



January 7, 2021

LNG Canada Development Inc.  
400- 4<sup>th</sup> Avenue SW  
Calgary AB T2P 0J4

Attention: LNG Canada Development Inc.

**RE: Amendment to Application Determination Number 100083612 OGC Legacy # 9709124**

**Permit Holder:** LNG Canada Development Inc.  
**Amendment Date of Issuance:** January 7, 2021  
**Amendment Effective Date:** January 7, 2021  
**Application Submission Date:** July 23, 2020  
**Amendment Application Number:** 100106055  
**Approved Disturbance Footprint:** 4.8640 ha

**AMENDMENT DETAILS**

<b>Facility Identification No.:</b> 00018315 <b>Facility Name:</b> LNG Canada	Amendment to the facility area and technical changes to permit conditions.
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**GENERAL PERMISSIONS, AUTHORIZATIONS and CONDITIONS**

**PERMISSIONS**

**Oil and Gas Activities Act**

1. The BC Oil and Gas Commission (the "Commission"), under section 31(7) and section 26(1)(d) of the *Oil and Gas Activities Act*, hereby grants an amendment to the permit issued for the above referenced Application Determination Number, any associated authorizations subject to the original permit, any subsequent amendments and any additional or revised conditions as set out herein, as per the Amendment Details table above and, if required, as detailed in the Activity Details table(s) below.
2. The permissions and authorizations granted under this permit are limited to the area identified in the spatial data submitted to the Commission in the permit application as identified and dated above; herein after referred to as the 'activity area'.

**Petroleum and Natural Gas Act**

3. Pursuant to section 138(1) of the *Petroleum and Natural Gas Act*, the Permit Holder is permitted to enter, occupy and use any unoccupied Crown land located within the activity area to carry out the oil and gas activities and related activities permitted, or authorized herein.
  - a) The permission to occupy and use Crown land does not entitle the Permit Holder to exclusive possession of the area.
  - b) The total disturbance within the activity area must not exceed the total approved disturbance footprint as referenced above.

## AUTHORIZATIONS

### Forest Act

4. The Commission, pursuant to section 47.4 of the *Forest Act*, hereby authorizes the removal of Crown timber from the activity area under the cutting permits associated with the Master Licence(s) as follows:

**Master Licence to Cut No.:** M02415

**Cutting Permit No.:** 1

**Timber Mark No.:** MTB607

**Total New Cut:** 4.864 ha

**Forest District:** (DKM) Coast Mountains Natural Resource District

**Region:** Coastal

5. The cutting permit is deemed spent upon the submission of the post-construction plan or upon either the cancellation or expiry of the activities authorized under the permit.

### Notification

6. Within 60 days of the completion of land clearing activities under this permit, the Permit Holder must submit to the Commission a post-construction plan as a shapefile and PDF plan accurately identifying the location of the total area actually disturbed under this permit. The shapefile and plan must be submitted via eSubmission.
7. The Permit Holder must submit the notice required under section 3(1)(g) of the Liquefied Natural Gas Facility Regulation ("LNGFR") in writing to [ogcpipelines.facilities@bcogc.ca](mailto:ogcpipelines.facilities@bcogc.ca) and by submitting a "Notice of Construction Start" through KERMIT.
8. At least ten (10) working days prior to the commencement of any changes in or about a stream associated with maintenance activities authorized under this permit, the Permit Holder must provide a notice of works to any First Nation(s) who may have Aboriginal Interests identified, as per the BC First Nations Consultative Areas Database, within the area in which the works are to occur.

### General

9. The rights granted by this permit in relation to unoccupied Crown land are subject to all subsisting grants to or rights of any person made or acquired under the *Coal Act*, *Forest Act*, *Land Act*, *Mineral Tenure Act*, *Petroleum and Natural Gas Act*, *Range Act*, *Water Sustainability Act* or *Wildlife Act*, or any extension or renewal of the same.
10. The Permit Holder must not assign, sublicense or permit any person other than its employees, contractors or representatives, to use or occupy any Crown land within the activity area without the Commission's written consent.
11. The Permit Holder must ensure that any Crown land within the activity area is maintained in a condition so as to minimize hazards, including but not limited to hazards associated with storage of materials and equipment.
12. The Permit Holder must ensure that any Crown land within the activity area is maintained free of garbage, debris and unused equipment.

### Clearing

13. The Permit Holder is permitted to fell any trees located on Crown land within 1.5 tree lengths of the activity area that are considered to be a safety hazard according to *Workers Compensation Act* regulations and must be felled in order to eliminate the hazard. Trees or portions of these trees that can be accessed from the activity area without causing damage to standing timber may be harvested.
14. The authorized cutting permit does not grant the Permit Holder the exclusive right to harvest Crown timber from the activity area. Authority to harvest some or all of the timber may be granted to other persons. The Permit Holder's right to harvest timber applies to any timber found on the site at the time they undertake harvesting activities.

15. All harvested Crown timber must be marked with the Cutting Permit's associated Timber Mark.
16. Timber harvesting under the above Cutting Permit must not commence until the Permit Holder has submitted the relevant appraisal documents to the Ministry of Forests, Lands and Natural Resource Operations and Rural Development and received confirmation of the stumpage rate.
17. Any timber removed from the activity area must be scaled in accordance with scaling requirements of the *Forest Act*.
18. Stumpage for cutting permits falling within the Coast Area, as defined in the Coast Appraisal Manual (Manual), will be calculated in accordance with the Manual (volume based).
19. Any waste assessments applied under the Master Licence to Cut are subject to the merchantability specifications and monetary waste billing requirements in the Provincial Logging Residue and Waste Manual specific to the region associated with the Cutting Permit authorization.

