Dorchester and Oldfield Road, Niagara Falls

D-6 Compatibility & Mitigation Study, Air Quality, Dust, Odour & Noise

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Executive Summary

SLR Consulting (Canada) Ltd. (SLR), was retained by Upper Canada Planning & Engineering Ltd. to conduct an environmental air quality and noise study for the proposed Dorchester and Oldfield Road development located in Niagara Falls, Ontario. The development site is located on Dorchester and Oldfield Road, Parcel 28232 in Niagara Falls. The lands are legally known as Part of Lot 197 and Part Road Allowance between Lots 196 & 197, City of Niagara ("Project site"). A Project site and area plan is provided in Figure 1 of the attached figures. The proposed Project concept plan is provided as Figure 4.

The environmental air and noise quality study is required by the City of Niagara Falls in support of a planning approval application for the development of the Project site. The proposed development is planned to include two 6-storey apartment buildings, 54 dwelling units, and associated surface parking.

The addition of "sensitive" land uses within the Project site, including residential, requires an assessment of land use compatibility with the surrounding proposed, and existing, employment land uses.

This assessment has considered:

- Industrial air quality, odour, and dust emissions;
- Industrial/ commercial noise; and
- Transportation-related noise.

The assessment has included a review of air quality and noise emissions from industrial facilities in the area.

The Project site is anticipated to be compatible with the surrounding land uses from an air quality and noise perspective. Further, the Project site will not affect the ability for industrial facilities to obtain or maintain compliance with applicable Provincial environmental policies, regulations, approvals, authorizations, and guidelines. The requirements of MECP Guideline D-6, Regulation 419/05, and Publication NPC-300 are met. As the applicable policies and guidelines are met, the Project site is:

- Unlikely to result in increased risk of complaint and nuisance claims;
- Unlikely to result in operational constraints for the major facilities; and
- Unlikely to result in constraints on major facilities to reasonably expand, intensify or introduce changes to their operations.

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1.0 Introduction

SLR Consulting (Canada) Ltd. (SLR), was retained by Upper Canada Planning & Engineering Ltd. to conduct an environmental air and noise quality study for the proposed Dorchester and Oldfield Road development located in Niagara Falls, Ontario. The development site is located on Dorchester and Oldfield Road Parcel 28232 in Niagara Falls. The lands are legally known as Part of Lot 197 and Part Road Allowance between Lots 196 & 197, City of Niagara ("Project site"). A Project site and area plan is provided in Figure 1 of the attached figures. The proposed Project concept plan is provided as Figure 4.

The environmental air and noise quality study is required by the City of Niagara Falls in support of a planning approval application for the development of the Project site. The proposed development is planned to include two 6-storey apartment buildings, 54 dwelling units, and associated surface parking.

The addition of "sensitive" land uses within the Project site, including residential, requires an assessment of land use compatibility with the surrounding proposed, and existing, employment land uses.

This assessment has considered:

- Industrial air quality, odour, and dust emissions;
- Industrial/ commercial noise; and
- Transportation-related noise.

In this assessment, SLR has reviewed the surrounding industrial land uses and major facilities in the area with respect to the following guidelines:

- The Provincial Policy Statement;
- Ministry of the Environment, Conservation and Parks ("MECP") Guidelines D-1, and D-6;
- Ontario Regulation 419/05: Air Pollution – Local Air Quality and its associated air quality standards and assessment requirements; and
- The MECP draft policies on odour impacts and assessment;
- MECP Publication NPC-300 noise guidelines for industrial and transportation, and
- City of Niagara Falls Noise Control By-law 2004-105 as amended.

This report identifies and evaluates options to achieve land use compatibility through appropriate design, buffering and/or separation distances between the proposed sensitive land uses, including residential uses, and nearby employment areas and/or major facilities.

2.0 Description of Development and Surroundings

2.1 Proposed Development

The Project site is located on Dorchester and Oldfield Road Parcel 28232 in Niagara Falls; southwest of the intersection of Dorchester and Oldfield Road and immediately east side of the Palfinger Inc. located at 7942 Dorchester Road. The lands are legally known as Part of Lot 197 and Part Road Allowance between Lots 196 & 197, City of Niagara. The Project site is currently occupied by a rail services construction company that includes storage of railroad ties and tracks. The Project site and context plan can be seen in Figure 1.

2.2 City of Niagara Falls Official Plan

The Project site and lands to the east and west has a split designation of Residential and Environmental Protection Area. The lands to the south are designated Environmental Protection Area. To the north, the lands are designated Industrial. Across Dorchester Road and north of the Industrial land, the lands are designated Residential. An excerpt from The City of Niagara Falls Official Plan Map for the area can be seen in the attached Figure 2A.

2.3 City of Niagara Falls Secondary Plan

The Project site and surrounding area are also subject to the City of Niagara Falls Riverfront Community Secondary Plan and Special Policy Area 56. Schedule A-6 to the Official Plan Riverfront Community Plan shows the land uses in the secondary plan, an excerpt of the plan and the Project site is shown in **Figure 2B**. The Riverfront Community plan is proposed to support Residential low/medium density uses; Mixed Use to promote commercial employment uses; Open Space and Environmental Protection Areas. The Project site is designated as Special Policy Area 56 in the Secondary Plan and the wooded area occupying a small portion at the south end of the Project site is designated as an Environmental Protection Area which is consistent with the Official Plan map shown in **Figure 2A**. The Project site context plan shown in **Figure 4** identifies a 30m setback from the wooded area which is intended to function as a buffer.

2.4 City of Niagara Falls Zoning By Law 79-200 (1)

The Project site and the lands to the south and to the east are currently zoned General Industrial ("GI"). The lands to the north and to the west are zoned Light Industrial ("LI"). Beyond Dorchester Road and the LI zoning, the lands are zoned Residential Low Density ("R4") and Residential Two Zone ("R2"). The Project site is identified on the City of Niagara Falls area zoning map in Figure 3.

2.5 Proposed Development

The proposed development is planned to include two 6-storey apartment buildings accommodating 54 dwelling units along the northern portion of the property adjacent to Dorchester Rd, and associated surface parking south of the proposed buildings. The existing woodlot at the southeast corner of the property is to remain in keeping with the City of Niagara Falls Environmental Protection Area, a 30m wetland buffer to the wooded area has been incorporated into the plan. A copy of the concept site plan is provided in Figure 4.

2.6 Surroundings

The Project site is currently occupied by a rail services construction company that includes storage of railroad ties and tracks and is bounded by Dorchester Road to the north. To the west is the Palfinger Inc. which is a crane dealer. North of Dorchester Road is a self storage facility and a gymnastics training facility with low density residential homes beyond.

3.0 Assessment Framework

The intent of this report is to identify any existing and potential land use compatibility issues and to identify and evaluate options to achieve appropriate design, buffering and/or separation distances between the surrounding sensitive land uses, including residential uses, and nearby Employment Areas and/or major facilities. Recommended measures intended to eliminate or mitigate negative impacts and adverse effects are provided.

The requirements of the Ontario planning regime are organized such that generic policy is informed by specific policy, guidance, and legislation, as follows:

- The Ontario Planning Act, Section 2.1 – sets the ground rules for land use planning in Ontario, whereby planning decisions have regard to matters of provincial interest including orderly development, public health, and safety; then
- The Provincial Policy Statement ("PPS") sets out goals – making sure adjacent land uses are compatible from a health and safety perspective and are appropriately buffered; then
- The Provincial Growth Plan, Section 2.2.5 – builds on the PPS to establish a unique land use planning framework for the Greater Golden Horseshoe, where the development of sensitive land uses will avoid, or where avoidance is not possible, minimize and mitigate adverse impacts on industrial, manufacturing, or other uses that are particularly vulnerable to encroachment; then
- The MECP D-series of guidelines set out methods to determine if assessments are required (Areas of Influence, Recommended Minimum Separation Distances, and the need for additional studies); then
- MECP and Municipal regulations, policies, standards, and guidelines then set out the requirements of additional air quality studies and the applicable policies, standards, guidelines, and objectives to ensure that adverse effects do not occur.

3.1 Ontario Planning Act

The Ontario Planning Act is provincial legislation that sets out the ground rules for land use planning in Ontario. It describes how land uses may be controlled, and who may control them. "The purpose of the Act is to:

- provide for planning processes that are fair by making them open, accessible, timely and efficient;
- promote sustainable economic development in a healthy natural environment within a provincial policy framework;
- provide for a land use planning system led by provincial policy;

- integrate matters of provincial interest into provincial and municipal planning decisions by requiring that all decisions be consistent with the Provincial Policy Statement and conform/not conflict with provincial plans;
- encourage co-operation and coordination among various interests;
- recognize the decision-making authority and accountability of municipal councils in planning"[1]

Section 2.1 of the Ontario Planning Act describes how approval authorities and Tribunals must have regard to matters of provincial interest including orderly development, public health, and safety.

3.2 Provincial Policy Statement

The PPS "provides policy direction on matters of provincial interest related to land use planning and development. As a key part of the Ontario policy-led planning system, the Provincial Policy Statement sets the policy foundation for regulating the development and use of land. It also supports the provincial goal to enhance the quality of life for all Ontarians."

The PPS is a generic document, providing a consolidated statement of the government policies on land use planning and is issued under section 3 of the Planning Act. Municipalities are the primary implementers of the PPS through policies in their local official plans, zoning by-laws and other planning related decisions. The current 2020 PPS came into effect on May 1, 2020. Policy direction concerning land use compatibility is provided in Section 1.2.6 of the PPS.

From the current 2020 version:

> "1.2.6 Land Use Compatibility
>
> 1.2.6.1 Major facilities and sensitive land uses shall be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities in accordance with provincial guidelines, standards and procedures.
>
> 1.2.6.2 Where avoidance is not possible in accordance with policy 1.2.6.1, planning authorities shall protect the long-term viability of existing or planned industrial, manufacturing or other uses that are vulnerable to encroachment by ensuring that the planning and development of proposed adjacent sensitive land uses are only permitted if the following are demonstrated in accordance with provincial guidelines, standards and procedures:
>
> a) there is an identified need for the proposed use;
>
> b) alternative locations for the proposed use have been evaluated and there are no reasonable alternative locations;
>
> c) adverse effects to the proposed sensitive land use are minimized and mitigated; and

[1] https://www.ontario.ca/document/citizens-guide-land-use-planning/planning-act

d) potential impacts to industrial, manufacturing, or other uses are minimized and mitigated."

The goals of the PPS are implemented through Municipal and Provincial policies, as discussed below. Provided the Municipal and Provincial policies, guidelines, standards, and procedures are met, the requirements of the PPS will be met.

3.3 D-Series of Guidelines

The D-series of guidelines were developed by the MECP in 1995 as a means to assess Recommended Minimum Separation Distances and other control measures for land use planning proposals in an effort to prevent or minimize 'adverse effects' from the encroachment of incompatible land uses where a facility either exists or is proposed. D-series guidelines address sources including sewage treatment (Guideline D-2), gas and oil pipelines (Guideline D-3), landfills (Guideline D-4), water services (Guideline D-5) and industries (Guideline D-6).

For this assessment, the applicable guideline is Guideline D-6 - *Compatibility between Industrial Facilities and Sensitive Land Uses and Guideline D-2 – Compatibility between Sewage Treatment and Sensitive Land Uses*.

Adverse effect is a term defined in the Environmental Protection Act and "means one or more of

- impairment of the quality of the natural environment for any use that can be made of it,
- injury or damage to property or to plant or animal life,
- harm or material discomfort to any person,
- an adverse effect on the health of any person,
- impairment of the safety of any person,
- rendering any property or plant or animal life unfit for human use,
- loss of enjoyment of normal use of property, and
- interference with the normal conduct of business".

3.3.1 Guideline D-6 Requirements

The guideline specifically addresses issues of air quality, odour, dust, noise, and litter. To minimize the potential to cause an adverse effect, Areas of Influence and Recommended Minimum Separation Distances are included within the guidelines. The areas of influence and Recommended Minimum Separation Distances from the guidelines are provided in the table below.

Table 1: Guideline D-6 - Potential Areas of Influence and Recommended Minimum Separation Distances for Industrial Land Uses

Industry Classification	Area of Influence	Recommended Minimum Separation Distance
Class I – Light Industrial	70 m	20 m
Class II – Medium Industrial	300 m	70 m
Class III – Heavy Industrial	1000 m	300 m

Industrial categorization criteria are supplied in Guideline D-6, and are shown in the following table:

Table 2: Guideline D-6 - Industrial Categorization Criteria

Category	Outputs	Scale	Process	Operations / Intensity	Possible Examples
Class I Light Industry	• Noise: Sound not audible off-property • Dust: Infrequent and not intense • Odour: Infrequent and not intense • Vibration: No ground-borne vibration on plant property	• No outside storage • Small-scale plant or scale is irrelevant in relation to all other criteria for this Class	• Self-contained plant or building which produces/ stores a packaged product • Low probability of fugitive emissions	• Daytime operations only • Infrequent movement of products and/ or heavy trucks	• Electronics manufacturing and repair • Furniture repair and refinishing • Beverage bottling • Auto parts supply • Packaging and crafting services • Distribution of dairy products • Laundry and linen supply
Class II Medium Industry	• Noise: Sound occasionally heard off-property • Dust: Frequent and occasionally intense • Odour: Frequent and occasionally intense • Vibration: Possible ground-borne vibration, but cannot be perceived off-property	• Outside storage permitted • Medium level of production allowed	• Open process • Periodic outputs of minor annoyance • Low probability of fugitive emissions	• Shift operations permitted • Frequent movements of products and/ or heavy trucks with the majority of movements during daytime hours	• Magazine printing • Paint spray booths • Metal command • Electrical production • Manufacturing of dairy products • Dry cleaning services • Feed packing plants
Class III Heavy Industry	• Noise: Sound frequently audible off property • Dust: Persistent and/ or intense • Odour: Persistent and/ or intense • Vibration: Ground-borne vibration can frequently be perceived off-property	• Outside storage of raw and finished products • Large production levels	• Open process • Frequent outputs of major annoyances • High probability of fugitive emissions	• Continuous movement of products and employees • Daily shift operations permitted	• Paint and varnish manufacturing • Organic chemical manufacturing • Breweries • Solvent recovery plants • Soaps and detergent manufacturing • Metal refining and manufacturing

3.3.2 Requirements for Assessments

Guideline D-6 requires that studies be conducted to assess impacts where sensitive land uses are proposed within the Potential Area of Influence of an industrial facility. This report is intended to fulfill this requirement.

The D-series guidelines reference previous versions of the air quality regulation (Regulation 346). However, the D-Series of guidelines are still active, still represent current MECP policy and are specifically referenced in numerous other current MECP policies. In applying the D-series guidelines, the current policies, regulations, standards, and guidelines have been used (e.g., Regulation 419).

3.3.3 Recommended Minimum Separation Distances

Guideline D-6 also *recommends* that no sensitive land use be placed within the Recommended Minimum Separation Distance. However, it should be noted that this is a recommendation only. Section 4.10 of the Guideline allows for development within the Recommended Minimum Separation Distance, in cases of redevelopment, infilling, and transitions to mixed use, provided that the appropriate studies are conducted and that the relevant air quality and noise guidelines are met.

4.0 Nearby Industries

The Guideline D-6 Separation distances from the Project site are shown in Figure 5. SLR personnel conducted a site visit to the area on October 24, 2022. Local industries within 1 km of the Project site were inventoried. The lands surrounding the Project site are generally compromised of industrial, commercial, and residential uses.

In Ontario, facilities that emit significant amounts of contaminants to the environment are required to obtain and maintain an Environmental Compliance Approval ("ECA") from the MECP or submit an Environmental Activity and Sector Registry ("EASR"). ECAs/ EASRs within 1 km of the site were obtained from the MECP *Access Environment* website[2].

Table 3 lists the identified industries within 1000 m of the Project site and within their applicable Area of Influence. A more detailed table of all industries within 1000 m is provided in Appendix A. Industries which lie within their applicable Area of Influence in respect to the Project are discussed further below.

Table 3: Identified Industries Within the Potential Area of Influence of the Project Site

Facility	Type of Operation	Environmental Compliance Approval No.	Industry Class	Area of Influence Distance (m)	Actual Distance to Site (m)	Additional Assessment Required?
Palfinger Inc.	Crane Assembly Facility	N/A	II	300	90	Yes
Quantum Niagara Gymnastics	Gymnastics Facility	N/A	I	70	30	Yes
WRB Sales and Marketing Inc.	Warehouse	N/A	I	70	240	No
Niagara Moving and Storage	Moving and Storage Service	N/A	I	70	30	Yes

The above noted Industries were identified inside their potential Area of Influence and, therefore, require additional discussion provided below.

All other industries are outside of their respective Guideline D-6 potential Area of Influence and are, therefore, anticipated to be compatible with the development from an air quality perspective. There are no Class III industries located within 1000m area of influence of the Project site.

4.1 Class I Light and Class II Medium Industries

There are a number of Class I and Class II light and medium scale industries within 1000 m of the Project lands. A full listing of the industries is provided in Appendix A. The majority of industries lie outside their Potential Area of Influence and outside the Recommended Minimum Separation Distance. Therefore, these industries are anticipated to be compatible with the Project site. Furthermore, the Project site is not anticipated to limit the ability of these facilities to obtain/ maintain their required MECP permits and/or approvals.

The following list of facilities are located within 300 m of the Project site:

- Palfinger Inc.;
- Quantum Niagara Gymnastics;
- WRB Sales and Marketing; and
- Niagara Moving and Storage

4.1.1 Palfinger Inc.

ADDRESS:	7942 Dorchester Rd
CONTACTS:	Les Neufeld – l.neufeld@palfinger.com
DISTANCE TO PROJECT:	90 M
D-4 CLASSIFICATION:	II

Palfinger is a manufacturer of cranes, hook lifts, cable hoists, forklifts, liftgates, service bodies and platforms. It is located west of the Project site. An on-line review indicates that Palfinger established a sales and service facility for KBC products in Niagara Falls.

On October 24 and November 2, 2022, SLR personnel conducted site visits to the area. Visible dust from the facility was not observed. Noise from forklift movement and air tools were observed. Very light paint-like odours were observed from the site but were not detectable at levels high enough for use of a field Olfactometer. The odour was observed at on the property line of the industry and not detectable at distances beyond the property line. The industry is a crane supplier, where the facility operations are understood to be primarily assembly based on publicly available information. The operations are fully enclosed within a building and outdoor storage of finished products are located on the property. Given the enclosed processes persistent or detectable odour is not anticipated at the Project site.

Based on the size and nature of the facility operations, Palfinger Inc. is considered a Class II Medium Industry under MECP Guideline D-6, with a Recommended Minimum Separation Distance of 70 m and a Potential Area of Influence of 300 m. The Project site lies outside of the Recommended Minimum Separation distance, but within the Potential Area of Influence. Therefore, additional assessment is warranted and is provided in subsequent sections of this report.

There are no MECP environmental permits available for the operations of Palfinger Inc. on the Access Environment[3] search directory. An Environmental Property Information ("EPI") request was filed for 7942 Dorchester Road. The EPI documents noted that a waste generator and spills record are recorded for the site. The EPI request did not identify any incident, abatement or occurrence reports, air approvals, or

[3] Access Environment (gov.on.ca)

inspections are recorded for the site. Therefore, no further freedom of information (FOI) requests are necessary for the air or noise emissions.

