



Georgia Strait Alliance
Caring for Our Coastal Waters

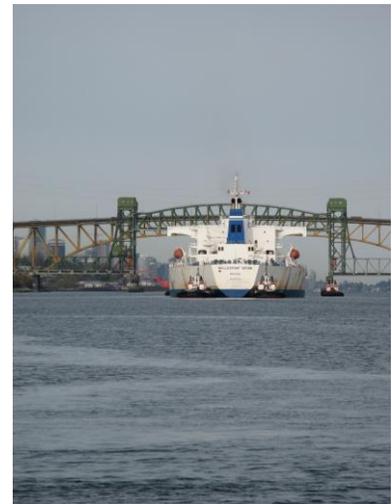
Oil Tankers in the Strait of Georgia ***Some questions and answers by and for concerned citizens***

What's the issue?

Crude oil tanker traffic is on the rise in Burrard Inlet and the Strait of Georgia, creating increased risks of a major oil spill for which we are woefully unprepared.

Since when do we have crude oil tankers in the Burrard Inlet and the Strait of Georgia?

The earliest oil tanker traffic dates back to 1908 when crude oil was delivered to the BC Oil Refinery in Port Moody (in small tankers compared to those of today). The volume of crude oil tanker traffic ebbed and flowed until around 1995 and ended temporarily with the last sailing of the Imperial Skeena from the loco. Refined product however continued to be shipped. After the Trans Mountain Pipeline was completed in 1953 to supply 3 refineries, mostly refined product was shipped through our waters even after the early 1990's when the refineries closed.¹



How many crude oil tankers travel through our waters now?

In 2003 the number was 12, which has steadily increased annually to 71 in 2010. In 2011 the number was reportedly down to 39 however terminology is a little confusing as what are referred to as "barges" are actually smaller tankers so the 2011 figure could be larger. Whatever the case, the shipments are expected to increase rapidly.²

¹ www.cityofportmoody.com, <http://kennedystewart.ndp.ca/issue-kinder-morgan-trans-mountain-pipeline>, Ballantyne, Richard (2011), Personal Communication

² Baker, Peter, 2010, A Crude Affair – West Coast Crude Oil Exports from Vancouver Harbour – A briefing Slide Deck; Pacific Pilotage Authority, 2011, Personal Communication; Port of Metro Vancouver, 2010, Second Narrows Transit Procedures Overview –Power Point Presentation, <http://www.bclocalnews.com/opinion/137496303.html>



How big are the tankers coming into the Strait of Georgia?

Panamax tankers are typically around 200 metres (656 ft) in length and 32 metres (106 ft) wide while their bigger cousins the Aframax tankers are around 245 metres (803 ft) long and 42 metres (137 ft) wide. Aframax tankers are the largest that can be accommodated today at the Westridge terminal in Burnaby, but plans are afoot to bring Suezmax tankers as large as 275 metres (935 ft) long into Burrard Inlet as soon as 2016.³

How much oil do they carry?

The largest tankers currently travelling our waters (i.e. Aframax) have capacity up to 879,600 barrels (120,000 metric tons) of crude oil. While at this time most tankers departing Vancouver are not fully loaded (approx. 87%) because of draft restrictions (how deep the vessels can be below the waterline) the load levels have slowly been increased because the draft restrictions have become progressively less strict and tankers can be loaded to a draft of 13.5 metres! Plans are to eventually dredge and deepen the Second Narrows, allowing the tankers to be fully loaded. Even at current capacity, they are still carrying huge amounts of oil. Suezmax tankers have capacity up to 1,759,200 barrels (240,000 metric tons).⁴ The Exxon Valdez was a single hulled Suezmax vessel that spilled up to 750,000 barrels from its load when it ran up on Bligh Reef in Prince William Sound, Alaska.⁵



Do these tankers have double hulls?

All of the large tankers transporting crude oil from the Westridge terminal now must have double hulls.⁶

Do double hulls on tankers eliminate the risk of a spill?

