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March 8, 2010

**M/T THEO T**  
**Ongoing Environmental Audit**  
**Singapore Straits**  
**February 19 – 22, 2010**

## **Preliminary**

The undersigned conducted an Ongoing Environmental Audit aboard the M/T Theo T, while the vessel was underway and at anchor in the Singapore Straits. The initial phase of the audit was planned to be carried out underway between Singapore and Tanjung Pleeas. Malaysia, about an 8-10 hour transit. The remainder of the audit would be carried out during a ship-to-ship (STS) transfer. After arrival Singapore, the location of the STS transfer changed, with two parcels of cargo being loaded in the Singapore Straits, off Pasir Gudang, Malaysia. This resulted in the underway time for the audit being reduced to about one-hour. The first STS transfer with the M/T Titan Mercury took place on February 20, 2010, in position 01°16.8' N, 104°07.0' E. Following this STS transfer, the vessel shifted to the nearby anchorage, where it remained for the duration of the audit. The second STS transfer was scheduled to take place on February 22, 2010, after my departure from the vessel

The Theo T is a 40,013 GRT, crude oil and product oil carrier, built in Samsung Shipyard, Koje Island, South Korea and delivered on August 7, 2003. The vessel has twelve cargo tanks with a total capacity of 81,618 m3. The vessel is powered by a B&W six cylinder main engine. Complete vessel particulars are attached.

Audit participants included:

Dimitrios Nikiforakis, Master  
Dimitrios Ferentinos, Relieving Master  
Miseroudis Konstantinos, Chief Engineer  
Hugene Arriesgado, Chief Officer  
Jolly Sus, Second Engineer  
Rudy Alcampor, Third Engineer  
Alfredo Garcia., Fourth Engineer  
Marlon Miguel, Electrician  
Leonard Rey Vincente, Pumpman

In addition to the above, various crewmembers from all departments were interviewed at different times with regard to their duties related to environmental aspects of ship operation and awareness.



The schedule of the initial audit was as follows:

February 19, 2010

- 1445 – Arrive aboard vessel, drifting in Singapore Straits
- 1500-1515 – Opening Meeting with Master, Relieving Master, Chief Officer (C/O), Chief Engineer (C/E), and Second Engineer (2/E) on Bridge.
- 1530-1730 – Engine Room inspection of operating machinery, pumps, etc; vessel underway 1540-1650.
- 1730-1830 – Dinner with Master, Relieving Master, C/E; discussions about audit
- 1830 – Retire for evening.

February 20, 2010

- 0500-0600 – On bridge for STS unmooring; 0512 vessel unmoored; 0540 vessel dropped starboard anchor
- 0600-0830 – Review Ionia Environmental Management Manual (EMM)
- 0830-1200 – Engine Room inspection; operational test of incinerator, OWS; check soundings of tanks against Enviro Logger; inspect engine room equipment; steering gear room.
- 1200-1300 – Lunch
- 1300-1400 – Review logs, records, plans, etc; carryout discussions with C/E
- 1400-1530 – Return to engine room for OWS testing
- 1530-1630 – attend crew training session; interview various crew members on EMS awareness and responsibilities; discuss anonymous reporting.
- 1630-1730 – Continue review of logs, records, plans, etc.
- 1730-1830 – Dinner with Master, Relieving Master, C/E
- 1830-1930 – Continue review of logs, records, plans, etc
- 1930 – Retire for evening

February 21, 2010

- 0730-1000 – Continue review of logs, records, plans, etc.; discussions with C/O; conduct pump room inspection; test ODME; conduct deck walk, Galley inspection; inspect garbage stowage and segregation.
- 1000-1230 – Meeting with Master; review training, drill, EMM, and audit records; review SOPEP and VRP
- 1230-1330 – Lunch
- 1330-1500 – Engine room with C/E; review logs; take soundings for Enviro Logger Comparison.
- 1500-1730 – Review and organize notes
- 1730-1830 – Dinner with Master, Relieving Master, C/E
- 1830-1930 – Review and organize notes
- 1930-2030 – Closing Meeting

February 22, 2010

- 1000 – Depart vessel



The audit was conducted in accordance with Attachment A, Section B of the Special Master Appointment and Scope of Work pursuant to the criminal case, United States of America v. Ionia Management S. A., Criminal No.3: CR134 (JBA). The audit process consisted of a review of Safety Management System (SMS) and Environmental Management System (EMS) documents; records and procedures related to environmental matters; MARPOL required logs and records; inspection and testing of vessel waste handling equipment, including the oily water separator (OWS), incinerator, sewage treatment plant (STP); and interviews with vessel personnel.

