Summary: Environmental Assessment Certificate Application

November 2014

LNG CANADA

Opportunity for British Columbia. Energy for the world

Joint venture companies

Mitsubishi Corporation

PURPOSE OF THIS DOCUMENT

This document provides information about LNG Canada and a summary of our application for an Environmental Assessment Certificate, which we prepared as part of the Environmental Assessment process for our proposed Liquefied Natural Gas (LNG) export facility in Kitimat, B.C. The full application is over 4,000 pages in length. In an effort to make the detailed information in the application more accessible, the topics covered in this document reflect those that we have heard are most important to you.

LNG Canada's Environmental Assessment is focused on effects that could potentially result from the construction and operation of our proposed LNG facility, marine terminal and shipping activities. While the purpose of the Environmental Assessment focuses on the potential negative effects associated with a project, it is important to also consider benefits the project could bring to the community. LNG Canada is committed to ensuring that benefits from our proposed project flow to the local communities of Kitimat and Terrace, and across B.C. and Canada. This document provides a summary of those benefits as well.

Any reader interested in reading more detailed information on any of the topics presented in this summary is welcome to visit **lngcanada.ca** or review and comment on the full Application at **eao.gov.bc.ca**

Opportunity for Input

We welcome the opportunity to discuss these findings with you, and encourage any comments or questions that arise from your review of this document. Please see the last page of this document to learn how to get involved.

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OUR COMMITMENTS TO THE COMMUNITY

LNG Canada is proud to outline its commitments to the community, created through a collaborative effort with local residents. In April, June and September 2014, LNG Canada met with the Kitimat community to develop and refine the commitments our company will meet to ensure we are a valued member of the community throughout the lifetime of our project. We are grateful to the many individuals who took part and shared their wisdom and experience.

1) **LNG Canada respects the importance residents place on companies being trusted members of their community.** We aspire to gain this trust by proactively engaging with the community in an honest, open and timely manner; by listening and being responsive and accessible; and by operating in a safe, ethical and trustworthy way.

2) **LNG Canada understands that the ongoing wellbeing of the community and the environment are of paramount importance.** LNG Canada will consider the health and safety of local residents, employees and contractors in every decision it makes.

3) **LNG Canada recognizes that the environment and natural surroundings are vital to the community.** We will be dedicated to working independently and with the community to identify and carry out ways to reduce and mitigate the impact of our facility footprint on the natural surroundings – in the Kitimat Valley, the Kitimat watershed and the Kitimat airshed.

4) **LNG Canada is aware of the importance to the community of maintaining and improving access to outdoor recreational opportunities.** We will work with the local community to facilitate the creation of new projects that protect or enhance the natural environment and that provide access to the outdoors and the water.

5) **LNG Canada recognizes it will be one company among other industrial companies operating in the community.** We will work with other local industry leaders to manage and mitigate cumulative social and environmental impacts, and create opportunities to enhance local benefits associated with industrial growth.

6) **LNG Canada acknowledges that the commitments we make are for the long term.** We will work with the community to develop an environmental, social and health monitoring and mitigation program that meets regulatory requirements, and we will share information on the program with the public for the life of our project.

7) **LNG Canada understands the need for the community to benefit from our project and values the contributions all members of the community make to the region.** We will work with the community to ensure that social and economic benefits from our project are realized and shared locally.

8) **LNG Canada acknowledges the importance the community places on our company being an excellent corporate citizen and neighbour that contributes to the community.** In addition to providing training, jobs and economic benefits, we will make social investments important to the community to positively impact community needs and priorities.

ABOUT LNG CANADA

LNG Canada is a joint venture company comprised of four global energy companies with substantial experience in LNG – Shell, PetroChina, KOGAS and Mitsubishi Corporation. Together, we are proposing to design, build and operate a liquefied natural gas (LNG) export terminal to be located in the traditional territory of the Haisla Nation, in the District of Kitimat, British Columbia.

Shell Canada Energy is the Canadian arm of the global energy company Royal Dutch Shell. Shell has been a global leader in LNG since 1964, helping to pioneer the LNG sector. Shell has interest in about one quarter of the world's LNG vessels, and operates 10 LNG projects in nine countries, with two new projects under construction.

PetroChina Investment Limited is China's largest oil and gas producer and supplier. PetroChina launched three LNG projects in June 2004, two of which started operations in the first half of 2011.

Why B.C.?

B.C. is Canada's second-largest natural gas producing province, and gas has been produced here for both domestic use and export, for more than 50 years. Recent discoveries of additional gas in the northeast of the province have identified even greater reserves.

Korea Gas Corporation (KOGAS) is the world's largest LNG importer and South Korea's principal LNG provider. KOGAS currently operates three LNG import terminals and a nation-wide pipeline network in South Korea. KOGAS has also diversified into LNG trading, and LNG terminal construction, operations and management.

Mitsubishi Corporation

Mitsubishi Corporation is Japan's largest trading company and handles about 36% of Japan's LNG imports. Since pioneering the first LNG import to Japan from Alaska in 1969, Mitsubishi Corporation has successfully built a portfolio of LNG export investments across Australia, Indonesia, Malaysia, Brunei, Oman, Russia and North America.

OUR COMMITMENT TO WORKING WITH ABORIGINAL GROUPS & LOCAL COMMUNITIES

LNG Canada believes that our relationships with Aboriginal Groups and local communities are foundational to our project's success. By working together and understanding what is important, we can design, build and operate a project that considers both Aboriginal and community interests, and provides benefits to north coast communities and all British Columbians.

Working with Aboriginal Groups

LNG Canada has been engaging with Aboriginal Groups with an interest in the project since 2012, to share project information, seek input on potential project effects related to Aboriginal rights and interests, discuss possible mitigations and understand what benefits are important to consider in project planning.

LNG Canada has been consulting with the following groups about the project since early 2012:

- Haisla Nation
- Gitga'at First Nation
- Gitxaala Nation
- Kitselas First Nation
- Kitsumkalum First Nation
- Lax Kw'alaams First Nation
- Metlakatla First Nation

LNG Canada has provided a range of opportunities for Aboriginal Groups to participate in, and provide input into, the Environmental Assessment including:

- Sharing information about the proposed project.
- Gathering information and studies, including traditional use, social and economic studies, to better understand the potential effects of the project on Aboriginal interests.
- Participating in environmental field programs.
- Incorporating local and traditional knowledge into baseline studies and effects assessments.
- Reviewing and providing feedback on studies and the results of the Assessment.
- Discussing strategies to avoid or manage potential project effects on Aboriginal interests and issues of concern.

Working with the Local Community

Since 2012, LNG Canada has worked with local governments, stakeholders and residents representing a broad range of community interests – from the environment to economic development – in the Kitimat and Terrace area to ensure that our approach to project development is respectful and inclusive of local knowledge.

While some of the consultations we have undertaken are required as part of the regulatory process, our approach to engagement has been to go beyond what is mandated by government and to focus on building relationships early on to create a foundation of knowledge about who we are and what we are proposing. We have worked with the community to gather input into many aspects of project planning – from the design of our project website, to how we share information with the community, to refinements to project design or development of environmental protection measures.

We are now at the place in the project development process where LNG Canada can share more detailed technical and environmental information to demonstrate the potential effects of our proposed project, and the ways we plan to avoid or reduce adverse effects, and enhance positive effects.

LNG CANADA IN THE COMMUNITY SINCE 2012

LNG CANADA PARTICIPATED IN MORE THAN

250 EVENTS

(including Open Houses, Presentations, and Workshops)

THESE EVENTS HAD MORE THAN

550 PEOPLE PARTICIPATE

ENGAGEMENT ACTIVITIES INCLUDED PARTICIPATION FROM MORE THAN

40 STAKEHOLDER GROUPS

AT OUR MOST RECENT **OPEN HOUSE** IN 2014

90% OF PARTICIPANTS RATED LNG CANADA AS DOING A **"GOOD"** OR **"EXCELLENT"** JOB

THE PROJECT OF CHOICE

From the beginning, LNG Canada set out to be the project of choice for British Columbia. Every decision made during the planning and design process was done by keeping safety, economics, the environment and community interests top-of-mind.

- We selected the most energy efficient gas turbines for the LNG liquefaction process to minimize GHG emissions and fuel use.
- We are using renewable power from the BC Hydro grid for auxiliary electricity supply, to ensure LNG Canada's facility has one of the lowest greenhouse gas emissions in the world.
- We chose an existing industrial site already zoned for industrial use, and an existing marine terminal, rather than a greenfield site, which will reduce the impact of our project on the environment.
- We will locate our flare stacks as far away from residential homes as the site allows and will use water-cooling to eliminate noise from air-cooling, and muffling devices on equipment where we can to further limit noise impacts.
- We have designed our worker accommodation village to be self-sufficient in terms of water, sewage, transportation and medical services to reduce any added pressure on the local services and protect community way of life.
- We have also come to learn some of the things that are important to Kitimat residents including continued access to the water, which is something we have committed to working on together with industry and the local community.

From the beginning, we have worked closely with the community, with Aboriginal Groups and with municipal and regional governments to understand how our project can help Kitimat and the region achieve its social, economic and environmental aspirations.

THE PROPOSED LNG CANADA PROJECT

The scope of LNG Canada's Environmental Assessment includes the proposed LNG export facility in Kitimat B.C., as well as the proposed shipping route. The Assessment is based on the fully completed project – with a four-train* facility. Two LNG trains will be built during the first phase of the project and an additional two trains could be built at a later time depending on market demand.

Key features at our proposed facility would include:

1 LNG Processing Units

Natural gas will enter into a train – where carbon dioxide, water, condensate, sulphur and any other impurities will be separated out. The gas will then be chilled to approximately -161 degrees Celsius and turned into LNG. Condensates will be stored and railed out to market.

2 Storage Tanks

LNG will be piped to storage tanks until it is loaded onto LNG carriers at the wharf.

3 LNG Loading Lines

Two LNG loading lines will transfer LNG from the storage tanks to the wharf and the LNG carrier. They will be insulated to conserve energy and to keep the LNG in its liquid form.

4 Marine Terminal

An existing wharf will be redesigned to accommodate up to two LNG carriers at a time. Every LNG carrier will be assisted at the terminal by four tugboats – tugs will manoeuvre alongside the LNG carrier, positioning it at a very low speed until the LNG carrier is secured at the berth.

5 Rail Yard

The rail yard inside the facility will be connected into an existing rail system, which will be used to load condensate, a petroleum liquid that is one of the natural by-products of turning natural gas into LNG. The condensate will be stored temporarily in tanks on the site and then transported off-site by rail car for sale to customers.

6 Water Treatment Facility

The facility will draw water from the Kitimat River for use in process cooling, drinking and other purposes. Water taken from the river will be treated as needed prior to use. Water will be reused in a closed loop system to reduce water loss. Most of the water used by the cooling system will evaporate during use. Water that does not evaporate will be treated, along with any other facility wastewater, in an on-site wastewater treatment facility before releasing it into Kitimat Arm.

