



**CRUISE CONTROL —
REGULATING CRUISE SHIP
POLLUTION ON THE PACIFIC
COAST OF CANADA**

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EXECUTIVE SUMMARY

Every year over one million passengers board a cruise ship to travel north to Alaska, along BC's famed Inside Passage. Cruise ship travel on the Vancouver to Alaska route grew at a rate of over 5% a year over the past decade. By 2000, there were 336 cruise trips from BC to Alaska carrying 1,053,000 passengers and over 12,000 crewmembers.

And each year those passengers and crewmembers generate more waste than a small town the size of Courtenay or Penticton.

This report looks at the effectiveness of the regulations controlling cruise ship pollution. It also reviews the standards set in the US and Alaska to deal with the same problem.

THE INSIDE PASSAGE

Canada's Inside Passage, renowned for its scenic beauty, is one of Canada's most majestic and delicate ocean environments. This "inland sea" is home to many rare and endangered species and contains up to 3.5% of all marine invertebrates in the world. Millions of migrating birds find habitat in its estuaries, marshes and bays. The Inside Passage is home to several species of whales as well as thousands of coastal salmon runs.

Cruise ship passengers spend hundreds of millions of dollars a year to take in the splendour of the BC and Alaskan coastlines. In turn, these tourism values are dependent upon preserving the natural beauty and abundance of our coastline.

SOURCES OF POLLUTION

Cruise ships plying the Inside Passage produce and discharge six principal waste streams, all of which have the potential to damage BC's coastal environment.

- **Sewage:** human waste;
- **Grey water:** wastewater from sinks, showers, galleys and laundry — may contain detergents, cleaners, oil and grease, metals, pesticides and medical waste;
- **Oil and Bilge water:** fuel, oil, oily water, on-board spills collected in the bilge located in the bottom of the cruise ship's hull;
- **Hazardous wastes:** toxic chemical waste from dry cleaning, photo processing, paint and solvents, batteries, fluorescent lamps and other sources;
- **Solid Wastes:** plastic, paper, wood, cardboard, food waste, cans or glass; and
- **Air pollution.**

With an average of 2,000 passengers and crew on every trip, cruise ships are floating towns, generating similar amounts of waste, sewage and garbage. Cruise ship pollution grows as the industry grows.

PROTECTING OUR WATERS FROM CRUISE SHIP POLLUTION: THE AMERICAN EXPERIENCE

The US and Alaskan governments have recognized the importance of environmental protection to the continued development of the cruise ship market and have developed an

extensive set of regulatory requirements to effectively monitor and restrict cruise ship pollution.

These regulations include the newly passed *Alaskan Commercial Passenger Vessel Regulation and Fees* law developed after a voluntary pollution control program was shown to be ineffective in the face of growth in the cruise industry.

Tighter restrictions were also imposed in the US after evidence of the industry's poor environmental record was made public. Between 1993 and 1998, there were 104 American prosecutions against cruise ships for pollution offences. Prosecutions resulted in over \$30 million (US) dollars in corporate fines.

PROTECTING OUR WATERS FROM CRUISE SHIP POLLUTION: THE CANADIAN EXPERIENCE

Canada is in its infancy in protecting against cruise ship waste and pollution. Laws and policies have not yet been updated to reflect the growth of the industry and its increasing pollution streams. In fact it is difficult to determine who is polluting how much because inspection and monitoring is minimal.

Where controls and regulations exist in the United States none exist in Canada: there are no standards for grey water discharge and no general prohibitions on untreated sewage discharge. American standards for hazardous and solid wastes are considerably stronger than Canadian standards.

Inspection, monitoring and enforcement are woefully weak to non-existent in Canada. While an industry funded inspection and monitoring system produces charges and millions of dollars in industry fines in the US, there have been no prosecutions of cruise ships and no fines levied over a similar period in Canada. In many cases, the same ships and the same companies operate in Canadian and American coastal waters.

PRESERVING THE GOOSE THAT LAYS THE GOLDEN EGG: RECOMMENDATIONS FOR CANADIAN CRUISE SHIP LAW REFORM

1. Create a new set of Cruise Ship Pollution Prevention regulations under the *Canada Shipping Act* — targeting sewage and grey water particularly.
2. Create comprehensive controls for grey water — if comprehensive pollution prevention regulations are not passed, at a minimum new regulations are required to capture the entire grey water waste stream.
3. Harmonize Canadian regulations with American standards — one set of standards should apply to the entire BC to Alaska cruise ship route.
4. Ban all cruise ship discharges in sensitive areas — key natural habitat, ports and other sensitive areas should be completely protected from cruise ship discharges.
5. Establish and strengthen effective inspection and enforcement systems — compliance depends upon effective enforcement.



INTRODUCTION

As the cruise ship fleet expands, and cruise trips become more popular, the volume of pollution generated by cruise ships also increases. Each year approximately one million cruise ship passengers embark from the port of Vancouver on the Vancouver- Alaska cruise, one of the world's most popular cruise routes. These "floating towns" carry an average of 2000 cruise ship passengers and crew on each trip and generate substantial volumes of waste.¹ Though the impacts of their sewage, oil, grey water (waste water from sinks, showers, galleys and laundry), garbage, air emissions and hazardous waste on the marine environment are not well documented, all these waste streams can have negative impacts.

Public concern about cruise ship pollution in BC is on the rise. This report describes the current laws regulating pollution from cruise ships in British Columbia.² Its purpose is to provide more information to the public about the current laws that apply in BC, compare these laws to those in the US, and suggest some possible changes to the Canadian laws.

Prevention of pollution from these ships is a public concern. Recent changes in the US have strengthened cruise ship pollution control laws in that jurisdiction. But Canadian laws have not kept pace. The federal *Canada Shipping Act*³["*Canada Shipping Act*"], the primary Canadian pollution control law for ships, controls some, but not all types of pollution and waste discharges from cruise ships. Cruise ships are free to discharge sewage and grey water into most areas of the Georgia Strait and the Canadian section of the transboundary Inside Passage (other than the ten designated no-discharge zones for sewage), contributing to the degradation of marine waters of BC. (In practice, untreated raw sewage is rarely, if ever, discharged from cruise ships, but grey water is more routinely released.) The current

Canadian laws do not prohibit these types of discharges, except in limited circumstances.

US regulations governing pollution from the cruise ship industry are stronger than the Canadian rules. Recently, well-publicised cruise ship pollution violations in Alaska have prompted American regulators to pass even more stringent laws and regulations. On June 29, 2001, the *Alaska Commercial Passenger Vessel Regulation and Fees* law was passed, setting enforceable cruise ship wastewater and air discharge standards and creating an industry funded program of sampling, testing and reporting. Stronger American legislation raises the possibility ships cruising the Inside Passage along the west coast of Vancouver, will take advantage of weaker laws in Canada and dump their sewage and wastewater before entering or after leaving Alaskan waters.

As borders dissolve around the world, and industries grow more and more accustomed to operate under internationally established rules for business, one set of environmental rules for the cruise industry makes sense. Those rules should ensure that the marine environment is protected. Protecting the natural assets on which the success of the industry lies — spectacular scenery, abundant wildlife, clean water and air — is common sense. But what is the best way to prevent cruise ship pollution? Regulations are one proven method to prevent pollution. Changing the Canadian regulations to align with the new more stringent US rules is one solution to this form of pollution. Other than the cruise

BC Sewage No Discharge Zones

The ten marine no discharge zones for sewage in BC are Carrington Bay (northwest coast of Cortes Island in the Strait of Georgia), Cortes Bay (east coast of Cortes Island in the Strait of Georgia), Manson's Landing and Gorge Harbour (southwest coast of Cortes Island in the Strait of Georgia), Montague Harbour (southwest coast of Galiano Island in the Strait of Georgia), Pilot Bay (near Gabriola Island in the Strait of Georgia), Prideaux Haven in Desolation Sound, Roscoe Bay, Smuggler Cove (southwest of Secret Cove), Squirrel Cove (east coast of Cortes Island in the Strait of Georgia), Shuswap Lake (north of Salmon Arm), Mara Lake (East of Salmon Arm) and the Okanagan Lakes (west of Kelowna).

ship industry's promotion of voluntary standards, stricter regulations advocated by nongovernmental authorities and some government agencies (in the US) are the only current proposals to address this environmental problem.

BACKGROUND

Why has the issue of cruise ship pollution become a concern in BC? In 2000, there were 336 cruise trips from BC to Alaska, and the number of trips is projected to increase. A combination of more cruise ship traffic and publicity about the industry's poor environmental record has raised public concerns.

In August 2001, an Alaska federal court judge ordered a cutback in the number of cruise ships allowed in Glacier Bay, one of the top attractions along the Vancouver to Alaska cruise route. The cutback was due to the US Parks' service failure to complete a supplementary environmental impact study on the effects of a growing number of cruise ship voyages to the Bay.

A report from the US General Accounting Office (GAO) in 2000 detailed numerous violations, prosecutions and penalties imposed on cruise ships in US and Caribbean waters in the 1990s. From 1993 to 1998 alone, cruise ships were involved in 104 confirmed cases of illegal discharges of oil, garbage, and hazardous wastes, and paid more than \$30 million in fines. Evidence from plea bargain agreements in these US cases also showed that some cruise ship lines had routinely and regularly illegally discharged harmful waste water in hundreds of incidents so the actual number of illegal discharges was far higher than the number of convictions. Although the majority of discharges were found to be accidental, 13% of the incidents involved intentional release of large volumes of waste.⁴



Record Fines around the world

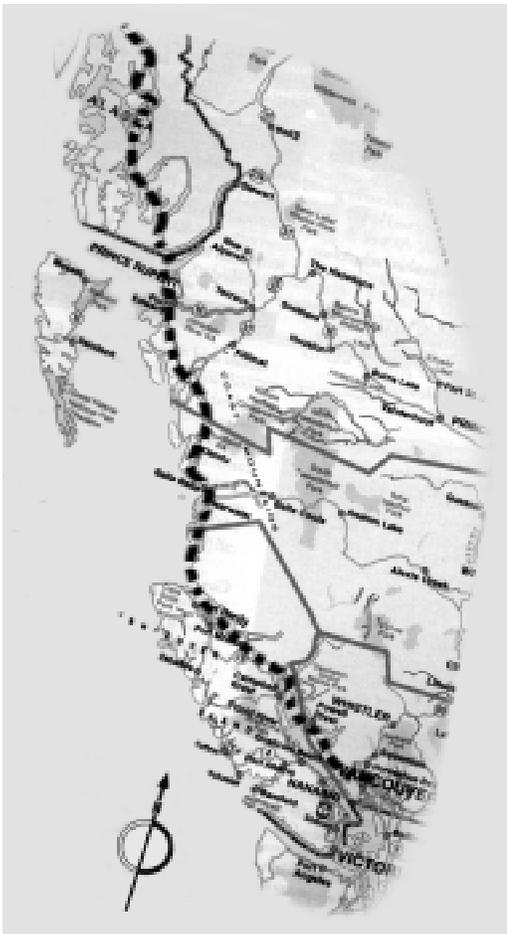
Stories of some cruise ship lines' blatant disregard for the law made headlines around the world. For example, Royal Caribbean Cruises Ltd. admitted to an extended, deliberate, routine dumping of waste oil and hazardous chemicals from photo processing labs, dry cleaning operations and print shops into several US harbours and coastal areas. The company pled guilty to a total of 21 felony counts in six US jurisdictions, and agreed to pay a record \$18 million in criminal fines.⁵ While most of the violations were in the Caribbean, Royal Caribbean Cruises Ltd. and Holland America Line Westours Inc., were convicted of illegally polluting the Inside Passage, within American waters, last year. Royal Caribbean was fined \$6.5 million; Holland America paid \$1 million in fines and \$1 million in restitution.⁶ An Associated Press analysis of marine pollution records revealed 26 allegations of cruise ships polluting Alaskan waters in the last nine years.

