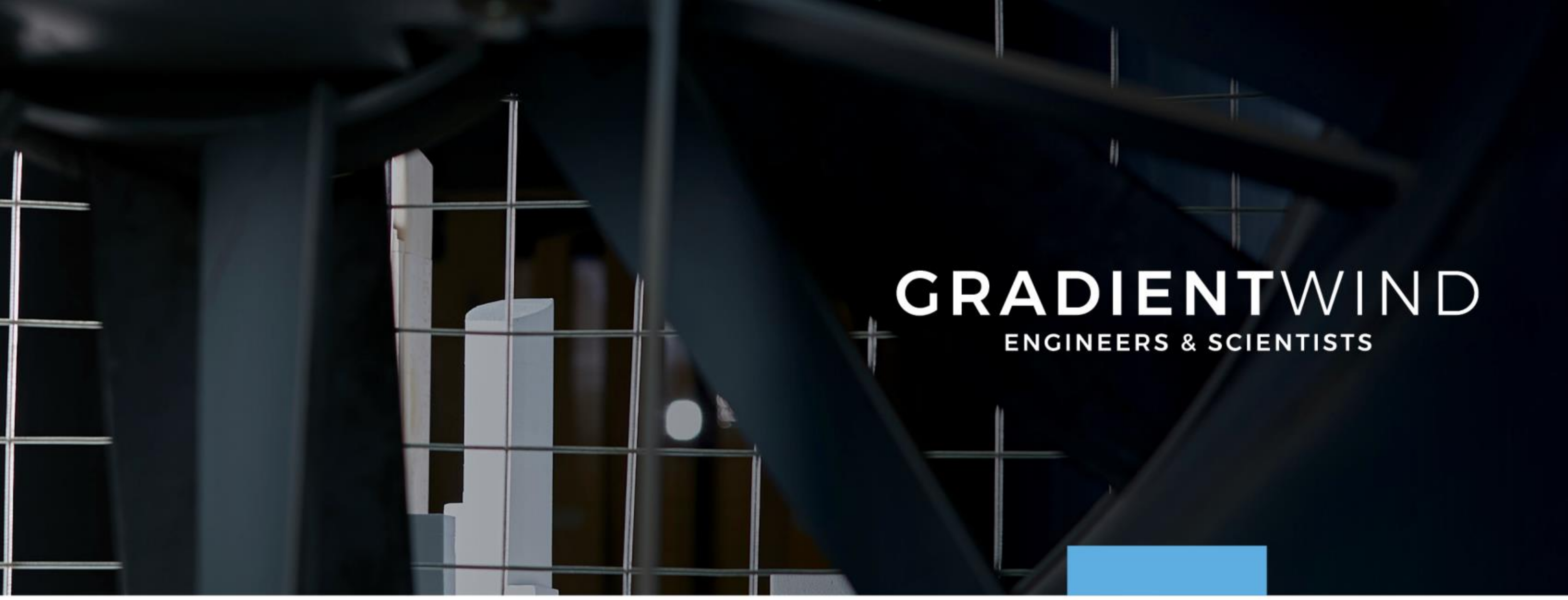
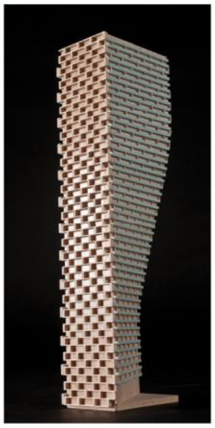
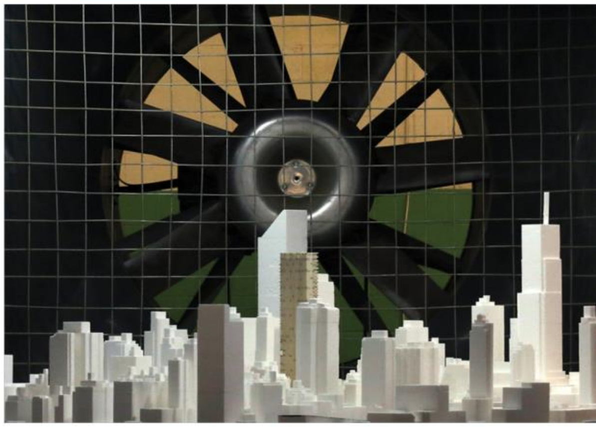


AIR QUALITY AND LAND USE COMPATIBILITY

6158 Rideau Valley Drive
Ottawa, Ontario

REPORT: 23-296 – Land Use Compatibility





June 19, 2025

PREPARED FOR
The owners of 6158 Rideau Valley Drive c/o Novatech
240 Michael Cowpland Drive, Suite 200
Ottawa, ON K2M 1P6

PREPARED BY
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EXECUTIVE SUMMARY

Gradient Wind Engineering Inc. (Gradient Wind) has been retained by the Owners of 6158 Rideau Valley Drive to undertake a Land Use Compatibility study for the development located at 6158 Rideau Valley Drive in Ottawa, Ontario. The complete scope of work within our mandate includes a review and a professional opinion in terms of air quality, noise, and vibration impacts from the study site onto neighboring sensitive dwellings. Figure 1 illustrates a complete site plan with surrounding context.

The study is based on the Ontario Ministry of Environment, Conservation and Parks (MECP) Land Use Compatibility Guidelines (D-Series) and the Environmental Noise Guidelines (NPC-300).

Based on the findings of this assessment, two residential dwellings are within the influence area of the study site; therefore, best practice or mitigation measures should be utilized to minimize dust and noise impacts. The study site is not a significant source of vibration.

Sensitive properties situated below the minimum recommended setback distance are not downwind of the study site, therefore, any dust impacts from unpaved roads and storage piles are infrequent. However, best dust management practices should still be utilized to further limit any potential impacts. Noise modelling results show that noise levels are above criteria at near-by residences due to hopper and hopper support operations. To reduce noise impacts, Gradient Wind recommends that the hopper and loaders associated with the hopper operations are moved to the west of the 2-storey metal cladding building workshop, as indicated in Figure 5. This will reduce noise impacts to MECP limits.

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1. INTRODUCTION AND TERMS OF REFERENCE

Gradient Wind Engineering Inc. (Gradient Wind) has been retained by the Owners of 6158 Rideau Valley Drive to undertake a Land Use Compatibility study for the farm located at 6158 Rideau Valley Drive in Ottawa, Ontario. The complete scope of work within our mandate includes a review and a professional opinion in terms of air quality, noise, and vibration impacts from the study site onto neighboring sensitive buildings. The study is based on the Ontario Ministry of Environment, Conservation and Parks (MECP) Land Use Compatibility Guidelines (D-Series) and the Environmental Noise Guidelines (NPC-300).

The focus of this land use compatibility study is the subject site situated on a nearly rectangular parcel of land bounded by single-family homes to the north and south, Rideau Valley Drive to the east, and farmland to the west. Buildings within the property comprise of a two-storey metal cladding building workshop, three single-storey storage sheds, a two-storey storage shed, a two-storey stucco building, and the landscaping supply sales shop next to two greenhouses. The main operations occur on the far east side of the site, with most of the property used for agriculture. Please refer to Figure 1 for site location and surroundings.

The proponent is seeking a minor zoning by-law amendment to request relief from specific zoning provisions related to home-based businesses in the rural area. The minor Zoning By-law Amendment application is in support of the existing trucking and landscaping home-based businesses on the property. Other uses of the property include farming, greenhouse farming, craft shop and tractor rides. These uses are currently permitted under the current zoning AG and exception 147r.

A site-visit was initially conducted on January 11, 2024, to review potential air quality, noise, and vibration impacts. At the time of the site visit, the landscape supply business was not in operation. Therefore, noise measurements that capture worst-case impacts were not possible. As an alternative approach, software modelling was used to predict noise levels. Another site visit was undertaken on June 24, 2024, to capture sound levels of the hopper machinery. This information was used to refine the software modelling. Results of this investigation is presented in this report.

2. METHODOLOGY OF AIR QUALITY ASSESSMENT

2.1 Identifying Sensitive Land Uses

A review of the study area was conducted to locate sensitive land uses near the subject site. In general, sensitive land uses include residences or facilities where people sleep, institutional buildings including schools, churches or community centers, and certain outdoor recreational uses deemed to be sensitive by the municipality. Sensitive lands are based on current zoning boundaries and a review of satellite imagery. The two adjacent single-family homes to the study site have been identified as the sensitive land uses closest and most exposed to the study site, with municipal addresses of 6168 Rideau Valley Drive and 6120 Rideau Valley Drive (see Figure 1).

2.2 Identifying Emission Sources

To minimize the potential for adverse impacts of industrial activities on sensitive land uses, the MECP has provided guidelines for adequate buffering of incompatible land uses under "Guideline D-6 Compatibility Between Industrial Facilities and Sensitive Land Uses". The minimum separation distances are based on both the size of a facility and the scope of industrial activities within the facility, classified as Class I, II, or III, for light, medium and heavy industrial uses, respectively.

For the purposes of this assessment, the study site has been identified as a Class II, which is defined as a medium-sized operation with outdoor storage of materials, occasional emissions of noise / odour / vibration, and low probability of fugitive emissions.

Please note that this guideline does not apply to the agricultural activities of the farm.

Table 1 summarizes the recommended separation distance and potential area of influence for each class. A sensitive development may be permitted within an influence zone if appropriate air quality studies are undertaken, and potential causes of adverse effects are mitigated.

TABLE 1: D-6 RECOMMENDED SEPARATION & INFLUENCE AREA

Class	Minimum Recommended Separation Distance (m)	Potential Influence Area (m)
I	20	70
II	70	300
III	300	1000

Two residential (sensitive) land uses were identified within the zone of influence of the study site (6168 and 6120 Rideau Valley Drive). As such, more detailed studies related to noise and dust impacts were considered.

