KITIMAT
A Marvel of Nature and Industry

SPECIAL MEETING OF COUNCIL
MEETING TO BE HELD IN COUNCIL CHAMBERS AT 606 MOUNTAINVIEW SQUARE ON MONDAY, NOVEMBER 24, 2025, AT 5:00 P.M.

Public Participation

The public can view the livestream of Council meetings on our Council Meeting Livestream webpage.

The public may attend in person. To participate electronically please contact the district office at (250) 632-8900 or email dok@kitimat.ca before 2:00 p.m. the day of the meeting.

1. Call to Order Special Meeting of Council

2. Move to a Closed Meeting of Council

   In compliance with the *Community Charter*, Council will move to a Closed Meeting for one or more items falling under:

   - Section 90(1)(d), security of the property of the municipality;
   - Section 90(1)(e), acquisition, disposition or expropriation of land or improvements;
   - Section 90(1)(g), litigation or potential litigation;
   - Section 90(1)(k), municipal service.

3. Reconvene the Special Meeting of Council at 7:00 p.m.

4. Adoption of Agenda

5. Delegations/Presentations

Page 3

   - Delegation Notice LNG Canada Operations Update (1.1.2.1.1)

6. Public Input / Questions on Agenda Items

7. Media Inquiries - For Clarification Only

8. Adjourn Special Meeting

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DELEGATION NOTICE

Date:	November 19, 2025
File No:	1.1.2.1.1.
To:	Warren Waycheshen, CAO – for Mayor and Council
From:	Jane Stevenson, Deputy Director of Corporate Administration
Delegation:	LNG Canada
Topic:	Noise Management Program
Request Type:	For Information Only
Presentation:	PowerPoint

KITIMAT
A Marvel of Nature and Industry

Teresa Waddington, LNG Canada's Deputy COO and Chief HSSE Officer, will be in attendance to provide Council with an overview of LNG Canada's Noise Management Program. Teresa will be supported by LNG Canada colleagues Tara Barnett, Chief Corporate Relations Officer; Kalada Hart, Environmental and Compliance Lead; and Manju Ranga, Environmental Advisor. Wood Group representative, Chris Bibby, Noise Service Line Manager, will also be in attendance.

Attachment(s): A. PowerPoint presentation

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LNG CANADA
Opportunity for British Columbia. Energy for the world

Noise Management Program Overview

November 24, 2025

Outline

- Land Acknowledgement
- Introductions
- Facility Update
- Intro to Environmental Sound
- Noise Perception
- LNG Canada Regulatory Requirements
- Noise Experienced Since Commissioning
  - Commissioning & Start-up
  - Operation
- Source Identification & Mitigation
- Lookahead

Land Acknowledgement

On the Traditional Territory of the Haisla Nation

We are building our asset on the traditional territory of the Haisla people alongside the neighbouring traditional territories of Kitselas First Nation and Kitsumkalum Band. Our shipping route passes through traditional territories of Gitga'at Nation, Gitxaala Nation, Metlakatla First Nation and Lax Kw'alaams Band

We are fortunate and grateful to have the support and involvement of the Haisla and these other Indigenous communities. Working closely with Indigenous communities including Metis people has provided us opportunities to listen, learn, and seek ways to participate in reconciliation

Introductions

Introductions

Representing LNG Canada:

- Teresa Waddington, Deputy COO and Chief HSSE Officer
- Tara Barnett, Chief Corporate Relations Officer
- Kalada Hart, Environmental and Compliance Lead
- Manju Ranga, Environmental Advisor

Chris Bibby

Noise Service Line Manager

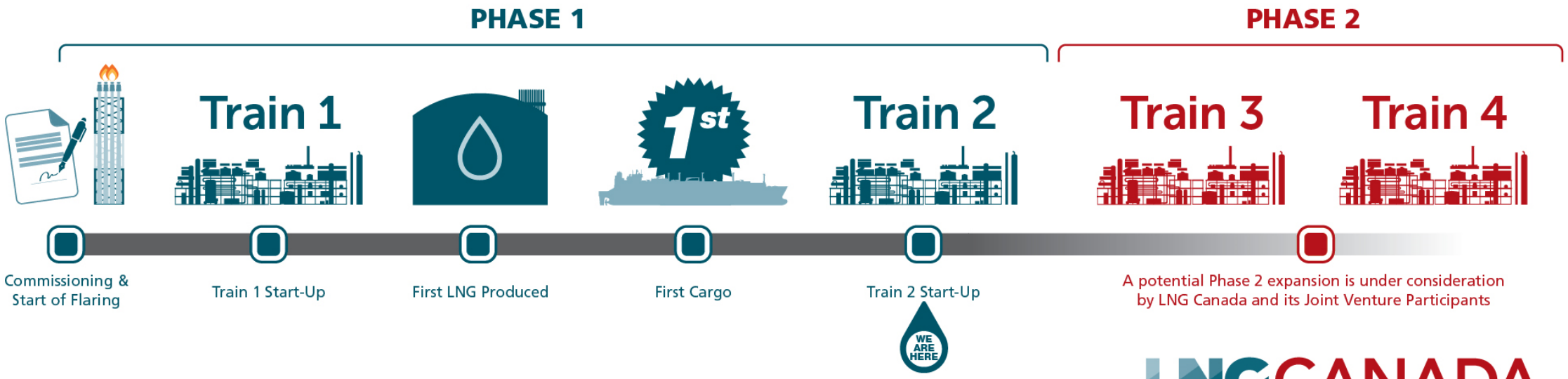
MASc, P.Eng.

Chris Bibby is an acoustical consultant with Wood Group. He has over 15 years' experience primarily focused on industrial noise assessment in Western Canada. Chris is a registered professional engineer in BC, Alberta, and Manitoba, and a member of the Canadian Acoustical Association and the Institute of Noise Control Engineers. He has a Masters degree in acoustics from the University of British Columbia, and 15 publications and presentation on noise and vibration.

Chris has been providing acoustical consultant to the LNG Canada project since 2017, drawing on Wood's experience with noise and vibration assessments for LNG facilities across North America and Australia.

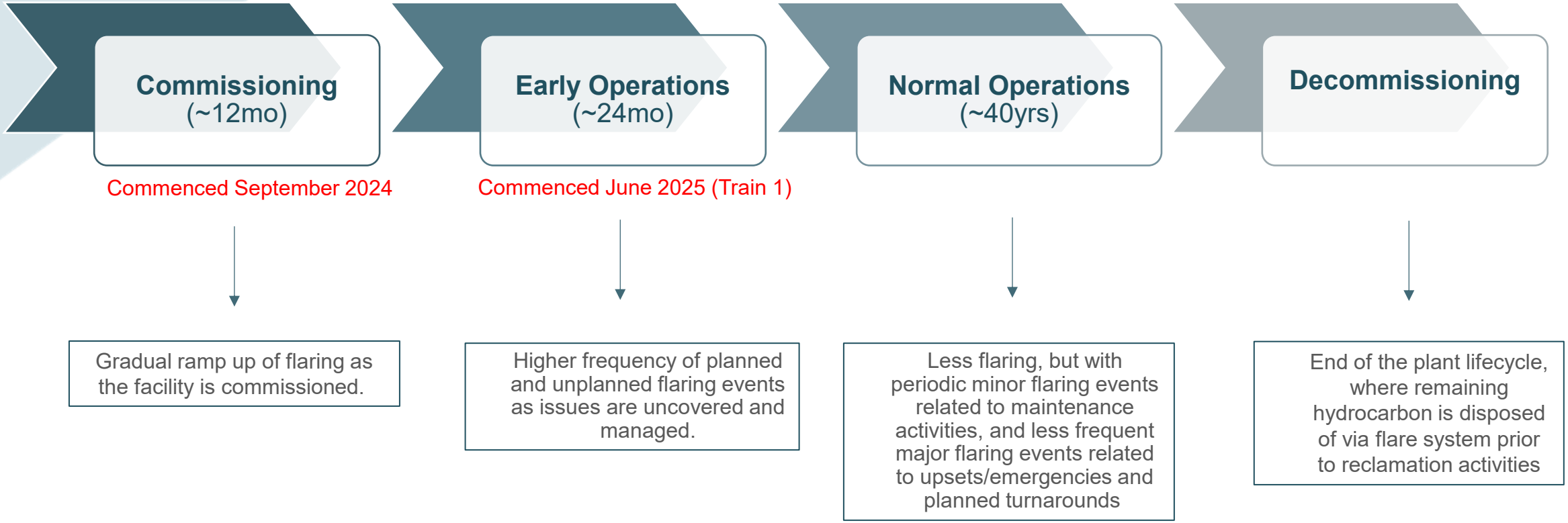
Facility Update

LNG Canada's Start-Up Process



LNGCANADA

How Long Does Flaring Last?



Environmental Sound

Chris

Amplitude and Frequency

AMPLITUDE relates to the VOLUME of the sound.

High volume = Loud

Low volume = Quiet

FREQUENCY relates to the PITCH of the sound.

High frequency = Treble

Low frequency = Bass

Chris

Amplitude – Decibel

The change in dB can be easily related to changes in human perception of loudness.