The actions of one US non-governmental organization have also raised public awareness about the cruise ship/pollution connection. In the spring of 2000, the Bluewater Network petitioned the US Environmental Protection Agency (EPA), setting a chain of events into motion which eventually led to more thorough scrutiny of the industry's environmental practices and improved regulations for Alaska, both in federal legislation and, late last month, in Alaska state law. Bluewater's petition asked the US EPA to make a thorough assessment of all cruise ship discharge and to take regulatory action on measures to address pollution by cruise ships.⁷

In response to the Bluewater petition, the EPA:

- Launched a national review of the cruise ship industry, looking for loopholes and exemptions in existing laws in order to determine whether tighter rules are warranted to reduce cruise ship pollution,
- Promised to conduct a dilution study of cruise ship discharges by June 2001,
- Issued a white paper that provided preliminary recommendations,
- Held 3 regional hearings to obtain additional information from concerned citizens, and
- Established an interagency work group to review the assessment of cruise ship environmental impacts and make recommendations regarding appropriate action.⁸

In addition, in 1999, the Alaska Department of Environmental Conservation (ADEC) established an Alaskan Cruise Ship Initiative. The steering committee consists of members of the ADEC, the Coast Guard, the EPA and the cruise ship industry who discuss and review the cruise ship industry's waste management and disposal practices. The steering committee has four work groups (air, water and solid waste, spill response, and environmental leadership) that meet regularly to identify problems and propose recommendations in various areas within the cruise industry.⁹



THE INSIDE PASSAGE CRUISE ROUTE

Though the Alaska route is a relatively short cruise route, it has been growing steadily with an estimated increase of an average of 5% a year through to 2003.¹⁰ The year 2000 was the 18th straight year of growth with 1,053,989 revenue cruise passengers¹¹ (an increase of 11% over 1999) and 336 voyages (an increase of 9% over 1999).¹² There were a total 13 cruise lines and 27 ships with 571,000 berths offered and 14,747 crewmembers operating on this route.¹³

Many of these cruise ships are foreign owned and originate from American ports, including San Francisco and Seattle, before entering into Canadian waters. An old US law entitled the *US Passenger Services Act*, restricts foreign cruise ships from transporting passengers between two American cities. Originally enacted to protect domestic transportation, the law in practice means that foreign ships going to or coming from Alaska must make a stop over in Canada, before continuing on. This means that any cruise traffic to and from Alaska directly impacts Vancouver and the BC coastal environment.¹⁴

Canada's sheltered Inside Passage, (*see map, previous page*) sometimes called an inland sea, is home to many rare and endangered species of flora and fauna. The productive estuaries, saltwater marshes and bays provide good habitat for over a million migrating birds, many of which are not found anywhere else in North America, several species of whales and other sea mammals,¹⁵ 3,800 species of invertebrates making up 3.5% of all marine invertebrates in the world,¹⁶ and the world's greatest variety of sea stars.¹⁷

The Canadian Coast Guard recognizes that boats of all kinds can negatively impact marine life. It has identified many marine areas that are especially sensitive to boating and to people, such as seal haul-outs, bird rookeries, whale-watching sites, estuaries, and wetlands, and aquaculture sites, and recommends that boaters make special efforts to avoid inadvertently harming these areas and the animals that depend on them.¹⁸ Yet little effort appears to be made to warn cruise ships away from these sensitive areas. Public information about cruise ship pollution in Canada is scant. A search of the Canadian Coast Guard web site for the phrase "cruise ship pollution" returned no replies.

CRUISE SHIPS IN VANCOUVER

A number of cruise lines operate out of the Vancouver port. For the year 2001, the major lines and the number of ships they have operating are; Carnival (1), Celebrity Cruises (2), Cruise West (1), Crystal Cruises (1), Hapag Lloyd (1), Holland America (6), Norwegian Cruise Lines (2), NYK (1), Mitsui O.S.K. Lines (1), Princess Cruises (5), Radisson Seven Seas (1), Royal Caribbean (3), World Explorer (1).¹⁹

The cruise industry generates substantial tourism dollars for British Columbia and for Canada. It is estimated that Passenger spending, plus cruise lines pending for supplies and services, amounts to approximately \$508 million dollars annually for Western Canada.²⁰

In a 1999 study by Tourism-Vancouver:

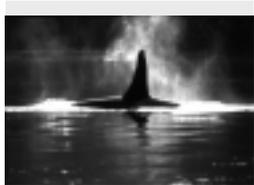
- industry output (sum total of all economic activity as a result of cruise passenger spending in *Greater Vancouver*) was \$172,393,994,
- wages and salaries (generated by initial cruise passenger spending) was \$61,727,517,
- taxes contributed to municipal, provincial and federal government relating to initial cruise passenger spending was \$39,738,549, and

Facts and figures

The worldwide cruise ship industry is worth over US\$12 billion and carried some 9.5 million passengers in 1998. With a consistent global growth rate of 8%, the industry expects to add 57 new vessels to its existing fleet of 223 by the year 2004, increasing passenger capacity by 35%. Approximately one-half of this fleet operates in North American waters on three main routes: Florida–Caribbean, California–Mexico, and Vancouver–Alaska.¹

¹ General Accounting Office. Report to Congressional Requesters. *Marine Pollution: Progress made to reduce marine pollution by cruise ships, but important issues remain*, February 2000. ("GAO Report") GAO website, www.gao.gov.





Impacts from cruise ships on marine ecology have received little study in Canada. Yet alarmingly, there are signs that increased cruise ship traffic is causing ecosystem stress. One example is Orcas, or killer whales, one of the most valuable species in economic terms to the province of BC. Seven killer whales from BC's fragile Orcas population have been presumed in 2001, triggering widespread alarm in the scientific and whale-watching communities. Dr. John Ford, who has been monitoring the whales for 20 years, said the deaths appear to be caused by a combination of factors, among them too little food, too many toxins and too much noise from whale-watching boats and other vessels.¹

¹ Charlie Anderson "Are We Killing Our Whales?" Vancouver Province, June 2, 2001, Page 3.

- 2,990 jobs were created (including full time and part time work generated by initial cruise passenger spending).²¹

In a separate study conducted by the North West Cruise Ship Association in 1999, it was estimated that each time a ship pulls away from the dock in Vancouver, it has left \$1 million in benefits to the economy.²²

The economic benefits generated by the cruise industry are important for British Columbia. Failing to adequately protect the marine environment could jeopardize the continued success of the industry, if tourists reject the Inside Passage destination due to degradation of the environment they have come to experience, or to concerns about inadequate environmental protection.

CANADIAN LEGAL CONTROLS FOR CRUISE SHIP POLLUTION

Cruise ships are regulated by both international and national law. In Canada, the federal government, not the provincial, has the constitutional jurisdiction to control cruise ship pollution through its powers over navigation and shipping; seacoast and inland fisheries; and trade and commerce. The federal government has control over Canada's territorial waters, extending 12 miles out to sea from the low water line.²³

A host of international laws dictate the content of national ship source pollution laws, particularly the *International Convention for the Prevention of Pollution from Ships* (MARPOL) and its six Annexes. The International Maritime Organization (IMO) administers this Convention, like other marine conventions. The signatories to MARPOL undertake to prevent pollution of the marine environment by creating national regulations that are consistent with MARPOL to control the discharge of harmful substances or effluents. Harmful substances are defined to include any substance which if introduced into the sea, is liable to create hazards to human health, harm living resources and marine life and damage amenities or interfere with other legitimate uses of the sea. MARPOL's chief controls are on preventing vessel discharges through the regulation of different types of pollutants in the Annexes.²⁴

MARPOL is generally considered to be a successful convention. Ship-generated pollution has fallen since it was adopted — from approximately 35% of global marine pollution sources in the early 70's to approximately 10% by the early 90's.²⁵ Many other marine treaties also apply to cruise ships. While treaties are important in establishing the global rules for the industry, these rules cannot usually be directly enforced against violators due to the nature of international treaties. Therefore, this report focuses on the Canadian federal laws that can be directly enforced against potential violators.

Main Law — *Canada Shipping Act*

The *Canada Shipping Act* [CSA] and its regulations are the primary legal controls on pollution from ships in Canada. The CSA is administered by Transport Canada.

PART XV of the CSA regulates pollution prevention and response from ships in Canadian waters. The CSA does not define cruise ships, but does define "ship,"²⁶ "discharge,"²⁷ and "pollutant."²⁸

PART XV gives the Minister of Transport wide powers to make regulations to control pollution from ships. A number of regulations have been passed, including regulations to prevent oil pollution, garbage dumping, and restrict sewage disposal in some limited cases. These regulations are discussed in more detail below.

Other federal laws are also part of the regulatory framework for cruise ship pollution control, including:

- Environment Canada administers the *Fisheries Act* (R.S. 1985, c. F-14), which prohibits the deposit of “deleterious substances” into fish habitat, or areas fish could inhabit, and also prohibits the harmful alteration, disruption to or destruction of fish habitat. The primary purpose of this *Act* is the protection of fish and their habitat, not prevention of pollution from ships.
- The *Canadian Environmental Protection Act, 1999* (c. 33), (CEPA) protects the marine environment by regulating the dumping of land-based sources of pollution (e.g., city garbage, toxic wastes). Administered by Environment Canada, the act prohibits dumping at sea unless requirements are met to obtain a permit. However, this act does not regulate normal ship operations and is primarily targeted at pollution produced on land. Cruise ships are not regulated under this legislation and not required to obtain ocean dumping permits. Additional CEPA controls on toxic substances apply to all pollution sources in Canada, including cruise ship pollution.
- The *Oceans Act, 1996* (c.31), gives the Minister of Fisheries and Oceans the power to develop and implement marine and coastal management strategies.

RECENT DEVELOPMENTS IN CANADIAN LAW

Transport Canada (TC) and the Department of Fisheries and Oceans are currently revising the *Canada Shipping Act*. Transport Canada is holding consultations to explore more appropriate options for addressing the effective management of vessel-based sewage pollution. The national Canadian Marine Advisory Council meeting in Ottawa in May 2000 agreed to develop, on the west coast, a pilot set of implementation standards for sewage regulations for all shipping, that could then be extended across the country. Work on developing these standards is ongoing. A working group composed of 60 people (“West Coast Working Group”) is currently helping TC to develop the standards, which will be implemented by a revised set of regulations. The new regulations are expected by the end of 2001.

These discussions do not yet include proposals for national regulations on grey water discharge. The recent increase in cruise ship operations and concerns over grey water may require a re-examination of whether to regulate grey water.²⁹

The West Coast Working Group is considering what type of standard to apply to the Inside Passage, whether an international one, one similar to the Great Lakes or another variation. The group is considering the current innovations and successes with US initiatives.³⁰

Why hasn't the *Fisheries Act* been used to prosecute pollution violations by cruise ships?

The federal *Fisheries Act* prohibits the harmful alteration, damage to or destruction of fish habitat and also prohibits the deposit of “deleterious substances” into fish bearing waters. Government regulators agree that there is no reason why this *Act* could not be used to prosecute cruise ships or other ships for dumping sewage or wastewater containing harmful chemicals into BC waters. Sewage may have a deleterious effect on fish, by lowering the amount of oxygen in the water. The *Fisheries Act* has been used on numerous occasions to prosecute pollution offences in marine waters from a variety of sources. Yet no prosecutions have been brought against cruise ships to date for violations of the federal *Fisheries Act* in Canada.



