Wisconsin Ballast Water Program Implementation: Step 1 in the Fight Against New AIS Introduction

Cordell Manz – Lake Superior Ballast Inspector
Susan Eichelkraut – Lake Michigan Ballast Inspector
Laura Madsen – Ballast Water Program Coordinator

WISCONSIN
DEPT. OF NATURAL RESOURCES

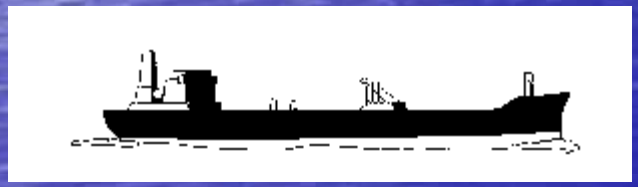
Why Regulate Ballast Water Discharges?

- 180 + Aquatic Invasive Species (AIS) in Great Lakes
- Estimated 55-70% since 1959 from ballast water
- Typically lack predators
- Disrupts native ecosystems
- Zebra mussels: annually, $100-400 million

Great Lakes Ports

Why Shipping?

Transportation Efficiencies

Class 10 Ore Vessel	Jumbo Railcar	Large Semi-Truck
		
62,400 Tons	100 Tons	26 Tons
		

1 Ore Vessel 62,400 Tons = 624 Railcars 62,400 Tons = 2,400 Trucks 62,400 Tons

COAL

Taconite

GRAIN


SALT

Why Shipping – Benefits!

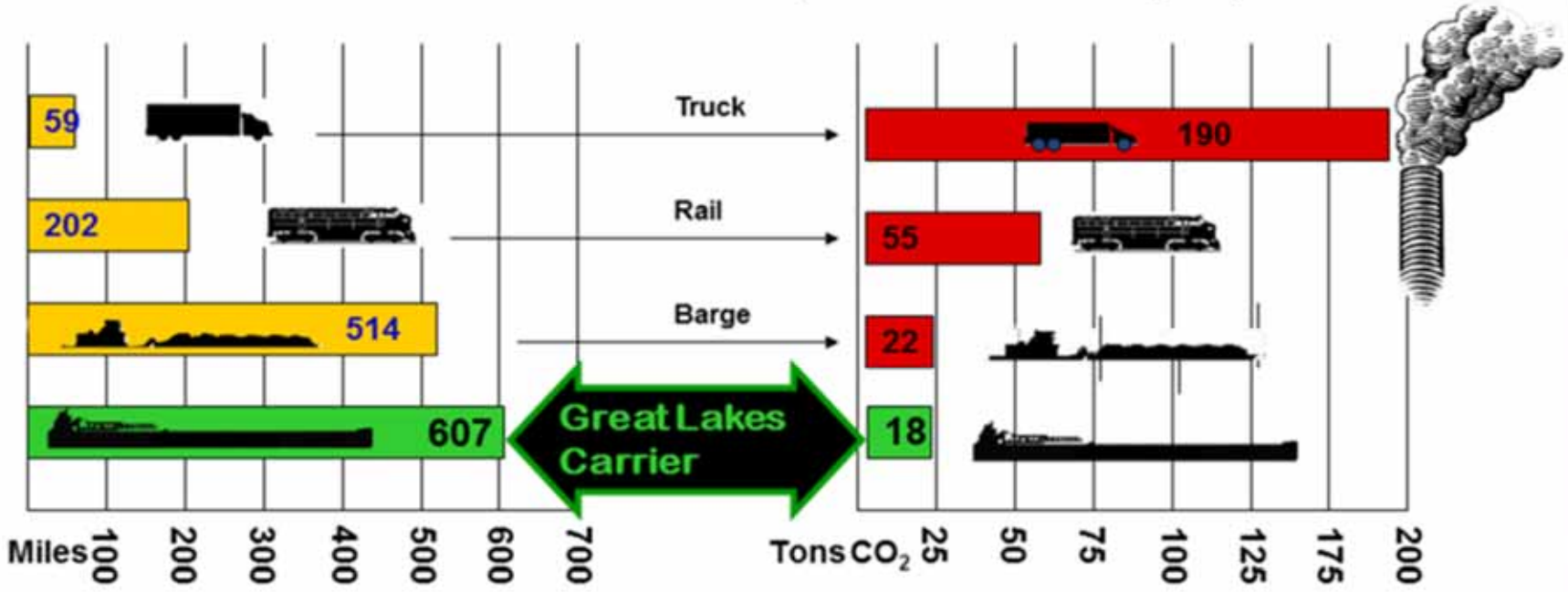
WATERBORNE TRANSPORTATION IS …

Safer *More Fuel-Efficient* *Fewer Emissions*

THAN RAIL OR TRUCK TRANSPORTATION

Miles 1 Ton of Cargo Carried Per Gallon of Fuel [1]

Tons of CO_2 Produced to Transport 1,000 Tons of Cargo 1,000 Miles [2]



1. *Source: USDOT Maritime Administration and Minnesota Department of Transportation*
2. *Assumes US DOE Fuel and Energy Emission Coefficient of 22.38 lbs of CO_2 per gallon (No.1,2,4 Fuel Oils and Diesel) for GL Carrier*

‘Watchlist’ for Potential New AIS Species

- GLRI funded project by ***NOAA*** in support of early detection and rapid response, synthesizing research from 1998 – 2010