A change of 1dB is not noticeable outdoors;

A change of 3dB is usually noticeable;

A change of 5dB is clearly noticeable;

A change of 10dB is usually considered to be *subjectively* twice as loud or half as loud

Residential Community Type	Typical Nighttime Sound Level (dBA)
Quiet Rural	35
Quiet Suburban	38-42
Normal Suburban	43-47
Urban	48-52
Noisy Urban	53-57
Very Noisy Urban	58-62

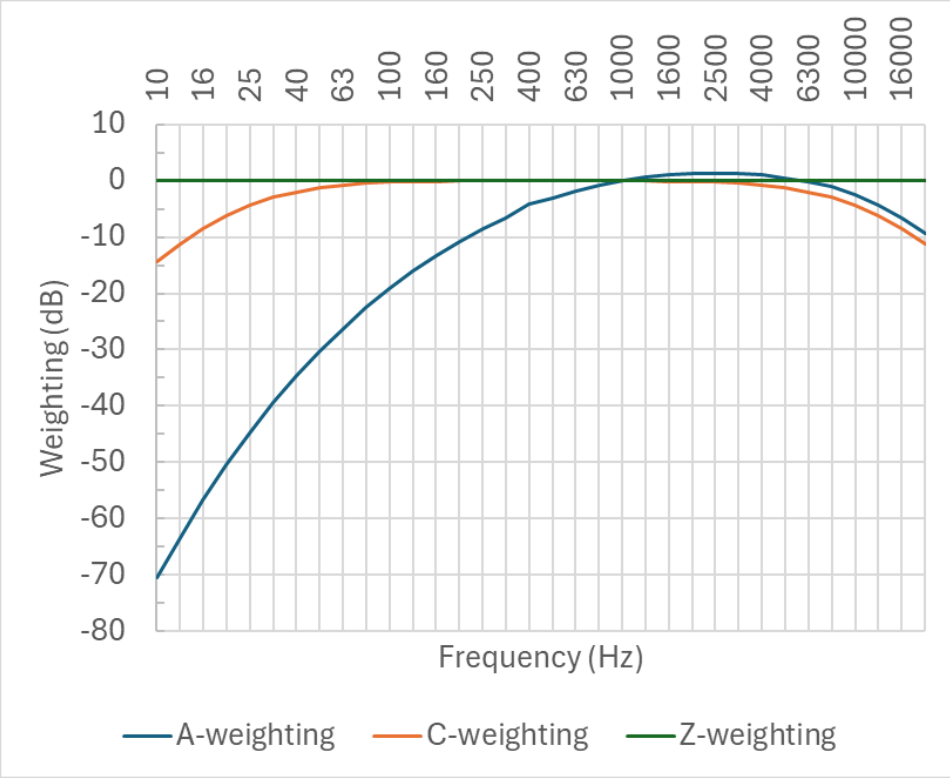
Health Canada, 2017

Chris

Frequency - Hertz

Frequency is given as Hertz (Hz)

The human range of detectable frequencies is about 20Hz to 20,000Hz



People do not perceive all frequencies as having equal loudness.

- A-weighting reflects human hearing at normal sound levels. It has reducing sensitivity below 500 Hz.
- C-weighting has increased sensitivity to low-frequency sound.

dBA and dBC are A- and C-weighted sound levels

Outdoor Sound Propagation

Sound Level at Receiver = Sound Power of Source – Attenuation from Propagation

- Sound is attenuated as it propagates:
  - Attenuation due to distance (spreading)
  - Molecular absorption
  - Ground absorption
  - Barrier and reflection effects of terrain and objects
  - Scattering and attenuation due to foliage
  - Wind and temperature gradient effects

- The attenuation of sound as it propagates from source to receiver is highly variable with changing wind and ground conditions (10 dB or more).
- Noise in the community can vary dramatically even when the noise source level is steady.

Industrial Noise: Perception in the Community

What is Noise?

Everything we hear is SOUND

UNWANTED sound is NOISE

An Example:

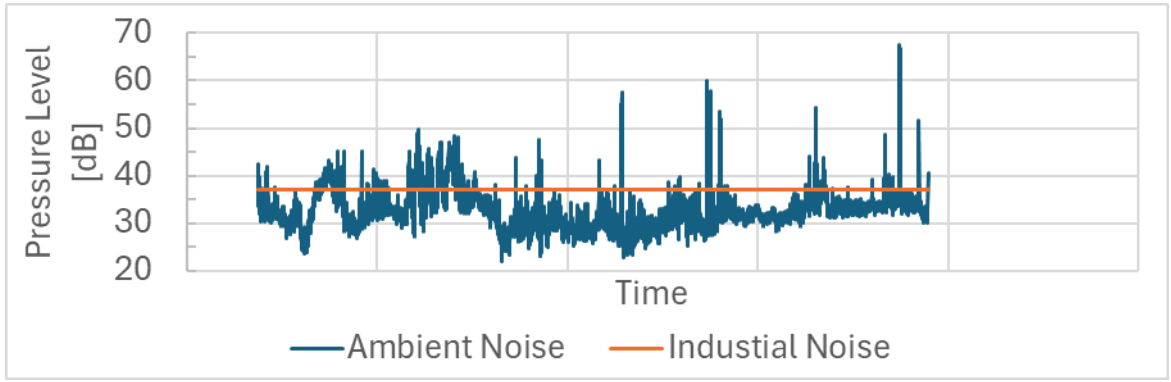
- A truck pulls up in a quiet residential street at 4am and the airbrakes wake all the residents.
- Is this sound or noise?
- For most of the residents, it will clearly be noise.
- But for the family of the truck driver, it means he's home safely – it's a *wanted* sound and therefore to them it's not noise.

Audibility

Compliance with BCER Noise Guideline does not imply inaudibility

"…considers the interests of both nearby residents and the permit holder. It is not a guarantee that residents will not hear noise from a well activity, or a facility; rather, it aims to address noise levels for residents nearby"

- limits are approximately 5 dB LAeq above the average ambient (clearly noticeable)
- Ambient fluctuates. Industrial noise is more audible when ambient is low.



Annoyance

- Acoustic characteristics **do not** play an overwhelming role in the concept of annoyance
  - Acoustic characteristics including loudness, frequency content, fluctuation, etc., only account for 33% of the annoyance response to noise
  - Noise levels only account for 16% of the annoyance response.

- Non-acoustic characteristics are just as important:
  - perceived control,
  - attitudes towards the sound and its source
  - personality traits like noise sensitivity,

The extent to which noise results in annoyance is strongly related to the individual and the relationship the individual has with the source of noise.

[1] R. Guski, THE CONCEPT OF NOISE ANNOYANCE: HOW INTERNATIONAL EXPERTS SEE IT, J of S&V, 1999
[2] E. Maris, The social side of noise annoyance, LEI Universiteit Leiden, 2008

LNG Canada Regulatory Requirements

Facility Permit

BCER facility permit conditions (Oct 20, 2023)	Pre-Construction	During Construction	During Operation
47: Noise impact assessment (modeling)	Completed		
50: Implement noise management program	Completed BCER Approved	Implement	Implement
44: Take reasonable measures to mitigate construction noise		Ongoing	Ongoing
46: Comprehensive sound level survey at four community receptors within 2 years of start-up			Future
49: Validate noise impact assessment within 2 years of start-up			Future

BC Noise Control Best Practices Guideline

BCER Residential Noise Limits (PSLs) apply during operation.

- If a credible complaint is received during operation, a noise survey must be completed to demonstrate compliance with the PSLs.

Noise emission not associated with normal operation does not have specific limits:

- Construction
- Commissioning and start-up
- Emergency and upset events

Noise management program always applies, including:

- Complaint response
- Measurement
- Continuous improvement

BCER Permissible Sound Levels

BCER Permissible Sound Level (PSL) established for each dwelling type based on:

- proximity to heavily travelled roads, and
- dwelling density

Compliance is assessed by comparing the sound level measured at the dwelling to the PSL.

Measured sound level is called the Comprehensive Sound Level (CSL)

- 5 dBA penalty is applied to the CSL if a Low-Frequency Noise (LFN) condition is present
- PSL can be increased for temporary noise events (e.g., flaring during a planned shutdown)

Nighttime Permissible Sound Levels

	Dwelling unit density per quarter section of land		
Distance to HWY (m)	1 - 8 dwellings; 22:00 - 07:00 (nighttime) (dBA Leq)	9 - 160 dwellings; 22:00 - 07:00 (nighttime) (dBA Leq)	>160 dwellings; 22:00 - 07:00 (nighttime) (dBA Leq)
>500 m	40	43	46
<500 m	45	48	51
<100 m	50	53	56

Noise Since Comissioning

Overview

Noise concerns were raised starting in the fall of 2024 when commissioning started.

Noise management program was followed, including:

- Proactive community engagement
- Proactive facility noise monitoring, source investigation, and mitigation
- Proactive community noise monitoring through commissioning (Kildala, Kitamaat Village, Strawberry Meadows)
- CSL surveys at complainants' residences to assess compliance
- Extended CSL survey in Strawberry Meadows, requested by BCER, to provide an extended record of assessed noise level during operation.

