	1	1	0		
Bromoform	µg/L	1	2	2	27	

Residual Biocide Monitoring (2015)

Analyte	Units	No. of Vessels	No. of Samples	No. Detects	Max. Value	Limit
Chlorine Dioxide	µg/L	9	9	2	100	200
Chlorine (as TRO)	µg/L	9	66	27	200 (1)	100
Total Trihalomethanes	µg/L	8	17	14	200	--
Haloacetic Acids	µg/L	8	17	14	53.4	--
Bromate	µg/L	3	4	1	174	--
Bromoform	µg/L	3	4	2	46.1	--
Menadione	ug/l	1	1	0	--	--
Chlorite	ug/l	8	17	4	1,900	--
Chlorate	ug/l	8	17	5	73,200	--
Akylamines	ug/l	1	1	0	--	--

(1) One value exceeded limit using ozone treatment system.

Reported Noncompliance (2014)

Permit Section	Number Reported Violations
Routine Visual Inspections	3924
Comprehensive Annual Inspections	257
Environmentally Acceptable Lubricants	125
Discharges of Oil	97
Fuel Spills/Overfills	70
Ballast Water Related	35
All Other Reported Noncompliance	227

* A total of 777 vessels out of 41,663 vessels that submitted annual reports (<2%) identified at least one noncompliant event in their 2014 annual report.

Example Reported Ballast Water Noncompliance (2014)

- Failure to monitor ballast water discharges
- Monitoring values exceeded effluent limitations
- Failure to record deballasting correctly
- Sheen noticed in ballast water discharge
- Used wrong ballast water reporting form
- BWMP incomplete
- BW exchange occurred within 200 NM of shore

Ballast Water Discharges (2014 Annual Reports)

Vessel Type	Operated in US	Discharged Ballast Water in US	BWTS	BW Monitoring Data
Bulk Carrier	3,297	2,954 (90%)	138	9
Container Ship	1,155	307 (27%)	64	1
General Cargo, Reefer	802	483 (60%)	48	5
Med./Lg Cruise Ship	201	49 (24%)	22	11
Oil/Gas/Chemical Tanker	2,228	1,642 (74%)	76	10
RORO/PCC/PCTC	489	71 (15%)	56	0
Other	27,143	774 (3%)	22	1
Total	**35,315**	**6,280 (18%)**	**426**	**37**

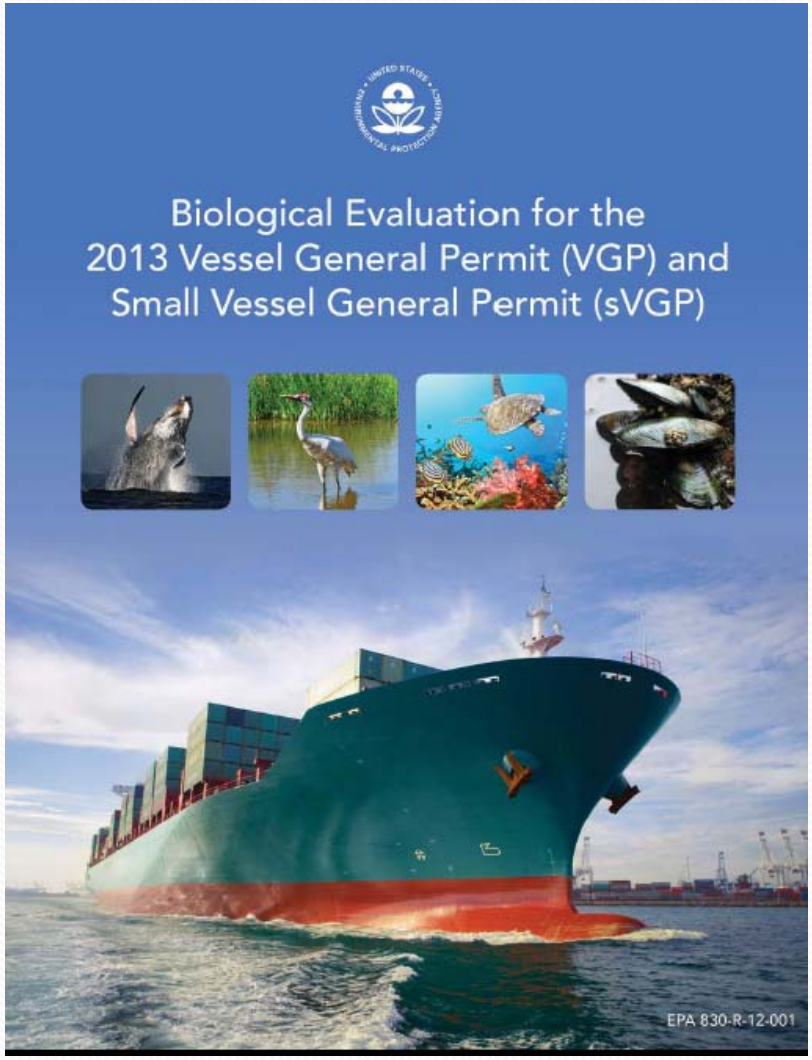
Ballast Water Treatment (VGP Annual Reports)