- ***Geographic criterion*:** Lives in a known donor region (e.g., rivers/lakes adjacent to Great Lakes, western Europe, the Ponto-Caspian region)
- ***Watchlist-specific criteria:***
  1. A transport vector currently exists that could move the species into the Great Lakes
  2. The species is likely to tolerate/survive transport (including in resting stages)
  3. The species has a probability of being introduced multiple times or in large numbers (Propagule pressure)
  4. The species is likely to be able to successfully reproduce in the Great Lakes
  5. The species has been known to invade other areas

http://www.glerl.noaa.gov/res/Programs/glansis/watchlist.html

High Priority 'Watchlist' for Potential New Great Lakes AIS Species

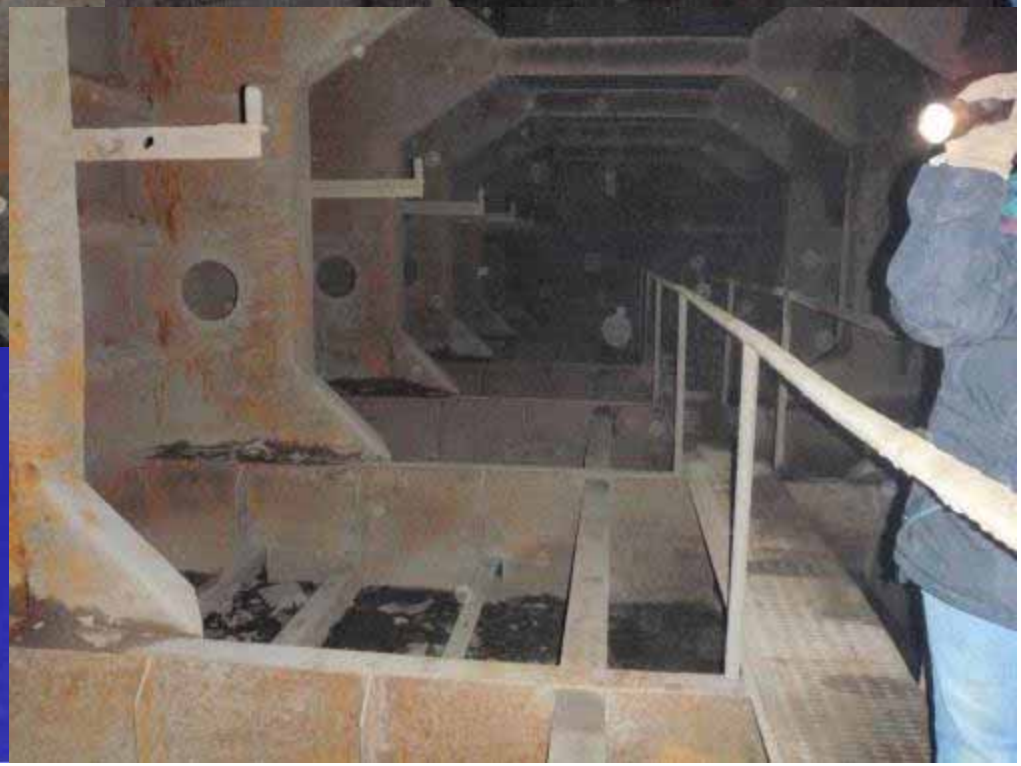
- **Crustaceans: 21 Total**
  - **Amphipods: 8 Species**
  - **Cladocerans: 3 Species**
  - **Copepods: 6 Species**
  - **Mysids: 4 Species**

- **Fishes: 19 Species**
- **Rotifers: 3 Species**
- **Plants: 6 Species**
- **Others: 4 Species**

(Mollusks, Annelids, Flatworms, Bryazoa)

- ***53 total species*** identified in the literature as high risk for invading and becoming established in the Great Lakes: *32 of which may survive exchange*.

Ballast tanks w/ Residual Mud:
Resting stages of some potential AIS may survive transport under harsh conditions such as residing in sediment in ballast tanks.



Species in N. America, but not in Lake Superior... *yet*

- Bloody Red Shrimp *(Hemimysis anomala)*
  - Mysis shrimp now found in all other Great Lakes. Food web impacts predicted.

- 'Cell from Hell' (*Pfiesteria piscicida*)
  - Dinoflagellate microbe found on the Atlantic coast that can cause fish kills.

Ballast Water Regulation History

- 1973 Discharges exempt from regulation under Clean Water Act
- 2005 CA court case determined exemption exceeded authority
- 2008 EPA issued 1st Vessel General Permit (VGP)
- 2009 Ballast Water Collaborative formed
- 2012 US Coast Guard Rule (3/12) & EPA VGP2 (11/12) issued

How Did WI Get Involved?

- Federal action slow; EPA VGP did not cover WI
- WPDES Ballast Water Discharge General Permit
  Issued: 2/1/2010; Modified: 4/1/2011 & 11/29/2012
- More protective than EPA VGP

Clean Water Act Section 401 Certification to VGP2:
WI 401 Cert.

Summary of WI Conditions

- **Ballast Water Exchange** for Salties
- **IMO standards**
- WI's **water quality standards**
- **Emergency treatment measures**
- **Test systems** for **freshwater** use
- **Monthly visual inspection** of systems
- **Report** all **non-compliance**

401 Certification Status:

Contested cases (3 in 1)

- Environmental groups
  - Not stringent enough (0 discharge)
  - Contest WI permit for same reason
- Shipping companies
  - Installation dates too stringent (2012/2014)
  - Stipulation reached (2013/2016)
- 11/29/12 – Summary Judgment decision in DNR's favor on all cases
  - 401 Cert. sent to EPA 11/30
  - Avoided trial

Current Federal Regulations

- 3/2012 – Coast Guard rule
  - International Maritime Organization (IMO) effluent limit standards (technology-based)
  - Requires Coast Guard treatment system type approval
  - Sunsets Ballast Water Exchange
- 3/2013 – EPA VGP2
  - IMO standards (technology-based)
  - Keeps Ballast Water Exchange
- These do not regulate Lakers!

