

# SOUTHERN ENVIRONMENTAL LAW CENTER

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October 20, 2009

Jeffrey Lape  
Director, Chesapeake Bay Program  
U.S. EPA  
410 Severn Avenue, Suite 109  
Annapolis, MD 21403

via email

Jon M. Capacasa  
Director, Water Protection Division

via email

John Pomponio  
Director, Environmental Assessment and Innovation Division  
U.S. EPA Region 3  
1650 Arch Street (3PM52)  
Philadelphia, PA 19103-2029

via email

**RE:** Omega Protein Discharge Relevant to Chesapeake Bay TMDL and Bay Restoration Efforts

Gentlemen:

The Southern Environmental Law Center (“SELC”) is very involved in a number of local, state, and federal efforts focused on restoring the Chesapeake Bay, including the Environmental Protection Agency’s (“EPA”) current effort to develop Bay-wide Total Maximum Daily Loads (“TMDLs”). We are writing to inform EPA of a potentially significant discharge of pollution to the Bay that we believe has not been accounted for in the models and analysis underlying the Bay TMDLs.

Omega Protein Corporation’s (“Omega”) menhaden processing facility in Reedville, Virginia appears to be discharging a significant volume of unreported, nutrient-rich “bail or bailing water” to the middle of the Chesapeake Bay on a routine, even daily, basis during the fishing season of May through December. Based on a conservative estimate of the volume and organic strength of bailing water produced at the Reedville facility, we believe that Omega’s bailing water discharge could be roughly comparable to the organic load discharged from Washington D.C.’s Blue Plains Advanced Wastewater Treatment Plant. Omega’s discharge could, therefore, be having a significant impact on the oxygen depleted zones of the Bay and is a discharge that EPA must account for in the Bay TMDL, if has not done so already.

Omega is the nation’s leading producer of fish meal products and Omega-3 fish oil. It owns and operates four menhaden processing plants, three of which process menhaden Omega harvests from the Gulf of Mexico. Omega’s fourth processing plant is located in Reedville,

Virginia and is the largest commercial fishing operation on the Chesapeake Bay. According to the Atlantic States Marine Fisheries Commission, Omega's annual harvest of menhaden from the Chesapeake Bay has been capped at about 109,000 metric tons, or 250 million pounds, per year. Additional catches in the Atlantic Ocean reportedly brought that figure to over 400 million pounds processed at the Reedville facility in 2007.

The Reedville facility's fleet of 10 fishing vessels operates throughout the menhaden fishing season, which generally falls between May and December each year. Once they reach the fishing grounds and begin to pull nets full of menhaden on board, the vessels take on water from the Bay, cool it with their refrigeration systems, and circulate it through their fish holds, to keep the freshly caught fish cold. Before returning to the Reedville dock to unload their catch, the vessels discharge most of this "refrigeration water" back into the Bay—as much as the vessel's pump system will allow. Refrigeration water contains fish blood and waste, and sometimes pieces of fish, and leaves a reddish trail when discharged into the Bay.

The vessels then proceed to the unloading dock, where they unload their catch by "bailing" the fish from the vessel to processing equipment on shore. This process begins by adding fresh well water to the fish hold, where it mixes with the fish and small amount of remaining refrigeration water. This mixture of fish and bail water can then be pumped off the vessel through large hoses to equipment on shore where the fish and water are separated. The bail water is then recycled back into the fish hold and reused until it is too thick to facilitate the pumping process, at which point the "spent" bail water is sent to a temporary storage tank at the Reedville facility. More fresh well water is added to the fish hold and the bailing process continues until all the fish are unloaded.

Spent bail water from the temporary storage tank is then pumped back onto the fishing vessels for the vessels to dispose of in the Bay on their way back out to the fishing grounds. Unlike refrigeration water, bail water is brown, thick, and extremely pungent. It also leaves a visible trail when discharged behind a vessel. Each time a fishing vessel hauls bail water, the crew must clean the fish hold to rinse out fish parts and oil residue. This takes time away from fishing. Omega, therefore, pays the crew a bonus for each load of bail water they haul. To keep track of the bonuses it must pay, Omega collects "wash water tickets" each week. These tickets only document the name of the vessel, the dates it hauled a load of bail water, and whether the chief engineer and second engineer were on board. They provide no information about the volume or organic strength of the bail water discharged.

