Volume 2:

Supporting Technical Reports

Appendix A:

Natural Heritage Reports

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Natural Heritage Reports

A1: Natural Heritage Characterization Report

SAVANTA
A GEI Company

Natural Heritage Characterization Report

Clarkson Wastewater Treatment Plant
Region of Peel,
Mississauga, Ontario

NOVEMBER 2022

SAVANTA
A GEI Company

Natural Heritage Characterization Report

Clarkson Wastewater Treatment Plant
Mississauga, Ontario

Submitted to:
The Region of Peel
c/o GM BluePlan
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Stoney Creek, ON L8E 5R9

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1.0 INTRODUCTION

Savanta Inc. – a GEI Company (Savanta) was retained GM BluePlan to prepare a Natural Heritage Characterization Report to understand the natural heritage features and functions associated with the Clarkson Wastewater Treatment Plant as part of the Schedule C Municipal Class Environmental Assessment. A Municipal Class Environmental Assessment is required to inform capacity expansion opportunities.

The property, herein referred to as the Subject Lands, is located north of the intersection of Lakeshore Road West and Avonhead Road, west of Southdown Road, and north of Lake Ontario in Mississauga, Ontario (**Figure 1, Appendix A)**. The Subject Lands currently host the wastewater treatment plant and is surrounded by commercial/industrial land uses. Immediately south of Lakeshore Road West is Lakeside Park, which borders Lake Ontario.

A Characterization Report is required to assess the natural heritage features and associated functions within the Subject Lands. This work considers applicable provincial and municipal requirements and policies including reference to the natural heritage policies of the Province of Ontario's Provincial Policy Statement (PPS; MMAH 2020) and associated provincial implementation guidance contained in the Natural Heritage Reference Manual (NHRM; Ministry of Natural Resources 2010).

The Characterization Report will include the following components:

- A review of existing natural heritage background information, policies and legislation applicable to the Subject Lands in its regional context;
- A background review of the natural heritage features on and immediately adjacent to the Subject Lands;
- An evaluation of the sensitivity of the natural heritage features and their functions on the Subject Lands; and
- An assessment of whether any of the existing natural heritage features within the Subject Lands meet the test of 'significance' as identified in the PPS.

This report presents the results of data collected during the background review and analyses of existing natural heritage conditions and provides an assessment of the significance and sensitivity of these resources in the context of the proposed wastewater treatment updates.

Based on the limited available background information and the nature of the site, the following ecological surveys were completed by Savanta in 2020 and 2022 within the Subject Lands:

- Botanical inventory and Ecological Land Classification (ELC; summer and fall);
- Breeding bird surveys; and
- Aquatic site reconnaissance.

2.0 NATURAL HERITAGE INFORMATION SOURCES

An assessment of the natural heritage features found on, and adjacent to, the Subject Lands and the potential impacts to these features from the proposed development applications was undertaken in association with the following legislation, policies and agency programs:

- City of Mississauga Official Plan (2021 Office Consolidation);
- Region of Peel Official Plan (2021 Office Consolidation);
- Credit Valley Conservation (CVC) – Ontario Regulation 160/06;
- Provincial Policy Statement (PPS; MMAH 2020);
- *Endangered Species Act* (Consolidation October 2021) (ESA);
- Federal *Fisheries Act* (R.S.C., 1985, c. F-14); and
- *Migratory Birds Convention Act*.

The Subject Lands are located outside of the Greenbelt and Oak Ridges Moraine planning areas.

2.1 City of Mississauga Official Plan

The City of Mississauga Official Plan (2011) was officially adopted by City Council on September 29, 2010. The Region of Peel granted partial approval on September 22, 2011 and the Official Plan came into partial effect on November 14, 2012. Further amendments have been made to the City of Mississauga Official Plan to reflect Council-approved Official Plan amendments, with the most recent office consolidation released on October 21, 2021.

As shown on Schedule 1a (Urban System – Green System), no Green Systems are identified within the Subject Lands.

As illustrated within Schedule 3 (Natural System), one Significant Natural Areas (NAS) is identified within the Subject Lands within the centre of the northern portion of the property (**Figure 2, Appendix A)**. This feature appears to be associated with an offsite treed area.

2.2 Region of Peel Official Plan

The Region of Peel Official Plan was adopted by the Regional Council on July 11, 1996 and approved by the Ministry of Municipal Affairs and Housing on October 22, 1996. Further amendments have been undertaken to revise the Regional Official Plan; however, the latest amended version (April 2022) is awaiting Provincial approval and has not come into force yet. Analysis of the September 2021 Office Consolidation was completed.

As illustrated within Schedule A (Core Areas of the Greenlands System in Peel), no Core Areas are identified within the Subject Lands. A treed area located north of the Subject Lands is identified as being part of the Core Areas, as shown on **Figure 2** (**Appendix A**).

2.3 Credit Valley Conservation

The Regulation Limit delineates hazardous lands, wetlands, shorelines and areas susceptible to flooding, and associated allowances. Pursuant to the *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (Ontario Regulation 160/06), any development in or on areas defined in the Regulation (e.g., river or stream valleys, hazardous land, wetlands) requires permission from the CVC. CVC may grant permission for development in or on these areas if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development. The Regulation also prohibits straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse or changing or interfering in any way with a wetland without permission from the CVC.

A review of the CVC's Regulation Mapping illustrated no hazard lands within the Subject Lands (**Figure 2, Appendix A)**. Hazard lands associated with Lakeside Creek are found immediately south of Lakeshore Road West.

A data request response from CVC was received on August 21, 2020 (**Appendix C**) identified portions of the Credit River Watershed Natural Heritage System within the Subject Lands. The following preliminary site sensitive/constraints were identified within or adjacent to the Subject Lands:

- Fish habitat within Lake Ontario and Lakeside Creek;
- Significant Natural Areas adjacent to and partially within the Subject Lands comprised of cultural woodlands, cultural meadow and deciduous forest ecosites;
- Highly vulnerable aquifer within the Subject Lands;
- Significant Wildlife Habitat (SWH) along the southern waterfront limits of the Subject Lands, as well as the norther limits of the Subject Lands; and
- Species at Risk (SAR) including:
    - Bobolink (*Dolichonyx oryzivorus)* – Threatened;
    - Eastern Meadowlark (*Sturnella magna)* – Threatened;
    - Little Brown Myotis (*Myotis lucifugus*) – Endangered; and
    - Peregrine Falcon (*Falco peregrinus)* – Special Concern.

2.4 Provincial Policy Statement

The PPS (MMAH 2020) provides direction on matters of provincial interest related to land use planning and development. It "supports improved land use planning and management, which contributes to a more effective and efficient land use planning system." The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together. The PPS (2020) came into effect May 1, 2020 and replaces the previous PPS issued April 30, 2014.

This report addresses those policies that are specific to Natural Heritage (section 2.1) with some reference to other policies with relevance to Natural Heritage and impact assessment considerations and areas of overlap (e.g., those related to Efficient and Resilient Development and Land Use Patterns, section 1.1; Sewage, Water and Stormwater, section 1.6.6; Water, section 2.2; Natural Hazards, section 3.1).

Eight types of significant natural heritage features are defined in the PPS, as follows:

- Significant wetlands
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- SWH;
- Fish habitat;
- Habitat of endangered and threatened species; and
- Significant areas of natural and scientific interest (ANSIs).

2.5 Endangered Species Act

The provincial *Endangered Species Act, 2007* (Consolidation 2021) was developed to:

- Identify SAR, based upon best available science;
- Protect SAR and their habitats and to promote the recovery of SAR; and
- Promote stewardship activities that would support those protection and recovery efforts.

The *Endangered Species Act* protects all threatened, endangered and extirpated species listed on the SARO list. These species are legally protected from harm or harassment and their associated habitats are legally protected from damage or destruction, as defined under the *Endangered Species Act*.

2.6 Federal Fisheries Act

The DFO administers the federal *Fisheries Act,* which defines fish habitat as "*spawning grounds and other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes*" (subsection (2)1). The *Fisheries Act* prohibits the death of fish by means other than fishing (subsection 34.4 (1)) and the harmful alteration, disruption or destruction of fish habitat (HADD; subsection 35. (1)). A HADD is defined as "*any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes*" (DFO 2019a).

2.7 Migratory Birds Convention Act

This federal legislation protects the nests and offspring of listed migratory bird species from destruction or disturbance. In its application, it requires best management practices to detect and avoid disturbance to active nests.

3.0 SECONDARY SOURCE DATA REVIEW

The following resources were used to access information relating to natural features and species that may be found on the Subject Lands:

- Land Information Ontario (LIO) database;
- Natural Heritage Information Centre (NHIC) database;
- Online Atlas Data; and
- Aquatic SAR distribution maps.

The results of the background review are discussed in the following sections.

3.1 Land Information Ontario Natural Features Summary

Based on the Ministry of Natural Resources and Forestry (MNRF) LIO geographic database, no features were identified on or adjacent to the Subject Lands (**Figure 2**, **Appendix A**). Immediately south of the Subject Lands within Lakeside Park, Lakeside Creek is identified.

3.2 Natural Heritage Information Centre

The NHIC database (MNRF 2022) was searched for records of provincially significant plants, vegetation communities and wildlife on, and in the vicinity of the Subject Lands. The database provides occurrence data by 1 km^2 area squares, with three squares overlapping at least a portion of the Subject Lands (17PJ1116, 17PJ1117, and 17PJ1216). Within these squares, the search revealed five species records. The following records are considered as current occurrences in this reporting:

- Species listed as Threatened or Endangered on the Species at Risk in Ontario (SARO) list:
    - Henslow's Sparrow (*Ammodramus henslowii*) – Endangered;
    - Butternut (*Juglans cinerea)* – Endangered; and
    - Eastern Meadowlark – Threatened.
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as provincially ranked S1-S3 species):
    - Peregrine Falcon – Special Concern.

One restricted species was recorded as part of the NHIC search. Listing a species as restricted is typically applied to species that are illegally hunted, harvested and/or fished for commercial and recreational purposes.

Moreover, one wildlife concentration area (Mixed Wader Nesting Colony) and one natural area (West End of Lake Ontario) was recorded.

3.3 Ontario Breeding Bird Atlas

The Ontario Breeding Bird Atlas (OBBA) contains detailed information on the population and distribution status of Ontario birds (Bird Studies Canada et al. 2006). The data is presented on 100 km^2 area squares with one square overlapping a portion of the Subject Lands (17PJ11). It should be noted that the Subject Lands are a small component of the overall bird atlas square, and therefore it is unlikely that all bird species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in bird species presence and use.

A total of 81 species were recorded in the atlas square that overlaps with the Subject Lands, with the following species of interest noted:

- Species listed as Threatened or Endangered on the SARO list:
  - Bank Swallow (*Riparia riparia*) – Threatened;
  - Barn Swallow (*Hirundo rustica*) – Threatened;
  - Bobolink – Threatened; and
  - Chimney Swift (*Chaetura pelagica*) – Threatened.
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as provincially ranked S1-S3 species):
  - Common Nighthawk (*Chordeiles minor*) – Special Concern;
  - Eastern Wood-Pewee (*Contopus virens*) – Special Concern;
  - Peregrine Falcon – Special Concern;
  - Wood Thrush (*Hylocichla mustelina*) – Special Concern;
  - Purple Martin (*Progne subis*) – S3S4B (Rare to uncommon to common and apparently secure); and
  - Red-necked Grebe (*Podiceps grisegena*) – S3B (Rare to uncommon), S4N (Common and apparently secure).

3.4 Ontario Reptile and Amphibian Atlas

The Ontario Reptile and Amphibian Atlas contains detailed information on the population and distribution status of Ontario herpetofauna (Ontario Nature 2018). The data is presented on 100 km^2 area squares with one square overlapping a portion of the Subject Lands (17PJ11). It should be noted that the Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all herpetofauna species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in herpetofauna species presence and use.

A total of 24 species were recorded in the atlas square that overlaps with the Subject Lands, of which three are salamander species, eight are frog and toad species, five are turtle species and eight are snake species. Of these species, the following species of interest are noted:

- Species listed as Threatened or Endangered on the SARO list:
  - Blanding's Turtle (*Emydoidea blandingii)* – Threatened.

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as provincially ranked S1-S3 species):
    - Northern Map Turtle (*Graptemys geographica*) – Special Concern;
    - Snapping Turtle (*Chelydra serpentina*) – Special Concern.

Eastern Milksnake (*Lampropeltis triangulum*) was identified and is listed as Special Concern in Canada, however it is not at risk in Ontario.

3.5 Ontario Butterfly and Moth Atlases

The Ontario Butterfly and Moth Atlases (Toronto Entomologists' Association 2018a, 2018b) contain detailed information on the population and distribution status of Ontario butterflies and moths. The data is presented on 100 km^2 area squares with one square overlapping a portion of the Subject Lands (17PJ11). It should be noted that the Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all butterfly and moth species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in butterfly and moth species presence and use.