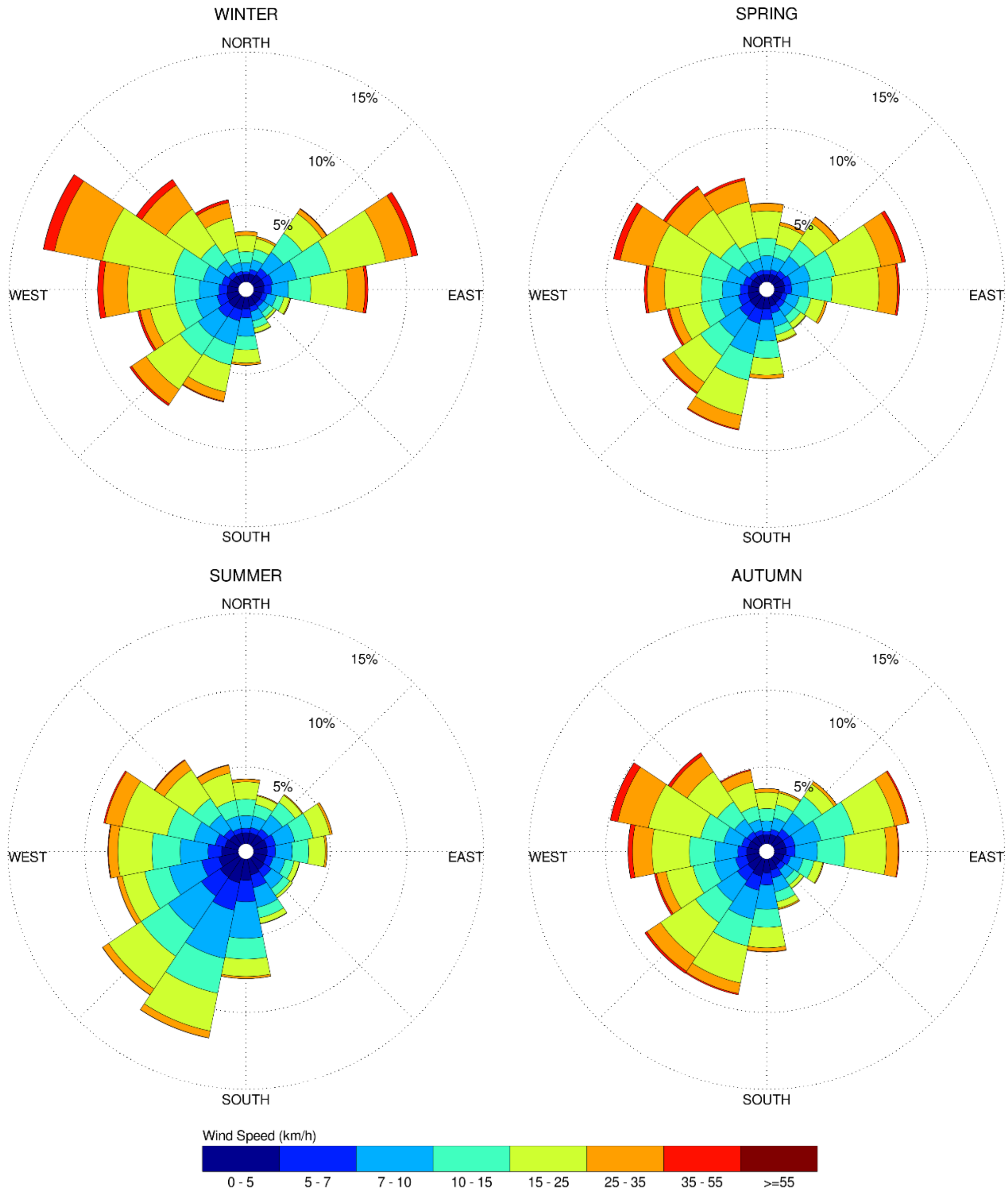
2.3 Meteorological Data Analysis for Potential Dust Impacts

A statistical model for winds in Ottawa was developed from approximately 40 years of hourly meteorological wind data recorded at Ottawa Macdonald-Cartier International Airport and obtained from Environment and Climate Change Canada. Wind speed and direction data were analyzed for each month of the year to determine the statistically prominent wind directions and corresponding speeds, and to characterize similarities between monthly weather patterns.

The statistical model of the Ottawa area wind climate, which indicates the directional character of local winds on a seasonal basis, is illustrated on the following page. The plots illustrate the seasonal distribution of measured wind speeds and directions in kilometres per hour (km/h). Probabilities of occurrence of different wind speeds are represented as stacked polar bars in sixteen azimuth divisions. The radial direction represents the percentage of time for various wind speed ranges per wind direction during the measurement period. The prominent wind speeds and directions can be identified by the longer length of the bars. For Ottawa, the most common winds occur for westerly wind directions, followed by those from the east, while the most common wind speeds are below 36 km/h. The directional prominence and relative magnitude of wind speed changes somewhat from season to season.

North and South winds, which have potential for creating dust impacts on the neighboring residential properties adjacent to the subject site, are far less common in Ottawa, so any dust events would be very infrequent.

SEASONAL DISTRIBUTION OF WIND
OTTAWA MACDONALD-CARTIER INTERNATIONAL AIRPORT



Notes:

1. Radial distances indicate percentage of time of wind events.
2. Wind speeds are mean hourly in km/h, measured at 10 m above the ground.

2.4 Dust Control Practices

A review of the farm was conducted to locate sources of airborne pollutants, dust, and odours. Potential sources of fugitive dust include emissions from the shared driveway between the study site and 6168 Rideau Valley Drive, and the blow-off from the stockpiles of soil, mulch, and gravel to the east of the study site and the stockpiles in the open storage areas. No odours or sources of odours were detected during the site visit.

Emissions from piles of granular materials are a result of wind erosion at certain wind speeds. As sensitive properties are not downwind of the prevailing wind directions, dust impacts are expected to be rare and infrequent.

The following dust control practices are recommended[1]. Please note that some practices listed below are already being applied for the landscape material piles:

- Providing full or partial enclosures.
- Locating storage piles against more durable materials, such as cement blocks. Very fine materials should be stored in a sheltered area or covered.
- Limit the height and slope of storage piles (flat and shallow piles are subject to less wind disturbance than tall, conical piles).
- Covering inactive piles with durable materials, such as tarpaulins or plastic. Where covers are used, they should be anchored to prevent them from blowing away.
- Applying water/dust suppressant applications that are compatible with the stored materials.

For the control of fugitive dust emissions from unpaved surfaces, the following practices are recommended[2]. Please note that some of the practices listed below are already being applied for the shared driveway:

- Wet suppressant should be applied during dry periods using a water truck or fixed sprinklers. As a general guide, best practice rules that the typical water requirements are up to 1 litre per square metre per hour, but vary depending on the precipitation.

[1] Technical Bulletin: Management Approaches for Industrial Fugitive Dust Sources, Government of Ontario Standards Development Branch, February 2017
[2] Technical Bulletin: Management Approaches for Industrial Fugitive Dust Sources, Government of Ontario Standards Development Branch, February 2017

- Chemical stabilization can be used in conjunction with wet suppression. This involves the use of chemical additives that form a crust on the surface and bind the dust particles together. Repeat treatments are usually required every 1 to 4 weeks.
- Limit vehicle speeds on unpaved surfaces.

3. STATIONARY NOISE IMPACTS

3.1 Perception of Noise

Noise can be defined as any obtrusive sound. It is created at a source, transmitted through a medium, such as air, and intercepted by a receiver. Noise may be characterized in terms of the power of the source or the sound pressure at a specific distance. While the power of a source is characteristic of that source, the sound pressure depends on the location of the receiver and the path that the noise takes to reach the receiver. Its measurement is based on the decibel unit, dBA, which is a logarithmic ratio referenced to a standard noise level (2×10-5 Pascals). The 'A' suffix refers to a weighting scale, which represents the noise perceived by the human ear. With this scale, a doubling of sound power at the source results in a 3 dBA increase in measured noise levels at the receiver and is just perceptible to most people. An increase of 10 dBA is often perceived to be twice as loud.

Stationary sources are defined in NPC-300 as *"a source of sound or combination of sources of sound that are included and normally operated within the property lines of a facility and includes the premises of a person as one stationary source, unless the dominant source of sound on those premises is construction"*[3]. As per NPC-300 guidelines, this assessment disregards noise sources addressed under the jurisdiction of the Ontario Ministry of Agriculture, Food and Rural Affairs, including but not limited to:

- Any equipment, apparatus or device used in agriculture for food crop seeding, chemical spraying, or harvesting.
- Greenhouse HVAC equipment
- Stationary sources on agriculture operations during normal farm practice. As the offering of tractor rides are a common practice on farms, noise emissions from tractors have been omitted.

[3] NPC – 300, page 16

Further, as per NPC-300, sources not considered as stationary sources include back-up beepers and auditory warning devices (blowing of horns, whistles, bells or gongs), the gathering of people, and parking lots for private passenger vehicles at commercial facilities.

3.2 Stationary Noise Criteria

The equivalent sound energy level, L_{eq}, provides a weighted measure of the time varying noise levels, which is well correlated with the annoyance of sound. It is defined as the continuous sound level, which has the same energy as a time varying noise level over a selected period of time. For stationary sources, the L_{eq} is commonly calculated on an hourly interval, while for roadways, the L_{eq} is calculated on the basis of a 16-hour daytime/8-hour nighttime split.

Noise criteria taken from the ENCG and NPC-300 apply to outdoor points of reception (POR). A POR is defined under NPC-300 as "any location on a noise sensitive land use where noise from a stationary source is received"[4]. A POR can be located on an existing or zoned for future use premises of permanent or seasonal residences, hotels/motels, nursing/retirement homes, rental residences, hospitals, campgrounds, and noise sensitive buildings such as schools and places of worship. The recommended maximum noise levels for a Class 3 area in a rural environment at a POR are outlined in Table 1 below. The study site is considered to be Class 3 as it is located within the "Rural Area" boundary as defined in Schedule A the City of Ottawa Official Plan[5]. These conditions indicate that the sound field is dominated by natural sounds having little or no road traffic.

TABLE 1: EXCLUSIONARY LIMITS FOR CLASS 3 AREA

Time of Day	Outdoor Points of Reception (dBA)	Plane of Window (dBA)
Daytime: 07:00 – 19:00	45	45
Evening: 19:00 – 23:00	40	40
Nighttime: 23:00 – 07:00	N/A	40

[4] NPC – 300, page 14
[5] City of Ottawa Official Plan Vol 1: Section 6

3.3 Modelling Scenarios and Sound Power Levels

Three operational scenarios were defined with the assistance of Miller's Farm, to capture the worst-case impacts onto neighbouring noise-sensitive land. A summary of 1-hour scenarios can be seen below:

Scenario A – Existing condition with hopper operation (see Figure 3):

- A dump truck comes in once per day and idles for 5 minutes while it's depositing materials. This only occurs in the daytime period.
- The hopper continuously operates during the 1-hour daytime period, between the storage shed and the Yellow Bag storage shed (current operations)
- Loader A continuously dumps material into the hopper. This only occurs in the daytime period.
- Loader B operates between the hopper and the truck and makes a run every 3 minutes. This only occurs in the daytime.
- Loader B idles for 10 minutes/hour to load up the truck. This only occurs in the daytime period.
- Eight (8) rental trucks/equipment drive down the driveway in the daytime period, and four (4) trucks/equipment drive down the driveway in the evening and nighttime periods.

