

Relevant Mitigation Measures

Mitigation Number	Mitigation Name	Proposed Mitigation	Project Phase	Timing of Implementation	EAC Condition Federal Decision Statement
M5.4-6	Schedule Noise Emitting Maintenance During the Day	Woodfibre LNG Limited will schedule high noise emitting maintenance activities during the day whenever possible.	Operation	Operation	
M5.4-7	Notify Residents	When appropriate, Woodfibre LNG Limited will notify residents prior to high noise-emitting maintenance activities (if appropriate).	Operation	Operation	
M5.4-8	Receive Feedback About High-noise Activity	Woodfibre LNG Limited will set up and implement means (e.g., an office in Squamish) for people to provide input when experiencing a high-noise activity.	Operation	Construction	
M5.8-1	Erosion Prevention and Sediment Control Plan	<p>Woodfibre LNG Limited will develop and implement an Erosion Prevention and Sediment Control Plan as part of the Construction Environmental Management Plan (CEMP). Existing applicable guidelines will be followed as appropriate to mitigate erosion and sediment transport and include the following:</p> <ul style="list-style-type: none"> • <i>Environmental Protection and Management Guide</i> (OGC 2013) • <i>Land Development Guidelines for the Protection of Aquatic Habitat</i> (DFO 1992) • <i>Develop with Care Environmental Guidelines for Urban and Rural Land Development in British Columbia</i> (MOE 2014) • <i>Standards and Best Practices for Instream Works</i> (MWLAP 2004) <p>The following erosion and sediment control measures will be implemented at the site during the construction and decommissioning phases and included in the Erosion Prevention and Sediment Control Plan (refer to Section 13.0 Summary of Proposed Environmental and Operation Management Plans and Follow-up Programs):</p> <ul style="list-style-type: none"> • Activities within riparian management areas, a 30-m-wide area on either side of both Mill Creek and 	Construction Decommissioning	Pre-construction	EAC Condition 21

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		<p>Woodfibre Creek, will be minimized. Erodible material will not be stockpiled in these areas and no refueling will occur within these areas.</p> <ul style="list-style-type: none"> • Vegetation cover will be maintained wherever possible. Disturbed areas adjacent to watercourses will be re-vegetated as soon as possible to prevent surface erosion or downstream water quality effects. • Overland flows will be diverted from undisturbed areas away from or around construction areas. • Erosion and sediment control measures, including silt fences, filter fabric, straw bales, gravel filter dikes, sedimentation ponds, perimeter ditches, cut-off swales or other water quality management measures, will be selected, implemented, monitored, maintained, and repaired as required. • Sediment pond(s) will be incorporated as required, and appropriately designed in accordance with current guidelines to meet site conditions and requirements. Sediment ponds will be maintained until construction or decommissioning is completed and the affected areas are sufficiently stabilized and re-vegetated to minimize erosion risk or sediment transport at the site as a result of construction activities. • Construction wastes, overburden, soil, or any other substances potentially deleterious to riparian, aquatic or marine habitat will be stored or disposed of in such a manner as to prevent entry to riparian, aquatic or marine areas. • No erodible materials will be stockpiled within riparian management areas. Soil stockpiles will be diked, sloped, and seeded or appropriately covered to minimize erosion. If temporary stockpiles are constructed then appropriate erosion prevention measures will be installed and regularly maintained until these stockpiles are decommissioned or seeded. Spoil will be managed in accordance with the appropriate Project-specified regulatory approvals or applicable legislation, regulations, and guidelines prior to the completion of construction activities. 			