The Project site is located within the 300 m Area of Influence of the Project site. Therefore, additional assessment is warranted and provided within other sections of this report.

4.1.2 Quantum Niagara Gymnastics

ADDRESS:	7875 Dorchester Rd
CONTACTS	N/A
DISTANCE TO PROJECT:	30 M
D-6 CLASSIFICATION:	I

Quantum Niagara Gymnastics is located immediately to the northwest side of the Project site. The site is a privately run organization for delivery of gymnastics training for children. There are no MECP environmental permits available for the operations of Quantum Niagara Gymnastics on the Access Environment search directory.

On October 24 and November 2, 2022, SLR personnel conducted site visits to the area. Odour, visible dust, and noise from the facility was not observed. A forklift was identified on-site which is assumed to be used to move mats and gym equipment.

Quantum Niagara Gymnastics is a commercial facility. Commercial uses are not categorized under the MECP D-6 Guideline. Commercial facilities are also considered to be odour sensitive points of reception in addition to community spaces and residences. The MECP odour policy applies to the commercial uses in the existing commercial plazas, as well as the proposed development.

Commercial facilities typically do not have air emission sources that would require an assessment. No additional assessment is required from an air quality perspective.

Based on the proximity to the Project site, further assessment regarding the potential noise from the forklift observed on site is provided in Section 6 of the report.

4.1.3 WRB Sales and Marketing Inc.

ADDRESS:	7825 Dorchester Rd
CONTACTS	Bill Bender – bill@wrbgifts.com
DISTANCE TO PROJECT:	240 M
D-6 CLASSIFICATION:	I

WRB Sales and Marketing Inc., is located to the south-west side of the Project site. It is an importer of party supplies, seasonal products, and festival items. The company occupies a medium sized warehouse that was previously operated by Urban Growing Systems, and Laurcoat Powder coating. The site is used for storage of products and has a small office building.

On October 24 and November 2, 2022, SLR personnel conducted site visits to the area. Odour, visible dust, and noise from the facility was not observed. There are no MECP environmental permits available for the operations of WRB Sales and Marketing Inc., on the Access Environment search directory. SLR staff contacted the owners of the property to discuss current operations. Based on discussions with the owner of the property the cooling towers on the rooftop were decommissioned when the property was purchased by WRB Sales. Truck movement on-site is at a maximum of 1 truck per week and various local Purolator/Fedex delivery vehicles to meet shipping demands.

Based on the SLR experience with similar facilities, WRB Sales and Marketing is considered Class I Light Industry under the MECP Guideline D-6, with a 70 m Area of Influence and a Recommended Minimum Separation Distance of 20 m.

The Project site is located outside the 70 m Area of Influence of the Project site. Therefore, a detailed assessment is not required.

4.1.4 Niagara Moving & Storage

ADDRESS:	7825 Dorchester Rd
CONTACTS	N/A
DISTANCE TO PROJECT:	30 M
D-6 CLASSIFICATION:	I

Niagara Moving & Storage is located immediately to the northeast side of the Project site. It is a full-service local and long-distance moving company, and they provide secure storage facilities as well. The company occupies a small area, and the site is mainly used for storage of moving trucks and vehicles and has small office building.

On October 24 and November 2, 2022, SLR personnel conducted site visits to the area. Odour, visible dust, and noise from the facility was not observed. There are no MECP environmental permits available for the operations of Niagara Moving & Storage on the Access Environment search directory.

Based on the SLR experience with similar facilities, Niagara Moving & Storage is considered Class I Light Industry under the MECP Guideline D-6, with a 70 m Area of Influence and a Recommended Minimum Separation Distance of 20 m.

The Project site is located within the 70 m Area of Influence of the Project site. Therefore, additional assessment is warranted and provided within other sections of this report.

4.2 Vacant Lots

Under Guideline D-6, the use of vacant buildings must be considered in land use compatibility studies. Lands surrounding the Project site are occupied. There are some vacant parcels of land surrounding the Project site north of the light industrial uses along Dorchester Road. This vacant corridor is zoned Light Industrial (“LI”) along the southern half of the corridor and Residential Low Density (“R4”) and Residential Two Zone (“R2”) along the northern half of the corridor.

If a new industrial operation were to relocate or construct a new facility, these new facilities are required to obtain an approval from the MECP (either EASR or ECA). In accordance with the MECP permit, the facility would be required to meet the applicable guidelines of O. Reg 419/05 at the facility property line and to meet the applicable requirements of MECP NPC 300. As part of the permitting process, the facility would be required to meet applicable guidelines at existing and approved residential locations. There are existing residential uses north of the corridor that would be immediately adjacent to any future uses on the vacant lots. These uses would not be able to operate with outputs of odour, dust or noise that would impact the neighbouring residences. It is therefore unlikely that future uses on the vacant lots would have outputs that may negatively impact the Project site.

4.3 Future Uses

The proposed new buildings will include mechanical heating, ventilation, and air conditioning systems.

These systems will be designed to ensure that the applicable MECP air quality regulations, standards and guidelines are met off-site and at the building itself. If required (depending on the type and size of systems used), an MECP ECA or EASR will need to be obtained. This is no different from any other similar development. As noted in the above section, future uses would not be able to operate with outputs of odour, dust or noise that would impact the residences north of Dorchester Road. It is therefore unlikely that future uses on the vacant lots would have outputs that may negatively impact the Project site.

Overall, adverse air quality emissions from new facility sources on the surroundings and on itself are not anticipated.

SLR understands that Niagara Region is currently undergoing Public Consultation related to siting a new wastewater treatment plant (WWTP) in South Niagara Falls. The current proposed site is south of the Welland River, approximately 1800m from the Project site. This places the proposed wastewater treatment plant well outside of the minimum 150m setback required for sewage treatment plants greater than 25,000 m^3/day as set out in Guideline D2. Therefore, the Project site is anticipated to be compatible with a future wastewater treatment plant if this is the preferred location.

4.4 Summary

From the list of industries identified in Section 4, two class I and one class II industry were identified to require further analysis, as a result of being within their potential Area of Influence:

- Palfinger Inc. (Class II);
- Quantum Niagara Gymnastics (Class I) – noise only;
- Niagara Moving & Storage (Class I).

Provided below are comments and findings related to the compatibility between the proposed development and the above noted identified industrial facilities.

5.0 Air Quality, Dust and Odour Assessment

5.1 Industrial Sources

5.1.1 Guidelines and Regulations

As previously discussed, within Ontario, facilities which emit significant amounts of air emissions to the environment are required to obtain and maintain an ECA from the MECP or submit an EASR. Facilities with an ECA/EASR should already meet the MECP guidelines for air quality contaminants at their property line.

5.1.2 Air Quality Contaminants

Under O.Reg. 419/05, a facility is required to meet prescribed standards for air quality emissions at their property boundary line and any location off-site. The MECP does not require industries to assess their emissions at elevated points off-site if a receptor does not exist at that location. While the introduction of mid- and high-rise residential properties could trigger a facility to re-assess compliance at new receptor location, the introduction of new low-rise receptors does not introduce any new receptors, as the facility is already required to comply at grade-level at their property line.

5.1.2.1 Odour

There are a select few compounds that are provincially regulated from an odour perspective; however, there is no formal regulation with respect to mixed odours. Impacts from mixed odours produced by industrial facilities are generally only considered and regulated by the MECP in the presence of persistent complaints (ECO 2010).

The MECP released an updated Draft Guideline to address odour mixtures in Ontario May 4, 2021. At the time of preparation of this report, the Draft Guideline has not been finalized.[4]

The MECP assesses mixed odours, in Odour Units, following draft guidelines. One odour unit (1 OU) has been used as a default threshold. This is the concentration at which 50 % of the population will just detect an odour (but not necessarily identify/recognize or object to it). Recognition of an odour will typically occur between 3 and 5 odour units. The following factors may be considered:

- Frequency – How often the odour occurs. The MECP typically allows odours to exceed 1 OU with a 0.5 % frequency.
- Intensity – The strength of the odour, in odour units. 1 OU is often used in odour assessments in Ontario.
- Duration – How long the odour occurs.
- Offensiveness – How objectionable the odour is.
- Location – Where the odour occurs. The MECP assesses at odours where human activity is likely to occur.

The MECP has decided to apply odour-based standards to locations "where human activities regularly occur at a time when those activities regularly occur," which is generally accepted to be places that would be considered sensitive such as residences and public meeting places. As a guide, the MECP May 2021 document provides clarification of point of Odour Receptors as follows:

"Each of the following locations is a Point of Odour Reception if the location is not on the same property as the facility from which the odour is or will be discharged:

1. *A building or structure that contains one or more dwellings.*
2. *A building used for a commercial purpose that includes one or more habitable rooms used as sleeping facilities, such as a hotel or motel.*
3. *A building used for an institutional purpose, including an educational facility, a childcare centre, a health care facility, a community centre.*
4. *A building used for a place of worship, other than a place of worship located on land that is zoned for commercial or industrial use.*
5. *A location on a vacant lot, other than an inaccessible vacant lot, that has been zoned to permit a building mentioned in paragraph 1, 2, 3 or 4.*

[4] https://prod-environmental-registry.s3.amazonaws.com/2021-03/Draft%20Odour%20Guidance.pdf

6. *A portion of a property used for recreational purposes, not including a portion used for a recreational trail.*
7. *A portion of a property that is used for as a campsite or campground at which overnight accommodation is provided by or on behalf of a public agency or as part of a commercial operation.*

The MECP notes that the above definition of a "Point of Odour Reception" is for screening purposes only. When assessing odour, the facility should consider additional points of odour reception such as commercial buildings, office buildings or outdoor areas where there is human activity."

In addition, the MECP provided proposed clarification of human odour receptors, as shown in the following table:

Table 4: Proposed Clarification of Human Receptors (MECP 2016)

Receptor Category	Examples	Exposure Type	Type of Assessment
Permanent potential 24-hour sensitivity	Anywhere someone could sleep including any residence or house, motels, hospitals, senior citizen homes, campgrounds, farmhouse, etc.	Individual likely to receive multiple exposures	Considered sensitive 24 hours per day
Permanent daily hours but with definite periods of shutdown/closure	Schools, day cares, community centres, soccer fields, farmland, churches, bicycle paths, hiking areas, lakes, commercial or institutional facilities (with consideration of hours of operation such as night clubs, restaurants, etc.)	Individual could receive multiple exposures	Night-time or daytime exclusion only (consider all other hours)
Seasonal variations with clear restrictions on accessibility during the off season	Golf courses, amusement parks, ski hills, other clearly seasonal private property	Short term potential for exposure	Exclusions allowed for non-seasonal use
Transient	Open fields, roadways, easements, driveways, parking lots, pump houses	Very short-term potential for exposure, may not be a single resident exposed to multiple events	Generally, would not be included as human receptors unless otherwise specified.

Under the May 2021 Guideline, MECP recommends that Land use compatibility assessments of potential odour sources identify facilities with the potential to emit mixed odours under the following industrial tiers:

Table 5: Industrial Tiers for Odourous Activities and Processes

MECP Tier	Activities/Processes Requiring Assessment	MECP Industry Requirements
Not Applicable	• Foundries, Forest Products, Pulp and paper, Petroleum Refining, Petrochemical and Asphalt Mix	• Screen out of Odour Assessment requirements if registered to MECP Industry Specific Technical Standard

Tier 1	• Wastewater facilities with design capacity <25,0000 m^3/day • Paint and Coating Manufacturing • Portable Asphalt paving mixture and block manufacturing • Adhesive manufacturing • Printing ink manufacturing • Blowing or expanding foam products • Crematory • Meat and poultry processing • Landfills • Thermal treatment of waste (non-biomass) • Plastic extrusion or melting • Printing <100 kg/hour and <400 kg/hour • Process using resins • Scented products manufacturing <10 million kg/year • Spraying operations <10 litres/hour • Indoor waste transfer and/or processing station (residential or IC&I)	• Regulated industry • Require an up to date Best Management Practice Plan (BMPP) to ensure odours are minimized
Tier 2	• Wastewater facilities with design capacity >25,0000 m^3/day and <100,000 m^3/day • Paper, newsprint, and Paperboard mills • Asphalt paving mixture and block manufacturing • Asphalt shingle and coating material manufacturing • Cooking or drying animal products • Leaf and yard waste composting • Food frying • Printing >400 kg/hour • Scented products manufacturing >10 million kg/year • Wastewater sludge pelletization • Spraying operations >10 litres/hour • Vulcanized rubber product manufacturing • Outdoor waste transfer and/or processing station (residential or IC&I)	• Regulated industry • Require an up to date Best Management Practice Plan (BMPP) to ensure odours are minimized • If in compliance with MECP Industry Standard required to implement Odour controls • Potentially require an up to date Odour Technology Benchmarking Report

Tier 3	• Wastewater facilities with design capacity <100,000 m^3/day • Wet corn milling • Oilseed processing • Fat and oil refining and blending • Anaerobic digestion • Animal or poultry slaughtering • Biofuel production • Rendering or tallow production • Thermal Treatment of biomass, other than wood waste • Waste transfer and/or processing of putrescible waste	• Regulated industry • Require an up to date Best Management Practice Plan (BMPP) to ensure odours are minimized • If in compliance with MECP Industry Standard required to implement Odour controls • Potentially require an up to date Odour Technology Benchmarking Report

The May 2021 Guideline further recommends that the Recommended Minimum Separation Distance for assessment of odour be measured from the point of reception to the nearest source of odour, not property boundary to property boundary.

5.1.2.2 Dust

Ontario Regulation 419/05 also provides limits for dust, including limits for suspended particulates and dust fall. Under Reg. 419/05, these air quality limits must be met at the property line and all points beyond. This is not changed by the addition of the Project site. That is to say, the existing mutual property line is already a point of reception for dust, and the limits must already be met at that location.

5.1.2.3 Cumulative Assessments

Cumulative impact assessments, examining the combined effects of individual industries, or the combined effects of industry and roadway emissions, are generally not required. Neither the PPS, the D-Series of guidelines, Regulation 419/05, or the current MECP odour assessment protocols require an assessment of cumulative impacts.

Which is not to say that such assessments are never warranted; rather, the need to do so is considered on a case-by-case basis, depending on the nature and intensity of the industrial operation(s), and the nature of the pollutants released. Based on the types of pollutants released by the industries in this area, cumulative effects assessments are not warranted.

5.1.2.4 Local Meteorology

Pre-processed Regional Meteorological data was obtained from the Midwestern Regional Climate Center (MRCC) website[5] to generate a wind rose. The surface wind data collected for The Niagara Falls Airport is from 2010 through 2020. The wind rose, as shown in **Figure 6**, represents the frequency of winds blowing from a certain wind direction. As can be seen in the wind rose, predominant winds are from the southwest through west southwest quadrants, while winds from the north and southeast quadrants may be the least frequent.

5.1.3 Site Visits and Odour and Dust Observations

A Project site visit was conducted to the area on October 24, 2022, by SLR personnel to identify significant sources of air quality emissions and to identify any significant sources of odour or dust in the Project neighbourhood. During the Project site visit, the staff members observed existing industries from the sidewalks and other publicly accessible areas. Wind conditions during the site visit were noted as:

- October 24, 2022: southeasterly winds, 10 km/h, 21.6°C, 48% RH

SLR personnel had a "Nasal Ranger"[6] olfactometry measurement device, an instrument for measuring ambient-odour Dilution-to-Threshold levels, to quantify odour intensities if odours were detected. The device was not used during the site visit, as no odours were observed at strengths that are detectable by the Nasal Ranger.

SLR personnel that complete odour sampling using the Nasal Ranger are frequently tested using the St Croix Sensory Inc. odour sensitivity testing kit. The odour sensitivity tests ensure that the personnel are representative of the average population based on the testing.

Staff members walked along Oldfield Road, Dorchester Road, and the riverfront trail, generally downwind of the industries. Very faint paint odour was detected immediately downwind at the property line of the Palfinger Inc. which is located to the west side of the Project site. Also, no fugitive dust emissions were detected at the Project site or the surroundings at the time of the site visit.

5.1.4 Assessment of Potential Air Quality Impacts

The following facilities were identified as being within the Potential Area of Influence for their industrial classification and were identified to require additional review from an air quality perspective:

- Palfinger Inc. (Class II); and
- Niagara Moving & Storage (Class I).

Further discussion regarding the facility and potential air emissions is provided below.

All the other industries surrounding the Project site were outside of the Potential Area of Influence. Therefore, the development of the Project site is anticipated to be compatible with these facilities from an air quality perspective. In addition, emissions of dust, and/or odour at the Project are not anticipated. Further the Project site is not anticipated to limit the ability of these industries to obtain or maintain required MECP permits and approvals.

5.1.4.1 Palfinger Inc.

As discussed in Section 4.1.1.1, Palfinger is a manufacturer of cranes, hook lifts, cable hoists, forklifts, liftgates, service bodies and platforms. It is located west of the Project site. An on-line review indicates that Palfinger established a sales and service facility, including product assembly, for KBC products in Niagara Falls. There are no MECP environmental permits available for the operations of Palfinger Inc. on the Access Environment search directory.

[6] https://www.fivesenses.com/equipment/nasalranger/nasalranger/

Based on the SLR experience with similar facilities, Palfinger Inc. is considered Class II Light Industry under the MECP Guideline D-6, with a 300 m Area of Influence and a Recommended Minimum Separation Distance of 70 m. The Project site lies outside of the Recommended Minimum Separation distance, but within the Potential Area of Influence.

On October 24 and November 2, 2022, SLR personnel conducted site visits to the area. Visible dust from the facility was not observed. Noise from forklift movement and air tools were observed. Very light paint-like odours were observed from the site but were not detectable at levels high enough for use of a field Olfactometer. The odour was observed at on the property line of the industry and not detectable at distances beyond the property line. The industry is a crane supplier, but they also perform some assembly and maintenance. The operations are fully enclosed within a building and outdoor storage of finished products are located on the property. Further, there are no permitted emission sources to atmosphere. Given the enclosed processes persistent or detectable odour is not anticipated at the Project site.

A review of the Wind Frequency Distribution diagram (Wind Rose) provided on Figure 6 identifies that the predominant winds are from the south and southwest quadrants, while winds from the north and southeast quadrants may be the least frequent. Winds with the potential to direction fugitive emissions from the Palfinger facility towards the Project site include winds from the west through to the west southwest. These winds are predicted to occur less than 28% of the time.

Based on the above information, and the fact that the operations are sufficiently separated from the Property site boundary, the Project site development is anticipated to be compatible with the Palfinger facility from an air quality perspective. Further, Emissions of dust, and significant odour at the Project site are not anticipated. The Project site is not anticipated to limit the ability of Palfinger to obtain or maintain required MECP permits and/or approvals, if required.

5.1.4.2 Niagara Moving & Storage

Niagara Moving & Storage is a full-service local and long-distance moving company providing secure storage facilities as well. Niagara Moving & Storage is located approximately 30 m northeast of the Project site. The company occupies a small area, and the site is mainly used for storage of moving trucks and vehicles and has small office building. A search of the MECP registry did not yield a permit or registration for the site.