Scenario B – Existing condition without hopper operation (see Figure 4):

- A dump truck comes in once per day and idles for 5 minutes, while it is depositing materials. This only occurs in the daytime period.
- "Small bag" materials are either bagged using shovels, or a loader for clients with trailers. A loader will operate once every hour, with 30 sec idling time to unload.
- Eight (8) rental trucks/equipment drive down the driveway in the daytime period, and four (4) trucks/equipment drive down the driveway in the evening and nighttime periods.

Scenario C – Mitigated existing condition with relocated hopper operation (see Figure 5):

- A dump truck comes in once per day and idles for 5 minutes, while it is depositing materials. This only occurs in the daytime period.
- The hopper continuously operates during the 1-hour daytime period, to the west of the 2-storey metal cladding building workshop (recommended new locations to minimize noise impacts).
- Loader A continuously dumps material into the hopper. This only occurs in the daytime period.
- Loader B operates between the hopper and the truck and makes a run every 3 minutes. This only occurs in the daytime.

- Loader B idles for 10 minutes/hour to load up the truck. This only occurs in the daytime period.
- Please note that for this scenario, the paths of the loaders between the hopper and trucks have been assumed as seen in Figure 5.
- Eight (8) rental trucks/equipment drive down the driveway in the daytime period, and four (4) trucks/equipment drive down the driveway in the evening and nighttime periods.

3.3.1 Sound Power Levels

Sound power levels of various equipment have been determined based on Gradient Wind's experience with similar machinery. For the hopper, sound measurements were taken on June 24th, 2024. The machinery was operating and vibrating 50 % of the time, for conservatism. The noise from the hopper was considered to be quasi-steady impulsive noise so a penalty of 10 dBA has been applied to the sound power to account for the nature of the sound produced by the hopper, as described in NPC-104.

TABLE 2: SOUND POWER LEVELS

Source	Height Above Grade/Roof (m)	Speed (km/h)	Sound Power (dBA re. 1 picowatt)
Trucks	2.7	20	**95**
Loaders – Moving	2.0	20	**112**
Loaders – Idling	2.0	N/a	**101**
Dump Truck – Idling	3.3	N/a	**103**
Dump Truck – Moving	3.3	10-15	**112**
Hopper	3.0	N/a	**94***

Note: *Sound power includes adjustment for Quasi-Impulsive sound

3.4 Stationary Source Noise Predictions

The impact of stationary noise sources on nearby noise-sensitive areas was determined by computer modelling using the software program Predictor-Lima. This program was developed from the International Standards Organization (ISO) standard 9613 Parts 1 and 2 and is capable of representing three-dimensional surfaces and first reflections of sound waves over a suitable spectrum for human hearing. The methodology has been used on numerous assignments and has been accepted by the Ministry of the Environment, Conservation and Parks (MECP) as part of Environmental Compliance Approval applications.

A total of eleven (11) receptor locations were chosen around the site to measure the noise impact at points of reception (POR) during the daytime period (07:00 – 19:00), evening period (19:00 – 23:00), as well as during the nighttime period (23:00 – 07:00). POR locations include outdoor points of reception (OPOR) and the plane of windows (POW) of the adjacent residential properties. Receptor locations are described in Table 4 and illustrated in Figure 2. Table 3 below contains Predictor-Lima calculation settings. These are typical settings that have been based on ISO 9613 standards and guidance from the MECP.

Ground absorption over the study area was determined based on topographical features (such as water, concrete, grassland, etc.). An absorption value of 1 was used which is representative of grass and soft surface conditions. Existing buildings were added to the model to account for screening and reflection effects from building façades. A Predictor-Lima modelling data is available upon request.

TABLE 3: CALCULATION SETTINGS

Parameter	Setting
Meteorological correction method	None
Ground attenuation factor for lawn areas	1
Ground attenuation factor for roadways and paved areas	0
Temperature (K)	283.15
Pressure (kPa)	101.33
Air humidity (%)	70

TABLE 4: RECEPTOR LOCATIONS

Receptor Number	Receptor Location	Height Above Grade/Roof (m)
R1	POW – 6168 Rideau Valley Drive – North Façade	4.5
R2	POW – 6168 Rideau Valley Drive – West Façade	4.5
R3	POW – 6168 Rideau Valley Drive – North Façade	4.5
R4	POW – 6168 Rideau Valley Drive – East Façade	4.5
R5	OPOR – 6168 Rideau Valley Drive	1.5
R6	OPOR – 6168 Rideau Valley Drive	1.5
R7	POW – 6120 Rideau Valley Drive – South Façade	4.5
R8	POW – 6120 Rideau Valley Drive – West Façade	4.5
R9	OPOR – 6120 Rideau Valley Drive	1.5
R10	OPOR - 6168 Rideau Valley Drive	1.5
R11	OPOR - 6168 Rideau Valley Drive	1.5

3.4.1 Criteria for Impulsive Stationary Noise

Impulse noise, such as bangs and firearm discharges, are expressed in terms of the Logarithmic Mean Impulse Sound Level (L_{LM}). The L_{LM} is the average of the individual sound pressure levels generated by each impulse event. According to NPC-300, the exclusion limit values for impulsive sound levels for Plane of Window and Outdoor Points of Reception are shown in Table 5.

TABLE 5: EXCLUSION LIMIT FOR IMPULSIVE SOUND LEVELS - CLASS 2 & 3 AREAS[6]

Time of Day	Actual Number of Impulses in Period of One-Hour	Class 3 L_{LM} (dBAI) Limit (Day/Night)	
		POW Points of Reception	OPOR Points of Reception
07:00 – 23:00/ 23:00-07:00	9 or more	45/40	45
07:00 – 23:00/ 23:00-07:00	7 to 8	50/45	50
07:00 – 23:00/ 23:00-07:00	5 to 6	55/45	55
07:00 – 23:00/ 23:00-07:00	4	60/55	60
07:00 – 23:00/ 23:00-07:00	3	65/60	65
07:00 – 23:00/ 23:00-07:00	**2**	**70/65**	**70**
07:00 – 23:00/ 23:00-07:00	1	75/70	75

3.4.2 Determination of Impulse Noise Sound Power

Impulsive noise is generated by the tailgate slams of the dump truck. This assessment models an impulse source, at the unloading location.

Sound power levels for the impulse noise due to tailgate slams are based on Gradient Wind's past experience and measurements. It was assumed that impulse events occur no more than two times within an hour. The Logarithmic Mean Impulse Sound Level (L_{LM}) used in the assessment was 104 dBA. The impulse sources were modelled as point sources at a height of 1 meter above grade. Impulse source locations can be seen in Figure 6.

[6] *Ministry of Environment and Climate Change (MOECC). Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning (NPC-300). August 2013.*

3.5 Results and Discussion

Noise impacts onto the surrounding noise-sensitive dwellings are presented in Tables 5 and 6, for Scenarios A and B, respectively. The sound levels are based on the scenarios outlined in Section 4.4. It should be noted that the results were generated using the sound power levels summarized in Table 2.

Results show that noise levels are above criteria at both 6168 and 6120 Rideau Valey Drive dwellings in Scenario A. This exceedance is due to the hopper and loader operations in the area. As such, Gradient Wind recommends that the hopper be relocated to the west of the two-storey metal cladding building workshop, as outlined in Scenario C and indicated in Figure 5. Moving the hopper to this location will reduce noise impacts to applicable MECP limits, as seen in Table 7.

Results also show that noise levels are below criteria in Scenario B at all receptors, where hopper and hopper support activities are not in operation. Noise contours for the daytime, evening, and nighttime periods can be seen in Figures 6-15 for Scenarios A, B, and C.

TABLE 5: SCENARIO A NOISE IMPACT LEVELS (UNMITIGATED)

Receptor Number	Receptor Type-Location	Noise Level (dBA)			Sound Level Limits (dBA)			Meets Class 3 Criteria		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
R1	POW – 6168 Rideau Valley Drive – North Façade	52	34	34	45	40	40	**No**	Yes	Yes
R2	POW – 6168 Rideau Valley Drive – West Façade	52	32	32	45	40	40	**No**	Yes	Yes
R3	POW – 6168 Rideau Valley Drive – North Façade	51	33	33	45	40	40	**No**	Yes	Yes
R4	POW – 6168 Rideau Valley Drive – East Façade	50	31	31	45	40	40	**No**	Yes	Yes
R5	OPOR – 6168 Rideau Valley Drive	47	33	33	45	40	N/a	**No**	Yes	Yes
R6	OPOR – 6168 Rideau Valley Drive	52	37	37	45	40	N/a	**No**	Yes	Yes
R7	POW – 6120 Rideau Valley Drive – South Façade	43	22	22	45	40	40	Yes	Yes	Yes
R8	POW – 6120 Rideau Valley Drive – West Façade	44	22	22	45	40	40	Yes	Yes	Yes
R9	OPOR – 6120 Rideau Valley Drive	42	20	20	45	40	N/a	Yes	Yes	N/a
R10	OPOR – 6168 Rideau Valley Drive	52	34	34	45	40	N/a	Yes	Yes	N/a
R11	OPOR – 6168 Rideau Valley Drive	50	35	35	45	40	N/a	**No**	Yes	N/a

TABLE 6: SCENARIO B NOISE IMPACT LEVELS (UNMITITGATED)

Receptor Number	Receptor Type-Location	Noise Level (dBA)			Sound Level Limits (dBA)			Meets Class 3 Criteria		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
R1	POW – 6168 Rideau Valley Drive – North Façade	44	34	34	45	40	40	Yes	Yes	Yes
R2	POW – 6168 Rideau Valley Drive – West Façade	40	32	32	45	40	40	Yes	Yes	Yes
R3	POW – 6168 Rideau Valley Drive – North Façade	44	33	33	45	40	40	Yes	Yes	Yes
R4	POW – 6168 Rideau Valley Drive – East Façade	44	31	31	45	40	40	Yes	Yes	Yes
R5	OPOR – 6168 Rideau Valley Drive	45	33	33	45	40	N/a	Yes	Yes	Yes
R6	OPOR – 6168 Rideau Valley Drive	45	37	37	45	40	N/a	Yes	Yes	Yes
R7	POW – 6120 Rideau Valley Drive – South Façade	39	22	22	45	40	40	Yes	Yes	Yes
R8	POW – 6120 Rideau Valley Drive – West Façade	39	22	22	45	40	40	Yes	Yes	Yes
R9	OPOR – 6120 Rideau Valley Drive	36	20	20	45	40	N/a	Yes	Yes	Yes
R10	OPOR – 6168 Rideau Valley Drive	40	31	31	45	40	N/a	Yes	Yes	Yes
R11	OPOR – 6168 Rideau Valley Drive	45	35	35	45	40	N/a	Yes	Yes	Yes