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		<ul style="list-style-type: none"> Erosion and sediment control measures will be maintained and any required changes made promptly to ensure they are working effectively. An inspection and maintenance program will be developed and followed as part of the Erosion Prevention and Sediment Control Plan. <p>Water collected in temporary sediment control structures will be analyzed and its quality determined. If water quality meets acceptable guidelines, it will be discharged into Howe Sound; otherwise it will be treated prior to discharge.</p>			
M5.8-2	Design for Stormwater Management	<p>Woodfibre LNG Limited will include stormwater management in the Project design with the following considerations:</p> <ul style="list-style-type: none"> Stormwater that comes into contact with areas that are not subject to LNG facility spills (e.g., roads, material storage areas, roof areas) will be collected in ditches and catch basins. It will then be directed through a stormwater treatment system to remove any oil and sediment prior to discharge into Howe Sound. Stormwater that comes into contact with the LNG facility or other process areas will be captured in the new lined stormwater retention pond. The water will be tested for compliance with the BC water quality guidelines. If it meets guidelines, stormwater will be discharged directly into Howe Sound; if not, stormwater will be pumped to the water treatment plant prior to being discharged into Howe Sound. Surface drains and ditches constructed as part of the Project will be graded according to BMPs and vegetated or lined to minimize erosion and increase the retention time of runoff. <p>Particular attention will be given to the construction methodology and design of new or upgrades to access roads to avoid the potential to alter existing drainage patterns by collecting overland drainage and concentrating it at specific locations, which may result in localized erosion.</p>	Operation	Final design	EAC Condition 21

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M5.9-1	Minimum Instream Flow Releases	Woodfibre LNG Limited will ensure that the minimum instream flow releases (IFRs) will be established by a qualified professional. When required, the water diversions will be interrupted or reduced as required to maintain minimum or higher instream flows.	Construction Operation Decommissioning	Final Design	EAC Condition 5
M5.11-1	Invasive Plant Management Plan	Woodfibre LNG Limited will develop an Invasive Plant Management Plan to mitigate the introduction, transport, and extent expansion of invasive plant species (including noxious weeds) to and from the Project area during construction and operation. The objectives of this plan will be to detect, control (i.e., remove), and monitor invasive plant species in the Project footprint area. Part of this plan will include mapping invasive plant extent and tracking this extent over the life of the Project to record invasive species proliferation. Monitoring will be conducted to make sure that mitigation measures are properly implemented and effective.	Construction Operation	Pre-construction	EAC Condition 10
M5.12-1	Wildlife Management Plan	Woodfibre LNG Limited will develop and implement a Wildlife Management Plan prior to initiation of the construction phase of the project. The Wildlife Management Plan will provide the following information: <ul style="list-style-type: none"> • details regarding any required pre-construction surveys and wildlife monitoring: <ul style="list-style-type: none"> ▫ call-playback surveys prior to clearing that specifically focus on western screech-owl at night to ensure the cleared areas are not being used as post-fledgling areas ▫ pre-construction surveys to assess potential western screech-owl nesting habitat in the potential corridors for the gas and water pipeline ROWs, and avoidance of such habitat in the final design for the Project ▫ surveys will also be conducted in areas to be cleared to confirm that natural mineral sites (i.e., mineral water springs) that may be used by band-tailed pigeon are not impacted by the Project 	Construction Operation	Pre-construction	EAC Condition 11 EAC Condition 12 Decision Statement Section 4

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		<ul style="list-style-type: none"> Information on how to report and record wildlife conflicts, including wildlife mortality due to vehicles and equipment. A database of wildlife mortality associated with construction and operation of the project should be maintained through the construction and operation phases. Observations of Red and Blue-listed species will be conveyed to the CDC. limit speed on roadways within the Project area to 30 km/h measures to identify amphibian crossings (if any) details regarding posting signage and educating workers to ensure vigilance for amphibians during peak movement periods (i.e., rainy nights in April and September) 			
M5.12-2	Retain snags and wildlife trees	Woodfibre LNG Limited will retain wildlife habitat features, including those for avifauna and bats, such as snags and wildlife trees (mature trees are included in M5.9-2) wherever possible and safe to do so. Prior to site clearing, wildlife habitat features to be retained will be demarcated with no-go fencing and signage. Habitat features to be field identified and retained will be included on Project Environmental Management Plan mapping.	Construction	Pre-construction Construction	EAC Condition 5
M5.12-3	Establish and retain vegetative buffers around raptor nests	Woodfibre LNG Limited will establish and retain vegetative buffers around raptor nests to mitigate sensory disturbance in accordance with <i>Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia</i> (MOE 2013). These guidelines suggest that a 100-m vegetated buffer be retained around osprey and bald eagle nests and a 200-m vegetated buffer be retained around western screech-owl nests. An additional 100-m no-disturbance buffer for each species nests is recommended during the nesting season.	Construction Operation	Pre-construction	EAC Condition 21
M5.12-5	Light management	Subject to safety and operational requirements, Woodfibre LNG Limited will use blue or green lighting rather than red or white lighting in order to reduce attractiveness to birds.	Construction Operation	Final Design	Decision Statement Section 4