US LEGAL CONTROLS FOR CRUISE SHIP POLLUTION

Generally, there are more regulatory controls on cruise ship pollution in the US than in Canada. The main law controlling cruise ship pollution in the US is the *Clean Water Act*, which sets rules limiting where untreated sewage, oil, and hazardous and other types of waste can be discharged in US navigable waters. A host of other US laws also applies to cruise ship pollution: the *Oil Pollution Act*; *Act to Prevent Pollution from Ships*; the *Clean Air Act* and others. The new Alaska state law further restricts cruise ship discharges, including grey water discharge.

For a full description of these laws, see the report from the Bluewater Network: *Cruising for Trouble: Stemming the Tide of Cruise Ship Pollution*,³¹ the Alaska Cruise Ship Initiative,³² and the Cruise Ship Discharges web site of the US Environmental Protection Agency.³³

The parts of these Acts relevant for each cruise ship waste stream are briefly described below in both a table and narrative form in order to provide a comparison with the existing Canadian laws.

WASTE STREAMS FROM CRUISE SHIPS AND REGULATIONS CONTROLLING WASTE

Environmental impacts from cruise ships come from many sources. Waste streams can be classified into six different types:

- (1) sewage,
- (2) grey water
- (3) oil pollution,
- (4) hazardous waste
- (5) solid waste and
- (6) air pollution.³⁴

Ballast water, water used on a ship to control buoyancy during loading and offloading, is also an environmental issue as it is a large pathway for the introduction and spread of aquatic nuisance species. Though ballast water is a problem, this report does not address ballast water issues or controls.³⁵

A description of each of these types of waste and both the Canadian and American regulations used to control the different waste streams is set out below. A chart comparing the Canadian and American regulations to control cruise ship pollution follows the descriptions of the waste and applicable regulations. Transport Canada lists no water quality objectives in the *Canadian Shipping Act*.

COMPARISON OF US AND CANADIAN LAWS REGULATING CRUISE SHIP POLLUTION

	Legal Requirement	US Federal Law	Alaska Law	Canadian Law
STANDARDS FOR SEWAGE	Requires MSD	Required.	Required.	Not required.
	Prohibits dumping of sewage within specified distance of shore	<p>3 miles for raw/inadequately treated sewage.</p> <p>1 nautical mile for treated (to federal standards) sewage and boat speed must be at least 6 knots. (Applies in Alaska only).</p> <p>To discharge at less than 1 nautical mile and/or slower than 6 knots need to meet more stringent standards and receive permission from the Coast Guard. (Applies in Alaska only).</p> <p>3 nautical miles from the farthest coastal point for raw sewage (prevents discharge in “donut holes” (Applies in Alaska only).</p>	Same as federal.	<p>Restrictions where needs are demonstrated (s.656 CSA)</p> <p>Regulations specify a limited number of no-discharge zones. No other restrictions on sewage.</p> <p>The <i>Fisheries Act</i> prohibits activities that could damage, destroy or harmfully alter fish habitat. This <i>Act</i> also prohibits the deposit of “deleterious substances” into fish bearing waters.</p>
STANDARDS FOR GREY WATER	Standards for grey water discharge	<p>No standards although the US EPA has been given authority to establish a new grey water standard. (Still under debate on whether this will only apply to Alaska or nationwide.</p> <p>Bans discharge of untreated grey water within one mile from shore while the ship is at rest. (Applies in Alaska only).</p>	<p>(In effect by 2003) Must not exceed fecal coliform count of greater than 200 colonies/100ml for ships discharging more than 1 mile from shore and travelling at least 6 knots.</p> <p>Must not exceed suspended solids of more than 150 mg/L.</p>	<p>No grey water standards.</p> <p>Same <i>Fisheries Act</i> prohibitions as above.</p>
	Prohibits dumping of grey water within specified distance of shore	Untreated grey water dumping prohibited within 1 mile from shore while boat is at rest. (Applies only to Alaska).	1 nautical mile.	<p>Not regulated.</p> <p>See above.</p>

COMPARISON OF US AND CANADIAN LAWS REGULATING CRUISE SHIP POLLUTION (CONTINUED)

Legal Requirement	US Federal Law	Alaska Law	Canadian Law
STANDARDS FOR OIL POLLUTION	<p>No detectable discharge of oil in US navigable waters, adjoining shorelines or contiguous zone.</p> <p>Discharge of oil within 12 miles of shore is prohibited unless passed through a 15 ppm oil water separator and does not cause a visible sheen.</p> <p>Beyond 12 miles, oil can be discharged en route if oil content without dilution is less than 100 ppm.</p>	<p>Not addressed.</p> <p>There are separate Alaska state regulations that govern oil pollution and that can be found under title 18 chapter 75.</p>	<p>“Zero discharge”.</p> <p>Oily bilge water can be discharged if it has been processed had has an oil content of less than 15 parts per million (not detectable by the naked eye).</p> <p>All discharges must be recorded.</p>
STANDARDS FOR HAZARDOUS WASTE DISPOSAL	<p>The <i>Clean Water Act</i> prohibits the dumping of hazardous waste into US waters. However, monitoring and reporting vary depending on “generator” size.</p> <p>It is unclear whether cruise ships should be considered large quantity, small quantity or conditionally exempt small quantity generators. The amount of hazardous waste disposed of changes from month to month. There is also confusion as to how to define “generator” — as the ship or as the company as a whole. As the company it would undoubtedly be a large quantity generator, but as a ship it may still be a small quantity generator. “Point of generation” — on the ship or where the waste is offloaded, is another contentious. Hence, the law governing hazardous waste is unclear.</p> <p>Large quantity generators (greater than 1,000 kg) have stringent regulations, including record keeping, labelling, systems to ensure that waste goes to permitted facility, and supplying information on the general chemical composition of hazardous wastes. Small quantity generators (100-1,000 kg) have less stringent tracking and reporting.</p> <p>Other legislation requires that all releases of hazardous substances from vessels in “reportable quantities” be reported to the National Response Center immediately.</p>	<p>Not specifically addressed although there is room for negotiations to set standards.</p> <p>Alaska state law outside of the new law does address hazardous waste and adopts the federal guidelines set out in 40 C.F.R. 264.</p>	<p>Governed by a number of regulations that detail when and how to report discharges, which chemicals are prohibited from discharge, storage and handling, and how hazardous waste should be treated both federally and provincially (<i>CSA</i>).</p> <p><i>Fisheries Act</i> prohibits deposit of “deleterious” substances.</p>

COMPARISON OF US AND CANADIAN LAWS REGULATING CRUISE SHIP POLLUTION (CONTINUED)

Legal Requirement	US Federal Law	Alaska Law	Canadian Law
STANDARDS FOR SOLID WASTE DISPOSAL	<p>Prohibition on the discharge of any type of plastics into the water.</p> <p>Floating dunnage, lining and packing material discharge is prohibited in navigable waters and in offshore areas less than 25 nautical miles from land.</p> <p>Food waste, paper, rags and glass cannot be discharged in navigable waters or in waters offshore inside three nautical miles from the nearest land.</p> <p>Material that would adversely affect human health, welfare, amenities, marine environment, ecological systems or economic potentialities is prohibited from discharge. Includes solid waste, sewage, sewage sludge, chemical and biological warfare agents, radioactive materials, etc.</p>	Not addressed.	<p>Prohibition on solid garbage dumping in the Inside Passage.</p> <p>No prohibitions on disposal of ground up food wastes.</p>
STANDARDS FOR AIR POLLUTION	<p>No specific legislation for cruise ship air emissions.</p> <p>The EPA has promised to formulate standards for NOx and particulate emissions for Category 3 (large ships) marine engines by April 2002 and finalize the standards in January 2003. This is in result of the recent success of Bluewater's lawsuit against the EPA for not having any NOx standards.</p>	<p>The Department of Environmental Conservation is authorized to research, monitor and study the opacity of air emissions from the vessels.</p> <p>State regulations also prohibit any visible air emissions within three miles of the Alaska coastline, that reduces visibility by more than 20 percent (Title 18 Environmental Conservation, Chapter 50 Air Quality Control, Section 70).</p>	Prohibits the discharge of emissions beyond a maximum level (20% black space) and prohibits the unnecessary discharge of soot within 1,000 yards of land.

COMPARISON OF US AND CANADIAN LAWS REGULATING CRUISE SHIP POLLUTION (CONTINUED)

Legal Requirement		US Federal Law	Alaska Law	Canadian Law
STANDARDS FOR MONITORING & ENFORCEMENT	Independent monitoring of samples	None.	State can monitor and sample without "authorization" from ships.	No monitoring.
	Monitoring and reporting requirements	<p>The Coast Guard examines the sewage and grey water discharge record book (tracks when, where, volume, type, flow rate and vessel speed), environmental compliance records, and performs a general examination of the vessel.</p> <p>Within 90 days of initial entry into Alaska, the ship is required to submit a certificate of participation under a Quality Assurance/Quality Control Plan for acceptable sampling and analysis.</p> <p>Not less than 30 days and not more than 120 days prior to initial entry, the vessel must provide certification that they meet the minimum standards for grey water and sewage effluent.</p> <p>Within 30 days of initial entry into Alaska provide a sampling plan for review and undergo sampling and testing for conventional pollutants of all treated sewage and grey water effluents.</p> <p>Be subject to unannounced, random sampling of treated sewage and grey water effluent.</p> <p>Vessels are responsible for all costs.</p>	<p>Ships required to register with the state and agree to terms and conditions.</p> <p>Ships are required to report on onshore discharge of any hazardous materials.</p> <p>Independent laboratories perform test sample analysis to ensure public accountability.</p> <p>Stakeholders can participate in negotiated rulemaking to set standards limiting discharge of fecal coliforms, ammonia, chlorine, COD, BOD.</p> <p>DEC can board ships for inspections and waste water sampling. Cruise industry must pay for at least 2 sampling events/year.</p> <p>DEC directly oversees mandatory monitoring testing of grey water and sewage water by independent 3rd parties.</p>	<p>Coast Guard monitors and enforces existing Transport Canada regulations. No jurisdiction over vessel sewage treatment. Focus primarily on safety issues.</p> <p>Primary means of looking for illegal discharges is through aerial surveillance.³⁶</p> <p>Focus on garbage and oil.</p> <p>DFO inspectors have to power to inspect, examine and take samples from any vessel that they believe on reasonable grounds to be undertaking an activity that could result in the deposit of deleterious substances in areas frequented by fish.</p>

COMPARISON OF US AND CANADIAN LAWS REGULATING CRUISE SHIP POLLUTION (CONTINUED)

Legal Requirement	US Federal Law	Alaska Law	Canadian Law
Number of prosecutions against cruise ships for pollution offences	From 1993-1998, there were 104 confirmed cases of illegal dumping with more than \$30 million in fines.	0	0
Fines for non-compliance	\$2000 – \$5000 civil penalty for each violation under §1322(j) of the <i>Clean Water Act</i> .	\$500 – \$100,000 civil penalty for a first violation and up to \$10,000 for each day a ship remains in violation.	<p>Summary conviction fine of up to \$250,000 and/or 6 months imprisonment (CSA)</p> <p>or</p> <p>Indictable offence; fine of up to \$1 million and/or 3 years imprisonment (s.664 CSA).</p> <p>Joint and several civil liability to Crown for all costs and expenses to prevent, mitigate and remedy all adverse effects to fish habitat (<i>Fisheries Act</i>)</p> <p>and/or</p> <p>Indictable offence; fine of up to \$1 million for first offence and \$1 million and/or 3 years imprisonment</p> <p>or</p> <p>Summary conviction; 1st offence \$300,000 and subsequent offences \$300,000 and/or 6 months imprisonment.</p>
Fees for monitoring and enforcement	Not addressed.	\$1 per cruise ship passenger.	Not addressed.