TABLE 7: SCENARIO C NOISE IMPACT LEVELS (MITIGATED)

Receptor Number	Receptor Location	Noise Level (dBA)			Sound Level Limits (dBA)			Meets Class 3 Criteria		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
R1	POW – 6168 Rideau Valley Drive – North Façade	44	34	34	45	40	40	Yes	Yes	Yes
R2	POW – 6168 Rideau Valley Drive – West Façade	40	32	32	45	40	40	Yes	Yes	Yes
R3	POW – 6168 Rideau Valley Drive – North Façade	44	33	33	45	40	40	Yes	Yes	Yes
R4	POW – 6168 Rideau Valley Drive – East Façade	43	31	31	45	40	40	Yes	Yes	Yes
R5	OPOR – 6168 Rideau Valley Drive	45	33	33	45	40	N/a	Yes	Yes	N/a
R6	OPOR – 6168 Rideau Valley Drive	45	37	37	45	40	N/a	Yes	Yes	N/a
R7	POW – 6120 Rideau Valley Drive – South Façade	45	22	22	45	40	40	Yes	Yes	Yes
R8	POW – 6120 Rideau Valley Drive – West Façade	45	22	22	45	40	40	Yes	Yes	Yes
R9	OPOR – 6120 Rideau Valley Drive	44	20	20	45	40	N/a	Yes	Yes	N/a
R10	OPOR – 6168 Rideau Valley Drive	44	36	36	45	40	N/a	Yes	Yes	N/a
R11	OPOR – 6168 Rideau Valley Drive	45	35	35	45	40	N/a	Yes	Yes	N/a

3.6 Impulse Noise Levels

The impulse noise levels from dump truck tailgate slams are summarized in Table 8. Results of the analysis indicate the resultant highest mean logarithmic impulsive sound level from the study site is 54 dBAI at the private outdoor area of 6168 Rideau Valley Drive. Impulse noise levels at all receptors comply with NPC-300 criteria. Noise contours from the dump truck tailgate slam across the site can be seen in Figure 16 and for the daytime period.

TABLE 8: NOISE LEVEL FROM TAIL GATE SLAMS

Receptor Number	Receptor Location	Noise Level (dBA)			Sound Level Limits (dBAI)			Meets Class 3 Criteria		
		Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
R1	POW – 6168 Rideau Valley Drive – North Façade	51	-	-	70	70	65	Yes	N/A	N/A
R2	POW – 6168 Rideau Valley Drive – West Façade	47	-	-	70	70	65	Yes	N/A	N/A
R3	POW – 6168 Rideau Valley Drive – North Façade	52	-	-	70	70	65	Yes	N/A	N/A
R4	POW – 6168 Rideau Valley Drive – East Façade	51	-	-	70	70	65	Yes	N/A	N/A
R5	OPOR – 6168 Rideau Valley Drive	53	-	-	70	70	N/A	Yes	N/A	N/A
R6	OPOR – 6168 Rideau Valley Drive	53	-	-	70	70	N/A	Yes	N/A	N/A
R7	POW – 6120 Rideau Valley Drive – South Façade	44	-	-	70	70	65	Yes	N/A	N/A
R8	POW – 6120 Rideau Valley Drive – West Façade	44	-	-	70	70	65	Yes	N/A	N/A
R9	OPOR – 6120 Rideau Valley Drive	41	-	-	70	70	N/A	Yes	N/A	N/A
R10	OPOR – 6168 Rideau Valley Drive	46	-	-	70	70	N/A	Yes	N/A	N/A
R11	OPOR – 6168 Rideau Valley Drive	54	-	-	70	70	N/A	Yes	N/A	N/A

4. CONCLUSIONS

Based on the findings of this report, two residential dwellings are within the influence area of the study site at 6168 and 6120 Rideau Valley Drive; therefore, mitigation measures should be applied to minimize dust and noise impacts. The study site is not a significant source of vibration.

Sensitive properties situated below the minimum recommended setback distance are not downwind of the study site, therefore, any dust impacts from unpaved roads and storage piles are infrequent. However, best dust management practices should still be utilized to further limit any potential impacts.

Noise modelling results show that noise levels are above criteria due to hopper and loader operations, in their current location. To reduce noise impacts, Gradient Wind recommends that the hopper and loader operations associated with bag filling be relocated to the west of the 2-storey metal cladding building workshop, as indicated in Figure 5. This will reduce noise impacts to MECP limits.

This concludes our land use compatibility study and report. If you have any questions or wish to discuss our findings, please advise us. In the interim, we thank you for the opportunity to be of service.

Sincerely,

Gradient Wind Engineering Inc.

LICENSED PROFESSIONAL ENGINEER
J. R. FOSTER
100155655
2025-06-19
PROVINCE OF ONTARIO

Efser Kara, MSc, LEED GA
Acoustic Scientist

Joshua Foster, P.Eng.
Lead Engineer

Gradient Wind File 23-296 – Air Quality and Land Use Compatibility Assessment

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PROJECT	6158 RIDEAU VALLEY DRIVE, OTTAWA AIR QUALITY AND LAND USE COMPATIBILITY ASSESSMENT		
SCALE	1:10000 (APPROX.)	DRAWING NO.	GW22-296-1
DATE	JULY 2, 2024	DRAWN BY	E.A.

DESCRIPTION

FIGURE 1:
STUDY SITE AND SURROUNDING CONTEXT

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SCALE 1:2000 (APPROX.)	DRAWING NO. GW23-296-2
DATE JULY 2, 2024	DRAWN BY E.A.

DESCRIPTION

FIGURE 2:
RECEPTOR LOCATIONS

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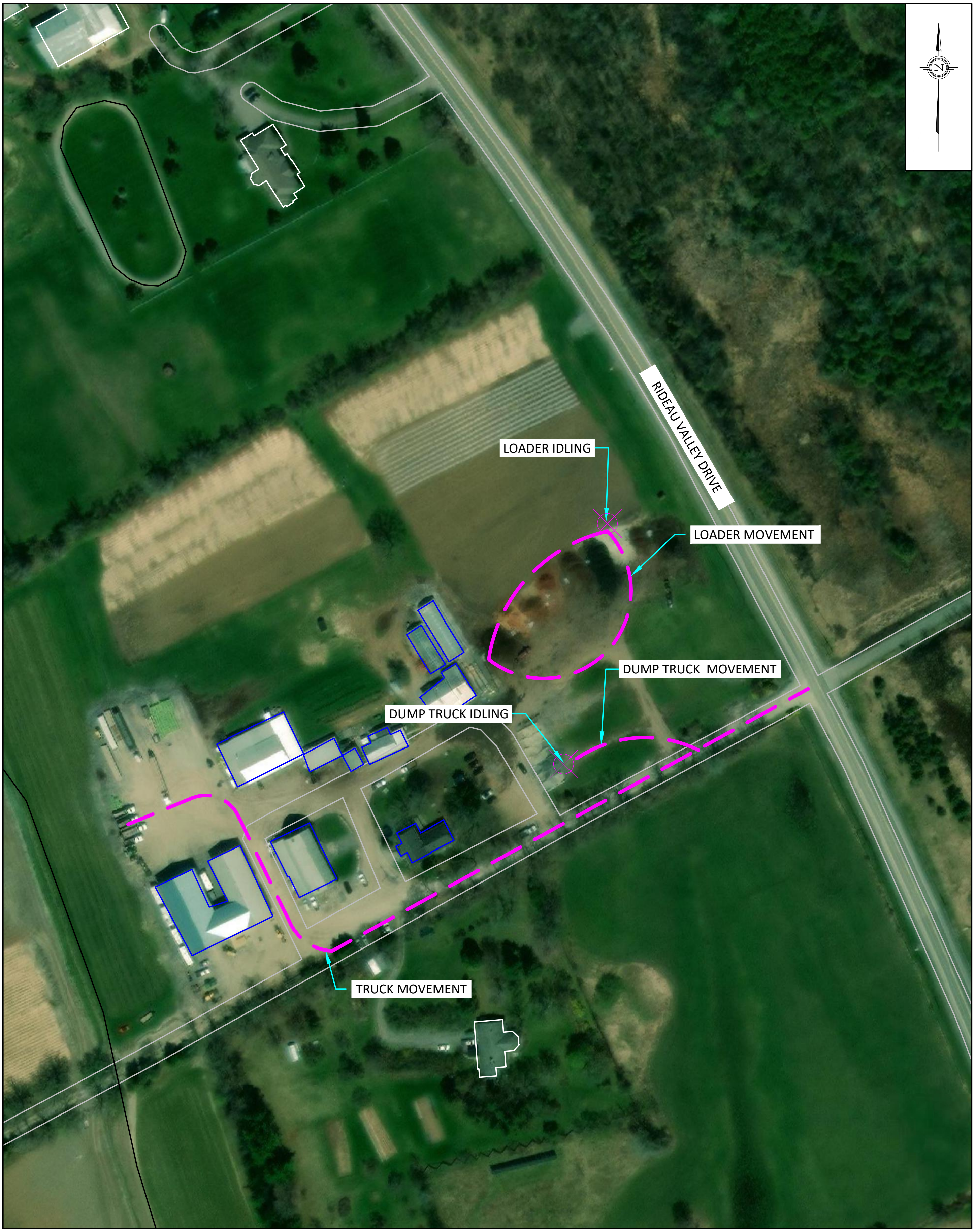
PROJECT: 6158 RIDEAU VALLEY DRIVE, OTTAWA AIR QUALITY AND LAND USE COMPATIBILITY ASSESSMENT		DESCRIPTION: FIGURE 3: SCENARIO A - WITH HOPPER OPERATIONS
SCALE: 1:2000 (APPROX.)	DRAWING NO.: GW23-296-3	
DATE: JULY 2, 2024	DRAWN BY: E.A.	



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PROJECT: 6158 RIDEAU VALLEY DRIVE, OTTAWA SITE VISIT		DESCRIPTION: FIGURE 4: SCENARIO B - WITHOUT HOPPER OPERATIONS
SCALE: 1:2000 (APPROX.)	DRAWING NO.: GW23-296-4	
DATE: JULY 2, 2024	DRAWN BY: E.A.	

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PROJECT	6158 RIDEAU VALLEY DRIVE, OTTAWA AIR QUALITY AND LAND USE COMPATIBILITY ASSESSMENT
SCALE	1:2000 (APPROX.)
DRAWING NO.	GW23-296-5
DATE	JUNE 17, 2025
DRAWN BY	E.K.
DESCRIPTION	FIGURE 5: SCENARIO C - WITH HOPPER OPERATIONS

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PROJECT	6158 RIDEAU VALLEY DRIVE, OTTAWA SITE VISIT		
SCALE	1:2000 (APPROX.)	DRAWING NO.	GW23-296-6
DATE	JULY 2, 2024	DRAWN BY	E.A.

