

MINUTES OF THE WOODFIBRE LNG COMMITTEE MEETING

Thursday, November 27, 2014 from 6:30pm – 10:00pm

Best Western, 38922 Progress Way, Squamish

- Present:** Donna Wall, Richard A. Wildman Jr., Karine Le Du, Linda Kelly Smith, Anthony Blaikie, Jennifer Reilly, Sara Van Mulligen, Doug Race, Rod MacLeod
- Facilitator:** Catherine Rockandel
- Regrets:** Sean Carron, Glenn Stainton, Randy Stoyko
- Guests:** Vancouver Aquarium Presentation Team: Peter Ross, Director Pollution Prevention; Jeff Marliave, Howe Sound Research Program; Lance Barrett-Lennard, Head of the VA Cetacean Research Program; Kathy Heise, Cetacean Acoustic Expert and Research Associate
- District of Squamish Observers: Linda Glenday, Deputy CAO; Councillor/Mayor-Elect Heintzman, Councillor-Elect Elliott
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1. **Opening Remarks**

The facilitator provided an overview of the agenda and welcomed the guests. She announced that in the next week Councillor-Elect Elliott would be appointed by Mayor-Elect Heintzman as an additional ex-officio joining Councillor Race on the Committee. A round of introductions opened the meeting.

Guest Presentation: The Vancouver Aquarium team is part of a long-standing research program that has been part of the Aquarium since its inception. More recently the Aquarium established the Coastal Oceans Research Institute of which the four presenters are a part.

The presentations focused on Howe Sound ecology and the impacts of historical industrial activity; focusing on issues such as noise and disturbance arising from construction and operation phases of the plant (blasting, pile driving, vessel traffic); Pollution related to routine construction, operations, maintenance of the plant; Pollution arising from ship-based traffic (ballast water, bilge water, fuelling operations, minor accidental spills); Catastrophic spills associated with accidents at the plant or on ship. All in the context of: Marine mammals residing in, or transiting through, Howe Sound; Fish inhabiting (e.g. rockfish), or transiting (e.g. salmon), Howe Sound; Invertebrates, sponge reefs; Commercial, recreational or aboriginal fisheries; Inherent biological or ecological value (estuaries, rockfish conservation areas, forage fish).

Each presentation included questions that the Committee can suggest that DOS Council and working group address.

Questions and comments related to the presentation:

Q1 What is the number if you see a whale?

A1 The Vancouver Aquarium manages the BC Cetacean Sightings Network. The web site is www.wildwhales.org and the number is 1-866-I-SAW-ONE (472-9663)

- Q2** One of the concerns about this proposal is that it is water cooled through a closed loop system that cycles the water. It puts the water back in an ambient temperature of 10 degree above centigrade, within 10 metres through a diffuser at 30-60 feet the water is dispersed at a one degree temperature difference. What is the potential impact of that on marine life?
- A2** Around Squamish there is a strong flow from the Squamish River. It takes and disperses toxins above (and away from) sensitive sponges on the seabed. There is tremendous seawater mixing up at the head of the Squamish reach near the area of discharge for the proposed plant. (i.e. the river outflow carries toxins out of the Reach at the surface and deep seawater replaces it over the sill at Porteau).
- This type of heating and cooling is the modern way to go. We use it at the Aquarium for our pools. It is very unlikely you will get a detectable signature in the vicinity. The only things you would likely see showing up are things that would find it cozier very close to the diffuser pipe, not that they are being harmed.
- Q3** What we have been told is that to keep the pipes from clogging from sea life chlorine will be introduced that is made from the seawater and then injected in and dispersed continuously?
- A3** You have to ask questions about the contact time ie: how long they leave it in the pipe? The Aquarium also uses chlorine for its marine mammal tanks. It dissipates as it knocks things off. However, if it is coming out continuously that is not a good way to clean your pipes. A batch dose at a higher concentration is more common de-fouling.
- Q4** In terms of the sediment samplings, the proposed lifespan of this project is 20 or 25 years. Is that a long enough time in the sediments to show noticeable changes if you are doing baselines prior to operations, then monitoring 5 years in, is that enough time to show differences?
- A4** Yes, of course, but it will depend to a degree on sedimentation rates, tidal flux and currents. Environmental scientists could determine through sediment the situation before for example: ballast water escapes, or black water discharge what the impact might be. From the proponent stand point if they don't want to be blamed for the pre-1989 Woodfibre use of chlorine as a bleaching agent that resulted in dioxins and furan deposits in the sediment then base lines would be important. It also depends on how stable that area is, how much the sediment is disturbed by bugs and current. This is one of the problems around the Crofton Mill where there is a lot of current creating turbidity moving the sediments around. Sediment geochemists and benthic marine ecologists understand how to document and respond to issues. Talk to Metro Vancouver or the Capital Regional District (CRD) in Victoria: they both have marine monitoring programs. The monitoring program in the CRD is extensive and costs one million dollar a year.. They have sophisticated sampling program around effluent plants – one week for this another week for that.
- Q5** Is the CRD monitoring program regulated or voluntary?