### Water Course Crossings and Works

20. Stream, lake and wetland crossings must be constructed in accordance with the methods and any mitigations, as specified in the application.
21. In-stream activities within a fish bearing stream, lake or wetland must occur
  - a) during the applicable reduced risk work windows as specified in the Skeena Region – Reduced Risk Work Windows; or
  - b) in accordance with alternative timing and associated mitigation recommended by a Qualified Professional and accepted by the Commission; or
  - c) in accordance with an authorization or letter of advice from Fisheries and Oceans Canada that is provided to the Commission.
22. At any time, the Commission may suspend instream works authorized under this permit. Suspensions on instream works will remain in place until such time as the Commission notifies permit holders that works may resume. Reasons for suspension of works may include, but are not limited to, drought conditions and increased environmental or public safety risks.
23. Equipment used for activities under this Permit must not be situated in a stream channel unless it is dry or frozen to the bottom at the time of the activity.
24. Following initial construction of the facility piping, stream, lake and wetlands crossings are authorized for necessary maintenance activities on the activity area except for:
  - a) stream bank or stream bed revetment works in a stream classified as S1, S2, S3, S4 or S5;
  - b) facility piping replacement within the stream channel where the original application specified a trenchless crossing method and the planned works involve a trenched crossing method;
  - c) permanent alteration of a stream bank;
25. Following initial construction of permanent access, stream crossings are authorized for necessary access modification or maintenance activities on the activity area except for:
  - a) construction or replacement of a bridge or major culvert on a S1, S2, S3 or S5 stream;
  - b) installation of a closed bottom structure in a fish bearing stream; and
  - c) excavation or grading of a stream bank or stream bed.
26. The Permit Holder must ensure any instream works related to maintenance are planned and overseen by a qualified professional. This individual must assess and determine whether planned works pose a risk to any of the features listed below, and is responsible for developing and implementing mitigation measures to reduce any potential impacts on these features, as required:
  - a) Fish or important fisheries habitat;
  - b) Species identified as special concern, threatened, or endangered under the federal *Species at Risk Act*; or

- c) Species identified by Order as a species at risk under the *Forest and Range Practices Act* or the *Oil and Gas Activities Act*.

This assessment must be provided to the Commission upon request.

27. Open cut crossings and works within streams, lakes or wetlands must be planned and conducted in accordance with the following requirements:
- a) An open cut of a stream classified as S1, S2, S3 or S4 must not occur, unless the stream is frozen to its bed or is completely dry with no evidence of subsurface flow;
  - b) Unless otherwise authorized by Fisheries and Oceans Canada, spawning gravels must not be disturbed when redds that contain eggs or alevins are present. The authorization must be provided to the Commission; and
  - c) Channels, banks and beds of streams, including any disturbed stable natural material must be restored, to the extent practicable, to the structure and conditions that existed before the crossing construction was initiated.
28. Flow isolation crossings and works must be planned and conducted in accordance with the condition above regarding open cut crossings, and the following additional requirements:
- a) Construction of the crossing or works, including the location and operation of any equipment, must be isolated from water flowing in the stream;
  - b) Water from flumes, pump-arounds, diversions, or other methods must be released to downstream areas in a manner that avoids erosion or sediment release;
  - c) Pump intakes must not disturb beds of fish bearing streams, except as necessary to ensure safe installation and operation of equipment, and must be screened with maximum mesh sizes and approach velocities in accordance with the Fisheries and Oceans Canada Freshwater Intake End-of-Pipe Fish Screen Guideline; and
  - d) Water flows downstream of in-stream construction sites must be maintained at volume and discharge consistent with upstream flows.
29. Mechanical stream crossings and stream crossings for permanent access must be constructed, maintained and deactivated according to the following requirements, as applicable:
- a) Only bridges, culverts, ice bridges or snow fills may be constructed at stream crossings;
  - b) The Permit Holder must ensure that permanent bridges are designed and fabricated in compliance with:
    - (i) the Canadian Standards Association Canadian Bridge Design Code, CAN/CSA-S6; and
    - (ii) soil property standards, as they apply to bridge piers and abutments; set out in the Canadian Foundation of Engineering Manual.
  - c) Except with leave of the Commission, the Permit Holder must ensure that:
    - (i) culverts are designed and fabricated in compliance with the applicable:
      - (a) Canadian Standards Association CSA G401, Corrugated Steel Pipe Products; or
      - (b) Canadian Standards Association Standard CSA B1800, Section B182.2, Plastic Non-pressure Pipe Compendium; or
    - (ii) Any pipe installed in lieu of a culvert is of at least equivalent standard and strength as any culvert as specified above.
  - d) Except with leave of the Commission, the Permit Holder must ensure that bridges or culverts meet the criteria set out in (i), (ii) or (iii) below:
    - (i) the bridge or culvert is designed to pass the highest peak flow of the stream that can reasonably be expected within the return periods set out in column 2 of the table below for the period the Permit Holder anticipates the structure will remain

on site, as set out in column 1 of the table below:

<b>Column 1</b> <b>Anticipated period crossing structure will remain on site</b>	<b>Column 2</b> <b>Peak flow period</b>
Bridge or culvert, 3 years or less	10 years
Bridge other than a bridge within a community watershed, more than 3 years but less than 15	50 years
Bridge within a community watershed, more than 3 years	100 years
Bridge, 15 years or more	100 years
Culvert, more than 3 years	100 years

(ii) The bridge, or any component of the bridge:

- (a) is designed to pass expected flows during the period the bridge is anticipated to remain on the site;
- (b) is constructed, installed and used only in a period of low flow; and
- (c) is removed before any period of high flow begins.

(iii) The culvert:

- (a) is a temporary installation, and the Permit Holder does not expect to subsequently install a replacement culvert at that location;
- (b) is not installed in a stream, when the stream contains fish;
- (c) is sufficient to pass flows that occur during the period the culvert remains on the site;
- (d) is installed during a period of low flow; and
- (e) is removed before any period of high flow begins.