DESCRIPTION

FIGURE 6:
IMPULSE NOISE SOURCE LOCATION

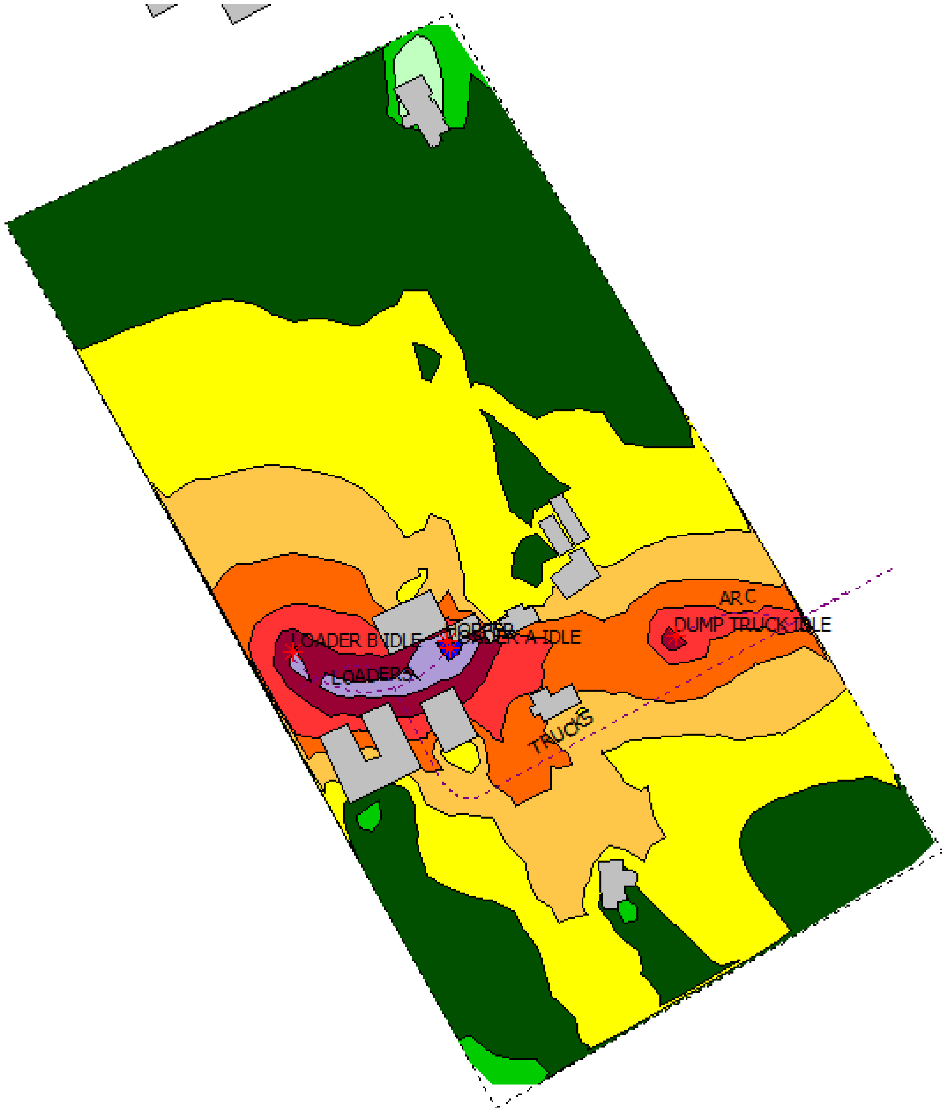
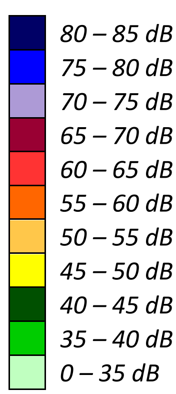


FIGURE 7: SCENARIO A - DAYTIME STATIONARY NOISE CONTOURS (4.5 METERS ABOVE GRADE)



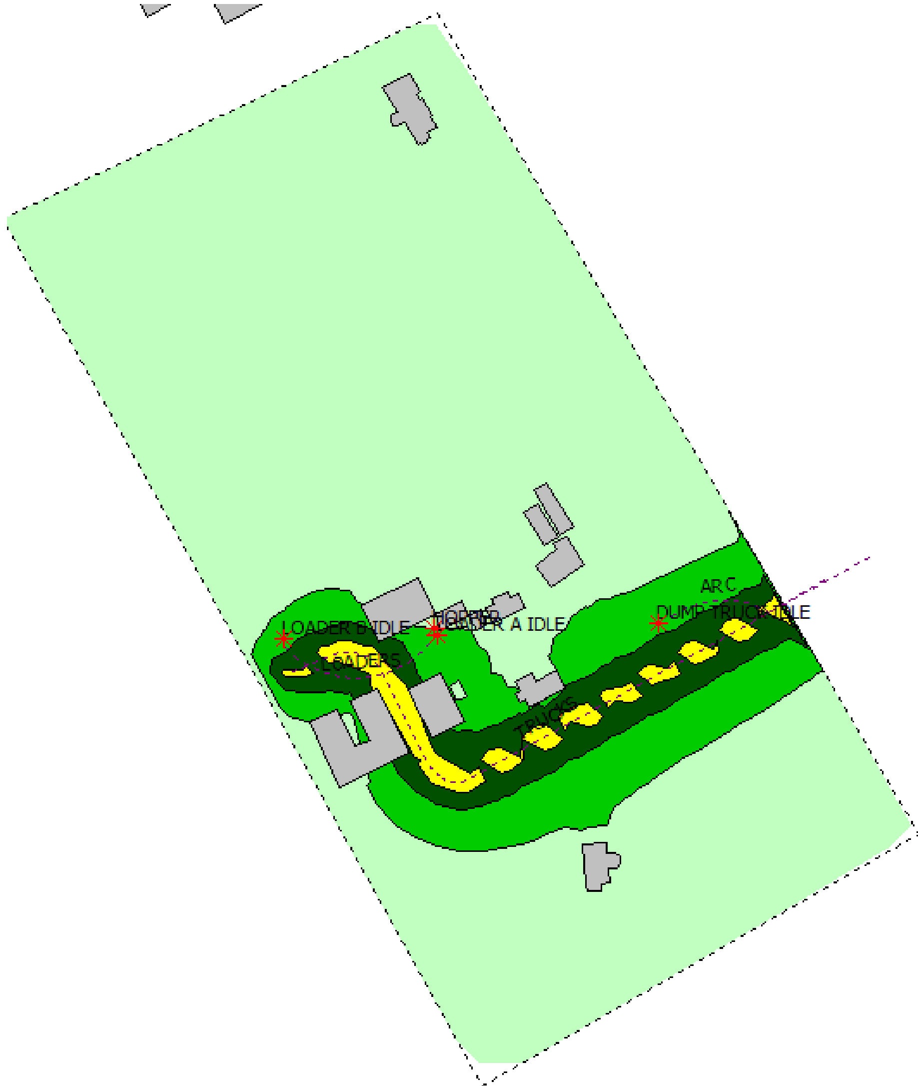
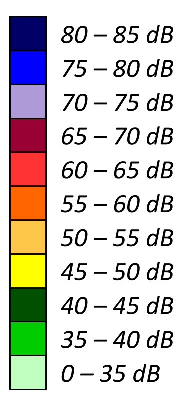


FIGURE 8: SCENARIO A - EVENING STATIONARY NOISE CONTOURS (4.5 METERS ABOVE GRADE)



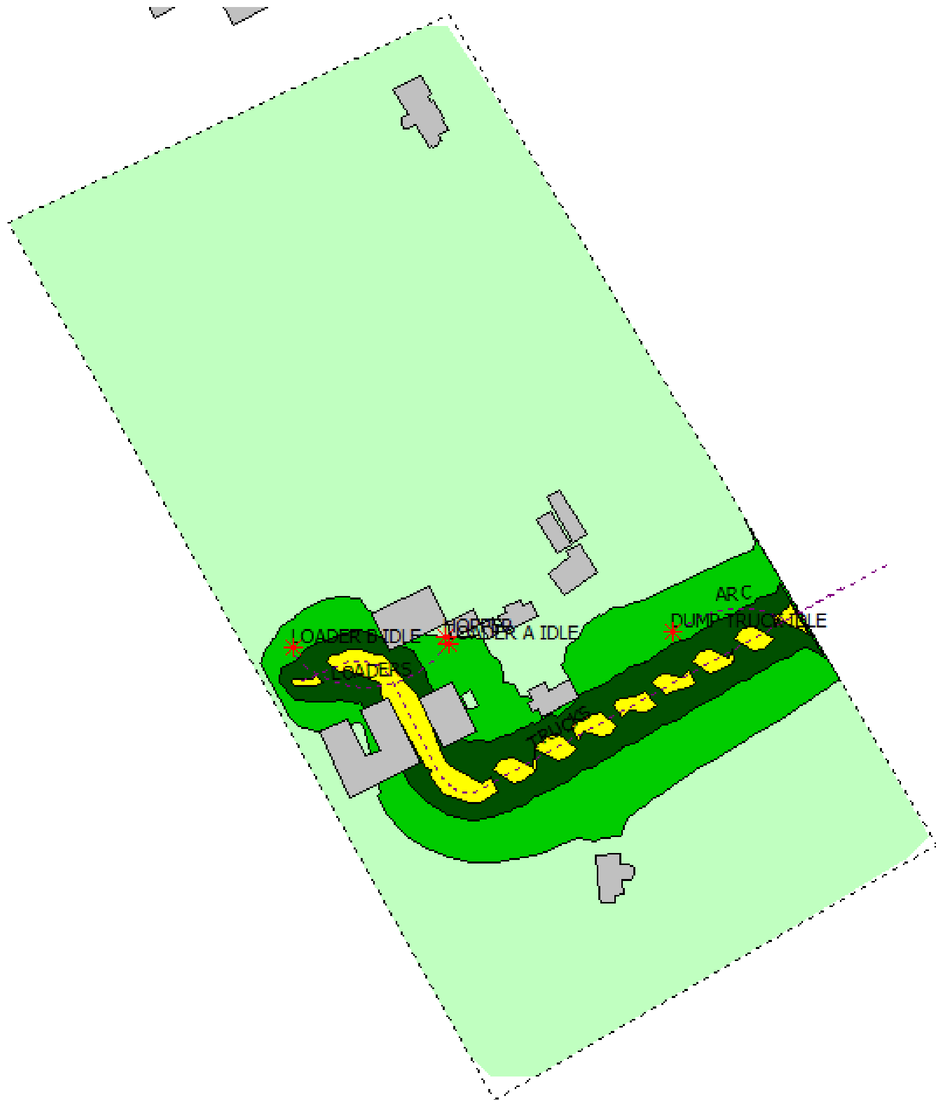


FIGURE 9: SCENARIO A - NIGHTTIME STATIONARY NOISE CONTOURS (4.5 METERS ABOVE GRADE)

