

# Frequently Asked Questions About LNG Canada's Effluent Discharge

## What is effluent, and what sort of effluent will be discharged from the LNG Canada facility?

Effluent describes liquid waste introduced into the environment. Effluent is a defined term in the *Environmental Management Act*. LNG Canada's effluent contains stormwater, cooling tower blowdown, treated sanitary wastewater and wastewater from the demineralization process. Most of the discharged water is stormwater.

## Why will effluent be discharged from the LNG Canada facility?

Most of the water we discharge into the environment is from the environment; for example, stormwater, which is an accumulation of rainwater and snow melt. As there isn't sufficient space to retain all the water that accumulates on site, we must return it to the environment by discharging it.

## Where will the discharged effluent go?

Effluent from the LNG Canada facility will be safely discharged into Douglas Channel via two underwater outfall pipes. These pipes are used to transport treated water from the LNG Canada site that meets regulatory criteria for discharge into the Douglas Channel. The outlet of the pipes and their placement ensures dispersion of the discharge.

## What will the discharge look like?

It is not anticipated that effluent discharge will be visible to the human eye at the water surface. The water discharge pipeline outlets are located south of the marine terminal in Kitimat Arm, at a depth of 11 metres below Chart Datum. There will always be a depth of water of 10 to 16 metres (equivalent to the height of a three to five storey building) above the effluent pipelines in all tidal conditions.

## How will wastewater be treated?

Wastewater will be treated in various ways. Some examples include:

- Segregation: Streams with different water qualities will be segregated, so that each can be treated appropriately
- Physical separation: Some streams containing oil will be treated in a corrugated plate interceptor, where oil will be removed from the top. Filtration is also used to remove solids and contaminants
- Physical separation for solids: Some streams that could contain high solids are stored in a pond to ensure settling of solids. Chemicals will be added to assist settling in some cases
- Biological: Certain streams such as sanitary waste will be treated by bacteria in a bioreactor

## How much effluent will be discharged?

The volume and frequency of water discharged from the LNG Canada facility will depend on weather conditions and the facility's operating conditions. The peak effluent discharge from the facility will be 6,000 m<sup>3</sup>/hr (which equates to draining the volume of 2.4 Olympic-sized swimming pools per hour), but will only occur during large rainfall events.

During dry weather periods, the discharge rate will be 2,000 m<sup>3</sup>/hr (which equates to draining the volume of less than one Olympic-sized swimming pool per hour). This will occur intermittently.

## What effluent quality guidelines must be met by LNG Canada?

Effluent must be within discharge limits that will be prescribed in LNG Canada's effluent waste discharge authorization (WDA). LNG Canada has submitted its permit application for normal operations to the BC Energy Regulator via the WDA application process. As part of the permit application, LNG Canada modelled contaminants of concern against applicable [BC Approved Water Quality Guidelines](#) approved by the BC Ministry of Environment and Climate Change Strategy to ensure any impact to the environment is as low as reasonably practicable.

## How will LNG Canada's effluent be monitored and managed?

Inside our facility's fence-line, LNG Canada has online analyzers to provide continuous monitoring of waste streams and holding ponds. This system will be complemented with a comprehensive sampling plan. The online analyzers and samples will be closely monitored by operations staff and engineers to ensure appropriate actions are taken as required to mitigate discharge that does not meet regulatory criteria. LNG Canada has plans in place to adaptively manage and mitigate anomalies in parameters of potential concern that may arise.

Outside the facility's fence-line, a marine monitoring program encompassing a marine water quality monitoring program (MWQMP) and an aquatic effects monitoring program (AEMP) will monitor and manage the effects of LNG Canada's effluent during operations. This plan will be finalized by a qualified professional and is subject to consultation with the Haisla Nation, British Columbia Ministry of Environment & Climate Change Strategy, Fisheries and Oceans Canada, and the BC Energy Regulator as per the conditions of LNG Canada's Environmental Assessment Certificate.

## How often will marine water near the outfall be sampled to determine whether the effluent meets the BC Approved Water Quality Guidelines?

The proposed frequency of the marine water quality sampling near the outfall will be defined in the Marine Water Quality Monitoring Program.

The monitoring frequency may change over the operational life of the facility. When a monitoring program has been implemented for several years, data analysis can be used to justify why seasonal variability has been characterized to reduce sampling requirements.

