MEETING DETAILS	**Woodfibre LNG Community Consultation** Furry Creek Small Group Meeting June 17, 2014, 6:00 p.m. – 8:00 p.m. Furry Creek Golf and Country Club Furry Creek

PURPOSE	Notes from a Small Group Meeting for the Woodfibre LNG Engagement held on June 17, 2014 at the Furry Creek Golf and Country Club.
FACILITATOR	Judy Kirk, Kirk & Co. Consulting Ltd.
PRESENTER	Byng Giraud, Woodfibre LNG
ATTENDEES	Ann Tranter Anne Owen Bruce Bessie C. Robertson Christina Laursen Craig McConnell Daniella Smith Don (Capt.) Tranter Eoin Finn Gord Homer Graham Parkinson Janis Johnson John Phillips Jorna Murphy Kati Palethorpe Lance Iverson Laurie Parkinson Long Cheng Mike Firth Murray Thompson Pam Tattersfield Rob Simons Rochelle Gerardi Ruth Simons Shaun Monteith Tom Davis
PROJECT TEAM ATTENDEES	AG Gelotti, Woodfibre LNG Byng Giraud, Woodfibre LNG Alex Brigden, Woodfibre LNG Jennifer Siddon, Woodfibre LNG Marian Ngo, Woodfibre LNG Gord Addison, Woodfibre LNG Jonathan Turner, Hemmera Lara Taylor, Hemmera David Bennett, FortisBC

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	Doris Huey, BC Hydro
AGENDA	1. Welcome and Review Agenda 2. Q&A 3. Closing Remarks

KEY THEMES

- Some participants were concerned about potential impacts from the Project, including air emissions and underwater noise
- Some participants expressed concerns about safety and security and asked about the "worst case scenario" and provisions for safety and security plans
- Some participants asked questions about the operation of the LNG facility, including the need for flaring and storage
- Some participants were concerned about the potential impact of the sea water cooling system and the release of warm water into Howe Sound

DISCUSSION

The record notes that the meeting was called to order at 6:00 p.m.

(Abbreviations will be used and mean – Q: Question, A: Answer, C: Comment)

Welcome and Agenda

Judy Kirk opened the meeting and round table introductions of the Woodfibre Project Team and participants were undertaken.

Discussion

C: *Byng Giraud:* Some of you may be familiar with the document similar to this that we used during our previous round of consultation last February. On the front, this is the current configuration. There are some significant changes from when we came out in February and we'll discuss those more as we move through the document tonight. The first couple of pages are straight-forward, page 2 explains this round of consultation and ways to give us input. We encourage you and other people you know to submit input online. One of the reasons there are changes to the design is because of input we received from the last round of consultation so this is an important process and we take it seriously. This meeting is not part of the environmental assessment process. This consultation and the one in February are our process; we are trying to extend the amount of information provided and receive input from the community. This page explains what the formal

environmental assessment entails. The regulators are currently in a public comment period on the Valued Component Selection document, so I encourage you to go online and find out more about that process.

Page 4 gets into the content. There is a description of the project and site selection and then a description of the components of the program. There are six bullets below which explain these components.

Byng explained what the project is, the reasons the site was selected and components of the project.

Q: *Ruth Simons*: Is the shipping of LNG also part of the environmental assessment (EA) process? Can you explain how big the tankers are relative to the storage containers? And will the ships be there one at a time?

A: *Byng Giraud:* Yes, shipping will be considered as part of the process.

A: *Alex Brigden:* The ships will be about the same length as the storage container and it is about the same in breadth as one of the rows of bubbles you can see in this picture. There will be one ship at a time.

C: *Judy Kirk:* I am going to ask that Byng goes through pages 5 and 6 and then we will pause and take questions.

C: *Byng Giraud:* So page 5 and 6, show some of the changes that result from consideration of the input from the February consultation. These are the six most significant changes; there are other less significant changes we've made as well. For example, number 1, we heard a lot of concern about air emissions and GHGs. As a result, we have made a decision to run this operation with electricity as opposed to gas drives that reduces the GHGs and other emissions produced. There are few, perhaps only one, other facility that has made this decision. It is in Norway.

The next change is the onshore liquefaction. For those of you who saw the last version of this document, you might remember that this part of the operation was on the water, so we were looking at a floating liquefaction facility. What we decided, based on three different factors that were raised during the consultation: one, people were concerned about underwater noise for marine mammals; two, people were concerned that if it was assembled in Asia and then we would lose those jobs and the third, was that if it was on water perhaps there would be less money paid in taxes. The third isn't an issue; the same tax would be paid whether it is on land or water. Nonetheless, our engineers look at this and the costs difference is not that significant, so all things being equal, if those are concerns, then we can put it on land.

As a result of those decisions, in particular the first one, we have made a decision about the cooling system. We are going to use sea water cooling as opposed to air cooling. There will be a water intake below 25 metres. The water doesn't actually interact with the facility; the water is in a pipe, in a loop system and then it is discharged. There is a treatment to keep barnacles or other growths out of the pipe; chlorine will be added to prevent that.