80 – 85 dB
75 – 80 dB
70 – 75 dB
65 – 70 dB
60 – 65 dB
55 – 60 dB
50 – 55 dB
45 – 50 dB
40 – 45 dB
35 – 40 dB
0 – 35 dB

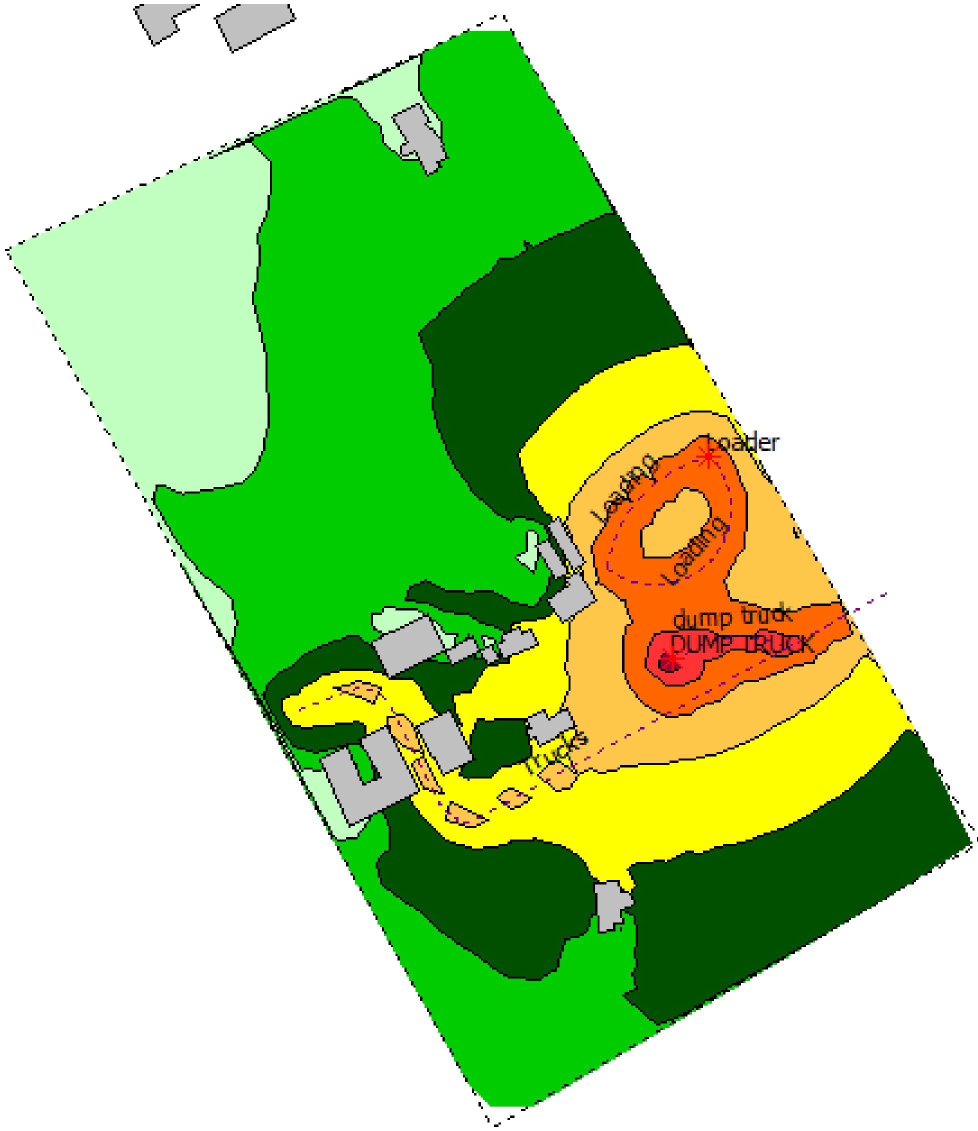
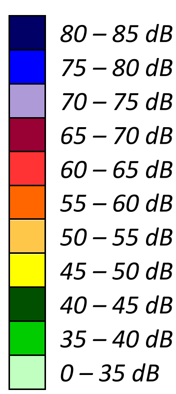


FIGURE 10: SCENARIO B - DAYTIME STATIONARY NOISE CONTOURS (4.5 METERS ABOVE GRADE)



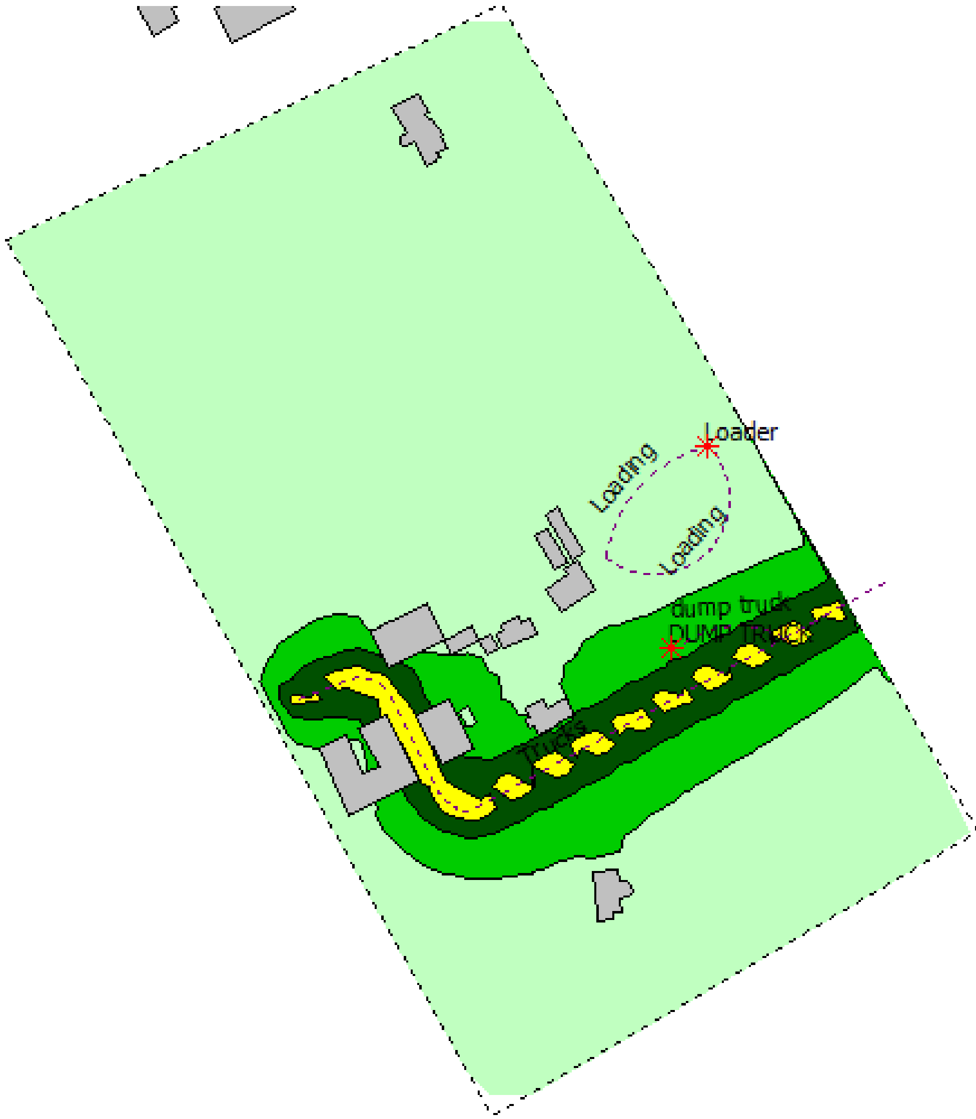
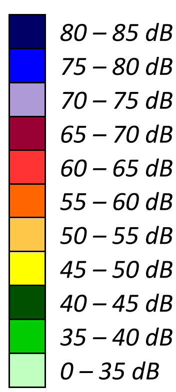


FIGURE 11: SCENARIO B - EVENING STATIONARY NOISE CONTOURS (4.5 METERS ABOVE GRADE)



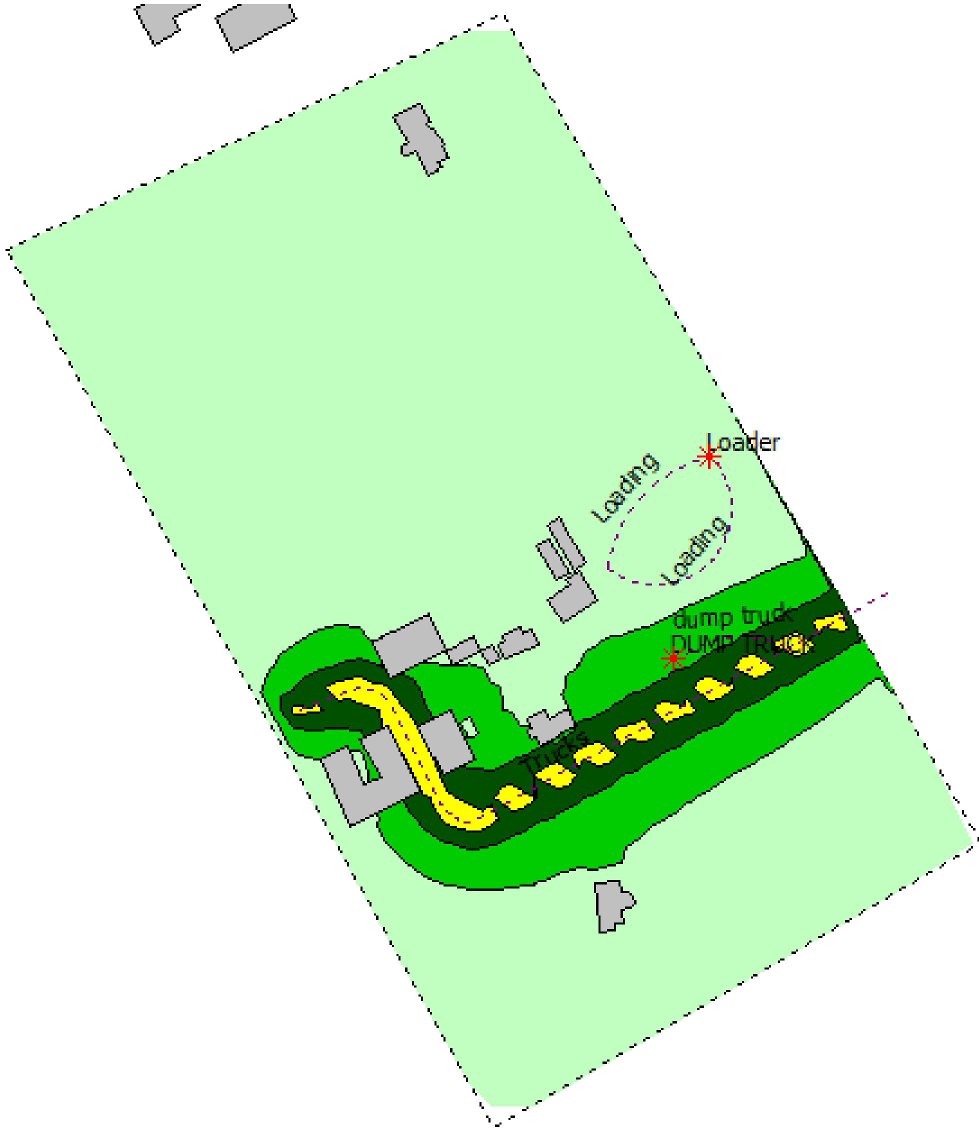
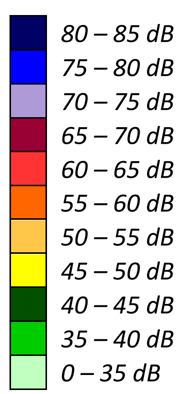