On Fridays, when no fishing vessels are heading out to the fishing grounds, Omega sends the day's spent bail water to Tank 40, which is where Omega stores various wastewaters from the processing plant that it collectively characterizes as "fish waste" and disposes of in the Atlantic Ocean. The Reedville facility uses one water boat, the Gulf Island, to haul and dispose of this Tank 40 "fish waste" in the Atlantic.

Because the volume of spent bail water generated each day depends on a number of factors, including how many fish have been caught and how hot it is that day,<sup>1</sup> it is not possible

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<sup>1</sup> Fish decay faster in hot weather, which causes bail water to become thicker faster.

to accurately predict the volume of bail water discharged based on the number of loads recorded by the wash water tickets. However, based on the company's representations, a conservative estimate of a single release of bail water is 25,000 gallons. Further, it appears that Omega is relying on its fishing vessels to dispose of the vast majority of spent bail water it generates at the Reedville facility, using each of its ten fishing vessels to haul an estimated 4-6 loads of bail water per month. Thus, these vessels are discharging 40-60 loads of bail water directly into the Bay each month during the fishing season. A handful of company samples taken in 1996 and 2007 determined that the biological strength of bail water from the Reedville facility ranged from 70,000 to over 150,000 mg/L BOD<sub>5</sub>, though an environmental consultant to the company estimated the typical BOD<sub>5</sub> value of bail water from August 2008 was 37,500 mg/L (compare to 6 mg/L BOD<sub>5</sub> for advanced sewage treatment plants, 30 mg/L for regular sewage treatment plants, or about 200 mg/L for raw sewage). Thus, it appears that each month of the fishing season, the company is discharging about 50 loads of wastewater, about 25,000 gallons each, ranging from 37,500 to 150,000 mg/L BOD<sub>5</sub>, to the middle of the Bay.<sup>2</sup> We have no data on the strength of bail water discharged to the Bay this year.

Omega's Virginia Pollutant Discharge Elimination System (VPDES) permit apparently authorizes it to discharge refrigeration water to the Bay. The permit says nothing about bailing water. Though the VPDES permit does not assign refrigeration water an outfall designation, one of the "Other Requirements and Special Conditions" mandates that Omega transport its refrigeration water to a particular part of the Chesapeake Bay and satisfy the following requirements: (1) the pH of the effluent must be between 6 and 9 S.U.; (2) the discharge must be made only east of a certain point and only while the vessel is underway and at such a rate that the visibility of the discharge plume is minimized; (3) Omega must maintain a vessel discharge log that it must make available to the Virginia Department of Environmental Quality ("DEQ") upon request; and (4) Omega must sample a designated area of the Bay before and after each discharge to monitor for certain parameters, including Ph and BOD<sub>5</sub>, and submit that data to DEQ with its DMRs each month. VPDES Permit No. VA0003867 (2005) at pages 11-12 of 23.

It is not clear when the requirements regarding refrigeration water were included in Omega's VPDES permit. Omega's 2003 (?) permit renewal application for its current five year permit mentions nothing about refrigeration water. Additionally, neither Omega's application nor its current VPDES permit mention anything with respect to Omega's discharge of bail water or bailing water.

Omega submits "Chesapeake Bay Water Quality Monitoring Data" reports to DEQ each month that suggest Omega is monitoring the Bay before and after its refrigeration water discharges. In contrast, as far as we can tell, Omega is not monitoring, logging, or otherwise

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<sup>2</sup> Omega's estimated discharge volume of 50 loads of 25,000 gallons each translates to 1,250,000 gallons per month or 0.0417 MGD of bail water. This volume, multiplied by the concentration range of 37,500 - 150,000 mg/L BOD<sub>5</sub> and a factor of 8.34 (to convert mg/L to lb/day) equals a discharge of between 13,042 - 52,166 lbs/day during May - December. Compare this discharge to the Blue Plains discharge some miles upstream of the Bay of up to 370 MGD, which when multiplied by its average concentration of 5 mg/L CBOD<sub>5</sub>, or 6 mg/L BOD<sub>5</sub>, and the 8.34 conversion factor, translates to 18,515 lbs/day throughout the year.

keeping track of the volume, biological strength, or water quality impact of any of the bail water it disposes of in the Bay.