7 Flare Stacks

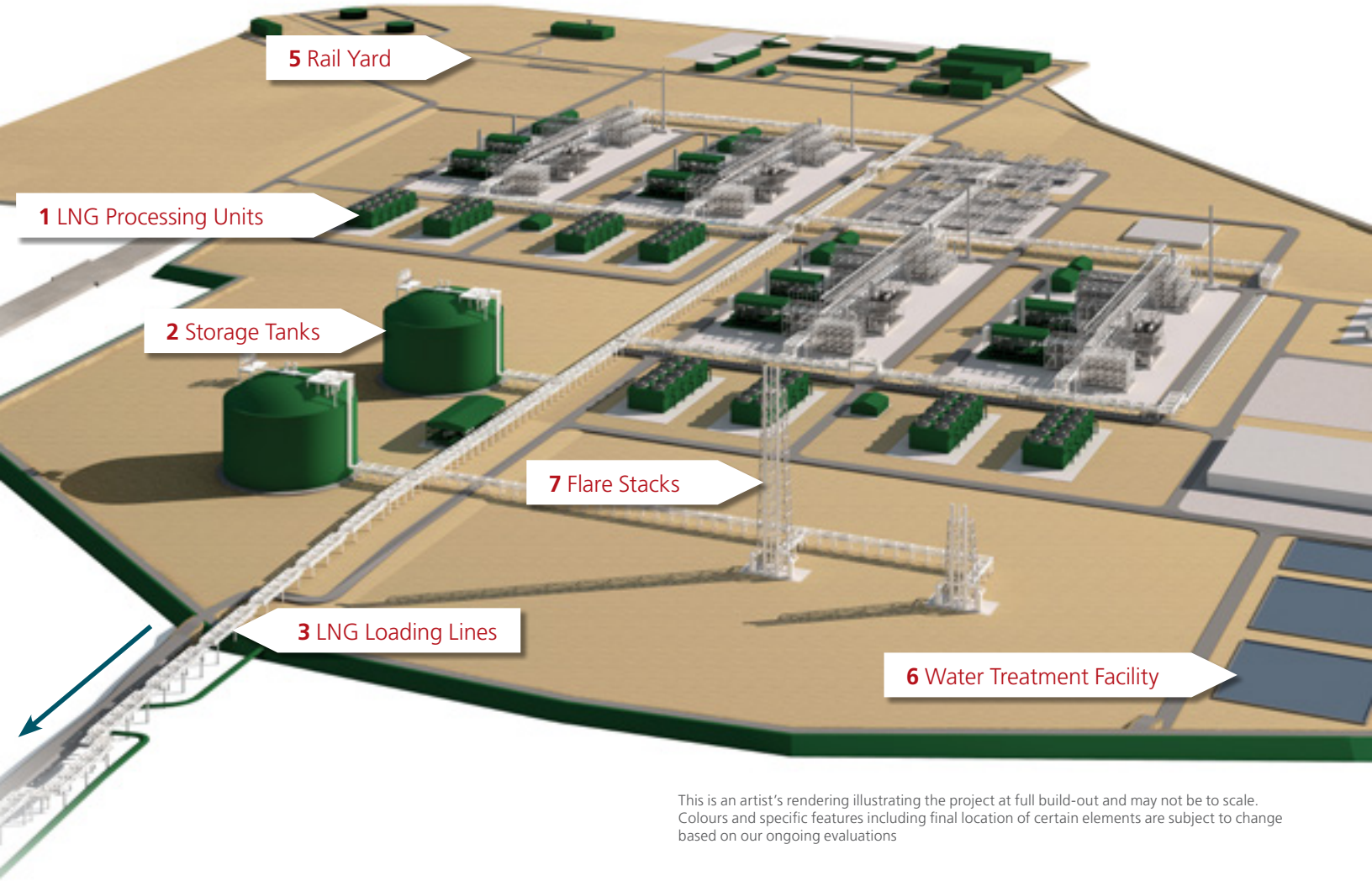
Two flare stacks – one that is approximately 60 metres tall and a second that is approximately 125 metres tall – will act as safety devices, a common feature in all LNG facilities. When the facility is operating normally, residents can expect to see a relatively small clean burning flame (essentially, a pilot light) at the top of the stacks. The size of this pilot light will be approximately three feet in height, and will likely not be visible during the day.

*"Trains" is the term used for the processing units that convert natural gas to LNG.

LNG Canada reviewed more than 500 sites in B.C. – from the north to the south of the province – prior to selecting the site near Kitimat at the head of Douglas Channel.

Key features of the proposed project site, which make it ideal for an LNG export facility, include:

- **Industrial-Zoned Land**
- **Year-Round Ice-free Deep Water Port**
- **Existing Infrastructure Including Roads, Power Lines and the Terrace Airport**
- **Positive Relationships with Local Government, Community and First Nations**



This is an artist's rendering illustrating the project at full build-out and may not be to scale. Colours and specific features including final location of certain elements are subject to change based on our ongoing evaluations

THE SHIPPING ROUTE

Our proposed shipping route from the Triple Island pilotage station to the northern end of Douglas Channel follows an existing commercial shipping route. From the pilotage station, the shipping route traverses south via the northern end of the Hecate Strait to Browning Entrance, then Principe Channel, Nepean Sound, Otter Channel, Squally Channel, Lewis Passage, Wright Sound and Douglas Channel up to Kitimat.

The shipping route passes through the traditional territories and marine use areas of Aboriginal Groups, and areas used for a range of activities such as recreational boating, commercial and recreational fishing, shipping and eco-tourism.

At full build-out, up to 350 LNG carrier visits are expected at the LNG Canada terminal annually – about one ship arriving and one ship departing per day. When only two trains are operating the number of ships will be half this number. An escort tug will accompany each LNG carrier from Triple Island through to the facility. Two certified B.C. Coast Pilots would board each LNG carrier at Triple Island to provide the ship's professional crew with crucial local knowledge to support the safe passage to and from the facility. Up to four harbour tugs will be available at the marine terminal to assist LNG carrier berthing and unberthing.

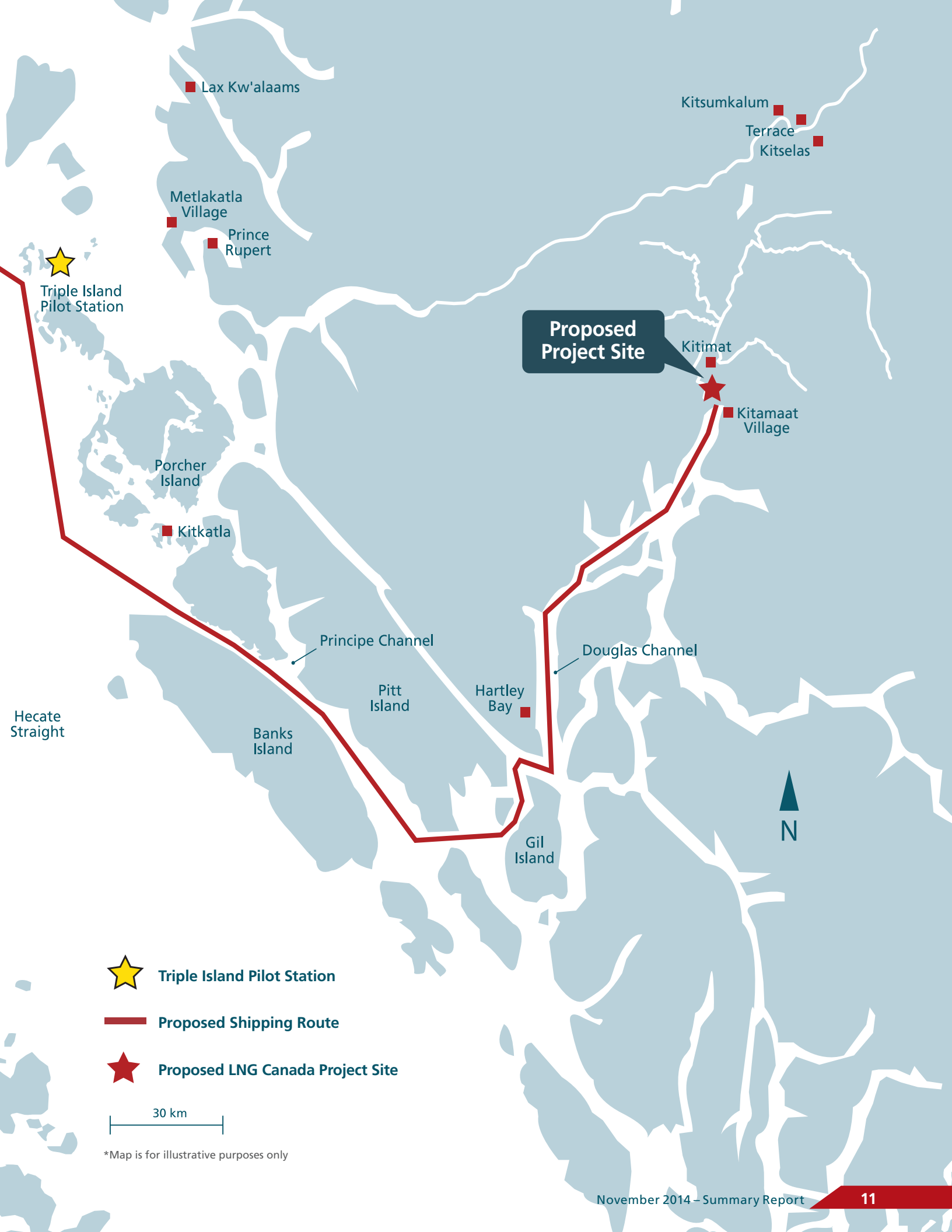
LNG SHIPPING HAS **ONE OF THE BEST SAFETY RECORDS** IN THE MARINE INDUSTRY:

OVER 75,000 CARGOES

DELIVERED WITHOUT A SINGLE CARGO LOSS
SINCE THE FIRST COMMERCIAL CARGO IN 1964

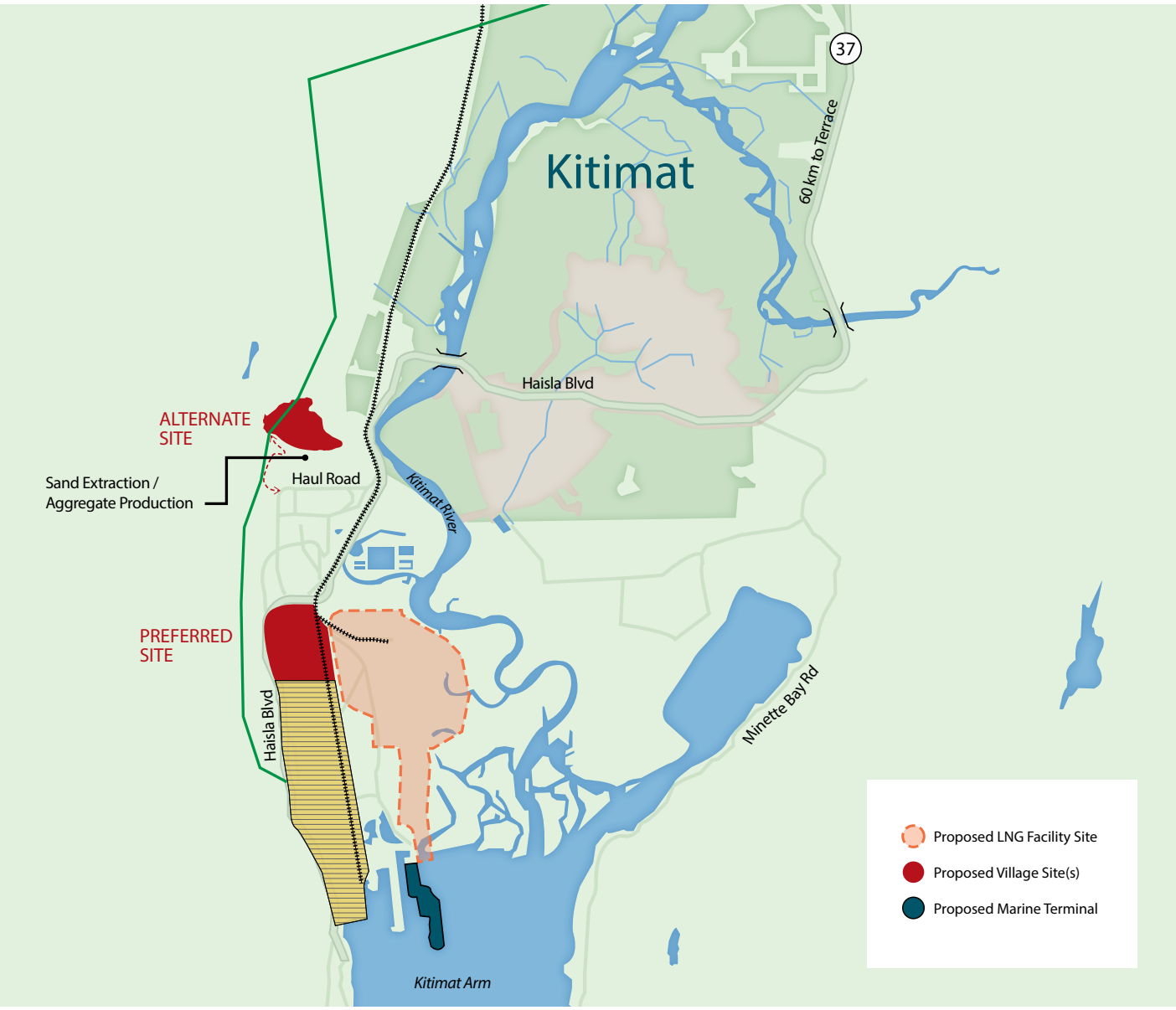
ALL LNG CARRIERS ARE BUILT WITH **DOUBLE HULLS + MEMBRANE.** CARGO TANKS HAVE **DOUBLE CONTAINMENT BARRIERS** AND ARE **DOUBLE INSULATED**

MORE THAN 400
LNG CARRIERS
ARE IN SERVICE TODAY


Lax Kw'alaams
Kitsumkalum
Terrace
Kitselas
Metlakatla Village
Prince Rupert
Triple Island Pilot Station
Proposed Project Site
Kitimat
Kitamaat Village
Porcher Island
Kitkatla
Principe Channel
Douglas Channel
Pitt Island
Hartley Bay
Hecate Straight
Banks Island
Gil Island
N
Triple Island Pilot Station
Proposed Shipping Route
Proposed LNG Canada Project Site
30 km
*Map is for illustrative purposes only

LNG CANADA'S WORKER ACCOMMODATION VILLAGE

During construction, the proposed project will employ 4,500 people, with a potential peak of up to 7,500. LNG Canada will build a worker accommodation village to house the majority of these workers during the construction phase. While the final location of the worker accommodation village has not been determined, it will be located in the industrial area of Kitimat. Both possible locations have been included in the scope of the environmental assessment.