- e) Snow fills must consist of clean snow and may only be located on streams that are dry or frozen to the bottom during the period of construction, maintenance and use. Where periodic thaws are anticipated, the Permit Holder must ensure measures are in place that allows meltwater to pass through, ensure movement of fish is not impeded, and prevent pooling on the upstream side of the snow fill. Snow fill and any installed culverts must be removed prior to spring snow melt;
- f) Ice bridges on fish bearing streams may only be constructed where sufficient water depth and stream flows prevent the bridge structure from coming in contact with the stream bottom;
- g) Water applied to construct an ice bridge on a water body must be sourced in accordance with the *Water Sustainability Act* unless
  - (i) the water body is a stream with a stream channel width of at least 5 meters and is not designated as a sensitive stream under the Fish Protection Act, or has a riparian class of W1, W3, or L1;
  - (ii) the water is sourced from the same water body proximal to the location on which the ice bridge is constructed;
  - (iii) the water body is not within the boundaries of a public park;
  - (iv) pump intakes do not disturb beds of streams or wetlands and are screened with a maximum mesh size and approach velocity in accordance with the Fisheries and Oceans Canada Freshwater Intake End-of-Pipe Fish Screen Guideline, and
    - (a) where the water body is a stream, the flow of water in the stream at the time and location of pumping exceeds 60 litres per second and the

- instantaneous pumping rate does not exceed 1% of the water flowing in the water body at the time and location the pumping occurs, or
- (b) where the water body is a lake or pond, the cumulative volume of water withdrawn does not exceed 10 cm of lake or pond depth, calculated as the product of lake or pond surface area x 10 cm;
- (v) records of water withdrawal and corresponding streamflow measurements are maintained by the Permit Holder and provided to the Commission upon request.
- h) Bridge or culvert abutments, footings and associated scour protection must be located outside the natural stream channel and must not constrict the channel width.
- i) Wetland crossings must be constructed, maintained and removed in accordance with the following:
  - (i) Organic cover within and adjacent to the wetland must be retained;
  - (ii) Minimize erosion or release of sediment within the wetland;
  - (iii) Any padding materials must be placed on the wetland surface only and must not be used for infilling;
  - (iv) Any padding materials must be removed as soon as practicable following construction, considering weather and ground conditions; and
  - (v) The wetland, including banks and bed, must be restored, to the extent practicable, to the condition that existed before the crossing was initiated.

**Archaeology**

- 30. If an artifact, feature, material or thing protected under the *Heritage Conservation Act* is identified within the activity area, the Permit Holder must, unless the Permit Holder holds a permit under section 12.4 of the *Heritage Conservation Act* issued by the Commission in respect of that artifact, feature, material or thing:
  - a) immediately cease all work in the vicinity of the artifacts, features, materials or things;
  - b) immediately notify the Commission; and,
  - c) resume work in the vicinity of the artifacts, features, materials or things in accordance with direction from the Commission.

**ACTIVITY SPECIFIC DETAILS PERMISSIONS AND CONDITIONS**

**FACILITIES**

Land Area Number: 100008586

**TECHNICAL ACTIVITY DETAILS**

<b>Facility ID:</b> 00018315	<b>Facility Name:</b> LNG Canada
<b>Facility Type:</b> LNG Plant	<b>Location:</b> A-005-B/103-I-02
<b>Equipment:</b> Generator	
<b>Equipment:</b> Compressor	
<b>Equipment:</b> Flare Stack	
<b>Equipment:</b> Incinerator	
<b>Equipment:</b> Facility Storage	
<b>Equipment:</b> Dehydrator	

**Technical Facility Permissions**

31. The Permit Holder may flare gas from the four flares and nine liquid burners, identified as “warm wet”, “cold dry”, “spare”, “storage & loading”, “liquid burner A,” “liquid burner B,” “liquid burner C,” “liquid burner D,” liquid burner E,” liquid burner F,” liquid burner G,” “liquid burner H” and “liquid burner I” in L001-06200-PX-2366-1002, rev H, Process Flow Diagram Unit 6200 Pressure Relief and Liquid Disposal System Sheet 2, 7 April 2020 for the following purposes:
- a) flare pilots;
  - b) flare system purge;
  - c) de-inerting of LNG carriers;
  - d) process upsets; and
  - e) commissioning.

*All permissions for this activity are subject to the following conditions:*

**Facility Conditions**

32. The LNG facility must not exceed any of the following:
- a) a maximum inlet gas rate of 4400 mmscfd;
  - b) a maximum inlet gas H<sub>2</sub>S concentration of 23 mg/m<sup>3</sup>;
  - c) a maximum of four LNG trains;
  - d) a maximum of two full containment or membrane LNG tank systems;
  - e) the following maximum specific storage limits:

<u>Stored Substance</u>	<u>Maximum Storage Container Capacity</u>
LNG	2 x 241,983 m <sup>3</sup> ,
Ethane Refrigerant	2,806 m <sup>3</sup> ,
Propane Refrigerant	2,086 m <sup>3</sup> ,
Precool Refrigerant	2,806 m <sup>3</sup> ,
Condensate	2 x 13,769 m <sup>3</sup> ,
Diesel	356 m <sup>3</sup>

- or,
- f) a maximum of two LNG carrier berths.