To implement the EMS, Ionia Management has recently developed an Environmental Management Manual (EMM), which has been placed aboard. The EMM contains environmental policies and procedures in alignment with the Scope of Work, as well as additional environmental procedures, developed by Ionia Management. In addition, environmental procedures are also contained in the vessel's SMS Manual. Ionia Management is also certified for ISO 14001/2004, DNV certificate No. 24257-2008-AQ-HRV-RvA, issued on April 08, 2008 with expiry on April 08, 2011; however, there were no specific manuals aboard, containing requirements or procedures related to this certification beyond the vessel's SMS and EMM.

Overall, I found the environmental procedures and requirements to be well implemented. I found the officers and crew to be very cooperative and positive throughout the audit. Senior officers, including the Master, C/E. and C/O were knowledgeable of the Scope of Work requirements and the EMM appeared fully committed to the purpose and philosophy of the EMM. This was clearly demonstrated throughout my audit and during discussions with these officers.

Following are my observations and comments. They are supported by the attached EMS Audit Checklist and the enclosures to this report. The observations are separated into two categories - those with recommendations and those without. Many of the recommendations relate to improvement of the existing EMS and do not necessarily reflect deficiencies or non-conformities with the requirements of the Scope of Work. The second category of Observations is primarily included in the audit report to provide an understanding of the functionality of the EMS aboard.

### **Observations with Recommendations**

1. Section 1 of the EMM contains Ionia's Environmental Policy, Ethics Policy and Non-Retaliation Policy. Areas specified where the policies are to be posted aboard the vessel include the Master's Office, Chief Engineer's Office, Bridge, CCR, and ECR. To ensure crewmembers have access to the posted policies and are fully aware of their contents, I recommend these policies also be posted in the officer & crew messes and smoking rooms. Attached are copies of the policies. The SMS Quality, Safety, and Environmental Policy, a separate policy from the EMM Environmental Policy, is posted in the crew mess.
2. Section 11 of the EMM details the procedure for crewmembers to report environmental concerns and to remain anonymous if so desired. Crewmembers may report such concerns by calling a toll free telephone number, anonymous reporting email or



anonymous reporting letter by post mail. Reporting procedures are also mentioned in the Code of Ethics pamphlet (copy attached), yet to be distributed to the crew. When I questioned various crewmembers on the reporting procedures and options, all seemed to be unaware. Recommend that signage be developed and posted in key locations on the vessel, including the officer and crew mess and other common areas. The name and contact information for the Corporate Compliance Manager (CCM) is posted in various locations aboard the vessel; however, there is no explanation of the role of the CCM in the posted notice or in the Code of Ethics pamphlet.

3. Included in the recently implement EMM is a Declaration of Environmental Commitment, Form ENV 020 (copy attached). Procedures for the implementation of the form are contained in Chapter 10; however, there appeared to be confusion with regard to the proper use of the form, as the only forms completed were for non-crewmembers. I was also asked by the Master to sign such a form. I discussed with the Master that the intent of the form was that crewmembers and officers aboard sign the form. According to the EMM procedure, this is required to be done as part of the pre-joining process. Recommend that procedures for the use of the form be clarified. I also recommend that all officers and crew currently aboard sign the form.
4. The Declaration of Environmental Compliance, Form ENV 021, signed upon sign-off, is only completed by officers aboard. Recommend the form be completed by all crewmembers upon sign-off.
5. Environmental Procedures for Non-Crew Members, Form ENV 022, (copy attached) is implemented aboard. Currently, the form is required to be signed by all non-crewmembers who come aboard, e.g. vendors, surveyors, pilots, agents, etc. To reduce the amount of paperwork and burden upon the crew, recommend the form be eliminated and a readily visible notice posted at the gangway, with the watch stander pointing out to all boarding personnel. The form should also be posted at other locations aboard, visible to visitors. As an alternative, or in addition to, the information could be printed on the visitor pass. Currently, safety & security information is printed on the passes (see photos). This information could be condensed and selected environmental info added.
6. During my review of the Ballast Water Management Plan (BWMP), I found it to be in alignment with the IMO Guidelines and also to meet the ship-specific requirements of the U.S. regulations. The appendix containing the U.S. ballast water exchange and reporting requirements, however, was outdated. The section still referred to the voluntary program, which has been mandatory since 2004. I questioned the C/O with regard to his knowledge of the U.S. ballast water requirements and he was fully aware and knew the current requirements were contained in the U.S. Code of Federal Regulations (CFR), a copy of which was on board. Recommend the section of the BWMP be updated with the current U.S. requirements, or a reference be made in the requirements section to the CFR.
7. The vessel maintains a Ballast Water Log in the format required by the BWMP, detailing the ballast operations associated with each ballast water tank. Ballast water operations