Measurement methodology

Sound measurement equipment conforms with BCER Comprehensive Sound Level survey requirements:

Class 1 sound measurement system

Current laboratory calibration

Calibration checked with a Class 1 field calibrator during deployment

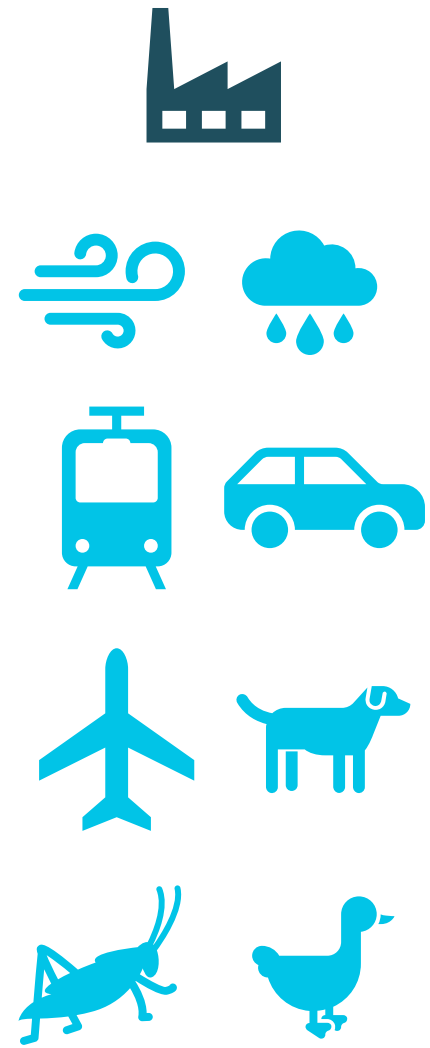
Microphone location approximately 15 m from the dwelling

- logs 1-minute noise data
- records continuous audio to support isolation analysis

Weather station deployed near the microphone

- logs 1-minute wind speed, wind direction, precipitation, temperature, humidity, pressure

Isolation methodology



The intent of the sound level survey is to quantify the impact of industrial noise.

Measured data also includes sound from many non-industrial sources such as trains, vehicles, wind, rain, pets, wildlife and other community sounds.

In cases where non-industrial noise exceeds normal ambient levels, these periods are excluded from the dataset (BCER Guideline Section 4.4.2).

Automated isolation for inclement weather

- High wind
- Rain

Manual isolation for abnormal noise events

Chris

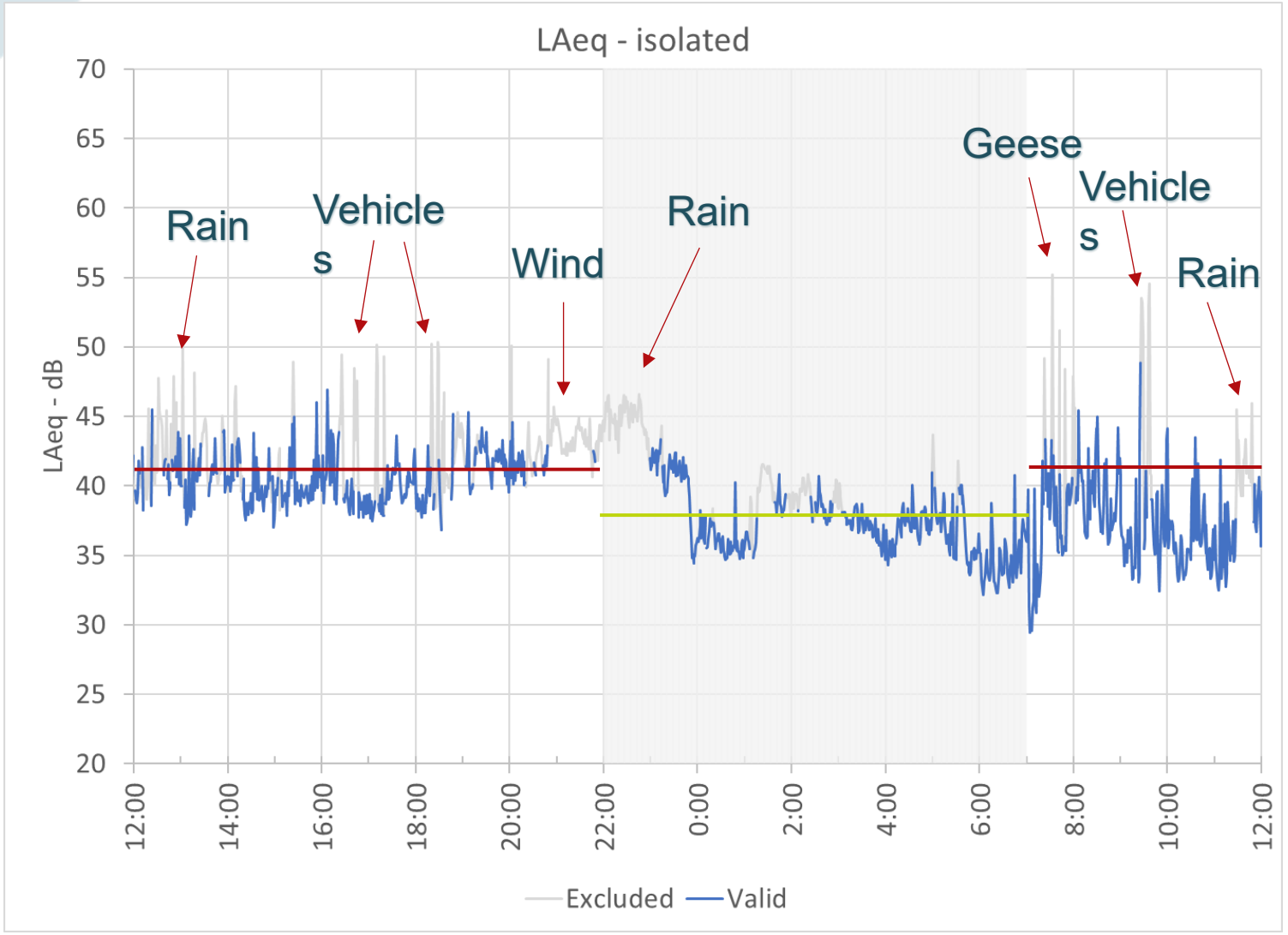
Determining CSL

Example:

Isolation analysis is completed to remove inclement weather and applicable noise events

Daytime and Nighttime CSL values are the average of all remaining valid data:

- 41 dB LAeq daytime
- 38 dB LAeq nighttime



Low-frequency Noise (LFN)

BCER uses the difference between dBC and dBA levels to indicate the prominence of low-frequency content

An LFN complaint condition may exist when:

Average daytime or nighttime dBC-dBA value exceeds 20 dB, and

A clear tonal component exists at a frequency below 250 hertz (Hz)

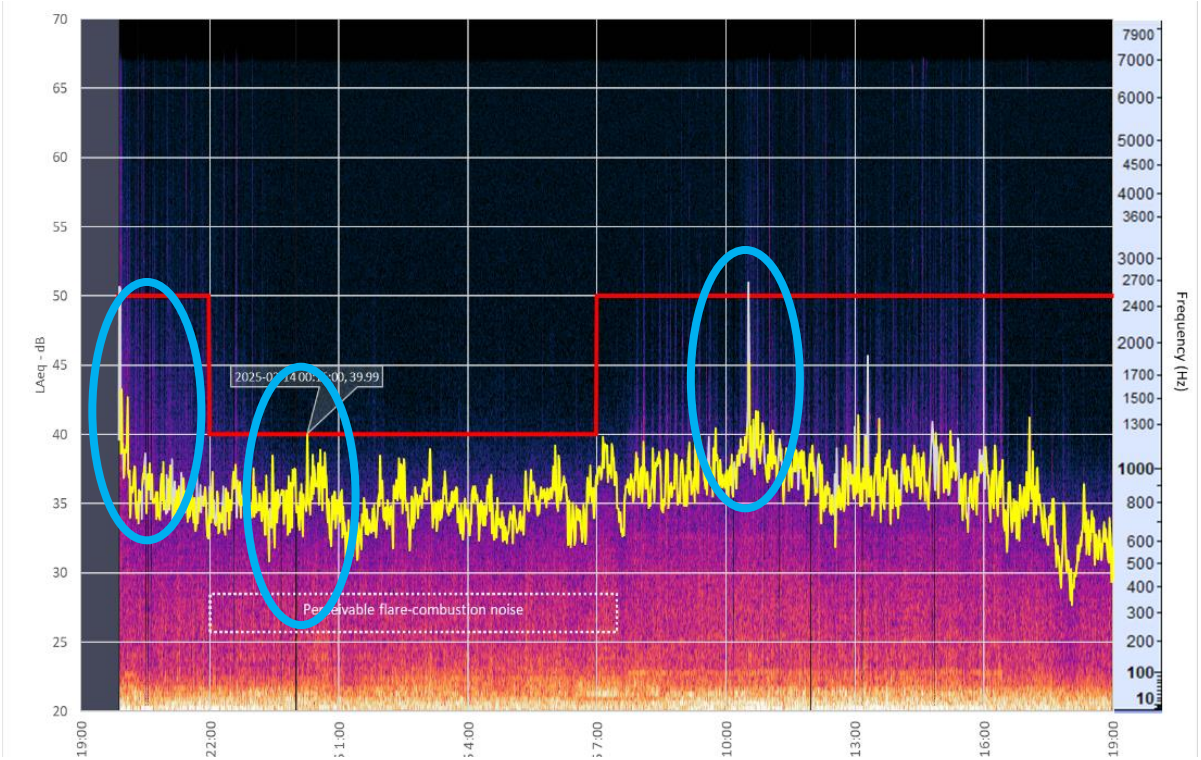
Confirmed LFN condition results in a 5 dBA penalty to the CSL.

