HGC ENGINEERING

Howe Gastmeier Chapnik Limited
2000 Argentia Road, Plaza One, Suite 203
Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044

March 30, 2021

Jeff Swartz
555 Canal Bank Developments GP Inc.
125 Villarboit Crescent
Vaughan, Ontario
L4K 4K2

via e-mail: JSwartz@empirecommunities.com

Re: Noise and Vibration Feasibility Study - Addendum,
Proposed Dain West Subdivision, Welland, Ontario
HGC Engineering Reference #: 01900790

Dear Jeff,

HGC Engineering completed a Noise and Vibration Feasibility Study, dated August 31, 2020 for the proposed Dain West Subdivision in Welland, Ontario. Verbio Diesel, an industrial use immediately south of the proposed development, has indicated they have updated their operations since the initial assessment was completed. The following summarizes the updated analysis of the industrial operations at Verbio Diesel.

Aercoustics Engineering Ltd., the acoustical consultant for Verbio Diesel, prepared a summary of the updated impulsive source activities at the site in a letter dated March 8, 2021. The following are indicated:

- The current facility operations involve rail shunting operations from a single train in a worst-case hour which may contain up to 5 cars and thus up to 5 coupling or uncoupling events. It is possible the facility's unloading equipment may be upgraded in the future to allow more than one train in an hour.
- A logarithmic mean impulse sound power level of 113 dBAI was used based on site measurements.
- The impulse measurements used to determine the sound power were on the loudest side of the operation. The orientation of the cars would result in a directivity correction to the southwest and northeast direction. A policy is in place to minimize rail shunting activity near existing dwellings, such that few of the coupling events occur in the southwest area.
- Absorptive ground was used throughout, except for the Verbio site for which G=0.1 was used, representative of packed earth.
- Two worst-case locations at which coupling events could occur were provided.
- All noise-sensitive lots within 350 metres of rail impulses should have a Class 4 designation.

It is unclear if Verbio Diesel is proposing to include frequent rail operations during nighttime hours (23:00-07:00). This would be a significant change over the current operations and it is likely there

would be significant challenges meeting the sound level limits at the closest existing noise sensitive receptors. The analysis included herein assumes daytime only operation (07:00 to 23:00).

Aercoustics has indicated absorptive ground was used throughout except for the Verbio site for which G=0.1 was used. HGC Engineering's previous assessment utilized G=0.3 for the Verbio site, representative of hard ground and G=0.7 throughout the remainder of the model, representative of a mixture of soft grassy areas and acoustically hard areas (sidewalks, roadways, driveways, etc.). The assessment included herein continues with G=0.3 and G=0.7 areas.

For impulsive noise, the criteria provided by the Ontario Ministry of the Environment, Conservation and Parks guidelines are expressed in terms of the Logarithmic Mean Impulse Sound Level (L_{LM}) in dBAI. Under guideline NPC-300, the limits for impulsive sounds differ depending on how frequently the impulses occur, as summarized in Table I:

Table I: Exclusion Limit, Impulsive Sounds, Class 2 and 4 Areas, L_{LM} [dBAI]

Number of Impulses per Hour	Class 2		Class 4		
	Daytime & Evening[1] (07:00 – 23:00)	Nighttime[2] (23:00 – 07:00)	Daytime & Evening[2] (07:00 – 23:00)	Nighttime[2] (23:00 – 07:00)	Outdoor (07:00-23:00)
9 or more	50	45	60	55	55
7 to 8	55	50	65	60	60
5 to 6	60	55	70	65	65
4	65	60	75	70	70
3	70	65	80	75	75
2	75	70	85	80	80
1	80	75	90	85	85

[1] Applicable at both planes of windows to noise sensitive spaces and outdoor points of reception.
[2] Applicable at planes of windows to noise sensitive spaces only.

Five (5) coupling or uncoupling events in one hour result in a criterion of 60 dBAI during daytime hours in a Class 2 environment. Under a Class 4 environment the limit is relaxed by 10 dBAI to 70 dBAI for receptor locations at the building façade (first or second storey windows) and 65 dBAI for outdoor points of reception (outdoor amenity areas).

In the instance the site expands their operations to include nine (9) or more impulses in one daytime hour, the criteria become 50 dBAI and 60 dBAI for Class 2 and 4 environments, respectively. Note that the impulsive limit for outdoor points of reception for frequent impulses in a Class 4 area would be 55 dBAI.

The predictive acoustic model for the proposed development was updated utilizing the source sound level information provided by Aercoustics. Topography, including the proposed berm/barrier combination, remain unchanged from the August 31, 2020 report. Three scenarios were assessed:

Scenario 1: Impulsive point source at Northeast extent of Verbio rail siding.