On October 24, 2022, SLR personnel conducted a site visit to the area. There was no odour or visible dust observed from the facility. There were no onsite operations or movements observed that results in any outputs of air emissions that could have an influence on the Project site.

Based on the size and nature of the operations, Niagara Moving & Storage is considered a Class I Light Industry under MECP Guideline D-6, with a 70 m potential Area of Influence and a Recommend Minimum Separation Distance of 20 m. The facility sources are located within the potential 70 m Area of Influence and beyond the Recommend Minimum Separation Distance of 20 m. The existing 30 m separation distance is anticipated to be sufficient to allow the Niagara Moving & Storage to operate in a compatible manner with the Project site.

Based on the above information, the Project site development is anticipated to be compatible with the Niagara Moving & Storage from an air quality perspective. Further, the Project site is not anticipated to limit the ability of Niagara Moving & Storage to obtain or maintain required MECP permits or approvals, if required.

5.1.4.3 Future Uses

The potential exists for industries to turn over, therefore SLR completed a review of City of Niagara Falls Zoning By-law No. 79-200 Chapter applicable to Permitted Uses of Light Industrial (LI) and have classified the uses in accordance with the MECP D-6 Guidelines.

Table 6: D-6 Classification of City of Niagara Falls Zoning By-law No. 79-200 Light Industrial LI - Permitted Uses

Land Use	Type of Operation	Industry Class	Area of Influence Distance (m)	Recommended Minimum Separation Distance (m)
Manufacturing	Classification depends on intensity. Given prohibitions listed, expected to be a Class I or Class II industry. MECP Permits required for emissions to atmosphere	I or II	70 or 300	20 or 70
Car rental	N/A	N/A	N/A	N/A
Car wash	Typically, a Class I industry. MECP Permits required for emissions to atmosphere	I	70	20
Carpenter shop	Classification depends on intensity. Given surrounding land uses expected to be a Class I industry. MECP Permits required for emissions to atmosphere	I or II	70	20
Cold Storage plant	Classification depends on intensity. Given surrounding land uses expected to be a Class I industry. MECP Permits required for emissions to atmosphere	I or II	70	20
Commercial bakery	Classification depends on intensity. Given surrounding land uses expected to be a Class I or Class II industry. MECP Permits required for emissions to atmosphere	I or II	70	20
Commercial printing and associated services establishment	Classification depends on intensity. Given surrounding land uses expected to be a Class I industry. MECP Permits required for emissions to atmosphere	I or II	70	20
Contractor's or tradesman's shop, Contractor's or construction equipment rental shop	Classification depends on intensity. Given surrounding land uses expected to be a Class II industry. MECP Permits required for emissions to atmosphere	II	300	70
Consulting engineering office	Self-contained minimal air/noise emissions	I	70	20
Grain and feed mill and storage	Classification depends on intensity. Given surrounding land uses expected to be a Class I or Class II industry. MECP Permits required for emissions to atmosphere	I or II	70	20
Ice manufacturing plant	Classification depends on intensity. Given surrounding land uses expected to be a Class I industry. MECP Permits required for emissions to atmosphere	I or II	70	20
Laboratory - experimenting, commercial or testing	Classification depends on intensity. Given surrounding land uses expected to be a Class I industry. MECP Permits required for emissions to atmosphere	I or II	70	20
Laundry plant	Classification depends on intensity. Given surrounding land uses expected to be a Class I industry. MECP Permits required for emissions to atmosphere	I or II	70	20
Machine shop	N/A	N/A	N/A	N/A

Monument, stone, clay or glass manufacturing plant	Classification depends on intensity. Given surrounding land uses expected to be a Class I industry. MECP Permits required for emissions to atmosphere	I or II	70	20
New Car Agency	N/A	N/A	N/A	N/A
Nursery for trees, shrubs, plants	Self-contained minimal air/noise emissions	I	70	20
Public garage, auto body	Typically, a Class I industry. MECP Permits required for emissions to atmosphere	I	70	20
Public garage, mechanical	Typically, a Class I industry. MECP Permits required for emissions to atmosphere	I	70	20
Shop for the repair and servicing of goods, machinery and equipment	Typically, a Class I industry. MECP Permits required for emissions to atmosphere	I	70	20
Silver plating and cutlery plant	Classification depends on intensity. Given surrounding land uses expected to be a Class I or Class II industry. MECP Permits required for emissions to atmosphere	I or II	70	20
Trucking or shipping terminal	Typically, a Class I industry. MECP Permits required for emissions to atmosphere	I	70	20
Used car lot	N/A	N/A	N/A	N/A
Warehouse	Self-contained minimal air/noise emissions	I	70	20
Wholesale establishment	Self-contained minimal air/noise emissions	I	70	20
Winery	Self-contained minimal air/noise emissions	I	70	20
Adult entertainment parlour	N/A	N/A	N/A	N/A
Body-rub parlour	N/A	N/A	N/A	N/A
An office which is an accessory use to one of the foregoing permitted uses	N/A	N/A	N/A	N/A

Based on the above employment characteristics, existing surrounding sensitive land uses, size, and nature of the possible employment land uses, the majority of the possible uses are considered a Class I Light Industries under MECP Guideline D-6, with a 70 m Area of Influence and a Recommended Minimum Separation Distance of 20 m. Depending on the intensity of the employment uses, Class II Medium Industries may also occur. Under MECP Guideline D-6, Class II industries have a 300 m Area of Influence and a Recommended Minimum Separation Distance of 70 m.

It is relevant and important to recognize that the other sensitive land uses surround the employment lands to the north and are already deemed to be compatible with existing and proposed employment uses. If industry were to start operations in the Area of Influence of the Project site, they would be required to be compatible with the existing sensitive land uses that include residential uses. Therefore, the Project site will not introduce a new condition related to environmental compliance for these lands.

5.2 Summary of Air Quality, Dust and Odour Conclusions and Recommendations

The potential for air quality emissions at the Project site, including dust and odour, have been assessed.

Based on the review completed, the Project site development is anticipated to be compatible with the surrounding land uses from an air quality perspective. Emissions of dust and odour at the Project site are not anticipated. The Project site is not anticipated to limit surrounding existing or future industries and the ability to obtain or maintain required MECP permits or approvals.

6.0 Noise Assessment

6.1 Stationary Sources

6.1.1 Surrounding Stationary Noise on the Development

6.1.1.1 Guidelines

6.1.1.1.1 MECP Publication NPC-300 Guidelines for Stationary Noise

The applicable MECP noise guidelines for new sensitive land uses adjacent to existing industrial commercial uses are provided in MECP Publication NPC-300. NPC-300 revokes and replaces the previous noise assessment guideline, Publication LU-131 and Publication NPC-205, which were previously used for evaluating noise impacts as part of Certificates of Approval / Environmental Compliance Approvals for industries granted by the MECP.

The new guideline sets out noise limits for two main types of noise sources:

- Non-impulsive, “continuous” noise sources such as ventilation fans, mechanical equipment, and vehicles while moving within the property boundary of an industry. Continuous noise is measured using 1-hour average sound exposures (L_{eq} (1-hr) values), in dBA; and
- Impulsive noise, which is a “banging” type noise characterized by rapid rise time and decay. Impulsive noise is measured using a logarithmic mean (average) level (L_{LM}) of the impulses in a one-hour period, in dBAI.

Furthermore, the guideline requires an assessment at, and provides separate guideline limits for:

- Outdoor points of reception (e.g., back yards, communal outdoor amenity areas); and
- Façade points of reception such as the plane of windows on the outdoor façade which connect onto noise sensitive spaces, such as living rooms, dens, eat-in kitchens, dining rooms and bedrooms.

The applicable noise limits at a point of reception are the higher of:

- The existing ambient sound level due to road traffic, or
- The exclusion limits set out in the guideline.

6.1.1.2 Application of the NPC-300 Guidelines

The stationary noise guidelines apply only to residential land uses and to noise-sensitive commercial and institutional uses, as defined in NPC-300 (e.g., schools, daycares, hotels). For the Project, the stationary noise guidelines only apply to the residential portions of the development, including:

- Individual residences;

- Communal indoor amenity areas; and
- Communal outdoor amenity areas.

All of the above have been considered as noise-sensitive points of reception in the analysis.

6.1.1.2.1 Guideline Interpretation & Limit Summary

The following presents a summary of the guidelines and settlements presented above.

- The applicable Ministry of the Environment noise guideline for assessing new residential development applications is Publication NPC-300.
- The acoustic environment surrounding the proposed development is dominated by the roadway noise. Therefore, the Class 1 limits have been adopted in this study.

The following tables set out the exclusion limits from the guideline.

Table 7: NPC-300 Exclusion Limits for Non-Impulsive Sounds (L_{eq} (1-hr), dBA)

Time of Day	Class 1 Area	
	Plane of Windows of Noise Sensitive Spaces	Outdoor Points of Reception
7 am to 7 pm	50	50
7 pm to 11 pm	50	50
11 pm to 7 am	45	n/a

Table 8: NPC-300 Exclusion Limits for Impulsive Sounds (L_{LLM}, dBAI)

Time of Day	No. of Impulses in a 1-hour Period	Class 1 Area	
		Plane of Windows of Noise Sensitive Spaces	Outdoor Points of Reception
7 am to 11 pm	9 or more	50	50
	7 to 8	55	55
	5 to 6	60	60
	4	65	65
	3	70	70
	2	75	75
	1	80	80
11 pm to 7 am	9 or more	45	n/a
	7 to 8	50	n/a
	5 to 6	55	n/a
	4	60	n/a
	3	65	n/a
	2	70	n/a
	1	75	n/a
n/a Not Applicable. Outdoor points of reception are not considered to be noise sensitive during the overnight period.			

The applicable guideline limits for infrequent events such as emergency generator set testing are +5 dB higher than the values above.

6.1.1.3 Sources of Interest

Based on the information obtained from the site visit conducted on October 24, 2022, and the review of the aerial imagery, the significant sources of noise in the area of the Project site have been identified. A screening level noise model was prepared for each of the facilities identified in Section 4 above, as follows:

Table 9: Modelled Noise Sources

Facility	Modelled Noise Sources
Palfinger Inc.	• HVAC mechanical equipment • Truck Loading with Forklift (1 forklift, 60 min/hr) • Truck movement (2/hr) • Air tools noise through open bay door (15 min/hr)
Quantum Niagara Gymnastics	• Forklift movement (1 forklift, 30mins/hr) • HVAC mechanical equipment
Niagara Moving & Storage	• Idling trucks (2 trucks, 15min/hr) • Truck movement (2/hr) • Impulsive Trailer Coupling (1/hr)

Figure 7 shows the location of the above facilities. Noise emission data used in the assessment can be found in Appendix C.

6.1.1.4 Noise Modelling and Results

Noise impacts were predicted within the Project site for each individual facility using Cadna/A, a computerized version of the internationally recognized ISO 9613-2 noise propagation algorithms. This is the preferred noise modelling methodology of the MECP. The ISO 9613 equations account for:

- Source to receiver geometry
- Distance attenuation
- Atmospheric absorption
- Reflections off of the ground and ground absorption
- Reflections from vertical walls
- Screening effects of buildings, terrain, and purpose-built noise barriers (noise walls, berms, etc.).

The following additional parameters were used in the modelling, which are consistent with providing a conservative (worst-case) assessment of noise levels:

- Temperature: 10°C
- Relative Humidity: 70%
- Ground Absorption G: G=0.0 (reflective) as default global parameter, specific absorptive areas such as parks, grassy areas defined as G=1.0 (absorptive).
- Reflection: An order of reflection of 1 was used (accounts for noise reflecting from walls)
- Wall Absorption Coefficients: Set to 0.37 (37 % of energy is absorbed, 63% reflected)

- Terrain: Assumed to be flat

A summary of the predicted noise impacts on each façade are shown in Table 10 and Figures 8-11 for the daytime/evening and night-time periods, for each industry/facility, respectively.

Table 10: Summary of Stationary Façade Sound Levels - Continuous

Industry	Development Building [1]	Stationary Sound Levels [2]		Applicable Guideline Limit		Meets Guideline Limits?	
		Day/Eve (dBA)	Night (dBA)	Day/Eve (dBA)	Night (dBA)	Day/Eve (Y/N)	Night (Y/N)
Palfinger Inc.	Building 1	45	45	50	45	Y	Y
	Building 2	42	42	50	45	Y	Y
Quantum Niagara Gymnastics	Building 1	46	31	50	45	Y	Y
	Building 2	41	27	50	45	Y	Y
Niagara Moving & Storage	Building 1	45	45	50	45	Y	Y
	Building 2	40	40	50	45	Y	Y

[1] Building labels are identified on Figure 8.
[2] Sound levels shown represent the worst-case impact along the identified building.

Table 11: Summary of Stationary Façade Sound Levels - Impulsive

Industry	Building [1]	No. of Impulses /Hour	Stationary Sound Levels [2]		Applicable Guideline Limit		Meets Guideline Limits?	
			Day/Eve (dBAI)	Night (dBAI)	Day/Eve (dBAI)	Night (dBAI)	Day/Eve (Y/N)	Night (Y/N)
Niagara Moving & Storage	Building 1	1	75	75	80	75	Y	Y
	Building 2		67	67	80	75	Y	Y

[1] Building labels are identified on Figure 8.
[2] Sound levels shown represent the worst-case impact along the identified building

The predicted worst-case noise impacts at the façade at all three buildings are predicted to be at or below the default class 1 criteria of 50 dBA during the day/evening and 45 dBA at night. Therefore, additional noise mitigation is not required.

6.1.1.5 Stationary Noise Mitigation Measures

Based on the detailed stationary noise modelling above, noise mitigation measures are not expected to be required for the surrounding industries to meet the applicable guideline limits at the development site.

6.1.1.6 Noise Warning Clauses

A Type E noise warning clause is recommended. See Appendix B for warning clause details. The warning clauses must be registered on Title and included in all agreements of purchase and sale or lease and all rental agreements.

6.1.2 Development Stationary Noise on Itself

The building mechanical systems for the proposed development have not been designed at this time. Although no adverse impacts are expected, such equipment has the potential to result in noise impacts on residential spaces within the development. This equipment is required to meet MECP Publication NPC 300 requirements at the façades of the noise sensitive spaces within the development. Therefore, the potential impacts should be assessed as part of the final building design.

The criteria is expected to be met at all on-site receptors with the appropriate selection of mechanical equipment, by locating equipment to minimize noise impacts within the development, and by incorporating control measures (e.g., silencers) into the design.

It is recommended the mechanical systems be reviewed by an Acoustical Consultant prior to final selection of equipment.

6.1.3 Development Stationary Noise on Surroundings

In terms of the noise environment of the area, it is expected that the project will have a negligible effect on the neighbouring properties. The traffic related to the proposed development will be small in relation to the traffic volumes within the area, and is not of concern with respect to noise impact.

Other possible sources of noise associated with the development with potentially adverse impacts on the surrounding neighbourhood are mechanical roof-top equipment of the proposed development. This equipment is required to meet MECP Publication NPC 300 requirements at the closest off-site noise sensitive receptors.

Given that the systems will be designed to ensure that the applicable noise guideline are met at on-site receptors, off-site impacts are not anticipated.

Regardless, potential impacts should be assessed as part of the final building design. The criteria can be met at all surrounding and on-site receptors by the appropriate selection of mechanical equipment, by locating equipment with sufficient setback from noise sensitive locations, and by incorporating control measures (e.g., silencers) into the design.

It is recommended the mechanical systems be reviewed by an Acoustical Consultant prior to final selection of equipment.

6.2 Transportation Sources

6.2.1 Transportation Noise Sources

Roadway noise sources of interest with the potential to have noise impacts at the proposed development include Dorchester Road and Oldfield Road.

Sound exposure levels at the development have been predicted, and this information has been used to identify façade, ventilation, and warning clause requirements.

6.2.2 MECP Publication NPC-300 Guidelines for Transportation Sources

Indoor Criteria

The following table summarizes the criteria in terms of energy equivalent sound exposure (L_{eq}) levels for specific indoor noise-sensitive locations. These indoor criteria vary with sensitivity of the space. As a result, sleeping areas have more stringent criteria than Living / Dining room space.

Table 12: NPC-300 Sound Level Criteria for Road and Rail Noise

Type of Space	Time Period	Energy Equivalent Sound Exposure Level Leq (dBA) [1]		Assessment Location
		Road	Rail [2]	
Criteria for Residential Units				
Living / Dining Room	Daytime (7 am to 11 pm)	45	40	Indoors
	Night-time (11 pm to 7 am)	45	40	Indoors
Sleeping Quarters	Daytime (7 am to 11 pm)	45	40	Indoors
	Night-time (11 pm to 7 am)	40	35	Indoors
General offices, reception areas, retail stores, etc.	Daytime (7 am to 11 pm)	50	45	Indoors
Living/dining areas of residences, hospitals, schools, nursing/retirement homes, day-care centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	Daytime (7 am to 11 pm))	45	40	Indoors
Sleeping quarters of hotels/motels	Night-time (11 pm to 7 am)	45	40	Indoors
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	Night-time (11 pm to 7 am)	40	35	Indoors

[1] Road and Rail noise impacts are to be combined for assessment of impacts.
[2] Whistle/warning bell noise is excluded for OLA noise assessments and included for indoor assessments, where applicable.

Ventilation and Warning Clauses

The following table summarizes requirements for ventilation where windows potentially would have to remain closed as a means of noise control. Despite the implementation of ventilation measures where required, some occupants may choose not to use the ventilation means provided, and as such, warning clauses advising future occupants of the potential excess over the indoor guideline limits are required.

Table 13: NPC-300 Ventilation and Warning Clause Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} (dBA)		Ventilation and Warning Clause Requirements [2]
		Road	Rail [1]	
Plane of Window	Daytime (7am to 11 pm)	≤ 55		None
		56 to 65 incl.		Forced Air Heating with provision to add AC + Applicable Warning Clause(s)
		> 65		Central AC + Applicable Warning Clause(s)
	Night-time (11 pm to 7 am)	51 to 60 incl.		Forced Air Heating with provision to add AC+ Applicable Warning Clause(s)
		> 60		Central AC + Applicable Warning Clause(s)

[1] Whistle/warning bell noise is excluded.
[2] Road and Rail noise is combined for determining Ventilation and Warning Clause requirements.

Building Shell Requirements

The following table provides sound exposure (Leq) thresholds which, if exceeded, require the building shell and components including wall and window to be designed and selected accordingly to ensure that the indoor location criteria are met.

Table 14: NPC-300 Building Component Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} (dBA)		Component Requirements
		Road	Rail [1]	
Facade	Daytime (7am to 11 pm)	> 65	> 60	Designed/ Selected to Meet Indoor Requirements [2]
	Night-time (11 pm to 7 am)	> 60	> 55	

[1] Including whistle/warning bell noise.
[2] The resultant sound isolation parameter from Road and Rail are to be combined for determining the overall acoustic parameter.

Outdoor Sound Level Criteria

The following table summarizes criteria in terms of energy equivalent sound exposure (L_{eq}) levels for the outdoor noise-sensitive locations, with a focus of outdoor areas being amenity spaces (called Outdoor Living Areas (OLAs) per NPC-300).

