Woodfibre LNG Project
Technical Working Group comments and responses on the Application for an Amendment to Environmental Assessment Certificate #E15-02
January – February 2017

The following table includes Woodfibre LNG Limited's (WLNG Ltd.) responses to Working Group comments submitted on the Woodfibre LNG Project Technical Working Group comments and responses on the Application for an Amendment to Environmental Assessment Certificate #E15-02. The Environmental Assessment Office (EAO) has reviewed the responses and is satisfied that WLNG Ltd. has addressed the Working Group's comments. In drafting EAO's referral materials to be submitted to the Executive Director for decision, EAO considered all of the Working Group comments and WLNG Ltd.'s responses.

ID #	Date	Source of Comment	Category/Theme of Comment	Page # and Section of the Amendment	Comment/ Issue Description	Proponent Response
T001	February 2, 2017	Cindy Watson, Vancouver Coastal Health	Ambient Noise Monitoring		Will noise monitoring during operations include all the receptor stations identified in the noise modelling report?	Noise monitoring to validate the model results is expected to take place at the three receptors located on the eastern shore of Howe Sound (SR1, SR2, SR3). Due to lack of receptors and access constraints, we would not anticipate undertaking noise monitoring at the four Oil and Gas Commission (OGC) noise guidelines compliance points (SR4, SR5, SR6, SR7) unless there is reason to believe that the guidelines were exceeded. Instead, we would expect to verify noise levels at the edge of the Project area.
T002	February 21, 2017	Claire Daniels, SLRD			In terms of comments on the Woodfibre LNG Project Amendment Application, the SLRD's interests are unaffected by the proposed amendments. More specifically, the air cooling system is seen as an improvement to the overall Woodfibre LNG Project and EA application.	Acknowledged. Thank you for your comment.
T003	February 21, 2017	Amy Van Reeuwyk, BC Climate Action Secretariat (CAS)	Adaptation/Climate Change	Sec 2.1	Can the air cooling capacity be increased at a later date, for instance by adding fans, if the ambient climate is warmer than anticipated? What would be the impacts of air cooling on hot days, for example when daily maximum temperature is above 25 degrees C or minimum temperatures are above 20 degrees C?	Yes, cooling capacity can be increased in the future if higher than designed annual ambient temperatures are experienced. While the system will be designed for an ambient air temperature of 12 degrees (i.e., the number and size of fans will be based on that temperature), the facility can operate safely at higher air temperatures – plant efficiency is simply reduced.
T004	February 22, 2017	Hardy Friedrich, BC Oil and Gas Commission	Air Cooling	Appendix D	Appendix D listed the noise model inputs. This list included multiple changes (equipment type, equipment number, and sound power levels) from the noise model inputs described in section 5.4.4.4.1 from the EA application. Some examples of changes that were not explained are as follows: - Removal of sour gas thermal oxidizer - Removal of mobile equipment (e.g. crane, truck, forklift) - Increasing the number of operating lean solvent pumps (this change is typical of most of the pumps) - Modifying the sound power levels for the BOG compressor (listed as tank return gas compressor in original application)	The noise modelling for the Amendment Application represents an updated design, which has been further developed and optimized from the Application. Detailed information will be provided to the OGC as part of the LNG Facility Permit application. The rationale for some specific changes are as follows: • Miscellaneous items such as cranes, pickup trucks, and forklifts were removed from the Amendment because during normal operations of the facility their use, and hence contribution to operating facility noise level, will be minimal. • Number of equipment (#pieces for each equipment): The Amendment Application lists all of the installed equipment rather than the quantity of operating equipment that was listed in the original.

					The list above is not complete; please provide the rationale for the changes to the noise model inputs. The BC Oil and Gas Commission (BCOGC) notes Woodfibre LNG's commitment to monitor noise during operation and in accordance with section 15 of the LNG Facility Regulation will require that any noise emissions are not excessive.	• The noise levels associated with some equipment changed where improved supplier information was available. For example, most pumps decreased from 93-96 dBA in Application to 85 dBA in the Amendment Application. • Air coolers added as noted for the change in cooling technology from seawater to air coolers. • As noted, the boil-off gas compressor replaces the low-pressure tank return gas compressor. The mixed refrigerant and regeneration gas compressors were not included in the Application but have been included in the Amendment Application. • The quantity of flares has been updated to the current design. Note that the flares will remain within a single flare stack as described in the Certified Project Description, and emissions will remain less than or equivalent to those assessed in the Application. • The hot oil fired heater was removed due to a change in heating medium from oil to hot water. Three components were inadvertently left off the list of equipment when updating for the Amendment Application: the sour gas thermal oxidizer, the hot water heater, and transformers. These components were added to the noise model and updated noise modelling was provided to the EAO. The addition of these components does not change the results of the modelling.
T005	February 22, 2017	Hardy Friedrich, BC Oil and Gas Commission	Short-Term Water Use	Section 2	The BCOGC is responsible for issuing Section 10 short-term water use approvals for oil and gas activities under the Water Sustainability Act. The proponent must apply to the BCOGC for the necessary approval.	Thank you for the information. The Ministry of Forests, Lands and Natural Resource Operations (FLNRO), OGC, and Woodfibre LNG have arranged a meeting for March 16, 2017 to discuss water licensing.
T006	February 22, 2017	Chris Wyckham, District of Squamish	Environment	6.5	We ask for further detailed assessment of the expected impact of cooling fans on the Little Brown Myotis (Myotis lucifugus), a bat species which is listed as "species at risk" and which is deemed to be present on the site. Of note are noise impact and physical impact with moving blades of the fans.	Noise-related effects to wildlife, including at-risk bats, was considered in Section 5.13 of the Application for an Environmental Assessment Certificate (Application). As noted in the Amendment Application, because the sound levels in the Project area will remain within the range assessed in the Application, there will be no additional effects to at-risk bat populations with the change to air cooling. The cooling fans are shrouded and oriented horizontally, which will help to protect bats from the fans. As noted in Section 8.0 of the Amendment Application, Woodfibre LNG will include monitoring of impacts to wildlife (including at-risk bats) in the wildlife monitoring and management plan for the operation phase.
T007	February	Chris Wyckham, District of	Visual	6.9	Request a full 3D mockup from different angles and day/night including new cooling system and all other cumulative project elements, including	As described in Section 6.9 of the Amendment Application, the air cooling system will be mounted on top of the LNG facility (train) on a