are listed consecutively, with the identity of each tank. During my review of the log, I discussed the format of the log with the C/O. While the current format is acceptable, using a page for each tank would make tracking operations associated with each ballast tank much easier. The C/O agreed and indicated that was his preference as well. Recommend consideration be given in this regard.

8. During my review of the Oil Record Book, Part I, I noted the sludge tank weekly retentions were only being recorded for two of the five sludge tanks listed under section 3.3.1 of the Supplement to the IOPP Certificate. Although the survey for the IOPP Supplement is dated August 20, 2008, changes were recently made by the ABS Class Surveyor on February 10, 2010. Previously, only the Bilge Oil Tank and Purifier Sludge Tank were listed. The change added FO Overflow Drain Tank, the Scavenger Air Box Drain Tank and Incinerator Waste Oil Tank. The C/E indicated he would begin recording the ROB for all the tanks listed in section 3.3.1.
9. Although not required by MARPOL, the weekly voluntary recording of the Bilge Tank ROB in the ORB, using the "I" Code is recommended. This is provided for by MEPC.1 Circ. 640 dated November 4, 2008.
10. The incinerator capacity listed on the Supplement to the IOPP Certificate is 15-60 liters/hour. Review of the technical data contained in the manufacturer's manual (copy attached) indicates this value is the capacity of the sludge pump and the liquid waste burn capacity is 38 kg/hour. Recommend that the accuracy of the Supplement to the IOPP Certificate be verified by Class during the next occasion of their visit to the vessel.
11. The Garbage Management Plan (GMP) is a fleet-wide plan with no ship-specific information. Recommend ship-specific information be added in the form of an appendix, detailing location of garbage storage and segregation areas, details of equipment such as incinerator, galley food grinder and specific procedures/restrictions regarding their use.
12. Hazardous waste such as fluorescent tubes, expired batteries, pyrotechnics, and medicines are being segregated from non-hazardous garbage and disposed of ashore. Shore side receipts specifically listing the categories of hazardous waste being sent ashore are being maintained by the C/O (see attached sample receipt). There are, however, no procedures for the disposal of hazardous waste contained in the GMP. Chapter 6 of the EMM contains a table for the proper disposal of both non-hazardous and some categories of hazardous waste. Recommend procedure also be included in the GMP and the listing of hazardous waste aboard be expanded to include all potential types found aboard, such as solvents, degreasers & cleaning wastes, oily rags, fluorescent and incandescent bulbs, expired/used boiler & engine chemicals, galley greases, pyrotechnics, etc.