WI Ballast Water Program Origins

3 full-time staff since late 2010

- 2 Inspectors – The only 2 in the Great Lakes States!
- 1 Program Coordinator

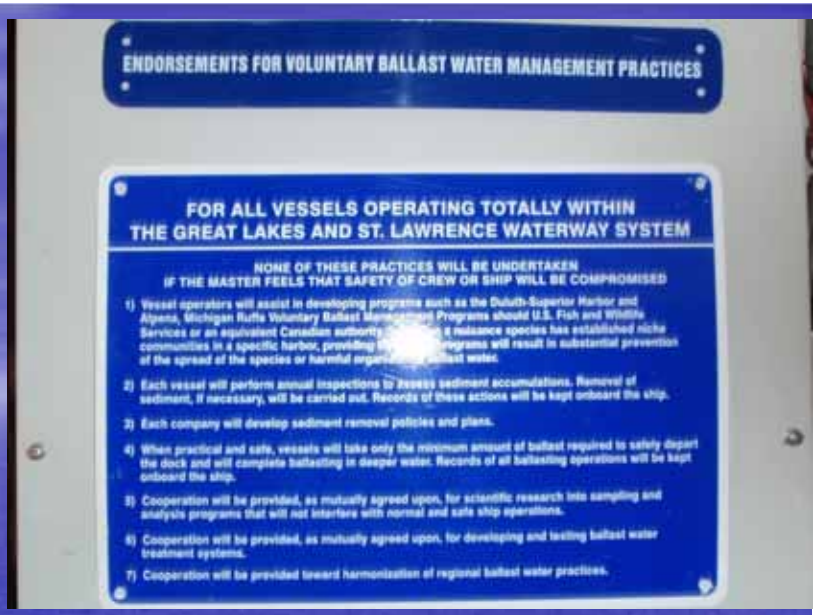
- Issued over 300 permits
- 133 inspections to date

WI Permit Requirements

- Lakers and Salties, or Barges
- > 50 m and > 8 m^3 ballast capacity
- Operating in WI waters

Permit Requirements

- Ballast Water and Sediment Management Plan
  - Disposal requirements
  - Record keeping
- Best management practices (BMPs) for Uptake/discharge
- Ballast Log Book
  - Uptake
  - Discharge
  - Sediment Disposal
  - Treatment (reporting)



Release Date 12-Sept-2006

OMB Control Number 1625-0069
Expiration date: 30-Sept-2006

BALLAST WATER REPORTING FORM

IS THIS AN AMENDED BALLAST REPORTING FORM? YES ☐ NO ☒

1. VESSEL INFORMATION	2. VOYAGE INFORMATION	3. BALLAST WATER USAGE AND CAPACITY
Vessel Name: M/V Frontenac	Arrival Port: Superior, WI	*Specify Units Below (m^3, MT, LT, ST, gal)*
IMO Number: 6804848	Arrival Date (DD/MM/YYYY): 30/09/2011	Total Ballast Water on Board:
Owner: Canada Steamship Lines	Agent: V-Ships Canada	Volume / Units / No. of Tanks in Ballast
Type: GL Bulk Carrier	Last Port: Windsor,ON	13384.0 / LT / 12
GT: 17808	Country of Last Port: Canada	Total Ballast Water Capacity:
Call Sign: VGNB	Next Port: Nanticoke, ON	Volume / Units / Total No. of Tanks on Ship
Flag: Canadian	Country of Next Port: Canada	14560.0 / LT / 14

4. BALLAST WATER MANAGEMENT Total No. Ballast Water Tanks to be discharged: 12

Of tanks to be discharged, how many: Underwent Exchange: 0 Underwent Alternative Management: 0

Please specify alternative method(s) used, if any:

If no ballast treatment conducted, state reason why not: Vessel's trading pattern does not require full ballast exchange.

Ballast management plan on board? YES ☒ NO ☐ Management plan implemented? YES ☒ NO ☐

IMO ballast water guidelines on board [res. A.868(20)]? YES ☒ NO ☐

5. BALLAST WATER HISTORY: Record all tanks to be deballasted in port state of arrival *(enter additional tanks on page 2)*. IF NONE, GO TO #6

Tanks/ Holds (List multiple sources/tanks separately)	BW SOURCE				BW MANAGEMENT PRACTICES						BW DISCHARGE			
	DATE DD/MM/YYYY	PORT or LAT. LONG.	VOLUME (units)	TEMP (units)	DATE DD/MM/YYYY	ENDPOINT LAT. LONG.	VOLUME (units)	% Exch	METHOD (ER/FT/ ALT)	SEA HT. (m)	DATE DD/MM/YYYY	PORT or LAT. LONG.	VOLUME (units)	SALINITY (units)
#1 P&S	28/09/2011	Windsor,ON	1680.0 LT	20.0 C			m3		ER		30/09/2011	Superior, WI	1680.0 LT	1.000 sg
#2 P&S	28/09/2011	Windsor,ON	2230.0 LT	20.0 C			m3		ER		30/09/2011	Superior, WI	2230.0 LT	1.000 sg
#3 P&S	28/09/2011	Windsor,ON	2260.0 LT	20.0 C			m3		ER		30/09/2011	Superior, WI	2260.0 LT	1.000 sg
#4 P&S	28/09/2011	Windsor,ON	2258.0 LT	20.0 C			m3		ER		30/09/2011	Superior, WI	2258.0 LT	1.000 sg
#5 P&S	28/09/2011	Windsor,ON	2256.0 LT	20.0 C			m3		ER		30/09/2011	Superior, WI	2256.0 LT	1.000 sg

Ballast Water Tank Codes: Forepeak = FP, Aftpeak = AP, Double Bottom = DB, Wing = WT, Topside = TS, Cargo Hold = CH, Other = O