Based on our experience with major projects and our consultation with the community, we have adopted a number of principles to inform the development of our worker accommodation village. These principles focus on establishing a design that provides a quality living environment, while also preventing or reducing any added pressure on local infrastructure and services.

Respect the Local Community

- Self-sufficient worker accommodation village to minimize impacts on local community services (e.g., sewer, water, waste management)
- Provide full service primary and occupational health services on site for workers to access
- Provide opportunities for workforce to volunteer in the local community

Create a Positive Worker Environment to Attract and Retain Good Workers

- Provide a safe, attractive and comfortable place for workers
- Facilities for health and wellbeing
- Provide open spaces and on site recreational activities
- Internal shuttle bus loop and separated pedestrian walkways

Provide a Safe and Secure Environment for All

- Locate in the industrial area near the project site to maintain separation between workforce and the community
- Full transportation model that limits use of personal vehicles to minimize traffic on local roads and improve road safety
- Design includes controlled access in and out of the worker village and secure fencing

"We have focused on designing a work force accommodation village that provides a quality living environment to attract and maintain our workforce, while also ensuring that we prevent or reduce any added pressure on the local community services."

– Elliott Smith, Real Estate Development and Delivery Manager, LNG Canada

WORKING TOGETHER TO DELIVER LOCAL BENEFITS

If the partners behind LNG Canada make the decision to move forward with the proposed project, we are committed to ensuring that benefits from the project flow to the local communities of Kitimat and Terrace, and across B.C. and Canada.

At a Glance: Potential Benefits of the LNG Canada Project	
Economic Benefits	• $94M in municipal and regional taxes during project construction • Approximately $15M per year in municipal and regional taxes during operations • $690M to $1.6B annually in provincial revenues during operations (excluding increased royalties on natural gas, taxes on corporate profits paid by LNG Canada or the proposed LNG tax) • $4.1B to $6.7B to British Columbia's gross domestic product (GDP) during construction and over $3.5B annually during operations • $12.2B to $19.6B increase in Canadian GDP based on the purchase of labour, goods and services during construction
Employment During Construction	• Employment of an average of 4,500 people during the first phase of construction, with a potential peak workforce of 7,500 people • Majority of the construction workforce in skilled trades, followed by labourers, management, supervisors and technicians • Creation of 54,000 – 94,000 person years of employment in Canada due to the manufacturing and provision of goods and services
Long-Term Operational Jobs	• 300 to 450 people employed during operations of the first phase, increasing to between 450 and 800 people should the full project (four trains) be built
Procurement	• More than $8B spent on goods and services in Canada during construction, with at least $3B spent in B.C. • $200M annually on goods and services needed for operations purchased from B.C. suppliers for the four-train facility, exclusive of purchased utilities and overhead costs, with businesses in northwest B.C. expected to supply at least $85M of this total

Our Commitment to Hiring Local

Most of the employment and contracting opportunities during construction will be carried out through CFSW LNG Constructors (CFSW), a partnership of Chiyoda, Foster Wheeler, SAIPEM and Worley Parsons – the main contractor for the project. LNG Canada and CFSW have committed to work together to help local residents and businesses become qualified for opportunities related to LNG including:

- Investing in skills training and capacity building initiatives
- Developing long-term partnerships with local education and training facilities in the region to develop and maintain a skilled workforce to support LNG development
- Hosting contracting networking sessions with local businesses and CFSW to profile the expertise and capacity of businesses in the northwest

Investing in the Local Community for the Long-Term

LNG Canada also contributes to local communities through its social investments. We are also actively involved in community events, such as the annual Kitimat River Clean up and Riverboat Days in Terrace. Whether or not the project proceeds, we are hopeful that the investments we have made so far benefit the community in the long-term.

LNG Canada also recognizes the value that local communities place on their relationship with the natural environment and coastal waters. Over the past few years, LNG Canada has had many conversations about how important access is to the water. We will work with the local community to facilitate the creation of new projects that protect or enhance the natural environment and that provide access to the outdoors and the water.

"At LNG Canada, we believe in providing lasting benefits to the community in which we hope to operate. Since 2012, we have contributed more than $500,000 funding important community initiatives such as emergency services, trade scholarships and housing."

– Jane Newlands, Manager Community Consultation and Social Performance, LNG Canada

UNDERSTANDING POTENTIAL EFFECTS

LNG Canada is committed to minimizing the effects of the proposed project on the environment and the local community. That said, we recognize that it is impossible to construct and operate an LNG export facility without any effects on the surrounding environment and community. Therefore, we want to be sure that where there are potential effects, we understand them and have incorporated appropriate measures to avoid or reduce them, wherever possible.

The purpose of the Environmental Assessment process is to evaluate potential project effects that could result from our proposed project.

We apply conservative assumptions – also referred to as "worst-case" scenarios – to help ensure that our conclusions are sound, even though many of these scenarios may be extremely unlikely to occur. We design our protective measures based on these conservative scenarios, to be sure that we are doing what we can to avoid or reduce adverse effects.

While the conservative approach for the LNG Canada project includes the assessment of the construction and operation of four LNG trains, the first phase of the project will start with only two trains.

OUR ENVIRONMENTAL ASSESSMENT

USED MORE THAN

20,000 PERSON HOURS

in B.C. to conduct surveys and collect data in and around our project site from 2012 to 2014

15 DIFFERENT **TOPICS** STUDIED

+3 YEARS

CLOSE TO 400 MEETINGS INTERVIEWS, AND OTHER ACTIVITIES

to collect information from community organizations, Aboriginal Groups and members of the public.

Evaluating Potential Effects

A series of steps are generally undertaken to evaluate potential effects and determine the most effective measures to avoid or reduce effects:

Step 1: What Exists Today?

The goal of this step is to understand what the conditions in the area are now, before the start of our proposed project.

This stage involves literature reviews, collection of baseline information, consultation, collecting samples and performing analysis to understand the existing conditions. This information sets the foundation for identification and evaluation of possible effects.

Step 2: What effects could occur?

Once we have a good understanding of the existing conditions, we consider the various activities of our proposed project, and how they may interact with the environment.

For example, how might shipping traffic affect whales? What might the visual effects be? What effects could there be on recreational fishing? How might the presence of a construction workforce affect the local economy? To ensure that the Assessment is accurate, local communities and Aboriginal Groups are involved in the identification of potential effects.

Step 3: How can LNG Canada respond?

If we identify potential adverse effects, our priority is to avoid these as far as practicable. We first consider whether we can change our proposed project design or our activities to avoid the effect. If we can't avoid the effect, we take steps to reduce it.

We do this by incorporating the latest technologies in our design, with management programs or by creating positive changes in other areas. These are called "mitigation measures." When we identify positive effects – such as increased local employment – we try to enhance these effects, particularly at a local level. We then review these response measures with the public and Aboriginal Groups to make sure these are appropriate and acceptable.

Step 4: What effects remain?

Once we reduce our potential effects as far as practicable, we then look closely to see what potential effects remain.

Sometimes, there is no remaining effect. But if there is a remaining effect, we evaluate it to determine if it is big or small. For example, we look at how many animals or species could be affected. Will one community be affected, or a whole region? We also look at what we anticipate will happen in the future, and consider how our potential effects could combine with those from other existing and planned facilities.

Step 5: Ongoing responsibility

The Environmental Assessment process is just that: an assessment. We make every effort to ensure that our studies are thorough and our conclusions are based on the most conservative assumptions, our Assessment is based on the information available to date.

We have the responsibility to ensure the results of our studies are accurate, and consider new information as and when it becomes available. For this reason, we develop detailed plans that set out how we will manage our activities to avoid or reduce potential adverse effects. The purpose of this step is to provide a transparent process for how we evaluate these effects and adjust our responses where necessary.

OUR POTENTIAL EFFECTS

The following pages provide an overview of our Environmental Assessment – particularly what we studied, what potential effects could result and how we propose to manage these potential effects.

We believe that by understanding the interests of Aboriginal Groups and local communities, we can design a project that minimizes potential effects on the environment and on the way residents interact with the environment. Many of the studies we conducted as part of our Assessment have benefited from local expertise gathered through consultations with the local community and Aboriginal Groups.

As we move through the Environmental Assessment process, local feedback will continue to help us ensure we get it right. We encourage you to review this information, ask questions and provide your input.

To read the full Application, please visit lngcanada.ca

AIR EMISSIONS

Understanding and responsibly managing air emissions is a key design and operations priority for LNG Canada, and will remain so throughout the life of our project. Based on the results of our assessment, we are confident our project will not be a major contributor to changes in air quality that would affect human health.

The air quality in the Kitimat Valley reflects the area's landscape and its economy. As the level of industrial activity has changed in the valley over time so have the emissions into the local environment. We undertook research to determine the existing air quality in the Kitimat Valley. This research shows that existing air quality meets regulatory criteria the majority of the time.

LNG Canada then conducted a modelling study to predict the effects of our emissions during construction and through operations. Given existing industrial emissions in the Kitimat Valley, some regulatory levels may be exceeded over very brief periods of time, although not in such a way that the overall health of the public or the environment could be affected.

What We Studied in our Assessment

- We reviewed air quality measurements collected from five monitoring stations that have been operating in the Kitimat area for almost 20 years.
- We installed 13 additional monitoring stations in 2013 and 2014 – covering a wide area across the Kitimat region and along the shipping route, including traditional territories of Aboriginal Groups – and collected monthly data from these stations.
- We worked with Aboriginal Groups and government to determine which potential effects from our emissions we would study.
- We used sophisticated computer modeling, following methods approved by the B.C. Ministry of Environment, to predict what effects the operation of our facility and marine vessels might have across the various expected weather conditions.
- We compared the predicted effects to levels designated for protection of human health, protection of ecosystems in nearby lakes and streams, and protection of vegetation health.
- We analyzed the potential for respiratory impacts from our air emissions by modeling predicted conditions in five "study areas" in and around Kitimat and Kitamaat Village.
- We modeled a typical scenario and a worst-case scenario. In this sense, the "worst-case" scenario reflects the combination of emissions and weather conditions that result in the highest predicted concentration at any particular location.

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
We studied the potential effects our emissions could have on human health, water quality and vegetation, and found the following: In the case of sulphur dioxide, our models told us the existing airshed has elevated concentrations before our project. The sulphur dioxide emissions from our project would be small but they would contribute to the existing situation. Our models predicted that the combined sulphur dioxide concentrations from our proposed facility as well as emissions from existing facilities would exceed hourly and daily health-based limits for a small fraction of the time and primarily in the industrial area. It is important to note that these exceedances are predicted to occur even without the LNG Canada project. For all other emissions our model predicted that the highest concentrations at the study locations would be below health-based limits and meet regulatory criteria. The existing and proposed project emissions of sulphur dioxide and nitrogen dioxide could change the acidity balance of nearby lakes, streams and soil. However, our study predicted that our project emissions will have little to no impact on existing acidification.	Design and operate our facility to manage emissions from gas turbine and incinerator exhaust to meet regulatory requirements. Maintain our vehicles and equipment so they are as low emitting as practicable. Use low-sulphur fuel in our diesel-powered equipment and marine vessels. Control road dust by reducing our vehicle speeds (limits of 25-40km per hour) and watering roads when needed. Continue to manage air emissions as a priority through the construction and operation of the project, and continue to collect data from monitoring stations. Look at further response measures and work with technical specialists, government and the community if monitoring indicates that effects are greater than expected.

"We understand that air quality is a critical issue for the community and because of this LNG Canada went beyond what is typically expected in an air quality study – an example of how community input shaped the project thus far."

– Russell Morrison, Staff Environmental Planner, LNG Canada

GREENHOUSE GASES

We have designed the LNG Canada Project to be one of the world's best performing LNG facilities in terms of greenhouse gas emissions and we will be lower than the B.C. LNG greenhouse gas intensity target. Through a combination of energy-efficient gas turbines and renewable electricity from BC Hydro, the LNG Canada project would emit less than half the greenhouse gas emissions of the average LNG facility.

We will describe our proposed greenhouse gas reduction strategies in detail within a Greenhouse Gas Management Plan. As changes in technology, best practices and regulatory requirements occur in the future, we will continue to review and update this plan.

We will also update the plan based on the information gained through our monitoring activities and operations experience to make sure that our emission reduction measures continue to be as effective as possible.

"The decision to drive our facility with renewable electricity and natural gas turbines reflects our commitment to listen to feedback from our stakeholders and to minimize our CO_2 footprint."