Table 15: NPC-300 Outdoor Sound Level Criteria for Road and Rail Noise

Type of Space	Time Period	Energy Equivalent Sound Exposure Level Leq (dBA) [1, 2]	Assessment Location
OLA	Daytime (0700-2300h)	55	Outdoors

[1] Excluding whistle/warning bell noise for OLA noise assessments
[2] Road and Rail noise impacts are to be combined for assessment of OLA impacts.

Mitigation and Warning Clauses

The following table summarizes mitigation and warning clause requirements for outdoor amenity spaces.

Table 16: NPC-300 Outdoor Living Area Mitigation & Warning Clause Requirements

Assessment Location	Time Period	Energy Equivalent Sound Exposure Level - L_{eq} [1, 2] (dBA)	Mitigation and Warning Claus Requirements [3]
OLA	Daytime (0700-2300h)	≤ 55	None
		56 to 60 incl.	Noise Control Measures may be applied, **and/or** Applicable Warning Clause(s)
		> 60	Noise barrier to reduce noise to 55 dBA, **or** Noise barrier to reduce noise to 60 dBA and Applicable Warning Clause(s)

[1] Whistle/warning bell noise is excluded.
[2] Road and Rail noise is combined for determining Ventilation and Warning Clause requirements.

As indicated in NPC-300, noise control measures may be applied to reduce sound levels to 55 dBA. If measures are not provided, potential purchasers/tenants are required to be informed of potential noise problems with the applicable Warning Clause(s).

If noise impacts are predicted to be greater than 60 dBA, noise control measures are required to reduce noise levels to 55 dBA. If noise control measures are not technically feasible for meeting 55 dBA, an excess of up to 5 dBA is allowed, with the inclusion of the applicable Warning Clause(s).

6.2.3 Traffic Data and Future Projections

Future (2041) volumes for Dorchester Road and Oldfield Road were determined based on Horizon Year Volumes taken from the Environmental Assessment entitled "MCEA for Dorchester Rd. and Oldfield Rd., Intersection Improvements, Transportation Assessment", dated January 2022. Overall truck percentages were provided in the EA, a split between medium and heavy trucks was assumed based on the SLR in house database for similar roadways. Copies of applicable traffic data and calculations can be found in Appendix D. The following Table 17 summarizes the road traffic volumes used in the analysis.

Table 17: Summary of Road Traffic Data Used in the Analysis

Roadway Link	Future 2041 Traffic Volumes (AADT)	% Day / Night Volume Split [1]		% Commercial Traffic Breakdown [2]		Vehicle Speed (km/h)
		Daytime	Night-time	Medium Trucks	Heavy Trucks	
Dorchester Road – North of Intersection	9,460	90	10	2.6	2.3	50
Dorchester Road – West of Intersection	10,910	90	10	2.7	2.4	50
Oldfield Road	4,460	90	10	2.6	2.2	50

[1] The standard Day/Night splits are based on SLR in house data.
[2] Commercial Traffic Breakdowns are based on truck percentages provided in the EA with splits from SLR's in house database.

6.2.4 Transportation Noise Modelling

Future (2041) road traffic sound levels at the proposed development were predicted using Cadna/A, a commercially available noise propagation modelling software. Roadways were modelled as line sources of sound, with sound emission rates calculated using ORNAMENT algorithms, the road traffic noise model of the MECP. These predictions were validated and are equivalent to those made using the MECP ORNAMENT or STAMSON v5.04 road traffic noise models. A STAMSON validation file is provided in Appendix E. It should be noted the validation location is based on the minimum setback allowed in the CadnaA modelling.

Sound levels were predicted along the façades of the proposed development using the "building evaluation" feature of Cadna/A. This feature allows for noise levels to be predicted across the entire façade of a structure.

Based on a review of the surrounding topography, the lands immediately surrounding the development are considered to be essentially flat. No grade adjustment was applied in the noise modelling.

Ground absorption was assessed conservatively as reflective surfaces (G = 0), as the conservative assessment of impacts.

6.2.5 Projected Sound Levels

Predicted worst-case façade sound levels are presented below in Table 18. The transportation façade sound levels at the development were predicted for daytime and nighttime are shown in Figure 12.

Table 18: Overall Projected Sound Levels

Component	Façade [1]	Roadway Sound Levels [2]	
		L_{eq} Day (dBA)	L_{eq} Night (dBA)
Building 1	North	67	60
	East	63	56
	South	49	43
	West	63	57
Building 2	North	67	60
	East	63	56
	South	50	44
	West	63	56

[1] Façade locations are shown in each corresponding figure.
[2] The sound levels presented are for the worst-case exposed façade, in which totals may not correspond to the same location.

The predicted roadway sound levels are predicted to be above 65 dBA and 60 dBA during the daytime and nighttime periods, respectively. Therefore, an assessment of building components is required.

6.2.6 Façade Recommendations

An assessment of indoor noise levels is required providing the façade sound levels due to road traffic exceed 65 dBA during the daytime or 60 dBA during the night-time periods.

Based on the roadway sound levels summarized in Table 18, exceedances are predicted on portions of the development. Therefore, a detailed assessment of glazing requirements is necessary to meet indoor noise criteria listed in Table 12.

Indoor sound levels and required Sound Transmission Class (STC) ratings for façade components were estimated using the procedures outlined in the National Research Council Building Practice Note BPN-56. This document provides corrections to estimate the STC ratings required based on either the roadway and/or railway noise.

Detailed floor plates were not provided at the time of this assessment. For the analysis, room dimensions for bedrooms and living/dining rooms have been assumed as documented follows:

- Window wall construction with glazing and glass spandrel panel elements;
- For kitchen/dining/living rooms 70% of the exterior wall area is vision glass / patio doors;
- For bedrooms 50% of the exterior wall area is vision glass;
- Non-glazing portions of the wall have an assumed STC rating of 45;
- Living rooms were assumed to be 3 m x 6 m in size and typically have a reflective level of acoustic absorption; and
- Bedrooms were assumed to be 3 m x 3 m in size and are very acoustically absorptive.

Table 19 outlines the requirements for glazing for each worst-case receiver location. Calculations using the BPN-56 method are provided in Appendix F.

Table 19: Transportation Noise Facade Sound Transmission Class (STC) Requirements

Component	Façade	Living Room (STC) [1]	Bedroom (STC) [1]
Building 1	North	OBC	OBC
	East	OBC	OBC
	South	OBC	OBC
	West	OBC	OBC
	North-east	OBC	OBC
	South-east	OBC	OBC
	South-west	OBC	OBC
	North-west	OBC	OBC
Building 2	North	OBC	OBC
	East	OBC	OBC
	South	OBC	OBC
	West	OBC	OBC
	North-east	OBC	OBC
	South-east	OBC	OBC
	South-west	OBC	OBC
	North-west	OBC	OBC

OBC – Element must meet the minimum thermal and structural requirements of the Ontario Building Code (i.e., no acoustical upgrades required)
[1] STC requirements may change once building outlines are defined at a later planning stage.

Notes: OBC – Element must meet the minimum thermal and structural requirements of the Ontario Building Code (i.e., no acoustical upgrades required)
[1] STC requirements may change once building outlines are defined at a later planning stage.

Windows meeting the standard Ontario Building Code (OBC) (assumed STC 29) will meet the indoor sound level requirements.

The combined glazing and frame assembly must be designed to ensure the overall sound isolation performance for the entire window unit meets the sound isolation requirements. It is recommended window manufacturers test data be reviewed to confirm acoustical performance is met. Glazing requirements should be re-evaluated as the building design progresses for the other phases of the proposed development.

6.2.7 Ventilation and Warning Clause Requirements

The requirements regarding warning clauses are summarized in Table 13. Based on the predicted noise sound levels, warning clauses are recommended to be included in agreements registered on Title for the residential units and included in all agreements of purchase and sale or lease, and all rental agreements.

Forced air heating with provisions for future installation of central air conditioning, and a Type C warning clause, is recommended for all affected units with façade sound levels that are between 56 and 65 dBA during the daytime, or between 51 and 60 dBA during night-time hours. This includes all the Façades listed below, Warning clause text can be found in Appendix B.

- Building 1 – East, West Façade; and
- Building 2 – East, West Façade.

Central Air Conditioning and a Type D Warning Clause is recommended for all affected units with façade sound levels that are above 60 dBA during night-time hours. This includes all the Façades listed below, Warning clause text can be found in Appendix B.

- Building 1 – North Façade; and
- Building 2 – North Façade.

6.3 Summary of Noise Conclusions and Recommendations

The potential for noise impacts on and the proposed development have been assessed. Based on the results of our studies:

- SLR staff completed a site visit on November 2nd,2022, to the development lands and surrounding area. The surrounding Niagara Moving and Storage, Palfinger Inc., and Quantum Niagara Gymnastics were identified as a significant contribution to potential stationary noise impacts at portions of the subject lands.
- An assessment of surrounding stationary noise was conducted. Sound levels are predicted to meet the exclusionary NPC 300 Class 1 guideline limits.
- An assessment of transportation noise impacts has been completed for the surrounding roadways including Dorchester Road and Oldfield Road.

- Based on transportation façade sound levels, windows meeting the standard Ontario Building Code (OBC) (assumed STC 29) will meet the indoor sound level requirements, as outlined in Section 6.2.6. Façade STC requirements should be reviewed by an acoustical consultant as the design progresses.
- Forced Air Heating with the Provisions for Air Conditioning are required for portions of the proposed development, as outlined in Section 6.2.7.
- Mandatory central air conditioning is required for portions of the proposed development, as outlined in Section 6.2.7.
- A Type C or Type D Warning Clause must be included in agreements registered on Title and included in the agreements of purchase and sale or lease and rental agreements for the proposed development residential units listed in Section 6.2.7.

7.0 Conclusions

A compatibility/mitigation assessment has been completed, examining the potential for air quality, dust, odour, and noise impacts from surrounding roadways and nearby industrial land uses to affect the Project site.

The assessment has included a review of air quality and noise emissions from industrial facilities in the area.

7.1 Air Quality

The potential for air quality emissions at the Project site, including dust and odour, have been assessed.

Based on the review completed, the Project site development is anticipated to be compatible with the surrounding land uses from an air quality perspective. Emissions of dust and odour at the Project site are not anticipated. The Project site is not anticipated to limit surrounding existing or future industries and the ability to obtain or maintain required MECP permits or approvals.

7.2 Noise

The assessment has included a review of noise emissions from industrial facilities in the area. Sound levels are predicted to meet the exclusionary NPC 300 Class 1 guideline limits. Therefore, mitigation for noise impacts from surrounding industries is not required.

An assessment of transportation noise impacts has been completed for the surrounding roadways including Dorchester Road and Oldfield Road. Windows meeting the standard Ontario Building Code (OBC) (assumed STC 29) will meet the indoor sound level requirements.

Forced Air Heating with the Provisions for Air Conditioning are required for portions of the proposed development, as outlined in Section 6.2.7. Mandatory central air conditioning is required for portions of the proposed development, as outlined in Section 6.2.7. Warning clause text is provided in Appendix B.

7.3 Overall

The Project site is anticipated to be compatible with the surrounding land uses from an air quality and noise perspective. Further, the Project site will not affect the ability for industrial facilities to obtain or maintain compliance with applicable Provincial environmental policies, regulations, approvals, authorizations, and guidelines. The requirements of MECP Guideline D-6, Regulation 419/05, and Publication NPC-300 are met. As the applicable policies and guidelines are met, the Project site is:

- Unlikely to result in increased risk of complaint and nuisance claims;
- Unlikely to result in operational constraints for the major facilities; and
- Unlikely to result in constraints on major facilities to reasonably expand, intensify or introduce changes to their operations.

8.0 Statement of Limitations

This report has been prepared and the work referred to in this report has been undertaken by SLR Consulting (Canada) Ltd. (SLR) for Upper Canada Planning and Engineering Inc., hereafter referred to as the "Client". It is intended for the sole and exclusive use of the Client. The report has been prepared in accordance with the Scope of Work and agreement between SLR and the Client. Other than by the Client and the City of Niagara Falls/Region of Niagara in their role as a land use planning approval authority, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted unless payment for the work has been made in full and express written permission has been obtained from SLR.

This report has been prepared in a manner generally accepted by professional consulting principles and practices for the same locality and under similar conditions. No other representations or warranties, expressed or implied, are made.

Opinions and recommendations contained in this report are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, locations, time frames and project parameters as outlined in the Scope or Work and agreement between SLR and the Client. The data reported, findings, observations and conclusions expressed are limited by the Scope of Work. SLR is not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. SLR does not warranty the accuracy of information provided by third party sources.

9.0 Closure

Should you have questions on the above report, please contact the undersigned.

Sincerely,

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1 electronic copy – SLR Consulting (Canada) Ltd.

10.0 References

Environmental Commissioner of Ontario (ECO, 2010), *Review of Posted Decision: Developing an Odour Policy Framework*, April 2010.

International Organization for Standardization, (ISO, 1989), ISO 2631-2: 2003 (1989) *Evaluation of human exposure to whole-body vibration — Part 2: Continuous and shock-induced vibrations in buildings (1 to 80 Hz)*

National Research Council Canada (NRCC, 1985), Building Practice Note BPN 56: *Controlling Sound Transmission Into Buildings*

Ontario Ministry of the Environment, Conservation & Parks (MECP), 1989, *ORNAMENT Ontario Road Noise Analysis Method for Environment and Transportation – Technical Document*.

Ontario Ministry of the Environment, Conservation & Parks (MECP), 1993, Publication NPC-207: *Impulse Vibration in Residential Buildings (Draft)*

Ontario Ministry of the Environment, Conservation & Parks (MECP), 1993, Publication NPC-216: *Residential Air Conditioning Devices*

Ontario Ministry of the Environment, Conservation & Parks (MECP), 1994, *Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices*

Ontario Ministry of the Environment, Conservation & Parks (MECP, 1995), Guideline D-1: *Land Use Compatibility*

Ontario Ministry of the Environment, Conservation & Parks (MECP, 1995), Guideline D-6: *Compatibility Between Industrial Facilities and Sensitive Land Uses*

Ontario Ministry of the Environment, Conservation & Parks (MECP, 1995), Guideline D-2: *Compatibility Between Sewage Treatment Plants and Sensitive Land Uses*

Ontario Ministry of the Environment, Conservation & Parks (MECP, 2021), *Guideline to Address Odour Mixtures in Ontario*, July 2021

Ontario Ministry of the Environment, Conservation & Parks (MECP, 2008), *Technical Bulletin, Standards Development Branch, Methodology For Modelling Assessments Of Contaminants With 10-Minute Average Standards And Guidelines Under O. Reg. 419/05*, September 2016

Ontario Ministry of the Environment, Conservation & Parks (MECP), 2013, Publication NPC-300: *Environmental Noise Guideline: Stationery and Transportation Sources – Approval and Planning*

Ontario Ministry of Municipal Affairs and Housing (MMAH, 2020). *Provincial Policy Statement*

Ontario Ministry of the Environment, Conservation & Parks (MECP, 2008), *Technical Bulletin, Standards Development Branch, Methodology For Modelling Assessments Of Contaminants With 10-Minute Average Standards And Guidelines Under O. Reg. 419/05*, April 2008.

Ontario Regulation 419/05 – *Local Air Quality.*

Figures

Dorchester and Oldfield Road, Niagara Falls

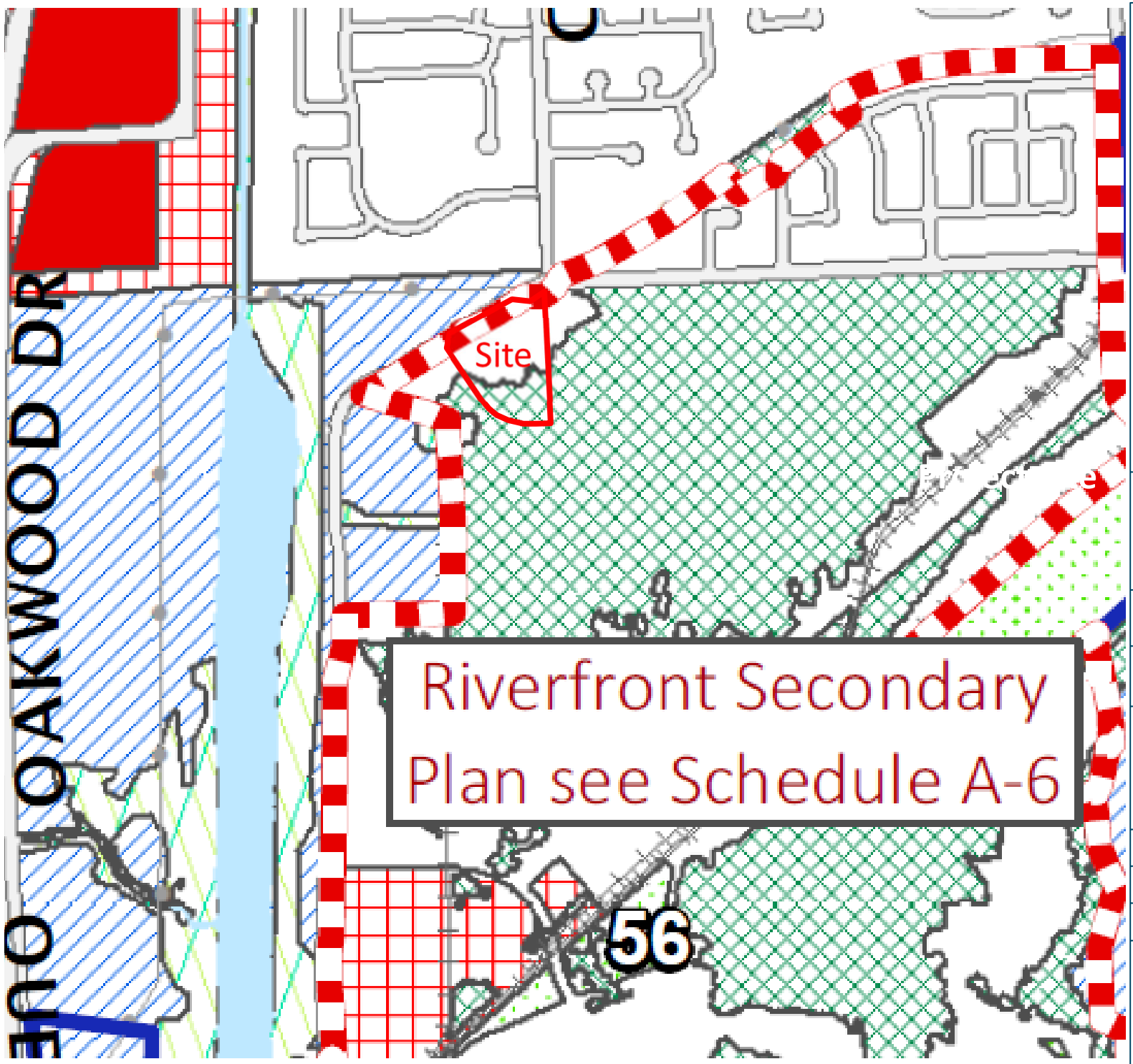
D-6 Compatibility & Mitigation Study, Air Quality, Dust, Odour & Noise

Upper Canada Planning & Engineering Ltd.