No. While most tankers throughout the world today have double hulls, which undoubtedly help reduce the risk of a spill, double hulls have some limitations and are no guarantee to eliminate

³ <http://en.wikipedia.org/wiki/Suezmax>; Port of Metro Vancouver (2010) *Second Narrows Transit Procedures Overview* by Yoss Leclerc, Director Operations and Security; Anderson, Ian, 2011, President Kinder Morgan Canada Group [Power Point presentation for investors](#)

⁴ Pacific Energy Partners, L. P. 2005 *Tanker Information For Pier 400 Crude Oil Receiving Terminal*; <http://en.wikipedia.org/wiki/Suezmax>

⁵ http://en.wikipedia.org/wiki/Exxon_Valdez_oil_spill

⁶ Transport Canada, 2009, [Standards for the Double Hull Construction of Oil Tankers- 4th Edition](#)

the risk of a spill. There have been several significant spills from double hulled tankers in other parts of the world.⁷

Are there any plans to increase oil shipments through Vancouver and Georgia Strait?

Yes. Plans are extensive.

The oil pipeline company Kinder Morgan wants to increase the capacity of its TransMountain pipeline from 300,000 barrels per day to 890,000 barrels per day, which translates to approximately 450 or more transits of large fully loaded tankers each year, depending on the size of the tankers/barges⁸. To increase that much, the current pipeline will have to be twinned and the Second Narrows Bridge in Burrard inlet might have to be dredged to allow even larger tankers into the Westridge loading facilities.⁹ Although there has never been a significant spill from the Westridge terminal or the ships servicing it that we are aware of, the possibility is always there and increases with increased traffic.

What are the chances of an oil spill?

An analysis done by an Ottawa consultant for the Canadian Coast Guard in 1999¹⁰ estimated we can expect a major spill (greater than 10,000 barrels) in Canadian waters every 7 years! The analysis was conducted before the major increases in oil tanker traffic out of Vancouver during the last decade. However in that time there have been some notable improvements in risk mitigation, especially in technology including navigation and communications software, so the actual probability of a big spill is hard to say. Although a comprehensive study is desperately needed and was recommended by the Auditor General in 2009¹¹, we have yet to see a full and comprehensive risk analysis. The 1999 study averaged together the risks throughout Canada. Simple probability and common sense tells us that more tanker transits in our local waters equal an increased risk of a catastrophic spill here. Probability, however, is not enough to consider the full risk and the consequences of a spill on the environment, social fabric and economy must be also taken into consideration.

There have been other risk analyses done including the Second Narrows Vessel Transits - Pilotage Risk Management Methodology (PRMM) in July 2008¹². Det Norske Veritas prepared the Fraser River Tanker Traffic Study for Port Metro Vancouver in 2012¹³. However, these risk

⁷ Living Oceans Society, 2011, [Tanker Technology - Limitations of Double Hulls](#)

⁸ Kinder Morgan Canada, 2013, [official TransMountain project website](#)

⁹ Anderson, Ian, 2011, President Kinder Morgan Canada Group [Power Point presentation for investors](#)

¹⁰ SL Ross Environmental Research Ltd., 1999, [Probability of Oil Spills from Tankers in Canadian Waters](#)

¹¹ Office of the Auditor General of Canada, 2010, [Report of the Commissioner of the Environment and Sustainable Development to the House of Commons FALL Chapter 1 Oil Spills from Ships](#)

¹² Hudson Gordon, 2008, *Second Narrows Vessel Transits - Pilotage Risk Management Methodology (PRMM) - Prepared for Vancouver Fraser Port Authority*

¹³ Det Norske Veritas 2012, [Fraser River Tanker Traffic Study](#)

analyses are either out of date, don't cover the specific or whole transit through the Strait of Georgia and transboundary islands or simply don't consider the full ecological, social and financial consequences of a large spill here.

What will a crude oil spill do to Georgia Strait? (Adapted from [Tanker Free BC](#)¹⁴)

Crude oil has a much greater impact on marine environments than refined gasoline products.



Crude oil is thicker and heavier, so it does not easily evaporate. The impact of modified crude oil, like what is being shipped through Vancouver, is yet to be fully researched and documented but is likely to be similar to, or worse than straight crude. Crude oil and modified crude can vary in composition and may contain sulphur, paraffins, asphaltics, naphthene, benzenes, and other compounds that have toxic effects on plants and animals including heavy metals.¹⁵ Depending on the composition

some of it may sink in the water column. Ecosystem damage in our area means damage to our economy and quality of life, from ruined fisheries to impacts on tourism and recreation.