- A5** It is required under Liquid Waste discharge permits issued by the Province of BC. The new model is to make it proponent-driven but it is equally important to ensure people on the outside are advocating monitoring requirements and reports. For example: with LNG hydrocarbon signatures might not be associated with the plant itself but at places such as the fueling dock. The Government enforcement officers will be looking for samples, baselines etc in the case of accident and if Squamish has that data it is helpful.
- Q6** In the case of seawater heat exchange at the Aquarium, do you monitor it to see what the impacts are?
- A6** We are looking at this. Our volumes are small and thermal impacts not measurable against a background of natural thermal variation. One of our water quality manager's biggest concerns is getting oceanographic data on what nature is sending us through First Narrows because we are seeing spikes that we didn't use to see.
- C7** Speaking of volumes, the WLNG water heat exchanger is proposing 17,000 cubic metres per hour 24/7
- A7** *Aquarium:* What is the discharge rate of the Squamish River? How many cubic rates? That is the comparison rate you need to make? Thinking about it in terms of swimming pools is also a helpful comparison.
- A7** *Member of Committee:* It is at 300 cubic metres per second.
- C7** *Member of Committee:* 17,000 cubic meters per hour is about 4 cubic metres per second. At Quest the Mashiter Creek and Ring Creek are about 10 cubic metres per second. This is the size of a small creek.
- C7** *Member of Committee:* Yes, the size of a small, chlorinated, warm water creek
- Q8** The proponent is currently doing remediation work, would it be useful to do some baseline studies now if they have not done them already, or would the work already disturbed things?
- A8** Hatfield Consultants after the dioxin and furan issue did a big study in the mid 1990s on the whole Strait of Georgia including the two mills in Howe Sound. So even though it might be almost twenty years ago some baselines do exist.
- Q9** If the federal and provincial regulations have been eroded is it possible to regulate at the municipal level? Have you seen that done in other municipalities?
- A9** I am not a policy person but regulation is usually made at provincial level. You might be able to influence the design and implementation of a monitoring program.
- Q10** Do you guys know where the whales are? Do you have a sense of where pods of orcas are weekly or monthly?
- A10** The whale watching fleets and individual spotters identify when they see whales but we don't track their weekly or monthly movements. The sighting reports give us a pretty good idea of where they are but there are gaps in our knowledge, especially in winter. In terms of humpback whales in Howe Sound these sightings are becoming more frequent. We gauge the effectiveness of the sightings network through redundancy of sightings—

in the summer we do get multiple reports of single occurrences of humpbacks or killer whales in the Sound.

Q11 There is an argument being made that we can't have big ships coming into Howe Sound because they will scare off cetaceans we love so much. Would the LNG ships have different sound signatures?

A11 Some animals are attracted to fast moving ships. For example: dolphins like to bow ride but you won't see a mother and calf bow ride. You have to put in context the type of animal, its age. This is why I would encourage this project to have an acoustic baseline and then look at how much additional noise will be added to that in project area.

Q12 How hard is it to put a hydrophone in the water?

A12 You can put one in over the side of a boat or you can permanently mount them. The citizen science groups have hydrophones that are permanently mounted on the sea bottom with cables to shore base stations that are wind or solar powered. Fisheries and Oceans places hydrophones at depth and leave them there for periods up to a year. They range in price from \$500 to \$20,000. To characterize soundscapes you need a really good quality hydrophone.

Historically the most scared animal on the BC Coast is the Pacific Herring. They were fished in Coal Harbour extensively to grease the skids used in the logging industry. Two centuries ago that was the first place herring stopped spawning. They scared them out of Departure Bay and Nanoose Bay. Fact is that when they went to the roe herring fishery, it was a competitive seine fishery and all the BC seine fleets set their gear at once. The acoustic signature of that must have been phenomenal. All the herring always formed a fright ball. Their reaction is to super aggregate. So you wound up with all the herring in Georgia Strait spawning in Lambert Channel. Only because boats were sinking and men were drowning did they change the rules and went to a pooled fishery where you had six or seven boats and you had to set your gear one boat at a time. The herring immediately randomized and that is why we have herring coming back to Skuttle Bay, Powell Sound and Howe Sound because they changed the management. The white-sided dolphin most likely came back to Howe Sound because of the herring. The herring respond to sounds and they are not like salmon, they don't have rigorous homing. They are more roaming.