So onto page 6 – these were also raised, perhaps not as frequently as the first three concerns we just discussed. We are remediating the site; as part of our purchase agreement with Western Forest Products, they are required to get a Certificate of Compliance stating that they have remediated the site up to industrial standards.

Next item is jobs. We previously estimated 300 jobs per year for two years during construction and then about 100 jobs during operations. But we didn't have much information about what kind of jobs. This is still being refined but in this document, we have listed types of jobs. We anticipate that most of these jobs will be able to be filled regionally. As a result of moving the liquefaction plant on land, we are now estimating about 500 construction jobs per year during construction, then the 100 jobs during operations. Those 100 jobs do not include jobs, like HR and admin, which would be in an office likely in Squamish. In March we officially received approval from the Government of Canada for our export license for approximately 2.1 million tonnes of LNG from the site.

Q: *Rob Simons*: Looking at the image on page 4, I understand there might be a flare or off gassing. Where would this be?

A: *Alex Brigden:* You used the term off gassing?

C: *Rob Simons*: Yes, are there gases that might escape in the process?

A: *Alex Brigden:* In our process, there is no intention for fugitive emissions of gases from combustion. We have three sources of emissions: an incinerator where we take some of the elements that cannot be liquefied from the feed gases, the same gas that comes into your homes. We incinerate those, which creates emissions. We also have a boiler to create hot oil, which we need in the liquefaction process, and the third source is a flare which is used in an emergency process when we need to depressurize the plant, or during start up, or during maintenance. We put methane gas through the flare and ignite that, which creates emissions.

Q: *Rob Simons:* How frequently would we see that?

A: *Alex Brigden:* 97 per cent of the time there is continuous operation, so there would be no flare. Part of the remaining 3 per cent of the time we wouldn't be operating because some of the equipment has shut down but we don't need to flare; we can contain the gases and let the pressure rise slightly in the system. If the pressure rises too much, then we have to put gases through the flare for safety reasons. So part of the 3 per cent of the time there would be a flare; I can't give you an exact percentage of the time.

Q: *Rob Simons:* So that's still quite a bit, even 1 per cent of 2 million tonnes, is still quite a lot.

A: *Alex Brigden:* That is not 3 per cent of gas; it is 3 per cent of time.

C: *Rob Simons:* I see.

Q: *Gord Homer:* What about the gas that will be constantly boiling off in the storage? Will you be re-liquefying that or flaring?

A: *Alex Brigden:* That's a good question. The gas that will be boiling off during storage, and to be clear, the reason that gas is boiling off is because LNG is not stored under pressure, will be re-introduced into the plant and re-liquefying and goes back to the storage.

Q: *Gord Homer:* So it will be re-liquefied, not flared?

A: *Alex Brigden:* Yes, that is correct.

Q: *Janis Johnson*: Regarding the cooling by water, when water is re-introduced to the ocean, what does chorine do and what does the increased water temperature do?

A: *Alex Brigden:* The chorine is produced from sea water itself, and then we dose the water at the intake to prevent growth in pipes. Then we monitor the discharge to make sure it stays below 0.02 µg/l; that is a regulatory requirement. The difference in temperature between the intake and discharge can be as much as 10 degrees. By designing a diffuser, which is a long pipe with holes, we diffuse the warmer water over larger and that discharged sea water mixes with the sea water in the Sound and within 10 metres the temperature difference is less than 1 degree. So the overall volume of seawater that is affected by the difference is 125 cubic metres.

Q: *Judy Kirk:* Which is the size of what?

A: *Alex Brigden:* That is less than a fifth of the volume of an Olympic-sized swimming pool.

Q: *Unidentified:* What is your actual flow rate?

A: *Alex Brigden:* It is 17,000 cubic metres of water an hour.

Q: *Eoin Finn*: Can I ask about the 80 per cent reduction. What's in the 20 per cent in terms of volumes of emissions?

C: *Judy Kirk:* You are talking about air emissions now. We went from water to air.

A: *Alex Brigden:* The decision to use electricity instead of gas for the compressors means there is a large reduction in emissions. The tonnage of GHGs that would have been emitted if we had used gas turbines, would have been about 450,000 tonnes per year. So now, with the use of electricity, it is 80,000 tonnes per year, which is a significant reduction. We also have a significant reduction in the production of NO_x from 310 tonnes to 20 tonnes per year. There is also sulphur, SO_x, which is a residual amount of 17 tonnes per year.

Q: *Graham Parkinson:* Can I just ask a question about that? At your earlier consultation sessions, I had asked how many vehicle equivalents the 80 per cent equated to? I never got an answer so I figured out myself that it would equal about 27,000 vehicles; so the 20 per cent is about 5,000 vehicles. So it's still not necessarily a good thing to have this plant running all the time for the air shed.

C: *Judy Kirk:* I am going to ask Byng to go to page 11. In between there is a frequently asked questions list, which I hope you find helpful. But due to the nature of the questions on environmental mitigation measures we are asking in the feedback form, I am going to ask Byng to go through each of the these topics so you can ask questions.