From studies of historic oil spills, these are some of the impacts from crude oil in a marine ecosystem:

Persistence: evidence from the Ixtoc spill in the Gulf of Mexico in 1979 and the Amoco Cadiz spill in France in 1978 shows that oil remains in the substrate after 30 years. Researchers have estimated that the crude oil may persist for a century, with impacts on flora and fauna.

Death: Fish, birds, marine mammals, reptiles, amphibians, shellfish, and plants are suffocated and poisoned. The Ixtoc spill killed 50-80% of the bottom dwelling animals along some shorelines. In the case of the Exxon Valdez, a population of killer whales (AT1) lost most of its reproductive age members due to the spill, and is now headed towards extinction.¹⁶



¹⁴ <http://www.notanks.dreamhosters.com/?p=51>

¹⁵ Parviz M. Rahimi and Thomas Gentzis, 2006, *The Chemistry Of Bitumen And Heavy Oil Processing*, National Centre for Upgrading Technology http://chentserver.uwaterloo.ca/aekamel/che720/che735/lectures_che735_students/new-book-practical-advances-refinery/chapter19-bitumen-and-heavy-oil-processing.pdf, <http://en.wikipedia.org/wiki/Bitumen>

¹⁶ Matkin, C. O., E. L. Saulitis, G. M. Ellis, P. Olesiuk, S. D. Rice 2008. *Ongoing population-level impacts on killer whales *Orcinus orca* following the "Exxon Valdez" oil spill in Prince William Sound, Alaska* (2008). *Mar Ecol Prog Ser.*, Vol. 356: 269-281, 2008

Disease: Oil is known to cause cancer, liver decay, tumours, ulcers, respiratory failure, narcosis, and other diseases in animals, including humans.

Erosion: Oil kills and stunts wetlands grasses and other plants, causing root structures to decay and soil to erode potentially destroying whole plant communities.

Food web disruption: Following the loss of phytoplankton, shellfish, fish and birds. Enough disruption can cause species to go extinct and biodiversity to dramatically decline reducing the overall health of the ecosystem.

Breeding habitats destroyed: The loss of plants and eroded soil destroy wetland nurseries for birds, fish, and other animals.

Now if risk equals probability by consequence, we could potentially argue all day about the probability of a major spill happening here. But if you understand anything about ecology, ecosystems and an economy dependent on them, then the dire consequences are pretty clear. Although there have been no comprehensive studies done in BC with regards to ecological and economic consequences of a major oil spill in the region, next door in Washington State they have. Several years ago, Department of Ecology conducted a study to determine what the economic impacts of a major spill might be.¹⁷ They concluded that a major spill would cost 165,000 jobs and 10.8 billion dollars in economic impacts alone. This does not include individual claims or environmental impacts. According to NOAA scientists, of all the threats posed to orca whales in the region, the threat of a major oil spill is the single greatest risk to the species. Such a spill could easily eliminate our resident orca populations.

Are we prepared for a catastrophic oil spill?

No.

We have a very professional response organization here in BC but if the spill is large enough, they simply don't have the capacity to handle it in a timely way on their own. Because our waters are narrow and the currents fast-moving, an effective response would have to be almost immediate. Yet Transport Canada requires that a response be capable of handling only 73,300 barrels (10,000 tonnes)¹⁸, a small fraction of a potential tanker spill. Actual experience with spills around the world has demonstrated time and time again that meaningful response efforts take many hours, days and even weeks to mobilize. We also learned recently that spill response counterparts south of the border have been advised by their lawyers not to respond in Canada¹⁹ as there is currently no immunity for non-Canadian responders under the Canada Shipping Act.²⁰

¹⁷ People for Puget Sound, 2011, *The Gulf Oil Spill: A Wakeup Call for Washington State*

¹⁸ Marine Safety Directorate-Transport Canada, 1995, [Response Organizations Standards](#)

¹⁹ Knox, Graham, BC MoE, 2011 Personal Communication

²⁰ <http://laws-lois.justice.gc.ca/eng/acts/C-10.15/index.html>



This is significant as there are not enough resources and staff available to be able to cover all spill possibilities in BC.²¹

The 2009 Auditor General's report²² also points out that our Coast Guard is not ready for a big spill, and the 2011 Oil Spill Task Force Transboundary report²³ lists 17 pages of recommendations to various agencies, response organization and industry to improve response, that have mostly yet to be implemented.

