

Joint venture companies



March 21, 2019

Dr. Alan E. Burger, President – BC Nature,
Via email: aburger@uvic.ca,
Phone: 250-378-2468

Dear Dr. Burger:

Re: Response to BC Nature Re: Concerns over the LNG Canada proposals in Kitimat

Thank you for sharing your correspondence to Premier Horgan. In response, I took the liberty of providing some additional information to address your concerns below. This information has been compiled by professionals and subject matter experts, including LNG Captains, Senior Fisheries Biologists, Climate Scientists and Engineers that are part of, or advisors to, the LNG Canada team.

Global Warming

LNG Canada has designed our project to achieve the lowest GHG emissions of any large-scale LNG facility currently operating in the world – about 50% lower than the average facility, and 30% lower than the best performing facility. This means that LNG produced by LNG Canada can help avoid higher emissions that would otherwise be generated by less efficient facilities currently operating or proposed to be built. These facilities are being built to meet the growing demand for LNG in Asian countries seeking to back out more carbon-intensive forms of energy, such as coal, as well as reduce harmful air pollutants. According to the World Health Organization, pollution is responsible for more than 3 million premature deaths each year.

You may note recent news that China is seeking to procure LNG from the US to help meet demand. Should this happen from more carbon intensive facilities, the globe will experience higher GHG emissions than what LNG Canada would produce to meet the same level of demand. Offshoring LNG production, or any other form of production, to more energy-intensive facilities is not a solution to global climate change. In fact, eliminating all B.C. GHGs would equate to shutting down China's emissions for only two days.

As you are undoubtedly aware, the most recent IPCC report is an extension of previous IPCC publications. Findings from these previous reports, including conclusions regarding



efforts to achieve 1.5° or 2° C warming, were reviewed and referenced in the LNG Canada Environmental Assessment report and provincial and federal decisions in 2015. The assertion that the environmental review of the project should be reconsidered given the outcome of the most recent IPCC reporting, is unnecessary.

The IPCC report models pathways to achieve the 1.5C and 2C goals in consideration of UN Sustainable Development Goals, which itself provides a blueprint to achieve a better and sustainable future for all around the globe. The most plausible scenario in this context states that by 2030, renewables will need to grow by 315%, nuclear must grow by 98% and natural gas must grow by 33%. Coal use must decline by 75%, and Carbon Capture and Storage (CCS) must be deployed at global scale by 2100. The recent IEA World Energy Outlook's Sustainable Development Scenario has a similar conclusion about the need for additional natural gas to meet global climate reduction goals.

It is critically important to acknowledge another relevant finding in the IPCC report -- that a lack of global cooperation will be a significant barrier to achieving the climate goal of 1.5C or 2C warming. The report points out that regionalization -- considering only regional goals, without consideration for the broader global context -- will lead to carbon leakage. Carbon leakage is where investment in energy projects moves from countries with carbon policies (like BC and Canada's) to countries without or with less stringent carbon policies. The US example referenced above is a case-in-point.

Based on a peer-reviewed life-cycle analysis, one year's supply of LNG from LNG Canada can back out the equivalent of 40 coal-fired power plants, or between 60 – 90 million tonnes per annum of CO₂e. This is the equivalent amount of all emissions produced in British Columbia annually, or 10% of Canadian emissions. Natural gas is clearly a part of the solution, as in natural gas shipped as LNG to Asia from B.C.

In terms of upstream emissions, it is possible that Pembina's estimates may assume that all of the natural gas shipped to the LNG facility from northeastern BC will be additional versus existing supply, and doesn't factor in electrification of the upstream sector, which has occurred and is expected to accelerate under Clean BC. The study also does not take into account there is likely to be sufficient production today to meet LNG Canada's initial requirements. This article by Nelson Bennett is a good example of what to expect. <https://biv.com/article/2018/10/lng-canada-unlikely-spark-fracking-frenzy>

Upstream producers have committed to reduce methane emissions by 45% and have already demonstrated innovative ways to do that through elimination of pneumatics, such as Shell's Generation 4 electric well pad. Shell is a signatory to the Global Methane Principles and Shell's methane intensity for its Groundbirch operation is aligned with the company's announced plans to maintain a methane emissions intensity below 0.2% by 2025 for all oil and gas assets for which Shell is the operator. The BC government has also introduced stringent measures to reduce methane leakage.