13. The GMP indicates green containers are used for recycling; however, hazardous waste such as, used batteries are being stored in these containers. Recommend the GMP and the labeling of containers be consistent.
14. A Spare Seal Inventory Log is maintained by the Master, and an Engine Room Seal Log is maintained by the C/E. Both logs are bound with sequentially number pages. Locations of seals are generally identified by a coded system (see attached "Vessel Seal Allocation". In addition, a piping system diagram identifies locations where seals are placed. While some seals are easy to locate with the system, others are not. For example, the seals placed on the OCM box, sample line connections, and OWS Enviro-Logger box are not. These specific seals do not appear to be identified on the piping diagrams either. Recommend the specific location of the seal be identified in the Engine Room Seal Log in the column labeled "Reason for Replacement. Attached are sample pages from the seal logs.
15. An operational test of the OWS was carried on 20 February 2010. Due the minimum underway time during the audit, an overboard discharge was not carried out and the test conducted with recirculation back to the bilge tank, using the in-port test arrangement. On February 20, 2010, at about 1000, the first attempt was made to carry out the operational test of the OWS and OCM. The test failed, as the C/E and 2/E could not get the bilge pump to start to draw suction from the bilge holding tank (BHT), the source tank for the OWS. After working on the problem, a second attempt was made at about 1115. This attempt also failed. Finally, at about 1400, after cleaning some electrical contacts, a successful test was carried out, drawing from the BHT and processing through the OWS through the in-port testing line off the overboard line, following the automatic 3-way valve. The 15-ppm alarm was tested, activating the 3-way valve to the recirculation mode. The oil purge valve was also tested upon start-up. Since the OWS is not frequently used, regular testing in the full operational mode is important.
16. I noted both the OWS discharge sample line and the OCM flushing line were painted orange. The ECP requires that the sample line be painted a bright color to distinguish it from other tubing in the area. Company instructions required both lines be painted orange. This was corrected onboard to conform to the Scope of Work requirement by painting the OCM flushing line blue (see photos). Recommend Ionia revise their instructions to the fleet.
17. The vessel has a computerized Preventative Maintenance System (PMS) using the Ulysses software. The PMS contains detailed maintenance procedures for the incinerator, which are in alignment with the manufacturer's recommendations. Maintenance procedures for the OWS and Sewage Treatment Plant (STP), however, are limited and do not appear to be in full alignment with the manufacturer's recommendations. As an example, the STP manual recommend the periodic removal of accumulated sludge; however, there is nothing in the PMS addressing this, nor is there any record on board of this being accomplished. Recommend the manufacturer's maintenance procedures be reviewed for all pollution prevention equipment (PPE) to ensure onboard procedures are in alignment.





18. The ORB Part 1 indicates monthly testing of the OWS, as required by the Scope of Work and the EMM Section 5.17 is being carried out. Based upon my review of the memory card for the OMD 2005 Oil Content Meter (OCM), it appears only a limited test is being performed and not a full operational test, which includes start-up of the OWS, start-up of the bilge pump to draw from the source tank, testing of the OCM and activation of the 3-way overboard valve. The OWS is fitted with an in-port test arrangement, which allows for such a test. From 10/21/09 to 2/3/10, there is no indication the OWS and OCM are being operationally tested. Following is a summary of the data obtained from the memory card:

Date	Time of Operation	ORB Entry (Y/N)	Discharge (D) or Test (T)
05/02/09	6 hrs.	Y	D
06/12/09	43 min.	Y	T
06/18/09	8 min.	Y	T
06/28/09	12 min	Y	T
08/06/09	4 hrs.	Y	D
08/20/09	7 min.	Y	T
08/24/09	21 min	Y	T
08/29/09	4.5 hrs.	Y	D
09/05/09	12 min	N	?
09/22/09	30 min.	Y	T
09/28/09	34 min	Y	T
10/21/09	31 min	Y	T
10/21/09	83 min.	N	?
02/03/10	97 min	Y	T*
02/09/10	5 min	Y	T**
02/20/10	64 min	Y	T***

- \* Enviro Logger Technician Test  
\*\* CCM Internal Audit Test  
\*\*\* IEC Ongoing Audit Test

Recommend Ionia Management revise the EMM procedures contained in Section 5.17 and provide additional guidance as necessary to ensure a full operational test is carried out, including testing of the oil purge valves. Also, item 8 of the current procedure requires oily water or an appropriate testing fluid be run through the 15-ppm bilge alarm monitor. The C/E was unsure how to accomplish this so I suggested during the operational test that he disconnect the OCM sample line from the overboard pipe connection, squirt a small amount of oil into the sample line and then reconnect the line. He was hesitant to this, so he tested the OCM for opacity by introducing a mechanical obstruction (bottle brush), which triggered the 15-ppm alarm. Recommend guidance be issued on how to introduce oily water through the OCM, as this would be a more effective test of the unit. I also recommend that all C/Es be advised that anytime there is a start-up of the OWS, an entry in the ORB be made using the "I" Code or "D" Code as appropriate.