33. The LNG facility must include:
- a) thermal oxidizers sized to manage continuous combustion of waste gas for each train; and
  - b) plume abated cooling towers for each LNG train, which utilize features, including low noise fans, to meet the requirements of conditions 44 through 50.
34. The Permit Holder must notify the Commission via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), at least 24 hours before de-inerting a LNG carrier at the LNG facility.
35. The Permit Holder must not undertake commissioning, or operation of the LNG facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, a Flaring Notification Plan. The Flaring Notification Plan will include:
- a) notification processes specific to
    - i. flaring during commissioning; and
    - ii. flaring during operations; and

- b) notification to residents, the Regional District of Kitimat-Stikine, the District of Kitimat and the Haisla Nation regarding flaring events. The Flaring Notification Plan must include the notification radius for residents as defined below:

H <sub>2</sub> S Content	Notification Radius
<1%	1.0 km
≥1% and <5%	1.5 km
≥5%	3.0 km

36. The Permit Holder must notify residents, the Regional District of Kitimat-Stikine, the District of Kitimat and the Haisla Nation at least 24 hours before a planned flaring event or within 24 hours of the start of an unplanned flaring event if the quantity of gas exceeds 10,000 m<sup>3</sup> per event or the duration exceeds 4 hours. This notification must be conducted in accordance with the relevant detail in the Flaring Notification Plan referenced in condition 35 above.
37. The Permit Holder must ensure that emissions from flares and incinerators do not:
- create a hazard to public health or safety;
  - result in off-lease odours; or
  - result in injury to vegetation or wildlife.
38. Subject to section 18(3) of the LNGFR the Permit Holder must design, maintain and operate flares and incinerators so that flaring, other than flaring for emergency purposes, does not result in:
- the emission of black smoke during normal operations; or
  - the emission of black smoke during process upsets that exceed a period or periods aggregating more than 15 minutes in any two hour period.
39. The Permit Holder must not undertake commissioning of the LNG facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, a Flaring Management Report that documents measures to design, construct and operate the LNG facility to minimize flaring of gas and liquids and associated emissions including, but not limited to, black smoke during commissioning.
40. The Flaring Management Report must be submitted to the Commission at least 18 months prior to commencement of commissioning, subject to any applicable written exemptions.
41. The Permit Holder must implement the measures set out in the Flaring Management Report.
42. The Permit Holder must not undertake any construction of the LNG facility, other than site preparation work, until it has submitted, to the satisfaction of the Commission, documentation demonstrating that the Permit Holder has coordinated the construction activities with the existing LNG Canada Kitimat Terminal methanol operation to protect all workers and assets, including an emergency response plan.
43. The Permit Holder must not undertake any delivery of modules using the material offloading facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, documentation demonstrating that operation at the LNG Canada Kitimat Terminal methanol operation has permanently ceased.
44. The Permit Holder must undertake reasonable measures to mitigate noise from construction activity.
45. The Permit Holder must not undertake commissioning or operation of the LNG facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, an updated ambient noise model including a new baseline survey.
46. Within two years of completing commissioning of each train, the Permit Holder must submit via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the Commission's satisfaction, a noise survey that includes data measurement and an assessment of whether the LNG facility noise emissions meet permissible sound levels and that has:
- been conducted during the summer months and at maximum operating conditions; or,



- b) with leave of the Commission, been conducted at steady state during the summer months, with an additional survey conducted at maximum operating conditions once that level of operation has commenced.

The noise survey must assess the extent to which the following permissible noise levels are met:

Receptor	Universal Transverse Mercator Coordinates (Zone 9 NAD 83)		Permissible Sound Level	
	Easting	Northing	Day	Night
Residence 1	522873 m	5986436 m	50 dBA	40 dBA
Residence 2	522055 m	5988455 m	53 dBA	43 dBA
Residence 3	523026 m	5989089 m	53 dBA	43 dBA
Residence 4	523077 m	5981326 m	53 dBA	43 dBA

47. The Permit Holder must not undertake commissioning, or operation of the LNG facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, a detailed noise impact assessment including:
- The sound power levels of the dominant noise sources and the basis of the sound power level;
  - Details of noise mitigations applied;
  - Results showing the predicted dBA and dBC comprehensive sound levels at far-field (1.5 km) locations and residences 1-4 under representative weather conditions; and
  - Noise contours that demonstrate that the LNG facility does not direct significantly more noise in any particular direction under representative weather conditions.
48. The Permit Holder must not undertake commissioning, or operation of the LNG facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, a background noise monitoring survey, excluding LNG facility construction, at a set of at least 4 representative model validation receptors. The model validation receptors must:
- be located to the north, northwest, west and southwest of the acoustic centre of the LNG facility;
  - be located not less than 100m from the boundary of the main process units such that the measured noise levels are dominated by the noise from the LNG facility as a whole; and
  - be located such that the noise levels are not dominated by a single noise source.
49. Within two years of completing commissioning of each train, the Permit Holder must:
- assess the noise impact assessment by comparing the predicted dBA and dBC comprehensive sound level from the noise impact assessment with the measured dBA and dBC comprehensive sound level at the model validation receptors to determine whether adjustment to the noise impact assessment is recommended; and
  - submit via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the Commission's satisfaction, a report of the assessment required by (a) and an updated noise impact assessment if recommended.
50. The Permit Holder must not undertake commissioning, or operation of the LNG facility until it has implemented a documented Noise Management Program that complies with the applicable requirements set out in the "British Columbia Noise Control Best Practices Guideline". Prior to being implemented, the Noise Management Program must be submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca) and be to the satisfaction of the Commission.
51. The Permit Holder must comply with the applicable requirements set out in the "Measurement Requirements for Upstream Oil and Gas Operations" at the LNG facility.
52. The Permit Holder must select, install and maintain a lighting design that conforms to the Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, Commission Internationale de l'Eclairage (CNC/CIE) 150:2003, as amended from time to time.

