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SECTION 1: MINIMIZATION OF WASTES

Section 1.01

Overview:

This waste management plan applies to the proposed cruise tour operation onboard our two expedition vessels, the M/V's Akademik Ioffe and Akademik Sergey Vavilov during the upcoming Antarctic 2017/18 season.

One Ocean Expeditions is committed to an operation that reduces the waste generated while travelling in the world's remote and pristine regions. This is accomplished through careful selection of ship's stores and provisions and constant review of our operation to look at ways to improve and reduce our waste production.

One Ocean Expeditions has no land-based infrastructure, therefore there is no waste generated or left on land in Antarctica.

Section 1.02

(a) Group 1 – sewage and domestic liquid wastes

Sewage and domestic liquid wastes are produced and contained aboard the vessel.

The vessels have a black water management plan as is required by international convention. The capacity of the black water tank on the Akademik Ioffe is 31 cubic metres or 26 hours at full capacity of the vessel (170 souls aboard) and the 29 cubic metres on the Akademik Sergey Vavilov, or 24 hours at full tank capacity (165 souls aboard).

The grey water capacity is 18 cubic metres, or about 3 days at full complement.

All sewage, gray water and kitchen sink water is stored in tanks until it can be processed.

The treatment plant chlorinates and flocculates sewage, separating solids and liquids. If possible all waste will be held in tanks and disposed of when the ship is north of the Antarctic Convergence (north of 60 degrees South latitude). If this is not possible, then untreated sewage will be discharged at a moderate rate while the vessel is underway at a speed of no less than 4 knots when the ship is more than 12 nautical miles from land or ice shelves. MARPOL permits the disposal of untreated sewage beyond the 3 nautical mile limit. Both the Akademik Ioffe and Akademik Sergey Vavilov comply with the MARPOL requirements for sewage treatment.

Reduction strategy – water conservation measures will be explained to passengers onboard the vessel. Standard suggestions include the reduction in shower time, turning off faucets while brushing teeth, and identification and repair of leaky faucets. Bed linen changes have been reduced to once every five days to reduce laundry generated waste and passengers will be encouraged to re-use towels until they are dirty. The standard onboard is to replace towels when requested, rather than as a daily procedure.

High-efficiency clothing and dish washing machines are utilized onboard in order to ensure

that the minimum amount of freshwater is used and that the minimum amount of wastewater is produced.

(b) Group 2 – other liquid wastes and chemicals, including fuel and lubricants

The vessels comply with the standards required under Article 3 of Annex IV. As mentioned above, both the Ioffe and Vavilov have an approved SOPEP, (Ioffe - No.818-010-1371/5 and Vavilov – No. 818-010-1371/4), certified respectively on 26.June.2005 and 10.June.2007. There is no expiry date on a SOPEP. Waste oil will be retained on board for disposal on return to port.

Akademik Ioffe is equipped with an oily water separator (OWS) (type SKIT/S-DEB) with a capacity of 5.0 cubic meters per hour. The OWS is equipped with a 15 ppm alarm (type – OMD 2005) and automatic shutoff (certificate nr.09.02009.272, issued 21.09.2009, Permanent. Last test water after Oily Water Separator 15.05.2017, next test 15.05.2018).

Akademik Sergey Vavilov is equipped with an oily water separator (OWS – Type SKIT/S-DEB) with a capacity of 5.0 cubic meters per hour. The OWS is equipped with a 15 ppm alarm (type – OMD 2005) and automatic shutoff (Cert. 5004249 valid until 01/06/2018) M/V Akademik Ioffe has a sludge oil holding capacity of 48.4 cubic meters and M/V Akademik Sergey Vavilov has a sludge oil holding capacity of 70.1 cubic meters. There is a bilge water holding capacity of 14.9 cubic meters (M/V Akademik Ioffe) and 14.3 cubic meters (M/V Akademik Sergey Vavilov).

(c) Group 3 – solids to be combusted

Experience shows that the Captain, his officers and crew, and ship's management (Expedition Leaders and Hotel Managers) are aware of their obligations under the terms of MARPOL. On-board incineration of waste is an approved garbage treatment process under MARPOL, and MEPC 59(33) incorporates specifications for shipboard incinerators. Posters depicting the regulations and obligations are located on the bridge of the vessel, in the galley and in the lobby. Passengers are able to access this information and police these regulations.

The incinerators on board the M/V Akademik Ioffe and the M/V Akademik Sergey Vavilov are designed, constructed, operated and maintained in accordance with the above-mentioned standard. Where possible, dry garbage is incinerated outside of the Antarctic Treaty area (North of 60 degrees South latitude). At times, it is necessary to incinerate while within the Antarctic Treaty area however every effort is made to reduce this. MARPOL totally prohibits the discharge of plastics at sea so all plastics are disposed of in port in South America at a suitable recycling and landfill site (recyclable plastics are separated onboard the vessel and stored in marked recycling containers).