19. The vessel maintains a Sounding Log as required by Section IV and Attachment B to the Scope of Work. Excerpts of the Log for January and February 2010 are attached. The form of the Sounding Log was recently revised to include the initials of the deck officer witnessing the taking of the soundings (required by the Scope of Work). The revised form eliminated the Remarks column and the certification statement. Recommend both be added back. While there were no Remarks in the previous completed form, a Remarks section would be beneficial in explain significant changes in soundings from one day to the next, e.g. operation of OWS, incinerator, transfer to slop tank.
20. SWOMS data for tank soundings was compared against manual tank soundings. The following table shows the results:

Date & Time: 1025 Singapore Time; 2/20/10							
Tank	Cap. (m3)	Manual (cm)	Manual (m3)	SWOMS (cm)	SWOMS (m3)	Diff. (m3)	% Diff. (m3)
BHT	43.3	21	1.78	26	2.37	.59	33%
SBOT	35.8	3	.13	13	.5	.37	285%
Pur. Sludge	5.6	25	2.14	27	2.34	.20	9%
WOST	1.89	42	.62	43	.63	.01	2%

Date & Time: 1345 Singapore Time; 2/21/10							
Tank	Cap. (m3)	Manual (cm)	Manual (m3)	SWOMS (cm)	SWOMS (m3)	Diff. (m3)	% Diff. (m3)
BHT	43.3	33	3.24	35	3.5	.26	8%
SBOT	35.8	5	.18	13	.5	.32	178%
Pur. Sludge	5.6	23	1.96	30	2.55	.59	30%
WOST	1.89	27	.40	43	.63	.23	58%

The above soundings were taken by the oiler in the presence of both me and the C/E. The vessel was at anchor, therefore there was no movement of the vessel that could skew the soundings. The sounding from the sounding tape was verified for each tank by both myself and the C/E and the value recorded. The printout of the SWOMS data was requested at about the same time the soundings were taken. While on a percentage basis the differences between the manual soundings and the SWOMS data appear significant, the amount of difference relative to the size of the tank is not. To ensure manual soundings are as accurate as possible, I recommend that the procedure for taking soundings include taking at least three manual soundings each time and recording the average or median value. On July 8, 2009, the WOST SWOMS level indicator was re-calibrated by a shore technician. Other SWOMS tank level indicators were also verified against manual soundings and found to be within specification (see attached technician report).

21. Neither the FO Overflow Drain Tank nor the Scavenger Air Box Drain Tank is monitored by the SWOMS. Both tanks are considered oily residue (sludge) tanks and are listed on the Supplement to the IOPP Certificate under 3.1. The size of the FO Drain Tank is 59.5





m3 and the Scavenger Drain Tank is only .55 m3. Recommend Ionia evaluate whether these tanks should be included in the SWOMS.

22. The ODME is tested monthly by the C/O and recorded in an ODME Test log (excerpt attached). During the audit, the ODME was tested by the C/O in my presence. Instructions contained in the manufacturer's manual were used to perform the tests, with values for ship speed, PPM, and flow rate manually entered. Due to the vessel being at anchor and also, since a blank flange is installed in the ODME discharge line, an actual discharge test could not be performed. It should be noted that the vessel does not discharge its slop tanks at sea. All slops from ballast and tank cleaning are sent ashore. The ORB Part II verified this. Accordingly, the ODME was tested based on the manual value input. The high PPM and 30 liters/nm exceeded were tested. The discharge prohibited alarm was also verified, along with the operation of the recirculation valve. The C/O was very competent in the ODME operation and knowledgeable of the discharge requirements. As per the Scope of Work, recommend the monthly testing also be recorded in the ORB.
23. As mentioned above discharges overboard from the slop tanks are not currently occurring. The overboard line is blanked. While currently there are no seals on the ODME sampling lines, should the blank in the overboard line be removed and overboard discharges from the slop tanks resumed, recommend seals be placed on the sample line connections and the flow valve.
24. The Oil Transfer Procedures, required by 33 CFR 155.720, are not in full alignment with the regulations. Recommend the procedures be amended to include specific citing of these regulatory requirements.
25. A flexible hose inventory is kept, with hoses stored in the mid-ship house and forecabin. There are, however, no tags or labels to identify each hose. Recommend the hoses be identified in some manner to ensure they are properly controlled and accounted for.
26. Vessel personnel are carrying out weekly and quarterly inspections to comply with the requirements of the EPA's recently adopted National Pollutant Discharge Elimination System (NPDES) Vessel General Permit. Attached is a sample of the weekly inspection report. Quarterly and annual inspection forms have also been developed (copies attached); however, have not been implemented yet. There was no evidence aboard indicating the Notice of Intent (NOI) was filed with the EPA or a copy of the EPA letter acknowledging coverage under the VGP. It is noted that these new regulations only apply to vessels calling U.S. ports. Should the vessel begin calling the U.S., the NOI must be filed prior to arrival in the first U.S. port.
27. The Fleet Engineering Survey, Form ENV 015 was completed by engineering officers on December 10, 2009. The revised survey, as recommended by the U.S. Government, has not been implemented aboard.



