

City and Borough of Sitka
VISITOR PLAN STAKEHOLDERS
“Environment” Subcommittee
Kenneth Rear, Presenter
April 22, 2006

Stakeholder Question

1. What is the environmental impact of the cruise industry?
2. What is the environmental comparison large ships to small?

History

In December of 1999, DEC Commissioner Michelle Brown invited the US Coast Guard, The US Environmental Protection Agency, and members from the Southeast Conference to join industry representatives and local concerned citizens in a public discussion. This forum became known as the Alaska Cruise Ship Initiative (ACSI). An Executive Steering Committee convened in January 2000 to direct the ACSI work groups. The Alaska Cruise Ship Initiative was dissolved in November 2001. The Commercial Passenger Vessel Environmental Compliance Program now leads the efforts to oversee the sampling and testing of wastewater and air opacity monitoring.

Reports about ACSI are available at

www.alaska.gov/local/akpages/ENV.CONSERV/water/cruise_ships/cruiseinitiative.

In 2000, the Central Council of the Tlingit and Haida Indian Tribes of Alaska passed a resolution citing the threat posed by cruise line discharges to subsistence foods.

In 2000 the Bluewater Network Petition, put pressure on the US EPA to take a more active role in Monitoring cruise ships, prompting new proposals and regulations for environmental enforcement. These include an EPA Cruise Ship White Paper [42] and prospective Cruise Ship Discharges Assessment Report [43], the US Coast Guard’s ‘Operation Cruise Watch and State governments’ initiatives in Alaska.

State Legislation

During a Special Session of the Legislature convened on June 7, 2001, HB 260 was passed, creating a Commercial Passenger Vessel Environmental Compliance Program. This legislation was signed by Governor Tony Knowles on June 28, 2001 and became effective July 1, 2001. The 2001 law set fecal coliform and TSS effluent discharge limits for both gray and blackwater for large ships but delayed compliance for small ships until January 1, 2004.

Information about the commercial passenger vessel environmental compliance program (www.dec.state.ak.us/water/cruise_ships/).

Federal legislation

In December 2000, the President signed federal legislation enacting *Title XIV – Certain Alaskan Cruise Ship Operations*. This legislation gives the Coast Guard and EPA new responsibilities, including the implementation of a cruise ship inspection regimen and the establishment of effluent limits for treated black water and gray water. All cruise ship discharges in Alaskan waters must be made while the ship is at a minimum speed of 6 knots and a distance of at least one-mile from shore. No cruise ship can discharge untreated black water anywhere in the Alaska waters of the Alexander Archipelago, waters of the U.S. within the State of Alaska, and within the Kachemak Bay National Estuarine Research Reserve.

The U.S.E.P.A. has sampling results for Alaska cruise ships on their website at (www.epa.gov/owow/oceans/cruise_ships/results.html)

Report

Some of the waste streams generated by cruise ships include bilge water (water that collects in the lowest part of the ship's hull and may contain oil, grease, and other contaminants), sewage, gray water (waste water from showers, sinks, laundries and kitchens), ballast water (water taken onboard or discharged from a vessel to maintain its stability), and solid waste (food waste and garbage). There is significant concern about the potential environmental impacts of these waste streams.

As established in AS 46.03.460 - 46.03.490, the effluent limits for black water, gray water, and other wastewater is 150 milligram per liter for total suspended solids (TSS) and 200 fecal coliform colonies per 100 milliliters for vessels that are traveling at least 6 knots and are at least 1 nautical mile from shore.

Fecal coli form by themselves are (except E-Coli) not pathogenic; they are indicator organisms, which means they may indicate the presence of other pathogenic bacteria. Pathogens are typically present in such small amounts it is impractical monitor them directly.

The number of individual *E. coli* bacteria in the [feces](#) that one [human](#) passes in one day averages between 100 billion and 10 trillion.

60 years of experience with setting standards using indicator bacteria has proven to be protective of human health. The small passenger vessel fleet discharges 6% of the total wastewater discharged into Alaska waters from passenger vessels. This number includes the ferries that operate year round. Small passenger vessels effluent often contains high levels of fecal coliform and suspended solids. These vessels are currently allowed to discharge everywhere.

Large cruise ships are allowed to discharge wastewater continuously if they have received approval from the U.S. Coast Guard. Twice monthly samples must be less than 20 parts per million. DEC and the U.S. Coast Guard work together closely to monitor and enforce cruise ship wastewater issues in Alaska.

By way of comparison this is Sitka's wastewater situation according to.