SLR Project No. 241.30060.00000

February 6, 2023

UPPER CANADA PLANNING & ENGINEERING LTD.– DORCHESTER & OLDFIELD RD	True North	Scale: 1: 2,500	METRES
D-6 COMPATIBILITY & MITIGATION STUDY		Date: Feb 6, 2023 Rev 0.0	Figure No. **1**
SITE AND CONTEXT PLAN		Project No. 241.30660.00000	



Legend

- Environmental Conservation Area
- Environmental Protection Area
- Extractive Industrial
- Good General Agriculture
- Industrial
- Major Commercial
- Minor Commercial
- Niagara Escarpment Plan Area
- Open Space
- Parkway Residential
- Residential
- Resort Commercial
- Theme Park Marineland
- Tourist Commercial
- Intake Protection Zone IPZ-1
- Secondary Plan Area
- Special Policy Area
- Urban Area Boundary

True North

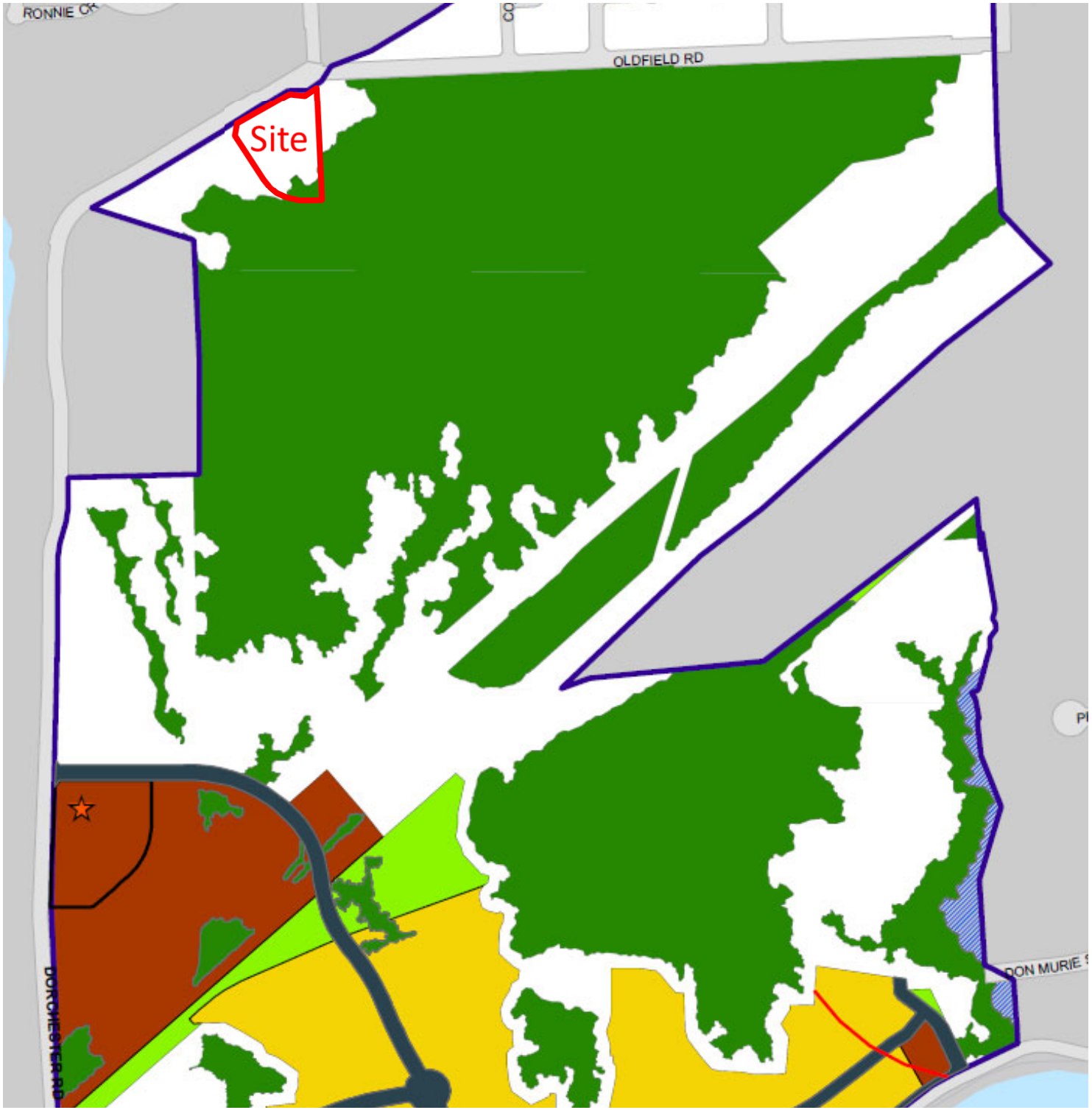
UPPER CANADA PLANNING & ENGINEERING LTD.

DORCHESTER AND OLDFIELD ROAD

EXCERPT FROM SCHEDULE A TO THE OFFICIAL PLAN
https://niagarafalls.ca/pdf/planning/official-plan/schedule-a-future-land-use-plan.pdf

Scale: n/a		METRES
Date: Feb 6, 2023	Rev 0.0	Figure No. **2A**
Project No. 241.30612.00000		

SLR



Residential, Low/Medium Density

Mixed Use

Environmental Protection Area

Open Space

Industrial

Special Policy Area 56

Proposed Collector Road

Area of further study FOD7-3 - see Part 5, Section 2

300m Distance speration from concrete batching plan

True North

UPPER CANADA PLANNING & ENGINEERING LTD.

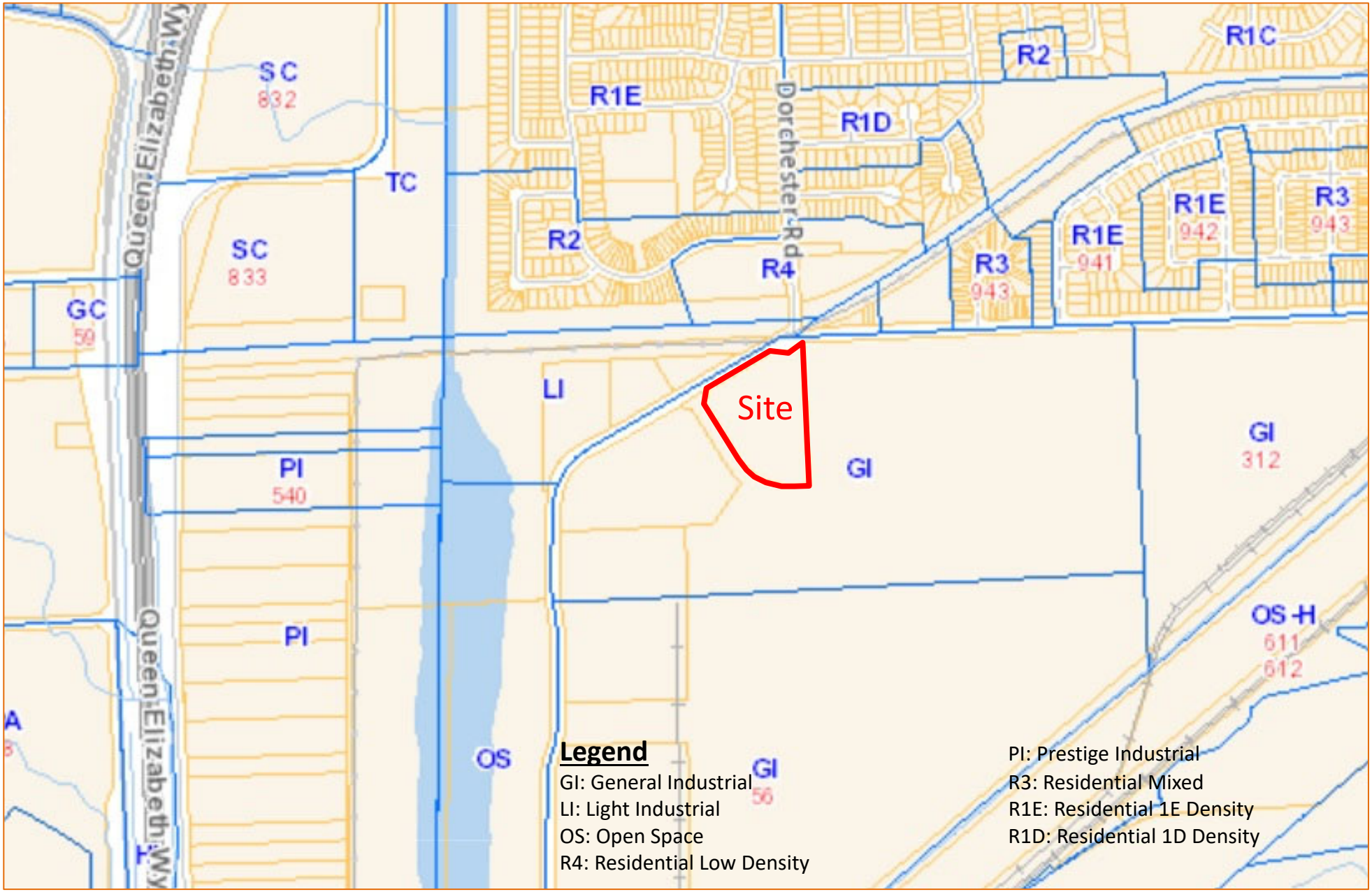
DORCHESTER AND OLDFIELD ROAD

EXCERPT FROM SCHEDULE A6 TO THE OFFICIAL PLAN RIVERFRONT COMMUNITY PLAN

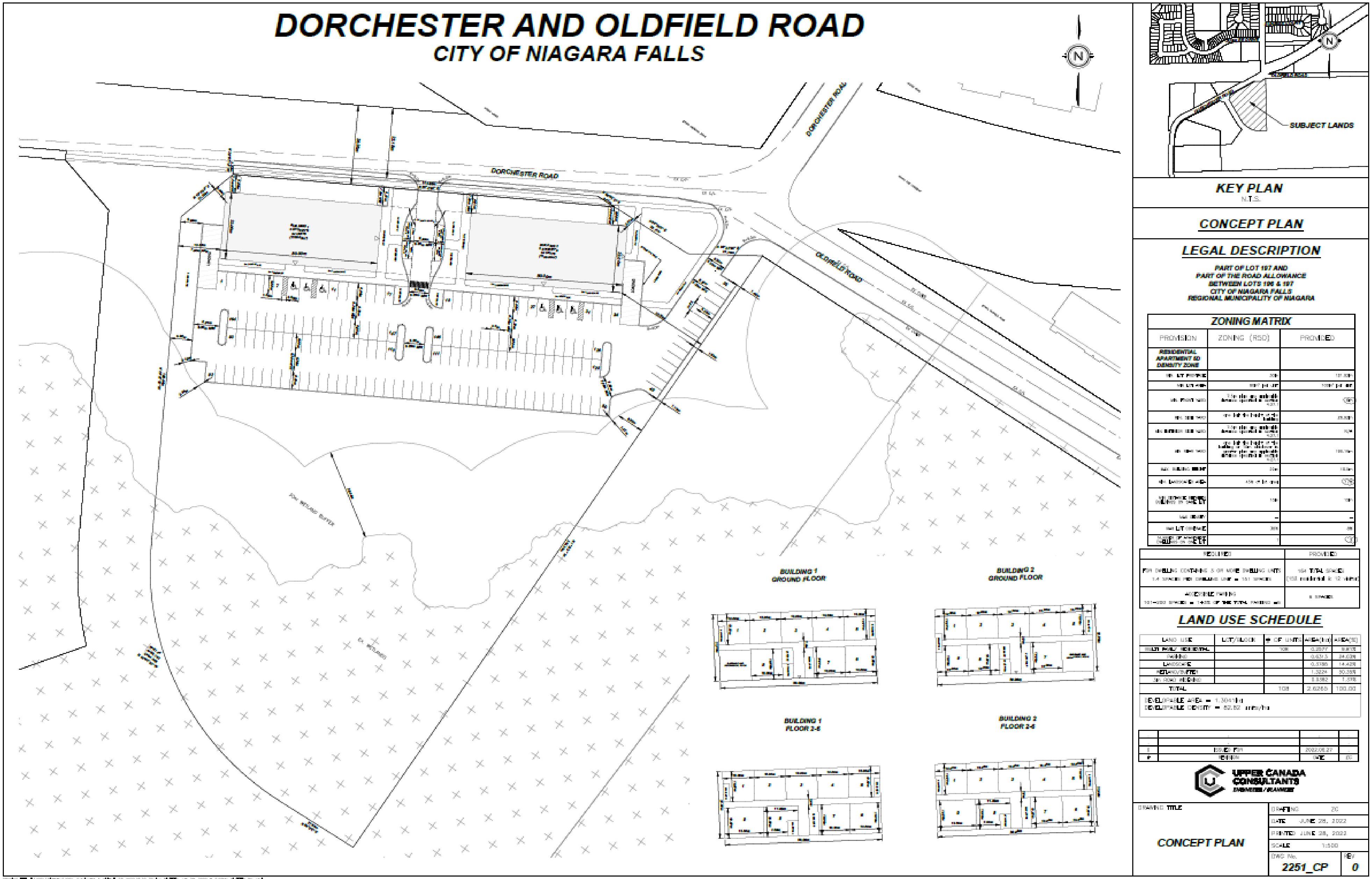
schedule-a6-riverfront-community-plan.pdf (niagarafalls.ca)

Scale:	n/a	METRES
Date: Feb 6, 2023	Rev 0.0	Figure No. **2B**
Project No. 241.30660.00000		

SLR



UPPER CANADA PLANNING & ENGINEERING LTD.– DORCHESTER & OLDFIELD RD	True North		METRES
D-6 COMPATIBILITY & MITIGATION STUDY		Date: Feb 6, 2023 Rev 0.0	Figure No. **3**
CITY OF NIAGARA FALLS ZONING BY-LAW PLAN		Project No. 241.30660.00000	SLR



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D-6 COMPATIBILITY & MITIGATION STUDY		Date: Feb 6, 2023 / Rev 0.0	Figure No. 4	
CONCEPT PLAN		Project No. 241.30660.00000		

SLR

20 m Separation

70 m Separation

300 m Separation

1000 m Separation

Project Site

1 PALFINGER Inc.

2 NIAGARA MOVING & STORAGE

3 Quantum Niagara Gymnastics

True North

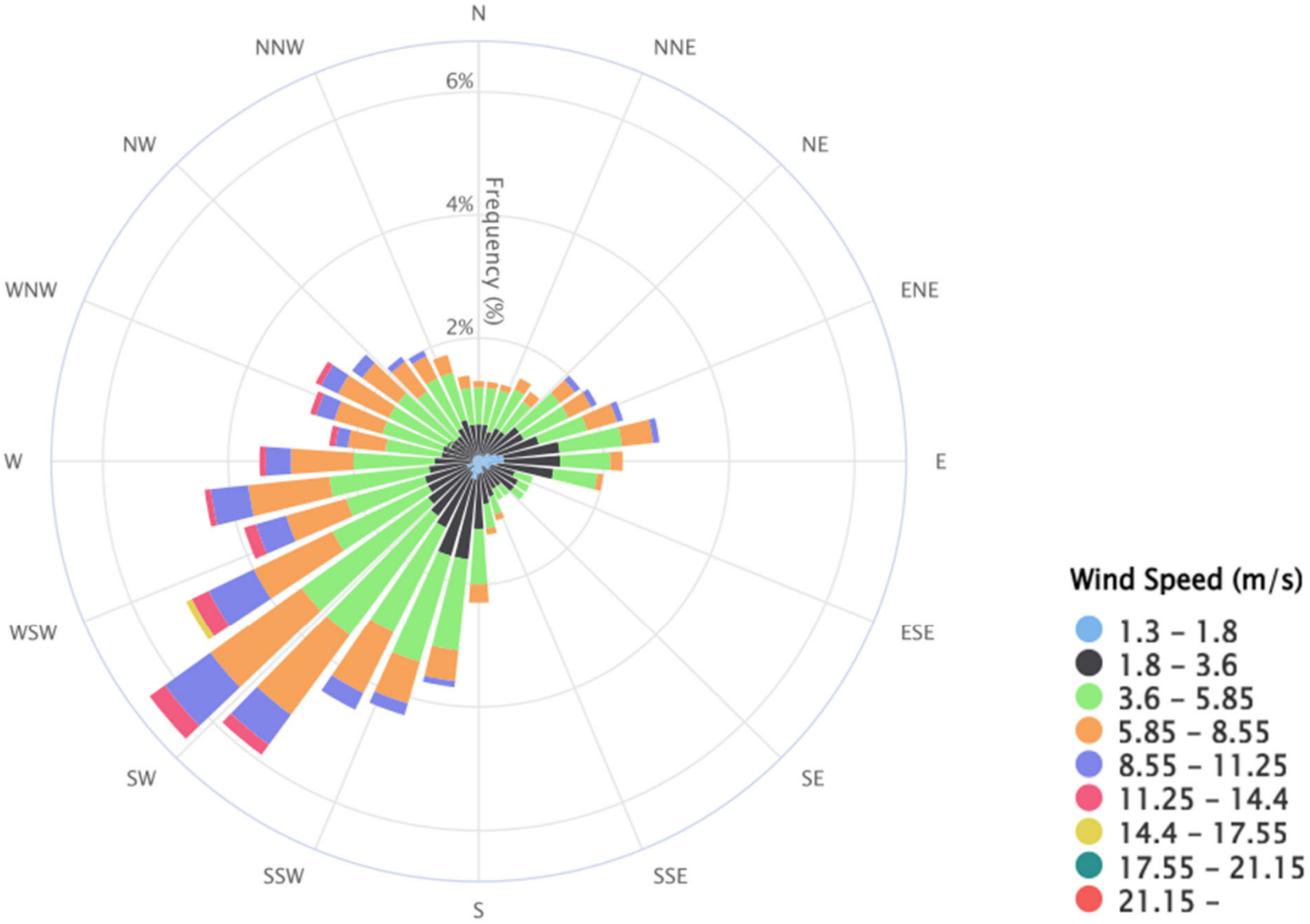
DORCHESTER & OLDFIELD ROAD

UPPER CANADA PLANNING & ENGINEERING LTD.– DORCHESTER & OLDFIELD RD

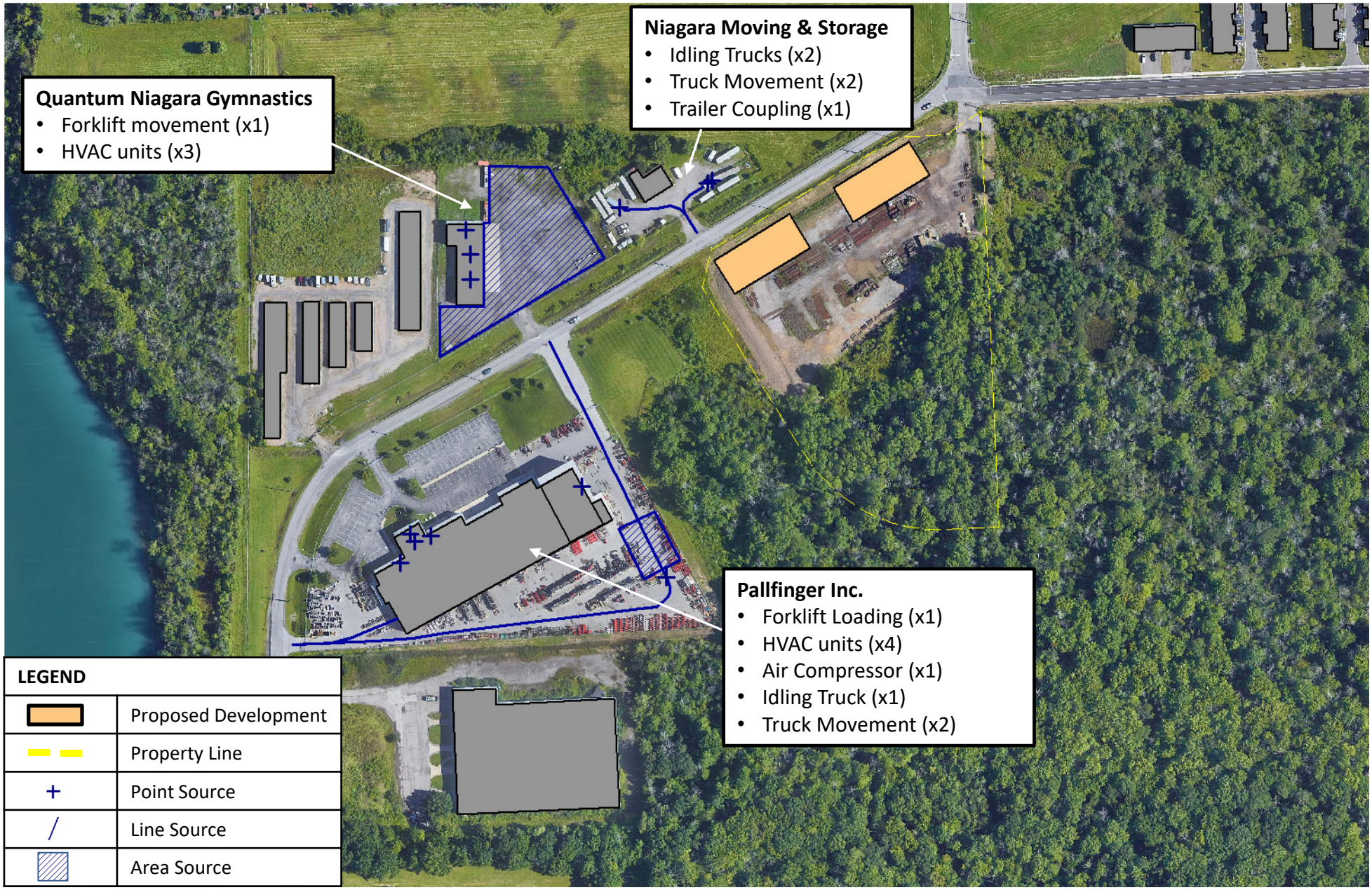
GUIDELINE D-6 SEPARATION DISTANCES – 1000 M