	22, 2017	Squamish			BC Hydro power lines and Fortis ROW.	pipe support structure. The structure will extend approximately three metres above the height of the structure in the artists rending of the Woodfibre LNG Project (June 2014), and will not have a notable visual effect. In addition, the heat exchangers (two towers) in the artist's rendering will remain the tallest part of the LNG processing facility. We also note that the artist's rendering available includes both BC Hydro and FortisBC right-of-ways. For clarity, neither the FortisBC pipeline within the Project area nor the BC Hydro interconnection infrastructure are considered Project components as they are not within the scope of the Project as defined in the section 11 order. Potential effects from FortisBC pipeline and BC Hydro substation projects are acknowledged and considered in the Cumulative Effects Section 7.5.4 of the original Application, based on the information available at the time of the assessment. Woodfibre LNG Limited continues to work with BC Hydro to determine the most appropriate transmission interconnection option.
T008	February 22, 2017	Chris Wyckham, District of Squamish	Engagement	3.2	This section holds a list of invitees. Who attended?	Representatives from the following groups attended the stakeholder meeting: • Coastal Inlet Adventures • Federation of Mountain Clubs of BC • Black Mount Logging • FortisBC Energy Inc. • Streamkeepers • Sea to Sky Gondola • Alpine Club of Canada, Van. Section • Squamish River Watershed Society • Squamish Windsports Society • Squamish Yacht Club A summary of the questions asked at the stakeholder meeting is included in Section 3.0 of the Amendment Application.
T009	February 22, 2017	Chris Wyckham, District of Squamish	Sound	6.1	Request analysis of the cumulative effects of sound based on all projects in the area, including upstream run of river projects, not just this one application.	The noise modelling undertaken as part of the Amendment Application includes baseline noise levels determined in accordance with Oil and Gas Commission guidelines and Health Canada guidance. The sound will be less noisy than a normal conversation within 1.5 km of the Woodfibre LNG Project (50 dBA). The noise modelling conducted in support of the Amendment Application shows that there will be noise levels generated by the facility reduces to background levels at about 1.5 km from the facility.

T010	February 22, 2017	Chris Wyckham, District of Squamish	Sound	6.1	Request a condition of approval that the modeled sound contours are met during actual operations. It isn't good enough to guess what the sound might be based on modeling. The province needs to be able to enforce maintenance of sound levels at or below those proposed.	Facility-related noise levels during Project operation are an important component of the LNG Facility Permit issued by the OGC, and we believe that noise levels are more appropriately addressed through that process than the Environmental Assessment Office (EAO) process. Section 15 of the LNG Facility Regulation will require that any noise emissions are not excessive. The OGC guidelines establish permissible sound levels of 50 dBA during the day 1.5 km from the Woodfibre LNG Project, which is approximately equivalent to an office environment (less noisy than a normal conversation).
T011	February 22, 2017	Chris Wyckham, District of Squamish	Sound	6.1 p24	Mentions 3 tugs during berthing. We believe there may be 2-4 escort tugs when traversing the sound. Are these modeled?	The modelling undertaken in support of the Amendment Application includes the following assumptions that result in conservative estimates of sound levels: • all noise-generating components of the Project operate continuously; • the wind is blowing towards the receptors at 5 m/s; • three tug boats assist with berthing; • both main and auxiliary LNG carrier engines are operating; and • there is no ground absorption. The use of three tug-boats is consistent with the Application.
T012	February 22, 2017	Chris Wyckham, District of Squamish	Sound	6.1	What is the effect of wind on the sound contours?	The noise model assumes the wind is blowing towards the sound receptors at 5 m/s. This increases the noise levels at each of the receptors.
T013	February 22, 2017	Chris Wyckham, District of Squamish	Sound	6.1	What is the noise spectrum? Will unnatural, high frequency noises be heard, even if at a relatively low level?	Sound power levels and their respective spectrums (which includes the sound power level at frequencies from 31.5 Hz to 8000 Hz) for each noise generating source were included in the model. No discernible increase in noise levels, including high frequency noise, were predicted at receptors.
T014	February 22, 2017	Chris Wyckham, District of Squamish	GHG impact		We request a detailed analysis to changes in power consumption due to the cooling change (and thus GHG, and also economic sustainability impacts)	Design optimization work has shown that by adjusting the number of fans in use at any given time, energy consumption for air cooling is expected to be equivalent to or less than the energy consumption for seawater cooling. As noted in the Application, the Project will have an operating power requirement of approximately 140 MW under normal conditions and 185 MW under peak loading. The Project will be powered by electricity provided by BC Hydro, thereby reducing air quality concerns and generating fewer GHG emissions in comparison with using gas turbine drives to run the main refrigerant compressors. GHG emissions will be monitored on an