In 1992, EPA Region 6 sent Omega's then-parent company, Zapata Haynie Corporation, a letter determining that the Company's bailing water was not subject to the permit requirements of the Marine Protection, Research and Sanctuaries Act ("MPRSA") because it fell within the exclusion for "fish waste," 33 U.S.C. § 1412(d), so long as the company discharged the "fish waste" in international waters more than 3 miles offshore. Letter from Myron Knudson, Director, U.S. EPA Region 6 Water Management Division, to Edward Swindell, Vice President, Operations, Zapata Haynie Corporation (Oct. 22, 1992) (copy attached). As a condition of the exemption from the requirement to obtain a MPRSA permit; however, the letter requires the Company to maintain a logbook "on each vessel, specifying loading dates and times, volumes of waste, discharge volume and location, and the vessel's speed."

Omega's fishing vessels from its processing facilities in EPA's Region 6 operate in the Gulf of Mexico, an ocean water governed by MPRSA outside the 3-mile territorial sea. In contrast, Omega's fishing vessels from the Reedville facility operate primarily in the Bay, an internal water not within MPRSA jurisdiction. Even though the Reedville facility transports some of its wastewater, occasionally including spent bail water, to the Atlantic using the Gulf Island, it may be operating under the assumption that the EPA Region 6 letter authorizes the discharge of bail water to the Bay under the MPRSA's "fish waste" exclusion. This would be incorrect, as the Clean Water Act governs discharges to the Bay, not the MPRSA.<sup>3</sup>

The fact that Omega's Reedville facility is apparently discharging significant amounts of bail water to the Bay without reporting this discharge to DEQ or EPA raises serious concern for the development and implementation of the Bay TMDLs. As the conservative estimates of the volume and biological strength discussed above suggest, this discharge could be contributing significantly to the nutrient and dissolved oxygen problems facing the Bay, even taking dilution factors into account. We ask that EPA act expeditiously to do what is within its power to clarify the matter and to ensure that Omega's discharge of bail water, and its impact on water quality in the Bay, is accounted for in the Bay TMDL development process that is already well under way.

Additionally, Omega's current VPDES permit expires on December 1, 2010. We believe the company has already applied for its permit renewal. How Omega's Reedville facility treats and discharges its bailing water should, therefore, be fully addressed and clarified as part of that permit renewal process.

We recognize that Omega has made substantial investments in the past 2-3 years to upgrade the environmental performance of its Reedville processing plant, and that its practice of discharging bailing water to the mid-Bay waters is a custom reaching back 30 years or more. However, it is incumbent upon EPA, in conjunction with Virginia DEQ and Omega Protein, to determine exactly what is being discharged where, to determine the nature and extent of the

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<sup>3</sup> Further, regardless of whether the Gulf Island's discharge is composed entirely of "fish waste", it appears from a plotting of a portion of the Gulf Island's 2007 discharge log entries that its discharges are not always in compliance with the MPRSA requirement that they be at least 3 miles offshore. See attached map and printed version of handwritten log entries.

ecological impact of those discharges, and to determine whether those discharges are already incorporated in the relevant TMDL-based water quality restoration models for pertinent segments of the Bay.