Q13 One of things that we have heard is the herring are spawning under the deep sea port pilings and in the Blind Channel where the small craft are moored. All these places have ambient noise.

A13 One of the places they are spawning. They are also spawning all the way down to Defense Island and all down by Woodfibre. You need to think of whether the LNG port will have loud noise or systematic continuous noise.

Q14 You talked about acoustic baseline data, if you had the data could you model to project what the sound would behave like?

A14 It is physics, but it could be done to predict what the animal would hear but not what the impacts would be. They have to eat so they would swim into all kinds of danger. Also acclimation plays a role. Port Metro Vancouver is dealing with similar issues. All the LNG

facilities on the coast are doing acoustic baselines so they should be paying for it. No one is arguing that there are not effects but they do argue how big they are. Naval architects have demonstrated that you can design quiet ships.

Q15 If baseline is organized. How experienced do the people who are doing the monitoring have to be?

A15 A good program is year round. Most citizen-science groups store the data they collect on hard drives and live stream some of it for educational purposes. Two First Nations schools on the central coast receive live acoustic feeds from hydrophones placed nearby. The proponents are generally not required to do long term continuous monitoring. Typically these companies will come and do baselines for two weeks and use that data. So you need to ask how long was the base line study conducted for? And whether they are doing a projection about what the facility will produce in terms of acoustical soundscape?

Ocean sound is a huge issue internationally. You can draw on this research, models, on pile driving noise, on ships, etc. Bella Bella and Hartley Bay are great case studies of community monitoring through hydrophones. Anyone can tune in with their FM radio at any time so the process is completely transparent.

Q16 Do you have capacity or interest in providing us with contacts and information if this project moves forward and we look at implementing educational monitoring programs?

A16 Yes, we have lots of information that could support this type of program

Q17 This afternoon I heard an interview about a new book about the Salish Sea on CBC. They mentioned that a one-degree difference in temperature had a significant impact on the plankton. Any comments on that

A17 There had been a one-degree rise in the temperature of the whole of the Strait of Georgia during the decade of the 1990s and the beginning of the new millennium. However the Strait of Georgia is cooling right now that is why global warming is important but you have to integrate them with natural shifts that are happening anyway. This makes it tricky to model. Howe Sound is huge but they should be able to identify the impacts

Q18 *Committee Member:* It has been my experience on certain projects that you can have a Marine Monitoring Plan included as part of Environmental Assessment Certificate. This could give guidelines to Squamish Council and be made a condition of the plan. Could we solicit feedback from you on what we came up with to see if there are any gaps?

A18 Yes, it also might be worthwhile to look at models developed elsewhere

C19 *Aquarium:* When they dredge the cleaner sediments are typically near the top but near mills you tend to have a lot of woody debris. The natural phytoestrogens in the bark and wood fibers can be very toxic for fish.. The thing is with sediments the further down you go the more contaminated from past contamination issues it will be. You will need to ask what the plans are for dredging and subsequent disposal, and what are the implications of exposing e.g. dioxins from deeper sediments for today's sea life in the area?

C20 *Aquarium:* It sounds like you are talking about remediation of the foreshore close to the Woodfibre site. Around Gambier and the north side the amount of woody debris on the seabed from log booms is phenomenal. It never breaks down and until you get to an offshore pinnacle that was never impacted you don't get a sense of how deep it is. For example: around Port Mellon the seabed has this deep, deep rich layer of fibrous sludge. A few things like it such as squat lobsters (N.B. not a real lobster) but other things like worms won't go near it. You can't remediate that but you don't want to make it worse through dredging and reclamation.

Around the Woodfibre site you likely have 60 degree sediment slopes that slump historically. A big part of the Britannia Mine issue is that there are 60 degree slopes that periodically slump. So the Mine site will involve deep toxin release issues in years to come... (re slumping)

C21 Is there anyone provincially or federally that is saying maybe we should put regulations around from shipping transport or industrial foreshore activity

A21 It was discussed as part of Oceans Act when it was brought in. The proponent has to be in compliance with Oceans Act and the Species at Risk Act. So there may be no regulations but it is illegal to harm, destroy habitat of protected species. The capacity of the government to create regulations and enforcement is diminished so it falls on proponents, which don't know where the bar is. We are seeing proponents such as LNG and Metro Vancouver being quite conservative. It is a good time to advocate that proponents meet a higher bar.