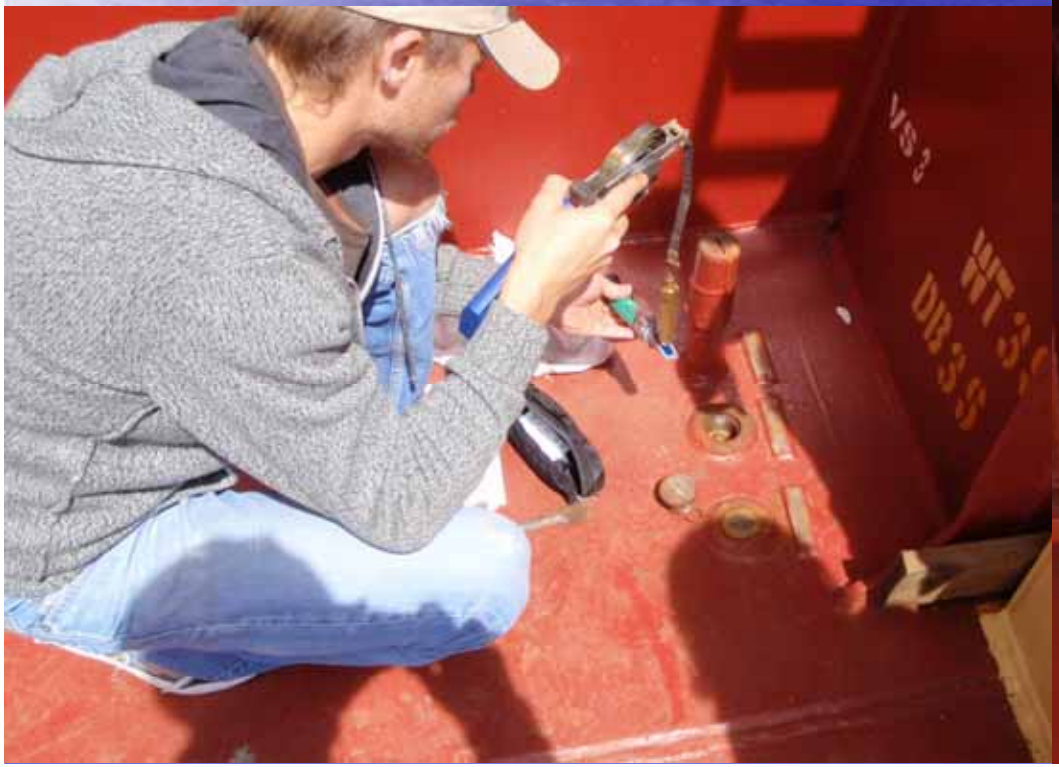
6. RESPONSIBLE OFFICER'S NAME AND TITLE: Oscar Dias Chief Officer

Dept Homeland Security USCG, CG-5662 (06-04)

Ballast trip 33 Superior 11.doc Previous edition may be used

Saltie Permit Requirements

- Mid-ocean Ballast Water Exchange/Flushing
  - Must be > 30 ppt salinity to enter St. Lawrence Seaway
- Treatment system approval
- Biocide discharge limits
- Salinity < 2.7 ppt



Additional Requirements for Salties:

New Ships – 12/2013; Existing Ships – 1/2016

- IMO standards for viable organisms/m^3
  - < 10 for organisms > 50 µm
  - < 10 for organisms 10-50 µm
  - E-coli < 250 cfu/100 ml
    - (beach standard 126 cfu/100 ml)
  - Intestinal enterococci < 100 cfu/100 ml
    - (beach standard is 33 cfu/100 ml)

E. coli

2011 Outreach – Implementing a New Program

- Terminal tenants
- Shipping companies
- Agents
- Press Release

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
FAX 608-267-3579
TTY Access via relay - 711

WISCONSIN DEPT. OF NATURAL RESOURCES

NOTICE TO OWNERS, OPERATORS and AGENTS OF VESSELS OPERATING IN WISCONSIN WATERS, USA:

BALLAST WATER DISCHARGE PERMIT REQUIRED
INSPECTIONS WILL BE CONDUCTED

EFFECTIVE FEBRUARY 1, 2010

Oceangoing vessels and Great Lakes vessels required to obtain the EPA Vessel General Permit (VGP) that operate within waters of the State of Wisconsin, USA, and which have a ballast tank capacity of at least 8 cubic meters and are 50 meters in length or more, shall obtain coverage under Wisconsin Pollution Discharge Elimination System from the Wisconsin Department of Natural Resources at least 30 days prior to entering Wisconsin waters.

To obtain permit coverage, a copy of the EPA VGP notice of intent (NOI) must be submitted to:

Wisconsin Department of Natural Resources
Bureau of Watershed Management – Wastewater Permits Section, WT/3
Attn: Laura Madsen
PO Box 7921
Madison, WI 53707-7921

If you have questions on the permitting process, please contact Laura Madsen at the above address, (608) 264-6285 or Laura.Madsen@wisconsin.gov

You should also be advised that inspections by the Department of Natural Resources will be conducted this shipping season. Inspections may include reviewing: records, sediment management plans, ballast water management plans and ballast log books. **Please let us know who you want us to contact to set up inspections when you are entering Wisconsin ports if is someone other than who is listed as the contact on the EPA VGP NOI**, contact information for the Wisconsin Department of Natural Resources Ballast Water Inspectors is below:

Susan Eichelkraut-**Lake Michigan**
Wisconsin Department of Natural Resources
2300 N DR MLK JR DR
Milwaukee, WI 53212
Susan.Eichelkraut@wisconsin.gov
(414) 263-8682

Cordell Manz-**Lake Superior**
Wisconsin Department of Natural Resources
1701 N 4th St
Superior, WI 54880
Cordell.Manz@wisconsin.gov
(715) 392-0805