Treatment System	2014 Total	2015 Total	USCG AMS?
Techcross (Electro-Cleen)	93	180	Yes
Panasia (GloEn-Patrol)	50	111	Yes
Alfa Laval Tumba (Pure Ballast)	64	98	Yes
Hyde Marine (Hyde Guardian)	41	67	Yes
Qingdao/Headway (OceanGuard)	11	53	Yes
JFE (BallastAce)	26	51	Yes
Hyundai Heavy Industries (EcoBallast)	13	40	Yes
Optimarin (Optimarin)	32	37	Yes
NK (Blue Ballast)	22	31	Yes
Ocean Saver (Ocean Saver)	9	30	Yes
RWO Marine (CleanBallast)	7	27	Yes
Samsung Heavy Industries (Purimar)	4	23	Yes
SunRui Marine (Balclor)	11	18	Yes
COSCO (Blue Ocean Shield)	5	13	Yes
Kuraray (Microfade)	8	11	Yes
Wuxi Brightsk (BSKY)	7	10	Yes
Other (approx. 18 vendors)	12	45	Yes

Ballast Water Treatment Technologies (2015)

Technology	# 2014 - Vessels Reported Using	# 2015 - Vessels Reported Using
Filtration	224	474
Ultraviolet	201	364
Chlorine Add./Electrochlor.	98	236
Electric Pulse	32	75
Ozone	29	34
Other: Electrolysis	28	70
Other: Advanced Oxidation	24	30
Other: Chemical Addition	18	60
Chlorine Dioxide	13	24
Ultrasound	12	38
Other: Other	19	29

Biofouling



- Hull fouling identified as one of the primary vectors for Aquatic Nuisance Species (ANS) introduction

Biofouling – Permit Requirements

- Hull fouling regulated under 3 discharge types in the VGP
  - Anti-foulant Hull Coatings
  - Cathodic Protection
  - Underwater Ship Husbandry (Primary Section)