A total of 63 species were recorded in the atlas square that overlaps with the Subject Lands, of which 57 are butterfly species and six are moth species. One Special Concern species was identified: Monarch (*Danaus plexippus*).

3.6 Aquatic Species at Risk Distribution Mapping

Aquatic species at risk distribution mapping (DFO 2022) was reviewed to identify any known occurrences of aquatic species at risk, including fish and mussels, within the subwatershed where the Subject Lands are located.

No aquatic species at risk were identified on or within 120 m of the Subject Lands, however, Deepwater Sculpin (*Myoxocephalus thompsonii* pop. 2) – S3? (rare to uncommon) was identified within Lake Ontario approximately 1.9 km east of the Subject Lands.

3.7 Species at Risk Assessment Tool

Mapped natural heritage features on the landscape were cross-referenced with species-specific habitat requirements through Savanta's Species at Risk Assessment Tool (SARAT) in order to determine potential species at risk habitat on the Subject Lands. SARAT includes all potential and known habitats for every species at risk listed under the ESA, and municipalities where these species are known to occur, where indicated in individual species assessment and/or recovery strategy reports.

The SARAT revealed that potentially suitable habitat is present on the Subject Lands for the following SAR:

- Species listed as threatened or endangered on the SARO list:
  - Barn Swallow – Threatened;
  - Bobolink – Threatened;
- Species listed as special concern on the SARO list:
  - Peregrine Falcon – Special Concern;
  - Snapping Turtle – Special Concern.

4.0 ECOLOGICAL INVENTORY METHODOLOGY AND RESULTS

A scoped fieldwork program was undertaken in 2020 within the Subject Lands including:

- Botanical inventory and ELC (summer and fall); and
- Breeding bird surveys.

An additional aquatic assessment was completed in May 2022, following comments received by CVC (**Appendix C**). The primary purpose of this visit was to further assess potential drainage features and wildlife corridors on site. CVC had indicated that a potential headwater drainage feature (HDF) flows onto the site from the northern property before being piped through the plant and presumably discharging into Lakeside Creek.

Survey dates and conditions can be found within **Table 1 (Appendix B).**

4.1 Vegetation

Survey Methods

Vegetation communities were first identified on aerial imagery and then verified in the field. Vegetation community types were confirmed, sampled and revised, if necessary, using the sampling protocol of the ELC for Southern Ontario (Lee at al. 1998). ELC was completed to the finest level of resolution (Vegetation Type) where feasible. Species names generally follow nomenclature from the Database of Vascular Plants of Canada (Brouillet et al. 2010+).

The provincial status of all plant species and vegetation communities is based on NHIC (2021). Identification of potentially sensitive native plant species is based on their assigned coefficient of conservatism (CC) value, as determined by Oldham et al. (1995). This CC value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific natural habitat. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters.

Survey Results

<u>Ecological Land Classification</u>

Developed/disturbed land cover occupies over 75% of the Subject Lands. This land cover type includes paved roads, buildings, wastewater treatment structures, mowed lawn, and periodically disturbed areas (e.g., gravel areas with sparse herbaceous regeneration). Mineral Cultural Meadow (CUM) accounts for the next highest area of land cover at approximately 20%. Wetland occupies approximately 3% of the land cover, which is primarily Mineral Meadow Marsh (MAM) and a small Deciduous Swamp (SWD).

Preliminary interpretation of the adjacent vegetation communities was completed to inform future impact assessments of the adjacent lands (120 m). This interpretation was completed using available aerial imagery. Adjacent communities included CUM, MAM, Deciduous Forest (FOD), Cultural Woodland (CUW1) and Cultural Thicket (CUT1) within a disturbed/developed landscape.

ELC mapping of the Subject Lands and adjacent properties is shown on **Figure 3 (Appendix A).** A detailed list and description of ELC units surveyed within the Subject Lands are provided in **Table 2 (Appendix B).** No provincially rare vegetation communities were present on or immediately adjacent to the Subject Lands (NHIC 2021).

<u>Vascular Plants</u>

Botanical inventories completed on the Subject Lands identified a total of 130 species of vascular plants. Of these, 50 (38%) are native and 80 (62%) are exotic. This proportion of exotic species is high, and likely reflects the urban location, as well as the active use and disturbance to many areas of the site. A full species list is included in **Table 3 (Appendix B)**.

The majority of the native species (91%) are ranked S5 (secure in Ontario), while four species (9%) are ranked S4 (apparently secure in Ontario; NHIC, 2021). Six regionally rare plants were observed, as per the Peel Region rarity rankings (Varga et al. 2005), including:

- Common Bedstraw (*Galium aparine*):
    - Infrequent to occasional within the CUM.
- Peached-leaved Willow (*Salix amygdaloides*):
    - Infrequent within the CUM abutting the MAM.
- Sandbar Willow (*Salix interior*):
    - Infrequent within the disturbed/developed area and CUM (usually within drainage features).
- White Spruce (*Picea glauca*):
    - Infrequent to occasional within the CUM and Developed/Disturbed areas. This species was not naturally occurring on site, but rather was planted as part of landscaping efforts.
- Red Pine (*Pinus resinosa*):
    - Infrequent within the Developed/Disturbed areas. This species was not naturally occurring on site, but rather was planted as part of landscaping efforts.
- Old Field Aster (*Symphyotrichum pilosum* var. *pilosum*)
    - Observed occasionally within developed/disturbed and Mineral Cultural Meadow features.

None of the species recorded from the Subject Lands had a co-efficient of conservation value of 9 or 10. No SAR plants were observed on the Subject Lands or immediate adjacent lands.

A NHIC search was conducted for the Subject Lands using the MNRF Biodiversity Explorer. One restricted species has been documented on or in the vicinity of the Subject Lands. Aside from this, no provincially rare or protected plant species have been historically documented (i.e., within the last 20 years) on or in the vicinity of the Subject Lands.

Wetlands

Wetlands are present on the Subject Lands, occupying less than 3% of the land cover. No surface water was observed in these wetlands during the July 21 and October 2, 2020 surveys. The majority of these wetlands were MAM, all of which were generally dominated by the invasive European Reed (*Phragmites australis* ssp. *Australis*), a Category 1 invasive species (Urban Forest Associates Inc. 2002). A small Green Ash SWD was observed in the east corner, which has been severely impacted by Emerald Ash Borer (*Agrilus planipennis*), another invasive species. These ELC communities are further described in **Table 2 (Appendix B).**

The LIO database was accessed to determine if any wetlands mapped by the MNRF occur on or in the vicinity of the Subject Lands. Such wetlands could include Provincially Significant Wetlands (PSWs), MNRF evaluated wetlands, unevaluated wetlands, or wetlands identified as “other”. Results of this search show that no wetlands have been mapped by MNRF on or adjacent to the Subject Lands. Wetland mapping prepared by the MNRF is not comprehensive for all of Ontario and is continuously subject to updates and refinements. For the purpose of this Characterization Report, ground-truthed wetland observations by Savanta will be used.

Invasive Species

Invasive species are those that can become (or presently are) a serious problem within a defined location. These species reproduce and spread aggressively, reducing the local biodiversity and threatening ecological function. Depending on existing conditions, some invasive species can outcompete all other species. Urban Forest Associates (2002) provides a categorical ranking system for species known to be invasive in southern Ontario. Of the 121 species observed on the Subject Lands, nine are ranked as Category 1 by Urban Forest Associates.

Category 1 species are deemed to be the most invasive and can dominate a site to exclude all other species, remaining dominant on the site indefinitely. These are a threat to natural areas wherever they occur because they have very effective reproduction and dispersal mechanisms, allowing them to move long distances. These are regarded as a top priority for control, where eradication and follow-up monitoring are often necessary to ensure its effective removal, where sought. The nine Category 1 species observed on the Subject Lands are:

- European Reed (*Phragmites australis* ssp. *Australis*):
    - Dominant within MAM communities.
- Canada Thistle (*Cirsium arvense*):
    - Occasional to abundant within the CUM and the Disturbed areas.

- Garlic Mustard (*Alliaria petiolata*):
  - Infrequent to occasional within the CUM and Disturbed areas.
- European Buckthorn (*Rhamnus cathartica*):
  - Found throughout the Subject Lands, though most abundant within the Green Ash SWD.
- Manitoba Maple (*Acer negundo*):
  - Infrequent to occasional within the CUM and Disturbed areas.
- Purple Loosestrife (*Lythrum salicaria*):
  - Occasional within the MAM communities.
- Purple Crown-vetch (*Securigera varia*):
  - Infrequent within the Disturbed areas.
- Multiflora Rose (*Rosa multiflora*):
  - Infrequent within the CUM.
- Dame's Rocket (*Hesperis matronalis*):
  - Infrequent within the Disturbed areas.

4.2 Breeding Birds

Survey Methods

Breeding bird surveys were conducted following protocols set forth by the Ontario Breeding Bird Atlas (Cadman et al. 2007), the Ontario Forest Bird Monitoring Program (Cadman et al. 1998).

Surveys were conducted between dawn and five hours after dawn with suitable wind conditions, no thick fog or precipitation (Cadman et al. 2007). A total of four point count stations were surveyed within the Subject Lands and are illustrated on **Figure 4** (**Appendix A**). Point count stations were placed in various habitat types, where present, within the Subject Lands and combined with area searches to help determine the presence, variety and abundance of bird species. Each point count station was surveyed for 10 minutes for birds within 100 m and outside 100 m. All species recorded on a point-count were mapped to provide specific spatial information and were observed for signs of breeding behaviour. Surveys were conducted nineteen days apart.

Survey Results

A total of 26 bird species were observed within the Subject Lands. Of this total, four species are confirmed, six are probable and nine are possible breeders on the Subject Lands. The remaining seven bird species are considered non-breeders, flyovers or migrants. The observed breeding bird species are discussed in the sections below. All species observed on the Subject Lands are listed in **Table 4** (**Appendix B**).

A total of 19 (100%) of the confirmed, probable or possible breeders are provincially ranked S5 , S4 or SNA (species not native to Ontario; NHIC 2022).

The following SAR were observed on or adjacent to the Subject Lands:

- Peregrine Falcon – Special Concern in Ontario: one individual was observed perched on a nearby tall man-made structure within the CHR Canada lands (west of Avonhead Road) where suitable conditions may exist for nesting. No further evidence of nesting was observed as this species requires tall heights in urban environments.
- Bank Swallow – Threatened in Ontario: small numbers were observed foraging over the Subject Lands. Nearest nesting is likely along the Lake Ontario shoreline, which is located offsite. No evidence of breeding was recorded within the Subject Lands.
- Barn Swallow – Threatened in Ontario: small numbers were observed foraging over the Subject Lands. No evidence of nesting on man-made structures was observed within the Subject Lands.

4.3 Aquatic Site Reconnaissance

Survey Methods

An aquatic site reconnaissance was conducted on May 25, 2022 which consisted of a visual survey to determine whether any drainage features were present within the Subject Lands. If a drainage feature was observed, the assessment took note of the following features:

- Hydrology (e.g., flowing or standing water)
- Feature type in accordance with CVC/TRCA's Headwater Drainage Feature Assessment Guideline (2014)
- Bed and bank substrates
- Instream habitat (e.g., woody debris, aquatic vegetation, undercut banks)
- Presence of obstructions to fish movement (e.g., culverts, debris jams)
- Evidence of groundwater inputs (e.g., seeps or springs, iron staining)
- Riparian habitat.

Survey Results

The site reconnaissance recorded one headwater drainage feature (HDF) on the Subject Lands. The feature connects through a narrow treed corridor to the north, entering onto the Subject Lands beneath a chain-link fence. The feature is conveyed southward through a poorly defined channel dominated by silt and clay. At the time of the assessment, there was no discernible flow within the feature. Stagnant isolated pools of variable depth persisted for approximately 100 meters onto the site before completely drying up. The riparian corridor surrounding this portion of the feature included a variety of trees and shrubs towards the northern boundary of the site, but was dominated primarily by large pockets of European Reed.

Further downstream within the feature, flows were directed through a small diameter culvert and piped beneath an adjacent roadway. The culvert outlet was located south of the roadway, connecting into a shallow swale characterized by a combination of European Reed and manicured lawn. The culvert outlet and drainage swale were dry at the time of the assessment. At the downstream end of the 30 metre drainage swale, the feature enters into a catchbasin and appears to be piped throughout the remainder of the Subject Lands. An outlet for the feature was not observed within the Subject Lands; however, a culvert was recorded on the southern side of Lakeshore Road West. It is likely that this feature drains into Lakeside Creek. Given that the feature is piped greater than 450 metres, it is unlikely that this feature support direct fish habitat, rather, the feature contributes seasonal flows and allochthonous materials to downstream habitats.