Scenario 2: Impulsive point source at loadout point.

Scenario 3: Impulsive line source, where impulse activity is distributed over a representative area where impulses are likely to occur.

The Scenario 1 assessment is a worst-case for the potential impulsive activities at Verbio Diesel and the impact on the proposed Dain West development. It is an unlikely condition to occur as all impulses in one hour would need to occur at the furthest northeast extent of the Verbio Diesel site. Regardless, the updated sound level predictions indicate that Verbio Diesel can meet either the Class 2 or 4 sound level limits for frequent impulsive activity for the respective designated areas at the proposed residential development. Under current operations (5 impulses per hour), the predictions indicate Verbio Diesel can meet Class 2 impulsive sound level limits. Note that a Class 4 designation has previously been proposed for a portion of the Dain West Subdivision, as indicated on Figure 1.

Under Scenarios 2 and 3, the updated assessments indicate Verbio Diesel can meet the more restrictive Class 2 sound level limit of 50 dBAI at the proposed residences under a frequent impulse scenario and likewise for the current operations which are less intensive. Figures 2 and 3 show the predicted impulsive sound levels.

The acoustic modeling indicates that the updated impulsive sound levels from Verbio Diesel, under the existing use (5 impulses per hour), will be within the MECP's sound level criteria under a Class 2 environment and that potentially future, frequent impulsive activity, will also be within the applicable sound level limits (Class 2 and 4). The proposed Class 4 areas for the Dain West lands are further than the suggested 350 metre setback and can provide some flexibility for future expansion activities at Verbio Diesel.

We trust this meets your current requirements. If you have any questions or concerns, please do not hesitate to call or e-mail.