1. Sewage — Description and Environmental Impact

Effects of Sewage on Marine Waters Sewage in marine waters, discharged from various sources including cruise vessels and municipalities, can degrade water quality; smother habitats; impact plant/animal habitat uses and impact human uses of marine species.¹

The marine environment is degraded from the introduction of both disease-causing microorganisms and excessive nutrients. Eutrophication occurs when an excess of sewage nutrients, like nitrogen and phosphorous, promote excessive algal growth, consuming oxygen levels in the water and preventing photosynthesis in other marine plants. The low levels of oxygen are below the amount required for fish and other marine animals, resulting in fish kills and a loss of diversity in the sea floor community. Plankton, which forms the base of marine food chains, also suffers a decrease in diversity and quantity. Bacteria and viruses tend to attach to particles and sink to the bottom, remaining in sediments that could become re-suspended.² Sewage could also contaminate shellfish beds by being taken up by bottom dwelling organisms, which can convey virtually all water-borne pathogens and viruses to humans.³ The incidence of human disease caused by the consumption of contaminated filter feeding shellfish such as oysters, clams and mussels is well documented.⁴

¹ BC Nearshore Habitat Loss Work Group, A Strategy to Prevent Coastal Habitat Loss and Degradation in the Georgia Basin, (Victoria: Government of BC) June 2001.

² San Francisco Estuary Project. How Boat Sewage Discharges Affect the Environment. Found at www.abag.ca.gov/bayarea/sfep/programs/boated/Sewage.html

³ San Francisco Estuary Project. How Boat Sewage Discharges Affect the Environment. www.abag.ca.gov/bayarea/sfep/programs/boated/Sewage.html

⁴ B.H. Kay. A State of the Environment Report: Pollutants in British Columbia's Marine Environment: A status report. Environment Canada. April 1989.

In a one-week trip, a typical cruise ship generates an estimated 210,000 gallons (794,936 litres) of sewage. During peak summer season, with an average of 20 ships carrying 2,000 passengers each, the daily discharge of sewage is approximately 2.5 million gallons per day (9.5 million litres), equivalent to the entire amount of sewage discharged in the city of Juneau.³⁷

“Black water” or vessel sewage, is more concentrated than domestic sewage because less water is used for sanitary purposes on cruises than on land. Due to American requirements, vessel sewage within a certain distance from the land is often treated to secondary standards before being discharged. However, due to the lack of specific Canadian laws requiring this treatment, there are potentially numerous problems that could be associated with the discharge of sewage from vessels.

Sewage solids cause increased turbidity that could alter the benthic habitat.³⁸ Sewage is also visually repulsive and poses health related hazards for water sports like swimming, scuba diving, and surfing.³⁹ The human impact can be seen in the closure of two out of 51 sampled beaches in the British Columbia region (August 27, 2001)⁴⁰ and the closure of as many as 11,270 beaches across the US (2000).⁴¹ Though not the primary source of pollution for these closures, vessel discharge, especially from large cruise ships, is a source of contamination. Shellfish closures are also a problem in coastal waters in BC, due to sewage and other pollution. Although this sewage originates primarily from treatment plants, and failing septic systems from houses, boat sewage is also listed as a cause of contamination contributing to BC shellfish closures.⁴²

In addition to natural human waste, cruise ship passengers may also flush plastics from personal hygiene and other products (e.g. toothbrushes, plastic bottles, disposable razors, feminine hygiene products etc.) down the ship's toilets. Once in the system, the products can be discharged into the sea with the black water if the waste is discharged directly without secondary treatment. Debris

discharged with the sewage includes plastics, which are hazardous to birds and mammals that eat it or become entangled and often die.⁴³ As many as 50,000 northern fur seal pups have died in a single year due to entanglement.⁴⁴

Pharmaceutical drugs are another class of water pollutant that increasingly surface in water, including antibiotics, hormones, painkillers, tranquilizers and chemotherapy chemicals. Humans excrete these drugs, and little research has yet been done on this issue.⁴⁵

Current Canadian Regulations for Sewage from Cruise Ships

The *Canada Shipping Act* has three regulations related to sewage from cruise ships:

1. The *Non-Pleasure Craft Sewage Pollution Prevention Regulations (NPCSPP) (SOR/91-659)* is the most important regulation of the three. Any ship carrying paying passengers is a non-pleasure craft according to the CSA's definition. Cruise ships are therefore classified as "non-pleasure craft".
2. The *Great Lakes Sewage Prevention Regulations (C.R.C., c. 1429)* require ships to have marine sanitation devices in the Great Lakes area. The only sewage regulations that currently apply to areas frequented by large passenger ships are these *Regulations*, which may provide a model for cruise ship regulation on the Inside Passage route.
3. The *Pleasure Craft Sewage Pollution Prevention Regulations (PCSPP) (SOR/91-661)*. These regulations were introduced in 1991 to control sewage pollution from vessels in select Canadian waters other than the Great Lakes, and were amended recently to limit sewage discharge in include some marine sites off the coast of BC.

Until very recently, there were no specific restrictions on ship sewage disposal in Canadian marine waters along the coast of BC. In January 2001, new regulations under the main Canadian ship source pollution control law were introduced, designating 10 marine sites in the Strait of Georgia as no-discharge zones for sewage. These regulations are the first controls on sewage from cruise ships marine waters off BC, and cover a limited area.

Section 4 of the *NPCSPP* uses the Schedule from the *PCSPP* that sets out areas where sewage dumping is prohibited. Until this year, all bodies of water designated had been inland lakes — in BC, the Shuswap, Mara, and Okanagan lakes with large amounts of recreational boat traffic, especially houseboats. In January 2001, fourteen new sites were designated as no-discharge zones for sewage, including 10 marine sites in the Strait of Georgia. Originally, the province of BC had proposed 75 sites, but this number was reduced to 14 in the final list of designated sites.

The *Non-Pleasure Craft Sewage Pollution Prevention Regulations* make no provision for on-board treatment of sewage through marine sanitation devices (MSDs). These regulations specify a zero-discharge requirement in the zones listed in the Schedule to the regulation.

No other Canadian legislation (other than the *Fisheries Act*, not yet used to prosecute any cruise ship) currently regulates sewage discharges from ships. Although American legislation requires MSDs aboard ships, there are no regulations for MSDs in Canada other than in the Great Lakes.

American Regulations for Sewage from Cruise Ships

Section 312 of the *Clean Water Act* (33 U.S.C. § 1322) prohibits the dumping of untreated or inadequately treated sewage into the navigable waters of the US — within three miles of shore. Beyond the three-mile limit, raw sewage can be dumped into the ocean. Within three miles from shore, water has to meet the water quality standards listed in the regulations of the *Clean Water Act*. Federal US legislation passed in December 2000 (the "Murkowski" bill) has made these guidelines more stringent for Alaskan waters. The discharge of even treated sewage is prohibited unless the vessel is more than 1 mile from shore and travelling at a speed of more than 6 knots. To discharge treated sewage closer than one mile and/or travelling



slower than six knots, the effluent must meet more stringent standards and the cruise ship must certify that they have completed a self-test. If all standards are met, the ship may receive permission from the Coast Guard to discharge. Under this new legislation, Alaska is also authorized to request the EPA to set aside environmentally sensitive areas as “no discharge” zones for grey water. No other state has the authority to make such a request.

Harmful effects of grey water

In a study by the Alaskan Department of Environmental Conservation, the characteristics of grey water from each source were listed as follows:¹

Automatic Clothes Washer — bleach, foam, high pH, hot water, nitrate, oil and grease, oxygen demand, phosphate, salinity, soaps, sodium, suspended solids and turbidity

Automatic Dish Washer — Bacteria (fecal coliforms), foam, food particles, high pH, hot water, odour, oil and grease, organic matter, oxygen demand, salinity, soaps, suspended solids, turbidity

Bathtub and shower — bacteria, hair, hot water, odour, oil and grease, oxygen demand, soaps, suspended solids and turbidity

Sinks, including kitchen — bacteria, food particles, hot water, odour, oil and grease, organic matter, oxygen demand, soaps, suspended solids, turbidity.

¹ Alaska Department of Environmental Conservation. Alaska Cruise Ship Initiative Part 2 Report. Draft. May 23, 2001.

Unlike Canadian legislation, vessels are required under Section 312 of the *Clean Water Act* to have marine sanitation devices (MSDs) certified by the US Coast Guard to prevent the discharge of untreated sewage. The implementing regulations of the *Clean Water Act* (40 C.F.R. § 140) require that treated sewage discharged from ships must not exceed a fecal coliform count greater than 200 per 100 mL, nor suspended solids greater than 150 mg/L. Note that this is the same count (200 per 100 mL) as specified by the Canadian Great Lakes Sewage Prevention Regulations, but at 150 mg/L, the suspended solids limit is 3 times greater (than 50 mg/L).

2. Grey Water Description and Environmental Impact

Grey water is the wastewater from sinks, showers, galleys and laundry.⁴⁶ It may contain contaminants such as detergents, cleaners, oil and grease, metals, pesticides, and medical and dental waste, as well as significant concentrations of hazardous pollutants.⁴⁷ It is usually characterized as untreated wastewater that has not come into contact with toilet waste. It does not include drainage from toilets, urinals, hospitals and cargo spaces.⁴⁸

The US delegation to the International Maritime Organization’s Marine Environment Protection Committee (MEPC) contends that grey water may contain contaminants that pose greater threats than sewage discharges.⁴⁹ According to studies by the US Department of Defense and the EPA, grey water, like sewage, “has the potential to cause adverse environmental effects because measured concentrations and estimated loadings of nutrients and oxygen-demanding substances are significant.”⁵⁰

The key measurable constituents of grey water include organics, petroleum hydrocarbons, oils and greases, metals, suspended solids, oxygen demand, nutrients, and coliform bacteria. Evidence shows that other contaminants, such as sewage, heavy metals and hazardous waste, have also been illegally mixed with grey water before discharge into coastal areas.⁵¹ In a sampling study in Alaska last summer, shockingly high levels of fecal coliform and total suspended solids were found in nearly all grey water samples. Of the 80 samples taken, only one met federal guidelines and some samples contained more than 50,000 times the bacteria allowed by federal law.⁵²

Grey water is generated at different rates, as a function of passenger capacity, demographics, and activity. Estimates range from 3,790 m³ (1,000,000 gallons)⁵³ to 4,200 m³ in a 7-day cruise.⁵⁴ Grey water can be collected for a maximum of 48 hours but controlled discharge every 20-48 hours is common.⁵⁵ In Alaska, the previously voluntary guidelines have been converted into legislation that requires that grey water discharge occur only when at least one nautical mile from the port and moving at a speed of at least 6 knots.⁵⁶ Theoretically, at greater speeds waste becomes increasingly more diluted and therefore less harmful (waste from a ship at 6 knots was 940 times more diluted than from a stationary ship).⁵⁷

Current Canadian Regulations for Grey Water from Cruise Ships

There is currently no Canadian legislation specifically regulating the discharge of grey water from cruise ships. This is a major gap in Canada's regulatory framework to control cruise ship pollution.

American Regulations for Grey Water from Cruise Ships

Under s.312 of the American *Clean Water Act* (33 U.S.C. §1322), grey water can be discharged anywhere (except the Great Lakes). Grey water discharge is also exempt from a NPDES permit (40 C.F.R. § 122.3). The NPDES permit is required before discharge of effluent from a point source is allowed. In Alaska, grey water is controlled under the recently passed federal legislation, where untreated grey water discharge within one mile from shore is prohibited.