53. The Permit Holder must not undertake commissioning or operation of the LNG facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission:
- a) a plan for implementation of a marine safety zone around the LNG carrier berths of 200 m while loading/de-inerting operations are in progress;
  - b) documentation verifying that the required Safety Integrity Levels were achieved;
  - c) an updated As Low As Reasonably Practicable (ALARP) demonstration report for the operational phase addressing health, safety and environmental risks; and
  - d) an analysis of LNG tank design fatigue life based on assumed operating conditions, with a supplementary summary report detailing:
    - i. critical data elements expected and used in this analysis, and
    - ii. events outside of normal operations that would require the completion of a post-event assessment.
54. The Permit Holder must implement a marine safety zone in accordance with the plan submitted pursuant to condition 53(a) above.
55. The Permit Holder must not undertake any construction of the LNG facility, other than site preparation work, until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, an updated ALARP demonstration report for the define phase addressing health, safety and environmental risks.
56. At least 30 days prior to commencing any construction activities under this permit, the Permit Holder must provide the Haisla Nation the proposed construction schedule.
57. Prior to undertaking construction activities within 100 m of a water supply well or waterworks, the Permit Holder must notify the land owner(s) and manager(s) of the water supply well or waterworks of the nature and planned timing of the construction activities.
58. Except where the owner of a water supply well has denied permission for testing, the Permit Holder must have the water in each water supply well or waterworks located within 100 m of the approved operating area analyzed by an accredited laboratory facility using standard and accepted field sampling procedures and have the complete results and analysis reported directly to the Commission via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca) and to the owners of the identified water supply wells. The analysis will include:
- a) basic drinking water chemistry, including anions, cations, pH, alkalinity, SO<sub>4</sub>;
  - b) metals; and
  - c) benzene, toluene, ethylbenzene, xylene and petroleum hydrocarbons.
59. The Permit Holder must not undertake any construction of the LNG facility, other than site preparation work, until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission:
- a) the updated site specific acceleration response spectra; and
  - b) a report on the simulation of the "Golder" slide (north of Moon Bay) modelled at the same water level conditions as the modelled 1975 Moon Bay slide to confirm that the 1975 Moon Bay slide is the most adverse landslide-generated tsunami scenario.
60. The Permit Holder must not undertake any construction of the marine facility, other than site preparation work, until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission:
- a) the updated assessment of the delta frontal slopes adjacent to the proposed marine facilities under both static and seismic loading conditions; and
  - b) the seismic design criteria for marine structures.

61. The Permit Holder must design the marine structures associated with the LNG facility in accordance with Canadian Standards Association (CSA) standard SPE-276.1, "Design requirements for marine structures associated with LNG facilities," and must construct and maintain those marine structures in accordance with the design.
62. The Permit Holder must comply with ASME B31.3-2016 paragraph M341.4 for all Category M Fluid Service piping.
63. The Permit Holder must not allow a LNG carrier to berth at the LNG facility until it has submitted, to the satisfaction of the Commission, a mooring and berthing analysis completed by a qualified professional, if the LNG carrier characteristics exceed:
  - a) a maximum loaded displacement of 148,700 tonnes;
  - b) a maximum length overall of 315.0 m;
  - c) a maximum length between perpendiculars (LBP) of 303.0 m;
  - d) a maximum beam of 50.0 m;
  - e) a maximum moulded depth of 27.0 m;
  - f) a maximum loaded draught of 12.31 m; or
  - g) a maximum ballasted draught of 10.0 m.
64. Despite section 1.1(b) of the LNGFR, the Permit Holder may adhere to the standard published by the Canadian Standards Association as Z276-2018 for the purposes of sections 4(1)(a), 4(2)(a) and 9(1)(a) of the LNGFR in relation to the following components of the LNG Facility:
  - a) two (2) of four (4) LNG trains, including:
    - i. acid gas removal system,
    - ii. dehydration system,
    - iii. LNG liquefaction system,
  - b) one (1) of two (2) full containment LNG tank systems,
  - c) one (1) of two (2) LNG carrier berths; and
  - d) inlet facilities, equipment and utilities associated with (a)-(c) above.

## **ADVISORY GUIDANCE**

1. Construction Plan FINAL\_010043239SK01R4\_2018-07-04.pdf is for the Permit Holder's internal reference only and was not reviewed as a decision tool for this permit, nor does it form an integral part of this permit.
2. Appropriate tenure will be issued upon acceptance of the post-construction plan. Submission of the original application and submission of the post-construction plan is considered an application for all subsequent applicable *Land Act* tenures. Upon the Commission's acceptance of the post-construction plan no further applications for replacement tenure are required.
3. While the permissible sound levels at the receptors listed above will be considered in noise surveys and assessments, the Commission recognizes that LNG facility construction and maintenance, as well as other development not under the control of the Permit Holder, may change the acoustic environment and therefore the permissible sound levels.
4. Prior to LNG facility commissioning, the Permit Holder must obtain a permit to discharge effluent under the *Environmental Management Act* for the operational discharges from cooling tower blowdown, storm water, the effluent treatment plant, and associated works.

## **DEFINITIONS**

For the purposes of interpreting this permit:

**Marine safety zone** is defined as an area surrounding marine infrastructure where a Permit Holder would limit access during specified activities in the interest of public safety.

**Commissioning** means the period of time commencing when operations begin in accordance with section 11 of the LNGFR and ending when the first cargo of LNG is shipped from the LNG train.

For the purposes of interpreting the portions of this permit that pertain to flaring:

**Normal operations** excludes emergency conditions and commissioning.

**Emergency conditions** involve activation of facility safety systems that could lead to emergency flaring. Emergency flaring occurs when safety controls within the LNG facility are enacted to depressurize equipment to avoid possible injury or property loss resulting from explosion, fire or catastrophic equipment failure.

**Process upset** means deviations that require the operator to take measures that prevent safety or production loss and preempt activation of safety systems. Process upset excludes safety systems activation.

This amendment forms an integral part of your permit(s) and should be attached thereto.

Signature



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Authorized Signatory  
Commission Delegated Decision Maker

Copied to: Haisla Nation; JGC Fluor; BC Environmental Assessment Office; WorkSafeBC; District of Kitimat; MFLNRO; Landowner(s)

December 20, 2019

LNG Canada Development Inc.  
400 – 4th Avenue SW (32nd Floor of Shell Centre)  
Calgary, AB T2P 0J4

Attention: LNG Canada Development Inc.