We urge EPA to take the following steps to evaluate this situation and determine the ecological significance of Omega's ongoing disposal practices:

- request the company provide detailed information about exactly what it is discharging and where;
- determine whether that information has been incorporated into the Bay TMDL models to the extent applicable;
- if discharge data and analyses have not been included in Bay TMDLs to the extent applicable, determine whether and to what extent the discharges affect water quality in the Bay;
- work with DEQ to clarify what is allowed to be discharged directly to the Bay under the state-issued VPDES permit, including essential clarification of terminology for various waste streams;
- assist DEQ in revising and reissuing Omega's VPDES permit for discharges from the Reedville facility and from the fishing vessels in the Bay, including record-keeping and monitoring requirements;
- clarify what waste streams can be discharged into the ocean under exemptions to the MPRSA, and clarify where those discharges must occur, what kind of record-keeping or log entries the company must maintain, and how EPA will oversee those discharges; and
- work with the company to reduce discharges to the Bay.

Thank you for taking the time to review this matter. Please let me know if you have questions or if I can provide you with any additional information.

Sincerely,



Richard A. Parrish  
Senior Attorney

cc via email: Ellen Gilinsky, Director, VDEQ Water Division  
Denise Mosca, VDEQ NPDES Permits  
Chuck Fox, EPA Special Assistant for Chesapeake Bay



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6  
1445 ROSS AVENUE, SUITE 1200  
DALLAS, TX 75202-2733

OCT 22 1992

REPLY TO: 6W-QM

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Mr. Edward W. Swindell  
Vice President, Operations  
Zapata Haynie Corporation  
1514 Martens Dr.  
Hammond, LA 70401

Dear Mr. Swindell:

We have reviewed the information you provided in response to our September 3, 1992 request, and we have determined that the bailing water from Zapata Haynie Corporation's vessels is excluded from the permit requirements of the ocean dumping regulations under 40 CFR, Section 220.1(c). Your disposal materials fall within the exclusion of that section and 33 U.S.C. Section 1412(d) [Section 102(d) of the Marine Protection, Research and Sanctuaries Act (the "Act")]. Under the authority of said statute and regulation, EPA may specify areas where dumping is not allowed. These areas are:

1. harbors or other protected or enclosed coastal waters;
2. the territorial seas;
3. navigation channels; and
4. water less than four (4) fathoms deep or greater than eight (8) fathoms deep. This depth restriction will prevent dumping at the more shallow fishing banks and the areas most likely to experience hypoxic conditions. It will also assure no dumping within the territorial seas, allow convenient transportation in the safety fairway off the Calcasieu Pass and Freshwater Bayou Channel, and allow ample area for discharging while underway.

All discharges shall occur while the discharging vessel is underway at a speed of at least five (5) knots.

No Ocean Dumping Permit will be required at this time, provided that you, your employees, agents, and all parties contracting with you comply with the above listed terms and conditions.

In addition, a log book will be maintained on each vessel, specifying loading dates and times, volumes of waste, discharge volume and location, and the vessel's speed.

This letter serves to notify you that, based on the information you have supplied to EPA , you need not submit an application pursuant to the Act if you comply with the restrictions listed above. You must also comply with U.S. Coast Guard, State of Louisiana, and other applicable legal requirements. In the event that subsequent information indicates that the discharges may endanger health, the environment, or ecological systems, applicability of the exclusion from the permit requirements will be reconsidered.

Sincerely yours,

~~Myron Knudson, P.E.~~

~~Director~~

~~Water Management Division (6W)~~

~~cc: Mr. John Jett (Zapata Haynie)~~

# Gulf Island Wastewater Discharges Locations

CHESAPEAKE BAY







Chesapeake Bay Bridge

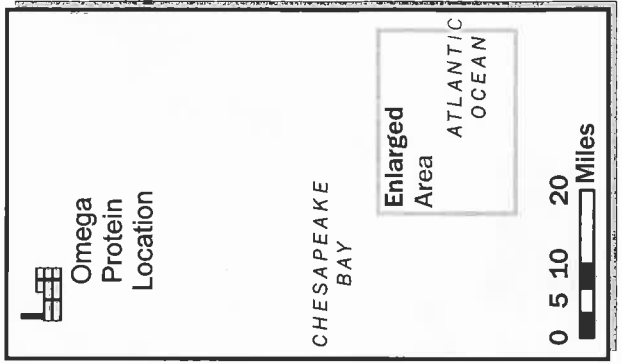
Chesapeake Bay Tunnel

3 Nautical Mile Line

77 out of 117 discharges occurred within 3 nautical miles of the shoreline

## Legend

-  Omega Protein Location
-  Inside 3 Nautical Miles
-  Outside 3 Nautical Miles
-  3 Nautical Mile Line
-  Chesapeake Bay Bridge
-  Chesapeake Bay Tunnel