What sort of oil is being shipped through our waters?

Diluted Bitumen (Dilbit), Synthetic Crude (Syn crude) or Modified Crude are all names for the tar sand extract that has been modified from its original form to allow for easier flow through the Trans Mountain pipeline.²⁴ Conventional crude oil and natural gas are also carried by the Trans Mountain pipeline.

Where does the oil come from?

The Alberta tar sands, Canada's single greatest and fastest growing greenhouse gas emitter, which is also having a negative impact on the local environment in that province.²⁵

Where is the oil going to?

West coast refineries in the US, as well as some Asian markets.²⁶

Who owns the tankers that are transporting crude oil in our waters?

Several different International shipping companies including:

Teekay Corporation; Tokyo Marine; Kyklades Maritime Corporation; Express Maritime Ltd.; Ap Moller Maersk²⁷

²¹ Reid, Stafford, 2008, [Major Marine Vessel Casualty - Risk and Response Preparedness in British Columbia](#), Living Oceans Society

²² Office of the Auditor General of Canada, 2010, [Report of the Commissioner of the Environment and Sustainable Development to the House of Commons FALL Chapter 1 Oil Spills from Ships](#)

²³ Pacific States/British Columbia Oil Spill Task Force, 2011, [The Stakeholder Workgroup Review of Planning and Response Capabilities for a Marine Oil Spill on the U.S./Canadian Transboundary Areas of the Pacific Coast - Final Project Report](#)

²⁴ http://en.wikipedia.org/wiki/Unconventional_oil, <http://en.wikipedia.org/wiki/Dilbit>, http://en.wikipedia.org/wiki/Synthetic_crude

²⁵ International Boreal Conservation Campaign, 2008, [Canada's Tar Sands](#)

²⁶ Anderson, Ian, 2011, President Kinder Morgan Canada Group [Power Point presentation for investors](#)

²⁷ www.marine-traffic.com; <http://twitter.com/#!/BurrardInletOil>

Who has to clean up any spills?

Under the Canada Shipping Act, whoever causes the spill is regarded as the “Responsible Party” or RP. They are charged with cleaning up any spill and paying for any associated costs. All shipping companies and terminal facilities operating in Canada must retain the services of a Response Organization (RO) who will conduct a response on their behalf. In BC the only RO is Western Canada Marine Response Corporation (WCMRC) previously known as Burrard Clean. Oil spill response and clean up is coordinated by the RP and overseen by the Canadian Coast Guard and/or the BC Ministry of the Environment depending where the oil ends up.²⁸ If the spill is regarded as a “mystery spill” or the RP is ineffective, these agencies will take over the clean up coordination.

Who pays for the clean-up, damages and other costs of a spill?

The responsible party is liable, but given that the Exxon Valdez disaster back in 1989 has cost at least \$3.5 billion USD²⁹, whoever it is may not be able to cover the costs. The limit of liability on Canada’s Ship Source Oil Pollution Fund is under \$1.6 Billion CAD³⁰ and the limit on The International Oil Pollution Compensation Funds is approximately \$1.15 billion USD³¹. That could mean that BC taxpayers may have to foot part of the direct financial cost along with all the local social, environmental and economic costs.

How long after a spill does a clean-up start?

It depends on many factors: where and when the spill occurs; how soon it is reported; if there is any other response occurring at the same time, the weather conditions. For a relatively small spill (up to 1100 barrels or 150 tonnes) in the Port of Metro Vancouver area, we can expect a full response within 6 hours as required by Transport Canada. For larger spills up to 73,300



barrels or 10,000 tonnes the response time is within 72 hours (3 days). So for a large spill near the Gulf Islands or in the Strait of Juan de Fuca the oil could have up to 12 tide changes before a full response is underway. Currents experienced in this region would spread any spilled oil far and wide.³²

²⁸ <http://laws.justice.gc.ca/eng/acts/C-10.15/>

²⁹ <http://www.livingoceans.org/sites/default/files/reports/Who%20Pays%20factsheet.pdf>

³⁰ <http://www.ssopfund.gc.ca/documents/AnnualReport2010-2011-e.pdf>

³¹ <http://www.iopcfund.org/SDR.htm>

³² 1995, Marine Safety Directorate-Transport Canada, [Response Organizations Standards](#)

Can all the oil from a spill be recovered?