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M5.12-8	Install nesting structures	Woodfibre LNG Limited will install western screech-owl and barn swallow nesting structures at suitable locations in the LAA once construction is complete to compensate for the removal of (possible) nesting habitat during construction. Artificial nest structures for barn swallows include nesting shelves or nesting cups attached to an appropriate surface.	Operation	Post-construction	
M5.12-9	Design buildings to reduce bird strikes	Woodfibre LNG Limited will design building facilities to reduce the potential for bird strikes and bird mortality. Design features will include minimizing the amount of glass and applying tints or facades where glass is required to provide visual cues.	Construction	Final Design Pre-construction	N/A
M5.13-1	Avoid Clearing during Bat Maternity Season	Woodfibre LNG Limited will avoid clearing when maternity roosts of at-risk bat species are likely to be active. The least risk season for bats in the Project area (i.e., when females are not heavily pregnant, nor when juvenile bats are present and unable to fly) is expected to occur between September 1 and May 15, therefore clearing will be avoided when possible between May 16 and August 31. Pre-clearing maternity roost surveys will be undertaken if the least-risk windows cannot be maintained. Acceptable non-disturbance buffers will be established around active maternity roosts.	Construction	Pre-construction Construction	Decision Statement Section 9
M5.13-2	Minimize the Amount of Ultraviolet Light	Woodfibre LNG Limited will, where possible, use lighting technology that minimizes the amount of ultraviolet light generated, thereby minimizing its attractiveness to insects.	Construction Operation	Final Design	
M5.13-3	Installation of Bat Boxes	Woodfibre LNG Limited will construct and install bat boxes away from potential sources of mortality (e.g., roads) to provide additional roosting habitat for bats.	Operation	Post-construction	Decision Statement Section 9

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M5.15-1	Follow Instream Works Best Management Practices for Fish	<p>Woodfibre LNG Limited will follow instream works best management practices, including those outlined in M5.8-3 and those outlined below.</p> <ul style="list-style-type: none"> • Reduced risk instream work windows <ul style="list-style-type: none"> ▫ Project activities and physical works conducted in freshwater fish habit will be undertaken during the reduced risk instream work window unless otherwise approved by MFLNRO. The reduced risk instream work windows for the Lower Mainland (Region 2) are between July 15 and September 15 for salmon, and between August 1 and 31 for trout and Dolly Varden (MOE 2006). • Avoidance of instream disturbance <ul style="list-style-type: none"> ▫ Project activities and physical works pertaining to placement of water supply infrastructure, as well as bridge construction on Mill Creek will avoid, wherever possible, instream operation of equipment and release of debris within the creek. • Isolation of instream works <p>The installation of the water supply intake in Mill Creek will require work areas within the creek to be isolated. If isolation of instream work areas will be required, activities will adhere to the provincial Standards and Best Practices for Instream Works (MWLAP 2004). If construction of required intake structures cannot avoid disturbance of instream environments from equipment operation, structure placement, or debris entering the creek, these activities will be isolated to minimize effects to the stream. If construction of the water supply intake cannot avoid the disturbance of instream environments, either directly by equipment operation or structure placement, or indirectly by causing debris to enter the creek, these activities will be isolated to minimize flow effects on bank erosion, will be protected from high flow events, will include the use of clean materials, and will allow for the salvage of fish.</p> 	Construction	Pre-construction	Decision Statement Section 3

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		<ul style="list-style-type: none"> <li>• Salvage of fish prior to instream works Any habitat isolation conducted in instream work areas will require fish salvage prior to the commencement of works. Prior to any fish salvage, fish sampling permits will be required under the provincial <i>Wildlife Act</i> (RSBC 1996, c. 488) and the federal <i>Fisheries Act</i>. Sampling methods will adhere to fish collection methods and standards (RISC 1997) and general operational BMPs for salvage of fish (MOE 2014c). <li>• Minimize the duration of activities within watercourses and riparian setbacks The duration of necessary activities, including both dismantling and constructing structures, which must occur within watercourses and within the 30-m riparian setback, will be minimized to avoid potential fish mortality and changes in fish presence, the quality and quantity of fish habitat, habitat availability, and riparian habitat. 			