Omega Protein Location

CHESAPEAKE BAY

Enlarged Area

ATLANTIC OCEAN

0 5 10 20 Miles

ATLANTIC OCEAN

Map created on October 13, 2009



0 0.5 1 2 3 4 5 Nautical Miles



Loading Date	Loading Time	Volume	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Discharge Date	Vessel Speed (mph)	Water Depth (ft.)	Heading (Degrees)	Location
1/2/2007	9am-2pm	121,000	37.01	-75.91	1/3/2007	11	40	130	Inside 3 Mile Zone
1/8/2007	9am-2pm	122,400	37.01	-75.91	1/9/2007	11	40	130	Inside 3 Mile Zone
1/9/2007	10am-3pm	116,000	37.01	-75.91	1/10/2007	11	40	130	Inside 3 Mile Zone
1/23/2007	10am-3pm	120,300	37.01	-75.91	1/24/2007	11	40	130	Inside 3 Mile Zone
1/24/2007	9am-2pm	116,000	37.01	-75.91	1/25/2007	11	40	130	Inside 3 Mile Zone
2/20/2007	8am-1pm	122,400	37.02	-75.76	2/21/2007	11	40	130	Outside 3 Mile Zone
3/7/2007	9am-2pm	122,400	37.02	-75.84	3/8/2007	11	40	130	Outside 3 Mile Zone
3/8/2007	8am-1pm	122,400	37.03	-75.98	3/9/2007	11	40	130	Inside 3 Mile Zone
3/19/2007	10am-2pm	120,200	37.01	-75.91	3/20/2007	11	40	130	Inside 3 Mile Zone
3/20/2007	9am-2pm	122,400	37.00	-75.91	3/21/2007	11	40	130	Inside 3 Mile Zone
4/3/2007	9am-2pm	121,200	37.02	-75.91	4/4/2007	11	40	130	Inside 3 Mile Zone
4/4/2007	9am-2pm	122,400	37.02	-75.91	4/5/2007	11	40	130	Inside 3 Mile Zone
4/18/2007	10am-3pm	120,800	37.02	-75.90	4/19/2007	11	40	130	Inside 3 Mile Zone
4/19/2007	9am-2pm	110,400	37.02	-75.90	4/20/2007	11	40	130	Outside 3 Mile Zone
4/26/2007	9am-2pm	110,400	37.01	-75.91	4/27/2007	11	40	130	Inside 3 Mile Zone
4/30/2007	8am-1pm	121,200	37.02	-75.76	5/1/2007	11	40	130	Outside 3 Mile Zone
5/1/2007	9am-2pm	111,400	37.01	-75.91	5/2/2007	11	40	130	Inside 3 Mile Zone
5/7/2007	8am-1pm	119,400	37.01	-75.91	5/8/2007	11	40	130	Inside 3 Mile Zone
5/8/2007	9am-2pm	120,300	37.03	-75.98	5/9/2007	11	40	130	Inside 3 Mile Zone
5/10/2007	9am-2pm	119,000	37.01	-75.91	5/11/2007	11	40	130	Inside 3 Mile Zone
5/16/2007	9am-2pm	118,000	37.01	-75.91	5/17/2007	11	40	130	Inside 3 Mile Zone