The incinerator has the capacity to incinerate between 100 and 250 kg/hour of garbage. It is used generally 3 to 5 times each voyage and if possible, we restrict the use of the incinerator to outside the Antarctic Treaty area. The incinerator burning temperature is 600 degrees Celsius and it is only used when the vessel is underway. The incinerator is a single-chamber incinerator.

Group 3 dry garbage could include any paper products, natural textiles, food waste (aside from poultry products) and food packaging crates (wood vegetable crates, etc).

Any non-recyclable plastics are stored onboard in the waste bin and disposed of in port with other non-combustible solid waste.

(d) Group 4 – other solid wastes

One Ocean Expeditions complies with the Protocol on Environmental Protection to the Antarctic Treaty, Annex III, Article 7 Prohibited Products. *No polychlorinated biphenyls (PCB's), non-sterile soil, polystyrene beads, chips or similar forms of packaging, or pesticides (other than those required for scientific, medical or hygiene purposes) shall be introduced onto land or ice shelves or into water in the Antarctic Treaty area.* If any of these items are found, they will be removed and brought back to port for disposal.

Discussions will take place with ship's management and crew to ensure that such packaging and other prohibited items are not used. Each vessel will also comply with Annex III of the Protocol to remove all stated items including electrical batteries. Publicity will be given to this on board ship. There is a separate box at reception where passengers, officers, staff and crew are asked to bring all expired batteries so that they can be returned to port for proper disposal. Due to the lack of battery recycling facilities in Ushuaia, Argentina, expired batteries will be returned to Europe following the season (with the ship) for proper recycling. Passengers are encouraged to take their used batteries back to their homes with them.

Food wastes are separated into 'poultry products' (Appendix 3.3, p. 93) and 'all other products.' All poultry wastes will either be kept refrigerated or in frozen storage for disposal upon return to port or incinerated. "All other products," predominantly kitchen waste from food preparation and disposal, will be stored in tanks until they can be released. No poultry products will be taken ashore or onto the ice.

One Ocean has a commitment to reduce solid waste onboard the vessel. As such, menu planning is designed to reduce waste, both a financial and an environmental decision. Medical waste onboard the vessel is separated into readily identifiable (yellow), heavy-duty plastic bags and given to our ship agent for disposal through an approved medical waste disposal facility. In Ushuaia, Argentina, this is done at the hospital. Sharps are kept in a purpose-designed sharps container and disposed of through the same system.

(e) Group 5 – radioactive material – not applicable

1.1. Before the expedition:

Pre-departure information details exactly what is provided in the cabins and what toiletries are provided. Recommendations are made as to what is required for passengers to bring. This is done by the travel agent the client books through. By stating explicitly what is provided, we reduce the amount of duplication of toiletries, and other potential waste that passengers bring.

1.1.1. Communication to passengers and crew before departure:

Communication specific to waste management reduction is not done extensively before departure as our agents maintain the contact with clients. Our pre-departure information contains some general education about the region however nothing specific to waste management. There is a maximum amount of information that we can send to prospective passengers and expect them to read. If we exceed that limit, we risk passengers not

reading any of the material. We communicate with the passengers about the impact of their voyage once they get on the ship.

1.2. During the expedition (on board): Explain in detail how passengers and crew members will reduce the quantity of wastes generated during the expedition.

(a) Cabin waste –

Very little cabin waste is generated – basically tissues and the occasional tea bag. this waste is incinerated onboard.

Cabin waste is collected in wastebaskets in each cabin. The stewards empty the baskets twice daily. Generally, cabin waste is Group 3 waste with some occasional recyclable waste. Cabin waste generally consists of facial tissues, empty packaging (camera memory cards, battery packaging, sea sickness tablet packaging), empty water bottles, occasional apple cores, banana peels, teabags, coffee grinds, feminine hygiene products, used seasickness bags). Cabin waste is sorted by the stewards in their supply cabin on each deck into bigger bags (recycling, combustible, disposal). These bags are taken to the storage facility on deck 3 (stern) for placement in appropriate containers.

(b) Bar waste –

Recyclables are separated as is combustible waste – the bar generates less than 3 gallons of waste each day – basically coffee grounds, tea bags, lemon rinds, etc

Bar waste is generally separated into recyclable and combustible, with some food waste included. Three waste bins are kept in the bar for general disposal. These are for recyclable, combustible, landfill).

Each day these bins are emptied and waste is stored in appropriate containers on deck 3 (stern deck).

(c) Galley and dining room waste-

Galley waste is composed of a mix of Groups 1 through 4. The chefs sort garbage as they work through the use of colour-coded garbage bins stationed around the kitchen.