– Andy Calitz, CEO, LNG Canada

What We Studied in our Assessment

- We researched international, Canadian and provincial greenhouse gas emissions data.
- We analyzed the performance of other industries and LNG facilities in terms of greenhouse gas emissions.
- We followed the guidelines of the Canadian Environmental Assessment Agency methodology for incorporating greenhouse gas considerations in our Environmental Assessment.
- We used industry best practices to estimate the quantities of greenhouse gases that will be released from our project.
- We researched best practices in greenhouse gas emission reduction and incorporated those into our facility design and operation plan, wherever possible.

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
A summary of our greenhouse gas emissions during construction: Total construction emissions of greenhouse gases are predicted to be significantly less than during operations – about 1-2% of annual operation emissions. These emissions would be primarily related to the fuel we use for construction equipment.	Implement industry best practices for construction equipment, such as regular maintenance, speed restrictions and reduced idling. Use buses, where feasible, instead of personal automobiles to transport people between the facility and workforce accommodations, to reduce traffic emissions. Size the footprint for temporary construction facilities to only what is needed for safe and efficient construction. Outside of the LNG facility footprint, use existing cleared areas, where practicable, to limit new disturbance. Avoid burning of biomass (such as forest residue or vegetation) where practicable.
A summary of our greenhouse gas emissions during operations: The LNG Canada project is predicted to emit about four million tonnes of greenhouse gases per year (when all four trains are operating), primarily from the operation of turbines, which would be used to power the equipment that cools down the natural gas to make LNG. Operations-related emissions are estimated to add 6.6% to annual B.C. greenhouse gas emissions and 0.6% to annual Canada greenhouse gas emissions, when compared to 2012 levels. Global greenhouse gas emissions are estimated to increase by 0.009%, when compared to 2010 data from the World Resource Institute.	We have developed a facility design to assure leading environmental management and to achieve our goal of best-in-class performance for greenhouse gas emissions. To accomplish this, we have designed the facility to: Use power from BC Hydro, which has very low greenhouse gas emissions, for auxiliary electricity supply to significantly reduce greenhouse gas emissions and the amount of fuel used by the facility. Use efficient aero-derivative gas turbine technology to drive the refrigeration compressors in the liquefaction process to reduce the amount of fuel we need to produce LNG. Operate combustion sources at optimal efficiency settings to reduce fuel consumption. Minimize flaring. Conduct rigorous preventative maintenance to optimize efficiency of the facility. Reuse heat recovered from gas turbine exhausts to reduce fuel consumption in other processes. Recover boil-off gas during LNG storage and loading, and reuse the recovered gas into the fuel and feed gas system to optimize efficiency and reduce emissions.

HELPING B.C. ACHIEVE THE CLEANEST LNG

We conducted extensive research analyzing facilities across the globe and determined that the average LNG facility emits about 0.35 tonnes of greenhouse gases (in carbon dioxide equivalents or "CO_2E") for every tonne of LNG it produces. We believe we can design our facility to achieve a lower level of 0.15 tonnes of greenhouse gases (in CO_2E) per tonne of LNG produced – more than twice as efficient as the industry average. This would make LNG Canada one of the world's best performing LNG facilities in terms of greenhouse gas emissions.

HUMAN HEALTH

One of our most important responsibilities in building an LNG export facility and related infrastructure is to ensure that our proposed project does not lead to significant effects on the health of the community. We are confident that, with our proposed design measures to avoid, reduce or mitigate effects, our project will not affect the overall health or health care capacity in the Kitimat community.

In undertaking our Assessment, we worked with a variety of stakeholders in the community to understand key concerns related to community health, so we could consider them in the Assessment. With the implementation of our proposed measures, we are confident that the local health care infrastructure and services will be able to manage the added demand associated with our proposed project, and that project-related demand will not result in a notable decline in the quality or accessibility of such services. Project-related demand will not result in a substantial decline in the quality or accessibility of such services. We do not anticipate any significant health effects associated with project air emissions or potential contamination of country foods. Please refer back to "Air Emissions" to read more about our study of the potential effects of air emissions on human health.

What We Studied in our Assessment

- We worked with Aboriginal Groups and the local community to develop an understanding of their harvested food sources.
- We undertook interviews with Aboriginal Groups, community members and affected stakeholders regarding health priorities.
- We developed a model to assess how the emissions from our facility might move into areas of the community, as well as how the emissions could affect water sources and vegetation on which wildlife rely.
- We analyzed historical sediment contamination data and performed additional sediment sampling in the areas to be dredged, to understand the nature of contamination in the sediments.
- We used best practices to analyze the potential for respiratory health effects from our air emissions or health effects from eating sources of harvested food exposed to contaminated sediments.
- We reviewed healthcare statistics and interviewed health services professionals at Northern Health and in the local area.

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
The potential effects we evaluated included the following: Potential respiratory health effects resulting from changes in air quality as a result of emissions from our project. Our project is not expected to measurably change the existing air quality so it is not predicted to cause additional respiratory health effects. Changes to health from reduced nutrition resulting from avoidance of local food sources such as fish, meat or berries, because people perceive them to be impacted by the facility. Reduced access to or quality of health care due to project-induced strain on the healthcare capacity in the community.	Design and operate our facility to manage emissions from gas turbine and incinerator exhaust, and use low-sulphur fuel in our diesel-powered equipment and marine vessels. Work with the Ministry of Environment to monitor air quality in the region. The Ministry recently expanded its air quality monitoring with installation of a new air quality monitoring station in Terrace. Continue to provide information to the local community and Aboriginal Groups to facilitate ongoing discussion and resolve any related concerns. Build and operate a primary care and occupational health clinic as part of our worker accommodation village, to minimize impacts on local health services, provide a quick response time in the event of illness or injury, and minimize traffic between the site and downtown Kitimat. Work with the community, Northern Health and a variety of medical service professionals through the Environmental Assessment process to identify ways we can work together to minimize the impacts and enhance access to medical services in Kitimat.

"The health of our workers and our neighbours is one of our top priorities. We are committed to continuing to identify ways we can work together to reduce our potential impacts and enhance access to medical services in Kitimat."

– Susannah Pierce, External Affairs Director, LNG Canada

COMMUNITY HEALTH & WELLBEING

LNG Canada is committed to developing and operating our facility so we have a positive impact on the community. We believe that our proposed mitigation measures will avoid or reduce potential adverse effects on community wellbeing, while enhancing the benefits that our proposed project can bring.

While LNG Canada will bring economic benefits to the area in the form of jobs, increased municipal tax revenue and economic diversification, we recognize there is concern over potential effects of a large, temporary workforce, and what that might mean to quality of life. LNG Canada is committed to developing and operating our facility so we have a positive impact on the community, and we will work closely with local communities as part of project planning and operation.

What We Studied in our Assessment

- We engaged with Kitimat and Terrace community members, service providers, community planners, officials, and Aboriginal Groups to identify key focus areas around effects on community wellbeing, as well as to understand current conditions in the area.
- We supplemented this information with data from literature reviews, government databases and online sources.
- We reviewed social and economic impact studies and other plans provided by Aboriginal Groups, and used this information to further understand Aboriginal use of health services in the greater Kitimat and greater Terrace areas.
- We assessed the potential adverse effects to community wellbeing due to changes in population, demographic composition, employment and income.

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
We evaluated the potential for our project to result in the following effects that can sometimes be concerns that accompany large temporary workforces: • Increased risk of homelessness or overcrowding, and possible reduced housing availability and affordability as a result of influx of temporary workers. • Spread of disease, increased crime and reduction in community cohesion as a result of rapid fluctuations in population. • Increased rates of domestic disturbance as a result of increased stress levels within households. • Increased drug and alcohol use in the area as a result of additional disposable income.	• Work with the local communities and Aboriginal Groups to support planning for an influx of workers, and to respond to community concerns if they arise. • House our non-local construction workforce in a dedicated worker accommodation village. The worker accommodation village will be self-sufficient in terms of sewer, water and waste management and will also include recreation and health care services to minimize impacts on local community services. • Implement a worker wellbeing program to promote physical and mental health of workers and reduce levels of stress and anxiety. • Implement an alcohol and drug policy that our workers would have to comply with, including pre-employment testing, awareness training and prevention programs.

"As an LNG Canada employee and a Kitimat resident, I can assure the community that the wellbeing and safety of all of us is the top priority of the LNG Canada Project team and will continue to be as we plan for the proposed project."

– Mary-Ellen Proctor, Community Liaison Officer (Kitimat), LNG Canada

NOISE LEVELS

The area around our proposed project facility currently has a mix of natural sounds, like bird songs, and wind moving through the trees, and man-made sounds from human activities including industrial facilities, aircraft, marine vessels and vehicles.

Construction and operation of the LNG facility will contribute to an increase in noise, as could be expected with any large-scale project. We expect that our construction activity noise will be heard within Kitimat and Kitamaat Village, but the expected average noise levels will meet the criteria established by Health Canada. During operation, the facility will meet the noise criteria established by the B.C. Oil and Gas Commission. As a responsible member of the community, we are committed to managing this aspect of our project well, and will maintain engagement with the local community to identify noise issues if they arise, and deal with them appropriately.

What We Studied in our Assessment

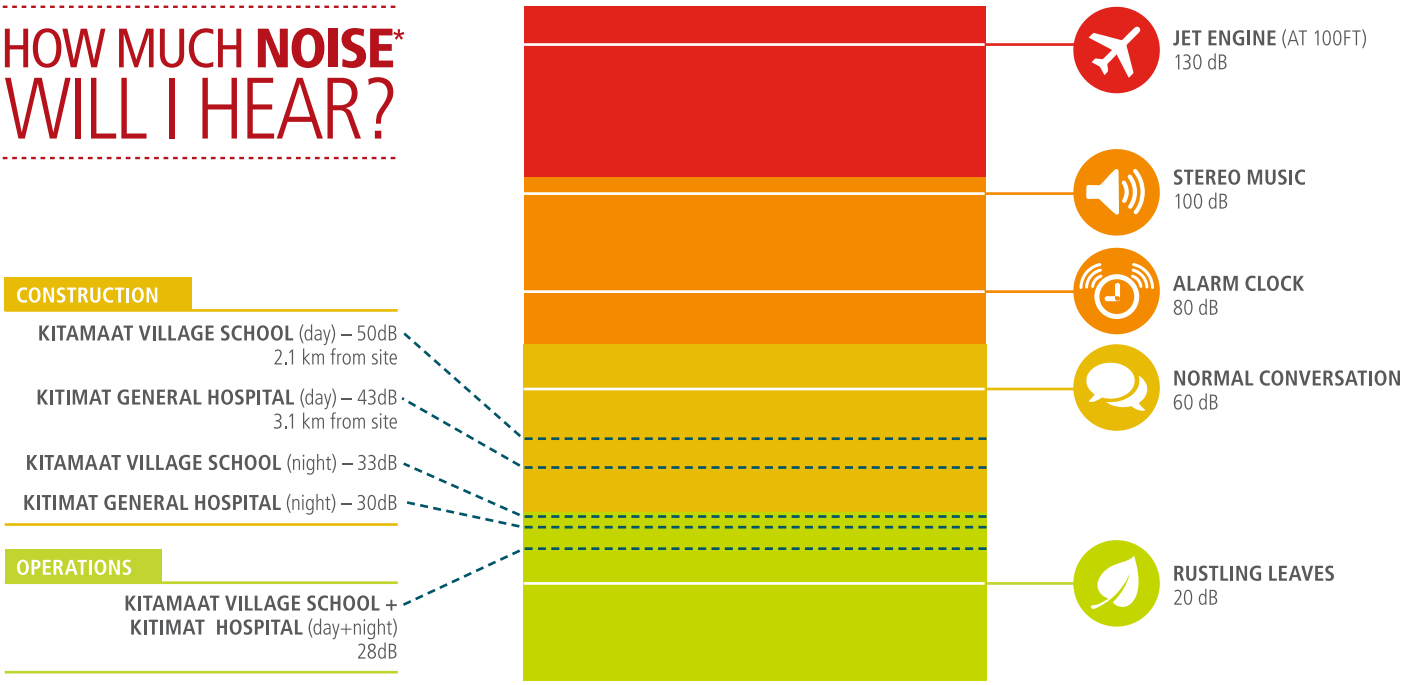
- We consulted with Aboriginal Groups and members of the community to design a noise-assessment program.
- We conducted three noise-monitoring programs between June 2013 and February 2014 to understand existing noise levels at numerous locations within the project area and along the shipping route. These included locations in Kitimat, Kitamaat Village, Promise Island and McCauley Island.
- We used noise modeling to predict how noise would be transmitted during construction and operation of the project. We modeled a conservative scenario, including weather conditions that allow sound to travel more, and with facility construction and marine construction happening at the same time.
- We compared the predicted noise levels to existing noise levels and to the criteria used by authorities to determine whether they are in compliance with provincial noise guidelines and municipal codes.