5/17/2007	9am-2pm	121,000	37.02	-75.84	5/18/2007	11	40	130	Outside 3 Mile Zone
5/21/2007	10am-3pm	121,600	37.00	-75.91	5/22/2007	11	40	130	Inside 3 Mile Zone
5/24/2007	9am-2pm	120,400	37.00	-75.89	5/25/2007	10	39	130	Outside 3 Mile Zone
5/25/2007	9am-1pm	90,000	37.01	-75.90	5/26/2007	11	40	130	Outside 3 Mile Zone
5/28/2007	8am-1pm	121,300	37.02	-75.96	5/29/2007	11	40	130	Inside 3 Mile Zone
5/29/2007	9am-2pm	121,600	37.00	-75.91	5/30/2007	11	39	128	Outside 3 Mile Zone
6/1/2007	8am-1pm	122,000	37.00	-75.90	6/2/2007	11	40	130	Outside 3 Mile Zone
6/4/2007	8am-2pm	121,300	37.01	-75.91	6/5/2007	11	40	140	Inside 3 Mile Zone
6/6/2007	8am-1pm	120,600	37.02	-75.92	6/7/2007	11	39	136	Inside 3 Mile Zone
6/8/2007	9am-1pm	100,000	37.01	-75.91	6/9/2007	11	40	135	Inside 3 Mile Zone
6/9/2007	9am-2pm	119,000	37.01	-75.91	6/10/2007	14	40	136	Inside 3 Mile Zone
6/11/2007	8am-1pm	121,400	37.07	-75.95	6/12/2007	11	40	125	Inside 3 Mile Zone
6/12/2007	8am-2pm	80,000	37.01	-75.90	6/13/2007	11	40	130	Outside 3 Mile Zone
6/14/2007	9am-2pm	110,000	37.01	-75.92	6/15/2007	11	38	128	Inside 3 Mile Zone
6/15/2007	9am-2pm	90,000	37.01	-75.91	6/16/2007	11	40	135	Inside 3 Mile Zone
6/16/2007	8am-1pm	85,000	37.01	-75.91	6/17/2007	11	40	130	Inside 3 Mile Zone
6/18/2007	10am-2pm	122,000	37.02	-75.90	6/19/2007	11	40	129	Inside 3 Mile Zone
6/19/2007	8am-1pm	122,300	37.01	-75.91	6/20/2007	11	40	130	Inside 3 Mile Zone
6/20/2007	8am-2pm	60,000	37.01	-75.91	6/21/2007	11	39	133	Inside 3 Mile Zone
6/21/2007	8am-3pm	65,000	37.01	-75.91	6/22/2007	11	40	130	Inside 3 Mile Zone
6/22/2007	8am-2pm	70,000	37.01	-75.91	6/23/2007	11	40	130	Inside 3 Mile Zone
6/23/2007	9am-2pm	80,000	37.01	-75.91	6/29/2007	11	40	128	Inside 3 Mile Zone
6/25/2007	8am-2pm	122,400	37.01	-75.91	6/26/2007	11	40	130	Inside 3 Mile Zone
6/26/2007	8am-1pm	121,300	37.01	-75.91	6/27/2007	11	35	135	Inside 3 Mile Zone
6/29/2007	5 hrs	122,450	37.01	-75.91	6/30/2007	11	30	130	Inside 3 Mile Zone