Scale: 1: 50,000		METRES
Date: Feb 6, 2023	Rev 0.0	Figure No. **5**
Project No. 241.30660.00000		

SLR



UPPER CANADA PLANNING & ENGINEERING LTD.– DORCHESTER & OLDFIELD RD	True North			SLR
D-6 COMPATIBILITY & MITIGATION STUDY		Date: Feb 6, 2023 Rev 0.0	Figure No. **6**	
WIND FREQUENCY DISTRIBUTION DIAGRAM (WIND ROSE) – NIAGARA FALLS AIRPORT (2010-2020)		Project No . 241.30660.00000		



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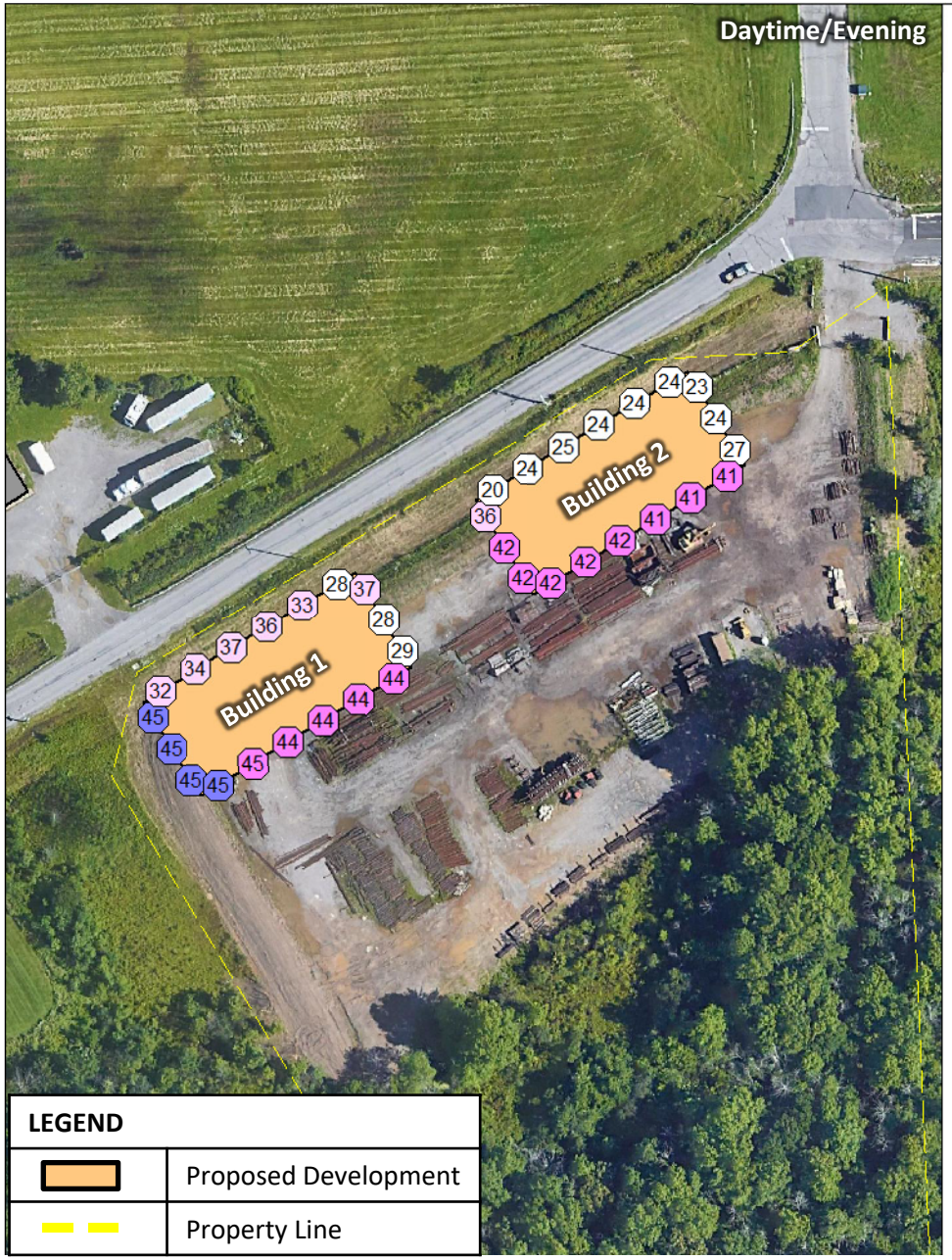
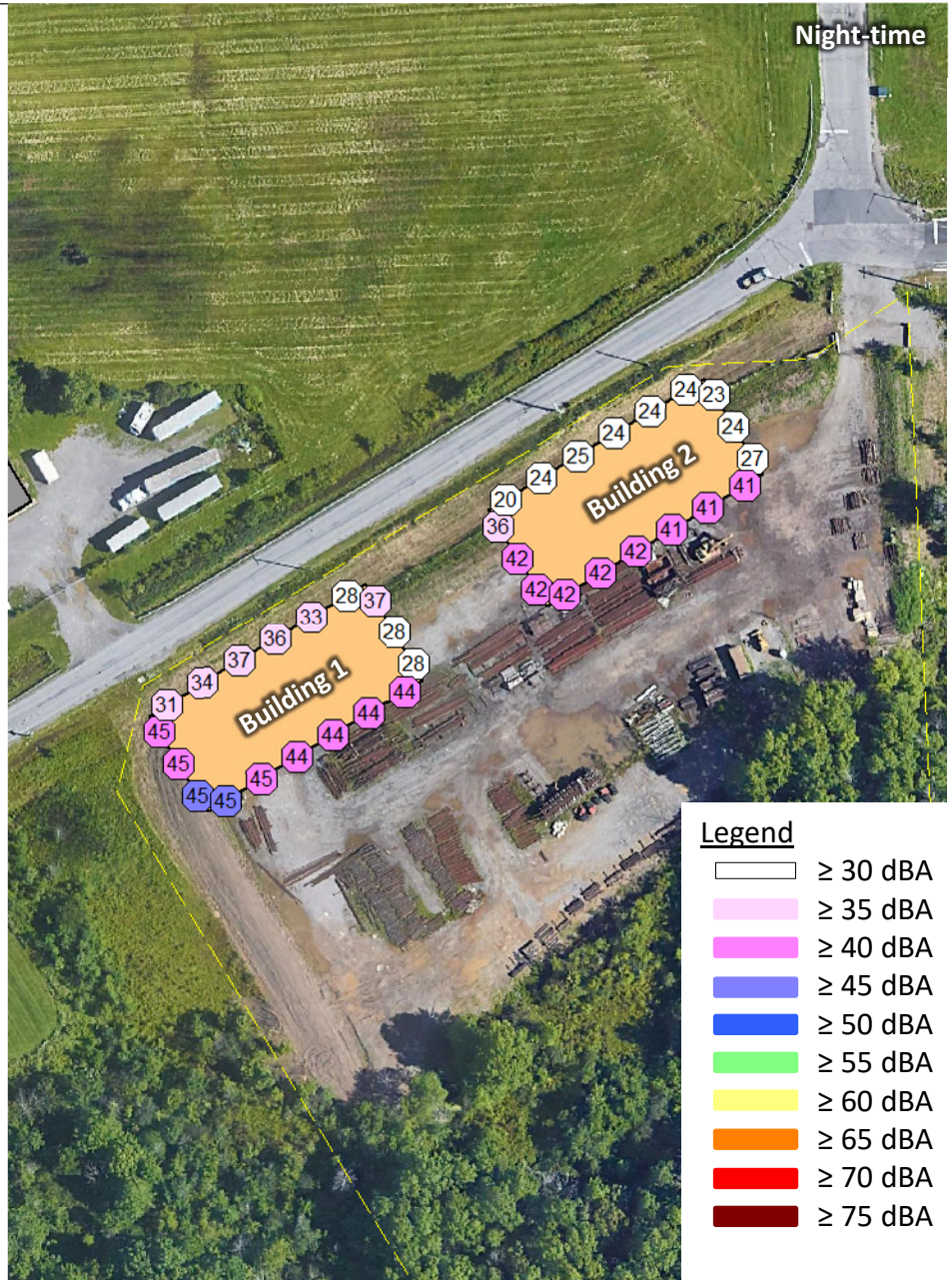
D-6 COMPATIBILITY & MITIGATION STUDY		Date: Feb 6, 2023	Rev 0.0	Figure No. 7
STATIONARY SOURCES MODELLED		Project No . 241.30660.00000		





UPPER CANADA PLANNING & ENGINEERING LTD.– DORCHESTER & OLDFIELD RD

D-6 COMPATIBILITY & MITIGATION STUDY

FAÇADE SOUND LEVELS – STATIONARY NOISE
CONTINUOUS – PALFINGER INC.