Manual Exclusion

How are events classified for exclusion?

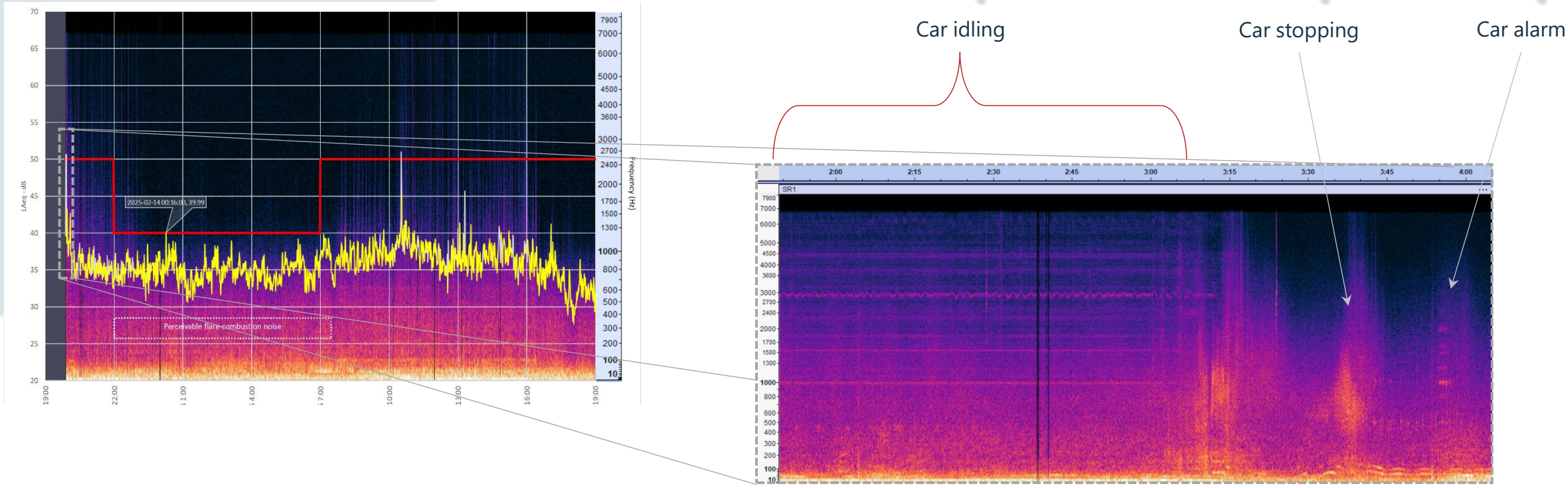
1. Identify instances of high noise

2. Review spectrogram and audio



Manual Exclusion

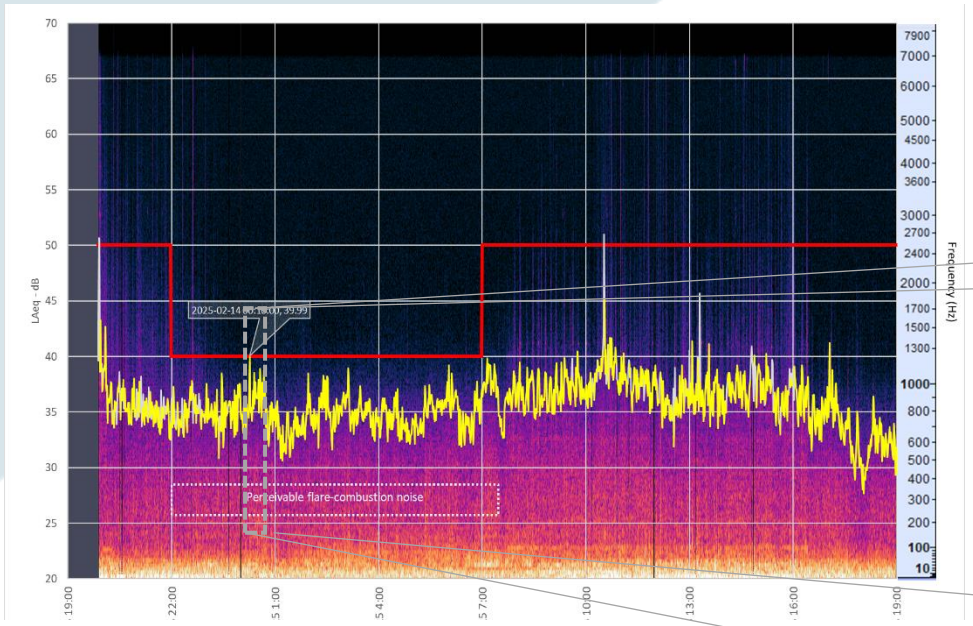
Excluded Noise Events



Chris

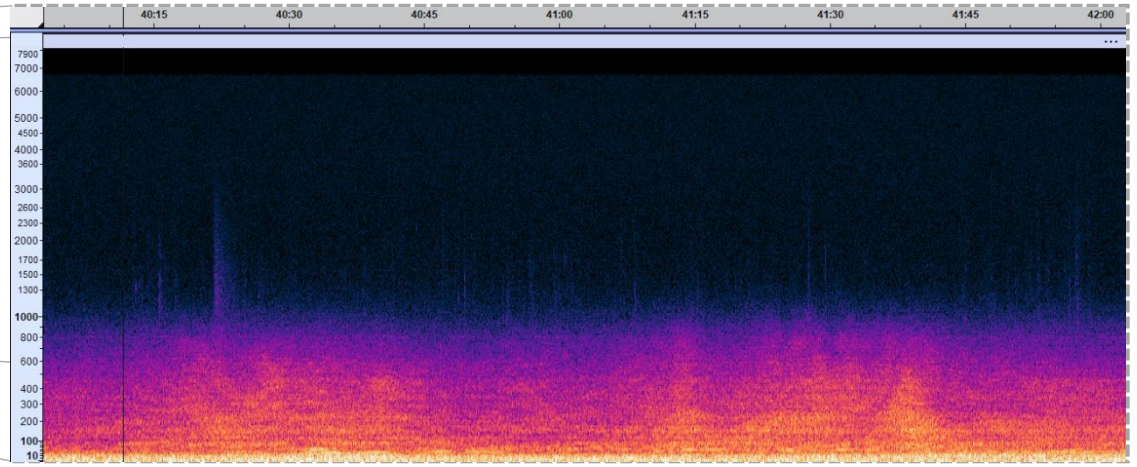
Manual Exclusion

Possible Industrial Noise – Not Excluded



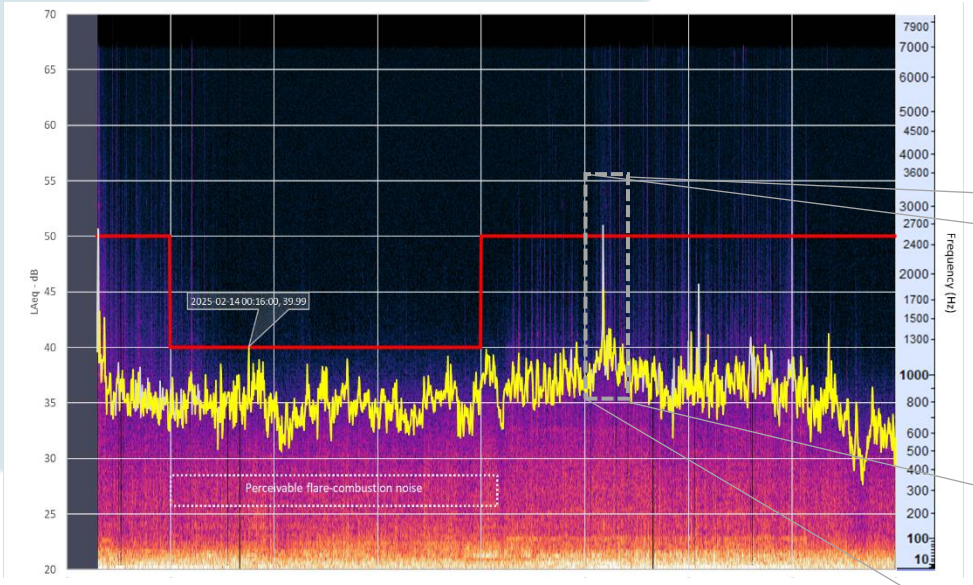
Industrial 1

Industrial 2



Manual Exclusion

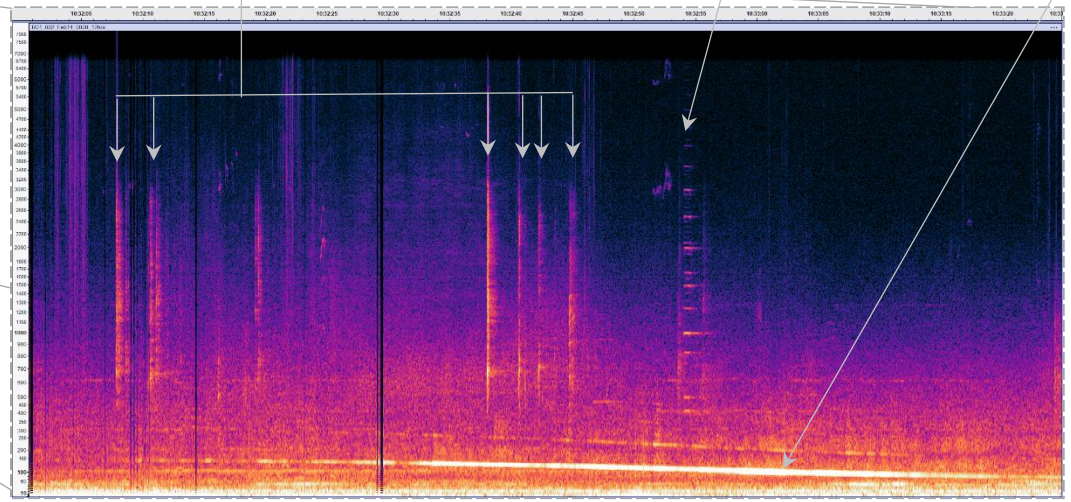
Excluded Noise Events



Dog barking

Car alarm

Aircraft for about 1.5min



Monitoring during Commissioning

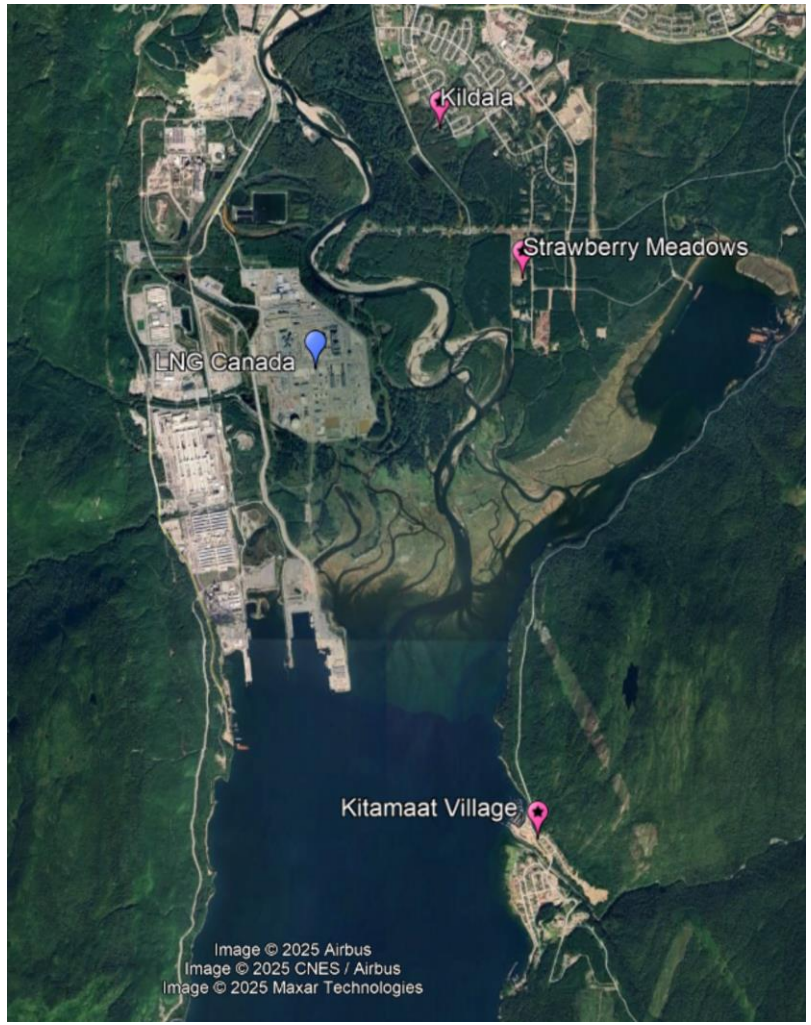