Loading Date	Loading Time	Volume	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Discharge Date	Vessel Speed (mph)	Water Depth (ft.)	Heading (Degrees)	Location
6/30/2007	5 hrs	121,500	37.02	-75.84	7/1/2007	0	30	128	Outside 3 Mile Zone
7/2/2007	5 hrs	120,900	37.02	-75.76	7/3/2007	11	29	129	Outside 3 Mile Zone
7/5/2007	6 hrs	120,300	37.01	-75.91	7/6/2007	11	30	130	Inside 3 Mile Zone
7/6/2007	6 hrs	121,100	37.01	-75.91	7/7/2007	11	30	129	Inside 3 Mile Zone
7/9/2007	5 hrs	122,000	37.01	-75.91	7/10/2007	11	30	130	Inside 3 Mile Zone
7/10/2007	6 hrs	121,300	37.01	-75.89	7/11/2007	11	32	120	Outside 3 Mile Zone
7/12/2007	5 hrs	120,400	37.02	-75.90	7/13/2007	11	21	125	Inside 3 Mile Zone
7/14/2007	5 hrs	121,600	37.02	-75.90	7/15/2007	11	30	129	Outside 3 Mile Zone
7/16/2007	5 hrs	122,000	37.02	-75.91	7/17/2007	11	30	125	Inside 3 Mile Zone
7/17/2007	5 hrs	121,300	37.01	-75.98	7/18/2007	11	30	130	Inside 3 Mile Zone
7/19/2007	5 hrs	120,000	37.02	-75.91	7/20/2007	11	29	130	Inside 3 Mile Zone
7/23/2007	6:30:00 AM	122,000	37.02	-75.90	7/24/2007	11	30	130	Outside 3 Mile Zone
7/26/2007	1:00:00 PM	123,000	37.02	-75.91	7/27/2007	11	30	128	Inside 3 Mile Zone
7/30/2007	9:00:00 AM	122,400	37.02	-75.91	7/31/2007	11	29	130	Inside 3 Mile Zone
7/31/2007	7:00:00 AM	121,600	37.01	-75.91	8/1/2008	11	26	130	Inside 3 Mile Zone
8/1/2007	5:00:00 AM	120,400	37.01	-75.91	8/2/2007	11	32	130	Inside 3 Mile Zone
8/3/2007	5:00:00 AM	120,800	37.01	-75.91	8/4/2007	11	31	128	Inside 3 Mile Zone
8/4/2007	6:00:00 AM	121,000	37.01	-75.91	8/5/2007	11	32	130	Inside 3 Mile Zone
8/5/2007	5:00:00 AM	122,000	37.01	-75.91	8/6/2007	11	31	130	Inside 3 Mile Zone
8/6/2007	5:00:00 AM	121,600	37.01	-75.90	8/7/2007	11	32	130	Inside 3 Mile Zone
8/7/2007	5:00:00 AM	120,400	37.01	-75.90	8/8/2007	11	31	127	Outside 3 Mile Zone
8/9/2007	5:00:00 AM	121,800	37.01	-75.90	8/10/2007	11	32	130	Outside 3 Mile Zone
8/10/2007	5:00:00 AM	121,100	37.01	-75.90	8/11/2007	11	32	130	Outside 3 Mile Zone
8/11/2007	5:00:00 AM	121,200	37.01	-75.90	8/12/2007	11	31	128	Outside 3 Mile Zone
8/12/2007	5:00:00 AM	121,100	37.01	-75.88	8/13/2007	11	32	130	Outside 3 Mile Zone
8/13/2007	5:00:00 AM	120,800	37.01	-75.91	8/14/2007	11	32	132	Inside 3 Mile Zone
8/14/2007	5:00:00 AM	121,400	37.01	-75.91	8/15/2007	11	31	128	Inside 3 Mile Zone
8/15/2007	5:00:00 AM	120,600	37.01	-75.91	8/16/2007	11	31	130	Inside 3 Mile Zone
8/16/2007	3:00:00 AM	60,000	37.01	-75.90	8/17/2007	11	32	129	Outside 3 Mile Zone
8/17/2007	6:00:00 AM	122,200	37.01	-75.88	8/18/2007	11	31	130	Outside 3 Mile Zone
8/18/2007	6:00:00 AM	121,300	37.01	-75.88	8/19/2007	11	31	130	Outside 3 Mile Zone
8/19/2007	6:00:00 AM	121,300	37.02	-75.90	8/20/2007	11	31	129	Outside 3 Mile Zone
8/20/2007	5:00:00 AM	123,100	37.01	-75.91	8/21/2007	11	31	130	Inside 3 Mile Zone
8/21/2007		-	37.01	-75.90	8/22/2007	11	32	130	Outside 3 Mile Zone
8/22/2007		-	37.01	-75.91	8/23/2007	11	32	132	Inside 3 Mile Zone
8/23/2007		-	37.01	-75.90	8/24/2007	11	32	130	Outside 3 Mile Zone
8/24/2007		-	37.01	-75.91	8/25/2007	11	32	131	Inside 3 Mile Zone
8/25/2007		-	37.01	-75.88	8/26/2007	11	32	132	Outside 3 Mile Zone
8/27/2007		-	37.01	-75.91	8/28/2007	11	32	128	Inside 3 Mile Zone
8/28/2007		-	37.01	-75.91	8/29/2007	11	32	131	Inside 3 Mile Zone
8/29/2007		-	37.01	-75.91	8/30/2007	11	32	130	Inside 3 Mile Zone
8/30/2007		-	37.01	-75.90	8/31/2007	11	32	129	Outside 3 Mile Zone
8/31/2007		-	37.01	-75.88	9/1/2007	11	32	131	Outside 3 Mile Zone
9/1/2007		-	37.01	-75.91	9/2/2007	11	32	130	Inside 3 Mile Zone
9/2/2007		-	37.01	-75.91	9/3/2007	11	32	128	Inside 3 Mile Zone
9/4/2007		-	37.11	-75.90	9/5/2007	11	32	130	Inside 3 Mile Zone