Yours truly,

Howe Gastmeier Chapnik Limited

Ian R. Bonsma, P.Eng., INCE
Senior Associate

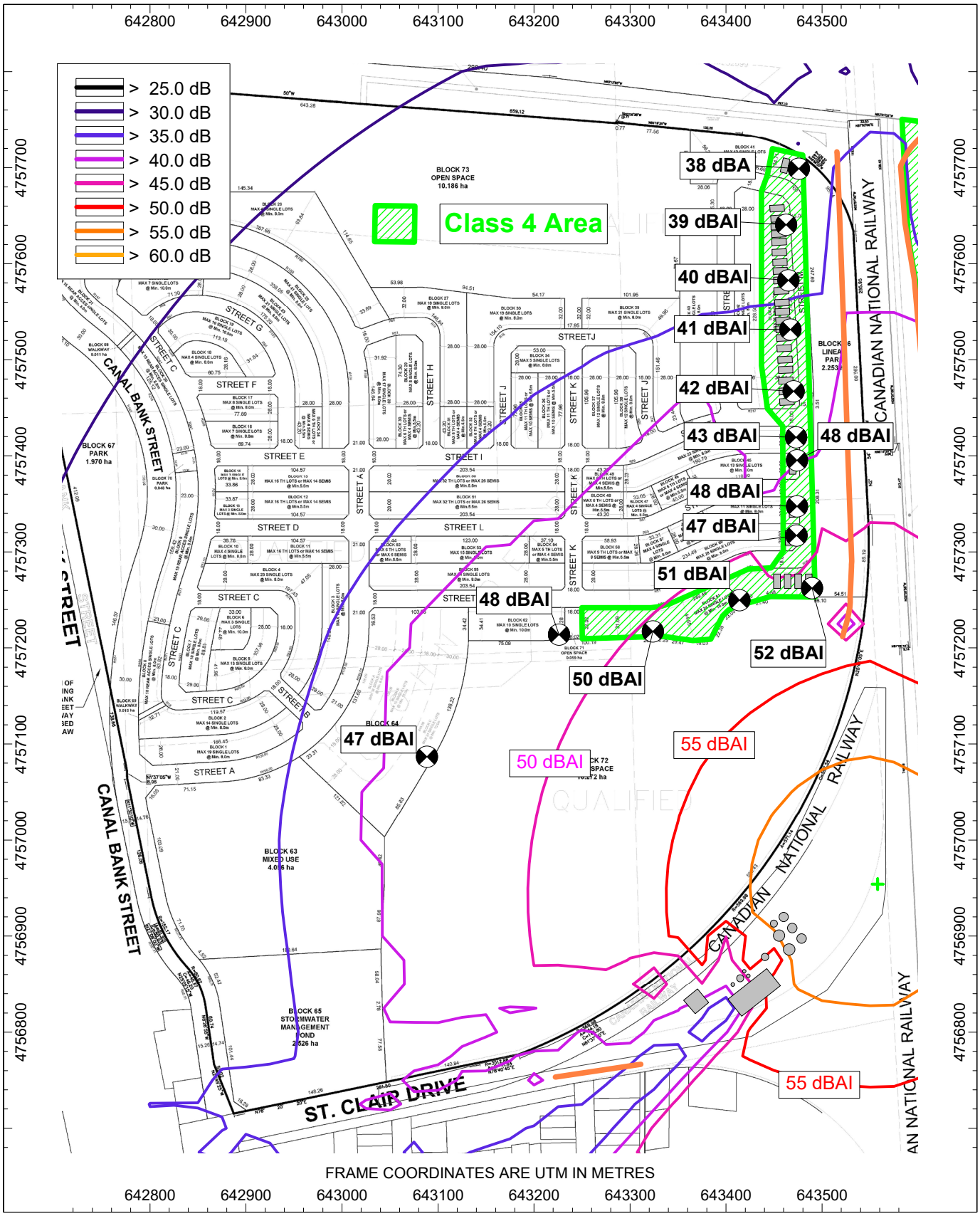

Figure 1: Impulsive Sound Level Predictions, LLM [dBAI] at 4.5 metres Above Grade
Scenario 1 - Verbio Diesel, Impulse Location 1 (Northeast)

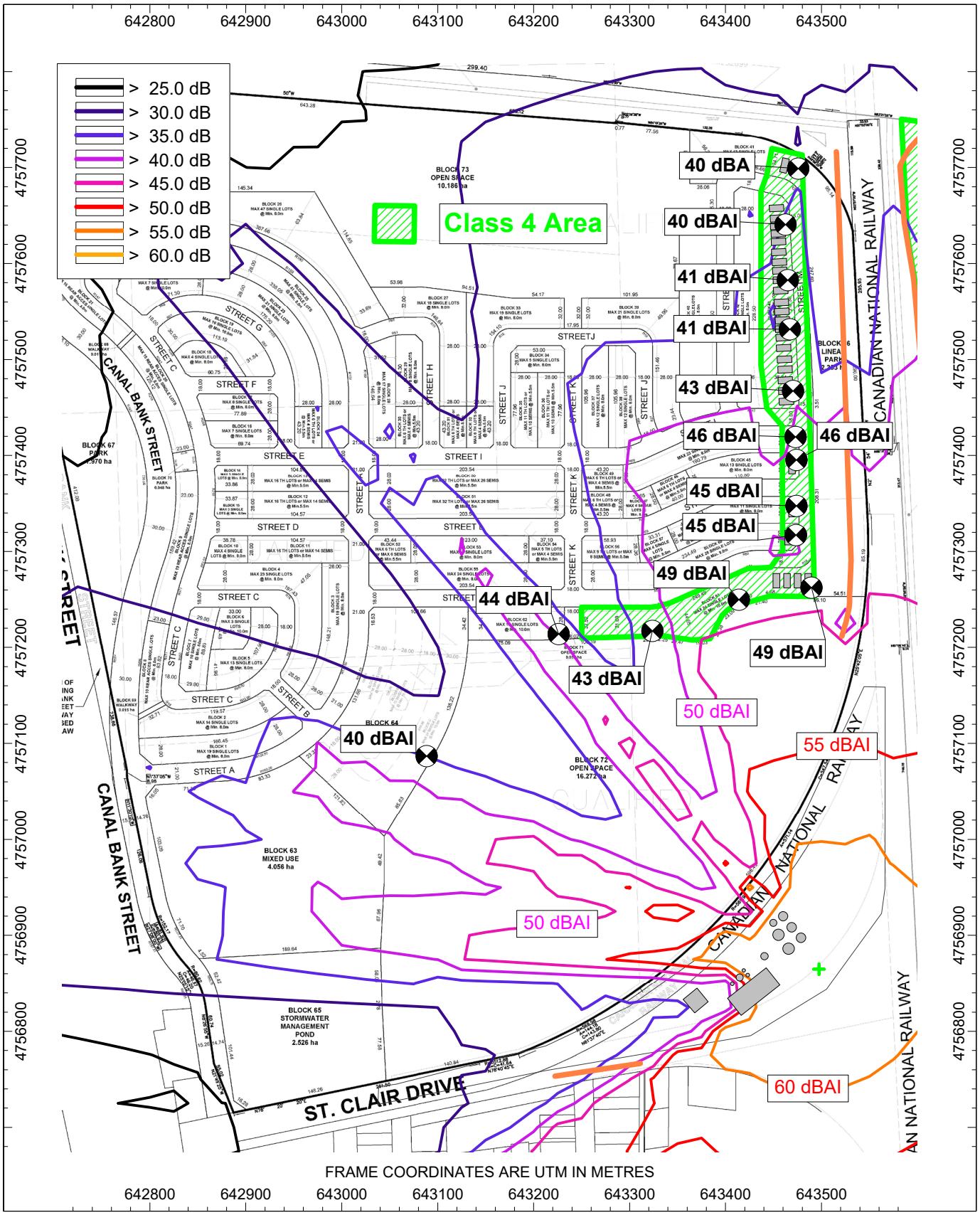

Figure 2: Impulsive Sound Level Predictions, LLM [dBAI] at 4.5 metres Above Grade
Scenario 2 - Verbio Diesel, Impulse Location 2 (Loadout Area)