Continuous noise monitoring was initiated in December 2024 and continued through Train 1 start-up in June 2025.

Survey Locations:

- Kildala
- Strawberry Meadows
- Kitamaat Village

Data was processed to exclude durations of inclement weather and abnormal events.

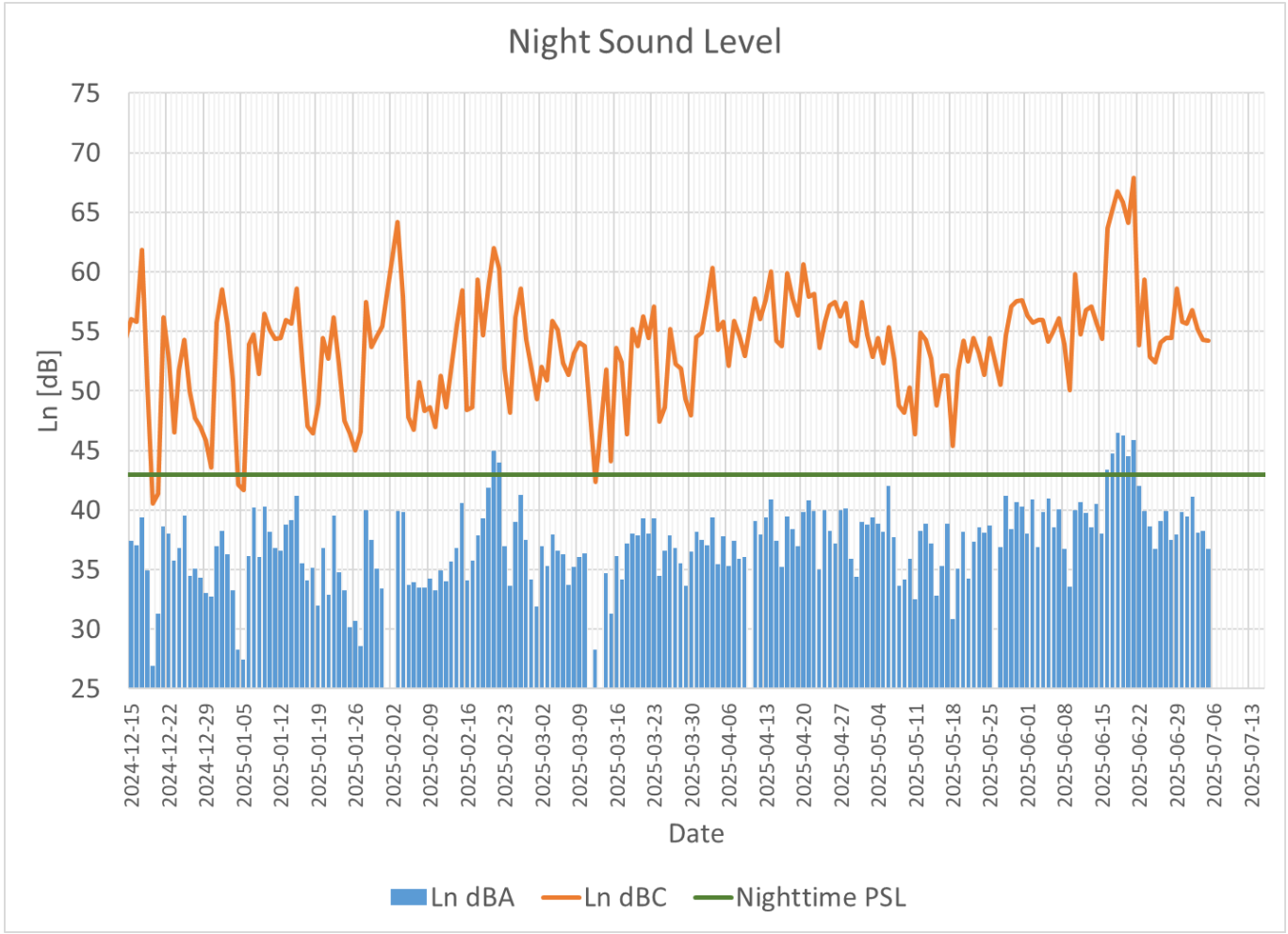
Average sound level of data after exclusion is indicative of the Comprehensive Sound Level for each night.



Noise Monitoring – Kildala

Average nighttime sound level (CSL) exceeded the 43 dBA PSL only during major flaring events[1].

Major flaring event in June exceeded 45 dBA and 65 dBC for multiple nighttime periods.