						annual basis and reported to the Ministry of Environment as required by the Greenhouse Gas Emission Reporting Regulation.
T015	February 22, 2017	Chris Wyckham, District of Squamish	Socio-economic		Please describe changes in construction employment, and other socio-economic factors.	The change from seawater cooling to air cooling is not expected to have a material effect on construction employment or other socio-economic factors.
T016	February 22, 2017	Chris Wyckham, District of Squamish	Socio-economic		The significant eDrive BC Hydro subsidy in-effect places a burden on other BC Hydro rate payers. What is the impact of that burden?	The Province of British Columbia's decision in November 2016 to offer the industrial rate to LNG projects that use electricity from B.C. Hydro to power their facilities ("eDrive") means Woodfibre LNG will pay the same fair rate as any mine, pulp mill or factory in BC. Woodfibre LNG will also be required to contribute the full cost of connecting to the BC Hydro system, as well as transmission system upgrades required to serve the facilities.
T017	February 22, 2017	Malissa Smith, Bryan Robinson FLNRO	Proposed project infrastructure	p. 4-7	Please clarify: - Intake location on Woodfibre Creek. - Intake location on Mill Creek. - Which licenced points of diversion are no longer being utilized (see attached excel spreadsheet with Water licence file #'s). Note: Existing licences which are no longer being utilized should be cancelled. - Which licensed points of diversion will continue to be utilized. Note: the water use must be for the same purpose as is listed in the original water licence. If the proposed intakes at Mill and Woodfibre Creek overlap with existing licenced intake structures, the water use purpose is not the same as listed in the existing licences. Thus, an amendment to the water licence would be required. Alternatively (and preferably) the existing licence could be cancelled and a new licence issued for the new proposed use. Any amendments to an existing water licence would go through FLNRO. Any cancellations of existing water licences must be done through FLNRO. The issuance of New water licences thereafter, may be conducted by the OGC.	The locations of the Project-related existing and proposed intakes are shown on Figure 2-4 of the Amendment Application. As FLNRO notes, there are eight water licences appurtenant to the Woodfibre fee simple property. However, only two of these water licences are related to the Woodfibre LNG Project: F017347 and F044330. The remainder of the water licences are related to the historical Woodfibre hydroelectric generating station. The proposed Mill Creek intake was included in the Application for an EAC. As described in the Amendment Application, Woodfibre LNG is currently investigating using the existing intake, which is approximately 2 km upstream of Howe Sound. The existing intake structure on Woodfibre Creek is located approximately 2 km upstream from Howe Sound. Water would either be drawn from existing infrastructure (i.e., the existing hydropower penstock) or directly from Woodfibre Creek using pumps. FLNRO, OGC, and Woodfibre LNG met on March 16, 2017 to discuss water licensing. The parties discussed all water licences appurtenant to the Woodfibre property at that meeting (both Project-related and non-Project-related licences). We also discussed the short-term use approval.
T018	February 22, 2017	Malissa Smith, Bryan Robinson	Surface water demand	p. 4	Existing surface water demands (i.e., use of existing water licences) need to be clarified before FLNRO can issue new water licences and or short term use approvals. Again, see attached spreadsheet for list of existing	FLNRO, OGC, and Woodfibre LNG met on March 16, 2017 to discuss water licensing. The parties discussed all water licences appurtenant to the Woodfibre property at that meeting (both Project-related and non-

		FLNRO			water licences.	Project-related licences). We also discussed the short-term use approval.
T019	February 22, 2017	Malissa Smith, Bryan Robinson FLNRO	Project interactions with the proposed project changes	p. 18, Section 5.1	The following interactions outlined in Table 5-1 require clarification: - **Surface Water Quality**: *no new interactions were predicted* – however, water withdrawal s have potential to impact water temperature and intake structures that include impoundments (such as a dam or reservoir) have potential to impact sediment distribution in the system. Additional rationale required on why water quality considerations were not included with proposed new intake location at Mill Creek and temporary intake at Woodfibre Creek. **Vegetation Communities**: *no new interactions predicted* – however, the following activities may be associated with the proposed intake structures – construct new intake, gain access to new infrastructure, create penstock right-of-way. These activities need to be clarified, as do the vegetation (specifically, riparian) impacts associated with those activities.	**Surface Water Quality:** The activities associated with the construction and operation of a water intake on Mill Creek were identified and assessed in Section 5.8 Surface Water Quality of the Application. The location of the intake does not notably change the interactions with surface water quality; thus, no new interactions are identified. Further, the backwatered area associated with the intake on Mill Creek already exists. There is no temporary intake structure proposed for Woodfibre Creek. Water would either be drawn from existing infrastructure (i.e., the existing hydropower penstock) or directly from Woodfibre Creek using screened pumps. **Vegetation:** As noted previously, there is no intake structure proposed for Woodfibre Creek. Use of temporary pumps will not require clearing of vegetation. The construction of a new Mill Creek intake and associated infrastructure (i.e., pipeline/penstock and water storage tank) was identified and assessed in the Application. The use of the existing intake and associated infrastructure (i.e., pipeline/penstock) on Mill Creek could result in a reduction in the effects to vegetation, mainly associated with a reduced need for clearing for a new penstock. However, in order to be conservative, a reduction in vegetation clearing is not considered in the Amendment Application. The amount of clearing associated with the Project remains the same as reported in the Application, approximately 10 ha.
T020	February 22, 2017	Malissa Smith, Bryan Robinson FLNRO	Atmospheric Sound	p.22, Section 6.1	What noise levels are associated with the construction of a new intake structure at Mill Creek? What is the proposed timing and duration of those construction activities, what equipment will be utilized, what vehicles would be accessing this area, what route, frequency of travel, number of persons on site, etc. If a new intake location is being proposed for Mill Creek, what is the plan for the 'existing' intake infrastructure? If removal is an option, what noise impacts would be associated with the decommissioning of the existing infrastructure? Does this section include sound effects that could potentially impact	The activities associated with the construction of the Mill Creek water intake were identified and assessed in Section 5.4 Atmospheric Sound of the Application. For the construction phase, the noise levels are not expected to materially change with the new activities considered in the Amendment Application. The potential effects of changes in ambient noise on wildlife were considered in each of the wildlife sections in the Application (e.g., Section 5.12 Avifauna). Because the sound levels during construction are not expected to materially change from those assessed in the Application, neither will the effects to wildlife.