I recently returned from a meeting of energy companies in Houston, Texas called CERA Week. There was a great deal of discussion about the energy transition that involves all forms of energy, and technological innovations to improve efficiency and reduce emissions. What struck me most is how fast and focused energy resource-rich countries like the US are at seizing the opportunity to meet the world's growing energy demands to help more than one billion people rise out of energy poverty. Meanwhile, in Canada, where our resources are produced with among the world's highest environmental standards, transparency, and in a manner that provides broader societal benefits to communities and First Nations, we find ourselves missing out of opportunities that not only set the global environmental bar higher, but also could provide important revenue to enable greater prosperity at home – particularly in Northern communities. Crystal Smith, Chief Elected Councilor of the Haisla First Nation says it best when she says First Nations are tired of managing poverty and they would like an opportunity to manage prosperity.

Hydraulic Fracturing

Regarding concerns about hydraulic fracturing, in Canada, unlike in other countries that use hydraulic fracturing or “fracking” to extract gas, the process is strictly regulated. In BC, the fracturing process takes place deep below the surface, far below the water table, so there can be no water contamination. In Shell's northeast BC operations, for example, the average well depth is 2,000 to 3,000 metres. The water used by industry in the fracturing process is subject to strict rules. Before companies receive any approvals to proceed, they must submit a permit application that undergoes a rigorous review. Companies that undertake hydraulic fracturing in British Columbia must publicly post information about the chemicals they use during the process on the public website FracFocus.ca. Upstream companies that will provide gas to LNG Canada's facility have spent years working with local communities and First Nations to ensure their interests and concerns are addressed in operations. I would note that many of these First Nations have signed project agreements with the Coastal Gas Link pipeline that would bring natural gas from their territories to the LNG facility in Kitimat.

Effects of shipping

The proposed routing has been evaluated by professional mariners with many years experience in the safe navigation and operation of LNG carriers around the world, both deep sea and in coastal waters, in all weather conditions. The route that has been identified is ideally suited for the safest navigation through the islands and coastal waterways of British Columbia's northern coast. Each LNG carrier is operated by a professional marine captain and crew meeting International Convention on Standards of Training Certification and Watchkeeping for Mariners (STWC) requirements that are higher than that required of Canadian shipping on coastal voyages, including local ferry services that already ply these waters. LNG carrier captains will additionally benefit from BC Coast Pilots who will board the ship. In addition to this, and even though an LNG carrier is perfectly capable of navigating unescorted, the project has committed to providing a powerful coastal tug escort when an LNG carrier is navigating under pilotage between Triple Island and the Port of Kitimat. This is more than regulations require and a higher



operational practice than for any other shipping activity on the British Columbia north coast today.

Traffic on the north coast is substantially less than on the south coast and nowhere near as significant as in other parts of the world where many LNG carriers are already operating. Tokyo Bay is a good example, where a significant concentration of daily shipping traffic takes place, including 30 to 40 LNG carriers entering and departing on regular schedules every day. These traffic considerations, and many others, significantly reduce the potential for accidents happening between ships or the shore. In the extremely unlikely event that an accident was to happen, the effects would be significantly minimized due to the higher level of controls in place for LNG carrier operations (as compared to domestic ship operations.)

In relation to your comments regarding Society of International Gas Tanker and Terminal Operators (SIGTTO) recommendations about terminal siting and navigating coastal waterways, we believe you are referring to interpretation of SIGTTO recommendations by a website called “LNG Terminal Siting Standards Organization.” LNG Canada views this website as lacking credibility and authority given its bias and purposeful misconstruing of the SIGTTO published wording in support of its advocacy agenda. I encourage you to contact SIGTTO directly and review the SIGTTO recommendations for yourselves for a better understanding. (www.sigtto.org/)

LNG Canada, as well as most of the individual shareholder companies, is a member of SIGTTO and has been since June 1, 2015. LNG Canada was one of the first two BC-based LNG projects approved by the SIGTTO board for membership. LNG Canada, very early on in the design phase, joined the Society and supports its statement that, “The dissemination of information stemming from the industry’s collective expertise and experience is the very essence of the Society’s purpose and remit.” Accordingly, LNG Canada receives regular information from SIGTTO that is reviewed and appreciated in helping the project adopt and benefit from LNG industry best practices. LNG Canada fully supports the handling and shipment of LNG in a safe manner and dedicates significant planning, design and resources to achieving that.