Under the new *Commercial Passenger Vessel Regulation* in Alaska, grey water cannot be discharged unless the vessel is at a speed of not less than 6 knots, the vessel is at least one nautical mile away from the shore and the discharge complies with all the effluent standards under the federal cruise ship legislation (a fecal coliform count of not more than 200/100ml and suspended solids of not more than 150 mg/L). Full compliance with this act is expected by the year 2003. Alaska can request the designation of no-discharge zones for grey water by petitioning the EPA.

The previous lack of regulation stems primarily from the insufficient body of knowledge surrounding grey water. However, recently there has been a growing body of literature on this problem, indicating the significant environmental impacts from grey water.

3. Oily Bilge Waste — Description and Environmental Impact

Oily bilge waste is made up of water, fuel, oil, on-board spills and waste from engines and other machinery. It collects in the bilge, the area located at the bottom of a vessel's hull. It is estimated that cruise ships generate up to 25,000 gallons of oily bilge water in one week.⁵⁸ The bilge water can also contain solid wastes like paint and glass. Other pollutants in the bilge contain high biological oxygen demand (BOD), chemical oxygen demand (COD), dissolved solids and other chemicals.

Oil destroys the thermal protection and natural water resistance of sea bird feathers, making them unable to fly, and also causes them intestinal problems possibly leading to starvation, liver failure, and other disease.⁵⁹ It can clog gills of fish,⁶⁰ and even in minute concentrations can cause changes in heart or respiratory rates, enlarged livers, reduced growth, fin erosion and other biochemical and cellular changes. It causes marine mammals to experience skin and eye lesions and interferes with their swimming ability. Other harmful effects include gastrointestinal tract hemorrhaging, renal failure, blood disorders, inflammation of mucous membranes, lung congestion, pneumonia and nervous system disturbances.⁶¹ It "taints" shellfish in that they can absorb enough of it so that humans can taste oil when they eat it. Some oil droplets can sink to the sediment of the ocean floor, where they can remain there for decades or even centuries, potentially killing the natural flora and fauna there.⁶²

Current Canadian Regulations for Oily Bilge Waste from Cruise Ships

Oil pollution is the cruise ship pollutant most thoroughly addressed by the current regulatory regime. The CSA creates a "zero discharge" regime for oil.



Regulations to control oil pollution from ships were strengthened after large oil spills in the Pacific region in the late 1980's galvanized public concern about this issue. The Exxon Valdez spill in Alaska and the Nestucca spill off the coast of Vancouver Island prompted significant changes to ship source oil pollution control and prevention regulations in both Canada and the US. The result has been increased awareness and reductions in oil pollution from ships.

The Marine Oil Spill Preparedness and Response Regime is an industry funded and managed under the leadership of the Canadian Coast Guard. Industry has the capability to clean up its own spills and maintain at least 10,000 tonne response capability in regions south of 60 degrees north latitude. The *Canada Shipping Act* requires ships to have arrangements with Canadian Coast Guard "certified response organizations" to ensure this 10,000 tonne response capability.⁶³

Plastics in the Ocean:

In the US, many proven cases of illegal waste discharge have involved the dumping of plastic. The US Coast Guard estimates that more than one million birds and 100,000 marine mammals die each year from eating or getting entangled in plastic debris. Other studies have also demonstrated that plastics, which reduce steroid hormone levels, can detrimentally affect seabird reproductive capabilities.¹

¹ Sea Web Ocean Update. "Plastics May Pose Threat to Marine Life on Ocean Floor: Report". July 1997; Associated Press. "Cruise, Shipping Companies Admit Dumping at Sea". November 17, 1997.

Oily bilge water discharges are regulated by the *Oil Pollution Prevention Regulations*⁶⁴ under the CSA. Ships are required to have oily water separators and only processed bilge water with an oil content of under 15 parts per million may be discharged into the ocean. The separated oil is discharged ashore, burned in an incinerator or burned in the engines, and records must be kept of all these operations. To prevent illegal discharges, ships are inspected, records are checked and there are aerial surveillance flights to detect oil in the water. Authorized discharges are allowed under certain limited emergency circumstances.⁶⁵

Oily bilge water, if brought ashore in B.C., is classified as "special waste" under BC's *Waste Management Act* and its disposal is subject to strict requirements.

Oily bilge waste is not considered a hazardous waste under the Transport of Dangerous Goods or under the Import/Export of Hazardous Wastes Regulations. Produced as a by-product of machinery, it has been suggested that it is not produced in sufficient quantities to qualify as a hazardous waste. Also, although the bilge water is stored onboard the vessel, it is usually either treated and discharged, as required by the CSA's *Oil Pollution Prevention Regulations*, in concentrations that are not considered hazardous, or brought onshore for disposal.⁶⁶

American Regulations for Oily Bilge Waste from Cruise Ships

In the US, the *Oil Pollution Act* (33 U.S.C. §§ 2701-2761) prohibits the discharge of oil or hazardous wastes in harmful quantities in US navigable waters, adjoining shorelines, or into waters of the contiguous zone. The *Clean Water Act* (33 U.S.C. § 1321(b)(3)) and its regulations (33 C.F.R. § 151.10) prohibit the discharge of oil within 12 miles of shore unless it has been passed through a 15 p.p.m. oil-water separator and does not cause a visible sheen. Outside of 12 miles, oil or an oily mixtures can be discharged up to 100 p.p.m. Ships are also required to maintain an Oil Record Book, which has to record the disposal of oily residues and discharge of bilge water.⁶⁷

4. Hazardous Waste — Description and Environmental Impact

Cruise ships generate a wide variety of toxic chemical wastes, which can include dry cleaning sludge (which contains perchlorethylene), waste from photo processing laboratories and x-ray

development (which contains silver), paint waste and dirty solvents (which contain toluene, xylene, benzene, turpentine, methyl ethyl ketone, etc.), print shop wastes (hydrocarbons, chlorinated hydrocarbons, and heavy metals), fluorescent lamp bulbs (mercury), and batteries (lead, corrosives, cadmium).⁶⁸ Deodorizers and marine sanitation devices (MSDs) can contain chlorine, quaternary ammonia, or formaldehyde, all of which are harmful to aquatic life.⁶⁹

In estimates provided by Royal Caribbean cruises, a typical cruise ship generates an estimated 141 gallons of photo chemicals, seven gallons of dry cleaning waste, thirteen gallons of used paints, five pounds of batteries, ten pounds of fluorescent lights, three pounds of medical waste and 108 pounds of expired chemicals on a one-week voyage.⁷⁰

The chemicals are extremely hazardous to human and animal health and could also lead to sediment contamination.⁷¹ Perchloroethylene is a listed hazardous waste that can cause cancer and birth defects in humans and has been shown to be toxic to aquatic animals in small amounts because they store it in their fatty tissue.⁷² Benzene, a component of fuel oil, is a volatile organic compound (VOC), is a known human carcinogen.⁷³ Chlorinated hydrocarbons are first absorbed by phytoplankton and zooplankton, which are then consumed by fish, which subsequently are eaten by bigger predators, bioaccumulating to create levels dangerous for human consumption. Even low levels of chlorinated hydrocarbons found in Arctic waters do a great deal of damage. Dioxins cause birth defects in humans and can persist in fatty acids for decades. This is especially dangerous for arctic mammals with thick layers of insulating fatty tissue as they can accumulate dangerous concentrations of dioxins.⁷⁴

Metals, such as silver, mercury, and lead, bind to sediment and are transported to coastal waters through sedimentation. These toxic substances can cause scarring, death, or reproductive failure in fish, shellfish, and other marine organisms. They too can accumulate in fish tissue, leading to fish consumption advisories.⁷⁵

Specific toxic effects of heavy metals include:

Lead — bioaccumulates, making fish toxic for human consumption. Can cause nervous system disorder, learning disabilities and retardation;

Mercury — disrupts the central nervous system in animals, it is persistent and bioaccumulative, its toxicity increases when it reacts with organic pollutants like sewage and bacteria (Minamata disease);

Cadmium — ends up in the liver and kidneys and eventually replaces calcium in the bones and can also cause high blood pressure;

Copper — in large doses is toxic to animals and human beings, chronic overexposure can cause cirrhosis of the liver, stunted growth and jaundice.⁷⁶

Current Canadian Regulations for Hazardous Waste from Cruise Ships

Canadian legislation that regulates hazardous waste includes:

1. *CSA- Pollutant Discharge Reporting Regulations, 1995 (SOR/95-351 amendments 99-99)* — sets out when and how a report should be made.

Could the NPRI be used to monitor emissions from cruise ships?

A National Pollutant Release Inventory (NPRI) exists under the Canadian Environmental Protection Act (CEPA) that requires stationary “facilities” to report the volumes of hazardous waste that they discharge. Although there has been some speculation about whether the NPRI could include cruise ships, to date cruise ships are not required to report their emissions. The NPRI does estimate the amount of emission produced by mobile sources, i.e. cruise ships. How useful this is or will be in monitoring cruise ship activities is yet to be seen.¹

¹ Verbal communication with Chris Roberts, Environment Canada Halifax, NPRI division.



2. *CSA- Pollutant Substances Regulations (C. R. C., c. 1458)* which contains schedules that prohibit the discharge of several hundred pollutants, from Acetaldehyde to Zirconium tetrachloride.
3. *CSA- Dangerous Goods Shipping Regulations (SOR/81-951 and amendments)* — sets guidelines for storage and handling of dangerous goods (as defined in the International Maritime Organization (IMO) code).
4. *CSA- Dangerous Chemicals and Noxious Liquid Substances Regulations (SOR/93-24)* — prohibits discharges of noxious liquids (as set out in the regulation) into Canadian waters, fishing zones and territorial sea zones that are not within an Arctic shipping safety control zone.
5. *Transport of Dangerous Goods Act* — separate federal and provincial legislation; safety standards and marks, allows for inspection, detection and sampling of ships.
6. *Waste Management Act* — BC provincial act that details how waste of all kinds, including hazardous and “special” waste, needs to be transported, handled, stored and permitted.

Full disclosure from ships on the generation and disposal of hazardous waste is not required. This information could affect how the above listed regulations and acts apply to cruise ships. The CSA and its various regulations are silent on the threshold quantities required to bring the regulations into effect.

Disposal of hazardous waste is an issue in Canada, especially hazardous waste that crosses boundaries. Recent studies show that the Canadian capacity to track hazardous waste generation and disposal is limited, and that the reliability of data regarding transboundary waste movements between Canada and the US must be seriously questioned.⁷⁷

A report by the Commissioner of the Environment and Sustainable Development of the Office of the Auditor General of Canada, stated that Canada “is not in a position to know the extent to which it is fulfilling its international obligations to prevent illegal traffic of hazardous waste at the border. Furthermore, Canada still has no comprehensive action plan to address long-standing and significant gaps in the enforcement of regulations governing the transboundary movement of hazardous waste.” For example, since 1997, there have been no significant improvements in either border inspections (one for the Yukon/Pacific region) or test sampling of suspect shipments for hazardous waste (3 for the Yukon/Pacific region).⁷⁸ This is of concern because there could be movement of cruise ship wastes to areas that have less environmentally stringent laws or are unable to manage the waste in an environmentally sound manner. Also, illegal movements would make it impossible to detect and control any discharges into the environment.