					wildlife?	
T021	February 22, 2017	Malissa Smith, Bryan Robinson FLNRO	Surface Water Quantity	p. 28, Section 6.3	**Mill Creek:** - IFR was to be determined for Mill Creek. What is the status of this EAC , Condition 5? The change in location of the intake may impact water demands assessment. More information is requested on the location of proposed intake and the potential for continued use and/or abandoning and decommissioning of the other existing licences on Mill Creek. **Woodfibre Creek:** - Section 15 of the WSA requires that a decision maker must consider EFN of a stream or an aquifer that is reasonably likely to be hydraulically connected when making a decision on an application, unless a specified decision is exempt under the Water Sustainability Regulation. For surface water licenses, EFN applies to new licences **and use approvals**. Thus, the EFN of Woodfibre Creek will need to be determined for consideration in the use approval application on Woodfibre Creek. **IFR monitoring and compliance:** - How will IFR be maintained? Monitored? Reported? - How exactly will water diversions be *interrupted or reduced to maintain IFRs downstream of intakes?* - How quick would the response time be if water level drops below IFR? - Is there a plan that outlines IFR commitments? **Ramping:** - The amendment application notes that water extraction would occur during 10-hour work shifts only. Start-up and shut-down of water withdrawal activities may impact fish and aquatic wildlife, e.g., ramping effects. - The magnitude and risk associated with these potential start-up and shut down of water withdrawals depends on the overlap with critical life stages of fish and aquatic wildlife. Was this discussed in the original EA application? Please provide clarification on the potential impacts associated with ramping.	**Mill Creek** Woodfibre LNG is currently working to engage a consultant to undertake additional hydrometric data collection and complete the report for EAC Condition 5. This report will be provided to FLNRO in accordance with the Environmental Assessment Certificate (EAC), and we will provide FLNRO with the timing of the report as early as possible. We acknowledge that changing the length of the diversion reach may affect the minimum instream flow requirement (IFR) to maintain fish habitat. The long-term IFR) for Mill Creek will be determined in accordance with Lewis et al. (2004), which includes the physical characteristics of the diversion reach. **Woodfibre Creek** We acknowledge than environmental flow needs will need to be considered as part of the use approval. Accordingly, Woodfibre LNG is proposing to add the requirement to determine an IFR regime for Woodfibre Creek to EAC Condition 5 (see Section 8.0 of the Amendment Application). **IFR monitoring and compliance** EAC Condition 5 Instream Flow Requirements outlines the requirements for the IFR, which include developing the IFR in consultation with FLNR at least 60 days prior to the commencement of Construction. WLNG is committed to complying with the requirements of this condition. **Ramping** Given the small amount of water that will be withdrawn from for the Project (0.007 to 0.07 m^3/h), Woodfibre LNG does not consider a ramping study necessary. In addition, water withdrawals are expected to be relatively constant (particularly during the operation phase). FLNRO, OGC, and Woodfibre LNG met on March 16, 2017 to discuss water licensing. The parties discussed all water licences appurtenant to the Woodfibre property at that meeting (both Project-related and non-Project-related licences). We also discussed the short-term use

						approval.
T022	February 22, 2017	Malissa Smith, Bryan Robinson FLNRO	Amphibians	p. 35, Section 6.6	Are more detailed mitigation measures described in the project application – specifically, the Environmental Protection Plan for works in and about a Stream and the Water Management Plan? Will search and salvage take place prior to installation of intakes (at both Mill and Woodfibre Creeks)? Is there risk of entrainment of amphibians?	The mitigation measures are described in the Application for an EAC. M5.14-4 Develop an Environmental Protection Plan for Works in and about Mill Creek will require coastal-tailed frog salvage for instream construction. Condition 11 of the EAC requires that Woodfibre LNG develop a wildlife management and monitoring plan for construction that incorporates wildlife mitigation measures from the Application (including M5.14-4). Regardless of whether the existing intake or a new intake on Mill Creek is used, the Project design measures include designing the water supply infrastructure to adhere to BMPs for Instream Works, and will follow the standards outlined in Fisheries and Oceans Canada (DFO)'s *Freshwater Intake End-of-Pipe Fish Screen Guideline* (DFO 1995) and *Measures to Avoid Causing Harm to Fish and Fish Habitat* (DFO 2013). The Mill Creek water intake will incorporate BMPs for approach velocities and screen spacing as outlined in *Freshwater Intake End-of-Pipe Fish Screen Guideline* (DFO 1995) and *Measures to Avoid Causing Harm to Fish and Fish Habitat* (DFO 2013). There is no installation of an intake proposed for Woodfibre Creek. WLNG is proposing to withdraw water using the existing intake infrastructure, or use temporary pumps to withdraw water from Woodfibre Creek. Pumps withdrawing water directly from Woodfibre Creek will incorporate best management practices (BMPs) for approach velocities and screen spacing, as outlined in *Freshwater Intake End-of-Pipe Fish Screen Guideline* (DFO 1995).
T023	February 22, 2017	Malissa Smith, Bryan Robinson FLNRO	Fish and Fish Habitat	p. 36, Section 6.7	Does the extended section of the Mill Creek diversion reach overlap with any sensitive fish habitat areas? Are the mitigation measures documents available for review, e.g. Instream Works Best Management Practices For Fish and Water Management Plan mentioned on p. 37 of the amendment application?	Fish habitat assessments during 2013 found there is little habitat complexity and no off-channel habitat present in Mill Creek. The creek channel width ranges from 4 m to 31 m and has an average width of approximately 14.4 m, with the dominant substrates in most sections composed of boulder and cobble. There are several barriers to fish present in the lower reaches of Mill Creek. Anadromous fish distribution is restricted to the lowest 415 m of the channel by 4-m-high falls. Sampling conducted in support of the Project resulted in the capture of rainbow trout. Mitigation measures and management plans will be developed following the completion of FEED-level design and in accordance with the EAC. The Water Management Plan described in the Application is

						equivalent to EAC Condition 5, and instream works best management practices will be incorporated into the Construction Environmental Management Plan (CEMP).
T024	February 22, 2017	Malissa Smith, Bryan Robinson FLNRO	Overlapping Land Use	Not included	Potential issue with overlapping land tenure: Investigative Use Licence for the purposes of waterpower development on Woodfibre Creek that covers the entire basin. Woodfibre LNG only has a PCL in place, thus Woodfibre does not have any formal rights to the land.	We understand that there are several water licence applications on Mill Creek, Woodfibre Creek, and their tributaries, and that there is an associated Investigative Use Licence. However, the permit over Crown land (PCL) allows Woodfibre LNG to maintain and operate the works authorized under Mill Creek water licences. FLNRO, OGC, and Woodfibre LNG met on March 16, 2017 to discuss water licensing. The parties discussed all water licences appurtenant to the Woodfibre property at that meeting (both Project-related and non-Project-related licences). We also discussed the short-term use approval.
T025	February 22, 2017	Malissa Smith, Bryan Robinson FLNRO	Condition M5. 15-1, Instream Works Best Management Practices for Fish	p. 124/129	Isolation of instream works should also include procedure for amphibian salvage in addition to fish salvage.	We acknowledge that amphibians may also require salvage, and this mitigation measure is included in the Application. Mitigation measure M5.14-4 (Develop an Environmental Protection Plan for Works in and about Mill Creek) requires a coastal-tailed frog salvage prior to instream construction. Condition 11 of the EAC requires that Woodfibre LNG develop a wildlife management and monitoring plan for construction that incorporates wildlife mitigation measures from the Application (including M5.14-4).
T026	February 22, 2017	Malissa Smith, Bryan Robinson FLNRO	Condition M5. 15-2, Water Management Plan	P 126/129	What is the IFR calculated for Mill Creek in accordance with Hatfield et al. 2003? - Monitoring o*f IFR includes continuous monitoring downstream of point of withdrawal*. Has this monitoring point been determined? - *Intermittent monitoring of biotic variables (e.g., fish abundance or density).* Have these monitoring variables been established? When will a plan be proposed? This should be submitted to FLNRO with adequate time for review, prior to construction-related withdrawals on Woodfibre Creek, and prior to any changes made to the Mill Creek intake. *Random IFR compliance audits.* Please clarify the frequency of audits. What are the actions to be taken if stream flow in diversion reach falls below IFR. How quickly will operating personnel be notified? Who exactly would receive this notification?	The EAC Condition 5 Instream Flow Requirements outlines the requirements for the IFR, which include developing the IFR in consultation with FLNR at least 60 days prior to the commencement of Construction. Woodfibre LNG is committed to complying with the requirements of this condition. FLNRO, OGC, and Woodfibre LNG met on March 16, 2017 to discuss water licensing. The parties discussed all water licences appurtenant to the Woodfibre property at that meeting (both Project-related and non-Project-related licences). We also discussed the short-term use approval.
T027	February 23, 2017	Tsleil-Waututh Nation	Air Cooling	Section 2.1 general	It was stated during a working group tele-conference, on February 8, 2017, and eluded to here that the Air Cooling system will require the most energy during clear hot days, most presumably in the summer. Given this	The Project will use electricity from the BC Hydro grid, which is more than 92% clean and renewable. BC Hydro's generation comes predominantly from hydroelectricity, which is also abundant during summer months due to increased flows associated with snow melt.