C: *Byng Giraud:* Okay, so we have already started to talk about some of these topics. We have a number of consultation topics; these are based on what we heard a lot about last time. These are not exclusive; we would like to hear from you on any topics. Also these are some of the things the BC Environmental Assessment Office, although they have their own process, these are some of the things they are considering. The first topic is air quality and emissions. This plant does have emissions and we have proposed some mitigation measures, including the switch from gas to electricity. There are other things as listed here that you can do on-site so we are looking at those and welcome further comments.

C: *Judy Kirk:* Just before we go further, I am going to ask Jonathan from Hemmera, the environmental consultant, to explain the current conditions studies that are going on now for this project.

C: *Jonathan Turner:* In terms of existing conditions, we are collecting information about how things are now. For example, we have an air quality specialist collecting information. We are also looking at climate data. It is a very dynamic air shed in Howe Sound. So we are looking at how air moves around the Sound in different climate conditions. Once we have that information, we will do modelling to understand how emissions from the project would be dispersed. We are looking at the link to human health; how does this affect people.

Q: *Laurie Parkinson:* If I understand correctly the LNG carriers can connect to power on shore?

A: *Alex Brigden*: Yes. But the majority of the LNG ships are not equipped with that technology. We will provide that ability for any ships that are able to do that.

Q: *Laurie Parkinson:* What percentage of ships would have the ability to do that?

A: *Alex Brigden*: It is a small percentage but I don't know the exact number.

Q: *Laurie Parkinson:* That would be a good direction to go in because if the ships' engines didn't have to be running while they were there, the disturbance to marine mammals and herring would be minimized. The herring are very sound sensitive and they are the basis of the food chain for all the other marine mammals you are rightly concerned about. They did not spawn when the cruise ships were up here for six weeks during the Olympics and we don't want that to happen again. Without herring there isn't food and nothing else matters.

Q: *Ruth Simons*: My question is for Jonathan around the air shed. Our air shed is the Sea-to-Sky/Howe Sound up against the Metro Vancouver air shed. So how far are you measuring?

A: *Jonathan Turner*: It is a regional area and local area assessment; I can't remember the exact number specifically on what that area is. We will be doing modelling within those areas.

A: *Lara Taylor*: It is 40 km by 40 km and it extends into Metro Vancouver and into the Sunshine Coast. It is square because the model needs a square so we've overextending the boundaries.

A: *Jonathan Turner*: That area has been determined by our experts as an appropriate area but we will also be working with the regulators and discussing the study area with Ministry of Environment and other health and regulatory agents and coming to agreement on regional and local area.

Q: *Lance Iverson*: You guys are proud of the fact you are using electricity and you have reduced GHG emissions but you are enabling the burning of all this gas and that is going to out millions of tonnes of GHG emissions into the environment. Even if you don't put it into the environment in Squamish, you put it in in China; it's all one atmosphere. Don't you guys get global warming? Do you care about greenhouse gas emissions or not?

A: *A.G. Gelotti:* Yes, we do.

C: *Lance Iverson:* Let's not build the plant then.

Q: *Craig McConnell*: Regarding your baseline studies on emissions, what have you found to be the major contributors?

A: *Jonathan Tuner*: Those studies are ongoing; I don't have that information for you today. Those will be considered under the cumulative effects studies. We will be looking at those projects and sources that exist today and contemplated future projects. One of those will be the Waste-to-

Energy Project being considered. So that will be shown within our cumulative effects study for the Application for Environmental Assessment Certificate.

Q: *Eoin Finn:* Howe Sound has recovered its marine life over the last five years – herring, dolphins, salmon – we finally have a salmon fishery here again. Will the baseline that used to estimate the effects of the project on the marine life be the original condition before it was degraded by industry, the current condition of Howe Sound, or some other measure? And over what period will the baseline be measured?

A: *Jonathan Turner*: That is a great question. The baseline for the purpose of the environmental assessment is defined as existing conditions. Studies have been ongoing since spring 2013. Information is being collected through specific on-site investigations and we are also looking at literature, other studies in the area, to develop a background existing condition section. We take that and we do a comparison to how the project will impact that current condition. That's how we determine what our impact will be. Information collection will be ongoing through construction and a period of operation that will be determined with the regulators and will be conditions of the environmental assessment certificate.

Q: *Eoin Finn:* I don't think you answered the question. What timeframe will you study what the population of herring, orca, salmon are?

C: *Judy Kirk*: I heard that it was from 2013 until when the study was completed, which is still to be determined as part of the environmental assessment process. Is that correct?

A: *Jonathan Turner*: Yes, we started in 2013 and construction is supposed to start in mid-2015. We will collect information during this period. During construction we will be monitoring for the two year period and then there will be ongoing monitoring as part of the permitting and authorization. In other projects, this is often up to 10 years in length. So information collection for this project will be ongoing from 2013, up to about 2027, if my math is correct.

Q: *Eoin Finn:* So my point is, the application to approve this project will precede knowing what the full effect will be?

A: *Jonathan Turner*: Yes, as professionals that is our job to predict and make recommendations.

C: *Judy Kirk*: I would say that if you think the predictive modelling is not adequate, you should provide that comment to the regulators, BCEAO and the CEAA. It is their jurisdiction. I am going to ask Byng to go through pages 12 and 13 now. We can come back if there are more questions on this section later.