### **Observations Without Recommendations**

1. I observed various engine room pumps and machinery in operation during the period of time the vessel was underway, at anchorage, and moored to the STS transfer vessel. . The engine room was noted to be in an exceptionally clean condition. Minimal lube oil leakages were noted from the main engine. No oil or oily residue was noted in the bilges or bilge wells. The bilge well below the main engine fly wheel was also free of any oily residues. According to the C/E, if any oil residue accumulates in the mid bilge well below the M.E. flywheel, the oily residue is removed manually and dumped into the SBOT to avoid contamination of the BHT. The bilge wells contained only small quantities of relatively clean water. The BHT was last cleaned on February 17, 2010. No leakages were noted from operating cooling water and general service pumps and there was no evidence of excessive leakages from static pumps. The accumulation of fresh water in the bilge wells appeared to be due to condensation on pipes from the main engine air cooler. Based upon review of the ORB bilge well transfer entries and the Sounding Log, bilge loading is minimal, slightly over 1 m<sup>3</sup>/week. The purifier room was very clean, with no evidence of excessive leakages from the purifiers. Auxiliary diesel engines on line, and fuel oil and lube oil pumps and valves were also noted to be leak free. Attached are photos depicting the condition of the engine room.
2. Similar to the engine room, both the cargo pump room and steering gear room were noted to be exceptionally clean, with no apparent leakages from pumps.
3. A monthly Environmental Performance Report, Form ENV 004, is submitted to the Ionia office on a monthly basis. Included on the form are garbage and hazardous waste disposal quantities. See attached sample report.
4. Incineration of sludge and evaporation from the WOST are carried out on a regular basis. See attached ORB excerpts. According to the ORB, the last four sludge incineration operations were as follows:

2/04/10	670 liters processed in 19.5 hours	34.36 liters/hour
2/01/10	380 liters processed in 6.8 hours	55.89 liters/hour
1/30/10	270 liters processed in 10.2 hours	26.47 liters/hour
1/29/10	580 liters processed in 20 hours	29.00 liters/hour

The vessel generates about 300 liters of sludge per day. Fuel consumption is about 40 mt/day. See attached Chief Engineer's Weekly Report, Form ENV 009. Sludge tank capacity, according to the Supplement to the IOPP Certificate, is 102.45 m<sup>3</sup>. Sludge tank capacities and incinerator capacity appear sufficient to manage the storage and disposal of sludge.

5. A test of the incinerator burning sludge was carried out on February 20, 2010. The first attempt to test at 0840 was unsuccessful, due to the burner assembly being clogged. Following removal and cleaning of the burner assembly by the 2/E, the incinerator was



successfully started at 0936 and run until 1522, with no stoppages. 205 liters of sludge from the WOST were burned, for a rate of 37.3 liters/hour.

6. The vessel is fitted with a sewage treatment plant (STP) made by DVZ, type DVZ-SKA-20, BIOMASTER, with a rated capacity of 3.70m<sup>3</sup> per day. The vessel has no sewage holding tank and all black water is treated with the recommended chemical dosage for discharge overboard. According to the C/E, the STP is in continuous operation, both in port and at sea, with the direct overboard valve kept chained and locked in the closed position, except during short periods of maintenance, while at sea. Accordingly, only treated sewage is discharged. According to the C/E the system is adequate for the complement of the vessel, though the model type indicates capacity for only 20 persons. The present complement during the audit was 25 persons. The vessel, however, is also equipped with a vacuum toilet system, which substantially reduces the amount of black water requiring processing.
7. The capacity of the OWS is 5 m<sup>3</sup>/hour, which appears more than adequate for the currently generated machinery space effluents. According to the ORB, the last three operations of the OWS were as follows:

8/29/09	22.9 m <sup>3</sup> processed	1104-1529	5.1 m <sup>3</sup> /hr
8/06/09	16.2 m <sup>3</sup> processed	1316-1729	3.9 m <sup>3</sup> /hr
5/02/09	27.7 m <sup>3</sup> processed	0831-1431	4.6 m <sup>3</sup> /hr

As noted above, there has been no recent processing of oily bilge water through the OWS. The vessel is equipped with a means to transfer E/R bilge water and sludge to cargo slop tanks. Section 3.2.4 of the Supplement to the IOPP Certificate allows this. Currently, the BHT and sludge tanks are periodically transferred to the cargo slop tanks through this approved connection. The cargo slop tanks are subsequently transferred ashore. Both the C/E and the C/O were aware that any machinery space bilge or sludge transfer to the slop tanks must be discharged ashore. ORB Part II entries verify all machinery waste transferred to the slop tanks is being sent ashore. Corresponding entries for the transfers to the slop tanks are recorded in the ORB Part I and Part II. See attached ORB excerpts.

8. As per the Scope of Work requirements, samples of the following were taken for content analysis:
  - a. Bilge Well Aft Seal # 4491539
  - b. BHT Seal # 4491540
  - c. BW Fwd Stb Seal # 4491538
  - d. OWS Discharge Seal # 4491535

All samples taken appeared to be water only with no visible oil. See attached photos.

9. A log of incinerator and OWS operations is maintained. All alarms are manually recorded in the Alarm Log. This is in addition to the ECR console printout.



10. The vessel has a Deckma OCM, model OMD 2005, which conforms with requirements of MEPC 107(49). The OCM was last calibrated on July 15, 2009 and August 14, 2009 (copies of certificates attached). The Scope of Work requires recalibration at least annually, with copies of the certificates maintained on board.
11. With the installation of the SWOMS, the flushing and sample lines to the OCM have been re-routed through the OWS LockBox, disabling the OMD 2005 manual flushing valve. The OWS LockBox's main function is to provide secured permissive functions that will only allow the 3-way overboard/recirculation valve to be moved to the overboard position once all the permissive functions are met. It will not allow for the mixing of the fresh and sample waters and must sense that enough sample water is flowing to the OCM for at least the last 20 seconds before it will allow control of the 3-way overboard/recirculation valve by the OCM. The flush push button is located on the front of the LockBox sealed cabinet. It is used to activate a solenoid valve in the LockBox which causes a 3-way valve to rotate 180 degrees and put fresh water to the OCM. The pushbutton signal is sent to the main Logger control panel in the ECR where it records that the flushing water has been activated, and then a signal from the control panel is sent to the solenoid in the Lockbox to activate the 3-way flushing valve. The 3-way valve is used to select whether the sample or fresh water is sent to the OCM. The design will not allow mixing of the sample thus ensuring that the sample cannot be diluted by fresh water. The flow switch inside the LockBox senses when sample water is flowing to the OCM and provides a contact closure to the system. It also provides the contact closure to indicate to the Logger that the OWS is running.
12. Daily checks of the Enviro Logger are being carried out and recorded on Form ENV 024. See attached samples.
13. The manifold trays on deck on either side to contain any leakages or drips during loading, discharging and disconnection of shore connections are adequate relative to the requirements. The vessel had two portable Wilden Pumps, one on each side of the vessel for use in case of an oil spill on deck during cargo operations and one spare (capacity 8 m<sup>3</sup>/h). FO vent containment, bunker line containment and sludge discharge containment are adequate and meets the U.S. Pollution Prevention Regulations.
14. The present engineering staff comprised of C/E, 2/E, 3/E, 4/E, three oilers, one engine cadet and an electrician appeared adequate to handle the operational, maintenance and repairs workloads for the systems, equipment and components on board. All the staff appeared to be professional and proficient in their knowledge and experience for the job allocated. They are fully aware of the effort needed to minimize the waste streams development. The vessel is certified for UMS operation. The Engine Room is manned between 0700 and 2000 while at sea. The 2/E makes rounds at 2300. In port and during cargo operations the Engine room is continuously manned.
15. Prior to joining MARPOL training is carried out in Manila for crewmembers. Weekly shipboard training, which includes safety, security and environmental training is carried out as per the six-month training schedule. Attached is a copy of the schedules for