True North

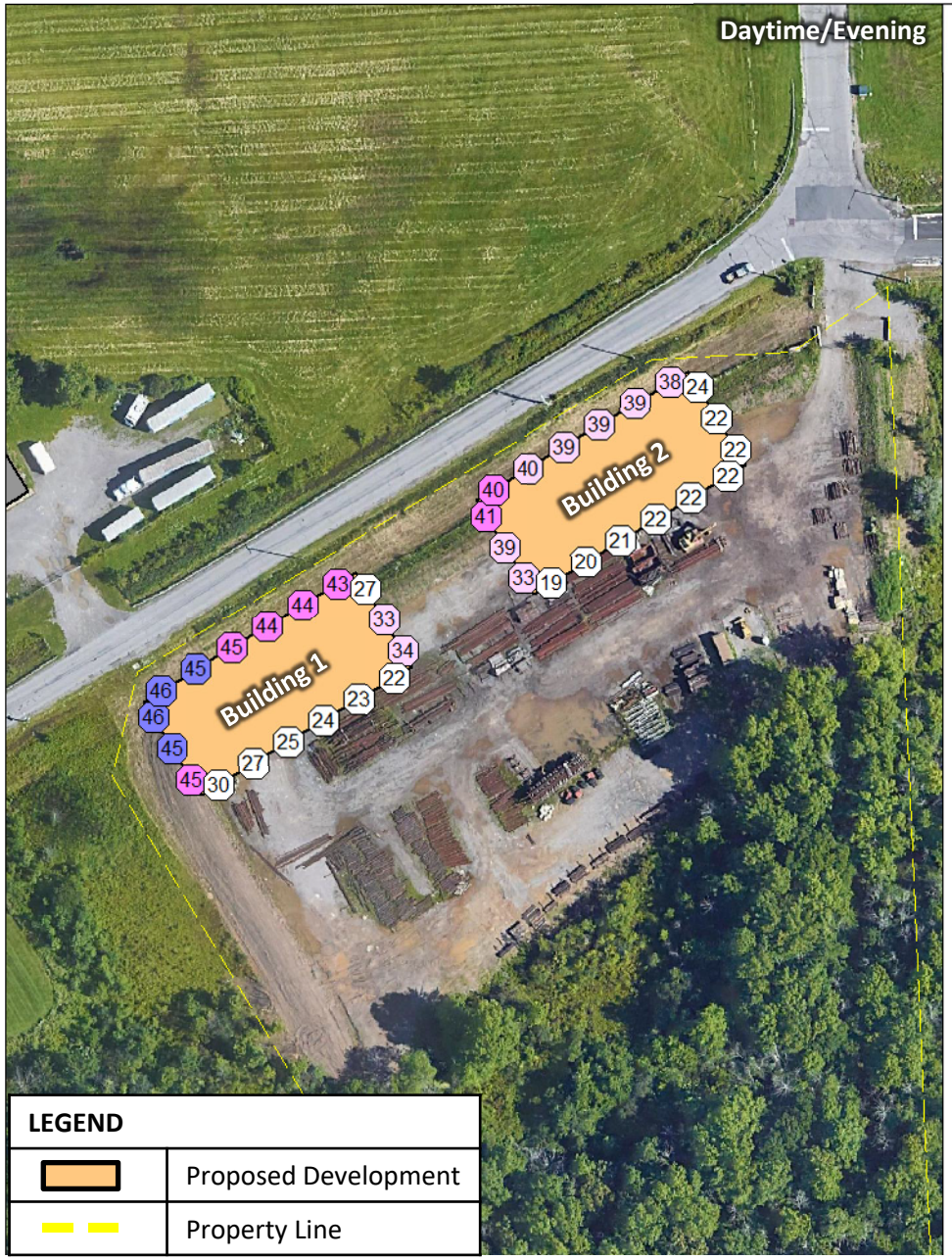
Scale: 1: 1,500

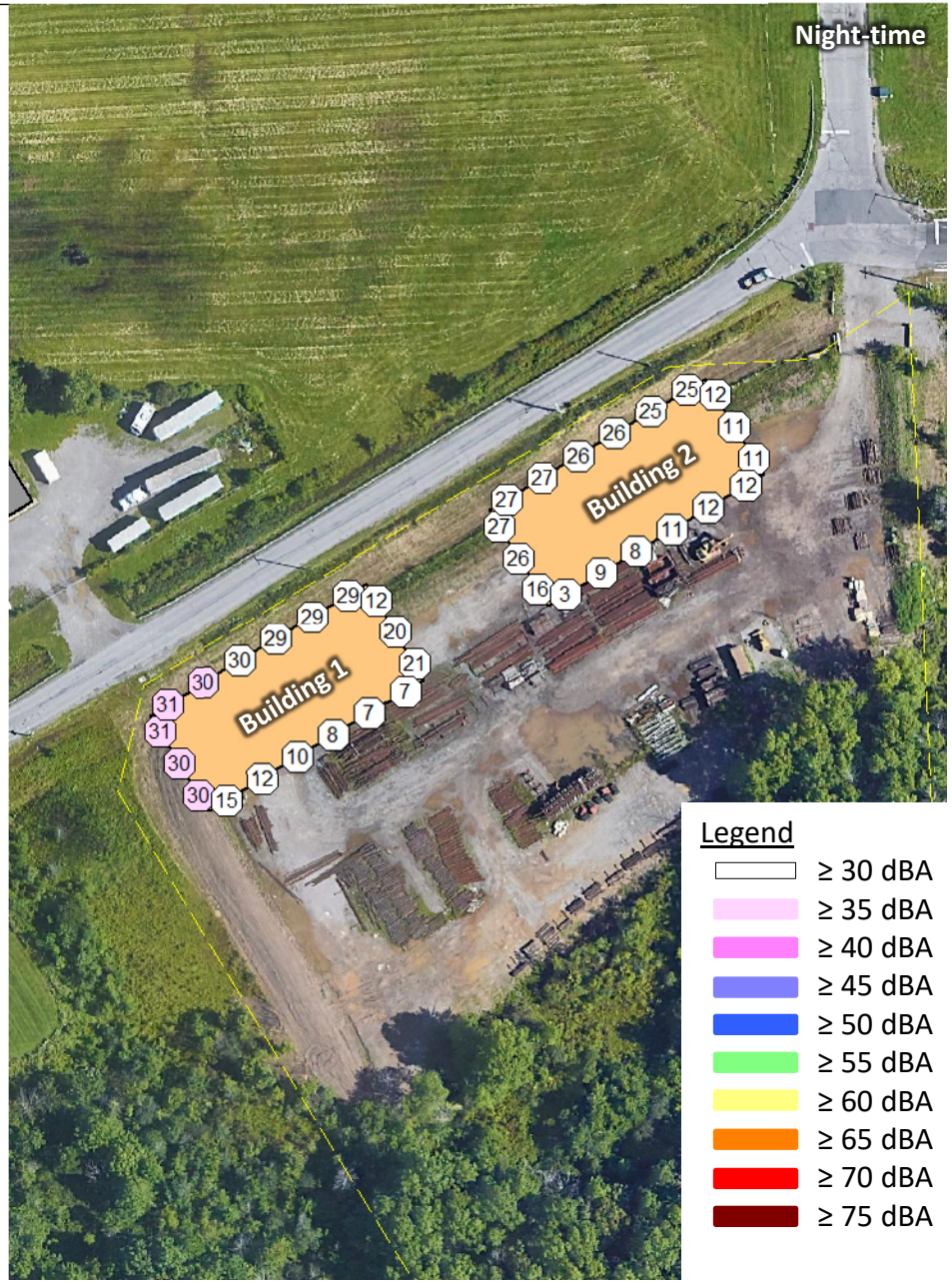
Date: Feb 6, 2023 | Rev 0.0

Project No . 241.30660.00000

Figure No. **8**

SLR





UPPER CANADA PLANNING & ENGINEERING LTD.– DORCHESTER & OLDFIELD RD

D-6 COMPATIBILITY & MITIGATION STUDY

FAÇADE SOUND LEVELS – STATIONARY NOISE
CONTINUOUS – QUANTUM NIAGARA GYMNASTICS

True North

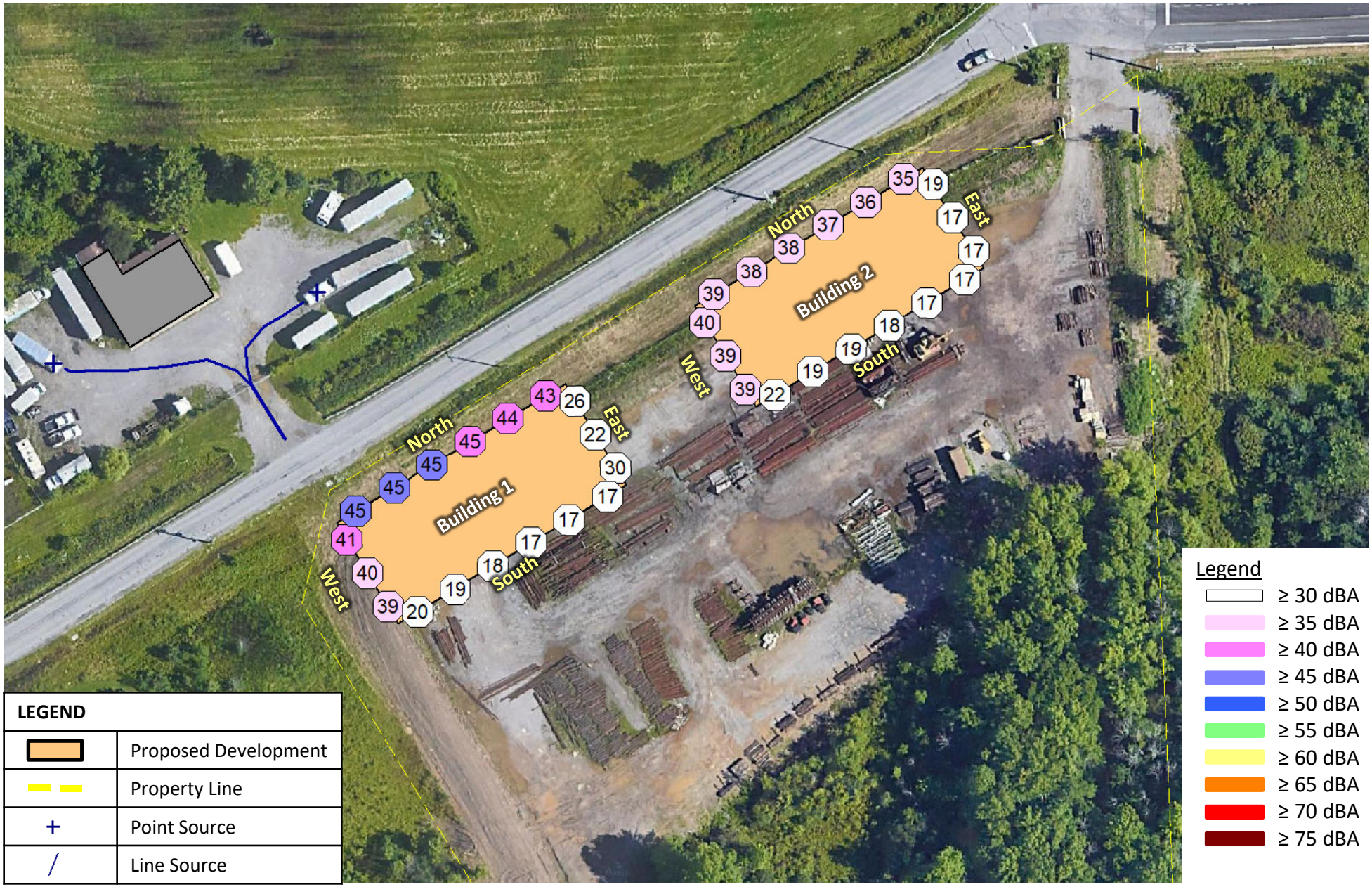
Scale: 1: 1,500

Date: Feb 6, 2023 | Rev 0.0

Project No . 241.30660.00000

Figure No. **9**

SLR



LEGEND	
	Proposed Development
	Property Line
+	Point Source
/	Line Source

UPPER CANADA PLANNING & ENGINEERING LTD.– DORCHESTER & OLDFIELD RD

D-6 COMPATIBILITY & MITIGATION STUDY

FAÇADE SOUND LEVELS – STATIONARY NOISE
CONTINUOUS – NIAGARA MOVING & STORAGE

True North

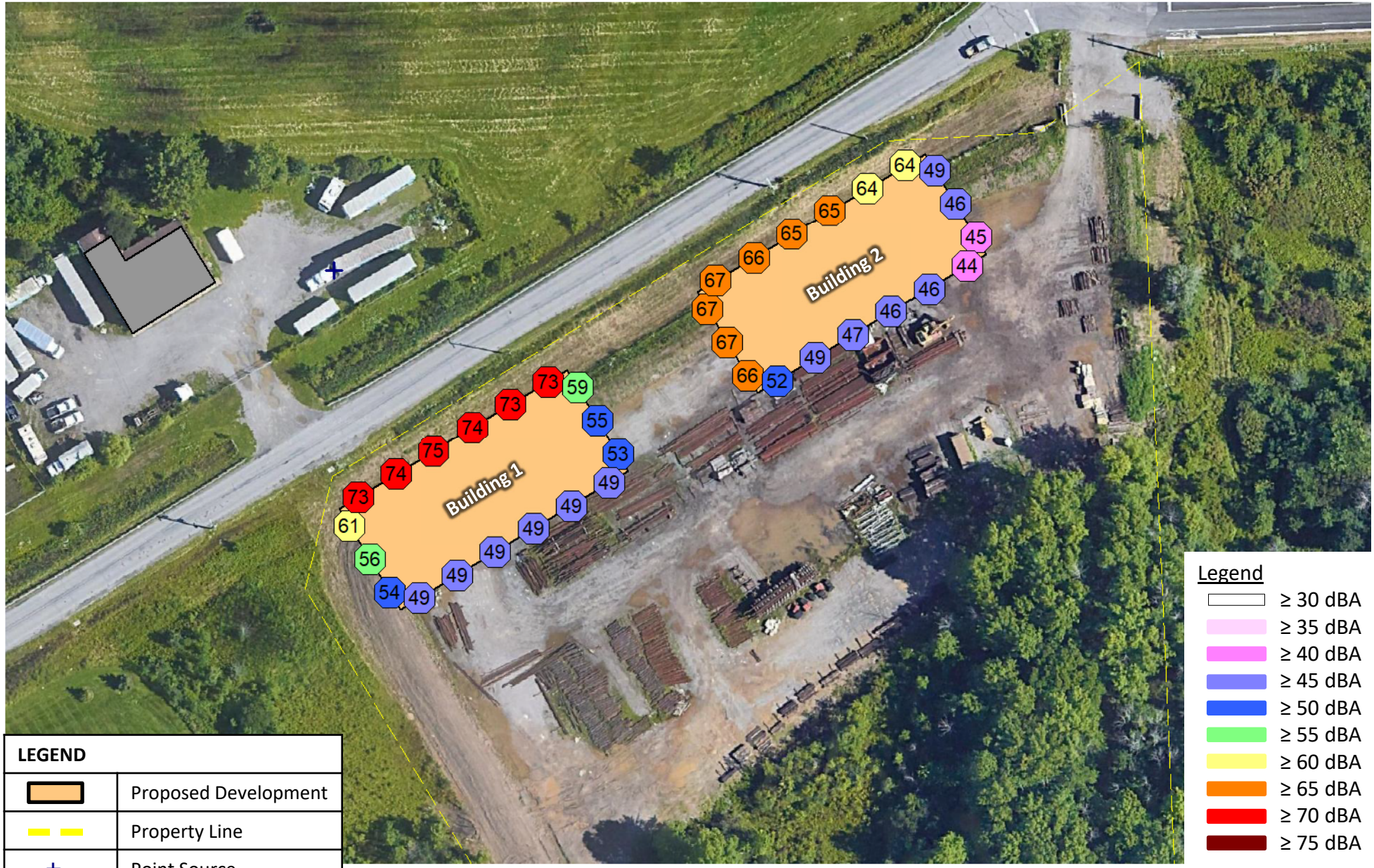
Scale: 1: 1,000

Date: Feb 6, 2023 Rev 0.0

Project No . 241.30660.00000

Figure No. **10**

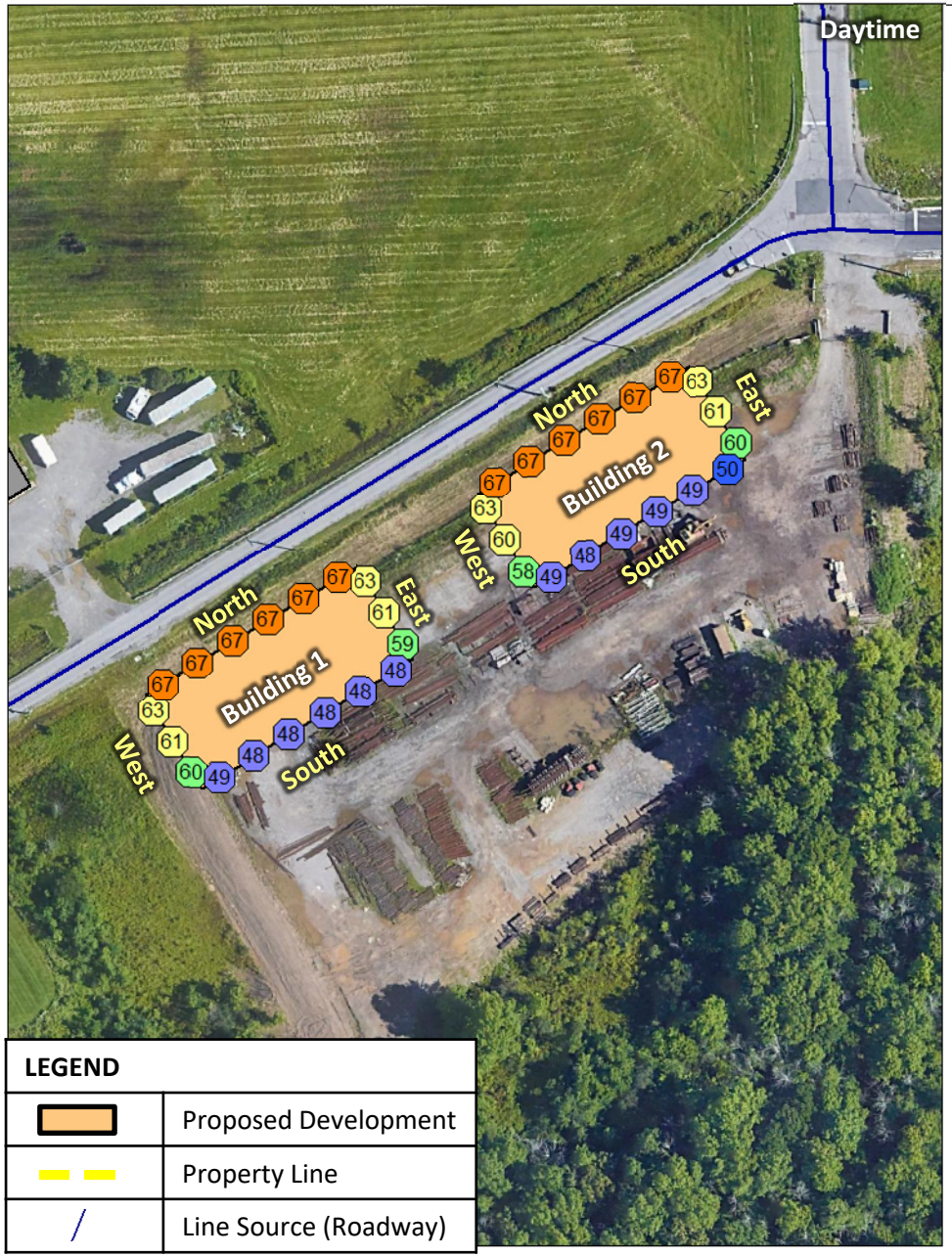
SLR

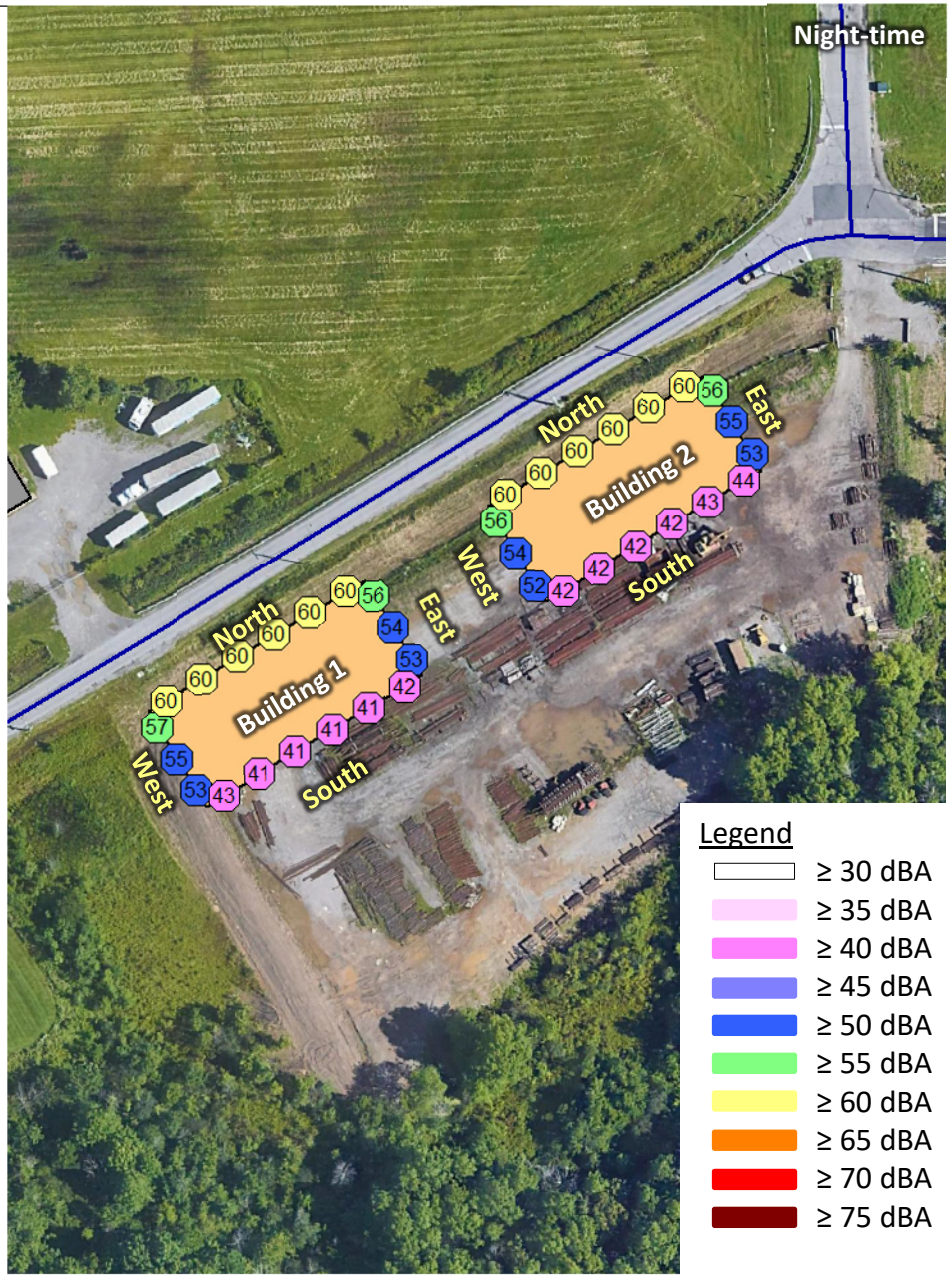


LEGEND	
	Proposed Development
	Property Line
+	Point Source

UPPER CANADA PLANNING & ENGINEERING LTD.– DORCHESTER & OLDFIELD RD	True North	Scale: 1: 1,000	
D-6 COMPATIBILITY & MITIGATION STUDY		Date: Feb 6, 2023 Rev 0.0	Figure No. 11
FAÇADE SOUND LEVELS – STATIONARY NOISE IMPULSIVE – NIAGARA MOVING & STORAGE		Project No . 241.30660.00000	

SLR





LEGEND	
	Proposed Development
	Property Line
/	Line Source (Roadway)

Legend

- ≥ 30 dBA
- ≥ 35 dBA
- ≥ 40 dBA
- ≥ 45 dBA
- ≥ 50 dBA
- ≥ 55 dBA
- ≥ 60 dBA
- ≥ 65 dBA
- ≥ 70 dBA
- ≥ 75 dBA

UPPER CANADA PLANNING & ENGINEERING LTD.– DORCHESTER & OLDFIELD RD

D-6 COMPATIBILITY & MITIGATION STUDY

FAÇADE SOUND LEVELS – TRANSPORTATION NOISE
ROADWAY

True North

Scale: 1: 1,500

Date: Feb 6, 2023 Rev 0.0

Project No . 241.30660.00000

Figure No. **12**

SLR

Appendix A Industry List

Dorchester and Oldfield Road, Niagara Falls

D-6 Compatibility & Mitigation Study, Air Quality, Dust, Odour & Noise

Upper Canada Planning & Engineering Ltd.