Biofouling – Permit requirements

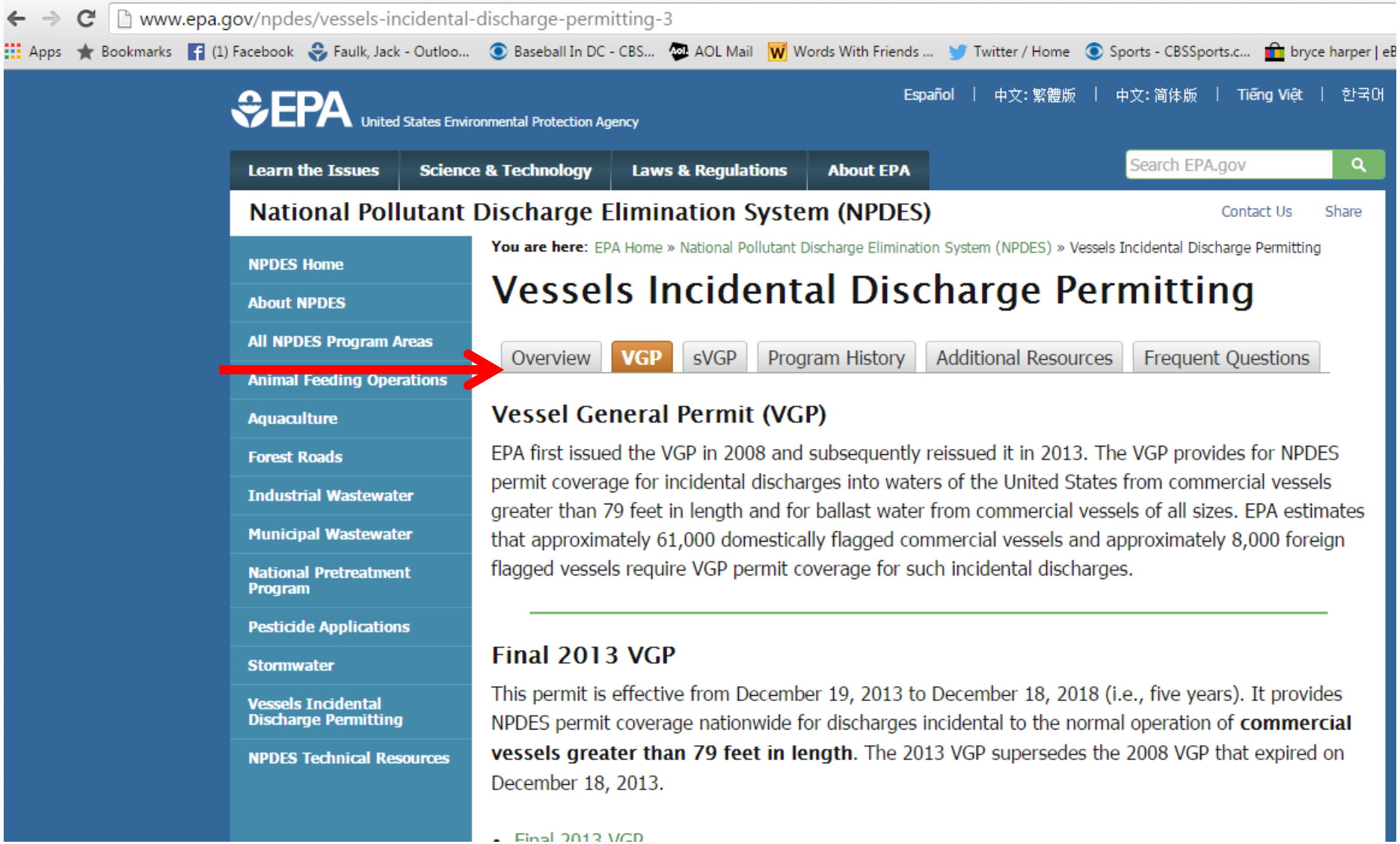
- Vessel operators must minimize hull fouling when not engaged in short distance voyages (from Underwater Ship Husbandry requirements):
  - Management measures to minimize the transport of attached living organisms include:
    - Selecting an appropriate anti-foulant management system and maintaining that system,
    - Conducting an in-water inspection,
    - Cleaning and maintenance of hulls, and
    - Thorough hull and other niche area cleaning when a vessel is in drydock.
  - Specified management measures consistent with IMO guidelines
- When feasible, flush-fit sacrifical anodes to the hull or fill the space between the anode and hull backing (From Cathodic Protection requirements)

Biofouling - Available Data

- Hull fouling data is now available through the eNOI database, should agencies/researchers choose to use it in their analyses

- eNOI Search tool on the Vessels Discharge Homepage

EPA NPDES VGP Webpage



Contacts/Information

Website

www.epa.gov/npdes/vessels-incidental-discharge-permitting-3

VGP Questions

VGP@epa.gov

Electronic Reporting Questions

VGPeNOI@epa.gov

Questions

Additional Ballast Water Monitoring Information

Ballast Water Monitoring

- Who is required to monitor (i.e., sample)?
  - Any vessel employing a ballast water treatment system (i.e., subject to Part 2.2.3.5.1.1.1 of the 2013 VGP), and that
  - Discharges ballast water into waters subject to the VGP.
- What must be monitored?
  - Biological Monitoring: Total Heterotrophic Bacteria, *E. Coli*, and Enterococci.
  - Biocide monitoring: Residual Biocides and/or Derivatives (Table 5 of 2013 VGP)
  - Functional monitoring: System Indicators (see Appendix J of 2013 VGP)

Ballast Water Monitoring (cont.)