American Regulations for Hazardous Waste from Cruise Ships

The American system handles hazardous waste and toxic chemicals discharges through the *Resource Conservation and Recovery Act (RCRA)* (42 U.S.C. §6901-6992) and its implementing regulations (40 C.F.R. § 260-266), the *Clean Water Act* (33 U.S.C. § 1311(a); 33 U.S.C. § 1319(c)(2)(A); 33 U.S.C. § 1342), and the *Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)* (42 U.S.C. § 9601-9675). However, a lack of clarity surrounds the laws that govern the management and disposal of these wastes. Substantial variation on the amount of waste disposed month to month and confusion as to the

definition of “generator” add to the confusion. “Generators” could be interpreted to mean single ships or the entire fleet. This would make a difference as to whether the cruise ships are “small quantity generators” (more than 100kg but less than 1,000 kg of hazardous waste/month) or “large quantity generators” (more than 1,000 kg of hazardous waste/month). This classification would lead to different standards in terms of management and reporting. Another issue that has arisen is the “point of generation” of hazardous waste. If the “point of generation” is where the waste is offloaded and not the ship itself, then the offloading site could receive waste from numerous vessels, thus influencing whether a cruise ship is a large quantity or small quantity generator. Bluewater Network claims that these problems, along with numerous others, make the law surrounding hazardous waste management ambiguous and leaves room for irresponsible handling, storage and disposal of wastes.

5. Solid Waste (Garbage) — Description and Environmental Impact

Solid waste generated on cruise ships includes plastic, paper, wood, cardboard, food waste, cans or glass. A typical cruise ship generates an estimated fifty tons of garbage on a one-week voyage.⁷⁹ While much of this solid waste is incinerated on board and the ash discharged at sea, or off-loaded ashore for disposal or recycling, some garbage inevitably ends up in the ocean.

There are also concerns that hazardous solid wastes, such as batteries, are being incinerated with garbage, creating hazardous incinerator ash that is subsequently being discharged at sea.⁸⁰

Current Canadian Regulations for Solid Waste from Cruise Ships

Within the CSA, solid waste is regulated by the *Garbage Pollution Prevention Regulations* (C.R.C., c. 1424). These regulations define “garbage” as “solid galley waste, food waste, paper, rags, plastics, glass, metal, bottles, crockery, junk or similar refuse.” S. 4 of the regulations sets out areas where garbage cannot be discharged. These include Canadian waters south of the 60th parallel of north latitude, which encompasses all of the Inside Passage within Canadian waters, so garbage dumping is completely prohibited in those waters. Also fishing zones described in s.16 of the *Oceans Act* (1996, c. 31) are no garbage discharge zones.⁸¹ Although ocean dumping permits are available through Environment Canada for land based garbage sources, this does not apply to garbage generated aboard cruise ships. The regulations prohibit the dumping of solid waste but do not prohibit the dumping of liquid or ground up wastes.

American Regulations for Solid Waste from Cruise Ships

American legislation governing solid waste includes the *Act to Prevent Pollution from Ships* (33 U.S.C. §§ 1901-1912), which establishes requirements to report discharges of oil, and otherwise deals with solid waste. The *Act* applies to all US flag ships anywhere in the world and to all foreign flag vessels operating in the navigable waters of the US or while at a port or terminal under the jurisdiction of the US. The regulations prohibit the discharge of plastics, including synthetic ropes, fishing nets, plastic bags and biodegradable plastics, into the water. Discharge of floating dunnage, lining and packing materials is prohibited in the navigable waters and in areas offshore less than 25 nautical miles from the nearest land. Food waste or paper, rags, glass, metal, bottles, crockery and similar refuse cannot be discharged in the



navigable waters or in waters offshore inside 12 nautical miles from the nearest land. Food waste, paper, rags, glass, and similar refuse cannot be discharged in the navigable waters or in waters offshore inside three nautical miles from the nearest land. There are some exceptions for emergencies.⁸²

The *Marine Protection, Research, and Sanctuaries Act* (33 U.S.C. §§ 1401-1445) regulates the ocean dumping of waste, provides for a research program on ocean dumping, and provides for the designation and regulation of marine sanctuaries. The act regulates the ocean dumping of all material beyond the territorial limit (three nautical miles from shore) and prevents or strictly limits dumping material that "would adversely affect human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities".

Material includes, but is not limited to dredged material; solid waste; incinerator residue; garbage; sewage; sewage sludge; munitions; chemical and biological warfare agents; radioactive materials; chemicals; biological and laboratory waste; wrecked or discarded equipment; rocks; sand; excavation debris; and industrial, municipal, agricultural, and other waste. The term does not include sewage from vessels or oil, unless the oil is transported via a vessel or aircraft for the purpose of dumping.⁸³

The *Shore Protection Act* (33 U.S.C. §§ 2601 et seq.) was enacted to minimize trash, medical debris and other potentially harmful and unsightly materials from waste transporting vessels, from being deposited in the coastal waters of the US. This *Act* puts the EPA in charge of developing regulations governing the handling of wastes and puts the Department of Transportation in charge of issuing permits and enforcing regulations. The *Act* also outlines vessel waste handling procedures.⁸⁴

6. Air Pollution Description and Environmental impact

Air emissions from cruise ships can cause pollution and reduce visibility. Emissions from large ships in particular contribute significantly to greenhouse gases and global warming.⁸⁵

Current Canadian Regulations for Air Pollution from Cruise Ships

In Canada, air pollution from ships is governed by the *Air Pollution Regulations* (C.R.C., c. 1404). These regulations apply to emissions of smoke by ships in Canadian waters within one mile of land. Density of smoke emissions is determined using a comparative chart method that displays various densities of emissions. A maximum of 20% black space is the usual allowance for all fuel burning vessels, but a 40% black space is allowed for up to four minutes in a thirty-minute period. Soot may not be discharged within 1,000 yards of land if it would be practical to emit it before or after leaving land or if an alternative method could have been employed. Despite these regulations, little regulatory attention is devoted to air emissions from cruise ships and marine vessels in general.⁸⁶

Current American Regulations for Air Pollution

The Clean Air Act (42 U.S.C. § 7401) governs air pollution in the US but does not specifically give the government jurisdiction to govern emissions from cruise ships. However, in January 2001, due to litigation initiated by Bluewater network, the EPA pledged to establish standards for particulate emissions and other pollutants for large vessels (Category 3 marine engines). The EPA is to issue a proposed rule in April 2002 and finalize the standards in January 2003.

The new Alaskan legislation authorizes the Department of Environmental Conservation to research, monitor, study and control the opacity of air emissions from commercial passenger vessels. State regulations also prohibit any visible air emissions within three miles of the Alaska coastline that reduces visibility by more than 20 percent.⁸⁷

ENFORCEMENT OF REGULATIONS

Inspection of cruise ships' waste streams, and enforcement of other pollution control laws that could be used to restrict pollution from cruise ships is limited in Canada. Daily aerial surveillance of ships by Coast Guard personnel is apparently the chief inspection and enforcement method used to judge whether cruise ships are abiding by Canadian pollution control laws. The aerial surveillance has no infrared detector and is primarily used to look for oil and garbage discharge. The scope of the aerial surveillance is also limited to shipping lanes around the Vancouver harbour area, with minimal monitoring extending upwards into the Inside Passage. Other methods used to detect illegal discharges are public complaints, complaints from passing ships and through monitoring of discharge logs.

There is no record of prosecutions, reported court cases, or penalties against cruise ships for pollution in Canadian marine waters. When ships are convicted of illegal discharges in the US, Canadian authorities undertake no extra measures to monitor or ensure compliance with Canadian legislation, perhaps because Transport Canada's primary emphasis is on safety

issues rather than on waste disposal.⁸⁸

Why is enforcement and monitoring of cruise ship pollution in Canada so limited?

Compared with the record fines and number of reported violations and recent court cases in the US, it is puzzling why no record of prosecutions, reported court cases, or penalties against cruise ships for pollution in Canadian marine waters exists. The difference in laws and monitoring and enforcement systems may explain the discrepancy. With limited regulatory duties to monitor and inspect, Canadian authorities may devote personnel and budget to pollution sources other than cruise ships.

There is also little official inspection of cruise ship treatment systems. Approximately 25% of all foreign vessels are inspected when they arrive in Canadian waters, however, Transport Canada looks mainly only for safety issues (i.e. fire safety), targeting older vessels. When cruise ships are inspected, Transport Canada may unofficially look at the sewage treatment systems, but without any Canadian legislation governing cruise ship waste treatment systems, the department has no authority to take regulatory action.

Currently, voluntary guidelines imposed by the cruise ship industry require cruise ships to have storage tanks and treatment systems and require discharge of treated sewage at least 10 miles from port.

In the US, the Coast Guard is the main federal agency for preventing, detecting and investigating discharges. The Coast Guard cruise intermittently inspects ships' MSDs while in port to ensure their proper functioning. Vessels are also required to submit various documents and certificates to ensure that they meet effluent standards for sewage and grey water. Under federal legislation, the Coast Guard is required to inspect environmental compliance records, to inspect the sewage and grey water discharge record book and ensure



the proper functioning and operation of equipment such as MSDs. Cruise lines are required to shoulder all the costs of this monitoring and reporting. The GAO report on cruise ship pollution incidents found that Coast Guard inspectors “rarely have time during scheduled ship examinations to inspect sewage treatment equipment or filter systems to see if they are working properly and filtering out potentially harmful contaminants.”⁸⁹

CURRENT INITIATIVES TO CHANGE THE LAW

New Alaska Law

On June 9, 2001, the Alaska legislature passed a new law to better control cruise ship pollution. Key leaders, including Governor Knowles of Alaska, indignant over the cruise industry’s environmental performance, pushed the law forward. Impetus for the bill increased when a voluntary testing program in 2000 revealed that almost none of the wastewater samples from ships met federal standards for suspended solids and fecal coliform bacteria. These results indicated that the MSDs were not operating effectively and that the supposedly harmless grey water discharges closely resembled sewage.⁹⁰

Alaska may now impose stricter standards for grey water and treated sewage discharges than those currently provided for in the applicable US federal law, the *Clean Water Act*. The state law limits sewage disposal from all cruise ships carrying 50 or more passengers and imposes grey water standards. In addition to requiring ships to provide information on their solid and hazardous waste handling practices, the new law gives the state access to water testing and discharge records and also gives the state authority to board ships to do its own testing. Cruise ships must register with the state and agree to all the terms and conditions of the new legislation.

As well as being governed by other federal and state hazardous waste regulations, the new legislation provides that if reporting of hazardous wastes such as photo-processing chemicals, medical waste and other toxic materials, is required federally in the US or by Canadian laws, these reports have to be submitted to the state department within 21 days after a copy has been submitted to the US government or agency or the Canadian government. Outside of federal and Canadian legislation, cruise ships must submit a plan that describes the ships’ policies and procedures for disposal and offloading of hazardous wastes. Violations lead directly to court. A \$1 head tax, instead of the proposed \$10 tax, for each passenger will be charged for the regulation, monitoring and enforcement of the program.

Other American Jurisdictions

Other states have also initiated new standards for the cruise ship industry. In March 2000, the Florida Department of Environmental Protection, the Florida-Caribbean Cruise Association and the International Council of Cruise Lines (ICCL) signed a Memorandum of Understanding committing members of the Association to meet or exceed standards set forth in Florida’s state laws⁹¹ for the disposal of solid wastes, hazardous wastes, and wastewater. Beginning July 1, the ICCL has set “mandatory” recycling and waste discharge guidelines, that if breached could result in loss of membership from the industry group.⁹² The standards

govern the disposal of silver associated with photo processing, chemicals used in dry-cleaning, printing, bilge and oily water residues and recyclables. Sewage and grey water can only be discharged at least four miles from port unless stipulated otherwise by authorities.