HDF Management Recommendations and Classifications

A formal Headwater Drainage Feature Assessment (HDFA) was not completed on the site; however, using a precautionary approach a management recommendation can be assigned to the feature using TRCA/CVC's HDFA Guideline (2014). Part 2 of the HDFA Guidelines provides an approach to classify HDFs by providing a step-by-step characterization of specific functions that may be associated with the features assessed, including hydrology, riparian function and provision of fish or terrestrial habitat.

Part 3 of the HDFA Guidelines provides guidance on linking the characteristics and functions of features to specific management recommendations that may be applied to those features. To assist, the HDFA Guidelines include Figure 2: "Flow Chart Providing Direction on Management Options." The flow chart depicts various decision points associated with hydrology, fish habitat, riparian vegetation and terrestrial habitat, and ultimately leads the user to an appropriate management recommendation for each HDF segment. Management recommendations can include the following:

- Protection;
- Conservation;
- Mitigation;
- Maintain Recharge;
- Maintain/Replicate Terrestrial Linkage; or
- No Management Required.

Given the presence of the upstream CUT1 community and the assumption that the feature flows during early spring, this drainage feature has been assigned a Conservation management recommendation. The recommended management approach for a Conservation management recommendation (as per the HDFA Guidelines) is as follows:

- Maintain, relocate and/or enhance drainage feature and its riparian corridor zone;

- If catchment drainage had been previously removed or will be removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage), as feasible;
- Maintain or replace on-site flows using mitigation measures and/or wetland creation, if necessary;
- Maintain or replace external flows;
- Use natural channel design techniques to maintain or enhance overall productivity of the reach; and/or
- Drainage feature must connect to downstream.

5.0 ECOLOGICAL CHARACTERIZATION

5.1 Physical Conditions

Currently the Subject Lands are occupied by a wastewater treatment facility and contain actively disturbed cultural communities. The Subject Lands are surrounded by industrial/commercial land uses within an urbanized setting. Lakeside Park is present immediately south of the Subject Lands and contains Lakeside Creek and forested communities, and borders Lake Ontario. One seasonal drainage feature has been identified along the northern quadrant of the Subject Lands (**Figure 5, Appendix A**). This feature connects onto the Subject Lands through a narrow treed corridor to the north. At the time this feature was assessed in May 2022, there was no flow or downstream connection within the channel. Stagnant isolated pools of variable depth persisted within the channel for approximately 100 m onto site, at which point the channel dried up completely. When flowing, this feature is piped beneath multiple roadways before entering what appears to be a municipal drain within a grass lined swale. It is unknown where the feature is piped to after entering the surface drain; however, it is likely that it ultimately drains into Lakeside Creek.

One small deciduous swamp community is present in the north-west corner of the Subject Lands adjacent to Avonhead Road, which is highly disturbed with invasive species such as European Buckthorn and Garlic Mustard. The impacts of Emerald Ash Borer are highly visible within this feature, causing many of the mature trees within this community to become deceased. Three MAM communities are located within CUM communities surrounding the wastewater treatment plant. These communities are highly disturbed from adjacent land-uses.

5.2 Biological Environment

The Subject Lands occur within the Carolinian or Deciduous Forest Zone (also referred to as the mixed wood plains), an area characterized by a relatively warmer climate that supports plant species typical of more southern areas. This zone is referred to by the Province as Ecoregion 7E. Broadleaved trees, including American Beech (*Fagus grandifolia)*, Sugar Maple (*Acer saccharum)*, Basswood (*Tilia americana)*, Red Maple (*Acer rubrum)*, White Oak (*Quercus alba)* and Bur Oak (*Quercus marcrocarpa)* dominate natural upland forest cover in this region (Rowe 1972). This region also contains Canada's main distribution of Black Walnut (*Juglans nigra)*, Sycamore (*Platanus occidentalis)*, Swamp White Oak (*Quercus bicolor)* and Shagbark Hickory (*Carya ovata)*.

Figure 2 (**Appendix A**) depicts the broader landscape and potential movement and linkage corridors surrounding the Subject Lands for abiotic and biotic movement of organisms, matter and energy. The Subject Lands are surrounded by an urbanized landscape consisting of a mixture of commercial/industrial areas. Lakeside Park is located immediately south of the Subject Lands and contains a mixture of wooded features along the Lake Ontario shoreline. This park is an isolated green space within a larger industrialized landscape, and therefore may support a variety of aquatic and terrestrial species. No apparent corridors or linkages appear to be present within or adjacent to the Subject Lands. No natural heritage systems appear to be present within the Subject Lands as the cultural communities are highly disturbed and disconnected due to the present land use. The entire perimeter of the Subject Lands is also surrounded by chain-link fencing topped with barbed wire. Gaps beneath the fencing were only noted at two locations, both of which occur along the northern boundary of site and do not connect with Lakeside Park. The adjacent road networks (Lakeshore Road West, Avonhead Road) are highly active and anticipated to further hinder the potential of movement.

The wastewater treatment plant is an actively managed facility that experiences a moderate amount of traffic on site. The perimeter of the Subject Lands is surrounded by chain-link fence. The perimeter fence is not only to protect the public from plant operations, but to minimize wildlife-human interactions as the active site could pose a significant risk of injury (exposed at-grade settling basins, trucks, etc.). The fence line would act as a visual and physical barrier for many wildlife species. It is noted that CVC indicated observations of Northern Raccoon (*Procyon lotor)* within the property and that north-south terrestrial corridors may be present within the Subject Lands. There is potential for local urban wildlife to use the site given its proximity to Lake Ontario and adjacent treed areas (found on the northern property). However, the truck activity, noises and other disturbances associated with the active wastewater treatment plan facility likely discourages wildlife from using the Subject Lands for any sensitive life processes. No primary or secondary linkages were identified within the Subject Lands. A primary linkage was identified approximately 2 km north-east of the Subject Lands associated with Sheldon Creek and Rattray Marsh Conservation Area.

A summary of all wildlife observed during Savanta's detailed assessments can be found within **Table 5 (Appendix B).**

6.0 ANALYSIS OF ECOLOGICAL AND NATURAL HERITAGE SIGNIFICANCE (PPS)

Eight types of significant natural heritage features are defined in the PPS (MMAH 2020), as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- SWH;
- Fish habitat;
- Habitat of endangered and threatened species; and
- Significant ANSIs.

The presence/absence of these natural heritage features on the Subject Lands are discussed in the subsequent sections of this Characterization Report. The Natural Heritage Reference Manual (NHRM; MNR 2010) was referenced to assess the potential significance of the natural areas, and their associated forms and functions on the landscape.

Where significant natural features are present on the Subject Lands, their sensitivities are discussed.

6.1 Significant Wetlands

Within Ontario, significant wetlands are identified by the MNRF or by their designates. Other evaluated or unevaluated wetlands may be identified for conservation by the municipality or the conservation authority. There are no PSWs identified on or adjacent to the Subject Lands.

Other Unevaluated Wetland Units

Two wetland community types were identified within the Subject Lands (**Figure 3, Appendix A)**:

- Mineral Meadow Marsh (MAM2); and
- Green Ash Mineral Deciduous Swamp (SWD2-2).

The SWD2-2 community is located in the north-west corner of the Subject Lands adjacent to Avonhead Road in between the industrialized area to the north and the wastewater treatment plant. Four MAM2 communities are present within the Subject Lands and surround the wastewater treatment plant facility.

6.2 Significant Coastal Wetlands

Similar to significant wetlands, the MNRF or their designates identify significant coastal wetlands present on the landscape. Coastal wetlands identified under the NHRM (MNR 2010) as:

a) "any wetland that is located on one of the Great Lakes or their connecting channels (Lake St. Clair, St. Mary's, St. Clair, Detroit, Niagara and St. Lawrence Rivers); or
b) Any other wetland that is on a tributary to any of the above-specified water bodies and lies, either wholly or in part, downstream of a line located two km upstream of the 1:100-year floodplain (plus wave run-up) of the large water body to which the tributary is connected."

No significant coastal wetlands are identified on the Subject Lands.

6.3 Significant Woodlands

Significant woodlands are identified by the planning authority using criteria established by the MNRF. Under the NHRM (2010), woodlands are defined as:

> *...treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels.*

One SWD community was identified in the north-west corner of the Subject Lands (**Figure 3, Appendix A).**

<u>Evaluation using the NHRM</u>

A review of Table 7-2 within the NHRM was completed to understand whether significance was met. Woodlands that meet any one of the below-noted criteria are considered significant.

Table 1: Test of significant woodland based on NHRM evaluation criteria

NHRM Criteria per Table 7-2		Criteria Met?
		SWD2-2
1. Woodland Size Criteria		No – Woodland measures at 0.10 ha.
2. Ecological Functions Criteria	a) Woodland interior	No – Woodland interior habitat is not present

NHRM Criteria per Table 7-2		Criteria Met?
		SWD2-2
	b) Proximity to other woodlands or habitats	No – Woodland is isolated within developed landscape
	c) Linkages	No – Woodland is not located within a defined natural heritage system
	d) Water protection	No – Woodlands are not located within sensitive or threatened watershed, or a specific distance from a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat
	e) Woodland diversity	No – Woodland is not expected to have a high native diversity or occur a composition of native forest species that have declined
3. Uncommon Characteristics Criteria		No – Woodlands do not contain uncommon characteristics and are not provincially rare
4. Economic and Social Functional Values Criteria		No – Woodlands are not economically, culturally or historically valuable

The north-western SWD2-2 vegetation community did not meet the test for significance per the NHRM (2010).

The SWD2-2 vegetation community would not qualify as a woodland as per section 6.3.12 of the Mississauga Official Plan (2011) due to the size and isolated nature of the feature.

<u>Evaluation using the Peel-Caledon Significant Woodlands and Significant Wildlife Habitat Study</u>

The Region of Peel does not define significant woodlands within their official plan; rather, the Peel-Caledon Significant Woodlands and Significant Wildlife Habitat (North-South Environmental Inc. et al. 2009) guideline has been developed in an attempt to better quantify criteria and thresholds in identifying significant woodlands. As per Section 5.4 of the Peel-Caledon Guideline, woodlands outside of the Oak Ridges Moraine planning boundaries satisfying any one of the following criteria should be considered significant:

1. With respect to woodland size (application of recommended thresholds to the Regional and Town scales may be determined through the policy development phase for the Region's and Town's Official Plan review exercises:
   - Option 1: Recommendation based on Urban-Rural System Distinction. Woodlands satisfying the following size criteria should be considered significant:

        - A) Urban Systems (i.e., within the 2031 urban boundaries for the Cities of Brampton and Mississauga): all woodlands equal to and larger than 4 ha in size;
        - B) Rural System (i.e., the Rural System that comprises all of the Town of Caledon): all woodlands equal to and larger than 16 ha.
    - Option 2: Recommendation based on Physiography/Historical Land Use. Woodlands satisfying the following size criteria should be considered significant:
        - A) Areas on and above (west of) the Niagara Escarpment: all woodlands equal to and greater than 16 ha in size;
        - B) Rural and Urban System below the Niagara Escarpment: all woodlands equal to and greater than 4 ha.
2. Woodlands, or inclusions in woodlands, that are 0.5 ha or greater in size, and older than 90 years should be considered significant.
3. It is recommended that any woodland (greater than or equal to 0.5 ha) identified as supporting a linkage function, as determined through a natural heritage study approved by the Region or Town, be considered significant (Regional and Town threshold).
4. Woodlands (greater than or equal to 0.5 ha) within 100 m of another significant feature (Regional and Town threshold).
5. Woodlands within 30 m of a watercourse, surface water feature or evaluated wetland (Regional and Town threshold).
6. Woodlands that supports any of the following (Regional and Town threshold):
    - A) any G1, G2, G3, S1, S2 or S3 plant or animal species, or community as designated by NHIC; or
    - B) any species designated by COSEWIC or COSSARO as Threatened, Endangered, or of Special Concern.
    - C) The following forest communities:
        - Dry-Fresh White Pine-Red Pine Coniferous Forest Type (FOC1-2)
        - Dry-Fresh White Pine-Oak Mixed Forest Type (FOM2-1)
        - Dry-Fresh White Pine-Sugar Maple Mixed Forest Type (FOM2-2)
        - Moist-Fresh Hemlock-Sugar Maple Mixed Forest Type (FOM6-1)
        - Dry-Fresh Red Oak Deciduous Forest Type (FOD1-1)
        - Dry-Fresh White Oak Deciduous Forest Type (FOD1-2)
        - Dry-Fresh Mixed Oak Deciduous Forest Type (FOD1-4)
        - Dry-Fresh Oak-Hickory Deciduous Forest Type (FOD2-2)
        - Dry-Fresh Hickory Deciduous Forest Type (FOD2-3)
        - Fresh Sugar Maple-Black Maple Deciduous Forest (FOD6-2)

The above noted criteria were not met within the SWD2-2 vegetation community.