C: *Byng Giraud:* One of the topics that we've heard a lot about is above and below water noise. We will be looking at ways to mitigate noise. With regard to marine noise, moving the liquefaction plan on land is a big one. But there are also things you can do during construction to mitigate noise. The concern about herring was mentioned; you could perhaps adjust the construction schedule to avoid herring spawning period. There are other methods we can use to minimize sound during construction.

Light is another issue we heard about. It is an issue that we see at all ports. The baseline right now is fairly minimal; there are some industrial operations there now. We have looked at it from the perspective of Britannia and the gondola and measures we can take to mitigate light. A ship shows

up every 10 days so that means light can be adjusted during operations. There are things we can do.

Q: *Graham Parkinson*: I have two comments one about light and one about marine noise. I have been involved in the Dark Skies initiative. It's a great place for kids to experience the stars, the northern lights, and other aspects of the night sky. I have written to BC Ferries and they have never responded. I spoke the Ministry of Transportation during construction of the Sea-to-Sky and they promised there wouldn't be more lights and that wasn't true. Do you have a light budget that you can share?

A: *Byng Giraud:* I don't know the answer to that…

Q: *Graham Parkinson*: The primary question I have is about marine noise, are there are submerged pumps in the storage facilities?

A: *Alex Brigden:* That is correct. In each of these LNG storage units is a submerged electric pump.

Q: *Graham Parkinson*: So those things will be running all the time. If you have 40 tankers a year coming in, you will be loading most of the time. When one comes, another will take its place.

A: *Alex Brigden:* That is not correct. A tanker will be arriving about every 10 days and it takes less than 24 hours to load.

Q: *Graham Parkinson*: So about 40 days a year. What would the magnitude of that noise be? How many horsepower is that?

A: *Alex Brigden:* There is a total of 2 megawatts of pumping power and at any one time there would be pumping for four or five of the tanks. These pumps are fully submerged in a tank full LNG so that dampens the noise. They are fully electric-driven pumps with high tolerance bearings. So we don't expect significant vibrations. The tanks themselves are insulated for temperature which helps with noise. The only contact between those and the ship is an equator ring that touches down in one place on the ship. My experience as an engineer is that when you have so many levels of dampening the noise and vibration will be very low.

Q: *Graham Parkinson*: Thanks, Alex. That was very good. Will there be analysis of residual noise?

A: *Jonathan Turner*: Yes that will be part of the EA Application.

Q: *Graham Parkinson*: What is the kill rate for larvae and other things that get sucked into the cooling system?

A: *Jonathan Turner*: That will be looked as part of permits through Fisheries and Oceans Canada.

Q: *Judy Kirk:* Would that be in the EA?

A: *Jonathan Turner*: The EA process is designed to look at feasibility of the project. Once the project is determined to be feasible there is a lot more design that needs to be done. Once feasibility has been determined the permitting process determines how the project will be implemented.

Q: *Judy Kirk:* Are there regulatory requirements for this?

A: *Jonathan Turner*: Yes, as part of the fisheries permit.

C: *A.G. Gelotti*: The cooling intake is designed so it won't act like a vacuum. It will be the minimum flow rate as it won't be sucking and there are screen meshes.

Q: *Ruth Simons*: With the setting of the geography of the plant with the mountains and water, are you taking into consideration the echoing? Are there other examples of plants like this in similar geographical settings?

A: *Jonathan Turner*: The listening stations are set-up at different locations to collect baseline information, so the ambient noise under different climate conditions. So again, what we are trying to do is look at what the current conditions are and then apply modelling to try and understand how noise attenuates across the Sound. So the model does consider the geography of Howe Sound.

Q: *Ruth Simons*: I have just one other question about noise. I don't see any mitigation measures suggested for shipping noise. I am curious to know how much noise these LNG carriers will make and whether that will be at night?

C: *Judy Kirk*: So what about shipping noise, is that considered as part of the assessment?

A: *Jonathan Turner*: Yes, shipping noise is considered.

C: *Judy Kirk*: And AG, maybe you can address Ruth's other questions: what kind of noise and will it be during the night time or day time?

A: *A.G. Gelotti:* These ships are dual fuel diesel, electric propulsion systems and like the pumps that are submerged in the storage tanks, these ships have highly sophisticated bearing systems so there will be minimal noise due to vibration unlike some of the older ships that come into Squamish now. The ships will come in at a slow speed, 8-10 knots.

Q: *Ruth SImons*: It would be a little more relevant if you could compare it to a BC Ferries in terms of noise and vibration. These ships are being compared to twice the size of a BC Ferry and we're familiar with the noise and vibration of a ferry.

A: *Alex Brigden:* I'm sorry, I don't know the range of different propulsion mechanisms on different BC Ferries.

Q: *Judy Kirk:* But you are meeting with them I understand.

A: *Alex Brigden*: Yes, we are meeting with them.

Q: *Gord Homer*: Is there any mercury in this gas when it arrives on the site?