					technical aspect of the Air Cooling System, TWN believes that this warrants the Proponent to look at alternative energy sources, such as solar panels to be used as part of the Project. The Air Cooling System will require the most amount of energy during the same time when the environment is perfect for the use of solar panels – clear hot sunny days. We would like to see this further looked at, and potentially implemented.	It is also worth noting that the Intergovernmental Panel on Climate Change calculates that the median lifecycle greenhouse gas emissions intensity (CO_2e per kWh) is greater for solar power than for hydropower[1].
T028	February 23, 2017	Tsleil-Waututh Nation	Mill Creek Intake	p. 5 Section 2.2	TWN would like to see more information regarding the existing Mill Creek intake: for example, what will be involved in the upgrades? And if a new one is constructed in its place (but the same location), what does this involve – will the entire pipe running the 1 km (or more) be dug up and replaced? There are major consequences and effects to these actions and in order to ensure that they are assessed correctly, they need to be shared and transparent to the WG for review. Please provide the additional information we require.	The extraction of water from Mill Creek during the Operation Phase was carried forward in the assessment (Table 6-8 Extraction of water from Mill Creek). The potential interaction occurs over a longer distance than that identified and assessed in the Application. Woodfibre LNG is currently undertaking an assessment of the existing Mill Creek intake. The objective of this study is to determine how much work would be required to refurbish the existing intake. Regardless of the work required to refurbish the existing intakes, the effects will be similar to those contemplated in the Application, and the mitigation measures proposed will be effective Additional information will be included in the Construction Environmental Management Plan, which will be provided to Tsleil-Waututh Nation for review prior to construction.
T029	February 23, 2017	Tsleil-Waututh Nation	Newly proposed intake locations: Mill Creek and Woodfibre	p. 6 Section 2.2-2.3	Tsleil-Waututh Nation is extremely interested in the reasoning behind why the project area has not been extended in the amendment? When inquiring about this during the WG tele-conference it was hard to get an answer; it was suggested that EAO was looking at this as an option. We would strongly suggest that this option be included as a requirement of the amendment. As construction and water withdrawal will occur at the two new locations outside the project area, it is imperative that any effects are studied as they were with the original location. We suggest that the project area be increased up each of the two creeks, with a width covering the area that will be utilized by the intakes and workers, up to the location of the intake, providing a buffer zone, again to cover any ground used by workers.	Woodfibre LNG concurs that the Certified Project Area included in the Certified Project Description be expanded to include the existing intake on Mill Creek. By making this change, any upgrades to the intake will be undertaken within the Certified Project Area. Woodfibre LNG is no longer requesting to withdraw water from the existing Woodfibre Creek infrastructure (e.g., penstock). As described in the Amendment Application, water will be withdrawn directly from Woodfibre Creek using a screened pump in the existing Certified Project Area. The mitigation measures described in the Amendment Application (e.g., minimum instream flow releases) will continue to be implemented.
T030	February 23, 2017	Tsleil-Waututh Nation	Withdrawal of Water: Woodfibre Creek	p. 7 Section 2.3	Why is an alternate water source required? It states that the volume of water required will not increase, and that the newly proposed second intake may work singly or in combination with Mill Creek; however, it does not discuss the need for this second source if the water levels	An alternate water source to Mill Creek will be required during upgrading or construction of the Mill Creek intake because it cannot be used over that period.

[1] Schlömer S., T. Bruckner, L. Fulton, E. Hertwich, A. McKinnon, D. Perczyk, J. Roy, R. Schaeffer, R. Sims, P. Smith, and R. Wiser, 2014: Annex III: Technology-specific cost and performance parameters. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