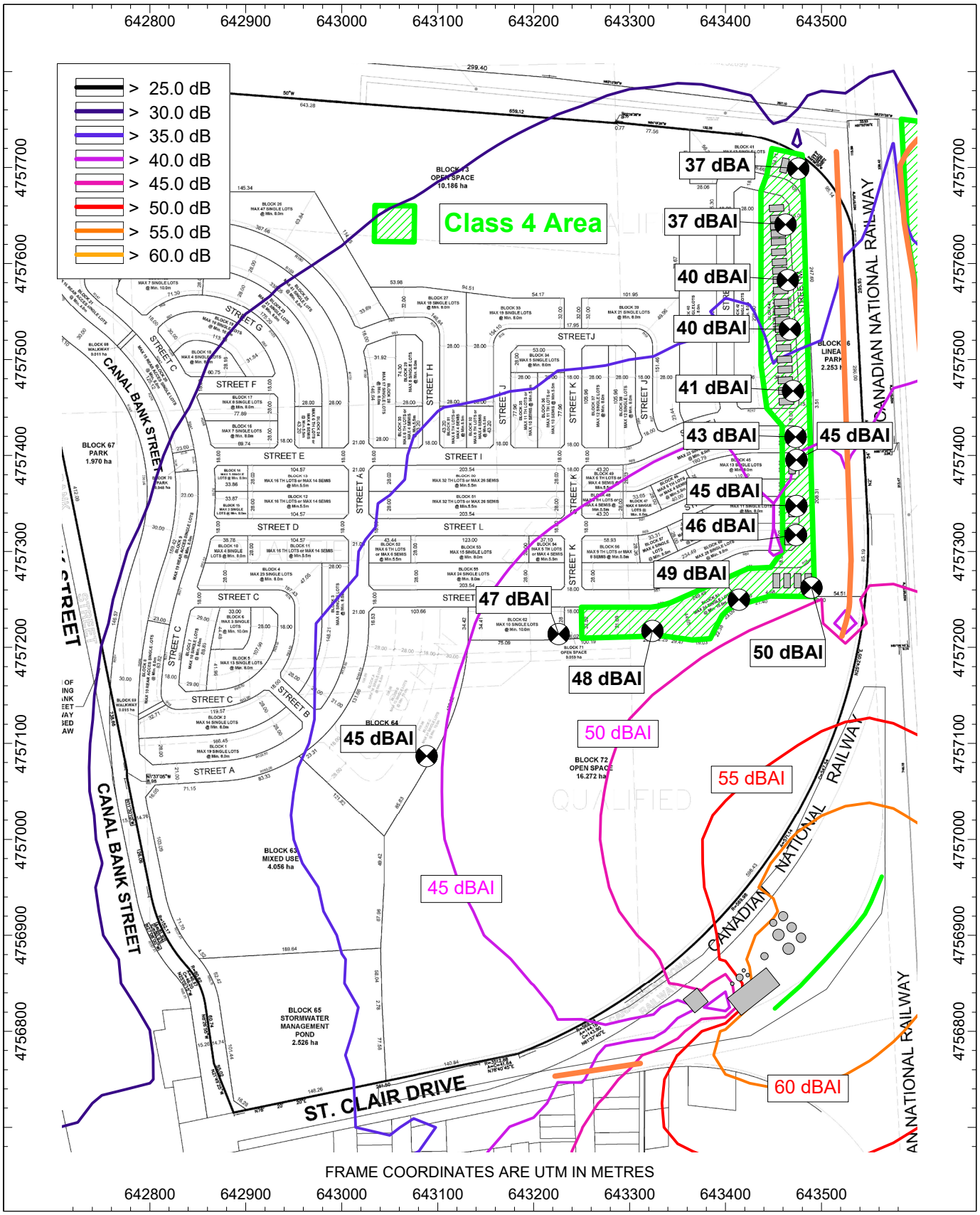

Figure 3: Impulsive Sound Level Predictions, LLM [dBAI] at 4.5 metres Above Grade
Scenario 3 - Verbio Diesel, Impulse as a Line Source