Draft NPDES Permit for:
City and Borough of Sitka, Alaska
Municipal Wastewater Treatment Plant
NPDES No.: AK-002147-4

The CBS owns and operates the plant which treats domestic sewage from local residents and commercial establishments. The average monthly flow rate from the facility is approximately 1.5 million gallons per day (mgd). The CBS facility provides primary treatment to all wastewater prior to discharge to the Middle Channel of Sitka Sound. *Fecal coliform monthly limitations.* The CBS request that the proposed monthly average discharge limit of 1,000,000 FC/100mL be revised to the current permit discharge limit of 1,500,000 FC/100mL. The CBS states that of the six samples collected in the year 2000, two samples were in excess of the proposed limit of 1,000,000 and the CBS expressed its concern that the new limit will result in permit violations ([yosemite.epa.gov/R10/WATER.NSF/95537302e2c56cea8825688200708c9a/df2a6b6c1adebe28825687900599df3/\\$FILE/ATT532JB/ak0021474rtc.pdf](http://yosemite.epa.gov/R10/WATER.NSF/95537302e2c56cea8825688200708c9a/df2a6b6c1adebe28825687900599df3/$FILE/ATT532JB/ak0021474rtc.pdf)).

According to the
*Alaska Department of Environmental Conservation Science
Advisory Panel
Commercial Passenger Vessel Environmental Compliance
Program* November 2002

Cruise ship discharges should also be considered within the context of a background of fecal coli form from all land-based sources. The number of fecal coli form excreted by warm-blooded animals, including humans, ranges from 10^9 to 10^{10} organisms per gram of feces [Eaton et al. 1995]. Alderisio and DeLuca (1999) demonstrated that gull feces contained about 3.68×10^8 bacteria per gram and that goose feces contain about 1.53×10^4 bacteria per gram, and that the volume of geese waste was typically 15 times that of the gull. Fecal coli form densities in storm runoff in southern California are typically in

the tens of thousands per 100 ml [OCSD, 1989]. Waters adjacent to Marine mammal haul-out areas will also contain elevated fecal coli form levels.

Background sources of fecal coli form complicate the water quality picture and in many

Cases result in fecal coli form concentrations higher at the shoreline than offshore.

The average cruise ship with 3,000 passengers and crew generates 37,000 gallons of oily bilge water every day. In the wake of the Exxon Valdez disaster, the Oil Pollution Act amended the Clean Water Act to prevent oil dumping by ships. Oil discharged within 12 miles of shore must leave no "visible sheen" and measure less than 15 parts per million (ppm). Beyond 12 miles from shore, ships may release oily waste that measures less than 100 ppm. The law also requires ships to retain the remaining oily waste onboard until it can be disposed at appropriate reception facility on shore. Ships also must record the disposal of oily residues and bilge water. If a large ship generates 50,000 gallons per day bilge water this calculates to $15/1000000 = 1.5/100000 = .75/50000$.

Since summer of 2000 over 250 opacity readings per year have been taken to monitor air emissions by cruise ship and ferries

Ambient air was monitored in downtown Juneau for SO₂, NO_x, and PM_{2.5} during 2000 and 2001. The pollutant levels were found to be way below federal and state health based standards. See the "[Alaska Cruise Ship Initiative 2000 Season: Part 2 Final Report](#)"

The average cruise ship produces 2.2 Lbs. of burnable waste, 1.1Lbs. foodwaste and 2.2Lbs. glass and tin waste per. person per. day (Ubersax).

2005 Non-hazardous Waste (Garbage) Offloading in Alaska

Alaska Statute (AS) 46.03.475(e)(1) requires owners/operators of commercial passenger vessels to submit a nonhazardous solid waste offloading and disposal (garbage) plan to the Department of Environmental Conservation (ADEC) prior to operating in Alaska's marine waters. As established by regulation (18 AAC 69.035), the garbage plan must describe the policies and procedures for offloading non-hazardous solid waste in Alaska or disposing such waste into Alaska marine waters. The plan, which is due annually by March 1 for the upcoming season, must also provide estimates of the amount of garbage that will be offloaded and disposed in Alaska's waters. After the season is completed, any deviations from the plan must be submitted to the ADEC by November 15 of each year. Some owners/operators also submit optional information on garbage offloaded or

discharged outside Alaska (i.e., in Canada, Washington or California). Tables 1 and 2 summarize garbage offloading data submitted to the ADEC during the 2005 season. Ships that visited Alaska but are not in this table did not offload any garbage in Alaska this season.

Hazardous waste offloading

As part of the plan required under AS 46.03.475(e)(2), Commercial Passenger Vessels operating in the State of Alaska are required to submit a hazardous waste and hazardous substance offloading plan to the Department of Environmental Conservation (DEC) for each year of operation within the state. This plan must describe the vessels policies and procedures for offloading hazardous waste within Alaska.