For more information on the permit and other ballast water information, please see the following website: http://dnr.wi.gov/org/water/wm/ww/gpindex/gpinfo.htm

dnr.wi.gov
wisconsin.gov

Naturally WISCONSIN

2011-12 Inspections – Scheduling…

- **Logistics in scheduling**
- **Contacts**
  - **Agents**
  - **Shipping companies**
  - **Terminal operator**
- **Where to find updated EAT and EDT**
- **Conducted first inspections in early May, 2011**

2011 - 2012 Inspections

- **2011**: Conducted 59 Total Inspections - 25 different companies
  - 23 Salties (1 cruise ship)
  - 13 US Lakers
  - 16 Canadian Flagged Ships
  - 7 Barges

- **2012**: Conducted 72 inspections , 30 different companies
  - 40 Salties
  - 12 US Lakers
  - 12 Canadian Flagged Ships
  - 8 Barges (U.S. or Can)

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
BALLAST WATER DISCHARGE PERMIT INSPECTION FORM L

1. SHIP NAME _____ 2. FLAG _____

3. IMO NO _____ 4. LAST PORT of CALL _____ 5. NEXT PORT _____

6. PERMITTEE _____ 7. BW MANAGER: _____

8. ARE COPIES OF THE FOLLOWING ON BOARD?

a) WPDES PERMIT:	YES ☐	NO ☐
If no, has an NOI been submitted?	YES ☐	NO ☐
Do they have questions on the permit?	YES ☐	NO ☐
Do they have/need a Minnesota discharge permit?	YES ☐	NO ☐
b) PUBLICATIONS:		
IMO Resolution A 868 (20):	YES ☐	NO ☐
US 33 CFR 151 Subparts C&D–Ballast Water Management for control of NIS in the Great Lakes	YES ☐	NO ☐
70 Federal Register 51831- BW Management for ships entering the Great Lakes declaring NOBOB	YES ☐	NO ☐
c) BALLAST WATER AND SEDIMENT MANAGEMENT PLANS:	YES ☐	NO ☐
Is the BWMP specific to this ship?	YES ☐	NO ☐
Does the BWMP contain operations, maintenance, and safety procedures for vessel & crew?	YES ☐	NO ☐
Does the BWMP prescribe detailed BMPs for BW uptake and discharge?	YES ☐	NO ☐
Does the BWMP contain instructions for ballast tank cleaning and sediment disposal practices?	YES ☐	NO ☐
Do plans prescribe BMPs to avoid hull and anchor fouling?	YES ☐	NO ☐
Do plans contain detailed instructions for submitting BW and DMR reports?	YES ☐	NO ☐
Were plans provided and/or reviewed by: Owner ☐ Manager ☐ Flag-state ☐ Other ☐	YES ☐	NO ☐
Do the BW and SMP designate a person charged with ensuring plans are implemented?	YES ☐	NO ☐
Name(s): _____		
d) BALLAST LOG BOOK, INCLUDING:	YES ☐	NO ☐
Ballast discharge information (dates/times, volumes, start/stop locations):	YES ☐	NO ☐
Ballast uptake information (dates/times, volumes, source locations, harbor):	YES ☐	NO ☐
Sediment records (dates tanks are cleaned, volume removed & disposal site and company info):	YES ☐	NO ☐
Treatment system (dosage rates, holding times, and monitoring records):	YES ☐	NO ☐
Safety exemption records (dates, circumstances, activities suspended):	YES ☐	NO ☐

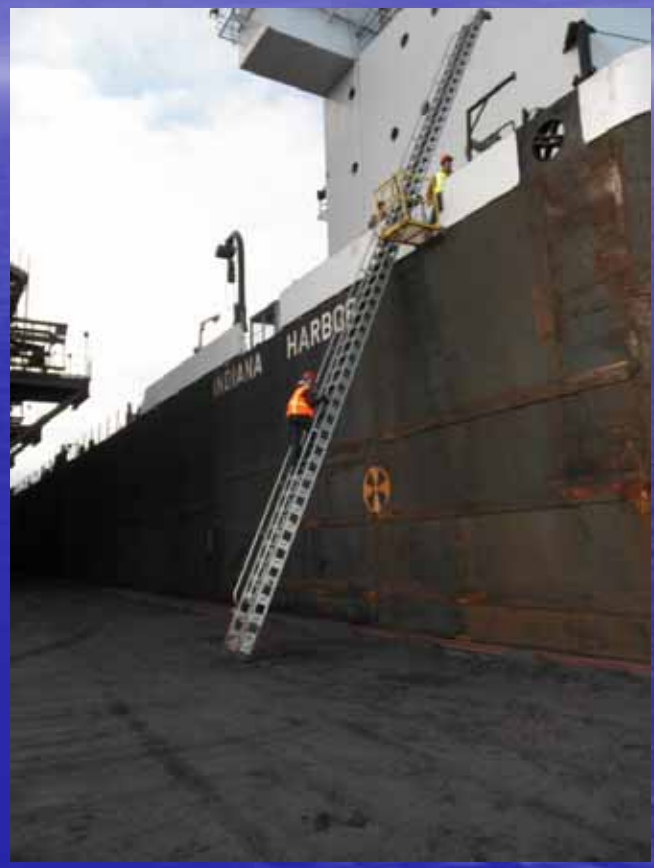
9. SPECIFIC BALLAST INFO: Total Number of Ballast Tanks: _____ BW Capacity: _____
Ship Length: _____ Number of Pumpable Tanks: _____ Number of Unpumpable Tanks: _____
Did the vessel arrive in port, harbor, or at the shipping dock with NOBOB or BOB? NOBOB ☐ BOB ☐
If BOB, a) place/port of origin: _____ b) date of discharge _____
c) location of discharge: _____ d) volume discharged _____