In California, a new law was passed requiring cruise ships to submit quarterly reports of any releases of grey water or sewage in state waters.⁹³ The law also requires the State Air Resources Board to measure and record the opacity of air emissions from vessels. An inter-agency Cruise Ship Environmental Task Force will now evaluate the environmental practices and impacts of cruise ships in California and to formulate recommendations as to how they can be better regulated. The California Environmental Protection Agency will report on the task Force's work to the legislature by June 2003.

Hawaii is also considering developing legislation to address cruise ship discharges.⁹⁴

VOLUNTARY GUIDELINES

The industry's trade association, the International Council of Cruise Lines, has set voluntary guidelines for recycling and waste discharges. The new guidelines cover treated sewage; grey water discharges from showers, sinks and kitchen galleys; disposal of silver from on-board photo-processing outlets; chemicals from dry-cleaning and printing facilities; bilge and oily water residues and recyclable material such as glass and cardboard.⁹⁵

While these guidelines are an improvement over current practices, studies show that regulation, rather than voluntary programs, consistently achieve more reductions in pollution.

In a 1998 report by Environment Canada, three case studies examined how well voluntary compliance worked as a clean up mechanism compared to inspection and enforcement combined with binding laws. In all three cases, pollution decreased remarkably when *and only when* the law and strict enforcement programs were in place. One example concerns toxic antisapstain chemicals, used to protect freshly cut lumber from moulds and fungi. A code of practice was developed to reduce pollution from these sources. But for three years, 1983-1986, the period of voluntary compliance with the code of practice, improvements were minimal. The study shows that there were minimal reductions in pollution until an inspection program was started, and a strategic enforcement program initiated. Pollution was reduced with that program and reduced even more when a provincial regulation was passed. Overall over a ten-year period, there was over a 99% reduction in the discharge of acutely toxic effluent. (The number of mills using the chemicals decreased from 108 to 51. Mills improved treatment with covered storage, reducing run off.) The results were similar for the other two cases covered by the study.⁹⁶

And another recent study has shown how one of the country's most highly regarded voluntary programs, the Responsible Care program of the Canadian Chemical Producers' Association, has achieved minimal results. The data found by these researchers showed that members of responsible Care were improving their relative environmental performance *more*



slowly than non-members. Their data also supported the hypothesis that dirtier firms participated in Responsible Care.⁹⁷

Voluntary compliance for the cruise ship industry in particular does not have a good record. In a recent example in Alaska, 79 of 80 samples taken from ships that were part of a voluntary monitoring program exceeded permissible levels for coliform. Only one sample met the voluntary guidelines.⁹⁸ This high failure rate demonstrates that voluntary programs by themselves may not be sufficient to solve pollution from cruise ships.

RECOMMENDED REGULATORY CHANGES TO IMPROVE CONTROL OF CRUISE SHIP POLLUTION

There are strong reasons favouring strengthening Canada's laws to better control harmful impacts from cruise ship discharges:

- To improve protection of BC's marine environment
- To eliminate the possibility that cruise ships will increase discharges in Canadian waters before entering more tightly regulated Alaskan waters, and
- To provide one clear set of rules for the cruise ship industry to prevent pollution.

Priority should be given to:

Creating a new separate set of regulations for cruise ships such as the Cruise Ship Pollution Prevention (CSPP). Regulations under the CSA are required which target the cruise ship industry specifically — and sewage and grey water particularly. A new set of regulations aimed specifically at cruise ships would also allow the separation of cruise ships from other commercial vessels. The scope and scale of cruise ship discharges is far above and beyond the sewage discharges of fishing boats and sight-seeing vessels — the Bluewater Network estimates that approximately 77% of all maritime pollution comes from cruise ships.⁹⁹

Creation of comprehensive controls for grey water. New regulations should restrict grey water discharges and set standards for this type of discharge.

Harmonization of new Canadian regulations with American standards. All cruise ships departing from Vancouver and travelling through Canadian waters are destined for sight-seeing in Alaska. Any new Canadian regulations should accord with those in place in Alaska, and Transport Canada work closely with American regulators on this issue. One set of standards would provide a clear set of operating rules for the cruise industry.

Strengthening monitoring and enforcement of existing pollution control legislation. For enforcement, with only minimal policing currently in place, Transport Canada relies on complaints from individuals and reports from other agencies such as the Coast Guard.¹⁰⁰ Implementing more targeted and effective and monitoring would require additional Coast Guard (DFO) resources, which should be required by regulation. A head tax, which would cover the costs of the inspections and enforcement, could be imposed in BC to cover these

An Alaskan study has recommended limiting cruise ship discharges in sensitive areas such as:

- Whale bird foraging areas;
- Sea bird colonies,
- Shellfish beds,
- Herring and eulachon spawning areas;
- Anadromous fish streams;
- Eagle nests;
- Areas of shore bird and waterfowl concentrations;
- Foraging and haul-out sites for sea otters, stellar sea lions, and harbour seals.

Areas where human use of the ocean is great could also be subject to limited discharges such as areas used for:

- Shrimp and crab fishing;
- Subsistence harvesting;
- Commercial fishing;
- Sport fishing.¹

¹ J. Colonell, R. Spies, and S. Smith; *Cruise Ship Wastewater Discharge into Alaskan Coastal Waters*, Alaska SeaLife Center Technical Report Number 2000-01, November 2000.

additional costs of monitoring, inspection and enforcement, reflecting the “polluter pays “ principle.

Avoiding sensitive areas for all types of cruise ship discharges. Sensitive areas along the Inside Passage and coast of BC have been mapped in part by the BC government.¹⁰¹ At present members of the Northwest Cruise Ship Association have engaged in a voluntary program of no discharge of wastewater in port or within 10 miles of a port of call among other voluntary restrictions. Expansion of this policy through binding regulation could minimize the impact of discharges on valued resources by allowing for government-controlled enforcement and monitoring and ensuring emergency operation plans.

A recent Alaskan study recommends that: “An increased margin of safety could be achieved by adopting a discharge strategy that avoids, to the extent possible (as dictated by on-board waste storage capacity, vessel routes, cruise schedules) discharging wastes in areas of demonstrated special sensitivity. Oil spill sensitivity maps with information on location of biological resources could be used. Using a combination of these resource maps with available information on tides and other currents, it would be possible to discharge wastes to maximize dilution and further minimize exposure of key sensitive areas to contaminants, given the above-mentioned limitations (e.g., storage capacity).”

A similar strategy could be used in BC.

CONCLUSION

As the cruise ship industry grows, so must efforts to minimize the harmful environmental impacts from these significant sources of pollution. While voluntary initiatives are welcome, these initiatives alone will not remedy the problem. New regulations are required to establish specific cruise ship discharge limits and areas where discharges should be prohibited. As the industry operates internationally, regulations should be harmonized to provide certainty, set a level playing field and avoid pollution dumping in jurisdictions with less stringent requirements. Canada’s current regulations should be changed to mirror the new and improved US and Alaskan regulations.

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¹ Seatrade Cruise Review, March 2001, Northwest Cruise Ship Association Information (fax).



² Jurisdiction over marine waters in Canada is federal, so the laws that control this type of pollution are federal. This subject of this report is pollution from cruise ships that travel along the coast of British Columbia, so federal regulations for different parts of Canada are not discussed.

³ R.S. 1985, c. S-9.

⁴ General Accounting Office. Report to Congressional Requesters. *Marine Pollution: Progress Made to Reduce Marine Pollution by Cruise Ships, but Important Issues Remain*, February 2000. ("GAO Report") GAO website, www.gao.gov.

⁵ Kira Schmidt, *Cruising for Trouble: Stemming the Tide of Cruise Ship Pollution* (March 2000). Report by the Bluewater Network, available online at www.earthisland.org/bw (the "Bluewater report").

⁶ *Id.*

⁷ Kira Schmidt, "Cruising for Trouble: Stemming the Tide of Cruise Ship Pollution" (March 2000). Report by the Bluewater Network, available online at www.earthisland.org/bw.

⁸ Bluewater web page, www.earthisland.org/bw.

⁹ Alaska Department of Environmental Conservation, <http://www.state.ak.us/local/akpages/ENV.CONSERV/press/cruise/execsteer.htm>.

¹⁰ 1999 Vancouver — Alaska Cruise Passenger Study. InterVistas Consulting on behalf of Tourism Vancouver, the Vancouver Port Authority, the Vancouver International Airport Authority, Tourism British Columbia and the North West CruiseShip Association. December 1999.

¹¹ Vancouver Port Authority, 2000 Statistical Survey, at www.portvancouver.com/frames/index.html.

¹² Personal communication, Anita Day of the Vancouver Port Authority, statistical division. May 9, 2001.

¹³ Northwest Cruiseship Association. *Economic Impact of International Cruise Lines in Canada*, 1999.

¹⁴ www.hawaii.gov/dbedt/he7-99/psa.html and at Seattle Daily Journal of Commerce www.djc.com/special/maritime/c10009803.html.

¹⁵ Alaska Geographic. British Columbia's Coast: The Canadian Inside Passage. Volume 13, No.3, 1986.

¹⁶ Environment Canada. Wildlife of the Pacific Marine Ecozone. www.ec.gc.ca/soer-ree/English/vignettes/Marine/pacific/wildlife.cfm.

¹⁷ Alaska Geographic. British Columbia's Coast: The Canadian Inside Passage. Volume 13, No.3, 1986.

¹⁸ Canadian Coast Guard, *Protecting the Marine Environment — A Boaters Guide*, (Ottawa: Coast Guard) 1997, online at http://www.ccg-gcc.gc.ca/obs-bsn/pubs_e.htm.

¹⁹ Vancouver Port Authority at www.portvancouver.com/frames/index.html.

²⁰ *Ibid.*

²¹ Marketing Research Tourism Vancouver. www.tourism-vancouver.org/docs/help/research/research_cruise_impact.html.

²² Northwest Cruiseship Association. *Economic Impact of International Cruise Lines in Canada*. 1999.

²³ Oceans Act 1996, c.31.

²⁴ The annexes are:

- ¹ the prevention of pollution by oil (Annex I);
- ² the control of pollution by noxious liquid substances in bulk (Annex II);
- ³ the prevention of pollution by harmful substances in packaged form (Annex III);
- ⁴ the prevention of pollution by sewage from ships (Annex IV) (not yet in force);
- ⁵ the prevention of pollution by garbage from ships (Annex V); and
- ⁶ the prevention of air pollution from ships (Annex VI).

²⁵ Donald R. Rothwell, "Global Environmental Protection Instruments" in Davor Vidas, ed. *Protecting the Polar Marine Environment — Law and Policy for Pollution Prevention* (Cambridge: Cambridge University Press), 2000, 60.

²⁶ "ship" includes any description of vessel or craft designed, used or capable of being used solely or partly for navigation, without regard to method or lack of propulsion; (CSA Part XV).

²⁷ "discharge" of a pollutant from a ship means any discharge of a pollutant from a ship that results, directly or indirectly, in the pollutant entering the water and includes, without limiting the generality of the foregoing, spilling, leaking, pumping, pouring, emitting, emptying, throwing and dumping.

²⁸ "pollutant" means

- (a) any substance that, if added to any waters, would degrade or alter or form part of a process of degradation or alteration of the quality of those waters to an extent that is detrimental to their use by man or by any animal, fish or plant that is useful to man, and
- (b) any water that contains a substance in such a quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any waters, degrade or alter or form part of a process of degradation or alteration of the quality of those waters to an extent that is detrimental to their use by man or by any animal, fish or plant that is useful to man,

and, without limiting the generality of the foregoing, includes crude oil, fuel oil, heavy diesel oil, lubricating oil, any other persistent oil and any substance or any substance of a class of substances that is prescribed for the purposes of this Part to be a pollutant.