Most commercial passenger vessels **do not** offload hazardous waste in Alaska and do not have to submit a plan. However all vessels have to fulfill requirements required under AS 46.03.475(d) by providing a copy of hazardous waste manifests submitted to Federal or Provincial governments to show disposal of hazardous wastes GENERATED while operating in state waters.

AS 46.03.826 defines hazardous substance as; (1) an element or compound which, when it enters into the atmosphere or in or upon the water or surface or subsurface land of the state, presents an imminent and substantial danger to the public health or welfare, including but not limited to fish, animals, vegetation, or any part of the natural habitat in which they are found; (2) oil; or (3) a substance defined as a hazardous substance under 42 U.S.C. 9601(14);

Small Ships

It is common practice for small cruise ships to unload garbage in the ports of Southeast Alaska and in 2005 Sitka received 542 cubic meters of garbage from small cruise ships. Sitka also receives far more small ship visits than other ports in Southeast Alaska. In 2003 Sitka had 140 small ship visits while Ketchikan had 100 visits and Juneau 96. Small ships do not have dry-cleaning or photo processing on board. Small ships do not produce enough hazardous waste to be required by law to manifest these wastes to a Federal or Provincial government. Typically, the only hazardous waste produced by the small vessels is used oil. However, some small ships have voluntarily reported other hazardous wastes that were offloaded during the 2005 season in Alaska, Canada, and Washington.

Summary

The executive steering committee for the ACSI convened in Jan 2000 their work lasted until 2001 and resulted in 2 reports on the environmental impacts of cruise ships. In December 2000, the President signed federal legislation enacting *Title XIV – Certain Alaskan Cruise Ship Operations*. This legislation gives the Coast Guard and EPA new responsibilities, including the implementation of a cruise ship inspection regimen and the establishment of effluent limits for treated black water and gray water. During a Special Session of the Legislature convened on June 7, 2001, HB 260 was passed, creating a Commercial Passenger Vessel Environmental Compliance Program.

All cruise ship discharges in Alaskan waters must be made while the ship is at a minimum speed of 6 knots and a distance of at least one-mile from shore. No cruise ship can discharge untreated black water anywhere in the Alaska waters of the Alexander Archipelago, waters of the U.S. within the State of Alaska. There is significant concern about the potential environmental impacts

of Cruise Ship waste streams. DEC and the U.S. Coast Guard work together closely to monitor and enforce cruise ship wastewater issues in Alaska. There have several past instances where cruise ships have been fined for illegal discharges. The most recent in the state of Alaska was 2002.

With the notable exception of the Exxon Valdez oil spill monitoring, there apparently does not exist any report on the state of the Alaska coast with respect to marine environmental contamination (such as exists for other states and regions)(ADEC impacts of cruise ship report). I have unable to find any reports of environmental damage by cruise ships in the State of Alaska. An independent panel of scientists that studied wastewater emissions by cruise ships found that emissions from large cruise ships don't threaten marine life due to high dilution factors and advanced treatment systems.

Most garbage from large cruise ships is offloaded out of state or incinerated onboard. It is common practice for small cruise ships to unload garbage in the ports of Southeast Alaska and in 2005 Sitka received 542 cubic meters of garbage from small cruise ships.

All of the large cruise ships hazardous waste is offloaded out of state in California, Washington or Canada. According to the state small cruise ships don't generate enough hazardous waste (primarily used motor oil) to require reporting. Some small ships do voluntarily report. Information can be found at

www.dec.state.ak.us/water/cruise_ships/pdfs/2005_haz_waste_offloading.pdf

Sources

www.epa.gov/owow/oceans/cruise_ships

www.dec.state.ak.us/water/cruise_ships

Environmentally sustainable cruise tourism: a reality check

David Johnson

<http://www.cse.polyu.edu.hk/~cekslam/Paper/science43.pdf>.

(www.dec.state.ak.us/water/cruise_ships/pdfs/cpvec_program_overview.pdf)

The Impact of Cruise Ship Wastewater Discharge on Alaska Waters

November 2002

http://www.alaska.gov/local/akpages/ENV.CONSERV/water/cruise_ships/pdfs/impactofcruiseship.pdf

There is a report on the environmental impact of cruise ships done by the American Society of Civil Engineers that is available for 15 dollars if this group thinks it would be helpful we may want to buy it. (

<http://scitation.aip.org/getabs/servlet/GetabsServlet?prog=normal&id=ASCECP000173040792000308000001&idtype=cvips&gifs=yes>)