FIGURE 12: SCENARIO B - NIGHTTIME STATIONARY NOISE CONTOURS (4.5 METERS ABOVE GRADE)



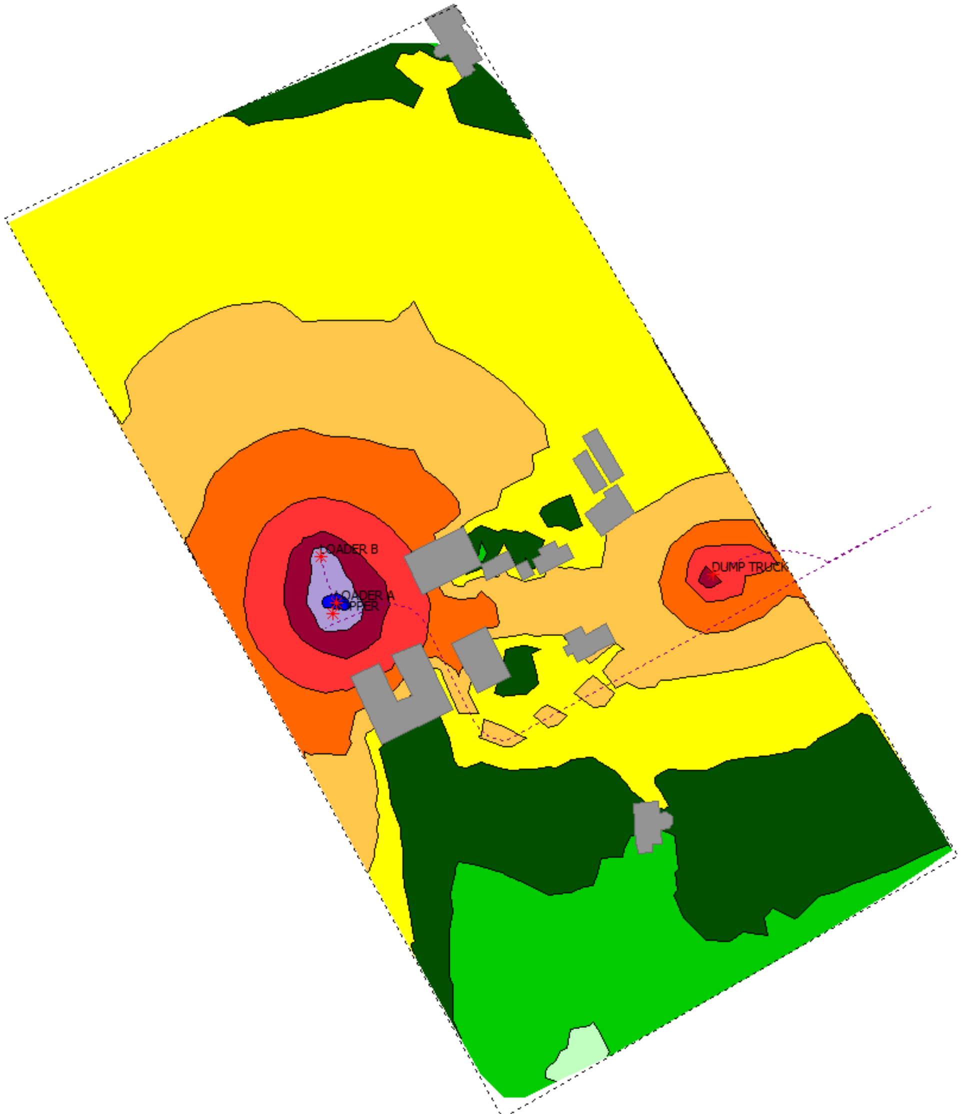
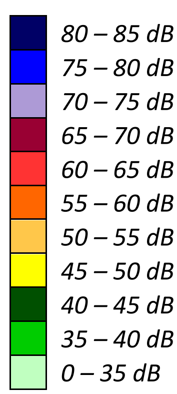


FIGURE 13: SCENARIO C - DAYTIME STATIONARY NOISE CONTOURS (4.5 METERS ABOVE GRADE)



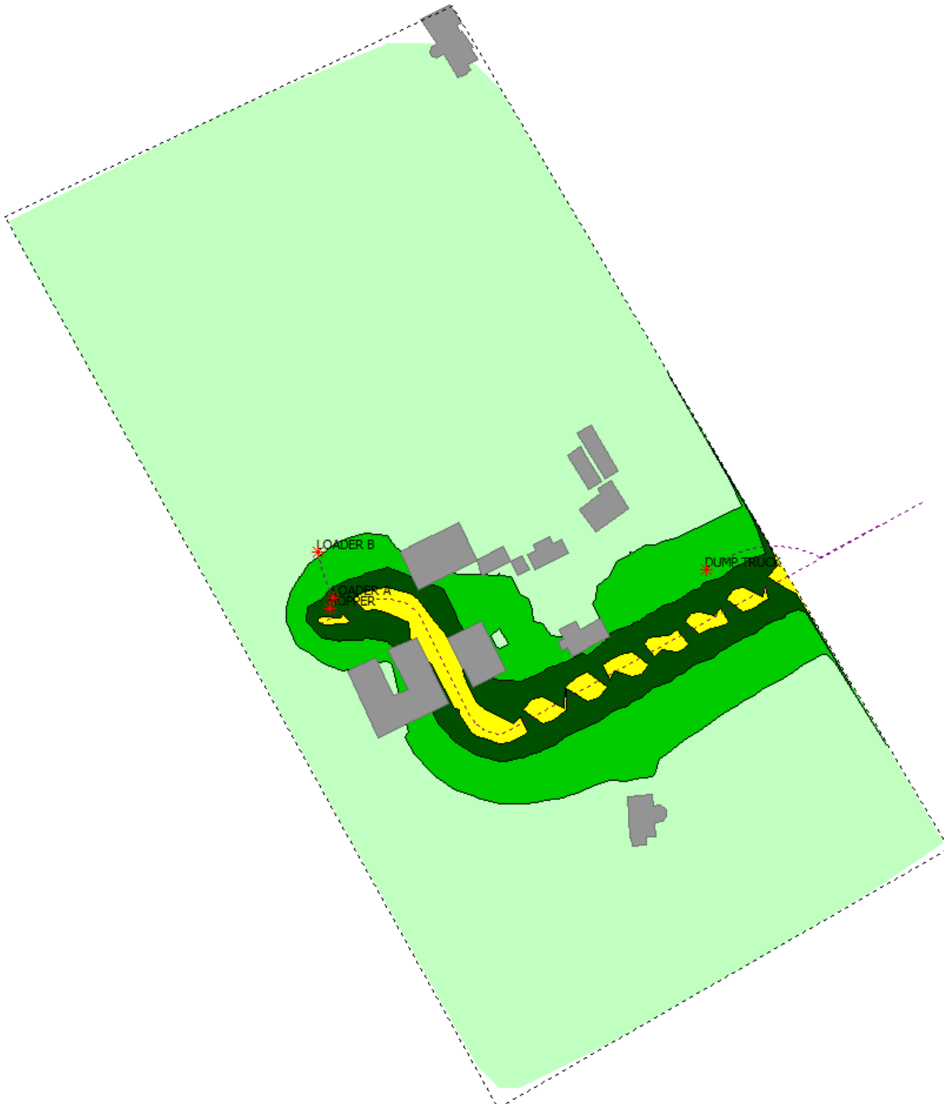
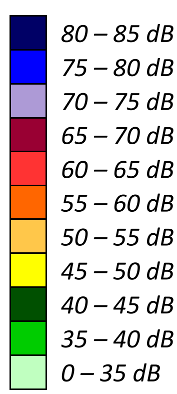


FIGURE 14: SCENARIO C - EVENING STATIONARY NOISE CONTOURS
(4.5 METERS ABOVE GRADE)