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M5.15-2	Develop and Implement a Water Management Plan	<p>Woodfibre LNG Limited will develop a Water Management Plan for Mill Creek, which will afford protection of fish and fish habitat by prescribing the minimum instream flow releases (IFRs). During low flows, water withdrawals from Mill Creek will be reduced to meet IFRs. If streamflows are less than the IFR, water will not be withdrawn from Mill Creek.</p> <p>Instream flow releases specific to the existing flow regime and geomorphology of Mill Creek will be developed in general accordance with <i>Assessment Methods for Aquatic Habitat and Instream Flow Characteristics in Support of Applications to Dam, Divert, or Extract Water from Streams in British Columbia</i> (Lewis et al. 2004) and consultation with MFLNRO. The information requirements for determining IFRs include the fish-bearing status of the stream, historic flow records, and any recently collected data. This current and historical information will allow for the establishment of seasonally adjusted instream flow thresholds calculated as percentiles of natural mean daily flows each month. Until such time as the Mill Creek-specific IFRs can be developed, the Project will adhere to IFRs calculated in accordance with the methods outlined in <i>Development of Instream Flow Thresholds as Guidelines for Reviewing Proposed Water Uses</i> (Hatfield et al. 2003)</p> <p>Monitoring will be a requirement of the Water Management Plan to confirm that the plan is effective in protecting fish and fish habitat. Effective monitoring will include a combination of compliance monitoring and biotic response monitoring and the definition of program objectives. Design of a monitoring program will consider program objectives, scope of effort, timing, and duration. Typical designs include, though are not limited to, the following:</p> <ul style="list-style-type: none"> • continuous streamflow monitoring downstream of point of withdrawal • intermittent monitoring of biotic variables (e.g., fish abundance or density) <p>random IFR compliance audits</p>	Construction Operation Decommissioning	Pre-construction	EAC Condition 5

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M5.17-2	Establish and Maintain Bird Nest Setbacks	Project activities will maintain a minimum 30 m setback distance from active marine bird nests identified in the Project area. Larger setbacks may be established for listed species and will be considered on a species-by-species case.	Construction Operation	Pre-construction	Decision Statement Section 4
M5.17-3	Establish and Maintain Marine Bird Breeding Colony Setbacks	Woodfibre LNG Limited will comply or require its contractors to comply with the recommended 300 m minimum setback from waterbird colonies (see Figure 5.17-2) for Project – related marine vessel traffic, and subject to safety concerns, refrain from blowing horns or whistles and maintain constant engine noise while passing near the colonies (EC 2013a).	Construction Operation	Construction	Decision Statement Section 4
M5.17-5	Minimize the Duration of Construction Activities in Intertidal Zone	Woodfibre LNG Limited will minimize the duration of necessary activities, including both dismantling and construction of structures, that must occur within the intertidal zone to the extent possible to reduce the disturbance of marine birds and marine bird habitat. Where practicable, activities will be scheduled during low tide.	Construction	Construction	EAC Condition 21
M5.17-8	Development of a Marine Bird Management Plan	<p>Woodfibre LNG Limited will develop and implement a Marine Bird Management Plan (MBMP) prior to the initiation of the construction phase of the Project. This MBMP will be part of an overall Wildlife Management Plan document. This plan will include:</p> <ul style="list-style-type: none"> • Pre-construction surveys within mapped (but not field-verified) marbled murrelet critical nesting habitat to be cleared as part of the Project will be undertaken following appropriate standards developed by the Resource Information Standards Committee for marbled murrelet inventory (MELP 2001). These surveys will determine if marbled murrelets are currently nesting in these areas (if timing of Project construction allows for these surveys to be conducted during nesting season), or if these areas provide suitable nesting habitat (if timing of Project construction prevents surveys of during active nesting activity). • Provision of information and training to all workers (contractors, staff, and employees) on how to report and record marine bird conflicts in the Project area, 	Construction Operation	Pre-construction	Decision Statement Section 4