					needed are not increasing? Please further explain the need for Woodfibre Creek.	
T031	February 23, 2017	Tsleil-Waututh Nation	Withdrawal of Water: Woodfibre Creek	p. 7 Section 2.3	There is a lack of information about the existing infrastructure at the Woodfibre Creek intake – will it require any upgrades? Is it in working order as required by this amendment? Will there be any construction involved? Please provide the additional information we require.	Construction period water withdrawals from Woodfibre Creek are proposed using the existing intake or temporary pumps. The Woodfibre Creek intake is currently used for the historical Woodfibre hydroelectric generating station and does not require upgrading for Project purposes.
T032	February 23, 2017	Tsleil-Waututh Nation	Woodfibre Creek Levels	p. 7, section 2.3	Without any studies done to determine the highest level rate and the lowest level rate that the Creek sits, we find it too early to determine that there will not be adverse effects. Especially now that water is proposed to be withdrawn from Woodfibre Creek. We require additional studies, such as the same studies done at Mill Creek during the application, to be done in order to make these determinations, and thus after which, adverse effects would be assessed. Please advise as to when these studies may occur and how we may be involved.	The hydrology of Woodfibre Creek is described in Section 5.9 of the Application for an EAC. Woodfibre Creek has a watershed area of 23 km^2 and a mean annual flow of approximately 2.0 m^3/s. The highest mean monthly flow is 2.6 m^3/s and occurs in May. The lowest flows typically occur in August, with a mean monthly flow of 1.1 m^3/s for Woodfibre Creek. Project-related water withdrawals from Woodfibre Creek will only occur on a temporary basis during the construction phase. Woodfibre LNG is proposing to add the requirement to determine an IFR regime for Woodfibre Creek to EAC Condition 5 (see Section 8.0 of the Amendment Application).
T033	February 23, 2017	Tsleil-Waututh Nation	Tsleil-Waututh Nation	p. 10 Section 3.1.2	TWN disagrees with the statement: "The switch from sea cooling to air cooling proposed herein will address the Tsleil-Waututh Nation's concerns above." We agree that the switch from sea cooling to air cooling does mitigate our concerns with sea cooling methods; however, this is only one of the three TWN issues listed above this quoted statement. It does not address our concerns with the methodology used to assess negligible effects and/or cumulative effects, which is the first issue listed among the three on page 10. Please edit this sentence to state that "The switch from sea cooling to air cooling proposed herein will address the Tsleil-Waututh Nation's concerns in regards to sea cooling methods".	Woodfibre LNG acknowledges that this statement should read "The switch from sea cooling to air cooling proposed herein will address the Tsleil-Waututh Nation's concerns in regards to seawater cooling methods."
T034	February 23, 2017	Tsleil-Waututh Nation	Tsleil-Waututh Nation	p. 10	- Will the IFR's discussed be lower than those discussed in the application and/or in any correspondence prior to the approval of the Project, and thus during the times when our concerns were shared? Please further explain how our concerns will be met in regards to the information in this amendment.	IFR regimes for both Mill and Woodfibre creeks will be developed in accordance with EAC Condition 5 following standard methodology (e.g., Lewis et al. (2004)). The approach proposed in the Amendment Application is consistent with that proposed in the Application.
T035	February 23, 2017	Tsleil-Waututh Nation	Assessment Methodology	p. 17 Section 4.0	Under *New Project Activities: Construction Phase*, only the upgrade to the existing Mill Creek Intake is listed, where in section 2.0 it discusses the possible option of constructing a new intake in place of the existing one, in the same location; this needs to be added as it is listed as a possibility	The construction of a new intake on Mill Creek was identified and assessed in the Application; therefore, it is not included in the Amendment Application. The activities and potential effects associated with constructing a new Mill Creek intake would be the same regardless of location. Similarly, the same mitigation measures will

					and part of the amendment.	apply.
T036	February 23, 2017	Tsleil-Waututh Nation	Assessment Methodology	p. 17 Section 4.0	- In addition, the extraction of water at the newly proposed intakes at Mill Creek and Woodfibre Creek need to be added to the Operations Phase as water will be taken during the Project lifetime from these newly proposed locations.	The extraction of water from Mill Creek during the Operation Phase is included in the Application. Since this is not a new activity, it is not included in the Amendment Application. The withdrawal of water from Woodfibre Creek is only proposed on a temporary basis during the Construction Phase.
T037	February 23, 2017	Tsleil-Waututh Nation	Heritage VC	p. 19	We disagree that there is no interaction between the Heritage VC and the two new intake locations. Given that the two newly proposed intake locations are outside of the original project area, if any groundbreaking is proposed to occur due to the use, improvements, upgrades, replacements and/or any work or construction on either of these intakes, TWN requires that a proper AIA be performed prior to such groundbreaking; the locations of the intakes may already constitute a disturbed area, however, unless it can be shown that an AIA was performed during their construction, it is not possible to tell that any aspects of heritage would not be found. Please advise if a) any groundbreaking will occur and, b) if so, when the AIA will be performed.	Woodfibre LNG undertook an Archaeological Impact Assessment (AIA) of the Project area in the summer of 2016. Fieldwork did not identify any new archaeological sites, and the report concluded that previous industrial developments within the Project area have disturbed the area so wholly that the potential to identify intact archaeological materials is very low. Regardless of the archeological potential, a chance find procedure will be included in the Construction Environmental Management Plan. As noted above, Woodfibre LNG is currently undertaking studies to determine the extent of the upgrades that would be required to use the existing Mill Creek intake. If ongoing design confirms that the existing intake can be reused and that ground disturbance is required, the AIA will be updated to include the intake area. As noted previously, there will not be an intake constructed on Woodfibre Creek. If water is withdrawn from existing infrastructure, it would be used as-is. The use of temporary pumps for water withdrawals from Woodfibre Creek is not anticipated to interact with the Heritage valued component (VC).
T038	February 23, 2017	Tsleil-Waututh Nation	Noise	p. 26, section 6.1	How often will noise monitoring be conducted, during operations?	Noise monitoring will be undertaken at the beginning of the Operation Phase to validate the noise modelling results.
T039	February 23, 2017	Tsleil-Waututh Nation	Interactions: Amphibians	p. 34	No new interactions are listed, and thus not carried forward for the existing Mill Creek intake and Amphibians – we disagree with this given that this new intake is a) outside of the project area and b) an additional 1km in distance. This is supported by the amendment which states that "the proposed change of the Mill Creek intake does not change the interactions with amphibians that were identified and assessed in the application; however, any interactions will occur over a longer section of the creek." This statement in the amendment in itself explains that there will be interactions that differ from those in the application, and possibly increase the interactions given the larger area, and therefore, they need	The extraction of water from Mill Creek during the Operation Phase was carried forward in the assessment (Table 6-8 Extraction of water from Mill Creek). The potential interaction occurs over a longer distance than that identified and assessed in the Application. As reported in Section 5.14 of the Application and Section 6.6 of the Amendment Application, the potential Project-related effects to amphibians as a result of extraction of freshwater are expected to include loss of amphibian breeding and tadpole rearing habitat (stream breeding species) due to water withdrawals. A minimum IFR will be developed and implemented that will minimize potential effects from