"LNG Canada has made some key design decisions to reduce impacts from the operation of our facility. For example we chose to locate our flare stacks as far away from residential homes, we will use water-cooling which eliminates noise from air-cooling, and muffling devices on equipment where we can to further limit noise impacts."

– Joost Van Tilburg, Operations Director, LNG Canada

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
We studied the degree to which noise from our project could affect surrounding areas and found the following: Construction activities, including land clearing, dredging in the harbour and pile driving are predicted to increase noise levels around the facility over the short-term. During construction, the average facility noise levels are predicted to be perceptible at most of the locations we studied in or around Kitimat and Kitamaat Village, but will still meet the criteria established by Health Canada. Operation of the facility and LNG carriers are predicted to marginally increase noise levels from what is currently experienced, but will not exceed provincial and federal guidelines.	Plan most construction activities, including pile driving, to occur between the daytime hours of 7am and 10pm. Night shifts may be required to complete specific activities or meet schedules. Use rubber-tired equipment rather than equipment with metal tracks or wheels, wherever practicable. Use sound-muffling devices on our equipment. Turn machines and vehicles off when they are not being used, rather than letting them idle. Inform nearby community members in advance when noisy activities, such as pile driving, cannot be avoided, and do our best to minimize the duration of these activities. Comply with all provincial noise guidelines and municipal codes and reduce noise as much as possible, in particular during certain sensitive times.

HOW MUCH **NOISE*** WILL I HEAR?



*Noise levels measured in A-weighted decibels (dB) – a standard unit that applies to the way humans perceive noise. dB measures sound pressure.

VISUAL EXPERIENCE

The proposed LNG Canada facility will be constructed on private land zoned for industrial development, and adjacent to existing industrial facilities. We recognize, however, that the construction and operation of a large LNG facility, and associated shipping activities, will result in a visual modification of the current landscape.

Our goal is to reduce visual disruption as much as we reasonably can, and we plan to limit the size of our land disturbance to the greatest extent possible. We will work with Aboriginal Groups and local communities on an ongoing basis to identify and address concerns around visual experience that may arise.

In undertaking our Assessment, we had a decision to make regarding our shipping route and its effects on views – a tradeoff between marine mammal safety and our ships being visible over a longer time. After many conversations with government, Aboriginal Groups and key stakeholders, we determined that safety should remain our highest priority, and that we would not increase the speed of our LNG carriers for the sole purpose of reducing visual effects.

What We Studied in our Assessment

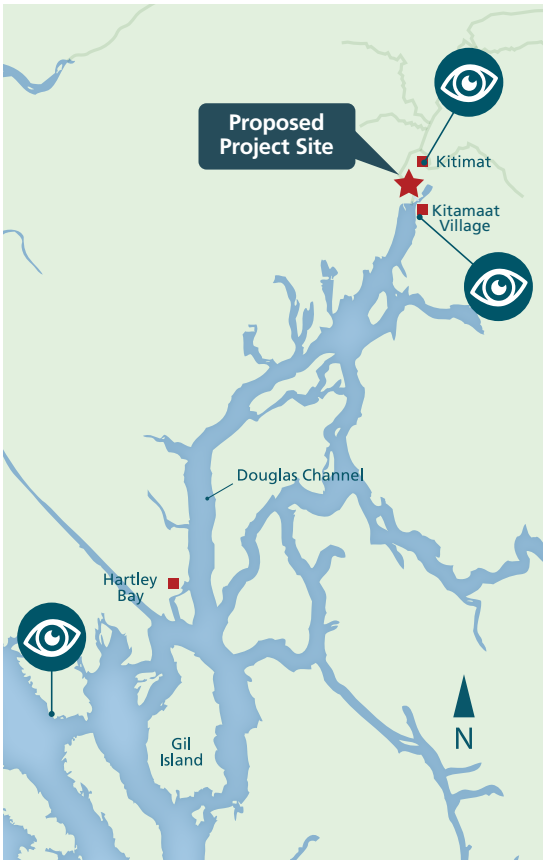
- We worked with community members and Aboriginal Groups to identify 43 important viewpoints along the Kitimat Arm (ranging from community parks and recreational trails to marinas and coastal communities) and 17 viewpoints of importance to Aboriginal Groups along the shipping route.
- Our studies showed that reducing our ship speeds would make our project safer for whales and other boats, but it would mean our ships would be visible over a longer period of time over the shipping route.
- We visited 28 of these viewpoints (11 associated with the facility and 17 associated with the shipping route), and photo-documented the existing visual conditions.
- We took baseline photographs for each of the 28 priority viewpoints, and added modeled images of the facility and/or LNG carriers. We used these simulated views to further assess visual effects.

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
We studied the ways in which our facility and LNG carriers could result in changes to the visual character of the landscape and found the following: LNG facility: The facility would be partially visible from a number of locations in Kitimat, as well as from Kitamaat Village. The facility and marine terminal would be well illuminated, as is required for large industrial sites, to ensure safe construction and operation.	Design the facility to reduce the size of the disturbed area, and blend it in with the environment as much as possible. Keep at least a 30-metre buffer zone of mature trees and shrubs between the project site and the Kitimat River. Restrict vegetation clearing to the project footprint by carefully flagging the areas in which trees can be removed. Replant trees and shrubs as soon as possible after construction, wherever practical, to reduce our effects on views over time. Terrain and vegetation screening may obstruct some of the facility or marine terminal light.
LNG carriers: Marine vessels would be visible from Kitamaat Village and Hartley Bay, and from areas along the marine access route.	Limit carriers from entering the channel unless berths are available in the terminal, and avoid anchoring of LNG carriers unless needed for safe navigation.

"One of the considerations in designing a project like ours is how best to minimize the visual effect on the surrounding environment. In designing our facility, we looked at ways to minimize visual disruption as much as we reasonably can, and we plan to limit the size of our land disturbance to the greatest extent possible."

– Wim Ravesloot, Technical Director, LNG Canada

The following images provide a simulation of what the project facility and LNG carriers could look like from various viewpoints in the project area and along the shipping route. It should be noted that views would vary depending on time of day and location.



View assessment looking northwest towards the proposed facility from MK Bay Marina, near Kitamaat Village

View assessment looking southwest towards the proposed facility from Coughlin Park in Kitimat

View assessment looking south from the southwest tip of Pitt Island of a simulated LNG Carrier in Otter Channel

ARCHAEOLOGY & HERITAGE

The town of Kitimat and the surrounding area lies within the traditional territory of the Haisla Nation, where for thousands of years, the Haisla have occupied a number of villages and used the area to hunt, fish and gather plants for food, medicine and raw materials. More recently, European settlers also used the area primarily for ranching.

We are confident that existing archaeology and heritage sites have been identified and assessed, and that effects will be avoided or reduced through our proposed mitigation measures.

We are committed to proceeding with care and respect for the heritage of this region, and will remain engaged with local communities to ensure our approach to archaeology and heritage is appropriate and effective.

What We Studied in our Assessment

- We reviewed archaeological and other heritage records and documents covering the site and the broad surrounding area.
- We obtained additional information from the Provincial Archaeology Branch.
- We consulted with the Haisla Nation regarding their past uses of the area and what cultural heritage resources we might expect to find.
- With Haisla members present, we carried out studies in 2013 and 2014, including over 500 shallow excavations (a standard approach to look for cultural heritage sites) in 23 areas.
- To determine the significance of archaeological and heritage resources, we followed a best practice approach of considering the following:
  - Standards of the BC Archaeological Impact Assessment Guidelines
  - Input from consultations with the Haisla Nation (for traditional use sites)
  - Input from relevant groups, such as local historical societies (for historic sites)

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
We conducted extensive surveys for archaeological and heritage resources on and around the proposed facility site, and found the following:	
Outside the project footprint, we identified a site showing evidence of a cooking fire and stakes from what we believe may have been a fish-processing site.	Mark and fence off the fish-processing site, to ensure our project activities do not impact it.
Inside the project footprint, we identified a site comprised of a scatter of chips from the manufacture of stone tools. This area was also used by the Euro-Canadian settlers of the region, as indicated by the remains of a wagon identified there.	Work with the Haisla Nation to determine the importance of the stone tool chips, and with local heritage groups on the importance of the remains of the wagon. Follow best practices by engaging experts to undertake a systematic study of the site, and then work with the Haisla Nation, government and the public to agree on next steps.
It is always possible that we could encounter a previously unrecorded archaeological or heritage site.	Develop and implement a "Chance Find Protocol," which will require that work stops in the unlikely event that a potential heritage site is identified. Work would only resume once a qualified professional and a Haisla representative inspect the site to evaluate and assess its potential significance.

ABORIGINAL INTERESTS

LNG Canada is committed to meaningful consultation and engagement, and has been in discussions with Aboriginal Groups about the project since its onset in early 2012. LNG Canada has provided support to Aboriginal Groups to enable their full participation in the Environmental Assessment process. We have incorporated their traditional knowledge and feedback throughout the process where possible, and have sought to understand their interests and concerns with respect to the project. We also focused particularly on potential adverse effects of our proposed project on Aboriginal Groups.

Our Assessment findings indicate that potential adverse project effects on Aboriginal Groups can be managed with appropriate measures in place. We are committed to continuing to work closely with Aboriginal Groups through the Application Review phase to continue to refine and develop these strategies.

Engagement and Consultation

LNG Canada is consulting Aboriginal Groups with respect to the following three areas:

1. **Facility** – the project footprint is located solely within the traditional territory of the Haisla Nation.
2. **Air Quality** – the traditional territories of the following Aboriginal Groups intersects with the Air Quality study area: Haisla Nation, Gitga'at First Nation, Kitselas First Nation, Kitsumkalum First Nation, Lax Kw'alaams First Nation, Metlakatla First Nation.
3. **Shipping** – the marine access route passes through the traditional territories or marine use areas of the following Aboriginal Groups: Haisla Nation, Gitga'at First Nation, Gitxaala Nation, Kitselas First Nation, Kitsumkalum First Nation, Lax Kw'alaams First Nation, and Metlakatla First Nation.

We developed a Consultation Plan with input from Aboriginal Groups with the objective of:

- Providing timely and relevant information about the project.
- Seeking feedback from Aboriginal Groups on their project-related interests.
- Collaboratively exploring ways to avoid or minimize potential project effects on Aboriginal interests, rights and/or asserted title.

Throughout the Application review phase, LNG Canada will continue to work to:

- Maintain good long-term relationships through open dialogue about issues and concerns that may arise.
- Respond to concerns regarding the avoidance and mitigation measures we propose.
- Proactively share project information to promote on-going understanding and awareness of project activities.

Aboriginal Interests	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects on Aboriginal Interests
LNG Canada consulted with Aboriginal Groups to more fully understand the potential for adverse project effects on Aboriginal Interests, and identified five key potential effects: • Disturbance of traditional harvesting (hunting, trapping, fishing, and collecting plants such as seaweed and berries) • Disturbance of the use of sacred and culturally important sites and landscape features • Changes that affect aspects of traditional Aboriginal governance systems • Changes in aspects of Aboriginal cultural identity • Effects on spiritual places	We will work to minimize effects to fish, plants and wildlife, and address other concerns related to Aboriginal Interests.
We also reconsidered potential effects to the environment, with a focus on how these might affect Aboriginal Groups. Potential areas of effect included: • Health and socio-economic conditions • Physical and cultural heritage • Current use of lands and resources for traditional purposes • Structures, sites or items of historical, archaeological, paleontological or architectural significance	Maintain open dialogue during construction and operations, and work to resolve issues that may arise.
We then considered the ways that the potential environmental and social effects of our proposed project might interact with Aboriginal Interests. For example, if fish were affected, we worked to understand how that could affect Aboriginal people, including changes to harvesting or traditional governance systems (such as the ability of families to host feasts using resources from traditional fishing grounds, or effects on traditional stewardship and land responsibility).	Train our staff on cultural sensitivity, to minimize the potential for adverse project effects on Aboriginal interests. Provide "safe shipping" workshops to raise awareness of LNG shipping and navigational safety.

"We are committed to working with First Nations in Kitimat and along the project shipping route, in order to understand and address, to the greatest extent possible, their interests and concerns, while ensuring our project provides long-lasting benefits.

– Michael Eddy, Senior Aboriginal Relations Advisor, LNG Canada

MARINE MAMMALS

Marine mammals are abundant on the north coast of B.C., and many species are found either year-round or seasonally along the shipping route. Our shipping route overlaps with areas that are important for several whale species, including humpback whales and northern resident orcas, which are listed as at-risk species by the federal government.

Our commitment is to avoid adverse effects to marine mammals wherever possible. As such, we have designed our mitigation measures to avoid exposing marine mammals to project-related risks, as far as practicable.