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		<p>specifically vessel strikes (bird species, location of carcass on vessel, weather conditions) in a database during construction, operation and decommissioning.</p> <ul style="list-style-type: none"> Should regular review of the database identify areas of persistent conflict or mortality rates that would affect populations, the Project operations will be reviewed to identify potential mitigation measures. <p>Pre- and post-construction (operation-phase) monitoring of marine birds in the Project area. If the monitoring identifies high levels of marine bird attraction and collision-related mortality associated with the Project on-shore infrastructure, lighting, weather or migration periods, additional mitigation measures will be explored, including: turning off unnecessary lights (exterior and interior), especially during periods of high marine bird migratory flight activity in the area, wider light shut-down periods during migratory periods and inclement weather events (overcast, cloudy and/or hazy and foggy conditions), avoidance of continuous red or flashing red incandescent lights, use of blue jelly-jar LED lights on suspension cables and rectangular blue LED lights on bridge decks (Golder et al. 2010). Survey methods may include stand watches during migratory periods (spring and fall) in an adaptive management approach.</p>			
M7.5-1	External surface finishing	Woodfibre LNG Limited will reduce the level of contrast by finishing new buildings' external surfaces or re-finishing existing buildings' external surfaces and structures as appropriate for required functional utility. The finish will have low glare and natural colours to reduce contrast with the qualities of the surrounding landscape features.	Construction	Construction	EAC Condition 20
M7.5-2	Screening of land-based infrastructure	Woodfibre LNG Limited will provide additional screening of land-based infrastructure not currently screened by existing vegetation through temporary or permanent planting, where possible and safe to do so.	Construction	Construction	EAC Condition 20
M7.5-4	Monitoring and maintenance of natural screening	Woodfibre LNG Limited will monitor and maintain natural screening to ensure minimal visibility of infrastructure and activity in operational areas by establishing vegetation and avoiding surface and root disturbance.	Operation	Construction	EAC Condition 20

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M7.5-5	Re-finishing and maintenance of external surfaces	Woodfibre LNG Limited will preserve the level of contrast for Project infrastructure by re-finishing and maintaining external surfaces as required. As part of the integrity management program, or other maintenance program, WLNG will establish re-finishing and maintenance schedules for site buildings and infrastructure external surfaces.	Operation	Operation	EAC Condition 20
M7.6-1	Consult with the Tsleil-Waututh Nation on additional mitigation for Aboriginal Interests	<p>Upon receipt of the completed Tsleil-Waututh Nation Knowledge Study, WLNG will work in consultation with the Tsleil-Waututh Nation to identify technically and economically feasible mitigation measures needed to address potential Aboriginal Rights issues identified in the Tsleil-Waututh Nation Knowledge Study, such as access to traditional marine mammals, vegetation, wildlife, and fishing areas, and additions to various Plans, including marine related plans, to accommodate Tsleil-Waututh Nation interests as well as heritage and culturally significant site issues. Examples of additional mitigation measures to discuss with the Tsleil-Waututh Nation are:</p> <ul style="list-style-type: none"> • Woodfibre LNG Limited will provide the Tsleil-Waututh Nation with an opportunity to review and comment on the draft Construction Environmental Management Plan, and other management plans that have a potential bearing on identified Tsleil-Waututh Nation Aboriginal Rights, such as the Squamish Harbour Vessel Traffic Plan, and Marine Transport Management Plan. • Woodfibre LNG Limited will work with the Tsleil-Waututh Nation to address issues that they may raise with respect to heritage resources. <p>Woodfibre LNG Limited will provide the Tsleil-Waututh Nation with an opportunity to review and comment on draft Heritage Resources reports, including the Heritage Resources Preliminary Field Reconnaissance Report, the Heritage Resources Impact Assessment Report, and the Chance Find Management Procedures for the Project.</p>	Construction Operation Decommissioning	Pre-construction	EAC Condition 22 Decision Statement Section 7