**RE: Permit Extension for Application Determination No. 100083612, OGC Legacy No. 9709124**

**Permit Holder:** LNG Canada Development Inc.  
**Permit Date of Issuance:** December 22, 2015  
**Extension Date of Issuance:** December 20, 2019  
**Extended Expiration Date:** December 22, 2020  
**Application Determination No.:** 100083612  
**Facility ID No.:** 18315

## **PERMISSIONS**

### **Oil and Gas Activities Act**

1. The BC Oil and Gas Commission (the “Commission”), under section 32(5) of the *Oil & Gas Activities Act*, hereby extends the permit and any associated authorizations to construct, maintain and operate a facility.
2. This permit extension is subject to the original permit, authorizations, subsequent amendments and any additional conditions as set out herein.
3. The prescribed period of this permit has been extended for one year and will expire on December 22, 2020 if the permit holder has not begun the activity by this date.

This extension forms an integral part of the permit and should be attached thereto.



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James O'Hanley  
Vice President, Applications  
Commission Delegated Decision Maker

December 17, 2018

LNG Canada Development Inc.  
400 – 4<sup>th</sup> Avenue SW (32<sup>nd</sup> Floor of Shell Centre)  
Calgary, AB T2P 0J4

Attention: LNG Canada Development Inc.

**RE: Permit Extension for Application Determination # 100083612, OGC Legacy # 9709124**

**Permit Holder:** LNG Canada Development Inc.  
**Permit Date of Issuance:** December 22, 2015  
**Extension Date of Issuance:** December 17, 2018  
**Extended Expiration Date:** December 22, 2019  
**Application Determination No.:** 100083612  
**Facility ID No.:** 18315

## **PERMISSIONS**

### **Oil and Gas Activities Act**

1. The BC Oil and Gas Commission (the "Commission"), under section 32(5) of the *Oil & Gas Activities Act*, hereby extends the permit and any associated authorizations to construct, maintain and operate a facility.
2. This permit extension is subject to the original permit, authorizations, subsequent amendments and any additional conditions as set out herein.

This extension forms an integral part of the permit and should be attached thereto.



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James O'Hanley  
Vice President, Applications  
Commission Delegated Decision Maker

December 13, 2017

LNG Canada Development Inc.  
400 – 4<sup>th</sup> Avenue SW (32<sup>nd</sup> Floor of Shell Centre)  
Calgary, AB T2P 0J4

Attention: LNG Canada Development Inc.

**RE: Permit Extension for Application Determination # 100083612, OGC Legacy # 9709124**

**Permit Holder:** LNG Canada Development Inc.  
**Permit Date of Issuance:** December 22, 2015  
**Extension Date of Issuance:** December 13, 2017  
**Extended Expiration Date:** December 22, 2018  
**Application Determination No.:** 100083612  
**Facility ID No.:** 18315

## **PERMISSIONS**

### **Oil and Gas Activities Act**

1. The BC Oil and Gas Commission (the “Commission”), under section 32(5) of the *Oil & Gas Activities Act*, hereby extends the permit and any associated authorizations to construct, maintain and operate a facility.
2. This permit extension is subject to the original permit, authorizations, subsequent amendments and any additional conditions as set out herein.

This extension forms an integral part of the permit and should be attached thereto.



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James O'Hanley  
Vice President, Applications  
Commission Delegated Decision Maker

December 22, 2015

LNG Canada Development Inc.  
400- 4<sup>th</sup> Avenue SW  
Calgary AB T2P 0J4

Attention: LNG Canada Development Inc.

**RE: Facility Permit 9709124**

Date of Issuance: December 22, 2015  
Commission File No: 9709124  
Job No.: 020531401-001  
Site Number: 000041284  
Location NTS: a-5-B/103-I-02  
**Facility Code: 00018315**

**PERMISSIONS**

1. The BC Oil and Gas Commission (the Commission), under section 25(1) of the *Oil & Gas Activities Act*, hereby permits the holder to construct, maintain and operate a facility (the LNG facility) for the purpose of production, gathering, processing, storage, or disposal of petroleum, natural gas or both, subject to the following conditions, any applicable exemptions and authorizations.
2. The permissions and authorizations granted under this permit are limited to the area described in Construction Plan; WSP File: 10043239SK01R1, revision 1, dated February 23, 2015 by WSP Canada Inc. as submitted to the Commission in the application dated September 3, 2015.
3. The permit holder may flare gas from the four flares and three liquid burners, identified as “warm wet”, “cold dry”, “spare”, “storage & loading”, “liquid burner A”, “liquid burner B” and “liquid burner C” in L001-06200-PX-2366-1002, rev C, Process Flow Diagram Unit 6200 Pressure Relief and Liquid Disposal System Sheet 2, 15 May 2015 for the following purposes:
  - a. flare pilots;
  - b. flare system purge;
  - c. de-inerting of LNG carriers;
  - d. process upsets; and
  - e. commissioning and start-up.
4. Pursuant to Section 138(1) of the *Petroleum and Natural Gas Act*, the Permit holder is authorized to enter, occupy and use any unoccupied Crown land located within the operating area to carry out the oil and gas activity authorized under this permit.
5. The authorization to occupy and use Crown land expires if this permit expires, or is suspended, cancelled, surrendered or declared spent.

**CONDITIONS**

1. Within 60 days of submitting to the Commission a notice of the intention to begin operation of a stage of the LNG facility, the permit holder must submit to the Commission a Post-Construction Plan as an ePASS shape file identifying the location of the total operating area.
2. The LNG facility must not exceed any of the following:
  - a. a maximum inlet gas rate of 4300 mmscfd;
  - b. a maximum inlet gas H<sub>2</sub>S concentration of 23 mg/m<sup>3</sup>;
  - c. a maximum of four LNG trains;
  - d. a maximum of two full containment or membrane LNG tank systems;



- e. the following maximum specific storage limits:

<u>Stored Substance</u>	<u>Maximum Storage Container Capacity</u>
LNG	2 x 240,401 m <sup>3</sup> ,
Ethane Refrigerant	2,086 m <sup>3</sup> ,
Propane Refrigerant	2,086 m <sup>3</sup> ,
Precool Refrigerant	2,086 m <sup>3</sup> ,
Condensate	2 x 13,040 m <sup>3</sup> ,
Diesel	332 m <sup>3</sup>

- f. a maximum of two LNG carrier berths.