					to be reassessed.	changes in water quantity to amphibians.
T040	February 23, 2017	Tsleil-Waututh Nation	Woodfibre Creek Water Withdrawal	p. 35, section 6.6	Once studies are completed, TWN would like to see the report that determined the stream levels of Woodfibre Creek. Please provide this once it is available.	The hydrology of Woodfibre Creek is described in Section 5.9 of the Application for an EAC. Woodfibre Creek has a watershed area of 23 km^2 and a mean annual flow of approximately 2.0 m^3/s. The highest mean monthly flow is 2.6 m^3/s and occurs in May. The lowest flows typically occur in August, with a mean monthly flow of 1.1 m^3/s for Woodfibre Creek. Project-related water withdrawals from Woodfibre Creek will only occur on a temporary basis during the construction phase. Woodfibre LNG is proposing to add the requirement to determine an IFR regime for Woodfibre Creek to EAC Condition 5 (see Section 8.0 of the Amendment Application). The EAC requires that the Ministry of Forests, Lands and Natural Resource Operations and the Squamish Nation approve the report describing the IFR regime.
T041	February 23, 2017	Tsleil-Waututh Nation	Fish Habitat	p. 37, section 6.7	- What quantity of fish habitat will be affected by having water withdrawn from Woodfibre Creek?	An IFR regime will be established based on available fish habitat in Woodfibre Creek and point of diversion (i.e., the existing intake or the pump location). Water withdrawals from Woodfibre Creek will occur only during the construction phase.
T042	February 23, 2017	Tsleil-Waututh Nation	Current Use	p. 43 Section 6.11	We disagree that the switch from the Mill Creek Intake in the project area to the existing Mill Creek intake does not trigger a "current use interaction". As the existing intake is not in the project area, and thus the effect of its construction and use have not been studied to the level of the intake in the application, it is impossible to determine what level of current use interaction will occur. We require further information to be gathered by the Proponent in order to study the existing Mill Creek option as equal to the Woodfibre option in regards to this amendment.	The local and regional assessment areas (LAA and RAA, respectively) in the Application were not the same as the Project area. The LAA for the Current Use VC was "The Tsleil-Waututh Nation's Consultative Area and the area where there is potential for direct Project-related effects to resources that are currently used by the Tsleil-Waututh Nation." (Table 7.6-2 and Figure 7.6-1 of the Application). The assessment of the current use VC for amount and quality of resources and sensory disturbance are also linked to other VCs. The related VCs assessed within the scope of the proposed Project changes include avifauna, freshwater fish and fish habitat, atmospheric environment, atmospheric sound, surface water quantity and visual quality. Given that the effects to these VCs are not expected to differ from those assessed in the Application, neither will effects to the Current Use VC. Other VCs and intermediate components linked to the Current Use VC in the Application included marine water quality, marine benthic habitat, forage fish and other fish (marine), marine birds and marine

						mammals. As identified in the Amendment Application, the proposed Project changes decrease the potential for Project-related effects on these components due to seawater cooling. Woodfibre LNG also reviewed the assessment in context with the Tsleil-Waututh Knowledge study. Any direct effects related to the Project changes, including the Mill Creek intake, are outside the Tsleil-Waututh Nation's Consultation Area.
T043	February 23, 2017	Tsleil-Waututh Nation	Human Health	p. 44-45 Section 6.12	TWN finds this section to be extremely lacking due to: a) referencing back to the application, which as we've stated numerous times, including in our Letter to the Ministers, was and is insufficient: "The draft Assessment Report fails to properly assess potential Project impacts on the Tsleil-Waututh and our members' cultural health and wellbeing. For example, in section 1.3 of CEAA 2012 Requirements, the EAO fails to assess the cultural health and well-being (social determinants of health) of Aboriginal groups. Even more troubling is that the draft Assessment Report completely fails to assess potential Project impacts on the cultural, mental, and emotional wellbeing of Aboriginal groups and their members who live outside of the LAA but that may nevertheless be adversely impacted by the Project, including Tsleil-Waututh Nation and our members. Further assessment of Project impacts on the health and socio-economic conditions must be carried out, based on a broader definition and scope of health, both spatially and temporally." Given that we did not support the human health assessment done for the application and the Project thus far, we do not support the assessment being carried forward and referenced in the amendment as it is not sufficient enough to do so. We require additional studies to be done in regards to cultural health in order to better assess the impacts.	As stated during the Working Group review phase of the Application for an EAC, Woodfibre LNG believes that the assessment of health and well-being is appropriate, follows the scope as identified in the Application Information Requirements document and guidance documents developed by EAO. The Community Health and Well-being VC relates directly to communities. With regard to TWN, the assessment on community health and well-being is focussed on those communities specifically located within the LAA for the health and well-being subcomponent. Members of the TWN residing within those communities have been taken into account in the overall community assessment. TWN communities are not within the LAA and are therefore not within the scope of the assessment. Forty-five locations were assessed as part of the Human Health Risk Assessment and could be considered surrogate locations for other areas, including potential locations of interest to the Tsleil-Waututh Nation. A "worst-case" location (i.e., maximum point of impingement) was included in the risk assessment, at the Project area boundary. The potential for human health risks were not identified beyond the Project boundary as this is considered the "worst-case" location scenario; therefore, risk identification was not necessary at the other locations assessed. Accordingly, health risks associated with the Project are not anticipated at locations of interest to the Tsleil-Waututh Nation because potential locations of interest are likely away from the "worst-case" Project area boundary location.
T044	February 23, 2017	Tsleil-Waututh Nation	Human Health	p. 44-45 Section 6.12	b) the level of assessment for cultural health is, also, and by no surprise, also lacking in the amendment on its own. Air quality, visual quality, and noise are the only aspects regarded in the amendment within Human Health. It's essential to ensure that the amendment does not increase effects on aboriginal groups, and that a cultural health study, including the social determinants of health, be done; this would be an easy addendum	As stated during the Working Group review phase of the Application for an EAC, Woodfibre LNG believes that the assessment of health and well-being is appropriate, follows the scope as identified in the Application Information Requirements document and guidance documents developed by EAO.