To verify that these measures are effective in avoiding potential effects to marine mammals, we will work with local community groups, Aboriginal Groups, marine specialists, and community stakeholders to monitor actual effects and identify if or where our plans may need to be revised.

What We Studied in our Assessment

- We received important information from Aboriginal Groups regarding the species of marine mammals that are present along the shipping route throughout the year, and the appropriate timing for marine mammal surveys.
- We conducted an extensive survey program, and had the survey methodology reviewed by a third party expert in marine biology.
- We conducted intensive studies on marine mammals along the entire marine shipping route using a statistically rigorous technique. This included 12 marine mammal vessel surveys conducted along the shipping route between January and October 2013 (each between 10 and 14 days in duration). The surveys evaluated periods of low and high marine mammal use.
- We collected data on current levels of underwater noise and used these data to conduct modeling to predict the potential effect that project noise could have on whales.
- Some of the unique aspects of LNG Canada's marine mammal study include:
  - A focus on estimating abundance rather than just presence or absence, which has typically been the case with other projects.
  - The size of the study area was extensive, and included the waters of Kitimat Arm, Douglas Channel, Whale Channel, Squally Channel, Caamano Sound, Estevan Sound, Principe Channel, and up to Triple Island.
  - Species studied included a variety of whales, sea lions, and white-sided dolphins.

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
The potential effects we evaluated included the following: Potential harm to marine mammals from the intense periods of noise and pressure waves caused by pile driving and dredging during construction of our marine terminal. Disturbance of marine mammals or effects to their behavior, such as communication, migration, foraging patterns, and surfacing and diving as a result of underwater noise and pressure waves caused by marine pile driving, dredging, and vessel movements. Collision of an LNG carrier with a whale during the operations phase, particularly during times of higher whale activity.	Protect marine mammals from harmful underwater noise levels by monitoring for their presence nearby during pile driving, and stopping when they are too close. Use methods to dampen underwater noise during construction, wherever possible. Use "soft starts" for marine pile driving: a method that involves a progressive buildup of warning pulses before we begin to work at full power, to provide marine mammals with time to move away from the area. Slow our LNG carriers to speeds of 8 to 10 knots from July through October, subject to navigational safety needs, in areas of high whale density between the northern end of Campania Island and the southern end of Hawkesbury Island. This both reduces the chance of a collision and reduces underwater shipping noise levels that may cause disturbance to marine mammals in the area. Have an experienced command team enhanced with two BC Coast Pilots to look out for marine hazards and ensure safety while transiting coastal waters.

"LNG Canada's marine mammal study is one of the most extensive surveys ever done by a proponent in B.C. and the data will make a significant contribution toward ensuring we can responsibly manage our potential effects, as well to the scientific understanding of marine mammals on British Columbia's north coast."

– Michelle Bailey, LNG Canada's Marine Mammal Specialist

KITIMAT RIVER ESTUARY

The Kitimat River Estuary is a critical part of the northwest B.C. ecosystem and of great importance to the people of the Kitimat area. Residents have told us that access to, and protection of, this environment is very important, as estuaries have long been recognized as being productive habitats for fish and wildlife, as well as important for recreational use. This is why so many of our proposed management measures focus on protecting the health and accessibility of this valued resource.

Our Assessment evaluated the potential effects on a number of valued components associated with the Kitimat River Estuary.

FISH AND FISH HABITAT

The Kitimat River and its tributaries provide important habitat for a variety of fish species, including Pacific salmon, rainbow trout, steelhead trout and cutthroat trout, dolly varden char and eulachon. Fish habitat in the area includes eelgrass and salt marsh, which provide important hiding and feeding environments for juvenile fish. The Kitimat River Estuary also acts as a gateway to freshwater for Pacific salmon to reproduce.

Our construction activities will remove or change some of this habitat. Because of this, we have worked hard to develop mitigation measures to avoid, reduce or replace our predicted effects on fish and fish habitat. We are committed to fully offsetting permanent loss or alteration of habitat, as required under the Canada Fisheries Act. LNG Canada will implement an approved Fish Habitat Offsetting Plan so there will be no net loss of fisheries productivity. We will develop this plan with the input of regulatory agencies, Aboriginal Groups and local stakeholders to ensure that the plan reflects the interests of those who value the Kitimat River Estuary the most.

What We Studied in our Assessment

- We reviewed federal and provincial online databases and used other mapping tools to understand existing fish and fish habitat conditions in the area.
- We worked with Aboriginal Groups to incorporate traditional knowledge into the Assessment, including specific information on the status of Kitimat River eulachon.
- We conducted studies to determine seasonal freshwater fish presence. We investigated fish habitat through surveys at Moore, Anderson and Beaver creeks, and a principle side channel of the Kitimat River.
- We collected information on migrating juvenile Pacific salmon in the estuary, and measured water quality in tidal channels on a monthly basis during late summer, fall, and winter; and on a bi-weekly basis during spring.
- We collected information on over 2,500 fish in freshwater bodies in the area, including both streams and seasonally important off-channel habitats.

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
The potential effects we evaluated included the following: Harm to fish caused by pile driving, infilling portions of water bodies, dredging activities or pumping of water from the Kitimat River. Changes in fish habitat from construction activities in marine, freshwater and estuarine habitats, which may eliminate or reduce access to spawning, rearing, overwintering and feeding habitats for fish, or from removal of vegetation during clearing, which could increase sediment runoff into adjacent creeks and affect water quality. Changes in fish health from effects to water quality stemming from project dredging activities that stir up sediment, or project air emissions that could cause acidifying effects.	Reroute sections of Beaver Creek and a principal side channel of the Kitimat River around the project footprint to maintain migration routes to upstream spawning habitats. Develop and implement a Fish Habitat Offsetting Plan that creates, restores or enhances fish habitat as a way to offset lost or altered habitat. Relocate fish to areas not affected by project activities before we begin infilling or certain other in-water construction activities. Minimize the project footprint to the extent possible to reduce the area of fish habitat we may disturb. Build the LNG loading line to optimize tidal flows and allow Anderson and Moore creeks to flow unobstructed to the Kitimat Estuary, to maintain continual fish passage and habitat use. Time construction and dredging activities during periods of least risk to fish and fish habitat. Design the water intake to minimize the risk of injury or mortality to fish. Contain sediment to the extent practicable when dredging, reducing the areal extent of sediment plume. Manage activities that could stir up sediment into the water to contain and control sediment as much as practicable. Observe the area during construction to determine how fish and their habitats respond to the mitigation measures we implement, and adapt our approach as needed.

BIRDS

The areas around our proposed project facility site and along the shipping route support a wide variety of birds. The forests near the facility site are important nesting habitat for bald eagle, osprey and other raptors. Stream-side and salt marsh habitats in the area also support many types of migrating and resident songbirds, raptors, waterfowl and marine birds. Marine birds extensively use the area's coastal wetlands, islands, estuaries and cliffs.

It is possible that our project would have an adverse effect on a small number of individual birds. However, we are confident that with the management measures in place, we would avoid widespread effects to bird populations. We would continue to work with Environment Canada, as well as with Aboriginal Groups and stakeholders, to follow up on the findings of our Assessment and to monitor the effectiveness of our proposed response measures.

What We Studied in our Assessment

- After reviewing existing studies on birds in the region and consulting with Aboriginal Groups, provincial and federal governments, and key stakeholders, we focused on eight key marine and terrestrial bird species: western screech-owl, harlequin duck, marbled murrelet, western sandpiper, black oystercatcher, double-crested cormorant, common goldeneye and glaucous-winged gull. These 'indicator' species were selected because effects to them are expected to be representative of those felt by other bird species in the area.
- We conducted extensive reviews of prior studies and surveys completed in the area.
- We consulted with Aboriginal Groups, regulators and naturalist groups to supplement this data set. For example, we incorporated several years of data provided by the Kitimat Valley Naturalists into our baseline description of the distribution of birds in the Kitimat region.
- We undertook extensive studies to supplement existing research. Our surveys include:
  - Breeding bird point count surveys from May–June 2013
  - Wetland bird call-playback surveys in May 2013
  - Raptor call-playbacks (directed at western screen owl) in 2014
  - Marbled Murrelet surveys, including occupancy and habitat assessment surveys, in May-June 2014 (these surveys did not find indications of Marbled Murrelet occupying the area)
  - Migrating waterfowl estuary surveys (from boats) in 2013
  - Marine bird surveys along the shipping route (from boats) and at the Kitimat River Estuary in 2012 and 2013
  - Habitat suitability mapping to identify and rank the quality of habitat for each of the key species of terrestrial birds we studied

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
The potential effects we evaluated included the following: Removal of or change to bird habitat within and adjacent to the project footprint due to construction of the facility. Construction of the facility footprint would result in the loss of 61.5 hectares of potential nesting habitat for marbled murrelet, which represents a small proportion (about 0.001%) of the total available nesting habitat for marbled murrelet along the Northern Mainland Coast. Attraction and disorientation of birds by artificial night lighting on our facility and on our LNG carriers – both when berthed and when moving along the shipping route – potentially resulting in harm to birds from colliding with our facility structures or carriers. Effects to the behavior of nesting birds in the two osprey nests we identified on the existing wharf, one of which is active. If left in their current locations, these nests could be exposed to nearby construction activities when we modify the wharf.	Flag important habitat features during construction, such as nests, that may be just outside the project footprint, so they are not unintentionally disturbed. Avoid clearing vegetation during bird breeding periods (April to mid-August for migratory birds, and January to September for raptors) where possible. Where this is not possible, take measures to protect birds and their eggs. Contribute to programs that restore ecologically important wetlands, which are important breeding and foraging locations for birds. Determine if osprey nests should be relocated or alternative sites constructed in suitable locations, in consultation with government authorities. Provide information to LNG carrier crews related to managing night lighting required for navigation and operation, to help manage the potential risk of bird strikes caused by deck lighting. Train vessel personnel on how to treat and release marine birds that become grounded on vessel decks as a result of a bird strike.

AMPHIBIANS

The Kitimat River Estuary and surrounding environment support several amphibian species including the coastal tailed frog, Columbia spotted frog, northwestern salamander and western toad.

The management measures we have proposed will reduce overall potential effects on amphibians, so they will not interfere with the health or sustainability of any particular species as a whole.

We will continue to monitor amphibian populations in the project area to evaluate the effectiveness of management measures. Where necessary to address unexpected effects, we will make changes or additions to these measures.

What We Studied in our Assessment

- As part of our Assessment, we undertook a thorough process together with Aboriginal Groups, the government and key stakeholders, to identify key species. The western toad was identified as an indicator species, given that effects to this species would likely represent the effects to other amphibians in the area.
- We completed a thorough literature review and incorporated data from local consultants and volunteer programs.
- We established a study area that consisted of the project footprint, plus a buffer area (total 2,300 hectares).
- We completed amphibian surveys in the summer of 2013 at 20 different wetlands sites.
- We timed our surveys to occur during predicted breeding and migration periods for the western toad.
- Our Assessment looked at possible effects to amphibians using 'worst-case' scenarios to conservatively estimate and plan for possible effects.
- We identified areas that supported amphibian breeding.

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
The potential effects we evaluated included the following: Loss of breeding habitat as a result of land clearing for the project. Habitat suitability modelling identified about 144 hectares in the study area as moderate-to-high-quality breeding habitat for the western toad. About 43% of this habitat is predicted to be lost as a result of land clearing. While this is only a portion of the quality-breeding habitat in the area around the proposed facility, LNG Canada takes the loss of this particular habitat seriously and we have proposed measures to reduce the overall effect on amphibian populations. Potential physical harm to amphibians resulting from clearing and other construction activities, in particular increased vehicle traffic. Limitations on the ability of amphibians to effectively move across the area (e.g., during migrations or dispersals) as a result of the introduction of physical barriers (such as berms, fences or upgraded roadways).	Protect amphibians through a salvage program that includes relocating toads away from project areas. Design the LNG loading line corridor so as to not impede amphibian dispersal or migration. Create, restore or enhance wetlands in other areas that are suitable for amphibian breeding. Establish and adhere to clearing limits to avoid disturbing any breeding ponds outside of the project footprint. Enforce reduced speeds for project vehicles, especially during amphibian migration and dispersal periods and near wetlands, to reduce the potential for harm to amphibians from traffic movements.

LAND MAMMALS

The project area is home to a variety of large and small mammals such as black-tailed deer, moose, grizzly bear, black bear and Pacific marten. The importance of protecting wildlife from possible project effects, including effects on habitat, has been raised by the local community in our consultation efforts, and is also something that is important to LNG Canada.

While we expect that some individual animals may be affected by the project, we have proposed measures to minimize effects to help ensure the long-term sustainability of animal populations in the area. We will continue to work with the government, scientific organizations, Aboriginal Groups and the community to monitor these effects carefully over the life of the project, and to use our observations to continuously improve the measures we take to protect wildlife.