A: *Alex Brigden*: Yes, there is mercury that will be removed in a system of activated carbon beds. These are contained within cartridges that approximately every 5 years will be removed from the equipment, put in an approved storage container and returned to the vendor of the equipment for certified disposal.

Q: *Mike Firth*: Using a barge to load LNG is somewhat unique, you do have a physical footprint at Woodfibre, so why have you chosen to use a barge rather than a land based facility?

A: *Alex Brigden*: To have an onshore storage, of the size we require, in seismic zone, is quite a challenging construction method. Adopting a floating storage unit, increases safety and decreases risk. Another factor is that it means it can be easily removed at end of the project when the site has to be returned to the original condition.

Q: *Tom Davis:* Just looking at the consultation topics you have listed, security and safety is absent. We live in a terrorist world. What is the potential disaster damage of this blowing up and taking out the Howe Sound? Unforeseen accidents – a helicopter or small plane hitting these storage containers.

C: *Judy Kirk*: So you're asking about security, accidents and malfunctions.

A: *A.G. Gelotti:* First of all, there has never been an incident that we can point to and see what the ultimate outcome was. I would point you to the Sandia website. They are an independent laboratory in the U.S. The U.S. government has asked them to do a test and try to look at what the

catastrophic outcome could be. They have done studies from 2004 to 2011 and they have a very good report showing what their assumptions were, both on the extreme and conservative side. They look at the worst case that could happen and what is more likely to happen. They also have some good videos on the website. You can watch them do some of their tests in the desert in the south west.

C: *Judy Kirk:* Jonathan, what about the analysis of accidents and malfunctions?

A: *Jonathan Turner:* The topics in the Discussion Guide don't represent all the topics that will be considered in the EA process. There is a document on the BCEAO website, Valued Component Selection, which describes the scope of what will be studied. Safety and security is very much considered as part of the analysis.

Q: *Graham Parkinson*: Can I just clarify the question that was never answered. What is going to be done about safety and security? I am familiar with what is happening in the States around Homeland Security. Is that's what's in our future?

A: *A.G. Gelotti*: I will start with the shipping side. We will be using the newest ships and the best technology. The ships follow international standards. These standards have been set by Lloyds Register. I would encourage you to look on their website. They have written the rules for the international gas transportation and they have worked with the Society of International Gas Tanker and Terminal Operators (SIGTTO). You can also look at them online.

C: *Unknown:* Actually you can't; you have to pay them $50.

C: *Laurie Parkinson*: And if you call them in England, they can't help you because you have to be a member.

C: *A.G. Gelotti*: Okay, I will see if I can I get a copy for you.

C: *Unknown:* It would be helpful if you could post those on your website.

C: *Judy Kirk*: Thank you for mentioning that. We will mark that as a follow-up item.

C: *A.G. Gelotti*: This is a very important subject on the safety; so I really want you to hear the kind of things we will do. In addition to using the best technology and the experience, we will also use lessons learnt. We can look at any incidents at gas processing facilities around the world, or LNG facilities, but there have been very few of those. When you look at the causes of those incidents we will put in systems – emergency response, firefighting – everything that is needed to mitigate incidents. We have had discussions with BC Pilots and there will be a pilot on every ship, who will board ship in Victoria, and go up and down the Sound with the ship. The tugs will come from English Bay. Three tugs will escort the ship. This is not a requirement by Transport Canada. One of those will be tethered to the stern and it will have enough power to stop the ship. The other tugs will be escorting as well. They will have firefighting capable and emergency response. The pilots and the tug captains will go through a training course and stimulation.

The site will have its own safety requirements; it will have a perimeter fence, a deluge system throughout the plant if there is an emergency.

C: *Alex Brigden:* I would just add very quickly, because I think AG is right, this is very important: if you look at layout of the site, the right hand site of Mill Creek is where we undertake hydrocarbon processing. This is where hydrocarbons will enter the site, will be liquefied, where other hydrocarbon activities will take place. As you can see this part of the site is separated from the south side of the site, and on the south side we have emergency systems, such as power

generation and fire pumps. We also have our control room on south side of the creek and that's where people will mainly be. The north side of the creek where the operations are is not permanently manned. Operators only go there when they have a job to do. We restrict number of people in the plant. Other passive measures: the plant is designed with separation between the equipment. If there is an incident, like an explosion, in one part of the equipment, it does not travel on and escalate the event. We also have other passive elements, like fire protection on steel columns, which prevents the steel from becoming soft that protects the integrity of the structural steel and prevents collapse. We also have a flare tower, in the event of an emergency the plant is depressurized and gas taken to flare. These are massive safety measures.

Active systems include: gas and fire detectors, vibration monitoring, and a number of other systems that can send alarms to the central control room on the south side of creek. We also have automatic shut down if action is not taken by the operators in time. There are sprinklers, or high pressure water deluge, which are very effective in putting out fires. Around the plant we also have fire and foam monitors. This is a large number of passive and active measures that prevent and mitigate incidents.