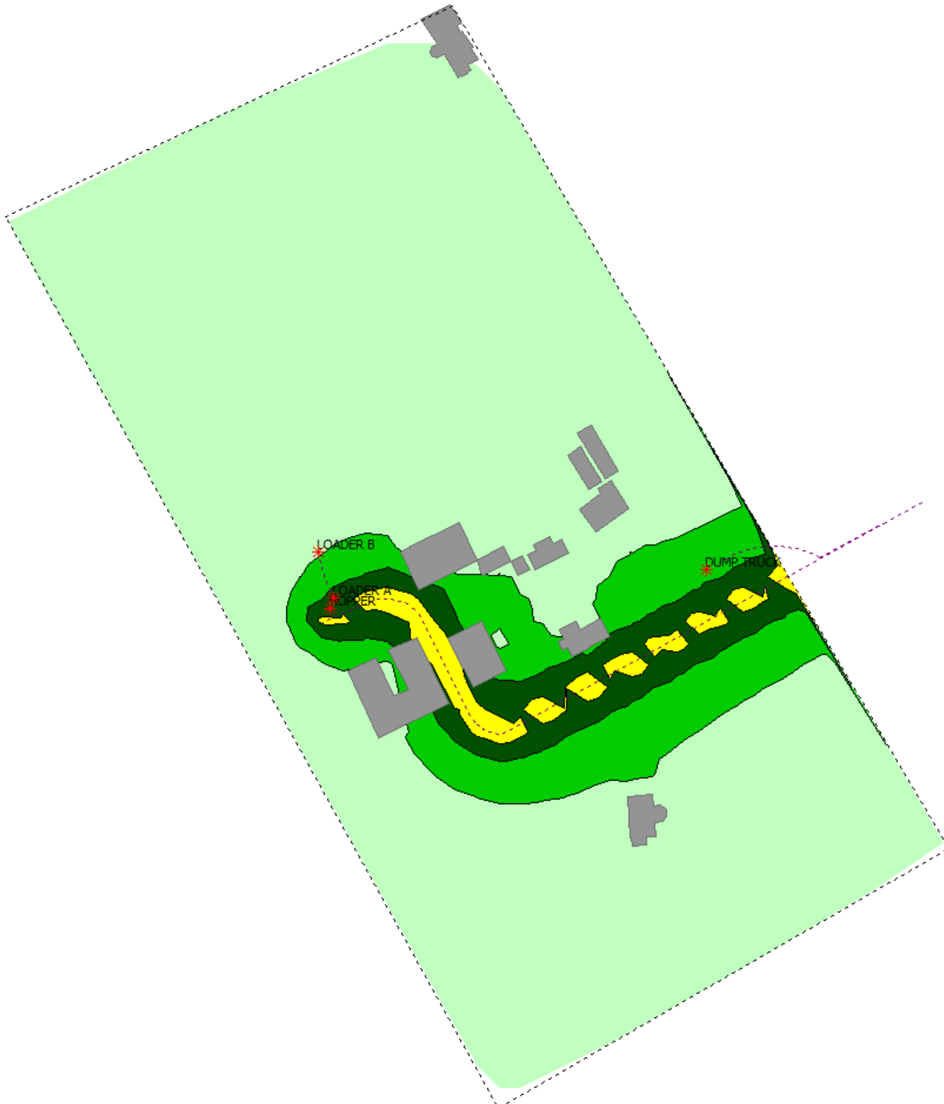


FIGURE 15: SCENARIO C - NIGHTTIME STATIONARY NOISE CONTOURS (4.5 METERS ABOVE GRADE)

- *80 – 85 dB*
- *75 – 80 dB*
- *70 – 75 dB*
- *65 – 70 dB*
- *60 – 65 dB*
- *55 – 60 dB*
- *50 – 55 dB*
- *45 – 50 dB*
- *40 – 45 dB*
- *35 – 40 dB*
- *0 – 35 dB*

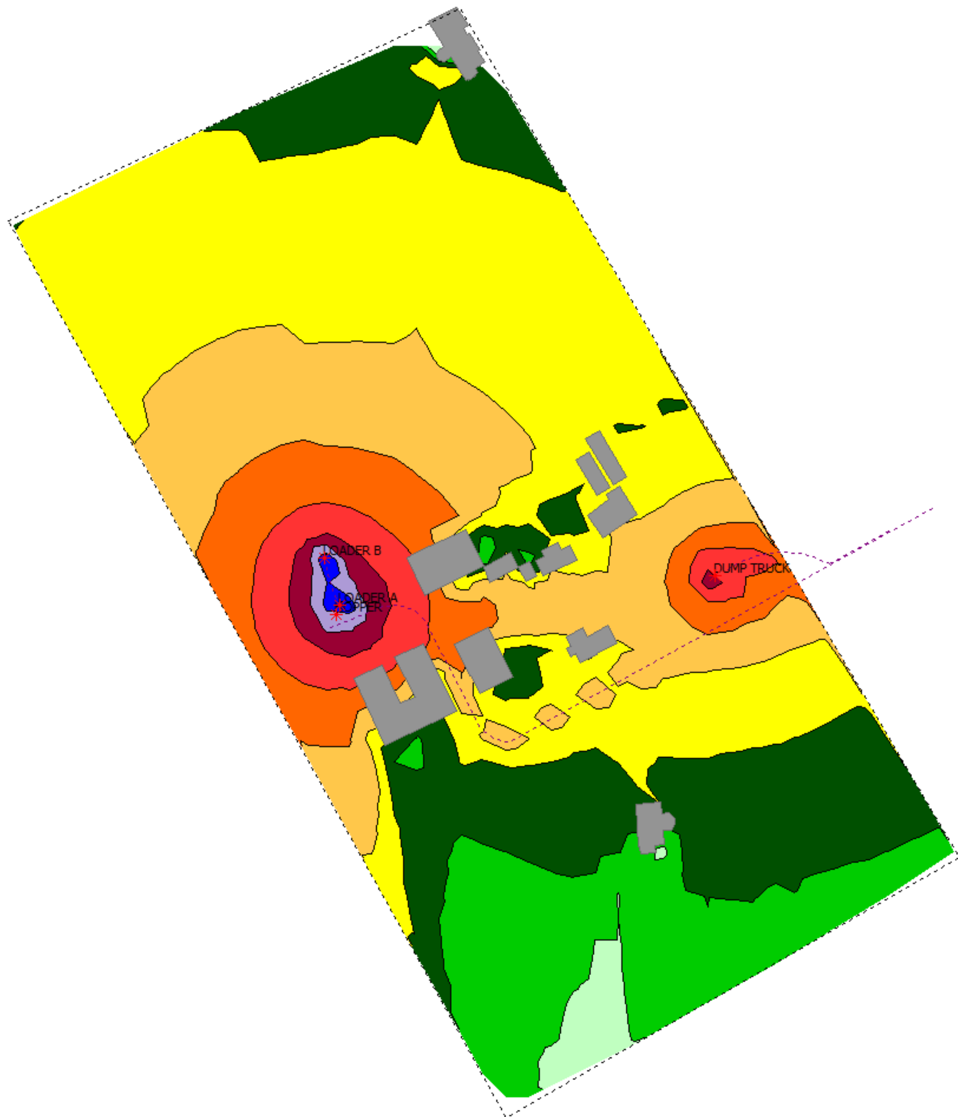
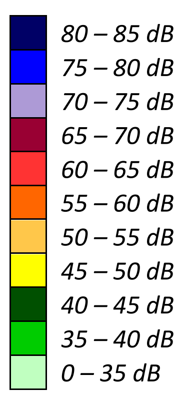


FIGURE 16: SCENARIO C DAYTIME STATIONARY NOISE CONTOURS (1.5 METERS ABOVE GRADE)



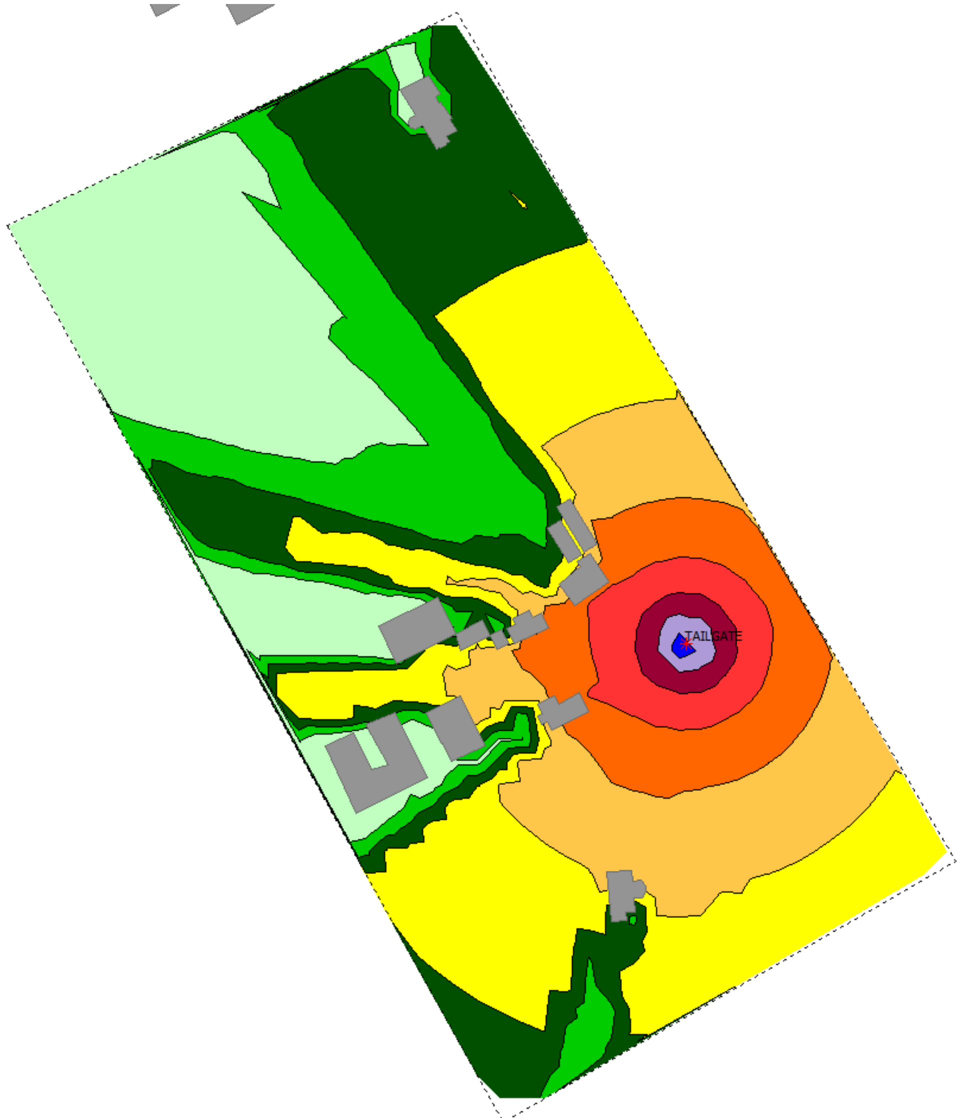


FIGURE 17: NOISE CONTOURS FROM TAILGATE SLAMS (IMPULSE)
(4.5 METERS ABOVE GRADE)

80 – 85 dB
75 – 80 dB
70 – 75 dB
65 – 70 dB
60 – 65 dB
55 – 60 dB
50 – 55 dB
45 – 50 dB
40 – 45 dB
35 – 40 dB
0 – 35 dB

APPENDIX A: SITE VISIT PHOTOS

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IMAGE 1: TRUCK PARKING AREA

IMAGE 2: EQUIPMENT STORAGE AREA

IMAGE 3: MAIN LANEWAY & STORAGE BUILDING FACING WEST

IMAGE 4: TRUCK PARKING AND STORAGE

IMAGE 5: MARKET AREA

IMAGE 6: STORAGE SHED

IMAGE 7: LANDSCAPE MATERIAL PILES

IMAGE 8: HOPPER