6.4 Significant Valleylands

Significant valleylands are defined and designated by the planning authority. General guidelines for determining significance of these features are presented in the NHRM (MNR 2010) for Policy 2.1 of the PPS. Recommended criteria for designating significant valleylands includes prominence as distinctive landform, degree of naturalness, and importance of its ecological functions, restoration potential and historical and cultural values.

No significant valleylands are present within the Subject Lands.

6.5 Significant Wildlife Habitat

SWH is one of the more complex natural heritage features to identify and evaluate. There are several provincial documents that discuss identifying and evaluating SWH including the NHRM (MNR 2010), the Significant Wildlife Habitat Technical Guide (MNR 2000), the SWH Eco-Region Criterion Schedule (MNRF 2015) and the Peel-Caledon Significant Woodlands and Significant Wildlife Habitat (North-South Environmental Inc. et al. 2009). The Subject Lands are located in Eco-Region 7E and were therefore assessed using the 7E Criterion Schedule (MNRF 2015).

There are four general types of SWH:

- Seasonal concentration areas;
- Rare or specialized habitats;
- Habitat for species of conservation concern; and
- Animal movement corridors.

General descriptions of these types of SWH are provided in the following sections.

Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. Seasonal concentration areas include deer yards; wintering sites for snakes, bats, raptors and turtles; waterfowl staging and molting areas, bird nesting colonies, shorebird staging areas, and migratory stopover areas for passerines or butterflies. Only the best examples of these concentration areas are usually designated as SWH.

Rare or Specialized Habitats

Rare and specialized habitat are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. SRANKS are rarity rankings applied to species at the ‘state’, or in Canada at the provincial level, and are part of a system developed under the auspices of the Nature Conservancy (Arlington, VA). Generally, community types with SRANKS of S1 to S3 (extremely rare to rare-uncommon in Ontario), as defined by the NHIC (2021), could qualify. It is to be assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant. Specialized habitats are microhabitats that are critical to some wildlife species. The NHRM (MNR 2010) defines specialized habitats as those that provide for species with highly specific habitat requirements, areas with exceptionally high species diversity or community diversity, and areas that provide habitat that greatly enhances species' survival.

Habitat for Species of Conservation Concern

Species of conservation concern include those that are provincially rare (S1 to S3), provincially historic records (SH) and Special Concern species. Several specialized wildlife habitats are also included in this SWH category, including Terrestrial Crayfish habitat, and significant breeding bird habitats for marsh, open country and early successional bird species.

Habitats of species of conservation concern do not include habitats of endangered or threatened species as identified by the ESA (2019). Endangered and threatened species are discussed in section 6.7 (below).

Animal Movement Corridors

Animal movement corridors are areas that are traditionally used by wildlife to move from one habitat to another. This is usually in response to different seasonal habitat requirements, including areas used by amphibians between breeding and summer/over-wintering habitats, called amphibian movement corridors.

The perimeter of the site has a fence line associated with it. Given the activity of the site and limited access points into the site as a result of the chain-linked fence, movement through the site is generally limited. No primary or secondary linkage features (at a landscape scale) were identified on the site.

Tables 6a and **6b (Appendix B)** discusses all types of SWH relevant to the Subject Lands based on background ecological data collected and presence of ELC communities. Adjacent lands were only assessed through desktop review as onsite access was not available and therefore could not confirm SWH presence.

One candidate SWH type may be present within the Subject Lands: Bat Maternity Colonies/Bat Maternal Roosts within the SWD community in accordance with both the SWH Eco-Region Criteria and the Peel-Caledon SWH Criteria. No other candidate SWH types are likely to be present within the Subject Lands based on availability of habitat and/or presence of SWH indicator species.

The following candidate SWH types were identified within the adjacent lands (120 m):

- Bat Maternity Colonies within the two FOD communities south of Lakeshore Road West;
- Reptile Hibernacula within naturalized communities;
- Bald Eagle and Osprey Habitat within the two FOD communities south of Lakeshore Road West;
- Seeps and Springs within the two FOD communities south of Lakeshore Road West; and
- Terrestrial Crayfish habitat within adjacent MAM vegetation communities.

The above-noted candidate SWH type within the Subject Lands will need to be confirmed with detailed ecological inventories (bat maternity surveys), should alterations be proposed adjacent to or within the vicinity of candidate SWH. Candidate SWH types within the adjacent lands should be confirmed in future detailed design phases following site assessments.

6.6 Fish Habitat

Fish habitat, as defined in the federal *Fisheries Act,* c. F-14, means "spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes." Fish, as defined in S.2 of the *Fisheries Act*, c. F-14, includes "parts of fish, shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals."

No watercourse features are identified within the Subject Lands. It is likely that Lakeside Creek flows underneath the wastewater treatment plant facility as this feature is present immediately south of Lakeshore Road West within Lakeside Park (**Figure 1, Appendix A)**. Indirect fish habitat (through contributions of flows and allochthonous material) is present within the seasonal headwater drainage feature. CVC has indicated that fish habitat is present within Lakeside Creek (**Appendix C**).

It was communicated to Savanta-GEI in 2020 that the City of Mississauga was currently developing the Southdown District Stormwater Servicing and Environmental Management Plan (SSEMP), which considered a new open by-pass channel for Lakeside Creek through the Subject Lands as an alternative (Appendix C). Since then, a preferred alternative has been identified in the final master plan report for the Southdown District SSEMP (2022), which identified an upgraded storm sewer on Avonhead Road, which would convey flows around the Subject Lands to the downstream receiving watercourse (Lakeside Creek). Given the existing conditions of the HDF, this feature provides indirect fish habitat to downstream habitats within Lakeside Creek.

6.7 Habitat for Endangered and Threatened Species

An evaluation of the background wildlife results and ecological findings from ecological inventories was reviewed to understand the SAR present within the vicinity of the Subject Lands.

A full review of SAR identified within the background wildlife review (section 3.0 of this report) has been completed to understand whether candidate SAR and SAR habitat may be present within the Subject Lands (**Table 7, Appendix B)**.

As previously identified within **Section 4.2**, no suitable breeding habitat was identified for Barn Swallow and Bank Swallow, despite them being observed foraging during targeted surveys. Moreover, no Bobolink, Eastern Meadowlark, Chimney Swift or Henslow's Sparrow were observed during targeted breeding bird surveys (**Table 4, Appendix B)**.

Candidate habitat for Little Brown Myotis may be present within the SWD vegetation community in the north-west corner.

6.8 Significant Areas of Natural and Scientific Interest

No ANSIs were identified on or within the general vicinity of the Subject Lands.

6.9 Key Natural Heritage and Hydrologic Features-City of Mississauga Official Plan

A review was undertaken to understand whether any key natural heritage features or key hydrologic features, as defined in the CMOP, are present within the Subject Lands.

Significant Natural Areas are comprised of areas that meet one or more of the following criteria:

- Provincially or regionally significant life science ANSI;
- Environmentally sensitive or significant areas;
- Habitat of threatened species or endangered species;
- Fish habitat;
- SWH;
- Significant woodlands;
- Significant wetlands (including PSW, provincially significant coastal wetlands, coastal wetland and other wetlands greater than 0.5 ha in size); and
- Significant valleylands.

Candidate SWH (Bat Maternity) and SAR bat habitat (Little Brown Myotis) may be present within the SWD2-2 vegetation community in the north-west corner of the Subject Lands. Given that the SWD2-2 contains two candidate criteria, it could be considered Significant Natural Areas. Detailed investigations are required to confirm whether or not SWH and SAR habitat is present within these habitats. All wetland units are less than 0.5 ha in size. Indirect fish habitat (through contributions of flows and allochthonous material) is present within the seasonal headwater drainage feature.

Portions of the City of Mississauga's NAS was identified within the Subject Lands along the northern property boundary. The NAS within the Subject Lands was identified as part of the cultural meadow community. This cultural meadow community contained four Category 1 invasive species including Canada Thistle, Garlic Mustard, Manitoba Maple and Multiflora Rose. No SAR or SWH were identified in association with these habitats. These communities should not be considered part of the City's Significant Natural Areas, given the absence of the above noted criteria. Moreover, the cultural meadow was located along the edge of the wastewater treatment plant, including one of the three access roads into and out of the site. It is likely that these communities are quite disturbed from the ongoing activity associated with the management of the plant. The seasonal headwater drainage feature is associated with the NAS as it appears to convey flows from the adjacent (northern) site before being piped under the wastewater treatment plant. These communities should not be considered part of the City's Significant Natural Areas, given the absence of the above noted criteria.

6.10 Region of Peel Official Plan

A review was undertaken to understand whether any Core Areas are present within the Subject Lands that hadn't previously been identified within the Official Plan. Core Areas include key natural heritage features, key hydrologic features and/or landform conservation areas.

Key Natural Heritage Features include:

- Habitat of endangered species and threatened species;
- Fish habitat;
- Wetlands;
- Life science ANSIs;
- Significant valleylands;
- Significant woodlands;
- SWH;
- Sand barrens, savannahs and tallgrass prairies; and
- Alvars.

Key Hydrologic Features include:

- Permanent and intermittent streams;
- Lakes (and their littoral zones);
- Seepage areas and springs; and
- Wetlands.

Two wetland communities are present within the Subject Lands (MAM2, SWD2-2). These wetland communities are considered both key natural heritage features and key hydrologic features. Candidate SWH and SAR habitat is present within the SWD2-2 community. Indirect fish habitat (through contributions of flows and allochthonous material) is present within the seasonal headwater drainage feature. No other key natural heritage features or key hydrologic features are present within the Subject Lands. No landform conservation areas are present within the Subject Lands.

6.11 CVC Regulated Features

Pursuant to Ontario Regulations 160/06, CVC has the authority to regulate development within its regulated areas. The CVC regulates the following features:

- Valleylands (defined and/or undefined);
- Environmentally Significant Areas (including rare or unique plants, animal populations or habitats, plant or animal communities, concentrations of natural features and unique ecological functions and hydrologic functions);
- Life Science ANSIs;
- Significant Woodlands within regulated areas;
- PSWs or other wetlands;
- Watercourses; and
- Natural Hazards such as flood hazards, erosion hazards, dynamic beach hazards and other hazardous lands.

Two wetland communities were identified within and adjacent to the Subject Lands (MAM, SWD). These wetland communities are not PSW; however, they are regulated by CVC. One seasonal headwater drainage feature was identified within the Subject Lands that provides indirect fish habitat functions (flow conveyance, contribution of allochthonous material). This feature is not regulated by CVC; however, they do provide guidance on their management through the HDFA Guideline (2014). As discussed above within **Section 4.3**, the drainage feature within the Subject Lands has been assigned a Conservation management recommendation based on the precautionary approach.

No Environmentally Significant Areas, Life Science ANSIs, significant woodlands, watercourses or other natural hazards were identified within or adjacent to the Subject Lands.

6.12 Summary of Ecological Components

The PPS (MMAH 2020) defines the important natural heritage features to consider in terms of impact assessment. The following components were identified within the Subject Lands:

- Candidate SWH (Bat Maternity Colonies within the SWD2-2 community);

- Candidate SAR (Little Brown Myotis);
- Indirect fish habitat; and
- Non-PSW wetlands (MAM2, SWD2-2).

The following key natural heritage features and hydrologically sensitive features were also identified within the Subject Lands, as per the Peel Region Official Plan (2018):

- Wetlands (MAM2, SWD2-2); and
- Candidate SWH and SAR habitat (SWD2-2).

Finally, two CVC-regulated wetland communities (MAM2, SWD2-2) are identified within the Subject Lands. One headwater drainage feature assigned a Conservation management recommendation was identified.

All features are shown on **Figure 6** (**Appendix A**).

7.0 CONCLUSIONS AND RECOMMENDATIONS

This Characterization Report addresses the natural heritage features and associated functions found on and adjacent to the Subject Lands. The Subject Lands are currently developed and functioning as a wastewater treatment plant.

A desktop review and targeted field studies (botanical inventories, ELC, breeding bird and aquatic surveys) were completed to understand what natural heritage features and associated functions may be present within the Subject Lands. Based on the above-noted information, confirmed non-PSW wetlands, indirect fish habitat and candidate SWH and SAR habitat may be present within the Subject Lands. The extent of natural heritage features are depicted on **Figure 6** (**Appendix A**).

Detailed ecological inventories have not been completed within some of the natural heritage features to determine whether significant features and functions are present within the Subject Lands (e.g., SWH, SAR). Should alteration within or immediately adjacent to these features be required, additional survey effort may be warranted to better assess potential impacts.