- 3. The LNG Facility must include:
  - a. thermal oxidizers sized to manage continuous combustion of waste gas for each train; and
  - b. plume abated cooling towers for each LNG train, which utilize features, including low noise fans, to meet the requirements of conditions 14-17.
- 4. The permit holder must notify the Commission via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), at least 24 hours before de-inerting a LNG carrier at the LNG facility.
- 5. The permit holder must not undertake commissioning, start up, or operation of the LNG facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, a Flaring Notification Plan. The Flaring Notification Plan will include:
  - a. notification processes specific to
    - i. flaring during commissioning; and
    - ii. flaring during operations; and
  - b. notification to residents, the Regional District of Kitimat-Stikine, the District of Kitimat and the Haisla Nation regarding flaring events. The Flaring Notification Plan must include the notification radius for residents as defined below:

H <sub>2</sub> S Content	Notification Radius
<1%	1.0 km
≥1% and <5%	1.5 km
≥5%	3.0 km

- 6. The permit holder must notify residents, the Regional District of Kitimat-Stikine, the District of Kitimat and the Haisla Nation at least 24 hours before a planned flaring event or within 24 hours of the start of an unplanned flaring event if the quantity of gas exceeds 10,000 m<sup>3</sup> per event or the duration exceeds 4 hours. This notification must be conducted in accordance with the relevant detail in the Flaring Notification Plan referenced in condition 5 above.
- 7. The permit holder must ensure that emissions from flares and incinerators do not:
  - a. create a hazard to public health or safety;
  - b. result in off-lease odours; or
  - c. result in injury to vegetation or wildlife.
- 8. Subject to section 18(3) of the Liquefied Natural Gas Facility Regulation (LNGFR), the permit holder must design, maintain and operate flares and incinerators so that flaring, other than flaring for emergency purposes, does not result in:
  - a. the emission of black smoke during normal operations; or
  - b. the emission of black smoke during process upsets that exceed a period or periods aggregating more than 15 minutes in any two hour period.
- 9. The permit holder must not undertake commissioning of the LNG facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, a Flaring Management Report that documents measures to design, construct and operate the LNG facility to minimize flaring of gas and liquids and associated emissions including, but not limited to, black smoke during commissioning.
- 10. The Flaring Management Report must be submitted to the Commission at least 18 months prior to commencement of commissioning, subject to any applicable written exemptions.
- 11. The permit holder must implement the measures set out in the Flaring Management Report.

12. The permit holder must not undertake any construction of the LNG facility, other than site preparation work, until it has submitted, to the satisfaction of the Commission, documentation demonstrating that the permit holder has coordinated the construction activities with the existing LNG Canada Kitimat Terminal methanol operation to protect all workers and assets, including an emergency response plan.
13. The permit holder must not undertake any delivery of modules using the material offloading facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, documentation demonstrating that operation at the LNG Canada Kitimat Terminal methanol operation has permanently ceased.
14. The permit holder must undertake reasonable measures to mitigate noise from construction activity.
15. The permit holder must not undertake commissioning or operation of the LNG facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, an updated ambient noise model including a new baseline survey.
16. Within two years of completing commissioning of each train, the permit holder must submit via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the Commission's satisfaction, a noise survey that includes data measurement and an assessment of whether the LNG facility noise emissions meet permissible sound levels and that has:
  - a. been conducted during the summer months and at maximum operating conditions; or,
  - b. with leave of the Commission, been conducted at steady state during the summer months, with an additional survey conducted at maximum operating conditions once that level of operation has commenced.

The noise survey must assess the extent to which the following permissible noise levels are met:

Receptor	Universal Transverse Mercator Coordinates (Zone 9 NAD 83)		Permissible Sound Level	
	Easting	Northing	Day	Night
Residence 1	522873 m	5986436 m	50 dBA	40 dBA
Residence 2	522055 m	5988455 m	53 dBA	43 dBA
Residence 3	523026 m	5989089 m	53 dBA	43 dBA
Residence 4	523077 m	5981326 m	53 dBA	43 dBA
1.5 km Receptor Boundary			50 dBA	40 dBA

17. On request of the Commission, the permit holder must submit to the Commission's satisfaction via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), noise surveys or additional assessments at any time in response to noise complaints, LNG facility changes, or any other reason. If the LNG facility noise emissions exceed the permissible sound levels listed in condition 16 above, the permit holder shall complete, to the Commission's satisfaction, a Noise Management Plan.
18. The permit holder must comply with the applicable requirements set out in the "Measurement Requirements for Upstream Oil and Gas Operations" at the LNG facility.
19. The permit holder must submit the notice required under section 3(1)(g) of the LNGFR in writing to [ogcpipelines.facilities@bcogc.ca](mailto:ogcpipelines.facilities@bcogc.ca) and by submitting a "Notice of Construction Start" form through KERMIT.
20. The permit holder must select, install and maintain a lighting design that conforms to the Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, Commission Internationale de l'Eclairage (CNC/CIE) 150:2003, as amended from time to time.
21. The permit holder must not undertake commissioning or operation of the LNG facility until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission:
  - a. a plan for implementation of a marine control zone around the LNG carrier berths of 200 m while loading/de-inerting operations are in progress;
  - b. documentation verifying that the required Safety Integrity Levels were achieved; and
  - c. an updated As Low As Reasonably Practicable (ALARP) demonstration report for the operational phase addressing health, safety and environmental risks.