Recyclables are washed and stored in a blue bin, and moved to the larger blue bin on deck 3 (stern).

Poultry waste is kept strictly separate and is frozen in heavy-duty waste bags.

Group 3 wastes are removed from the galley and stored in the incinerator waste bin for incineration in the Drake Passage (north of 60 degrees South latitude).

Meal related waste has been reduced using the following methods:

- Dinner menu choice selected by passengers at lunch – reduces need for chef to over estimate dinner entrées.
- Passengers are given a choice of portion size and specify this when they order their dinner – reduces food left on plates.
- Condiments are not individually packaged – example – sugar in a dispenser rather than a packet, bottle of ketchup on table as opposed to packets, milk and cream in insulated 750 ml carafes, rather than individual creamers.

Group 4 waste, excluding poultry products, is bagged and placed in the dumpster on deck 4 (stern) for removal in port.

Detailed composition of galley waste:

- Organic waste – excess food, vegetable and fruit peels, offcuts, meat

- trimmings and bones, fish trimmings and bones, egg shells
- Food packaging – minimized through purchasing of bulk quantities of food – this generally consists of plastic bags, paper sacks, cardboard boxes and plastic film wrap, also juice and UHT milk cartons
- Other paper products – paper towels, parchment paper, stationary (chef's notes)

(c) Engine room and paint locker waste –

Ships fluids, cleaning products, etc are supplied in bulk quantities and daily use containers are refilled minimizing the disposal of numerous small packages. Rags are used instead of paper towel. This consists of oily rags and other products soiled with petroleum or petroleum-based products/solvents.

This waste is stored in a separate hazardous materials waste bin located on deck 3 (stern). This bin is marked and is emptied in port by a port authority approved hazardous waste removal company.

Detailed composition of engine room and paint locker waste:

- Empty paint cans (minimized through use of bulk paint (5 gallon containers)
- Old paint rollers, paint rags – cleaned and reused where possible
- Oily rags

(d) Ship's office waste –

Very little printing is done on the ship – a daily program is printed and posted on 8 boards around the ship. Any changes to this program are updated on a whiteboard at reception. Excursion organizational charts are drawn on a whiteboard in the expedition room. Passenger accounts are available to the clients digitally if they wish. Cabin info booklets are printed on card stock and therefore only replaced once a season. Generic account chits are produced that can cross from bar to laundry to giftshop to spa. This reduces the variety of paper supplies needed.

DISPOSAL OF WASTE IN PORT-

Group 2 and Group 4 wastes are disposed of in port. On occasion Group 3 waste that is not incinerated is also disposed of in port.

In each case, waste disposal is organized through our port-authority recognized ship agent. Our agent makes arrangements with an approved waste disposal company at the request of our vessel Master. Garbage disposal is recorded in the Garbage Record Book, which is the responsibility of the Chief Officer to maintain. This book is kept on the navigating bridge along with copies of the vessel certificates and logbooks. Garbage disposal is recorded by type and weight or volume depending on the type of waste. The vessel is in port 2 to 3 times each month for a period of approximately 12 hours each time. Waste disposal happens at this time.

1.3. Waste reduction on day-to-day activities: Explain in detail the procedures undertaken to minimize the usage of waste generating items in daily activities:

(a) Food preparation: chefs are trained not to be wasteful and are responsible for their budget, which is efficient and tight. This responsibility and accountability ensures that chefs are not wasteful.

(b) Cleaning: supplies are purchased in bulk quantities but rationed out to cleaning stewards. Containers are refilled from bulk supply and cotton rags are used instead of disposable cloths / towels where permitted, according to sanitation standards.

(c) Laundry: Linen changes are undertaken once every 5 days unless otherwise requested by passengers due to special needs/requirements.

(d) Other: Cloth napkins used in dining room for lunch and dinner reducing waste.

1.4. Staff preparation regarding waste management and related duties: Explain in detail what instructions/training will be given to the crew/staff in relation to following the Waste Management Plan and also what their responsibilities will be in order to fulfill their duties.

(a) Chief Mate is responsible for vessel waste management. He works closely with Hotel Manager and Passenger Mate to ensure that training is undertaken.

(b) Passenger mate undertakes training of relevant crew in regards to waste management plan implementation. Hotel manager is responsible for training staff on waste management plan implementation. For crew this consists of a number of training sessions and for the staff it consists of one 6 hour training session.

1.5. Waste reduction during excursions on land/at historical sites: Explain in detail the measures undertaken to protect the environment and manage wastes at such locations.

(a) Land: No waste is taken ashore or left ashore. In detail, this means that we leave the waste on the ship. Passengers are asked to carry their used tissues back to the vessel. Passengers also return to the vessel in order to use the toilet. Passenger clothing and camera bags, backpacks are cleaned and vacuumed out prior to first excursion. Each passenger signs a bio-security declaration declaring that they have cleaned and checked all of their belongs that will go ashore for invasive species and soil, etc.