Should you have any questions or concerns regarding the report, please contact one of the undersigned.

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APPENDICES

Appendix A – Figures

Figure 1:	Location of Subject Lands
Figure 2:	Landscape Setting
Figure 3:	Ecological Land Classification
Figure 4:	Breeding Bird Station Locations
Figure 5:	Drainage Features
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Appendix B – Tables

Table 1:	Field Studies and Natural Inventories (2020)
Table 2:	Ecological Land Classification Community Descriptions
Table 3:	Master Plant List
Table 4:	Master Bird Table
Table 5:	Master Wildlife List
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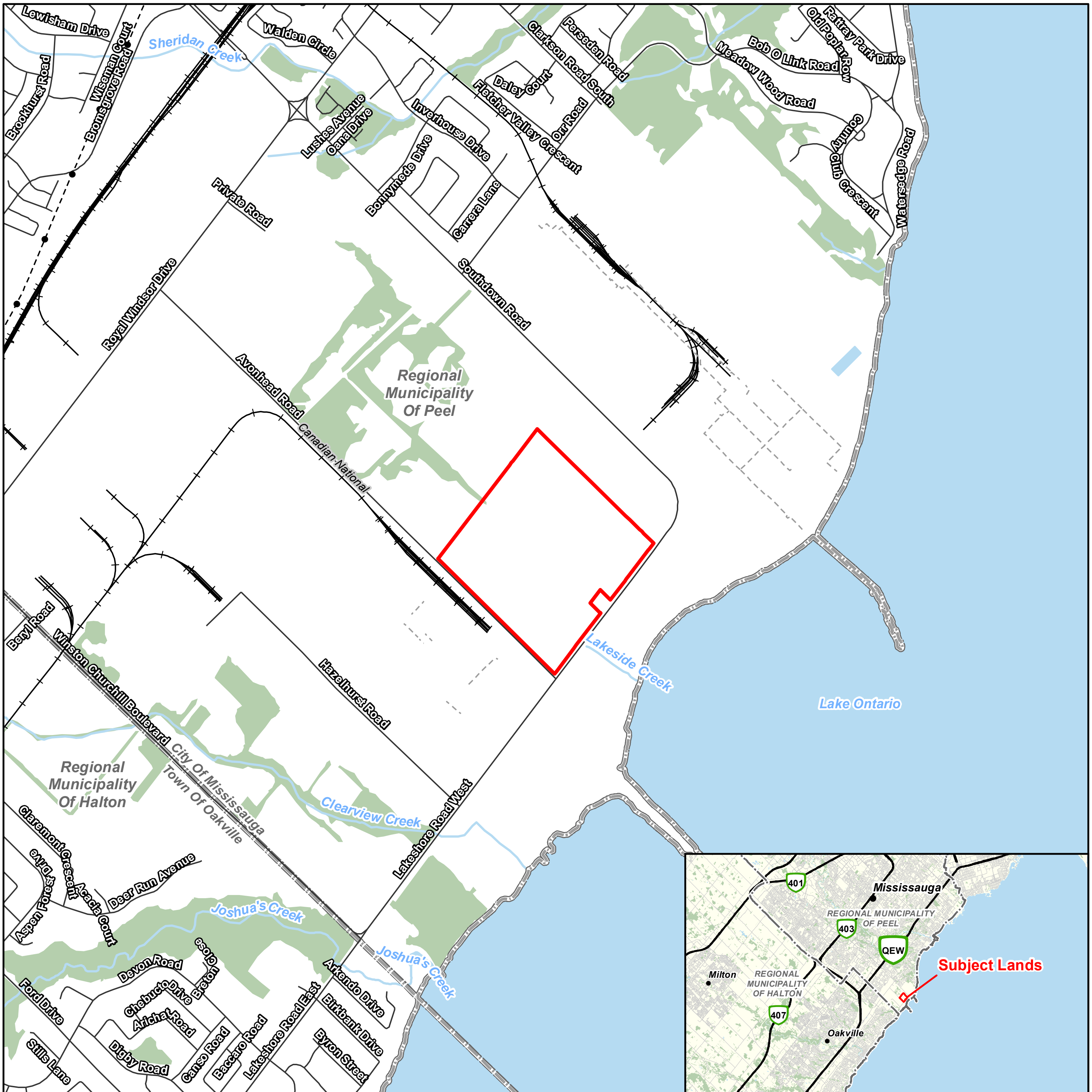
Table 6b:	Significant Wildlife Habitat Peel-Caledon
Table 7:	Species at Risk Potential Habitat

Appendix C – Consultation and Agency Correspondence

Appendix A – Figures



NOTES:
1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.

Legend
- Subject Lands
- Road
- Railway
- Hydro Line
- Unknown Pipeline
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary, Lower/Single Tier
- Municipal Boundary, Upper Tier

Project 2003025

Clarkson Wastewater Treatment Plan
GM BluePlan

Figure 1
Location of Subject Lands

0 200 m
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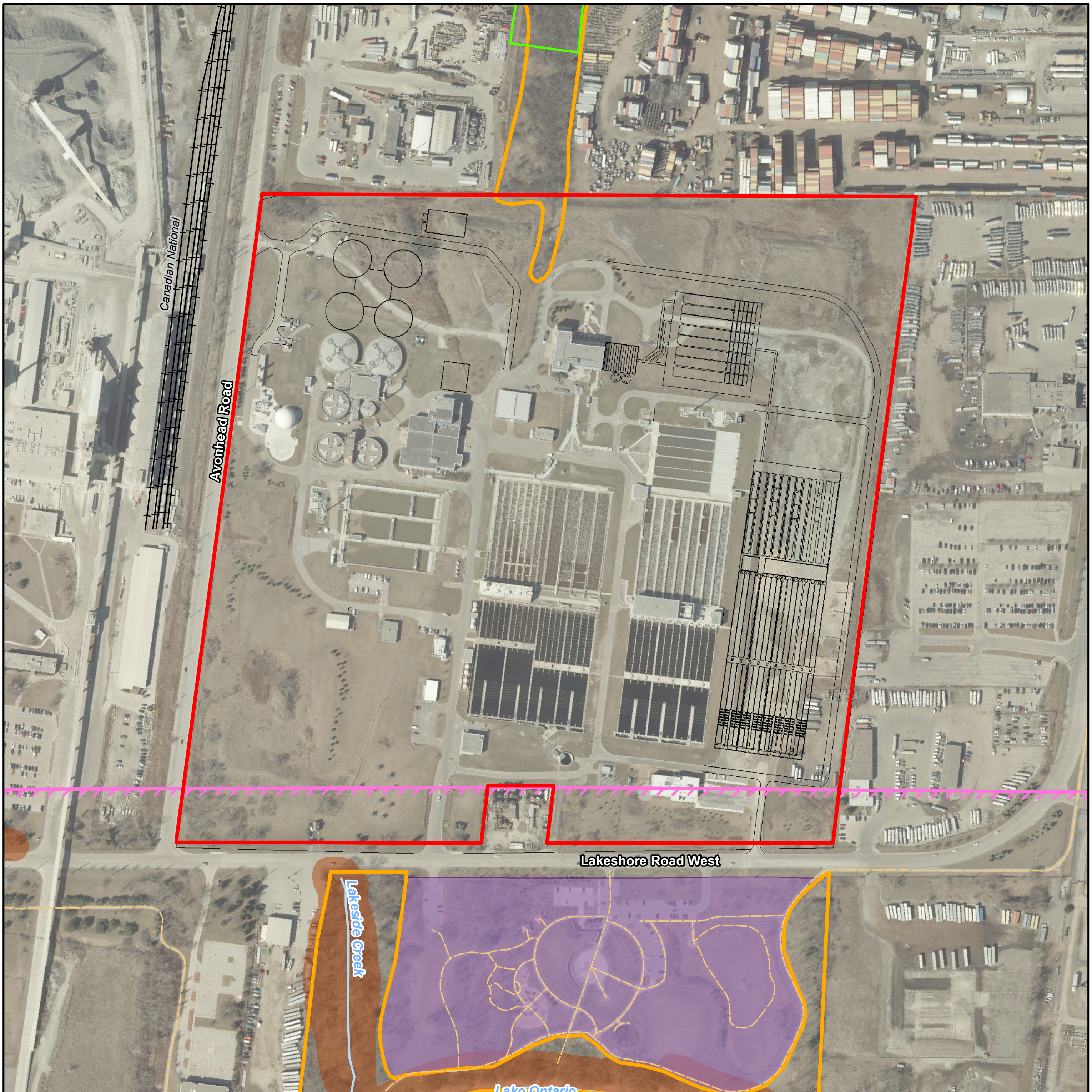

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Legend

- Subject Lands
- Proposed Development
- Railway
- Trail Segment (OTN)
- Watercourse
- Waterbody
- Important Bird Area - West End of Lake Ontario (BSC)
- CA Regulation Limits (CVC)
- Core Areas of the Greenlands System (Region of Peel)

Natural Heritage System (City of Mississauga)

- Significant Natural Areas and Natural Green Spaces
- Special Management Areas

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Figure 2
Landscape Setting

0 100 m
1:5,000

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Legend

Subject Lands
Railway
Confirmed Ecological Land Classification
Interpreted Ecological Land Classification
Watercourse

ELC Legend

CUM1, Mineral Cultural Meadow
CUT1, Cultural Thicket
CUW1, Cultural Woodland
DIST, Disturbed
DEV, Development
FOD, Deciduous Forest
MAM2, Mineral Meadow Marsh
SWD2-2, Green Ash Mineral Deciduous Swamp

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Figure 3 Ecological Land Classification

0 100 m
1:5,000

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Legend

Subject Lands
Breeding Bird Station
Preliminary Ecological Land Classification
Railway
Watercourse

ELC Legend

CUM1, Mineral Cultural Meadow
CUT1, Cultural Thicket
CUW1, Cultural Woodland
DIST, Disturbed
DEV, Development
FOD, Deciduous Forest
MAM2, Mineral Meadow Marsh
SWD2-2, Green Ash Mineral Deciduous Swamp

Clarkson Wastewater Treatment Plan
GM BluePlan

Figure 4
Breeding Bird Station Locations

0 100 m
1:5,000

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Legend

- Subject Lands
- Railway
- Watercourse
- Confirmed Ecological Land Classification
- Interpreted Ecological Land Classification
- Drainage Feature
- Drainage Feature (Piped)
- Culvert
- Surface Drain/Catch Basin

ELC Legend

- CUM1, Mineral Cultural Meadow
- CUT1, Cultural Thicket
- CUW1, Cultural Woodland
- DIST, Disturbed
- DEV, Development
- FOD, Deciduous Forest
- MAM2, Mineral Meadow Marsh
- SWD2-2, Green Ash Mineral Deciduous Swamp

Clarkson Wastewater Treatment Plan
GM BluePlan

Figure 5
Drainage Features

0 50 m
1:5,000

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Legend

Subject Lands
Railway
Watercourse

Provincial (Ontario)

Candidate Significant Wildlife Habitat (Bat Maternity Colonies)
Candidate Species at Risk Habitat (Little Brown Myotis)

Regional (Region of Peel)

Key Natural Heritage Features and Key Hydrologic Features (Non-Provincially Significant Wetlands)
Key Natural Heritage Feature (Candidate Significant Wildlife Habitat and Habitat for Endangered Species)

Local (City of Mississauga)

Candidate Significant Natural Area (Candidate Significant Wildlife Habitat and Habitat for Endangered Species)

Credit Valley Conservation

Regulated Wetlands
Conservation HDF

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GM BluePlan

Figure 6
Natural Heritage Features (Provincial, Regional and Local Significance)

0 50 m
1:3,500
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Appendix B – Tables

Table 1: Field Studies and Natural Inventories (2020, 2022)

SURVEYORS (SURNAME, INTL)	SURVEY ROUND	SURVEY TYPE	DATE	TIME		AIR TEMP (°C)	HUMIDITY (%)	CLOUD COVER (%)	BEAUFORT WIND SPEED	PRECIPITATION COMMENTS
				START	END					
2020										
Foerster, L.	1	Breeding Bird Survey	11-JU	5:30	7:00	17	78	70	5	None
Foerster, L.	2	Breeding Bird Survey	30-JU	7:00	8:00	23	66	0	2	None
Leslie, J.	1	Summer Botanical Inventory & Ecological Land Classification	21-JL	9:00	15:30	23	63	80	2	None
Leslie, J.	2	Fall Botanical Inventory	02-OC	9:30	13:00	12	80	100	2	None
2022										
Kimble, B.	1	Aquatic Assessment & Wildlife Passage	25-MA	12:00	16:00	19	52	35	1	None