Q: *Tom Davis:* Just to keep this simple, can you address the relative power range between one of these fully loaded storage areas and a hydrogen bomb? Just from my simplistic view of this. Stored capacity from one to the other.
A: *Alex Brigden:* I am not familiar with hydrogen bombs.
C: *Judy Kirk:* That's good.
Q: *Tom Davis:* Let's assume the worst case scenario, what is the plan to evacuate the residents?
A: *Alex Brigden:* I think it's an assumption we would have to evacuate. We are working through the emergency response procedures. We meet with fire department in Squamish where we discussed how we would interact in terms of an emergency at the plant. So any considerations will be regulated by OGC, BC Safety Authority and WorkSafe BC and in conjunction with our submitted emergency response system, which are being discussed with the emergency response teams. I don't have the full answer for you today but it is certainly part of our EA submission.

Q: *Lorna Murphy:* In your opening statement, you mentioned that you would be using the latest technology LNG ships and from what I understand you will not own the ships, they will be leased from the customer who decides to come to Woodfibre and purchase LNG.
C: *Judy Kirk*: Let's find out if that's correct because I heard something different earlier today.
A: *A.G. Gelotti:* Our plan is to charter the ships that we need to move the product to the customer and not sell directly to the customer at the terminal.
Q: *Lorna Murphy:* So when LNG is transferred from the storage container onto the vessel, you would be responsible from an insurance and indemnity perspective of that product through our waters?
A: *A.G. Gelotti:* Yes, that is correct.

Q: *Ruth Simons:* I agree that safety is a glaring omission. I am glad we are having the discussion. I appreciate Mr. Gelotti coming from Houston to tell us about the mitigation and safety measures that are going to be in place. But you have also mentioned the environment assessment process and when we look at the five pillars of the environmental assessment process – environment,

social, economy, heritage and heath – I know that safety probably fits under each of those. But when I look at Valued Components Document, I don't see where loss of life is covered? Which is the Minister responsible for our safety? Because my understanding is that it is going to be a decision of the environment Ministers federally and provincially.

C: *Judy Kirk:* There is going to be an opportunity at Wednesday's open house to speak directly to people from the BCEAO. I would encourage you Ruth, and others, to come and talk to them directly. But it is my understanding that it is not just the Minister of Environment that make the decision; it is also another minister, not connected to environment. The safety and disaster is included in the assessment.

A: *Jonathan Turner*: In terms of what could go wrong, there is a section in the assessment called Accidents and Malfunctions. We try to anticipate what could go wrong and that is things like bridge collapses or things like ship collisions. As part of the assessment we would reach out to our pillars, so in terms of the social pillar that would look at the response that would be required. We would also look under human health as an area of assessment.

C: *Judy Kirk:* I am going to again encourage you to speak directly to the BCEAO.

A: *Alex Brigden:* We are discussing the EA process here but our facility also has to be permitted by the Oil and Gas Commission. As part of that permit we have to follow the standard CSAZ276, which is available to review. Under the OGC is the BC Safety Authority and there are a number of other attached authorities, such as Transport Canada and WorkSafe BC. We have to demonstrate to them on a technical level our compliance with the codes and standards and we have to satisfy them before we receive a facilities permit that would allow us to start construction and there are a number of other permits that we need before we can start operation. The decision to go forward is not just an EAO decision; it is also a decision of the regulatory authorities responsible for oil and gas in B.C. and responsible to the federal government.

Q: *Kati Palethorpe*: A quick note about the EA process first. We have created a handout that breaks down the process. We can hand that out later. My question is going back to the water and the cooling system. You will be taking out and putting back 17,000 litres an hour/24 hours per day, and that water that gets put back can be up to 10 degrees warmer. Can't you cool water back down to the same temperature? The other question is, while you use natural elements to produce chorine it is still in a concentrated form. Could that be taken out before it goes back into the ocean?

A: *Alex Brigden:* This is a very good question. Indeed, we have the technology providers looking at ways that the water temperature difference could be adjusted. One of those considerations is that when we receive gas from the Fortis pipeline, we have to let down the pressure before it comes into the plant. That process cools the gas and can produce hydrates which are ice formation in the pipe. We have to heat the gas when we let down the pressure. So we are looking at whether we could use the warmed seawater to heat the inlet of the gas and minimize the temperature difference of the outtake water. We are also studying what systems we can use and if there is something we can do further to reduce the discharge of chlorine. But we don't have those solutions to share yet.

Q: *Rob Simons*: I see two storage facilities. Why are there two? And I heard a disturbing thing last week that the pipe is being expanded in diameter to 24". So my question is: is this plant being planned for future expansion?

A: *A.G. Gelotti:* The export license is for 2.1 million tonnes and the reason for the second storage unit is that when we are looking at logistics of how much LNG is being produced each day, the amount of storage we have, when the ship comes and how much depletes the storage and the arrival of the next ship – you want to get the best balance you can in terms of a ship coming to load and then storage in the tanks to continue to produce. It works out that to operate at 2.1 million tonnes, what we are licensed for, having 250,000 cubic metres of liquid storage gives us the best logistics.

Q: *Judy Kirk:* Do you have plans to expand?