No! Depending on where and when the spill occurs, the type of oil and the weather conditions, less than 10% may be recovered with a full response. It also is very dependent on response times especially in areas of high current that we have around the Strait of Georgia. Even in a best case scenario perhaps only 25% or less of the spilled toxic oil in open waters may be recovered. Even though much of the remaining oil will eventually biodegrade or photodegrade (decomposition by radiant energy), the effects on our local waters in the meantime can be devastating.³³ Diluted bitumen and other forms of oil from the tar sands are likely to have even lower rates of recovery.

When a large spill happens here, how will it be cleaned up?

Several methods will be used to contain, recover and clean up the spilled oil. Mechanical recovery will involve the use of skimmers, booms and other equipment. Given the geography of our region there is a good chance chemical dispersants and in-situ burning would be used to try to stop the oil reaching shorelines.³⁴

Who's concerned about the possibility of an oil spill?

Citizens who live, work and recreate around this beautiful body of water; professional fishermen, sports fishermen, shellfish farmers, business leaders, property owners, tourism operators and First Nations. The Tsleil-Waututh First Nation of Burrard inlet, oppose Kinder Morgan Pipeline Expansion to Pacific saying it is “a risk too great to accept”³⁵.

In polling commissioned in April of 2011 by several environmental groups, and conducted by Strategic Communications³⁶, 56% of respondents reported that they thought it ‘very likely’ or ‘somewhat likely’ that there would be a major oil spill in Georgia Strait. In addition, 65% of respondents ‘strongly disagreed’ or ‘somewhat disagreed’ that oil spill response plans were adequate to protect the marine environment. If more people knew the risk, these figures would no doubt be higher--only 1 in 10 people polled knew that tanker traffic had increased significantly (9% - another 21% knew it increased somewhat).

³³ Steiner, Richard, 2011, *Oil Spill Expert – Personal Communication*,
Graham, Gerald, 2011, *World Ocean Consulting – Personal Communication*
<http://www.livescience.com/6380-experts-gulf-oil-spill-won-cleaned.html>

³⁴ BC Ministry of Environment (2011) Incident Management Team Training

³⁵ http://www.twntation.ca/~media/Files/Press%20Releases/TWN_PressRelease_KinderMorgan_31Oct2011.ashx

³⁶ [Organizing for Change](#), 2011, *Opinion Research*



What's being done to minimize the risk of an oil spill in our waters?

Port of Metro Vancouver has some very stringent procedures in place for tankers transiting the Second Narrows in Burrard Inlet³⁷. Pilots for these vessels are highly trained and experienced and have access to the latest technology. There are also a number of Canadian and international regulations that pertain specifically to oil tankers. Escort tugs are used on some sections of a tanker's journey from the Westridge terminal in Burrard Inlet to the Pacific Ocean^{38, 39}.

Will anyone involved in the oil shipments absolutely guarantee there will never be a major spill from an oil tanker in our waters?

No one that we have talked to would guarantee that, and no guarantees have been found in all our research. The reality is that accidents can and do happen. As several independent experts have told us, it's really a matter of when, not if.

Are oil tankers the only risk for oil spills around the Strait of Georgia?

Unfortunately there are other significant risks. Firstly, all the other shipping that uses the Strait carry fuel and oil. Oil spills from these types of vessels can be large⁴⁰. Many happen each year throughout the world and even here we have had our share. Remember the 2009 Westwood Annette spill in Squamish and the Squamish Estuary⁴¹ where approximately 243 barrels (29,000 litres) of Bunker C oil was spilled when the M/V Westwood Annette, departing under tow from the Squamish docks during high wind conditions, punctured a starboard fuel tank on a metal piling. Spills from pipelines can also be significant and there are a number of pipelines close to marine waters. The Burnaby spill from the ruptured Transmountain pipeline in 2007⁴² spilled approximately 1470 barrels (234,000 litres) of Crude Oil gushed out of a Kinder Morgan crude oil pipeline connecting their Burnaby Tank Farm to the Westridge Marine Terminal which was punctured by a construction crew digging along the Barnett Highway.