LEGEND:

BEAUFORT WIND SPEED SCALE	
0	Calm (<1 km/hr)
1	Light Air (1-5 km/hr)
2	Light Breeze (6-11 km/hr)
3	Gentle Breeze (12-19 km/hr)
4	Moderate Breeze (20-28 km/hr)
5	Fresh Breeze (29-38 km/hr)

MONTH (CODE)	
JA	January
FB	February
MR	March
AP	April
MA	May
JU	June
JL	July
AU	August
SE	September
OC	October
NO	November
DE	December

Table 2: Ecological Landscape Characterization (ELC) Community Descriptions

ELC TYPE	COMMUNITY DESCRIPTION	S-RANK / G-RANK (NHIC 2021)	Area (in ha)
CULTURAL			
Cultural Meadow			
CUM1 Mineral Cultural Meadow	• Graminoid/Forb upland meadow with scattered occurrences of young to mid-age trees as well as shrub species. • Trees/shrubs were infrequent overall and often planted, variably composed of White Spruce (*Picea glauca*), White Ash (*Fraxinus americana*), Manitoba Maple (*Acer negundo*), Eastern Cottonwood (*Populus deltoides*), Hybrid Crack Willow (*Salix* x *fragilis*), Showy Fly Honeysuckle (*Lonicera* x *bella*), and Staghorn Sumac (*Rhus typhina*), among others. • Herbaceous species most commonly consisted of Kentucky Bluegrass (*Poa pratensis*), Canada Thistle (*Cirsium arvense*), and Quackgrass (*Elymus repens*), with common associations of Tall Goldenrod (*Solidago altissima*), Great Burdock (*Arctium lappa*), Bird's-foot Trefoil (*Lotus corniculatus*), Wild Carrot (*Daucus carota*), Smooth Brome (*Bromus inermis*), and Red Fescue (*Festuca rubra*),	Not ranked	7.57 ha
SWAMP			
Deciduous Swamp			
SWD2-2 Green Ash Mineral Deciduous Swamp	• Many dead or dying Green Ash (*Fraxinus pennsylvanica*) in the canopy, but with abundance of regenerative Green Ash in the sub-canopy. Hybrid Crack Willow was infrequent, but present in this canopy / sub-canopy. • Understory species was generally restricted to just occasional occurrences of Green Ash saplings and European Buckthorn (*Rhamnus cathartica*). • Ground cover was quite sparse, with only infrequent observations of Bittersweet Nightshade (*Solanum dulcamara*) and Tender Sedge (*Carex tenera*). • Surface water was not present in July, though indicators of seasonal pooling was noted (e.g. water stains at base of woody stems, exposed tree roots). If pooling occurs seasonally, the depth likely does not exceed 12cm for extended periods of time.	S5	0.10 ha
MARSH			
Meadow Marsh			
MAM2	• Frequently dominated by European Reed (*Phragmites australis*), with occasional herbaceous associations of Creeping Bentgrass	Not	0.86 ha

ELC TYPE	COMMUNITY DESCRIPTION	S-RANK / G-RANK (NHIC 2021)	Area (in ha)
Mineral Meadow Marsh	(*Agrostis stolonifera*), Purple loosestrife (*Lythrum salicaria*), and Bittersweet Nightshade, and Riverbank Grape (*Vitis riparia*). • Surface water was not present in July.	ranked	

														LOCAL / REGIONAL STATUS			
ORDER	FAMILY	LATIN NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	OWES WETLAND SPECIES	WEEDINESS INDEX	INVASIVE EXOTIC RANK (Urban Forest Associates 2002)	PROVINCIAL STATUS (S-RANK)	GLOBAL STATUS (G-RANK)	COSSARO (MECP)	COSEWIC STATUS		PEEL (Varga 2005)	GTA (Varga 2005)	CVC/PEEL (CVC 2002)	AUTHORITY
DICOTYLEDONS	Adoxaceae	Viburnum opulus ssp. opulus	Cranberry Viburnum		-3		-1	4	S5	G5				X	X	I	L.
DICOTYLEDONS	Amaranthaceae	Atriplex hortensis	Garden Saltbush		0		-1		SNA	GNR					X		L.
DICOTYLEDONS	Amaranthaceae	Atriplex patula	Spear Saltbush		-3				SNA	G5				X	X	X	L.
DICOTYLEDONS	Amaranthaceae	Bassia scoparia	Common Kochia		3		-1	3	SNA	GNR				X	X	I	(L.) Voss
DICOTYLEDONS	Amaranthaceae	Chenopodium album	Common Lamb's-Quarters		3		-1		SNA	G5				X	X	X	L.
DICOTYLEDONS	Anacardiaceae	Rhus typhina	Staghorn Sumac	1	3				S5	G5				X	X	X	L.
DICOTYLEDONS	Apiaceae	Daucus carota	Wild Carrot		5		-2		SNA	GNR				X	X	X	L.
DICOTYLEDONS	Apocynaceae	Asclepias syriaca	Common Milkweed	0	5				S5	G5				X	X	X	L.
DICOTYLEDONS	Asteraceae	Ambrosia artemisiifolia	Common Ragweed	0	3				S5	G5				X	X	X	L.
DICOTYLEDONS	Asteraceae	Arctium lappa	Great Burdock		3				SNA	GNR				X	X	X	L.
DICOTYLEDONS	Asteraceae	Carduus acanthoides ssp. acanthoides	Spiny Plumeless Thistle		5		-1		SNA	GNR				X	X	X	L.
DICOTYLEDONS	Asteraceae	Cichorium intybus	Wild Chicory		5		-1		SNA	GNR				X	X	X	L.
DICOTYLEDONS	Asteraceae	Cirsium arvense	Canada Thistle		3		-1	1	SNA	G5				X	X	X	(L.) Scop.
DICOTYLEDONS	Asteraceae	Cirsium vulgare	Bull Thistle		3		-1		SNA	GNR				X	X	X	(Savi) Tenore
DICOTYLEDONS	Asteraceae	Echinops sphaerocephalus	Great Globe-Thistle		5		-1		SNA	GNR				X	X	X	L.
DICOTYLEDONS	Asteraceae	Erigeron annuus	Annual Fleabane	0	3				S5	G5				X	X	X	(L.) Pers.
DICOTYLEDONS	Asteraceae	Lactuca serriola	Prickly Lettuce		3		-1		SNA	GNR				X	X	I	L.
DICOTYLEDONS	Asteraceae	Leucanthemum vulgare	Oxeye Daisy		5		-1		SNA	GNR				X	X	X	Lam.
DICOTYLEDONS	Asteraceae	Picris hieracioides	Hawkweed Oxtongue		5		-1		SNA	G5					X		L.
DICOTYLEDONS	Asteraceae	Solidago altissima var. altissima	Tall Goldenrod	1	3				S5	G5				X	X	X	L.
DICOTYLEDONS	Asteraceae	Sonchus arvensis ssp. arvensis	Field Sow-Thistle		3				SNA	GNR				X	X	I	L.
DICOTYLEDONS	Asteraceae	Symphyotrichum ericoides var. ericoides	White Heath Aster	4	3				S5	G5				X	X	X	(L.) G.L. Nesom
DICOTYLEDONS	Asteraceae	Symphyotrichum lanceolatum ssp. lanceolatu	Panicled Aster (ssp. lanceolatum)	3	-3	I			S5	G5				X	X	X	(Willd.) G.L. Nesom
DICOTYLEDONS	Asteraceae	Symphyotrichum novae-angliae	New England Aster	2	-3				S5	G5				X	X	X	(L.) G.L. Nesom
DICOTYLEDONS	Asteraceae	Symphyotrichum pilosum var. pilosum	Old Field Aster	1	3				S5	G5				R1	R	R	(Willd.) G.L. Nesom
DICOTYLEDONS	Asteraceae	Symphyotrichum x amethystinum	Amethyst Aster						HYB_n	GNR				X	X	X	(Nutt.) G.L. Nesom
DICOTYLEDONS	Asteraceae	Tanacetum vulgare	Common Tansy		5		-1	3	SNA	GNR				X	X	I	L.
DICOTYLEDONS	Asteraceae	Taraxacum officinale	Common Dandelion		3		-2		SNA	G5				X	X	I	F.H. Wiggers
DICOTYLEDONS	Asteraceae	Tripleurospermum inodorum	Scentless Chamomile		0		-1		SNA	GNR				X	X	I	(L.) Schultz-Bip.
DICOTYLEDONS	Asteraceae	Xanthium strumarium	Rough Cockleburr	2	0	T			S5	G5				X	X	X	L.
DICOTYLEDONS	Balsaminaceae	Impatiens capensis	Spotted Jewelweed	4	-3	I			S5	G5				X	X	X	Meerburgh
DICOTYLEDONS	Boraginaceae	Echium vulgare	Common Viper's Bugloss		5		-2		SNA	GNR				X	X	X	L.
DICOTYLEDONS	Brassicaceae	Alliaria petiolata	Garlic Mustard		0		-3	1	SNA	GNR				X	X	X	(M. Bieb.) Cavara & Grande
DICOTYLEDONS	Brassicaceae	Barbarea vulgaris	Bitter Wintercress		0		-1	3	SNA	GNR				X	X	X	W.T. Aiton
DICOTYLEDONS	Brassicaceae	Diplotaxis muralis	Annual Wall Rocket		5		-1		SNA	GNR					X		(L.) de Candolle
DICOTYLEDONS	Brassicaceae	Erysimum cheiranthoides	Wormseed Wallflower		3		-1		S5	G5				X	X	X	L.
DICOTYLEDONS	Brassicaceae	Hesperis matronalis	Dame's Rocket		3		-3	1	SNA	G4G5				X	X	I	L.
DICOTYLEDONS	Brassicaceae	Lepidium campestre	Field Peppergrass		5		-1		SNA	GNR				X	X	I	(L.) W.T. Aiton
DICOTYLEDONS	Brassicaceae	Sisymbrium altissimum	Tall Tumble Mustard		3		-1		SNA	GNR				X	X	I	L.
DICOTYLEDONS	Brassicaceae	Thlaspi arvense	Field Pennycress		5		-1		SNA	GNR				X	X	I	L.
DICOTYLEDONS	Caprifoliaceae	Dipsacus fullonum	Common Teasel		3		-1	3	SNA	GNR				X	X	X	L.
DICOTYLEDONS	Caprifoliaceae	Lonicera x bella	Showy Fly Honeysuckle		3		-3		HYB_e	GNR				X	X	I	Zabel
DICOTYLEDONS	Caryophyllaceae	Silene latifolia	White Campion		5				SNA	GNR				X	X	I	Poiret
DICOTYLEDONS	Convolvulaceae	Convolvulus arvensis	Field Bindweed		5		-1	3	SNA	GNR				X	X	X	L.
DICOTYLEDONS	Cornaceae	Cornus sericea	Red-Osier Dogwood	2	-3	I*			S5	G5				X	X	X	L.
DICOTYLEDONS	Elaeagnaceae	Elaeagnus angustifolia	Russian Olive		3		-1	3	SNA	GNR				X	X	I	L.
DICOTYLEDONS	Euphorbiaceae	Euphorbia virgata	Leafy Spurge		5		-2		SNA	GNRTNR				X	X	I	L.
DICOTYLEDONS	Fabaceae	Lotus corniculatus	Garden Bird's-Foot Trefoil		3		-2	2	SNA	GNR				X	X	I	L.
DICOTYLEDONS	Fabaceae	Medicago lupulina	Black Medick		3		-1	4	SNA	GNR				X	X	I	L.
DICOTYLEDONS	Fabaceae	Melilotus albus	White Sweet-Clover		3		-3	2	SNA	G5				X	X	I	Medik.
DICOTYLEDONS	Fabaceae	Melilotus officinalis	Yellow Sweet-Clover		3		-1	2	SNA	GNR				X	X	I	(L.) Pallas
DICOTYLEDONS	Fabaceae	Robinia pseudoacacia	Black Locust		3		-3	2	SNA	G5				X	X	I	L.
DICOTYLEDONS	Fabaceae	Securigera varia	Purple Crown-Vetch		5		-2	1	SNA	GNR				X	X	X	(L.) Lassen
DICOTYLEDONS	Fabaceae	Trifolium pratense	Red Clover		3		-2	4	SNA	GNR				X	X	I	L.
DICOTYLEDONS	Fabaceae	Vicia cracca	Tufted Vetch		5		-1	2	SNA	GNR				X	X	I	L.
DICOTYLEDONS	Hypericaceae	Hypericum perforatum ssp. perforatum	Common St. John's-Wort		5		-3	4	SNA	GNR				X	X	I	L.
DICOTYLEDONS	Juglandaceae	Juglans nigra	Black Walnut	5	3				S4?	G5				X	X	X	L.
DICOTYLEDONS	Lamiaceae	Leonurus cardiaca ssp. cardiaca	Common Motherwort		5		-2		SNA	GNR				X	X	I	L.
DICOTYLEDONS	Lamiaceae	Nepeta cataria	Catnip		3		-2	4	SNA	GNR				X	X	I	L.
DICOTYLEDONS	Lythraceae	Lythrum salicaria	Purple Loosestrife		-5	I	-3	1	SNA	G5				X	X	I	L.
DICOTYLEDONS	Malvaceae	Abutilon theophrasti	Velvetleaf		3		-1	3	SNA	GNR				X	X	X	Medikus
DICOTYLEDONS	Malvaceae	Tilia americana	Basswood	4	3				S5	G5				X	X	X	L.
DICOTYLEDONS	Oleaceae	Fraxinus americana	White Ash	4	3				S4	G4				X	X	X	L.
DICOTYLEDONS	Oleaceae	Fraxinus pennsylvanica	Red Ash	3	-3	T			S4	G4				X	X	X	Marshall
DICOTYLEDONS	Onagraceae	Epilobium ciliatum ssp. ciliatum	Northern Willowherb	3	-3	I*			S5	G5				X	X	X	Raf.
DICOTYLEDONS	Onagraceae	Oenothera biennis	Common Evening Primrose	0	3				S5	G5				U	U	X	L.
DICOTYLEDONS	Oxalidaceae	Oxalis stricta	European Wood-Sorrel	0	3				S5	G5				X	X	X	L.
DICOTYLEDONS	Plantaginaceae	Chaenorhinum minus ssp. minus	Dwarf Snapdragon		5		-1		SNA	GNR				X	X	X	(L.) Lange
DICOTYLEDONS	Plantaginaceae	Linaria vulgaris	Butter-And-Eggs		5		-1	4	SNA	GNR				X	X	I	Miller
DICOTYLEDONS	Plantaginaceae	Plantago lanceolata	English Plantain		3		-1		SNA	G5				X	X	I	L.
DICOTYLEDONS	Plantaginaceae	Plantago major	Common Plantain		3		-1		SNA	G5				X	X	I	L.
DICOTYLEDONS	Polygonaceae	Fallopia convolvulus	Eurasian Black Bindweed		3		-1		SNA	GNR				X	X	I	(L.) Á. Löve
DICOTYLEDONS	Polygonaceae	Persicaria maculosa	Spotted Lady's-Thumb		-3	T	-1		SNA	G3G5				X	X	I	Gray
DICOTYLEDONS	Polygonaceae	Polygonum aviculare ssp. aviculare	Prostrate Knotweed		3		-1		SNA	G5TNR				X	X	I	L.
DICOTYLEDONS	Polygonaceae	Rumex crispus	Curled Dock		0	T	-2		SNA	GNR				X	X	I	L.
DICOTYLEDONS	Portulacaceae	Portulaca oleracea	Common Purslane		3				SNA	GU				X	X	I	L.
DICOTYLEDONS	Ranunculaceae	Ranunculus sceleratus	Cursed Buttercup	2	-5	I			S5	G5				X	X		L.
DICOTYLEDONS	Rhamnaceae	Rhamnus cathartica	European Buckthorn		0	T	-3	1	SNA	GNR				X	X	I	L.
DICOTYLEDONS	Rosaceae	Fragaria virginiana	Wild Strawberry	2	3				S5	G5				X	X	X	Miller
DICOTYLEDONS	Rosaceae	Geum canadense	White Avens	3	0	T			S5	G5				X	X	X	Jacquin
DICOTYLEDONS	Rosaceae	Potentilla recta	Sulphur Cinquefoil		5		-2		SNA	GNR				X	X	I	L.
DICOTYLEDONS	Rosaceae	Prunus nigra	Canada Plum	4	3				S4	G4G5				U	U	X	Aiton
DICOTYLEDONS	Rosaceae	Rosa multiflora	Multiflora Rose		3		-3	1	SNA	GNR				X	X	I	Thunberg
DICOTYLEDONS	Rosaceae	Rubus idaeus ssp. strigosus	North American Red Raspberry	2	3				S5	G5T5				X	X	X	(Michaux) Focke
DICOTYLEDONS	Rosaceae	Rubus occidentalis	Black Raspberry	2	5				S5	G5				X	X	X	L.
DICOTYLEDONS	Rubiaceae	Galium aparine	Common Bedstraw	4	3				S5	G5				R4	U	L	L.
DICOTYLEDONS	Salicaceae	Populus balsamifera	Balsam Poplar	4	-3	T			S5	G5				X	X	X	L.
DICOTYLEDONS	Salicaceae	Populus deltoides ssp. deltoides	Eastern Cottonwood	4	0	T			S5	G5T5				X	X	X	Bartram ex Marshall
DICOTYLEDONS	Salicaceae	Populus tremuloides	Trembling Aspen	2	0	T			S5	G5				X	X	X	Michaux
DICOTYLEDONS	Salicaceae	Salix amygdaloides	Peach-Leaved Willow	6	-3	T			S5	G5				R6	X	L	Andersson
DICOTYLEDONS	Salicaceae	Salix interior	Sandbar Willow	1	-3	T			S5	GNR				R5	X	L	Rowlee
DICOTYLEDONS	Salicaceae	Salix petiolaris	Meadow Willow	3	-3	I			S5	G5				X	X	X	J.E. Smith
DICOTYLEDONS	Salicaceae	Salix x fragilis	Hybrid Crack Willow			T	-3	3	HYB_e	GNA				XSR	X	I	L.
DICOTYLEDONS	Salicaceae	Salix x sepulcralis	Golden Weeping Willow						HYB_e	GNA				XSR	X		Simonkai