(b) Historical sites: See above note.

(c) Zodiac excursions: Passengers return to vessel to use toilet. Zodiacs are 4 stroke oil injected and therefore low emission. Engines are run at optimal or fuel efficient cruising speeds to reduce fuel consumption.

ONGOING ANALYSIS OF EFFECTS OF WASTE DISPOSAL IN ANTARCTICA

One Ocean Expeditions is committed to the conservation of Antarctica and the Antarctic environment / ecosystem. As such, we take pains to ensure that each aspect of our business follows the highest standards that are commercially feasible.

We make it a priority to provide free transport to scientists onboard our vessels, should they need passage to an Antarctic station. To this end, we have developed excellent

relationships with scientists from numerous countries including Bulgaria, Russia, Chile, Uruguay, Germany, France, England, New Zealand, Australia and Brazil. While transporting these scientists we endeavour to learn from their specific areas of expertise and learn from their observations and opinions about our program. We continually improve in this regard.

Based on their comments and our own observations, we believe that waste disposal from vessels is not having a visual impact on the ecosystem. In addition, we have received no feedback from marine biologists indicating that our actions are having an impact (whether positive or negative) on marine organisms.

From our experience, we have learned that incineration of waste in pristine bays of Antarctica create a visible smoke plume that can be memorialized in passenger photographs for years after the smoke has dissipated. We analysed the use of the incinerator in the Antarctic and decided, based on discussion with the Chief Officer that we would make every effort not to use the incinerator in the Antarctic. On occasion, our storage facilities for combustibles reach their capacity and it becomes necessary to incinerate within the Antarctic Treaty area. As we continue to improve our reduction strategies, we find that we are able to reduce our incineration needs to just two or three days each voyage, generally outside of the Antarctic Treaty area.

1.6. Minimization of other sources of pollutants:

Explain in detail what measures will be undertaken to reduce the sources of the following pollutants:

Air pollution –ships engines maintained regularly to reduce emission generation, engines stopped when at anchor, distillate fuel used by ship, zodiacs engines are maintained to a high standard and therefore run smoothly. Zodiacs are not left idling, when not in use.

Noise pollution – no boom boxes taken ashore, bagpipes not encouraged on landings, vessel horn or whistle only used in emergency situations, zodiacs slow down when approaching landing site to reduce noise of engines in proximity to breeding birds (also impact on beach).

Light pollution – not generally an issue for much of the season due to 24 hours of daylight however during the last month of the season the outer deck lights are turned off except for the absolute minimum required for safe movement about the ship. Cabin blinds are pulled down by the stewards at dinner time reducing light pollution from cabin windows. Ship spotlights are used for safe navigation only and not for light shows.

SECTION 2: STORAGE OF WASTES ONBOARD THE SHIP

Explain in detail how each waste identified below will be stored on the ship.

(a) **Sewage and domestic liquid wastes** – this waste is stored in the grey and brown water tanks onboard.

(b) **Other liquid wastes and chemicals, including fuel and lubricants** – stored in barrels and disposed of in port by appropriate waste management company.

(c) **Solids to be incinerated** – stored in enclosed storage area close to incinerator and burned three to five times per voyage.

(d) **Other solid wastes** – stored in closed and latched dumpster on stern deck of

vessel. Dumpster is lashed down with steel cable and doors are kept shut with bolts or locks.

(e) Radioactive material – N/A

REVIEW AND UPDATE OF WASTE MANAGEMENT PLAN

One Ocean is committed to reviewing and updating the waste management plan on a monthly basis. Based on the waste management guidelines document provided to Canadian tour operators in July 2013, we continue to update the information provided to clients in our pre-departure package to incorporate a more robust waste reduction education message in this information.

Any resulting changes to the waste management plan will result in a revised copy being forwarded to Environment Canada.

SECTION 3: DISPOSAL OR REMOVAL OF WASTES

Explain in detail how, when and where each waste identified below will be disposed of.

Sewage and domestic liquid wastes – disposed of this waste at sea according to MARPOL and the black water management plan – where possible, sewage and domestic liquid waste is kept onboard and disposed of in the Drake Passage north of 60 degrees South latitude.

Other liquid wastes and chemicals, including fuel and lubricants – disposed of in port with a waste management contractor licensed to dispose of this type of waste.

Solids to be incinerated – incinerated generally 3 to 5 times per voyage generally during the early morning before the vessel arrives in a sheltered bay.

Other solid wastes – dumpster is unloaded in the port of Ushuaia or Stanley and disposed of by approved waste management contractor at the municipal landfill site.

Radioactive material – N/A

Submitted by:



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