A: *A.G. Gelotti:* No plans for expansion beyond that. We've gone to Fortis asked "what is the maximum amount of natural gas they can deliver to the site" that then determines the size of plant we can build. There is nothing specific in the design for plans to expand.

A: *David Bennett:* The move from 20" to 24" diameter means about a 4 per cent increase in delivery capacity. A lot of people think that increase would mean a lot more capacity, like 45 per cent, but it is the pipe upstream is the limiting factor.

Q: *Eoin Finn*: There are no export LNG plants in the country, how many LNG plants does this company own or operate?

A: *Alex Brigden*: The simple answer is that this company has not built or operated an export LNG plant. That is both the Canadian and the parent company. However, we are a shareholder in an LNG import terminal in China.

Q: *Eoin Finn:* There are two companies called Woodfibre. The one that got the export license is the Singapore-based company. What size of insurance policy is which of those companies holding and how big is it?

A: *A.G. Gelotti:* This facility, both the Woodfibre LNG plant onshore, will carry the appropriate insurance to cover possible events, and the export company that you are referring to, who will have the export ships, they will have P & I (Protection and Indemnity) insurance, which is required, they will have Charters Liability insurance. There are standing insurance requirements and we will have those. We don't know the amounts yet.

C: *Byng Giraud:* Going to pages 15, 16 and 17. We recognize there are potential environmental impacts. We are proposing some mitigation features here and we welcome your comments on these or others that you have. So in terms of underwater noise, we have moved the facility onshore and there are others listed here, such as adjusting construction schedules and having an environmental management plan and other monitoring plans. Visual quality is another concern that has been raised. We've had some of the tourist operators out to site; we've looked at it from the gondola and other perspectives. We can do quite a bit to address this. Greening of site, buildings will be painted, landfills will be removed and there are other things we can do. On marine transport, this has some information about the safety that we were discussing earlier. Regulatory processes that we are entering to mitigate the impact of those 40 vessels a year travelling through the Sound.

C: *Judy* Kirk: AG, you mentioned a lot of these things earlier – tugs, pilots.

C: *A.G. Gelotti*: Yes, I also talked about Lloyds Register earlier. We have them doing a risk assessment for us of shipping from open ocean to terminal and back. We also met with Transport Canada and they have a process called TERMPOL. It's a voluntary system that we've elected to do from the open ocean to the terminal.

Q: *Graham Parkinson:* I appreciate the comments about the TERMPOL process. There isn't much resolved about those processes in Canada. One of the questions we asked early was what security measures would be implemented? It says on page 17: "the escort vessels will also manage the area around the carrier to prevent conflicts with ferries and pleasure craft". As I resident I am concerned about what the effects are going to be. I am concerned about travelling to our cabin. I am concerned about the wake caused by a tanker going 8 knots. The Star of Japan came through Howe Sound a month ago and it created a 2 metre wake.

Q: *Judy Kirk:* And were they going 8 knots?

A: *Graham* Parkinson: I don't know. They were going way too fast. You are asking about community consultation, we need to identify what is going to be required in terms of exclusion zones, vessel management and how you are going to compensate communities for the impact. You are planning on making money from using a public resource, you are going to be impacting us.

C: *Judy Kirk:* So what I have heard previously is that there is not an exclusion zone.

A: *A.G. Gelotti*: That's correct. There is not requirement for an exclusion zone in Canada. That doesn't mean that Transport Canada won't decide to put one in place. We are not opposed to an exclusion zone.

Q: *Graham Parkinson*: I am asking about vessel wake management. There should be a restriction on wake size.

A: *A.G. Gelotti:* The ship needs to go a minimum speed for the rudder to work. We are doing a bow wave and wake study to determine what size of bow wave and wake would be created by a ship of that size doing 8-10 knots in the Sound.

Q: *Ruth Simons:* My question is about transparency of this process. I appreciate that there has to be permits issued in order to operate. But is it possible that we are going to suffer through this entire process, right up to the EA saying you have met all the requirements and here are the conditions and then find out whether permits will be issued? Or will there be some information about permits available over the next year? And will that information from Lloyds and the safety regulators be transparent? Will the public be able to access it?

A: *A.G. Gelotti:* The study that Lloyds is doing and the TERMPOL process will be part of the EA application and therefore public.

C: *Judy* Kirk: Jon, I believe the permits are all listed in the EA application and if you go on the safety regulatory websites there are transparency requirements.

C: *Jonathan Turner*: Yes, the permits are listed in the application.

C: *Byng Giraud*: The permitting process happens after the EA. The EA is can it be done and the permitting is how it can be done.

C; *Ruth Simons:* My question is really about knowing if this project meets the requirements of the permits. Is there any reason why an agency refuses to issue a permit?

C: *Judy Kirk*: Generally the reasons would be posted. There are serious transparency requirements around these processes.

C: *Jonathan Turner:* The EA is a test of feasibility. One of those is whether this project can be permitted under each of those individual permits? Is there any information to do that?

Q: *Bruce Bessie:* My work is with Tourism Squamish – the goal is expanded tourism and expanded waterfront and we would be interested to know how you will marry LNG tankers and expanded tourism and your visual impact in the corridor?