²⁹ Personal communication Tom Morris (6 June 2001).

³⁰ Personal communication with Richard Day (15 February 2001).

³¹ Kira Schmidt, *Cruising for Trouble: Stemming the Tide of Cruise Ship Pollution* (March 2000). Report by the Bluewater Network, available online at www.earthisland.org/bw.

³² <http://www.state.ak.us/local/akpages/ENV.CONSERV/press/cruise/cruise.htm>.

³³ http://www.epa.gov/owow/oceans/cruise_ships/.

³⁴ Another somewhat less significant source of pollution is "sedimentation pollution", created when a ship travelling through shallow water stirs up sedimentation on the ocean floor.

³⁵ US Coast Guard website at www.uscg.mil/hq/g-m/mso/mso4/bwm.html.

³⁶ Telephone call with Rod Nelson, Communications, Transport Canada.

³⁷ See generally, the Alaska Cruise Ship Initiative website:
<http://www.state.ak.us/local/akpages/ENV.CONSERV/press/cruise/cruise.htm>.

³⁸ B.H. Kay. A State of the Environment Report: Pollutants in British Columbia's Marine Environment: A status report, Environment Canada, April 1989.

³⁹ San Francisco Estuary Project. How Boat Sewage Discharges Affect the Environment.
www.abag.ca.gov/bayarea/sfep/programs/boated/Sewage.html.

⁴⁰ Capital Health Region, Health Promotion and Environmental Services. Fax on Beach closures and coliform counts.

⁴¹ Beach Pollution. Natural Resource Defense Council. Found at www.nrdc.org/water/oceans/qttw.asp.
http://ecoinfo.org/env_ind/region/shellfish/shellfish.htm.

⁴² Gorman, Martha. Environmental Hazards Marine Pollution. Contemporary World Issues; Santa Barbara, California. 1993.

⁴³ Kathryn O'Hara, Suzanne Iudicello, and Rose Bierce, A Citizen's Guide to Plastics in the Ocean: More Than a Litter Problem. 3rd rev. ed. Washington, D.C. Center for Marine Conservation, 1988. p.16.

⁴⁴ "Drugs in the Water". Rachel's Environment and Health News, September 3, 1998, available online at http://www.rachel.org/bulletin/index.cfm?issue_ID=501.

⁴⁵ United States General Accounting Office. Marine Pollution. Progress Made to Reduce Marine Pollution by Cruise Ships, but Important Issues Remain. Report to Congressional Requesters. February 2000.

⁴⁶ US Navy Naval Sea Systems Command and US EPA Office of Water. Technical Development Document: Phase 1, Uniform National Discharge Standards for Vessels of the Armed Forces.

⁴⁷ Alaska Department of Environmental Conservation. Alaska Cruise Ship Initiative Part 2 Report. Draft. May 23, 2001.

⁴⁸ United States' Submission to the 44th Session of the Marine Environment Protection Committee of the International Maritime Organization. "Interpretations and Amendments of MARPOL 73/78 and Related Codes; Proposed Amendments to MARPOL Annex IV" (December 1999).

⁴⁹ Kira Schmidt, *Cruising for Trouble: Stemming the Tide of Cruise Ship Pollution*. Bluewater Network's Cruise Ship Campaign. March 2000.

⁵⁰ *Id.*



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- ⁵² Cruise Ships: Testing the Waters in Alaska. By Bob King, Alaska Office of the Governor. Coastal Services Magazine. Found at <http://www.csc.noaa.gov/magazine/2001/04/alaska.html>.
- ⁵³ Kira Schmidt, Cruising for Trouble: Stemming the Tide of Cruise Ship Pollution. Bluewater Network's Cruise Ship Campaign. March 2000.
- ⁵⁴ Alaska Department of Environmental Conservation. Alaska Cruise Ship Initiative Draft Report of the Work Groups (May 10, 2000).
- ⁵⁵ Kim D.K., et al. Cruise Ship Waste Dispersion Analysis: Report on the Analysis of Grey water Discharge. International Council of Cruise Lines. September 14, 2000. Found at www.iccl.org/publicinfo/wastedisp.html.
- ⁵⁶ *Ibid.*
- ⁵⁷ *Ibid.*
- ⁵⁸ F.R. Engelhardt. "Assessment of Vulnerability of Marine Mammals to Oil Pollution." Chapter in *Fate and Effects of Oil in Marine Ecosystems*, ed. J. Kuiper and W.J. van den Brink, 1987; Peter H. Albers. *Oil Spills and Living Organisms*.
- ⁵⁹ Gorman, Martha. Environmental Hazards Marine Pollution. Contemporary World Issues; Santa Barbara, California. 1993.
- ⁶⁰ Gorman, Martha. Environmental Hazards Marine Pollution. Contemporary World Issues; Santa Barbara California. 1993.
- ⁶¹ Bluewater Petition, available online at Bluewater web page, www.earthisland.org/bw.
- ⁶² Gorman, Martha. Environmental Hazards Marine Pollution. Contemporary World Issues; Santa Barbara California. 1993.
- ⁶³ Fisheries and Oceans Canada. Marine Oil Spill Preparedness and Response Regime. Report to Parliament 1998-2000. www.ccg-gcc.gc.ca/rser-ssie/er-ie/rtp/main.htm.
- ⁶⁴ SOR/93-3, 95 & 98 (amendments).
- ⁶⁵ See s.31-34 of the CSA Oil Pollution Prevention Regulations.
- ⁶⁶ Personal communication with Biant Warn, Transport Canada Marine Branch, August 2001.
- ⁶⁷ Bluewater petition, available online at Bluewater web page, www.earthisland.org/bw.
- ⁶⁸ Kira Schmidt, Cruising for Trouble: Stemming the Tide of Cruise Ship Pollution. Bluewater Network's Cruise Ship Campaign. March 2000.
- ⁶⁹ Kira Schmidt, Cruising for Trouble: Stemming the Tide of Cruise Ship Pollution. Bluewater Network's Cruise Ship Campaign. March 2000.
- ⁷⁰ *Id.*
- ⁷¹ B.H. Kay. A State of the Environment Report: Pollutants in British Columbia's Marine Environment: A status report. Environment Canada, April 1989.
- ⁷² *Ibid.*
- ⁷³ *Ibid.*
- ⁷⁴ Gorman, Martha. Environmental Hazards Marine Pollution. Contemporary World Issues; Santa Barbara, California. 1993.
- ⁷⁵ McKay et al. Danger at Sea: Our Changing Ocean. Found at www.earthisland.org/bw/, the website for Cruising for Trouble: Stemming the Tide of Cruise Ship Pollution. Bluewater Network's Cruise Ship Campaign. March 2000.
- ⁷⁶ Gorman, Martha. Environmental Hazards Marine Pollution. Contemporary World Issues; Santa Barbara California. 1993.
- ⁷⁷ Texas Center for Policy Studies, CIELAP, Proyecto Emisiones. *The Generation and Management of Hazardous Waste and Transboundary hazardous Waste Shipments between Mexico, Canada and the United States, 1990-2000*, May 2001.
- ⁷⁸ Report of the Commissioner of the Environment and Sustainable Development — 2000. Chapter 9: Follow up of Previous Audits: More Action Needed.

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- ⁷⁹ Cruise ships: Testing the waters in Alaska, by Bob King, Alaska Office of the Governor. Coastal Services Magazine. Found at <http://www.csc.noaa.gov/magazine/2001/04/alaska.html>.
- ⁸⁰ Kira Schmidt. Cruising for Trouble: Stemming the Tide of Cruise Ship Pollution.
- ⁸¹ The *Oceans Act*, administered by the Department of Fisheries and Oceans (DFO), is focused on the management of ocean resources and not shipping.
- ⁸² NOAA Coastal Services Center. Legislative Summaries <http://www.csc.noaa.gov/opis/html/summary/apps.htm>.
- ⁸³ NOAA Coastal Services Center. Legislative Summaries http://tis.eh.doe.gov/oeпа/law_sum/MPRSA.HTM.
- ⁸⁴ Cruise Ship White Paper. United States Environmental Protection Agency, August 22, 2000.
- ⁸⁵ Environment News Service. <http://ens.lycos.com/ens/jan2001/2001L-01-16-09.html>.
- ⁸⁶ Email from Environment Canada, August 6, 2001.
- ⁸⁷ Title 18 Environmental Conservation, Chapter 50 Air Quality Control, Section 70.
- ⁸⁸ Personal Communication. Rod Nelson, Transport Canada, Communications.
- ⁸⁹ See *Marine Pollution: Progress Made to Reduce Marine Pollution by Cruise Ships, but Important Issues Remain*, (February 2000). US General Accounting Office, Report to Congressional Requestors, GAO/RCED-00-48, available online at www.gao.gov/new.items/rc00048.pdf.
- ⁹⁰ Alaska Department of Environmental Conservation. Wastewater Monitoring. November 2000. Found at: <http://www.state.ak.us/local/akpages/ENV.CONSERV/press/cruise/history.htm#meetings>.
- ⁹¹ Memorandum of Understanding between Florida Department of Environmental Protection (FDEP) and the Florida Caribbean Cruise Association (FCCA).
- ⁹² Florida Times-Union www.Jacksonville.com. June 10, 2001.
- ⁹³ This bill was sponsored (and partly developed) by the Bluewater Network.
- ⁹⁴ US Environmental Protection Agency, Cruise Ship White Paper, August 2000, available online at http://www.epa.gov/owow/oceans/cruise_ships/white_paper.pdf.
- ⁹⁵ The standards are listed on the ICCL website at www.iccl.org. at <http://www.iccl.org/policies/environmentalstandards.pdf>.
- ⁹⁶ Peter Krahn, Enforcement vs. Voluntary Compliance: An Examination of the Strategic Enforcement Initiatives Implemented by the Pacific and Yukon regional Office of Environment Canada 1983-1998, Regional Program report 98-02.
- ⁹⁷ King, A. and Lenox. (2000) Industry Self-regulation Without Sanctions: The Chemical Industries Responsible Care Program, *Academy of Management Journal* 43 (4).
- ⁹⁸ Alaska Department of Environmental Conservation. Alaska Cruise Ship Initiative.
- ⁹⁹ See *Cruise Ship Factoids*, on the Bluewater website.
- ¹⁰⁰ See the Province article, "Cruise ships dumping sewage in BC waters" (7 November 2000).
- ¹⁰¹ Government of BC, Land Use Coordination Office, has produced a *Coastal Resource and Oil Spill Response Atlas* and a Guide to Spatial Land and Resource Information in LRMP — Marine Resources. Atlases for the Southern Strait of Georgia (Race Rocks to Nanaimo) and the West Coast of Vancouver Island (Barkley Sound to Esperanza Inlet) have already been prepared. Data has also been collected for: Northern Strait of Georgia (Nanaimo to Quadra Island), Johnstone Strait (Quadra Island to Cape Caution); Mid Coast (Cape Caution to Princess Royal Island); North Coast (Princess Royal to Portland Inlet; Queen Charlotte Islands; North West Coast of Vancouver Island (Esperanza Inlet to Mexicana Point. The Province's goal is to eventually have a digital atlas for each of the regions to aid the Province in Oil Spill Response, coastal resource inventory, marine protected areas strategies and coastal planning and development issues. See the GIS — Coastal and Marine Initiatives Homepage at <http://www.luco.gov.bc.ca/coastal/mris/coasthm.htm>.