10. SPECIFIC SEDIMENT MANAGEMENT INFO:		
Are records of cleaning and/or sediment disposal available?	YES ☐	NO ☐
Do records indicate when/where ballast tanks were last cleaned with sediment removed ?	YES ☐	NO ☐
Were tanks cleaned in Wisconsin?	YES ☐	NO ☐
If YES, was a DMR submitted to the Department?	YES ☐	NO ☐
11. WERE SEA CHESTS, INTAKE FILTERS OR SCREENS CLEANED?	YES ☐	NO ☐
If yes, are records available?	YES ☐	NO ☐
12. IS A BW TREATMENT SYSTEM ON BOARD VESSEL?	YES ☐	NO ☐
If YES, was the treatments system approved by the Department?	YES ☐	NO ☐
If YES, is there a monitoring plan?	YES ☐	NO ☐
If YES, was a DMR submitted to the Department?	YES ☐	NO ☐
If YES, does treatment system/plan describe items such as dosage rates & holding times?	YES ☐	NO ☐
If NO, are any actions being taken to install or implement BW treatment requirements?	YES ☐	NO ☐

Ballast Water Discharge Permit Inspection Form L, continued on Page 2.

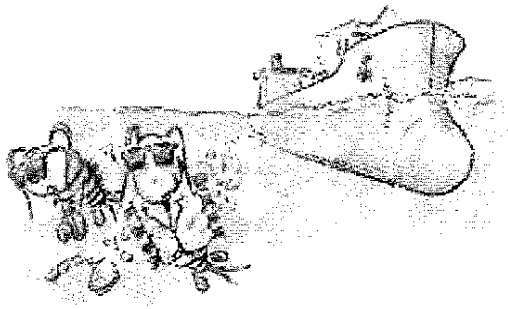
Ballast Water Inspection Reviews

- Ballast water management plans
- Log books
- Sediment records
- Seaway exam report and potential letter of retention compliance
- Look for hull fouling
- Educate crew on AIS, permit and BMPs
- Sample ballast water salinity if discharging



Ballast Water Management Plans

BALLAST WATER MANAGEMENT PLAN AND RECORD BOOK



For compliance with Regulation B-1 of the International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004 and the IMO 'Guidelines for Ballast Water Management and Development of Ballast Water Management Plans' Resolution MEPC 127 (53).

SHIP NAME:

IMO No.

CAUTION: This is not a guide to ballasting. Refer to ship specific manual section of ballasting for more information

Lake Carriers' Association

The Greatest Ships on the Great Lakes

BALLAST WATER MANAGEMENT PLAN©

EFFECTIVE SEPTEMBER 27, 2004

Suite 915 • 614 West Superior Avenue • Cleveland, Ohio 44113-1383
Fax: 216-241-8262 • www.lcaships.com

[redacted]

Ballast Water & Sediment Man. Plan - Contents

Contents

Duties, Training, & Best Management Practices

DUTIES OF THE APPOINTED OFFICER IN CHARGE OF BALLAST WATER MANAGEMENT

- Ensure that ballast water management and/or treatment procedures are followed and recorded
- Where ballast exchange is required, follow the applicable ballast exchange sequence, (BES) or develop a new BES on the basis of vessels assessment criteria, condition of hull, equipment, and weather forecast
- Ensure adequate and enough personnel and equipment are available for the execution of the BES and/or treatment
- Ensure adequate and enough personnel and equipment are available for the execution of the BES and/or treatment
- Ensure that the steps/sequences of the BES are followed in the prepared order
- Maintain the water ballast record book and all other relevant/applicable documentation
- Prepare the appropriate national or port ballast water declaration form prior to arrival at destination
- Assist the port state control or quarantine officers for any sampling that may need to be undertaken
- Undertake familiarization and training of involved crew in ballast water management requirements and applicable shipboard systems and procedures

BWMP Training and Familiarisation Record

Vessel officers and ratings engaged in ballast water were trained in and familiarized with the following:

1. The vessel pumping arrangement including ballast arrangements.
2. The location of air and sounding pipes of ballast tanks.
3. The positions of ballast water suction and pipelines.
4. The overboard discharge arrangements and openings for release of water on deck.
5. Inspection and maintenance for ensuring that sounding pipes are clear and non-return devices and air pipes are
6. The times and circumstances required to undertake the various ballast water exchange operations.
7. The methods for ballast water exchange at sea used, the related safety precautions and associated hazards.
8. The method of on-board ballast water recording keeping, reporting and recording of routine sounding.
9. General knowledge about ballast water management.
10. Information about ballast water management practices.
11. Ballast water exchange and/or treatment systems.
12. General safety consideration.
13. Ballast water record book and records
14. Safety aspects associated with the systems.
15. Precautions for entering tanks for sediment removal.

C/O Liu Chong | 2/O Zhang Bo | 3/O Liu Zi Bin | BSN Lin Hui

4. **Darkness:** Uptake of ballast will be avoided or minimized in shallow waters during hours of darkness, when organisms may rise up in the water column.

5. **Shallow Harbors:** In shallow water harbors where uptake of ballast is required, vessels shall use, if fitted, upper intakes versus lower intakes to reduce the amount of sediment drawn into the vessel's ballast tanks.

6. **Use of Pumps:** Under normal circumstances, ballast water will be pumped into the tanks, rather than run-in by gravity. This will require all water and any potential fish to flow through the high speed pump impeller.

7. **Ballast Minimized:** During cargo discharge operations, only the minimum amount of ballast water shall be taken on to allow for safe navigation and vessel control when departing the port.

8. **Ballast Delayed:** Ballast water intake shall be delayed as long as possible after commencement of cargo discharge operations to allow maximum clearance between the channel/slip bottom and the underside of the ship to minimize sediment uptake. Boom list water transfer, hull stress, and bending moments must be taken into consideration.