Loading Date	Loading Time	Volume	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Discharge Date	Vessel Speed (mph)	Water Depth (ft.)	Heading (Degrees)	Location
9/5/2007		-	37.01	-75.90	9/6/2007	11	32	129	Outside 3 Mile Zone
9/6/2007		-	37.01	-75.90	9/7/2007	11	32	130	Outside 3 Mile Zone
9/7/2007		-	37.01	-75.91	9/8/2007	11	32	131	Inside 3 Mile Zone
9/8/2007		-	37.02	-75.90	9/9/2007	11	32	125	Inside 3 Mile Zone
9/9/2007		-	37.01	-75.91	9/10/2007	11	32	128	Inside 3 Mile Zone
9/10/2007		-	37.01	-75.91	9/11/2007	11	32	130	Inside 3 Mile Zone
9/11/2007		-	37.01	-75.91	9/12/2007	11	32	131	Inside 3 Mile Zone
9/12/2007		-	37.01	-75.91	9/13/2007	11	32	130	Inside 3 Mile Zone
9/13/2007		-	37.02	-75.90	9/14/2007	11	32	132	Outside 3 Mile Zone
9/14/2007		-	37.02	-75.84	9/15/2007	11	32	128	Outside 3 Mile Zone
9/15/2007		-	37.01	-75.91	9/16/2007	11	32	130	Inside 3 Mile Zone
9/16/2007		-	37.01	-75.91	9/17/2007	11	32	128	Inside 3 Mile Zone
9/17/2007		-	37.02	-75.90	9/18/2007	11	32	128	Inside 3 Mile Zone
9/18/2007		-	37.01	-75.91	9/19/2007	11	32	120	Inside 3 Mile Zone
9/19/2007		-	37.01	-75.90	9/20/2007	11	32	120	Outside 3 Mile Zone
9/20/2007		-	37.01	-75.92	9/21/2007	11	32	120	Inside 3 Mile Zone
9/21/2007		-	37.01	-75.91	9/22/2007	11	32	128	Inside 3 Mile Zone
9/22/2007		-	37.01	-75.90	9/23/2007	11	32	130	Outside 3 Mile Zone
9/23/2007		-	37.02	-75.88	9/24/2007	11	32	90	Outside 3 Mile Zone
9/24/2007		-	37.02	-75.89	9/25/2007	11	32	110	Outside 3 Mile Zone
9/25/2007		-	37.01	-75.91	9/26/2007	11	32	135	Inside 3 Mile Zone
9/26/2007		-	37.01	-75.90	9/27/2007	11	32	125	Inside 3 Mile Zone
9/27/2007		-	37.01	-75.90	9/28/2007	11	32	130	Outside 3 Mile Zone
9/28/2007		-	37.01	-75.90	9/29/2007	11	32	120	Outside 3 Mile Zone
9/29/2007		-	37.01	-75.88	9/30/2007	11	32	0	Outside 3 Mile Zone