Navigational risk is not higher for LNG carriers than other vessels of the same size that already safely navigate the north coast of British Columbia (and worldwide). Additionally, LNG carrier navigational risk is considered less than the navigational risk posed to cruise ships (same size or bigger operating at higher speeds unescorted) and domestic coastal ferries (higher potential for risk to humans and more traffic frequency) that currently operate between the Port of Vancouver and Alaska on a regular basis. The suggestion that what the ship carries as cargo significantly impacts its safe navigation does not correlate and is distracting from the operational reality that all shipping is subject to the same Collision Regulations (Navigational Rules) and use the same navigational aids when transiting the same waters, no matter what they carry. In the case of an LNG carrier, the size, applicable standards, high construction cost, inspection regime, government



oversight and safety management of this type of ship demonstrates that multiple redundancies, safety barriers and mitigations are in place to achieve a higher navigation capability and survivability than most, if not all Canadian domestic shipping, including passenger ferries that carry hundreds of people.

In terms of interactions with marine mammals, LNG carriers will be operating at reduced speeds along the proposed shipping route specifically to accommodate marine mammals as a mitigation measure to prevent collision and interaction. With navigational speeds between 10 and 14 knots, both crews and whales that may by chance be in the centre of a channel at the same time will have sufficient time to avoid each other. Along the entire marine route, the minimum width of the channel never decreases below 1.6 kilometers (note: an LNG carrier is 50m wide or less) providing enough space for both marine mammal and shipping. The carrier pilots and crews will also be provided with guidance for marine mammal awareness and avoidance throughout the year. Efforts and commitments have been made to establish industry best practices for marine mammal avoidance that will meet or exceed what other marine traffic is currently doing on the north coast.

LNG Carriers are designed and managed for safe navigation in sea areas subject to typhoon level (tropical cyclone) conditions, which are the most severe marine weather phenomenon experienced on the face of the planet. The weather for the north coast has been evaluated (and experienced by many types of shipping, from large vessels to small boats) and does not come close to typhoon conditions. An LNG carrier is comfortably capable of managing the winds and seas experienced in the British Columbia coastal waters. Additionally, it has the ability to slow down or stay off shore to manage its passage and eliminate or reduce the negative effects/risks from poor weather conditions, if warranted or as needed, for safety. This is a standard operational practice done every day around the world by competent mariners.

In relation to the research cited by Sandia Laboratories, the outcomes you have described are not considered credible given that these studies are based on unmitigated and impractical situations. Simply stated, ship design and operational control measures eliminate or prevent these scenarios from being realistic. For these studies, the researchers were looking at generating worst case “what-if” scenarios that do not take into consideration operational probability nor historical LNG shipping incidents that have occurred in the LNG shipping industry in over 50 years of cargo operations.

LNG Carrier shipping is one of the safest shipping activities with a safety record that is the envy of the rest of the shipping fleets, including Canadian domestic vessels such as coastal ferries, some of which are now already operating with LNG as their fuel source for propulsion. LNG as a fuel in itself provides additional benefits including reduced emissions as compared to traditional low sulfur diesel currently used by most motor vessels on the British Columbia coast. The shipping industry is moving towards the adoption of LNG for fuel because of the environmental benefits for meeting lower emissions standards, as well as for its safety, reliability and lower cost in marine transport applications. Almost all LNG



carriers use part of their own cargo for propulsion and gas management needs, making them one of the most efficient and environmentally-friendly operated forms of shipping, next to traditional sailing ships powered by the wind.

Destruction of wetlands

In your letter you express concern regarding “restrictions placed by LNG Canada on legitimate wildlife monitoring that volunteers have been doing there for many years.” Please note all land access to the estuary has been consistently managed through private landowners, and on the west side of Kitimat, for safety purposes. In 2016, LNG Canada facilitated escorted access across our active construction areas for the volunteer groups, and then in 2017 & 2018, with the slowdown in construction activity and staffing, this initiative was turned over to Rio Tinto to manage. Thus far in 2019, LNG Canada has again provided escorted access to the estuary for bird surveying, and as construction activity increases, the safety of visitors will be assessed to determine if this can continue.

The reference to 400 hectares is not accurate. There is approximately 40.1 hectares of ecologically sensitive habitat that will be affected and require compensation to achieve zero net loss. As noted, LNG Canada is both committed to and has commenced the compensation of both wetland, wildlife and fish habitat through offsets. LNG Canada’s commitment includes compensation for effected habitat at a higher ratio then what is measured to be impacted, to deliver a net benefit to these important resources.