What We Studied in our Assessment

- We worked together with Aboriginal Groups and the community to gather local knowledge and expertise; we worked with these groups as well as with provincial and federal governments and key stakeholders to decide which species would be the focus of our Assessment.
- We reviewed decades of wildlife data from government, scientists, local consultants and citizen-science research programs.
- We began to assess wildlife habitat in 2012, and then surveyed for large mammals across all seasons in 2013, with some additional surveys conducted in the spring and summer of 2014.
- We recorded all wildlife or signs of wildlife that we saw in the course of our work in the area.
- We engaged local groups for input and feedback through several engagements, including open houses and stakeholder meetings.

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
The potential effects we evaluated included the following: Loss of or changes to habitat due to vegetation clearing, as well as other construction activities. Changes in animal behavior due to the sounds or lights associated with our activities. Changes in access to key forage habitats due to the presence of physical barriers introduced in existing animal movement corridors. Potential physical harm to animals due to increased interactions with people (for example, when bears are attracted to waste) or increased potential for vehicle collisions with wildlife.	Clearly mark clearing boundaries to avoid unnecessary impacts on adjacent wildlife features and habitat. Keep animal trails outside the construction site, clear of equipment and construction debris. Protect active bear dens with 200-metre buffer zones around them. Design the LNG loading line corridor so as not to impede wildlife movement. Manage our waste to avoid attracting wildlife, in particular bears. Enforce reduced speeds for project vehicles to reduce potential for wildlife injuries. Install bear-proof fences around the facility and worker accommodation centre(s) to deter interactions between bears and people.

VEGETATION

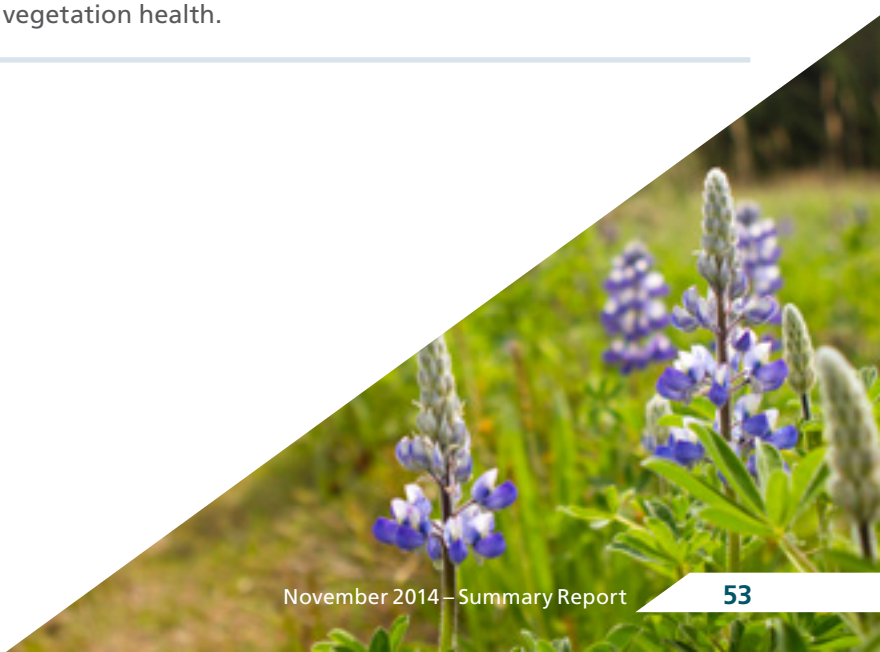
Although our proposed project will be built on an existing industrial site, construction and operation could still affect vegetation in the area, which includes a combination of old growth and second growth forests, as well as plant life growing in swamps, fens, marshes and wetlands.

Our priority has been to avoid or reduce potential effects to vegetation where possible, primarily by limiting the area of disturbance and only removing plants and trees when necessary. Through proposed measures to reduce potential effects on vegetation, we are confident that effects on vegetation can be managed so they are generally localized around the project area, and do not compromise the sustainability of key species or habitat in the region.

What We Studied in our Assessment

- We consulted with Aboriginal Groups to identify key areas of focus in relation to vegetation effects, and to identify the plant species used by Aboriginal Groups for food, medicine and materials.
- We used existing and project-specific data sources to map the vegetation across nearly 128,000 hectares – including 39 different ecological communities.
- We conducted surveys in 2012, 2013 and 2014 – over 105 locations in total – to verify the information we obtained by research, and to search for any rare or at-risk plants or any traditional use plants. We found three at-risk plant species on or near the facility site. We found two of these species in the project footprint. Rock sandwort – a low-growing perennial with tiny white flowers; and long-leaved aster – a perennial with violet flowers that is commonly found in meadows. We found the third species, eminent bluegrass, in two locations outside of the project footprint, though one of these locations is near enough to warrant attention during construction.
- We conducted 73 surveys in areas that might be affected by emissions to assess the health of vegetation and soil.
- We considered other major existing and planned projects in the area, together with our project, and modeled the combined effects of emissions on plant health across a 500,000-hectare study area, extending up to Lakelse Lake and Terrace.

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
The potential effects we evaluated included the following: Due to the removal of approximately 300 hectares of trees and/or vegetation, including 45 hectares of old forest and 84 hectares of wetlands, when we clear the land for our facility: • Change in the overall abundance of plant species that are rare, important at the provincial or federal levels, or used by Aboriginal Groups for food, medicine or material. • Change in the abundance or condition of ecologically important areas, such as old forest, floodplains or wetlands. Effects to the health and diversity of native vegetation, as a result of air emissions from our facility combined with emissions from other facilities, either through direct exposure of vegetation to emissions or through over-fertilization and soil acidification that can result from our emissions affecting the soil the vegetation grows in.	Remove plants and trees only where absolutely needed to construct and safely operate the facility. Mark off clearing boundaries to distinguish between areas to be cleared and areas with plants and trees to be protected. Relocate and transplant protected plant species (rock sandwort and long-leaved aster) that we find within the project footprint before we begin construction. Replant trees, shrubs and other vegetation as soon as possible after construction is complete in areas cleared for construction and workforce accommodations that do not need to remain clear for operations. Take measures to control the introduction of weeds or non-native plants that could upset the natural balance in the surrounding plant communities during restoration of cleared construction areas. Create and implement a plan that offsets the loss of wetland functions in the project area by creating, restoring or enhancing wetlands elsewhere. Consult with community, regulators and Aboriginal Groups as we develop this plan. Incorporate traditional-use plants wherever appropriate during restoration of cleared construction areas and development of new wetland habitat. To minimize the potential effects of air emissions on vegetation, we have incorporated multiple design features to reduce emissions from our facility. Please refer back to "Air Emissions" to read more about our study of the effects of air emissions on vegetation health.



MANAGING IMPACTS TO FISH AND FISH HABITAT AND WETLAND FUNCTIONS

Our proposed project is expected to remove or alter wetlands and important habitat for fish and wildlife within the project footprint. We will be required to prepare and implement robust plans for the creation, restoration and enhancement of fish and wildlife habitat, as well as wetland function in other places to offset these effects. As part of these plans we will continue to monitor these effects and the success of our measures, so we can be certain that we replaced or restored the functions that the project will affect.

Habitat and wetland compensation could include:

Creating spawning habitat

- Gravel reduces the amount of suspended silt in water; fish are visual foragers that typically dislike silty water.
- Salmon spawn in gravels with sufficient subsurface flow.

Building side channels

- Slower-flowing water in side channels is especially good for juvenile fish, who are not yet strong swimmers.
- Side channels provide cover and refuge for fish to hide from predators or find food sources.

Increasing the complexity of existing fish habitat

- Adding logs or boulders to streams reduces the flow of water to be more hospitable to juvenile fish.
- Logs in streams create a more complex habitat, offering more nutrients and food sources for fish.
- Complex environments create more places for juvenile fish to seek refuge.

Creating wetlands

- Wetlands are good for fish at all stages of the life cycle because they provide refuge and can be an important source of food.
- Wetlands add complexity to the aquatic ecosystem and support aquatic organisms that fish species like to eat.
- The focus is to create wetlands elsewhere similar to those that could be affected.

Funding research into sustainable fish populations

- New government guidelines allow proponents to propose up to 10% of their offsetting budget on research into fish populations and more community-based environmental projects.
- Research must be done in partnership with NGOs or universities.

INFRASTRUCTURE & SERVICES

Kitimat and Terrace areas have been experiencing changes due to infrastructure projects and industrial development. The development and maintenance of healthy and vibrant communities will be a responsibility we share with local and provincial governments, Aboriginal Groups, local communities, stakeholders and the general public.

We believe that our approach to managing effects on infrastructure and services will minimize potential impacts to the communities we propose to operate in, while providing benefits through additional revenues that could be used to fund infrastructure and services improvements of benefit to the community well beyond the life of the project.

What We Studied in our Assessment

- We reviewed published reports, statistical information, academic literature and other data sources.
- We spoke with representatives from government departments and agencies (municipal, provincial, and federal), Aboriginal Groups and local organizations to confirm our initial findings and address information gaps. Our engagements took the form of interviews (in-person and by telephone), focus groups, workshops and surveys. This information was supported by our extensive consultation activities.
- We undertook a field program to obtain information about existing traffic conditions at road-rail intersections and are working with the Ministry of Transportation to understand implications for the road network.
- We undertook socio-economic research collaboratively with Aboriginal Groups and incorporated existing and new information into our study.

"While our proposed mitigation measures focus on preventing adverse effects to infrastructure and services, our project is expected to result in increased revenue to all levels of government. These revenues could be used to fund infrastructure and services improvements that could benefit local communities well beyond the life of the project."

– Daria Hasselmann, Social Performance Advisor, LNG Canada

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
The potential effects we evaluated included the following: **Road Traffic** Potential increase in traffic congestion and traffic accidents caused by the movement of workers, materials and equipment by road, as well as everyday traffic from our workforce and their families during construction. We anticipate traffic impacts during operations to be minimal.	Minimize road traffic by employing a dedicated bus system to move our workforce to and from the construction site. Develop and enforce a Traffic Management Plan to manage use of local and regional roads; this will include scheduling worker rotations to avoid peak traffic volumes. Participate in the province's regional transportation study. Use a Traffic Management Plan in the operations phase, including measures such as timing our work shifts so they don't coincide with busier traffic times.
Housing Potential impacts on housing availability and affordability based on increased demand from workforce during construction and operations. We anticipate that housing requirements will stabilize during operations.	Work with developers and the District of Kitimat to create new housing in Kitimat equal to LNG Canada's housing needs. Support the outcome of the Kitimat Housing Plan that is under development by the province in partnership with the local community. Support initiatives to serve at-risk populations in accessible housing, transitional housing and affordable housing. Build an easily expandable workforce accommodation with water, sewer and other utilities, without placing additional pressures on the community.
Airport Use Airport congestion caused by increased use of the local airport for project-related travel during construction. The operations phase workforce will reside in Kitimat or the nearby area, so airport use by the project will be significantly reduced.	Use chartered planes as often as possible, so that effects to flight availability will be reduced. Support implementation of the Airport Master Plan. Transport workforce by bus to and from the airport.
Community Infrastructure and Services During construction, potential increased demand on community infrastructure and services, such as waste disposal and sewage, as a result of population increase. We expect the capacity of community services will be sufficient to accommodate the additional demand from the operations workforce.	Create a worker accommodation village and ensure it has its own water, sewage, health and recreational facilities. Engage local and regional governments on an ongoing basis to support planning and preparation for population increases, and the related demand on infrastructure and services. Maintain adherence to the District of Kitimat's community planning and zoning to preserve the character of the community.

MARINE TRANSPORTATION & USE

LNG Canada understands the importance the community places on access to Douglas Channel and the coastal waters off Kitimat. We know that Aboriginal Groups value these coastal waters for their way of life, and that the route is also highly valued by commercial and recreational fishers, eco-tourism operators and other stakeholders, for their livelihood and general enjoyment.

Since project planning began, we have been working with local communities to identify the potential effects to marine transportation and use associated with project vessels transiting through the marine access route. We also assessed potential effects to marine transportation and use associated with marine construction activities. We believe that our activities will have minimal effects on marine transportation and use. Even so, we will continue to work with the community to preserve the ways people use and enjoy the waters we will share, and to assess and address any unexpected effects that arise.

What About the Wake?

We have heard questions about vessel wake and how it could affect shoreline harvesting, small craft safety, and shoreline erosion. The size of wake waves depends on a range of factors, including water depth, channel width, vessel design, vessel size, vessel speed, and distance between the vessel and other boats or the shore.

We evaluated the results of several previous wake studies and factored those into the predictions of the wake we will produce. Based on this evaluation, we anticipate that the height of wake waves reaching shoreline habitats from our vessels will be within the range of natural wave conditions. We have also commissioned a separate third-party study on wake effects to verify these findings, which we will share with the local community and Aboriginal Groups.