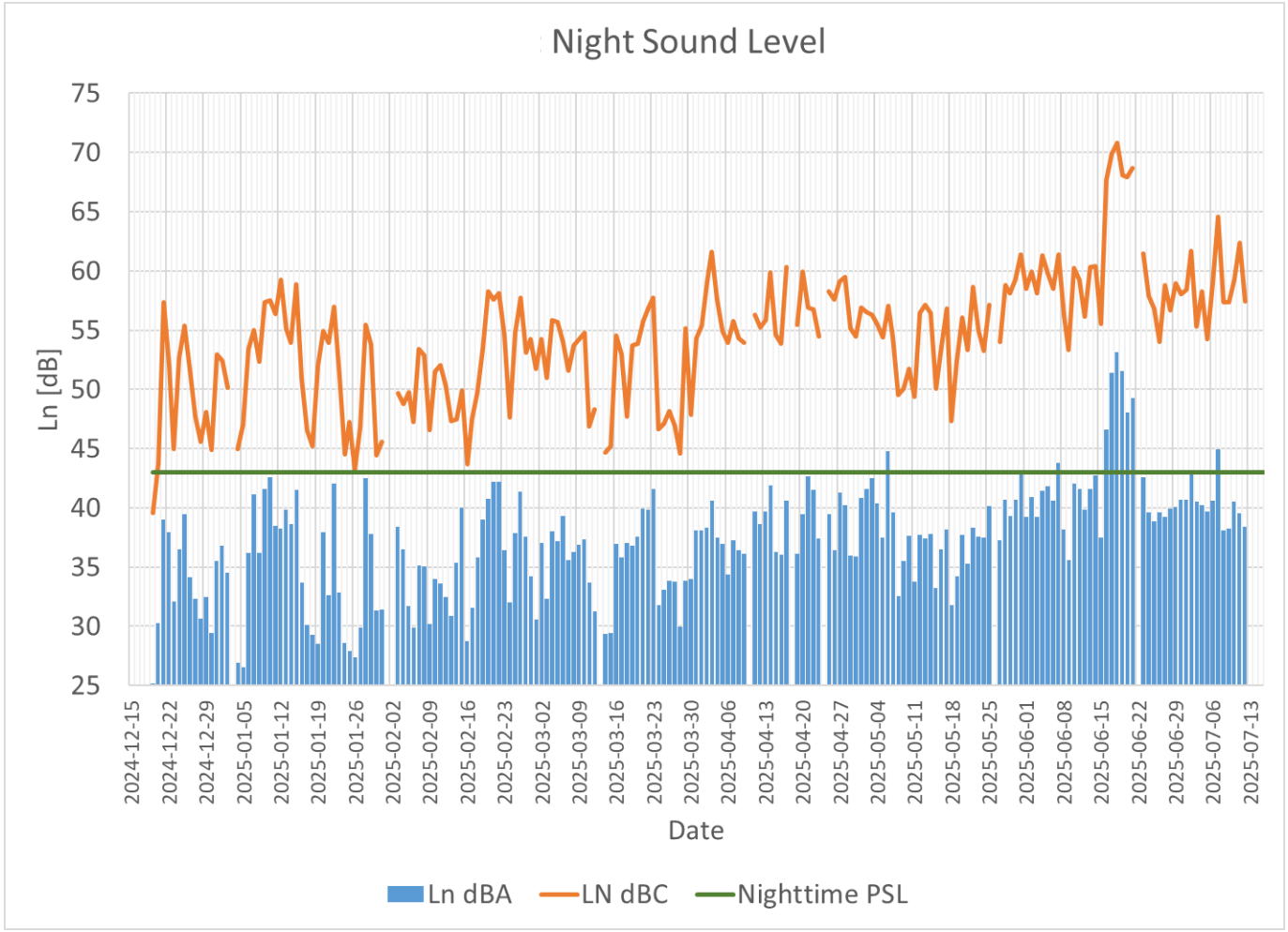


[1] PSLs are not applicable during start-up or unplanned upset events

Noise Monitoring – Strawberry Meadows

Average nighttime sound level (CSL) exceeded the 43 dBA PSL only during major flaring events[1].

Major flaring event in June exceeded 50 dBA and 70 dBC for multiple nighttime periods.



[1] PSLs are not applicable during start-up or unplanned upset events

Monitoring during Operation

Short-term Comprehensive Sound Level Surveys were completed after Train 1 start-up in response to complaints received after start-up:

July 16 – July 18 (two locations in Strawberry Meadows)

July 31 – Aug 14 (one location in Kitamaat Village)

Aug 28 – Sept 4 (two locations in Strawberry Meadows)

All surveys showed compliance with the PSLs during normal operation. Sound levels were likely impacted by minor flaring, so contribution of Train 1 alone is not known

Chris

Monitoring during Operation

An extended CSL survey has been initiated in Strawberry Meadows at the request of the BCER from Sept 26 through Dec 6.

Findings from Sept 26 through Nov 7 include:

Noise levels have been compliant with the PSLs under normal operation

High noise levels were measured during two Train 1 process upsets and the Train 2 start-up.

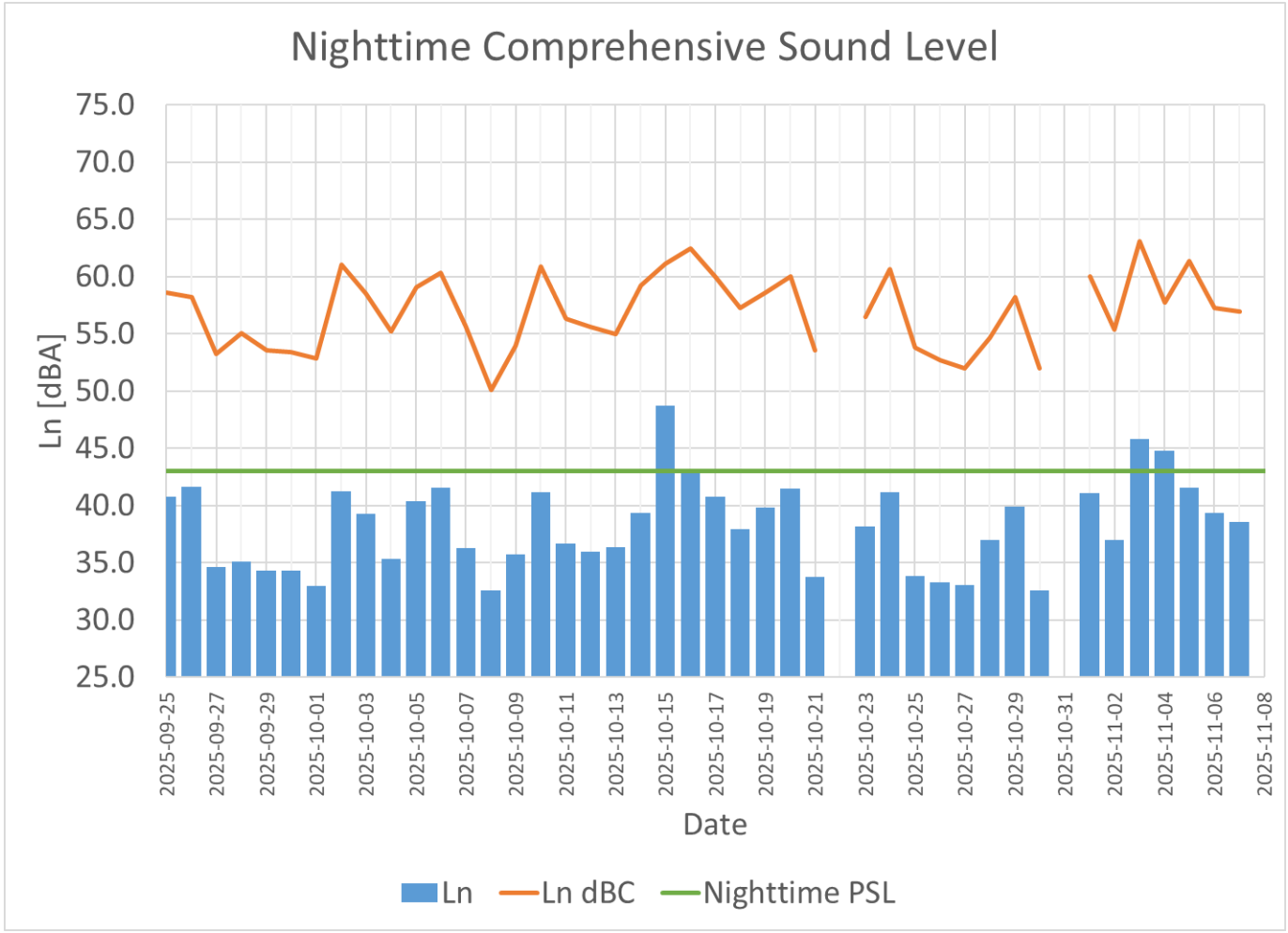
Noise Monitoring – Strawberry Meadows

Average nighttime sound level (CSL) exceeded the 43 dBA PSL during the major flaring events:

- Oct 15-16 Train 1 process upset
- Nov 3-7 Train 1 process upset and Train 2 start-up

Highest sound levels during both events were excluded due to persistent rain.

The highest hourly noise levels reached 65 dBA on the morning of Oct 16 and Nov 7.



Source Investigation and Mitigation

Typical Liquefaction Facility Noise Sources

Continuous (normal operation)

- Compressors
- Compressor piping
- Gas turbine drivers
- Cooling tower
- Pumps, motors, valves

Temporary (start-up, upset)

- Flare
- Gas turbine bleed valve
- Control valves

Source Investigation

Noise monitoring equipment was deployed starting April 2025 to monitor noise near the LNG Canada facility.