22. The permit holder must implement a marine control zone in accordance with the plan submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, pursuant to condition 21 above.
23. The permit holder must not undertake any construction of the LNG facility, other than site preparation work, until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission, an updated ALARP demonstration report for the define phase addressing health, safety and environmental risks.
24. At least 30 days prior to commencing any construction activities under this permit, the permit holder must provide the Haisla Nation the proposed construction schedule.
25. Prior to undertaking construction activities within 100 m of a water supply well or waterworks the permit holder must notify the land owner(s) and manager(s) of the water supply well or waterworks of the nature and planned timing of the construction activities.
26. Except where the owner of a water supply well has denied permission for testing, the permit holder must have the water in each water supply well or waterworks located within 100 m of the approved operating area analyzed by an accredited laboratory facility using standard and accepted field sampling procedures and have the complete results and analysis reported directly to the Commission via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca) and to the owners of the identified water supply wells. The analysis will include:
  - a. basic drinking water chemistry, including anions, cations, pH, alkalinity, SO<sub>4</sub>;
  - b. metals; and
  - c. Benzene, toluene, ethylbenzene, xylene and petroleum hydrocarbons.
27. If artifacts, features, materials or things protected under section 13(2) of the *Heritage Conservation Act* (HCA) are identified the permit holder must, unless the permit holder holds a permit under section 12 of the HCA issued by the Commission in respect of that artifact, feature, material or thing:
  - a. immediately cease all work in the vicinity of the artifacts, features, materials or things;
  - b. immediately notify the Commission; and
  - c. refrain from resuming work in the vicinity of the artifacts, features, materials or things except in accordance with an appropriate mitigation plan that has been prepared in accordance with the HCA and approved by the Commission.
28. The permit holder must not undertake any construction of the LNG facility, other than site preparation work, until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission:
  - a. the updated site specific acceleration response spectra; and
  - b. a report on the simulation of the "Golder" slide (north of Moon Bay) modelled at the same water level conditions as the modelled 1975 Moon Bay slide to confirm that the 1975 Moon Bay slide is the most adverse landslide-generated tsunami scenario.
29. The permit holder must not undertake any construction of the marine facility, other than site preparation work, until it has submitted via email to [postpermitrequests@bcogc.ca](mailto:postpermitrequests@bcogc.ca), to the satisfaction of the Commission:
  - a. the updated assessment of the delta frontal slopes adjacent to the proposed marine facilities under both static and seismic loading conditions; and
  - b. the seismic design criteria for marine structures.
30. The permit holder must design the marine structures associated with the LNG facility in accordance with Canadian Standards Association (CSA) standard EXP276.1, "Design requirements for marine structures associated with LNG facilities", and must construct and maintain those marine structures in accordance with the design.

## AUTHORIZATIONS ASSOCIATED WITH THE PERMIT

### Cutting Permit Authorization

1. Pursuant to section 47.4 of the *Forest Act*, the Commission hereby issues Cutting Permit No. 1, under Master License to Cut number M02415, Coast Mountain Forest District, to cut and remove timber from the areas of Crown land within the operating area subject to the following conditions:
  - a. This Cutting Permit is subject to the terms and conditions in the Master Licence to Cut.
  - b. All harvested Crown timber must be marked with Timber Mark Number MTB607.

- c. This Cutting Permit is deemed spent upon the submission of the "Post-Construction Plan" or upon either the cancellation or the expiry of the "permitted oil and gas activity".
- d. This Cutting Permit does not grant the Permit Holder the exclusive right to harvest timber from the License area and the Commission reserves the right to grant rights to other persons to harvest timber from the License area.
- e. The felling, bucking and utilization specifications as described in Appendix A of your Master License to Cut applies to this Cutting Permit.
- f. Stumpage for this Cutting Permit will be calculated in accordance with the Coast Appraisal Manual.
- g. Timber that is stored in decks or piles must be marked with the correct timber mark before transportation, or at the end of every shift. The marking must be applied to one end of at least 10% of the timber pieces in each deck or pile using a hammer indentation or paint. Marking must be kept concurrent with decking.

**ADVISORY GUIDANCE**

- 1. While the permissible sound levels at the receptors listed above will be considered in noise surveys and assessments, the Commission recognizes that LNG facility construction and maintenance, as well as other development not under the control of the permit holder may change the acoustic environment and therefore the permissible sound levels.
- 2. The permit holder is advised that archaeological site GaTe-5 is in conflict with the proposed LNG facility; all archaeological sites must be avoided unless issued a site alteration permit by the Commission, pursuant to section 12 of the HCA.
- 3. The permit holder may only make changes in and about a stream in accordance with an approval under the *Water Act* or in accordance with the regulations, or a licence or order under that Act.
- 4. Prior to LNG facility commissioning, the permit holder must obtain a permit to discharge effluent under the *Environmental Management Act* for the operational discharges from cooling tower blowdown, storm water, the effluent treatment plant, and associated works.

**DEFINITIONS**

For the purposes of interpreting this permit:

**Marine control zone** is defined as an area surrounding marine infrastructure where a permit holder would control access during specified activities in the interest of public safety

For the purposes of interpreting the portions of this permit that pertain to flaring:

**Commissioning** means the period of time commencing when operations begin in accordance with section 11 of the LNGFR and ending when the first cargo of LNG is shipped from the LNG train.

**Normal operations** excludes emergency conditions and commissioning.

**Emergency conditions** involve activation of facility safety systems that could lead to emergency flaring. Emergency flaring occurs when safety controls within the LNG facility are enacted to depressurize equipment to avoid possible injury or property loss resulting from explosion, fire or catastrophic equipment failure.

**Process upset** means deviations that require operator to take measures that prevent safety or production loss and preempt activation of safety systems. Process upset excludes safety systems activation.



Mayka Kennedy, P.Eng., C.Dir.  
 Chief Engineer  
 Commission Delegated Decision Maker

pc: Roy Northern Land Service Ltd.  
MoFLNRO  
CFSW LNG Constructors  
Haisla Nation  
BC Environmental Assessment Office  
WorkSafe BC  
Land owner(s)