					in the amendment if a proper study had taken place during the application.	The selection of air cooling by Squamish Nation Chiefs and Council was the result of a study conducted by the Woodfibre Environmental Working Group, which was supported by Woodfibre LNG and consisted of Squamish Nation and Woodfibre LNG representatives. It compared three alternative cooling technologies: a seawater cooling system, an air cooling system, and a system that combines air cooling with freshwater spray, as well as their potential effect on the continued exercise of Aboriginal Interests, including effects on traditional and current Aboriginal use of lands and resources. The Woodfibre Environmental Working Group determined that of the three cooling technologies, seawater cooling had the highest net environmental effect and that air cooling was considered to have the lowest net environmental effects, including effects on traditional and current Aboriginal use of lands and resources.
T045	February 23, 2017	Tsleil-Waututh Nation	Proposed Amendments	p. 51 Section 8.0 – 1. Re: section 2.0	TWN disagrees with the wording of the text to be added to Section 2.0: "outside the certified Project Area". This wording creates and continues a precedent that it's ok to have project elements outside of the Project Area and thus not assess them to the same extent as those within the area. TWN strongly believes and expects the project area to be expanded up along the rivers to include the new proposed intakes.	Woodfibre LNG concurs that the Certified Project Area included in the Certified Project Description be expanded to include the existing intake on Mill Creek. By making this change, any upgrades to the intake will be undertaken within the Certified Project Area. Water from Woodfibre Creek will be withdrawn from existing infrastructure within the Certified Project Area or using screened pumps directly in Woodfibre Creek. Construction will not occur outside of the Certified Project Area in either of these cases. Accordingly, all Project-related activities connected to water withdrawal from Woodfibre Creek are already included within the Certified Project Area.
T046	February 23, 2017	Tsleil-Waututh Nation	Proposed Amendments	p. 51 Section 8.0 – 2.	Please explain why Condition 7: Marine Water Quality – Operations, will be removed, rather than edited as only 2 of the 5 points regard the sea cooling process. As it stands we currently question this action as the monitoring of marine water quality for this project, during operations, irrespective of the cooling mechanism, is essential for the health of Howe Sound and the right, titles and interests of Aboriginal groups.	EAC Condition 7 resulted from concerns from Aboriginal groups and the public regarding discharges from the seawater cooling system, particularly temperature and residual chlorine, and relates directly to those concerns. Given the switch to air cooling, the requirements of this condition are no longer believed to be relevant. Regardless of this condition being removed, any discharges from the Project will meet provincial and federal water quality standards.
T047	February 23, 2017	Tsleil-Waututh Nation	Proposed Amendments	p. 52 Section 8.0 – 3.	Please explain why there is no new text being added, with the removal of text in Condition 8: Marine Fish and Fish Habitat (sea cooling intake). The text being removed discusses the intake for the sea cooling process; this makes sense. However, there are still intakes that will interact with fish and fish habitat in each of the Creeks; the text should be edited to ensure	Condition 8 relates to marine fish and fish habitat and would not apply to freshwater intakes. Condition 3 of the federal Decision Statement includes mitigation measures that apply to freshwater intakes, including designing, installing and operating a water intake structure to avoid or reduce the risk of injury or mortality to fish in Mill Creek.

					management of these intakes is included in this condition.	
T048	February 24, 2017	David Leung, Environment and Climate Change Canada	Migratory birds and At-risk bats	2.1 (Air Cooling), 6.4 (Avifauna) and 6.5 (At-risk Bats)	The project amendment includes the proposed construction and operation of an air cooling system with fans. Migratory birds and bats can be inadvertently harmed or disturbed as a result of many activities including but not limited to being struck by air intake fans. ECCC recommends that the proponent provide mitigation measures (such as the use of protective screens) to avoid potential impacts of the air cooling system on birds and bats (e.g. collisions with fan blades). Clear reference to the variety of species present and their sizes is required to assess the appropriateness of the mitigation measures.	The cooling fans are shrouded and oriented horizontally, which will help to protect birds and bats from the fans. Due to this configuration, the only way for a collision with a fan blade to occur would be for a bird or bat to pass vertically through the fan. Additional information regarding migratory birds is available in Sections 5.12 and 5.17 of the Application. Information regarding at-risk bats is available in Section 5.13 of the Application. As noted in Section 8.0 of the Amendment Application, Woodfibre LNG will include monitoring of impacts to wildlife (including at-risk bats) in the wildlife monitoring and management plan for the operation phase.
T049	February 24, 2017	David Leung, Environment and Climate Change Canada	Amphibians	6.6 (Amphibians)	The project amendment includes proposed changes to where and how water may be withdrawn for construction, operation and firefighting purposes. Water may be withdrawn from a different location on Mill Creek via different intake arrangements and water may also be withdrawn – for short term uses - from Woodfibre Creek via pumps or an existing intake. The western toad, listed as Schedule 1 Special Concern under the *Species at Risk Act*, has the potential to occur in both creeks. Impacts to amphibians at risk such as the western toad could include entrainment and impingement as a result of water withdrawals from these creeks. ECCC recommends that the proponent provide information describing how potential impacts to amphibians at-risk (e.g., entrainment, impingement) during water withdrawals will be avoided or mitigated.	Western toad is a pond-breeding amphibian whereas any intakes will be located in high-gradient creeks. However, regardless of the species, amphibians will be protected by the mitigation measures implemented to protect fish. Freshwater intakes must be designed to protect fish from entrainment and impingement. For example, Condition 3 of the federal Decision Statement includes mitigation measures that apply to freshwater intakes, including designing, installing and operating a water intake structure to avoid or reduce the risk of injury or mortality to fish in Mill Creek.
T050	February 24, 2017	Dave Pehl, Fisheries and Oceans Canada			The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada has reviewed the proposed changes to Woodfibre LNG project that include: • change in cooling technology from seawater cooling to air cooling; • use of the existing Mill Creek intake, including screenhouse, flume, and penstock, as an alternative to constructing a new intake for water withdrawals; and • withdraw of water from Woodfibre Creek for short-term needs during construction Based on the information provided, DFO understands the change in cooling technology will reduce project impacts resulting from construction and operation of seawater cooling system infrastructure and mitigation including minimum Instream Flow Release (IFR) will be developed for	Acknowledged. Thank you for your comment.

					Woodfibre Creek water withdrawals. DFO does not anticipate any new adverse environmental effects to fish and fish habitat resulting from the proposed modifications or recommend additional mitigation measures to manage adverse effects on fish or their habitat	