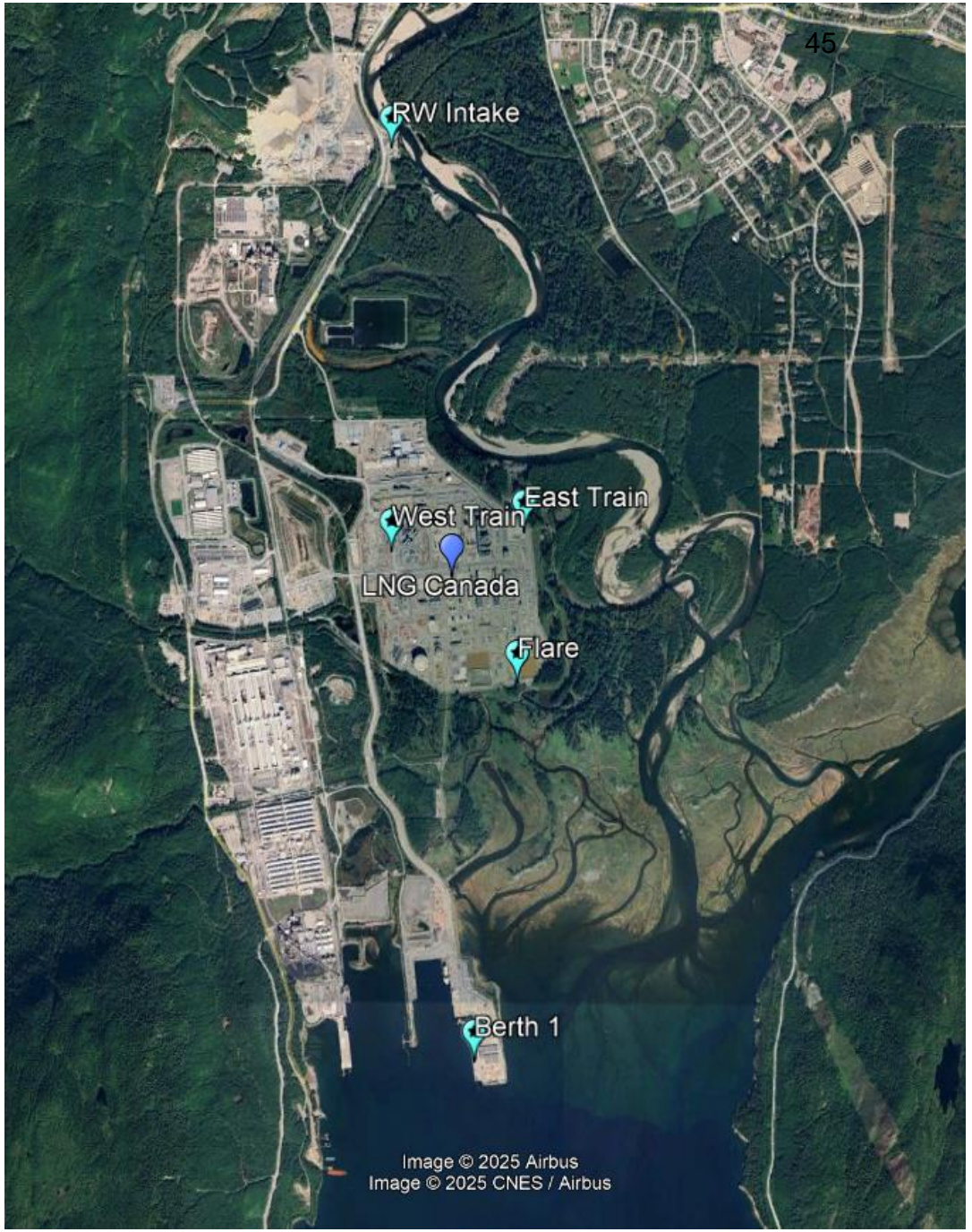
Monitoring equipment was deployed at five locations, two of which are most useful to address community noise:

East Train (200 m east of Train 1)

- Exposed to liquefaction Train 1 noise radiated in the direction of the community

Flare (250 m south of the flare stack)

- reliable indication of flare noise as it is closed to traffic and 500-1000 m from other major equipment noise sources



Liquefaction Operating Trends vs Measured Noise

Chris

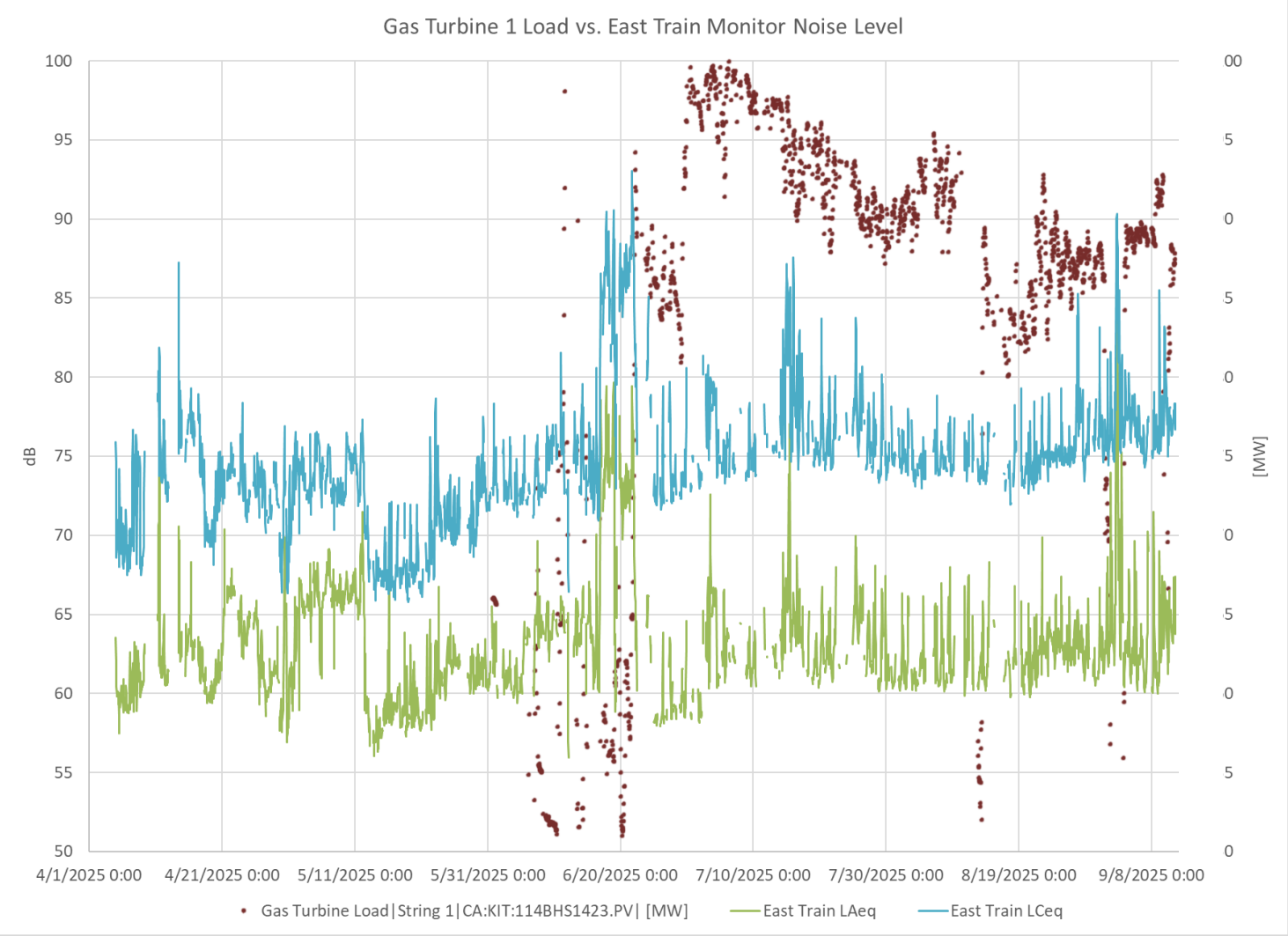
Operating trends of major equipment were plotted alongside East Train noise data, seeking to identify if the change in noise is associated with a change in the operating state.

No correlation between facility noise and liquefaction train operating conditions were identified.