2009 and the first half of 2010. Dates when training is conducted are annotated on the schedule; however, there was no record of attendees for each training session. In addition, environmental training is also carried out during monthly Safety Committee Meetings. See attached Safety Committee Meeting Minutes for November 2009 and February 2010. In October 2009, computer based training (CBT) was implemented on board. Attached is the email notice to implement, available training courses, designation of which courses each crewmember is required to take, a viewing schedule, and participant log.

16. The vessel had all the manuals of equipment related to waste stream and type test certificates. Schematic diagrams and pipeline diagrams were on board. Attached are copies of the sanitary and bilge piping diagrams.
17. Ionia has an effective internal environmental auditing procedure in place. Attached is a copy of the Internal Environmental Audit Report, Form ENV 016, for the audit conducted on February 4, 2010. The audit report is very detailed and comprehensive. Five non-conformities were identified and were in the process of being corrected at the time of this audit. The non-conformities were as follows:
  - a. C/E is training the 2/E in operation of OWS, but has not logged, in the engine room logbook. (corrected)
  - b. Transfers to M.E. Scavenger Tank recorded in ORB, but tank is not listed on IOPP Certificate. (corrected; tank is listed on new IOPP Certificate)
  - c. Checks of oil to sea interface equipment not logged. (corrected; logged in engine room logbook)
  - d. Hazardous waste garbage container color not noted.
  - e. Personnel onboard unaware of Code of Ethics pamphlet

Overall condition of the vessel and waste management equipment is very good. As noted previously, despite the number of Observations with Recommendations noted above, the Scope of Work and EMM requirements are well implemented on board. All the personnel on board cooperated fully during the audit and were sincerely interested and very positive in complying with the environmental procedures.

Respectfully submitted by:

Capt. Richard C. Wigger, USCG-Ret.  
Independent Environmental Consultant

**Enclosures:**

1. Completed Environmental Checklist
2. Ship's Particulars
3. Crew List



4. Environmental Policy
5. Ethics Policy
6. Non-Retaliation policy
7. Code of Ethics Pamphlet (20 pages)
8. IOPP Certificate (4 pages)
9. Supplement to IOPP Certificate (10 pages)
10. Sewage Treatment Plan Manual Excerpt (2 pages)
11. Oil Record Book Part II Excerpts (5 pages)
12. Oil Record Book Part I Excerpt (7 pages)
13. OCM Calibration Certificate dated 8/14/08
14. OCM Calibration Certificate dated 7/15/09
15. Enviro-Logger Service Report dated 7/8/09 (3 pages)
16. Sounding Log Excerpt Revised (2 pages)
17. Sounding Log Excerpt Old (2 pages)
18. ODME Test Record (2 pages)
19. Training Program 2010
20. Training Program 2009
21. Safety Committee Meeting Minutes 11/25/09 (2 pages)
22. Safety Committee Meeting Minutes 2/14/10 (3 pages)
23. Email Re: CBT Implementation
24. CBT Training Courses
25. CBT Training Requirements
26. CBT Schedule
27. CBT Accomplished (4 pages)
28. Sanitary Piping Diagram (3 pages)
29. Bilge Water Piping System (3 pages)
30. Engine Room Seal Log Instructions
31. Engine Room Seal Log System Code
32. Engine Room Seal Log Diagrams (3 pages)
33. Engine Room Seal Log Excerpt (2 pages)
34. Spare Seal Inventory Log Instructions
35. Spare Seal Inventory Log Excerpt
36. Hazardous Waste Disposal Certificate Sample
37. Incinerator Technical Data (2 pages)
38. Internal Audit Report dated 2/4/10 (7 pages)
39. NPDES Weekly Inspection Sample
40. NPDES Quarterly Inspection Sample
41. NPDES Annual Inspection Sample
42. Environmental Procedures for Non Crewmembers – ENV 022
43. Envirologger Checklist – ENV 024 (2 pages)
44. Monthly Environmental Performance Report – ENV 004
45. Chief Engineers Weekly Report - ENV 009 (2 pages)
46. Photos