Impacts of the project have been fully assessed through a variety of permitting processes and require compensation for wetlands, sensitive habitats and fish habitat. In many cases, regulations require the compensation for lost habitats to be at a higher ratio then what was lost, with the intent to provide a net benefit to the area. This ties into the additional comments around the Minette Bay offsets. Please find specific answers to your questions below:

1) Was the extensive Minette Bay data research from the May 2016 Kitimat Estuary bioblitz considered in the company’s mitigation plans? LNG Canada supported access through the site for the Kitimat Estuary “bioblitz”, which was conducted well after the assessment, application and receipt of the required permits.

2) Will the government and company commit to meaningful follow-up monitoring of the overall effects of their plans? If there are unanticipated losses of wetland functions will the government and the company commit to follow-up compensation? All offset projects have required effectiveness monitoring as conditions of the received permits. In some cases, LNG Canada has committed to monitoring above the normal mandate (10 years versus the standard 5.)

3) Will affected Red and Blue-listed plant species be transplanted and studied in documented follow-ups? This is already a condition of our Provincial Environmental Assessment and Environment Plans.



4) Does any research support the effectiveness of adding copious quantities of alienated gravel to mud-flat habitats? If “copious quantities of alienated gravel” refers to construction of salt marsh habitat, then there is extensive professional scientific reporting that can confirm the benefits to ecosystems.

5) Why can't LNG Canada plans be adjusted to allow more of the productive mud flats to remain available to migratory and local birds? There are many considerations and factors that go into a project of this scale. LNG Canada has made best efforts to minimize the impacts of the project. The effectiveness of mitigation plans will be monitored as noted above as provided for under relevant permitting authorities.

6) Will the government and the company commit to a more meaningful consultation process that will consider local knowledge that could avoid problematic environmental decisions? LNG Canada has gone through a very extensive environmental permitting process and received the appropriate permits to conduct work. Part of these processes involved local knowledge from landowners, including the Haisla First Nation, which was extensively involved in the selection of habitat offset locations. We will continue to do that going forward, as well as include other local organizations and stakeholders.

In closing, I think it is important to share information about the benefits of the project, and why it has experienced such strong support from First Nations and local communities, in addition to all levels of government.

LNG Canada and the Coastal GasLink pipeline project, which will transport natural gas from north eastern BC to the export facility in Kitimat, have received what many consider to be unprecedented support from 23 First Nations at the facility, along the shipping route, and pipeline right-of-way. In fact, Coastal GasLink has signed agreements with 20 of 20 First Nations along the pipeline route. I have met many of the elected and hereditary chiefs along the pipeline right-of-way to the LNG facility in Kitimat. I can speak about how these communities regard LNG Canada and Coastal GasLink as projects that will deliver transformative benefits that many of these communities have never had nor may never have again.

The benefits to these communities from the LNG Canada project that come from direct employment and indirect employment benefits, the billions of dollars of contracting to First Nations businesses, the billions of dollars provided to municipal and provincial governments that help pay for the quality of life we so enjoy in the province, and the opportunity to produce LNG with the lowest amount of CO₂e emissions per tonne of LNG to displace more carbon intensive forms of energy around the globe, provide substantial reasons why this project is the right project at the right time.

As I stated above, LNG Canada went through a thorough environmental review and has worked with First Nations and local communities to incorporate traditional knowledge into



the planning and design of the facility. We have put extra effort into ensuring we delivered a responsible energy project that provides significant opportunity for British Columbia, while providing natural gas energy for the world.

I hope this information is helpful to you and your ongoing discussions about appropriate and sustainable energy project development in the province. If you should wish to meet with any of our subject matter experts, many of whom re-located to Kitimat to oversee and manage construction, please do not hesitate to let me know.

Kind regards,



Susannah Pierce
Director, Corporate Affairs
LNG Canada

c.c. The Honourable Catherine McKenna, Minister of the Environment & Climate Change
catherine.McKenna@parl.gc.ca

c.c. The Honourable John Horgan, Premier of British Columbia, premier@gov.bc.ca

c.c. The Honourable Michelle Mungal, Minister of Energy, Mines & Petroleum Resources
michelle.mungal.mla@leg.bc.ca

c.c. The Honourable George Heyman, Minister of the Environment & Climate Change
george.heyman.mla@leg.bc.ca

c.c. The Honourable Andrew Weaver, Leader of the B.C. Green Party,
andrew.weaver.mla@leg.bc.ca

c.c. LNG Canada info@lngcanada.ca

c.c. Bird Studies Canada- Steven Price- President sprice@birdscanada.org

c.c. Nature Canada info@naturecanada.ca

c.c. Canadian Wildlife Federation info@cwf-fcf.org