Major liquefaction noise sources	Community noise impact to date
Gas Turbine (compressor driver)	Low
Gas turbine variable bleed valve exhaust	Low
BOG Compressor	Low
Cooling tower	Low

Chris

Train 1 String 1 Gas Turbine

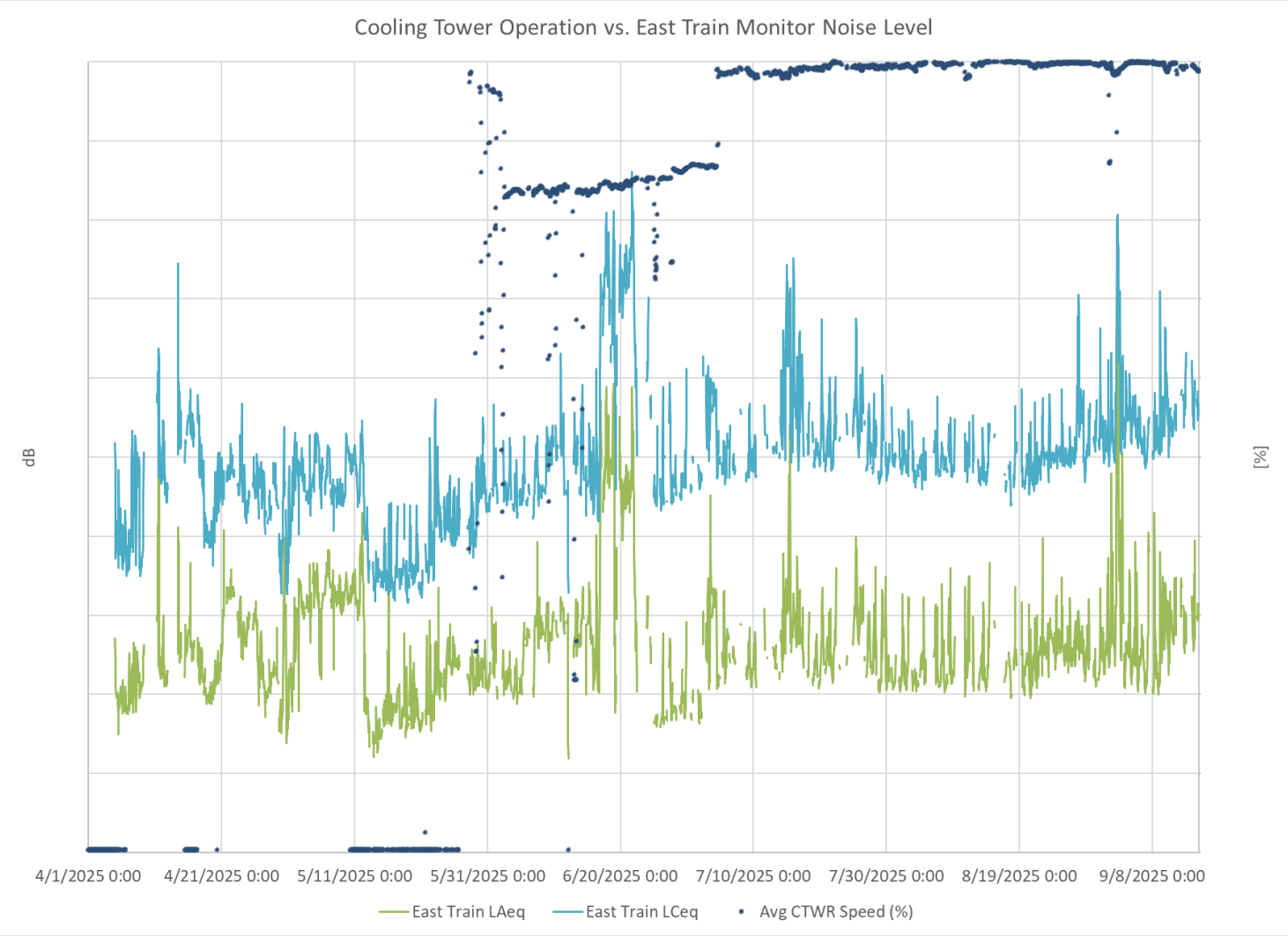


The Train 1 String 1 gas turbine started operating under load around June 22.

GT load also implies the main gas compressors are operating.

No correlation with noise data is apparent.

Cooling tower



Cooling tower state is presented as

the average fans speed across all bays (% of max).

No correlation with noise data is apparent.

Flare Operating Trends vs Measured Noise

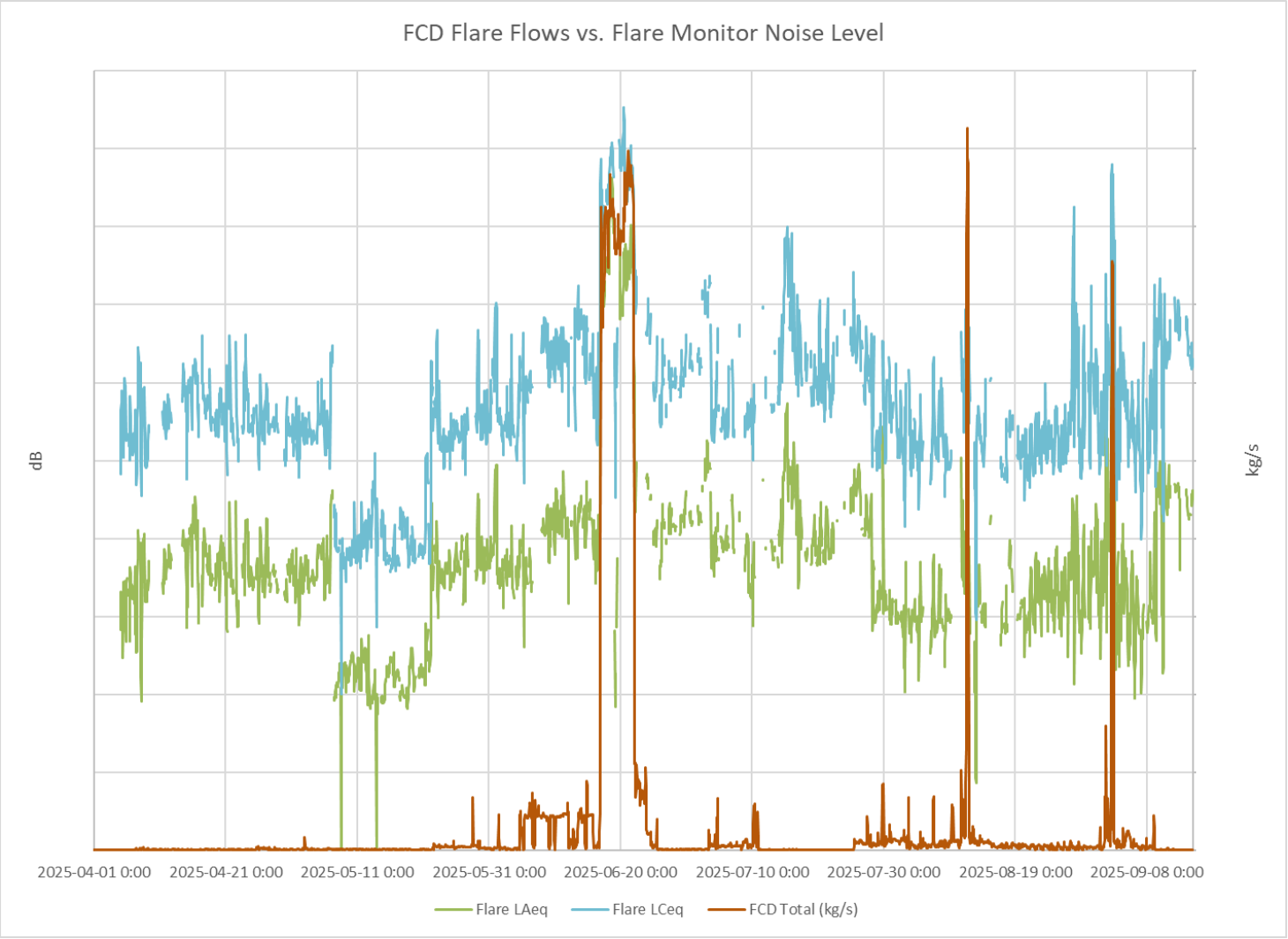
Flow rates of individual flares were plotted alongside Flare noise data to identify if the change in noise is associated with a change in flare rate.

Severe noise events were due to the cold dry flare.

Extended durations of moderate but audible flare noise caused by Wet Warm Assist and Spare Assist. Mitigation has been implemented.

Flare tips	Community noise impact to date
Wet Warm Main	Low
Wet Warm Assist	Med
Cold Dry	High
Low Pressure Main	Low
Low Pressure Assist	Low
Liquid	Low
Spare Main	Low
Spare Assist	Med

Cold Dry Flare



Flare noise is strongly correlated with high FCD flow events.

FCD flow is usually very low and not audible; however, the peak flow events during Train start-up have caused all the highest noise events.

Mitigation

- Extensive mitigation included in design, including but not limited to:
  - Silencers and enclosures on gas turbines
  - Silencers and acoustic insulation or compressors
  - Motor silencers
  - Low-noise cooling fans

- There is no indication that complaints have been received due to noise from equipment associated with normal operation. Installed mitigation appears to be effective.

- Flare noise levels are higher than expected. Flare noise impact has been reduced through:
  - Reduced flaring rate during start-up (process optimization)
  - Reduced flaring duration during start-up by importing nitrogen for dry-out and importing LNGC to accelerate cool-down
  - Minimizing use of assist gas flow for all flaring events

Lookahead

Lookahead

Planned activities:

- Continue noise monitoring noise in facility
- Continue investigating noise sources and identifying opportunities to reduce noise impact from flaring
- Continue with complaint response, including surveys at complainant residences
- Continue informing community of upcoming events with potentially increased noise
- Conduct model validation and compliance surveys as required by permit conditions 46 and 49 (Summer 2026)

Lookahead: Noise impact

Train 2 Start-up:

- Anticipate restart of Train 2: December

Steady-state operation:

- Low community noise impact
- Few complaints expected based on evidence to date

Process upsets:

- Reducing frequency of upsets
- Reduced duration of flaring during upset and restart
- Audible noise in community

LNG CANADA

Opportunity for British Columbia. Energy for the world

Joint venture companies