What We Studied in our Assessment

Our studies looked at information collected through consultation with Aboriginal Groups and stakeholders, from government reports and data, and from a number of other sources. Data collection included the following:

- Fisheries workshops in Kitimat and Prince Rupert to meet with Aboriginal, commercial and recreational fishers, as well as guided angling outfitters, to identify potential effects and ideas for managing effects.
- One-on-one interviews with Kitimat residents to discuss fisheries, recreation, guided angling and ideas for managing effects.
- Vessel surveys for 10 weeks along the shipping route to supplement shipping data, especially with respect to recreational boating and placement of fishing gear.
- Phone surveys with eco-tourism operators to understand the nature and size of the eco-tourism industry.
- Ongoing community engagement activities, including open houses, feedback forms and stakeholder meetings, to receive community input.

Key Study Findings and Potential Effects we Assessed	Our Proposed Measures to Avoid, Reduce or Mitigate Potential Effects
The potential effects we evaluated included the following: Interference with navigation, from dredging and wharf modifications for the LNG terminal.	Establish safety zones in the waters around our facility during construction and operations phases. Communicate with authorities and marine users regarding our shipping activities and the timing of our marine construction activities.
Increased use of marine facilities by our construction workforce, during their time off.	Work together with the government and other industry to support the creation of water access, which could include a boat launch.
Interference with fishing vessels or their gear, shoreline harvesting and recreation from our marine vessel movements.	Communicate with authorities and marine users regarding our shipping activities. Manage safe operating distances from other vessels and pass other large vessels in straight sections of the route. Travel with two B.C. marine pilots on board plus an escort tug between Triple Island and Kitimat during all LNG carrier transits. Conduct "safe shipping" workshops to raise operational awareness for local marine users.

"Throughout the life of our proposed project, we will continue to work with the community to preserve the ways people use and enjoy the waters we will share. If unexpected effects arise, we will work with the community to assess and address these appropriately."

– Mark Turner Senior Marine Advisor, LNG Canada

ACCIDENTS AND MALFUNCTIONS

The proposed LNG Canada project will meet some of the strictest regulatory standards in the world for both safety and environmental protection. Our proposed facility will be among the most modern, will adhere to industry best practice and will include safeguards to protect against incidents.

Potential Accidents and Malfunctions Assessed

The Environmental Assessment includes an examination of the potential effects of an accident or malfunction that could occur as part of the construction and operation of the proposed project, including shipping activities. The Assessment focuses on the worst-case scenarios, even if there is only the slightest possibility an incident could occur. For example, LNG has the best shipping record of any industry, with over 50 years without any significant incident resulting in a loss of cargo at sea or in port.

Common elements to address each of these potential accidents and malfunctions include a robust Emergency Response Plan, as well as extensive training to ensure that site personnel are specialized in the operation of their respective duties, and know how to detect potentially unsafe conditions and respond to emergencies effectively and efficiently.

Potential Accident/Malfunction	Prevention Measures	Response Measures
LNG spill at the facility A leak in the low pressure loading arms or lines and release of LNG.	Design LNG facilities to contain the minimum quantity of hydrocarbons required and also to have the minimum potential leak sources; adequate distances between LNG storage and facility boundaries; emergency and automatic shutdown systems; remote monitoring devices for fire and leak detection; primary and secondary containment systems on LNG tanks.	Remote activated deluge systems; fixed and moveable foam fire protection systems and fire water monitors.
Spills of hazardous materials other than LNG A spill, due to a breach of a tank, equipment failure or leakage during loading operation from the condensate tank to railcars.	Release prevention barrier and leak detection systems beneath condensate tanks; overfill protection, automatic tank gauging and inventory monitoring in condensate tanks; daylight loading only for condensate railcars; hazardous materials storage no less than 30 metres from water bodies or sensitive habitats; regular maintenance and inspection.	Immediate steps will be taken to minimize the spill through isolation and segregation; firefighting equipment; and spill response materials onsite.

"Safety is critical to our ability to deliver energy responsibly. One of our core values, and a commitment we are making to the community, is to protect our neighbours, employees and contractors."

– Wael Awad, Director, Health & Safety, LNG Canada

Potential Accident/Malfunction	Prevention Measures	Response Measures
Emergency shutdown of the facility Full shutdown of all production trains, with routing of gas in pressurized systems to be flared (burned) in a controlled way.	Design facility to shut down in response to serious upset conditions; control system and emergency shutdown system; detectors for combustible gas, fire, smoke, and heat; safe work procedures and a work permit system for site operations.	Flare system with minimum destruction efficiency of 99.5%; continuously lit pilot lights on flares.
Explosion or fire at the facility An uncontrolled release, in the presence of an ignition source, of gases that are stored or used within high pressure systems.	Sophisticated fire protection is included as part of the design and operation in compliance with applicable codes. Workplace safety assessments to detect and eliminate fire hazards; design to promote natural ventilation and dispersion of potential vapour clouds; confinement and diversion dikes at potential spill sources; systems that prevent or minimize release of liquids (e.g. fire-safe valves); use of fire-resistant materials; and fire and gas detection systems.	Firefighting equipment, including onsite storage of water for six hours of continuous firefighting; collection and clean-up of firefighting chemicals and debris to prevent entry into terrestrial or aquatic habitats.
Grounding or collision of a marine vessel and potential LNG leak Worst-case outcome being a hull breach and loss of contents of one LNG tank and one fuel tank.	Double hulled carriers with a specialized insulated containment system with leak sensors; B.C. Coast Pilots onboard to provide local knowledge to ship's officers; LNG carriers traveling at speeds below 14 knots; communication of position at all designated call-in points; automatic identification system (AIS) and two-way communication with other traffic; LNG carriers assisted by an escort tug and up to four harbour tugs for berthing and deberthing.	For spills in the marine environment, response procedures could include natural dispersion for LNG and mechanical containment for oil and recovery through the use of booms and its subsequent removal using sorbents, skimmers, and other mechanical recovery devices and techniques, and shoreline cleanup as required.

ENVIRONMENTAL MANAGEMENT PLANS

As part of our Application, we have proposed the development of a number of detailed plans that set out how we will manage our activities and potential adverse effects, as well as enhance positive effects. These plans outline how we propose to monitor the effects of our activities over the life of the project, with the goal of demonstrating ongoing responsibility and responsiveness to our proposed project effects.

In many cases, the development of these plans will require input from local stakeholders, Aboriginal Groups and government agencies. Local knowledge from these groups will be critical to the successful development of these plans.

LNG Canada will develop a comprehensive Environmental Management Program (EMP) that provides the environmental framework to manage each phase of the proposed project – construction, operations and decommissioning. The EMP will include a series of separate specific management plans to protect the environment, personnel, and the public by preventing or reducing potential adverse effects from project activities. Each plan will provide the following information:

- The purpose, scope, and objective of the plan
- Roles and responsibilities
- Site orientation and training requirements
- Clear and concise written procedures
- Key emergency and LNG Canada contact information
- Monitoring and reporting requirements

An environmental management team will be established to oversee the implementation of the EMP and carry out monitoring and reporting requirements. The team will consist of environmental specialists, including representative from local Aboriginal Groups, and will monitor site activities during construction and environmental performance during operation.

The environmental management team will work with construction and operation managers to provide assurance of compliance with the EMP and the regulatory requirements or conditions of approvals, permits, and/or licenses.

Prior to the start of construction, management plans will be developed to cover the following areas:

- Air quality
- Archaeological and heritage resources
- Emergency response
- Erosion and sediment control
- Fish habitat offsetting
- Greenhouse gases
- Health and safety
- Invasive plants
- Marine activities
- Noise
- Surface water and wastewater
- Traffic
- Waste
- Wetland compensation
- Wildlife

"As part of the commitments we have made to the community, LNG Canada will develop an environmental and social monitoring/mitigation program that meets regulatory requirements, and we will share information on the program with the public for the life of our project."

– James Baldwin, Environmental and Regulatory Affairs Manager, LNG Canada

BEYOND THE ENVIRONMENTAL ASSESSMENT CERTIFICATE

While the Environment Assessment Certificate is one of the main permits we require prior to making a final investment decision about our proposed project, LNG Canada is concurrently working with other key agencies to obtain additional permits and licences that would be required to construct and operate the proposed LNG export facility in Kitimat, B.C.

Permit / License	Scope	Responsible Agency	Timeline for Submission
LNG Facility Permit	The LNG Facility Permit review process addresses the requirements of the B.C. Oil and Gas Commission's mandate for managing public and environmental safety associated with the construction, operation, and cessation of operation and site restoration of the LNG export facility. LNG Canada will include community and Aboriginal input received to date, and as part of the EA process, in the development of our LNG Facility Permit Application. We will also share information about this permit at the appropriate time.	B.C. Oil and Gas Commission	**January/ February 2015**
Disposal At Sea Permit	LNG Canada is proposing to dispose of suitable dredged material in an approved manner at sea. In order to dispose materials at sea, a permit is required from the federal government. We have been working with the Haisla First Nation and stakeholders during the preliminary planning and will be sharing information related to these plans in the coming months.	Environment Canada	**January 2015**
TERMPOL	TERMPOL (Technical Review Process of Marine Terminal Systems and Transshipment Sites) is a voluntary technical review of the proposed shipping route that will identify navigational and other recommendations to support a safe-shipping environment. LNG Canada has been working with local Aboriginal Groups and stakeholders to seek input into and/or share information related to this process.	Transport Canada	**January/ February 2015**
Fisheries Authorization Act	LNG Canada will be required to obtain a Fisheries Authorization Act Permit, which requires the development of an Offsetting Plan that ensures there is No Net Loss of productivity in the fishery. We have developed a draft Offsetting Plan that we will review with local Aboriginal Groups, stakeholders and regulatory agencies over the coming months as part of the Environmental Assessment process and our engagement program.	Fisheries and Oceans Canada (DFO)	**February/ March 2015**

APPLICATION QUICK GUIDE

This document is a summary and does not take the place of the full Environment Assessment Certificate Application. For ease of access, we have provided a quick guide below that lists the topics discussed in this document and the corresponding sections of the Application where those topics are discussed in more detail.

You can review the full Application at **eao.gov.bc.ca**

Topic	Corresponding Section in EA
Aboriginal Interests	Section 14
Accidents and Malfunctions	Section 10
Air Emissions	Section 5.2, 5.5, 5.9 and 9
Amphibians	Section 5.6
Archaeology & Heritage	Section 8
Birds	Section 5.6
Community Health	Section 9
Community Wellbeing	Section 7.5
Fish and Fish Habitat	Section 5.7, 5.8
Greenhouse Gases	Section 5.3
Infrastructure & Services	Section 7.2

Topic	Corresponding Section in EA
Kitimat River Estuary	Section 5: 5.5, 5.7, 5.6, 7.4
Land Mammals	Section 5.6
Local Benefits	Section 2.5
Marine Transportation and Use	Section 7.4
Marine Mammals	Section 5.8
Noise	Section 5.4
Vegetation	Section 5.5
Visual Experience	Section 7.3

WE'D LIKE TO HEAR FROM YOU

Designing an LNG project requires many years of planning, studies and engagement with Aboriginal Groups, local communities and stakeholders. We believe in taking our time to make sure we are doing it right, and this belief will extend well beyond the Environmental Assessment phase.

As always, your input is important in ensuring our plans consider the interests of the local community. We encourage you to learn more, ask questions and provide your input.

Learn more about the Environmental Assessment

Review

- Review the complete Application online at: **eao.gov.bc.ca**, or a hard copy in your local library or at our Kitimat Information Centre.
- From **November 10**, you can visit a new section of LNG Canada's website which will help guide you through the Environmental Assessment results.

In Person

- Come to an open house where you can speak with the Environmental Assessment Office (EAO), and LNG Canada project representatives and environmental specialists:

  Nov 25, 2014 5pm – 8pm | Rod & Gun Club - Kitimat, B.C.

  Nov 26, 2014 5pm – 8pm | Best Western Hotel - Terrace, B.C.
- You can also request to have the LNG Canada team meet with your organization. Please contact us at **1-855-248-3631** (Local **1-250-639-3229**) to make an appointment.

Provide Input

A public comment period will be hosted by the EAO between November 7 and December 22, 2014. You can submit your comments on our Application to the EAO:

Web: eao.gov.bc.ca | **Email**: eaoinfo@gov.bc.ca | **Fax:** 250 356-7477

Mail: 2nd Floor, 836 Yates St., PO Box 9426, Stn Prov. Govt., Victoria, B.C., V8W 9V1

The public comment period closes December 22, 2014.


LNG CANADA
Opportunity for British Columbia. Energy for the world
Joint venture companies

NOTES

LNGCANADA
Opportunity for British Columbia, Energy for the world

Joint venture companies

Mitsubishi Corporation

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