- How often must ballast water be monitored?
  - Biological Monitoring
    - Two times in the first year (for vessels with high quality data) with possible reduction to once a year if below limits
    - Four times a year (for vessels without high quality data)
  - Biocide Monitoring
    - Three times in first 10 discharges (not to exceed 180 days (for vessels with high quality data) and then twice a year thereafter
    - Five times in the first 10 discharges (not to exceed 180 days (for vessels without high quality data) and then four times a year thereafter
  - Functional Monitoring
    - At least monthly

General Monitoring Questions

- Required to monitor ballast water if don't discharge ballast water in waters subject to the permit?
  - No.
- Does monitoring have to be performed by an approved lab?
  - No. Appropriate methods must be used and reports must be certified to their accuracy by an authorized representative (or duly authorized).
- Collect one sample and had it analyzed three times. How report results?
  - Limits are instantaneous maximums. Averaging is not allowed. Should report the highest of the three results.
- Can sample be collected from ballast tank for compliance purposes?
  - No. Samples are to collected of the discharge.

Biological Monitoring

- Used as biological indicator of adequacy of the treatment of organisms
- Limits are instantaneous maximums (results not to be averaged)
- High quality data considered for reduced monitoring:
  - USCG type approved or AMS
  - Foreign type approved using ETV and IL and data available to EPA
- Requires use of methods in Table 2 or in 40 CFR Part 136, as applicable.
- Some biological parameters have monitoring with no limits and some have limits with no monitoring.

Biological Monitoring Questions

- Some microbiologicals have approved methods reported as MPN or cfu but limits are in cfu. Can methods be used that report MPN?
  - Yes, consistent with monitoring requirements in permit.
- Holding time for *E. coli* and Enterococci. Is it 6 or 8 hours and from when?
  - Incubation to start as soon as possible but no later than 8 hours from time of collection.
- Can an updated method be used for monitoring (e.g., ISO 9308-1:2000 for *E. coli* was updated in September 2014)?
  - Methods must consistent with permit language. In some instances, that may provide for use of updated methods (consistent with 40 CFR § 136.6 procedures).

Residual Biocide Monitoring

- Meet biocide discharge limits in Table 3, as applicable (chlorine dioxide, chlorine, ozone, peracetic acid, hydrogen peroxide)
- For other biocides:
  - Do not exceed acute water quality criteria, or
  - If no criteria, notify EPA of biocide to be used at least 120 days in advance of discharge.
- Similar high quality data provisions as biological monitoring
- Requires use of methods in Table 5 or 40 CFR Part 136.

Residual Biocide Monitoring Questions

- Are operators required to monitor for all parameters identified in Table 5 of the VGP for each specific biocide?
  - Yes
- What if biocide is not identified in Table 5 of VGP but operator intends to use such.
  - Users must monitor for any residual biocides and derivatives, even if not in table. May require notifying EPA to determine appropriate monitoring.

Functional Monitoring

- List of parameters to monitor included in Appendix J. Identify appropriate methods to monitor for each treatment technology.
- Calibrate sensors at least annually (or more frequently if recommended by manufacturer). Do not discharge when sensors are being calibrated.

Functionality Monitoring Questions

- Permit says calibrate sensors at least annually but manufacturer says calibrating every 2 and a half years is adequate. What to do?
  - According to permit, must calibrate at least annually.
- Must all metrics identified in Appendix J of the VGP for any given technology be measured/reported?
  - EPA expects operators to measure those performance indicators that are appropriate for evaluating system operation.
- Permit requires monthly monitoring but system records continuously. What must be reported?
  - All data obtained during operation must be reported. If that is continuous, reporting tool provides for reporting of such.

Self-Monitoring Reference Tool

- 2013 VGP Sampling Requirements
- Finding a Sampling Service Provider and/or an Analytical Laboratory
- Sample Preparation
- Collecting and Handling Samples
- Shipping Samples to a Laboratory
- http://water.epa.gov/polwaste/npdes/vessels/VGP-Monitoring-and-Reporting.cfm