Table 3: Plant List

														LOCAL / REGIONAL STATUS			
ORDER	**FAMILY**	**LATIN NAME**	**COMMON NAME**	**COEFFICIENT OF CONSERVATISM**	**WETNESS INDEX**	**OWES WETLAND SPECIES**	**WEEDINESS INDEX**	**INVASIVE EXOTIC RANK** (Urban Forest Associates 2002)	**PROVINCIAL STATUS (S-RANK)**	**GLOBAL STATUS (G-RANK)**	**COSSARO (MECP)**	**COSEWIC STATUS**		**PEEL (Varga 2005)**	**GTA (Varga 2005)**	**CVC/PEEL (CVC 2002)**	**AUTHORITY**
DICOTYLEDONS	Sapindaceae	Acer negundo	Manitoba Maple	0	0	T		1	S5	G5				X	X	X	L.
DICOTYLEDONS	Sapindaceae	Acer saccharinum	Silver Maple	5	-3	I			S5	G5				X	X	X	L.
DICOTYLEDONS	Sapindaceae	Acer x freemanii	Freeman's Maple	6	-5	I			HYB_n	GNA				XSR	X		E. Murray
DICOTYLEDONS	Scrophulariaceae	Verbascum phlomoides	Clasping Mullein		5		-1		SNA	GNR				X	X	I	L.
DICOTYLEDONS	Scrophulariaceae	Verbascum thapsus ssp. thapsus	Common Mullein		5		-2		SNA	GNRTNR				X	X	I	L.
DICOTYLEDONS	Solanaceae	Solanum dulcamara	Bittersweet Nightshade		0	T	-2	3	SNA	GNR				X	X	I	L.
DICOTYLEDONS	Ulmaceae	Ulmus americana	White Elm	3	-3	T			S5	G4				X	X	X	L.
DICOTYLEDONS	Ulmaceae	Ulmus pumila	Siberian Elm		3		-1	2	SNA	GNR				X	X	I	L.
DICOTYLEDONS	Vitaceae	Parthenocissus vitacea	Thicket Creeper	4	3				S5	G5				X	X	X	(Knerr) Hitchcock
DICOTYLEDONS	Vitaceae	Vitis riparia	Riverbank Grape	0	0				S5	G5				X	X	X	Michaux
GYMNOSPERMS	Pinaceae	Picea abies	Norway Spruce		5		-1		SNA	G5				X	X	I	(L.) Karsten
GYMNOSPERMS	Pinaceae	Picea glauca	White Spruce	6	3	T			S5	G5				R3	X	L	(Moench) Voss
GYMNOSPERMS	Pinaceae	Pinus resinosa	Red Pine	8	3				S5	G5				R1	R	RL	Aiton
MONOCOTYLEDON	Asparagaceae	Asparagus officinalis	Garden Asparagus		3		-1		SNA	G5?				X	X	X	L.
MONOCOTYLEDON	Cyperaceae	Carex tenera	Tender Sedge	4	0	T			S5	G5				X	X	X	Dewey
MONOCOTYLEDON	Cyperaceae	Carex vulpinoidea	Fox Sedge	3	-5	I			S5	G5				X	X	X	Michaux
MONOCOTYLEDON	Juncaceae	Juncus gerardi ssp. gerard	Blackgrass Rush		-5	I	-1		SNA	G5TNR					X		Loiseleur-Deslongchamps
MONOCOTYLEDON	Poaceae	Agrostis stolonifera	Creeping Bentgrass		-3	T			SNA	G5				X	X	X	L.
MONOCOTYLEDON	Poaceae	Bromus inermis	Smooth Brome		5		-3	4	SNA	G5T5				X	X	I	Leysser
MONOCOTYLEDON	Poaceae	Bromus japonicus	Japanese Brome		3		-1		SNA	GNR				X	X	I	Thunberg ex Murray
MONOCOTYLEDON	Poaceae	Dactylis glomerata	Orchard Grass		3		-1	3	SNA	GNR				X	X	I	L.
MONOCOTYLEDON	Poaceae	Echinochloa crus-galli	Large Barnyard Grass		-3	T	-1		SNA	GNR				X	X	I	(L.) Palisot de Beauvois
MONOCOTYLEDON	Poaceae	Elymus repens	Quackgrass		3		-3	3	SNA	GNR				X	X	I	(L.) Gould
MONOCOTYLEDON	Poaceae	Festuca rubra	Red Fescue		3				S5	G5				X	X	X	L.
MONOCOTYLEDON	Poaceae	Hordeum jubatum ssp. jubatum	Foxtail Barley	0	0	T			S5?	G5T5				X	X	I	L.
MONOCOTYLEDON	Poaceae	Lolium perenne	Perennial Ryegrass		3		-1	4	SNA	GNR				X	X	I	L.
MONOCOTYLEDON	Poaceae	Panicum capillare ssp. capillare	Common Panicgrass	0	0				S5	G5				X	X	X	L.
MONOCOTYLEDON	Poaceae	Panicum dichotomiflorum ssp. dichotomiflorum	Fall Panicgrass		-3		-1		SNA	G5				X	X	I	Michaux
MONOCOTYLEDON	Poaceae	Phalaris arundinacea var. arundinacea	Reed Canary Grass	0	-3	T		P	S5	GNR				X	X	X	L.
MONOCOTYLEDON	Poaceae	Phleum pratense ssp. pratense	Common Timothy		3		-1		SNA	GNRTNR				X	X	I	L.
MONOCOTYLEDON	Poaceae	Phragmites australis ssp. australis	European Reed		-3	T		1	SNA	G5T5				X	X		(Cav.) Trinius ex Steudel
MONOCOTYLEDON	Poaceae	Poa compressa	Canada Bluegrass		3				SNA	GNR				X	X	X	L.
MONOCOTYLEDON	Poaceae	Poa pratensis	Kentucky Bluegrass	0	3			2	S5	G5				X	X	X	L.
MONOCOTYLEDON	Poaceae	Puccinellia distans	Spreading Alkaligrass		-3	T	-1		SNA	G5				X	X	I	(Jacq.) Parlatore
MONOCOTYLEDON	Typhaceae	Typha angustifolia	Narrow-Leaved Cattail		-5	I		P	SNA	G5				X	X	X	L.
MONOCOTYLEDON	Typhaceae	Typha x glauca	Blue Cattail		-5	I		P	HYB_n	GNA				X	X	X	Godron

STATISTICS		
Species Diversity		
Total Number of Species:	130	
Native Species:	51	39%
Exotic Species:	79	61%
S1-S3 Species:	0	0%
S4 Species:	4	8%
S5 Species:	44	92%
Regionally Rare (Peel)	6	
Floristic Quality Indices		
Mean Co-efficient of Conservati	2.7	
CC 0 - 3 = lowest sensitivity	30	65%
CC 4 - 6 = moderate sensitivit	15	33%
CC 7 - 8 = high sensitivity	1	2%
CC 9 - 10 = highest sensitivity	0	0%
Floristic Quality Index (FQI)	18	
Weedy & Invasive Species		
Mean Weediness Index (Oldhar	-1.5	
-1 = low potential invasivene	46	65%
-2 = moderate potential invas	13	18%
-3 = high potential invasivens	12	17%
Mean Exotic Rank (Urban Fores	3	
Category 1	9	24%
Category 2	7	18%
Category 3	11	29%
Category 4	8	21%
Potentially Invasive (P)	3	8%
Wetland Species		
Mean Wetness Index	1.6	
Upland	27	21%
Facultative upland	56	44%
Facultative	16	13%
Facultative wetland	21	17%
Obligate wetland	7	6%