#### **What are the reporting requirements?**

The reporting requirements will be prescribed in the Waste Discharge Authorization - effluent permit conditions, issued by the BC Energy Regulator.

#### **Will fish be contaminated by effluent discharge?**

LNG Canada predicts no adverse effects on water quality or marine aquatic life. Only marginal increases in effluent concentrations are predicted with no exceedance of the BC Approved Water Quality Guidelines.

A subtidal survey was conducted in October 2012 in support of LNG Canada's Environmental Assessment Certificate (EAC) application and to characterize baseline marine environment. A total of 26 fish species were observed in this survey, alongside three species within the proposed Initial Dilution Zone (IDZ) (flounders, poachers and dolphins).

The environmental effects assessment predicted no adverse effects on water quality or marine aquatic life. Based on modeling, only marginal increases in effluent concentrations were predicted and there was no exceedance of the BC Approved Water Quality Guidelines were predicted, unless there were exceedances in the baseline conditions. Furthermore, no end-of-pipe toxicity was predicted, as the proposed permit limits are derived from various regulatory guidelines. At the marine outfall, within the IDZ, mobile marine organisms such as fish will be able to move to avoid exposure to higher contaminant concentration. Parameters of potential concern (POPC) in the effluent do not bioaccumulate, so organisms within the IDZ will not pass the contamination up through the food chain.

#### **How might effluent discharge impact crustaceans and other marine life that live on the seabed?**

A subtidal survey was conducted in October 2012 in support of LNG Canada's Environmental Assessment Certificate (EAC) application and to characterize baseline marine environment. A number of marine invertebrates and organisms were included in this survey, within the bounds of the IDZ. While no end-of-pipe toxicity is predicted, some organisms may be affected by higher sediment exposure. POPC in the effluent does not bioaccumulate, so organisms within the IDZ will not pass contamination up through the food chain.

#### **Will large marine life, like dolphins and whales, be affected by the effluent discharge?**

Given that POPC does not bioaccumulate, no end-of-pipe toxicity is predicted by the hydro-dispersion modelling. LNG Canada conducted marine mammal surveys in 2013 for its Environmental Assessment Certificate application. Year-round sightings were recorded at the north end of Kitimat Arm for Steller sea lions, harbour seals, Pacific white-sided dolphins, harbour porpoises and Dall's porpoises. The BC Approved Water Quality Guidelines were developed to protect the most sensitive organisms and incorporate a safety margin that protects other more tolerant marine species.

Adhering to these guidelines will protect the range of marine invertebrates, fish, and mammals present in the northernmost area of Kitimat Arm.

#### **Will local marine waters be warmed as a result of effluent discharge?**

Water discharge effects on the ambient, marine waters of Kitimat Arm will be highest during dry, summer conditions, when the temperature of the water discharged from the LNG facility is warmest. Based on modelling, we anticipate that discharge temperature would not exceed 23 degrees Celsius. The discharge will mix within the IDZ and is not expected to have adverse effects on marine life.

#### **Are there any practical alternatives to discharging effluent?**

Due to the large volumes of water that will be generated and collected at the LNG Canada facility, especially from the surface runoff and cooling water system blowdown, recycling or reusing effluent is not practical.

Most of the water discharged will be stormwater due to the heavy rainfall at the Kitimat site.

#### **How will you monitor to make sure that marine life is not affected?**

LNG Canada has established several monitoring programs:

- **Discharge Monitoring Program**, which includes measures for monitoring effluent discharge, including location, frequency, parameters, quality assurance / quality control measures, and compared to discharge limits
- **Marine Water Quality Monitoring Program**, which will validate model predictions, and assure that water quality guidelines are being met and detect change and impacts to the receiving environment
- **Aquatic / Environmental Effects Monitoring Program**, which will include weight of evidence assessment and cumulative effects monitoring in areas that may potentially be affected by the effluent discharge. The monitoring program will be sufficiently robust to assist in detecting a biologically significant predetermined change

#### **Will the outfall pipes be visible during low tide? Will I be able to see the outfall pipes, or the turbulence created by the discharge on the surface of the water?**

The portion of the twin 30" diameter, high density polyethylene (HDPE) effluent pipelines have been laid on the intertidal mudflat at the toe of the former Terminal B quay wall, which is approximately 40 metres long, will be visible at low tide. The outlets of the effluent pipelines are at a depth of 11 metres below Chart Datum and there will be no turbulence created at the water surface during effluent discharge.