SLR Project No. 241.30060.00000

February 6, 2023

Name	Address	Description	MECP ECA or EASR No. (Date)	MECP Guideline D-6					
				Class	Area of Influence	Recommended Separation Distance	Actual Distance	Within Area of Influence?	Within Recomended Separation Distance
Niagara Falls Nissan	8180 Oakwood Dr	Car Dealer		I	70	20	750	-	-
Niagara Falls Art Gallery & Niagara Children's Museum	8058 Oakwood Dr	Art Gallery		I	70	20	800	-	
ACC Auto Credit Canada	7960 Oakwood Dr	Car Dealer		I	70	20	600	-	
Sunbelt Rentals	7888 Oakwood Dr	Equipment Rental Agency		II	300	70	600	-	
Mobile Business communications Ltd.	Oakwood Dr	Mobile Home Dealer		I	70	20	900	-	
Tow Brothers Auto	7868 Oakwood Dr	Auto Repair Shop		I	70	20	600	-	
Niagara Truck Repair and Tire	7868 Oakwood Dr	Truck Repair Shop		I	70	20	600	-	
Wild Bills Auto Repair	7868 Oakwood Dr	Auto Repair Shop		I	70	20	600	-	
Atlantic Body Shop & Towing Ground	7868 Oakwood Dr	Auto Body Shop		I	70	20	600	-	
Blue Jay Irrigation	7868 Oakwood Dr	Lawn Sprinkler System Contarctor		I	70	20	600	-	
Pappetti Auto Repair	7868 Oakwood Dr	Auto Repair Shop		I	70	20	600	-	
Cardinal Kia	7818 Oakwood Dr	Car Dealer		II	300	70	560	-	
LCBO	7481 Oakwood Dr	Liquor Store		I	70	20	800	-	
SmartCentres Niagara Falls	7481 Oakwood Dr	Shopping Mall		I	70	20	700	-	
Reitmans	7481 Oakwood Dr	Women's Clothing Store		I	70	20	700	-	
PetSmart Dog Training	7481 Oakwood Dr	Dog Trainer		I	70	20	700	-	
Walmart Supercentre	7481 Oakwood Dr	Department	R-003-2553621994 (2015)	I	70	20	800	-	
Petro-Canada	7307 Oakwood Dr	Gas Station		I	70	20	900	-	
WRB Sales & Marketing Inc.	8100 Dorchester Rd	Souvenir Manufacturer		I	70	20	240	-	

Name	Address	Description	MECP ECA or EASR No. (Date)	MECP Guideline D-6					
				Class	Area of Influence	Recommended Separation Distance	Actual Distance	Within Area of Influence?	Within Recomended Separation Distance
Chemtrade Logistics Inc.	6300 Oldfield Rd	Storage Facility	3355-9TZLBT (2015), R-010-6111569981 (2019)	II	300	70	720	-	
Enjoy the Beauty of the Falls	7745 Pender St	Hotel		I	70	20	650	-	
Palfinger Inc.	7942 Dorchester Rd	Crane Dealer		II	300	70	90	Yes	
Warehouse, Casino Niagara Falls	Dorchester Rd	Warehousing Storage		I	70	20	180	-	
Storage One Self Storage	7979 Dorchester Rd	Self-storage Facility		I	70	20	160	-	
Quantum Niagara Gymnastics	7875 Dorchester Rd	Gymnastics Centre		I	70	20	30	Yes	
Niagara Moving & Storage	7825 Dorchester Rd	Moving and Storage Service		I	70	20	30	Yes	
Niagara Falls Fire Station	7036 McLeod Rd	Fire Station		I	70	20	750	-	
Elementary School Catholic Notre-Dame-De-La-Jeunesse	7374 Wilson Crescent	Educational institution		I	70	20	770	-	
CONSTANIN SARUC	7868 Oakwood Dr	Automotive Refinishing	R-001-3110412945 (2018)	I	70	20	600	-	
CYRO Canada Inc.	8100 Dorchester Rd	Resin&Rubber Manufacturing	4622-4LRL63 (2000)	I	70	20	320	-	
Laurcoat	8100 Dorchester Rd	powder coating and industrial sandblasting facility	5650-8S6LVJ (2012)	I	70	20	320	-	
The Regional Municipality of Niagara	7606 Oakwood Dr	Sewage Pumping Station	1680-9XLNPD (2015)	I	70	20	650	-	

Appendix B Warning Clauses

Dorchester and Oldfield Road, Niagara Falls

D-6 Compatibility & Mitigation Study, Air Quality, Dust, Odour & Noise

Upper Canada Planning & Engineering Ltd.

SLR Project No. 241.30060.00000

February 6, 2023

SUMMARY OF POTENTIAL MITIGATION MEASURES AND WARNING CLAUSES

Warning Clauses

Transportation Sources (Road and Rail)

MECP Type C Warning Clause

"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."

MECP Type D Warning Clause

"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."

Industrial Sources

MECP Type E Warning Clause

"Purchasers/tenants are advised that sound levels due to the adjacent industries are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed."

Appendix C Stationary Noise Modelling Inputs

Dorchester and Oldfield Road, Niagara Falls

D-6 Compatibility & Mitigation Study, Air Quality, Dust, Odour & Noise

Upper Canada Planning & Engineering Ltd.

SLR Project No. 241.30060.00000

February 6, 2023

STATIONARY SOURCE MODELLING DATA

Source Description	Maximum Sound Power Level (1/1 Octave Bands)									Modelled Sound Power Level (dBA/dBAI)	Source Notes
	31.5	63	125	250	500	1000	2000	4000	8000		
Quantum Niagara Gymnastics											
Rooftop HVAC - 5ton (x3)	77	80	81	81	80	78	74	70	64	82.5	Based on historical SLR data - Operates 60 minutes per hour during daytime/evening hours - Operates 30 minutes per hour during night-time hours
Forklift Movement	89.1	112.0	96.1	95.7	96.2	94.5	92.7	91.8	85.4	100.2	Based on historical SLR data - Operates 30 minutes per hour during the daytime hours
Palfinger Inc.											
Air Compressor (open bay door noise)	106.1	105.5	100.8	94.3	91.0	91.3	88.5	89.8	85.8	97.1	Based on historical SLR data - Operates 5 minutes per hour during daytime/evening and night-time hours
Rooftop HVAC - 10ton (x4)	80.0	83.0	84.0	84.0	83.0	81.0	77.0	73.0	67.0	85.5	Based on historical SLR data - Operates 60 minutes per hour during daytime/evening hours - Operates 30 minutes per hour during night-time hours
Idling Truck (x1)		93.0	88.0	83.0	90.0	87.0	88.0	82.0	71.0	93.1	Based on historical SLR data - Operates 3 minutes per hour during daytime/evening and night-time hours
Moving Trucks (x2)	90.2	93.6	91.9	88.2	89.2	91.1	87.0	81.1	97.2	98.3	Based on historical SLR data - 2 movements per hour during daytime/evening and night-time hours - 1 movement of flatbed throughout site - 1 movement to and from the loading bay on west side of building - Assumed speed of 10 km/h
Forklift Movement	89.1	112.0	96.1	95.7	96.2	94.5	92.7	91.8	85.4	100.2	Based on historical SLR data - Continuous movement during the daytime, evening, and night-time hours
Niagara Moving and Storage											
Idling Trucks (x2)		93.0	88.0	83.0	90.0	87.0	88.0	82.0	71.0	93.1	Based on historical SLR data - Operates 15 minutes per hour during daytime/evening and night-time hours
Trailer Coupling/Uncoupling					120.0					120	Based on historical SLR data - 1 impulse per hour during daytime/evening/night-time hours
Moving Trucks (x2)	90.2	93.6	91.9	88.2	89.2	91.1	87.0	81.1	97.2	98.3	Based on historical SLR data - 2 movements per hour during daytime/evening hours - 1 movement per hour during the night-time hours - Assumed speed of 10 km/h

Appendix D Traffic Data and Calculations

Dorchester and Oldfield Road, Niagara Falls

D-6 Compatibility & Mitigation Study, Air Quality, Dust, Odour & Noise

Upper Canada Planning & Engineering Ltd.

SLR Project No. 241.30060.00000

February 6, 2023

O R N A M E N T - Sound Power Emissions & Source Heights

Ontario Road Noise Analysis Method for Environment and Transportation

Road Segment ID	Roadway Name	Link Description	Speed (kph)	Period (h)	Total Traffic Volumes	Auto %	Med %	Hvy %	Auto	Med	Heavy	Road Gradient (%)	Cadna/A Ground Absorption G	PWL (dBA)	Source Height, s (m)
DorchN_avg	Dorchester Road	Daytime Impacts	50	16	8514	95.1%	2.6%	2.3%	8097	223	194	0	0.00	**78.8**	**1.2**
DorchN_avg	Dorchester Road	Nighttime Impacts	50	8	946	95.1%	2.6%	2.3%	900	25	22	0	0.00	**72.3**	**1.2**
DorchS_avg	Dorchester Road	Daytime Impacts	60	16	9819	94.9%	2.7%	2.4%	9318	268	233	0	0.00	**81.2**	**1.2**
DorchS_avg	Dorchester Road	Nighttime Impacts	60	8	1091	94.9%	2.7%	2.4%	1035	30	26	0	0.00	**74.7**	**1.2**
Old_avg	Oldfield Road	Daytime Impacts	50	16	4014	95.2%	2.6%	2.2%	3821	103	90	0	0.00	**75.5**	**1.2**
Old_avg	Oldfield Road	Nighttime Impacts	50	8	446	95.2%	2.6%	2.2%	425	11	10	0	0.00	**69.0**	**1.2**

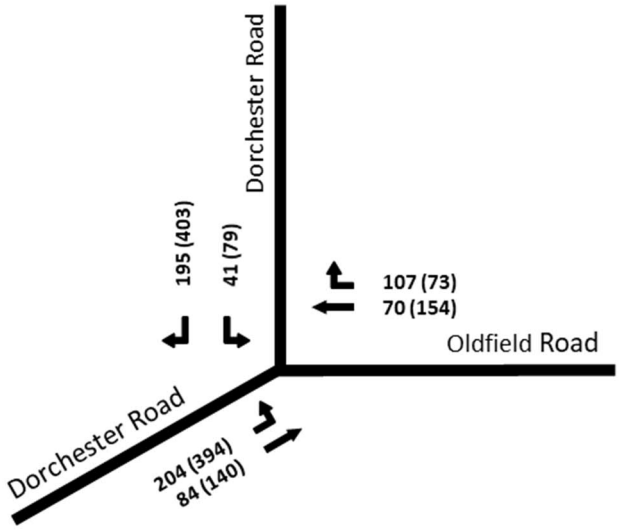


Figure 3-2
Horizon Year 2041 AM (PM) Peak Traffic Volumes

3.5.2 Traffic Operations Assessment

The results of the capacity analysis for the horizon year 2041 is summarized in Table 3-2. All Synchro output reports are provided in Appendix B.

Dorchester Rd @ Oldfield Rd

Total Count Diagram

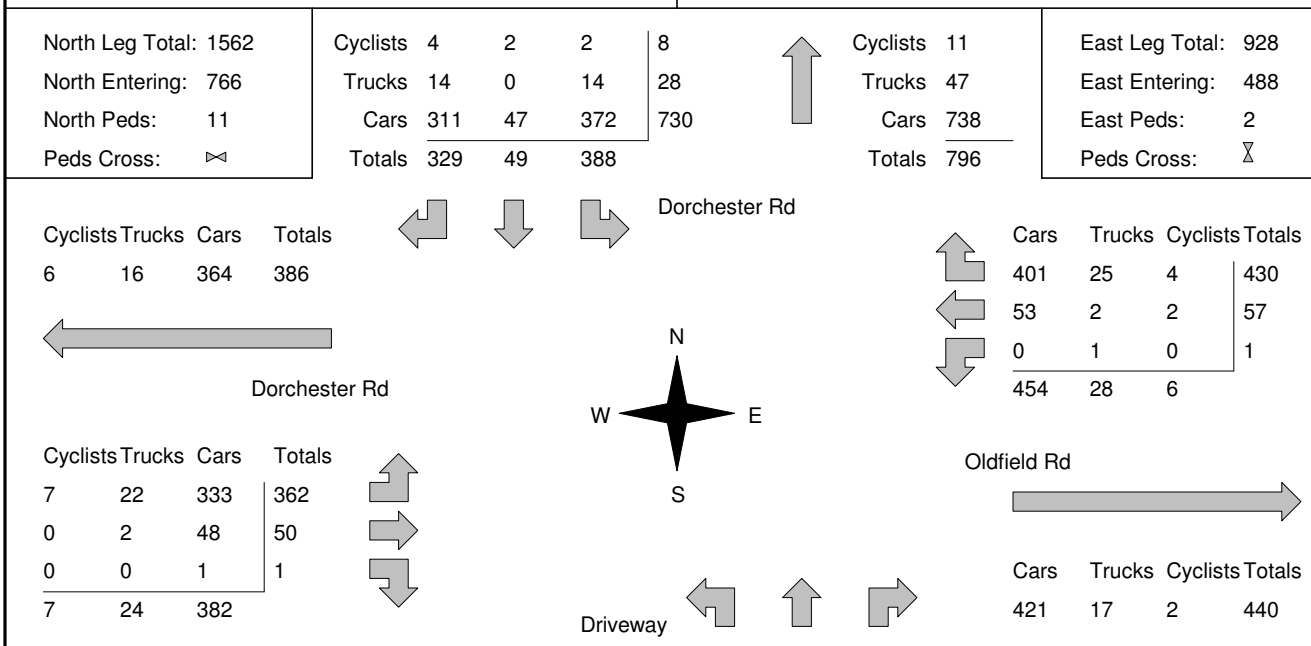
Municipality: Niagara Falls
Site #: 0000000007
Intersection: Oldfield Rd & Dorchester Rd
TFR File #: 7
Count date: 10-Sep-2019

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Non-Signalized Intersection ****

Major Road: Oldfield Rd runs W/E



Comments

Appendix E STAMSON Validation

Dorchester and Oldfield Road, Niagara Falls

D-6 Compatibility & Mitigation Study, Air Quality, Dust, Odour & Noise

Upper Canada Planning & Engineering Ltd.

SLR Project No. 241.30060.00000

February 6, 2023

UPPER CANADA PLANNING & ENGINEERING LTD.– DORCHESTER & OLDFIELD RD

D-6 COMPATIBILITY & MITIGATION STUDY

FAÇADE SOUND LEVELS – TRANSPORTATION NOISE
ROADWAY

True North

Scale: 1: 1,000

Date: Feb 6, 2023 Rev 0.0

Project No . 241.30660.00000

Figure No.
E1

SLR

STAMSON 5.0 NORMAL REPORT Date: 06-02-2023 11:26:32
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: dorch.te Time Period: 16 hours
Description: 1st floor receiver, east facade building 2

Road data, segment # 1: DorchN

Car traffic volume : 8097 veh/TimePeriod
Medium truck volume : 223 veh/TimePeriod
Heavy truck volume : 194 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: DorchN

Angle1 Angle2 : -90.00 deg -47.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 27.60 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Road data, segment # 2: DorchS

Car traffic volume : 9318 veh/TimePeriod
Medium truck volume : 268 veh/TimePeriod
Heavy truck volume : 233 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: DorchS

Angle1 Angle2 : 0.00 deg 70.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 15.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Road data, segment # 3: Oldfield

```
--------------------------------
Car traffic volume  :  3821 veh/TimePeriod
Medium truck volume :   103 veh/TimePeriod
Heavy truck volume  :    90 veh/TimePeriod
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

Data for Segment # 3: Oldfield
------------------------------
Angle1   Angle2           :  48.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      2       (Reflective ground surface)
Receiver source distance  :  30.10 m
Receiver height           :   1.50 m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

🠝
Results segment # 1: DorchN
---------------------------

Source height = 1.23 m

ROAD (0.00 + 54.91 + 0.00) = 54.91 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90    -47   0.00  63.77   0.00  -2.65  -6.22   0.00   0.00   0.00  54.91
-------------------------------------------------------------------------------

Segment Leq : 54.91 dBA

🠝
Results segment # 2: DorchS
---------------------------

Source height = 1.24 m

ROAD (0.00 + 62.05 + 0.00) = 62.05 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     70   0.00  66.15   0.00   0.00  -4.10   0.00   0.00   0.00  62.05
-------------------------------------------------------------------------------

Segment Leq : 62.05 dBA

🠝
Results segment # 3: Oldfield
-----------------------------
```

Source height = 1.22 m

ROAD (0.00 + 51.12 + 0.00) = 51.12 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
48	90	0.00	60.46	0.00	-3.02	-6.32	0.00	0.00	0.00	51.12

Segment Leq : 51.12 dBA

Total Leq All Segments: 63.10 dBA

TOTAL Leq FROM ALL SOURCES: 63.10

Appendix F BPN-56 Calculations

Dorchester and Oldfield Road, Niagara Falls

D-6 Compatibility & Mitigation Study, Air Quality, Dust, Odour & Noise

Upper Canada Planning & Engineering Ltd.

SLR Project No. 241.30060.00000

February 6, 2023

BPN 56 Calculation Procedure - Required Glazing STC Rating (Fixed Veneer) - Living/Dining Rooms

Dorchester & Oldfield, Niagara

Receptor ID	Source Description	Sound Levels		Room / Façade Inputs					Source Inputs		Veneer - Component 1		Glazing - Component 2	
		Façade Sound Level: (dBA)	Required Indoor Sound Level: (dBA)	Glazing as % of Wall Area	Exposed Wall Height (m)	Exposed Wall Length (m)	Room Depth (m)	Room Absorption:	Incident Sound Angle: (deg)	Spectrum type:	Assumed Veneer STC (STC)	Component Category:	Component Category:	Require Glazing STC (STC)
DAYTIME														
Building 1 - North	Roadways, Daytime	67	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**25**
Building 1 - East	Roadways, Daytime	63	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**21**
Building 1 - South	Roadways, Daytime	49	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**7**
Building 1 - West	Roadways, Daytime	63	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**21**
Building 2 - North	Roadways, Daytime	67	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**25**
Building 2 -East	Roadways, Daytime	63	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**21**
Building 2 - South	Roadways, Daytime	50	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**8**
Building 2 - West	Roadways, Daytime	63	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**21**
NIGHT-TIME														
Building 1 - North	Roadways, Night-time	60	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**18**
Building 1 - East	Roadways, Night-time	56	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**14**
Building 1 - South	Roadways, Night-time	43	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**1**
Building 1 - West	Roadways, Night-time	57	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**15**
Building 2 - North	Roadways, Night-time	60	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**18**
Building 2 -East	Roadways, Night-time	56	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**14**
Building 2 - South	Roadways, Night-time	44	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**2**
Building 2 - West	Roadways, Night-time	56	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**14**

BPN 56 Calculation Procedure - Required Glazing STC Rating (Fixed Veneer) - Bedrooms

Dorchester & Oldfield, Niagara

Receptor ID	Source Description	Sound Levels		Room / Façade Inputs					Source Inputs		Veneer - Component 1		Glazing - Component 2	
		Façade Sound Level: (dBA)	Required Indoor Sound Level: (dBA)	Glazing as % of Wall Area	Exposed Wall Height (m)	Exposed Wall Length (m)	Room Depth (m)	Room Absorption:	Incident Sound Angle: (deg)	Spectrum type:	Assumed Veneer STC (STC)	Component Category:	Component Category:	Require Glazing STC (STC)
DAYTIME														
Building 1 - North	Roadways, Daytime	67	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**25**
Building 1 - East	Roadways, Daytime	63	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**21**
Building 1 - South	Roadways, Daytime	49	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**7**
Building 1 - West	Roadways, Daytime	63	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**21**
Building 2 - North	Roadways, Daytime	67	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**25**
Building 2 -East	Roadways, Daytime	63	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**21**
Building 2 - South	Roadways, Daytime	50	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**8**
Building 2 - West	Roadways, Daytime	63	45	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**21**
NIGHT-TIME														
Building 1 - North	Roadways, Night-time	60	40	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**23**
Building 1 - East	Roadways, Night-time	56	40	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**19**
Building 1 - South	Roadways, Night-time	43	40	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**6**
Building 1 - West	Roadways, Night-time	57	40	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**20**
Building 2 - North	Roadways, Night-time	60	40	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**23**
Building 2 -East	Roadways, Night-time	56	40	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**19**
Building 2 - South	Roadways, Night-time	44	40	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**7**
Building 2 - West	Roadways, Night-time	56	40	70%	2.9	3.0	6.0	Intermediate	0 - 90	D. mixed road traffic, distant aircraft	45	D. sealed thick window, or exterior wall, or roof/ceiling	C. sealed thin window, or openable thick window	**19**