A: *Byng Giraud*: Tourism Squamish has asked us to be members; so at their request we will join. We have met with them and will continue to. We don't believe that tourism and industry can't work together. Can we avoid impacts, visual and other, so that tourist operators are not impacted. We have been having discussions with the gondola, which probably has the biggest potential visual impact, and the Britannia Mining Museum. Lots of concerns and questions of course but I don't think we're seeing a situation where people feel that tourism and industry can't coexist.

Q: *Lorna Murphy:* I have a basic question. We have spent years trying to regenerate the Sound. Why have we chosen this site when there is an LNG site at Tilbury? One of the problems with this process is that it is very fragmented. We have FortisBC who will be providing you with the raw material, how they get that product is a whole other ball of environmental issues that people are very concerned about: fracking for one. There is a facility at Tilbury, so rather than twin a pipeline that is going through mountains and will require blasting next to an existing pipeline - I don't know how you cover off the safety of that – why don't you just go to Tilbury?

Q: *Judy Kirk:* So, could a plant like this be accommodated at Tilbury?

A: *David Bennett:* Tilbury is on the river so the size of ships is limited. We are expanding it so we can load smaller vessels.

C: *Judy Kirk*: So it's a question of why this site?

C: *Lorna Murphy*: No, I've read the material and I understand why they chose this site but I just wanted to know why not Tilbury.

C: *David Bennett:* On the safety side, we operate pipelines across the province and we are regulated by the same people – the BCEAO and the Oil and Gas Industry. Any blasting will be done very carefully; people on Vancouver Island rely on that pipeline.

Q: *Laurie Parkinson:* I have been told that there is normally nitrogen gas in the storage facility to avoid getting air in there and the risk of explosion. But you aren't going to be having nitrogen in your storage containers?

A: *Alex Brigden*: During normal operation there is not a requirement to have a nitrogen blanketing system as the gas that is boiling off, there is no oxygen available in the tanks. During maintenance, we have to replace the LNG with an inert gas and that could be nitrogen.

Q: *Laurie Parkinson:* Is it not quite normal in the industry to have nitrogen in the storage containers? That's what I've been told; can you answer yes or no? Just trying to save time.

C: *Judy Kirk*: It's a technical question so let's hear the full explanation.

A: *Alex Brigden*: This use of nitrogen, in the insulation that is around the tanks, we purge the insulation with nitrogen and we sample that nitrogen to ensure that there is no hydrocarbon leakage into that nitrogen. We are not introducing nitrogen into the tanks during normal operation. During maintenance when we have to go through a phase where we have to take out

the hydrocarbon gases, we put inert gas into the tank before we introduce air to ensure there is no flammable hydrocarbon and oxygen mix.

Q: *Unidentified:* What happens during loading?

A: *Alex Brigden*: During loading, the tanks come in and its tanks are full of methane gas so during loading that gas is displaced and reintroduced into the plant and re-liquefied; it is not flared.

Q: *Ruth Simons:* You mentioned the tourism industry and that you are conscious of the possible impacts of the project on that. What about real estate? There is a community being proposed for Britannia Beach; it has been proposed for some time. In the Valued Component Selection Document there is a specific exclusion around the need to look at the impact on real estate as there are no private or crown lands near the facility. The facility is only 5.5km from Britannia Beach, the tankers will travel close to the community, Britannia Beach looks right at the site. There are a thousand units planned in the OCP. It is the most impacted community and nowhere in the documents does it recognize Britannia. What are you doing about determining the impact to the real estate market?

A: *Byng Giraud*: There are two parts to that and Jon will help me with the second part about the socio-economic study. As part of our outreach we are meeting with real estate agents and organizations to get a sense of what they think the impacts might be as they are the experts in that area. I meet with 25 real estate agents on Monday.

Q: *Ruth Simons*: Was that Howe Sound real estate agents of Squamish?

A: *Byng Giraud*: That was one example; I have meet with over 35 groups.

C: *Jonathan Turner*: We are looking at housing supply as part of the socio-economic assessment, as related to jobs and pressure on the community – potential demand. You mentioned the Britannia project that is one of the projects we are looking at in terms of cumulative effects.

C: *Judy Kirk:* But as for Ruth's question on property values, is there anything that the EAO requires with regard to property values?

A: *Jonathan Turner:* I don't have a clear answer for that. It is looked at in terms of socio-economic study. That part of the document you are referring to

C: *Ruth Simons*: But it is not in the Valued Component Selection Document that the public is being asked to comment on.

C: *Judy Kirk*: Fair enough and that should be part of your comments to the BCEAO.

A: *Jonathan Turner:* That part of the document you are referring to where it is excluded is referring to properties needed to be purchased by the Project and that doesn't apply in this case – no purchases other than the site.

C: *Byng Giraud:* Thank you for coming tonight and providing your thoughts and feedback. We do take it very seriously. There are a lot of things we still need to work through and address but I think we've shown with the changes from February to now that we are willing to listen and to make changes to the Project plans.

Closing Remarks

Judy Kirk closed the meeting and reminded participants of the ways to give feedback.

The meeting record notes that the Small Group Meeting ended at 8:00 p.m.