9. **After Departure:** As the Master deems necessary, additional ballast water may be taken on after departure from port in waters deep enough to minimize uptake of bottom sediment.

10. **Log Book Entry:** The Master or officer on watch shall affirm by log book entry shortly after departing port that "minimum ballast taken on for safe port departure" and list the forward, aft, and mean drafts. The Master or officer on watch shall also affirm by log book entry shortly after departing port the final ballast condition and list the forward, aft, and mean drafts.

11. **Anchoring:** Anchors and anchor chains will be rinsed during raising to return organisms and sediments to their place of origin.

12. **Safety First:** If, in the Master's professional judgment, any of these actions will jeopardize the safety of the crew or vessel, the proscribed action can be superseded by steps necessary to protect the crew and vessel. In such instance, the Master shall make entry in the vessel's log book and explain the risk and why such action was taken.

13. **Sea Chest Screens:** If the Master believes a ballast water sea chest screen is missing or severely damaged, an inspection should be conducted as soon as practical. A reportable grounding in the vicinity of the sea chest, a known strike of an object in the vicinity of the screen, the observation of excessive solids in ballast water discharge and in the ballast tank, or a combination of these or other reasons could indicate the possibility of a missing or damaged screen.

Ballasting Operation Record Keeping

CODE	ITEM	OPERATION
D	-	**Internal transfer of ballast water**
	1	Date and time of commencement of transfer
	2	Location in Latitude/Longitude or port/facility
	3	Tanks being transferred from
	4	Tanks being transferred to
	5	Estimated volume of transfer in cubic metres
	6	Origin of ballast water
	7	Date and time of completion of transfer
	8	Location in Latitude/Longitude or port/facility
E	-	**Discharge of ballast water to a shore reception facility.**
	1	Date and time of commencement of discharge
	2	Location of discharge (port and facility)
	3	Tanks that were deballasted
	4	Estimated volume of discharge (cubic metres)
	5	Origin of the water discharged
	6	Date and time of completion of discharge
	7	Tanks in which ballast water is still remaining greater than 5% by volume
	8	Volume of ballast water remaining on board
F	-	**Treatment of ballast water**
	1	Date and time of commencement of operation
	2	Estimated volume of circulated/treated water in cubic metres
	3	Method of treatment used
	4	Location in Latitude/Longitude or port/facility
	5	Date and time of completion of the operation
G	-	**Accidental or other exceptional uptake or discharge o ballast water**
	1	Date and time of the occurrence
	2	Position of occurrence (Latitude/Longitude or the port/facility)
	3	Estimated volume of ballast discharged in cubic metre
	4	Tanks affected by the incident
	5	Circumstances and reasons of the uptake, discharge, escape or loss.
	6	Origin of the ballast water escaped/lost.
	7	Volume of ballast water remaining on board in cubic metres.
	8	Tanks in which ballast water is remaining.

NAME OF SHIP: [redacted] IMO NUMBER [redacted]

DATE	ITEM	CODE	RECORD OF OPERATION	SIGN
14/07/12		A	Ballasting of Tanks.	
	1.		14/07/2012 @ 1040 hrs.	
	2.		Hamilton, Canada.	
	3.		3P(844), 3S(847), 4P(765)	
			4S(790), 5P(846), 5S(849)	
			6P(528), 6S(532) m^3	
	4.		9.0 m	
	5.		N/A	
	6.		6024 m^3	
	7		0.998	
	8.		16/07/2012 @ 1150 hrs.	
	9.		Hamilton, Canada.	

Sediment Management Records

SEDIMENT REMOVAL AND TANK FLUSHING LOG

Ballasttank	Date	Sediment Removed	Flushed	Location (Position)
Fore Peak	16/05/09	✓	X	38-12,0'N 036'55,6'W-039'22,7'N040'52,3'W
Deep tank	16/05/09	✓	X	38-12,0'N036'55,6'W 039'22,7'N 040'52,3'W
DB 1 C	16/05/09	✓	X	38'12,0'N 036'55,6'W 039'22,7'N 040'52,3'W
DB 1 PS	16/05/09	✓	X	38'12,0'N 036'55,6'W 039'22,7'N 040'52,3'W
DB1 SB	16/05/09	✓	X	38'12,0'N 036'55,6'W 039'22,7'N 040'52,3'W
ST 1 PS	16/05/09	✓	X	38'12,0'N 036'55,6'W 039'22,7'N 040'52,3'W
ST 1 SB	16/05/09	✓	X	38'12,0'N 036'55,6'W 039'22,7'N 040'52,3'W
DB 2 C	16/05/09	✓	X	38'12,0'N 036'55,6'W 039'22,7'N 040'52,3'W
DB 2 PS	16/05/09	✓	X	38'12,0'N 036'55,6'W 039'22,7'N 040'52,3'W
DB 2 SB	16/05/09	✓	X	38'12,0'N 036'55,6'W 039'22,7'N 040'52,3'W
ST 2 PS	16/05/09	✓	X	38'12,0'N 036'55,6'W 039'22,7'N 040'52,3'W
[illegible]	16/05/09	✓	X	[illegible]

[redacted]

Ballast Water Management Plan

Appendix 1

SEDIMENTS HANDLING LOG

Record of Sediments disposal

Ship..... Port of Registry ..... IMO number.....