Q22 Do we have species at risk in Howe Sound and if so, how many?

A22 From a mammal cetacean perspective, humpbacks are listed as 'Special Concern'. . Transient killer whales are listed and threatened and Southern Resident Killer Whales as Endangered. Harbour porpoises are 'special concern', and Dall porpoises, whitesided dolphins are not listed. From a fish perspective the federal government has never protected any commercially fished species. Any monitoring plans you implement could apply to the cetaceans. There is a draft plan coming that will legally protect Killer Whales. SARA is a piece of legislation that is powerful.

Q23 In terms of the cooling system adding chlorine to seawater; what is the chemistry of sodium hypo-chloride in seawater when it is added as a biocide? What is the effect of hypobromic acids or aganabromines or bromoamines on starfish?

A23 *Aquarium:* These are very toxic and particularly when you do batch doses that are very high. I have heard that the levels are going to be very low. If that is the case it would likely have very little effect.

Committee Member: This is consistent with what the Aquarium is saying. The hypobromine is probably the worst. As a chemistry professor I don't know the effect on starfish or marine life. The point of the discharge is to kill sea life that may foul the lines. It depends on the concentration and dispersion rate. The Committee has not seen anything in terms of modeling of dispersion.

Aquarium: At low levels chlorine when mixed with seawater does not break down.

- Q24** In terms of shipping increases what are all the forms of pollution that should be monitored, not just spills of hydrocarbons because the risk of that is pretty low in this case? What else should we be looking at?
- A24 Good question, Port Metro Vancouver was asking me about that. When you look at the history of shipping there have been some big changes. For example: anti-fouling paints used to bottom paint ships caused wide spread shellfish damage. They were banned. Hydrocarbons and bilge and ballast water have caused lots of problems back east.. Another thing is non-indigenous species in ballast water. There have been some new technologies used to kill organisms in ballast water and others are required are to do ballast exchange out at sea which makes a difference because they are not near shore. How is the Canadian government monitoring IMO guidelines about off shore ballast exchange when ships are coming from all over the world to Squamish Terminals but also to the LNG facility? For example: 95% of the biomass in San Francisco Bay is invasive species.
- C25** You need to advocate about pile driving because the monitoring is based on whomever happens to be in the office at DFO's local office. There is no one in the Prince Rupert office and piling is noisy in air and water. You don't want to see the use of impact hammers. Vibratory hammers can be used. Mitigations for pile driving can be very effective so you want to ensure they are included.
- Q26** Are there companies in Vancouver that have this technology?
- A26 There are companies that have vibratory hammers but it is expensive so you need to advocate for its use. In Germany the government made a regulation that said no more than 160 DB from every pile that is being installed. Regulation drove innovation and Germany is the leader in this area.

Other recommendations discussed included:

- Ensure high resolution lab analysis and baseline studies of hydrocarbon signatures in sediments is part of environmental assessment and monitoring.
- Ensure acoustic baseline data is part of environmental assessment.
- See questions identified in presentations

2. **Wrap Up Activities**

- Rod Macleod provided an update on the Fortis Project environmental assessment application being reviewed by working group right now. It will be going public in January. The Working Group expects to see the Woodfibre application next week.
- The BC EAO AIR was released on November 26 to the Public. It will be distributed to the committee and questions will be gathered via email for DOS staff to take forward to the Working Group
- Ongoing research of interest to the Committee includes:
 - Impacts of WLNG to the Squamish tourism brand and challenges for marketing. Panel speakers could include local, regional representatives in tourism branding such as Paul Vallee, Tourism Vancouver or someone from Canmore because it is similar to Squamish

- Health – Review AIR to identify an gaps given Vancouver Coastal Health has repeatedly declined participating in the committee as they say they are focusing on identifying health concerns through the environmental assessment process
- Economic impacts and benefits. Potential speakers or contributors include Quest University economics professor, DOS finance/taxation
- Heritage – Squamish Nation has undertaken own process with BC EA
- Local impacts from climate change on DOS infrastructure
- Upcoming Schedule: Thursday, December 18th 2014 Meeting 6:30-9:30pm. The Committee identified it would like to focus on Economic Impacts and Local Impacts from Climate Change on DOS infrastructure

Meeting adjourned at 10:00 pm