Then there are the cumulative small spills that occur from recreational boating, parking lot run off and other sources. In fact "nearly 85 percent of the 29 million gallons of petroleum that

³⁷ Port Metro Vancouver, 2010, *Second Narrows Movement Restriction Area Procedures*

³⁸ Pacific Pilotage Authority, 2010, *Notice to Industry 05/2010 Interim Operating Rules for Loaded Crude Oil Tankers in excess of 40, 000 Dead WeightTonnage*

³⁹ BC Chamber of Shipping Promotional Video

⁴⁰ Reid, Stafford, 2008, Major Marine Vessel Casualty -Risk and Response Preparedness in British Columbia, Living Oceans Society

⁴¹ http://www.env.gov.bc.ca/eemp/incidents/2006/westwood_06.htm

⁴² http://www.env.gov.bc.ca/eemp/incidents/2007/burnaby_oil_spill_07.htm

enter North American ocean waters each year as a result of human activities comes from land-based runoff, polluted rivers, airplanes, and small boats and jet skis⁴³

Is the level of risk associated with increasing tanker traffic worth it?

Well that depends on who you talk to. Conversations we've had with interested parties in the shipping and oil industries say it's definitely worth it to build a strong economy and expand our trade. Speak to some of the locals in the Gulf Islands where a spill could wash up and we've heard an almost resounding "no". In actual fact, so far in this region, the majority who live, work and play here have not been asked. As told to us during our research, the public has been purposely left out of the discussion.

What more needs to be done to prevent the risk of a large spill in our waters?

- It is imperative that **comprehensive public consultation** is held to find out if all the other people who live work and play in this region are willing to take the risks associated with increases in crude oil shipments.
- Much **more in-depth risk analyses than has been done to date** needs to be undertaken that will **consider the full ecological, social and financial consequences** of a large spill here.
- **More extensive tug escort requirements** should be considered.
- To reduce the likelihood of a spill, the government should not allow infrastructure to be built that will lock in more oil tanker traffic along our coast – and greatly increased carbon emissions – for decades to come. With climate change, pipeline leaks, oil spills and more, it is past time to **move beyond our addiction to the whole oil economy** and find new ways to prosper together.



Oil from the Westwood Annette spill in the sensitive Squamish River Estuary

* Updated June, 2013 - *Information contained in this document is believed correct at time of publication. Please advise us of any errors or omissions.*

⁴³ National Research Council, 2002, Oil in the Sea III: Inputs, Fates, and Effects

What can I do to help make sure our precious waters and shore are protected from crude oil spill damage?

Act Now!

- **Write/email our politicians:**
[Prime Minister Stephen Harper, pm@pm.gc.ca](mailto:pm@pm.gc.ca)
[Minister Denis Lebel](mailto:mintc@tc.gc.ca), Transport Canada, mintc@tc.gc.ca
[Minister Terry Lake](mailto:env.minister@gov.bc.ca), BC Ministry of the Environment, env.minister@gov.bc.ca
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[Duncan Wilson](mailto:info@portmetrovancover.com), VP, Corporate Social Responsibility, info@portmetrovancover.com
[Darrell Desjardin](mailto:Darrell.Desjardin@portmetrovancover.com), Director, Environmental Programs, Darrell.Desjardin@portmetrovancover.com
- Write/email to Industry Leaders:
[Ian Anderson](mailto:externalrelations@kindermorgan.com), President, Kinder Morgan Canada, externalrelations@kindermorgan.com
Captain [Stephen Brown](mailto:stephen@cosbc.ca), President, BC Chamber of Shipping, stephen@cosbc.ca
[Kaity Stein](mailto:kaity@kaitystein.com), President and Secretary General, International Ship-Owners Alliance of Canada Inc., kaity@kaitystein.com
[Jane McIvor](mailto:info@bcshippingnews.com), Editor, BC Shipping News, info@bcshippingnews.com
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