TANK LOCATION	DATE	SEDIMENT DISPOSAL (M^3 or tons)	GEOGRAPHIC LOCATION OF SHIP IF RELEASED AT SEA (Lat. & Long.)	PORT OR RECEPTION FACILITIES IF RELEASED ON SHORE	NAME OF OFFICER IN CHARGE	SIGNATURE OF OFFICER IN CHARGE	RANK

BMPs for Biofouling - Plans & Records

	BIOFOULING MANAGEMENT PLAN	Created by:	SQA Dept.
		Approved by:	DPA
		Issue Date:	01/11/2012
	Annex to BWMP	Issue No:	01
		Revision No:	Initial
		Page:	2 of 35
	Doc. Code: BMP-244	Doc. Control	9230000

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CHAIN LOCKER INSPECTION

ITEM NO.	DATE OF INSPECTION	CONDITION	RINSING CONDUCTED (RINSING IS PROHIBITED WITHIN WATER SUBJECT TO VESSEL GENERAL PERMIT)
1.	02.10.2009	GOOD	1300-1600 INSPECTION AND RINSING CONDUCTED
2.	05.12.2009	GOOD	INSPECTION AFTER CHAIN LOCKERS CLEANING AT DRY DOCK
3.	22.02.2010	GOOD	INSPECTION CHAIN LOCKER PS. AND SS
4	24.09.2010	GOOD	CHAIN LOCKER PS - REMOVED ABOUT 0,1 m^3 MUD FROM THE LOCKER
5	08.08.2010	GOOD	RINSING CONDUCTED - PORT SIDE CHAIN LOCKER.
6	06.08.2010	GOOD	CHAIN LOCKER SSIDE - REMOVED ABOUT 0,05 m^3 MUD FROM THE LOCKER
7	14.02.2011	GOOD	0830 - 1200 INSPECTION AND RINSING OF STBD CHAIN LOCKER CONDUCTED
8	01.06.2011	GOOD	CHAIN LOKERS PS AND SB HAS BEEN FILED BY SEAWATER AND PUMP OUT DURING PASSAGE FROM EUROPE TO USA.
9	07-05-2012	GOOD	PORT CHAIN LOCKER INSPECTED. LOOSED OUT CHAIN FROM P.S. LOCKER CLEANED LOCKER & REMOVED OUT SEDIMENTS. COLLECTED 0,1 m^3 OF SEDIMENTS
10	21-05-2012		1400 LST φ=44°20,6'N λ=008°56,9'. REMOVED OVERBOARD A/M 0,1 m^3 CHAIN LOCKER SEDIMENTS
11	24-05-2012	GOOD	STBD CHAIN LOCKER INSPECTED. LOOSED OUT CHAIN FROM STBD LOCKER. CLEANED LOCKER & REMOVED OUT SEDIMENTS. COLLECTED 0,09 m^3 OF SEDIMENTS
12	30-05-2012		1600 LST φ=51°27,9'N λ=014°07,4'W REMOVED OVERBOARD A/M 0,09 m^3 CHAIN LOCKER SEDIMENTS
13	01-06-2012		1000-1400 CHAIN LOCKERS PS & SS. RINSING WITH SEA WATER CARRIED OUT.

MASTER SIGNATURE ..... PAGE NO. 1...

Hull fouling-by Titan Acorn Barnacle, *Megabalanmus coccopoma*

- **Marine organism, can't survive in freshwater**
- **Currently no regulations in U.S/Canada for hull fouling (low risk)**
- **IMO recently approved Guidelines for Biofouling** – Canada may adopt

Inspection Issues

- Vessel not permitted
  - Review shows other ships did not have permit upon arrival
- No copy of permit/updated permit onboard vessel
- Discharge of seawater exceeding chloride limits
- No sediment cleaning/disposal records onboard
  - Some companies discharge sediment in Can. Waters
- BWMP is not specific to the vessel, limited in detail
- Knowledge of WI permit
- Responsibility
- Knowledge of ballast water management plans
- Overall – good compliance and knowledge
- Follow-up letter for all inspections

Current Research

A.J. Reed, J.B. Welch, and R.E. Hicks
Department of Biology

Microbial Diversity of Ship Ballast Water Transported to the Duluth-Superior Harbor

Project Goals:

- Describe the composition of the bacterial communities in the ballast water of ships and the Duluth-Superior Harbor
- Compare the bacterial communities in seawater and freshwater ballast from variety of source ports

UNIVERSITY OF MINNESOTA DULUTH

Current Research

C. Sloan, A.J. Reed, and R.E. Hicks
Department of Biology

Identification of Antibiotic and Heavy Metal Resistant Genes from Commercial Ship Ballast Water Discharged into the Duluth-Superior Harbor

Project Goals:

- Characterize the antibiotic and heavy metal resistance of bacteria discharged with the ballast water of commercial ships into the Duluth-Superior Harbor.

Sampling Methods

- Ships are identified only by source port and month of entry in the Duluth-Superior Harbor
- Ballast water samples collected when possible by siphon through sounding tube or directly from ballast tanks, pumps/stripping pumps

Sounding tubes

Siphoning ballast water

<u>2011</u>:

- 16 samples
- from 15 ships
- 9 Lakers
- 1 Salty-SW
- 6 Salties-FW

<u>2012</u>:

- 9 samples
- from 7 ships
- 3 Lakers
- 1 Salty-SW
- 5 Salties-FW


B TK 2

Summary: 2011-12 Shipping Seasons

- >920 Vessel Visits to Superior-Duluth 2011 and 2012 year
- ~140 different vessels, ~40 different shipping companies
- ~460 Vessel Visits to WI Lake Michigan Ports
- 2011: Inspected 59 ships from 25 Companies
- 2012: Inspected 72 ships from 30 Companies

With 2012…

- >300 vessels permitted
- Inspected 124 different ships (7 twice)
- 40 Different Companies

Future Plans

- Continue inspections:
  - Prioritize ships and companies not inspected in 2011-2012
  - Goal to inspect 25% of the ocean going and laker vessels that visit WI ports during the shipping season.
- Expand knowledge of treatment systems: inspect systems and monitoring records
- Continue to educate crew members on AIS and BMPs (Guidance) & public outreach (Presentations/Brochures)
- Continue to assist/facilitate ballast sampling for research

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