Common Name	Species Code	Scientific Name	Provincial Status (S Rank)	Global Status (G Rank)	SARO (MECP)	SARA Schedule 1 (Federal)	Highest Breeding Evidence
Anseriformes							
Anatidae							
Canada Goose	CANG	*Branta canadensis*	S5	G5			OB-X
Mallard	MALL	*Anas platyrhynchos*	S5	G5			OB-X
Columbiformes							
Columbidae							
Rock Pigeon	ROPI	*Columba livia*	SNA	G5			OB-X
Mourning Dove	MODO	*Zenaida macroura*	S5	G5			PR-T
Charadriiformes							
Charadriidae							
Killdeer	KILL	*Charadrius vociferus*	S4B	G5			PO-H
Scolopacidae							
Spotted Sandpiper	SPSA	*Actitis macularius*	S5B	G5			PO-H
Laridae							
Ring-billed Gull	RBGU	*Larus delawarensis*	S5	G5			OB-X
Falconiformes							
Falconidae							
Peregrine Falcon	PEFA	*Falco peregrinus*	S4	G4	SC	SC	PO-H
Passeriformes							
Tyrannidae							
Willow Flycatcher	WIFL	*Empidonax traillii*	S4B	G5			PR-T
Vireonidae							
Warbling Vireo	WAVI	*Vireo gilvus*	S5B	G5			PR-T
Hirundinidae							
Bank Swallow	BANS	*Riparia riparia*	S4B	G5	THR	THR	OB-X
Tree Swallow	TRES	*Tachycineta bicolor*	S4S5B	G5			PO-H
Northern Rough-winged Swallow	NRWS	*Stelgidopteryx serripennis*	S4B	G5			OB-X
Barn Swallow	BARS	*Hirundo rustica*	S4B	G5	THR	THR	OB-X
Turdidae							
American Robin	AMRO	*Turdus migratorius*	S5	G5			CO-FY
Mimidae							
Northern Mockingbird	NOMO	*Mimus polyglottos*	S4	G5			PO-S
Sturnidae							
European Starling	EUST	*Sturnus vulgaris*	SNA	G5			CO-FY
Bombycillidae							
Cedar Waxwing	CEDW	*Bombycilla cedrorum*	S5	G5			PO-H
Fringillidae							
House Finch	HOFI	*Haemorhous mexicanus*	SNA	G5			PO-S
American Goldfinch	AMGO	*Spinus tristis*	S5	G5			PR-P
Passerellidae							
Savannah Sparrow	SAVS	*Passerculus sandwichensis*	S5B, S3N	G5			PO-S
Song Sparrow	SOSP	*Melospiza melodia*	S5	G5			CO-CF
Icteridae							

Common Name	Species Code	Scientific Name	Provincial Status (S Rank)	Global Status (G Rank)	SARO (MECP)	SARA Schedule 1 (Federal)	Highest Breeding Evidence
Red-winged Blackbird	RWBL	*Agelaius phoeniceus*	S5	G5			CO-CF
Brown-headed Cowbird	BHCO	*Molothrus ater*	S5	G5			PO-S
Common Grackle	COGR	*Quiscalus quiscula*	S5	G5			PO-H
Parulidae							
Yellow Warbler	YWAR	*Setophaga petechia*	S5B	G5			PR-P
Cardinalidae							
Northern Cardinal	NOCA	*Cardinalis cardinalis*	S5	G5			PR-T

Species Common Name and Scientific Name: Chesser, R. T., K. J. Burns, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., D. F. Stotz, and K. Winker. 2019. Check-list of North American Birds (online). American Ornithological Society. Available online: http://checklist.aou.org/taxa

Species Code: Consistent with the American Ornithologists' Union. 2019. Species 4-Letter-Codes. Available online: http://www.birdsontario.org/atlas/codes.jsp?lang=en&pg=species

Highest Breeding Evidence: Codes assigned for breeding evidence are consistent with the Ontario Breeding Bird Atlas (OBBA). 2018. Breeding Evidence Codes. Available online: http://www.birdsontario.org/atlas/codes.jsp?lang=en&pg=breeding&sortorder=aou

S ranks: Provincial ranks are from the Natural Heritage Information Centre; S1 (critically imperiled), S2 (imperlied), S3 (vulnerable), S4 (apparently secure), S5 (secure); ranks were updated using NHIC species list December 2018. Available to download from: https://www.ontario.ca/page/get-natural-heritage-information

G ranks: Global ranks are from the Natural Heritage Information Centre; G1 (extremely rare), G2 (very rare), G3 (rare to uncommon), G4 (common), G5 (very common); ranks were updated using NHIC species list December 2018. Available to download from: https://www.ontario.ca/page/get-natural-heritage-information

COSSARO (MNRF): Ontario Species at Risk as listed by the Committee on the Status of Species at Risk in Ontario (from NHIC Table December 2018 and updates posted on Ontario Regulation 230/08 Species at Risk in Ontario website as of August 1, 2018: https://www.ontario.ca/laws/regulation/080230/); END - Endangered; THR - Threatened; SC - Special Concern; NAR - Not at Risk

COSEWIC: Assessed Species at Risk at the national level as listed by the Committee on the Status of Endangered Wildlife in Canada (from COSEWIC: https://wildlife-species.canada.ca/species-risk-registry/sar/index/default_e.cfm); END - Endangered, THR - Threatened, SC - Special Concern, NAR - Not at Risk

SWH Indicator Species: SWH refers to Significant Wildlife Habitat as defined by the MNRF (2015) Significant Wildlife Habitat Criteria Schedules for Ecoregions 7E and 6E (as appropriate for the Subject Lands). SWH indicator species are identified in this table and any potential SWH is discussed in the text of this report. Available online: http://www.townofnemi.on.ca/wp-content/uploads/2016/02/NEMI-OP-App-C-schedule-6e-jan-2015-access-ver-final-s.pdf

COMMON NAME	SCIENTIFIC NAME	Provincial Status (S RANK)	Global Status (G RANK)	SARO (MECP)	SARA Schedule 1 (Federal)	Local Status CVC	SWH Indicator Species 7E
ODONATA							
Black Saddlebags	*Tramea lacerata*	S4	G5				
BUTTERFLIES							
Northern Crescent	*Phycoides pascoensis*	S5	G5				
BIRDS							
Canada Goose	*Branta canadensis*	S5	G5				X
Mallard	*Anas platyrhynchos*	S5	G5				X
Rock Pigeon	*Columba livia*	SNA	G5				
Mourning Dove	*Zenaida macroura*	S5	G5				
Killdeer	*Charadrius vociferus*	S4B	G5				
Spotted Sandpiper	*Actitus macularius*	S5B	G5				
Ring-billed Gull	*Larus delawarensis*	S5	G5				X
Peregrine Falcon	*Falco peregrinus*	S4	G4	SC	SC		X
Willow Flycatcher	*Empidonax traillii*	S4B	G5				X
Warbling Vireo	*Vireo gilvus*	S5B	G5				
Bank Swallow	*Riparia riparia*	S4B	G5	THR	THR		
Tree Swallow	*Tachycineta bicolor*	S4SB5	G5				
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	S4B	G5				X
Barn Swallow	*Hirundo rustica*	S4B	G5	THR	THR		
American Robin	*Turdus migratorius*	S5	G5				
Northern Mockingbird	*Mimus polyglottos*	S4	G5				
European Starling	*Sturnus vulgaris*	SNA	G5				
Cedar Waxwing	*Bombycilla cedrorum*	S5	G5				
House Finch	*Carpodacus mexicanus*	SNA	G5				
American Goldfinch	*Spinus tristis*	S5	G5				
Savannah Sparrow	*Passerculus sandwichensis*	S5B, S3N	G5				X
Song Sparrow	*Melospiza melodia*	S5	G5				
Red-winged Blackbird	*Agelaius phoeniceus*	S5	G5				
Brown-headed Cowbird	*Molothrus ater*	S5	G5				
Common Grackle	*Quiscalus quiscula*	S5	G5				
Yellow Warbler	*Setophaga petechia*	S5B	G5				
Northern Cardinal	*Cardinalis cardinalis*	S5	G5				
MAMMALS							
White-tailed Deer	*Odocoileus virginianus*	S5	G5				X

SUMMARY

Total Odonata:	*1*
Total Butterflies:	*1*
Total Other Arthropods	*0*
Total Amphibians:	*0*
Total Reptiles:	*0*
Total Birds:	*27*
Total Breeding Birds:	*19*
Total Mammals:	*1*

SIGNIFICANT SPECIES

Global:	*0*
National:	*3*
Provincial:	*3*
Regional:	*0*
Local:	

Explanation of Status and Acronymns

COSSARO: Committee on the Status of Species at Risk in Ontario
COSEWIC: Committee on the Status of Endangered Wildlife in Canada
S1: Critically Imperiled—Critically imperiled in the province (often 5 or fewer occurrences)
S2: Imperiled—Imperiled in the province, very few populations (often 20 or fewer),
S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)
S4: Apparently Secure—Uncommon but not rare
S5: Secure—Common, widespread, and abundant in the province
SX: Presumed extirpated
SH: Possibly Extirpated (Historical)
SNR: Unranked
SU: Unrankable—Currently unrankable due to lack of information
SNA: Not applicable—A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#: Range Rank—A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species
S#B- Breeding status rank
S#N- Non Breeding status rank
?: Indicates uncertainty in the assigned rank
G1: Extremely rare globally; usually fewer than 5 occurrences in the overall range
G1G2: Extremely rare to very rare globally
G2: Very rare globally; usually between 5-10 occurrences in the overall range

COMMON NAME	SCIENTIFIC NAME	Provincial Status (S RANK)	Global Status (G RANK)	SARO (MECP)	SARA Schedule 1 (Federal)	Local Status CVC	SWH Indicator Species 7E

G2G3: Very rare to uncommon globally

G3: Rare to uncommon globally; usually between 20-100 occurrences

G3G4: Rare to common globally

G4: Common globally; usually more than 100 occurrences in the overall range

G4G5: Common to very common globally

G5: Very common globally; demonstrably secure

GU: Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
1. SEASONAL CONCENTRATION AREAS					
Waterfowl Stopover and Staging Areas (terrestrial)	Yes – CUM vegetation communities are present on the Subject Lands. CUT and CUM vegetation communities are also present within the adjacent lands (120 m).	No – Features are not large enough to attract or support significant numbers. This area does not have historical waterfowl stopover use and is not an area known for sheet water use.	No	N/A	Not Present
Waterfowl Stopover and Staging Areas (aquatic)	Yes – One SWD vegetation community is present within the Subject Lands.	No – SWD vegetation community is not large enough to attract or support large congregations of waterfowl.	No	N/A	Not Present
Shorebird Migratory Stopover Areas	Yes – MAM vegetation communities are present within and adjacent to the Subject Lands.	No – MAM vegetation communities are disturbed from adjacent wastewater management plant. Features are not large enough to attract or support significant numbers.	No	N/A	Not Present
Raptor Wintering Areas	No – Forested communities	No - Minimum size	No	N/A	Not Present

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
	are not present within the Subject Lands; however, two FOD vegetation communities were identified within the adjacent lands	criteria was not met (>20 ha with combination of forest and upland habitat).			
Bat Hibernacula	No – Vegetation communities are absent from the Subject Lands and adjacent lans.	N/A	No	N/A	Not Present
Bat Maternity Colonies	Yes – One small SWD vegetation community is present within the Subject Lands. Two FOD vegetation communities are present within the adjacent lands.	Candidate – The size of trees (diameter at breast height, dbh) present in this community is unknown. However, the area of the SWD community is small and unlikely to support significant numbers of bat maternity colonies.	Yes	No field surveys have been conducted at this time.	Candidate
Turtle Wintering Areas	Yes – MAM and SWD vegetation communities are present within and adjacent to the Subject Lands.	No – MAM and SWD vegetation communities do not support overwintering habitat as they are dry for a majority of the year.	No	N/A	Not Present
Reptile Hibernacula	Yes – ecosites are present on and adjacent to the Subject	No – No anthropogenic or natural features	Yes – within adjacent lands.	N/A	Candidate within adjacent lands

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
	Lands.	provide any subsurface access below the frost line within the Subject Lands. Candidate habitat may be present within the adjacent naturalized habitats.			
Colonial Bird Nesting Sites (bank/cliff)	Yes – CUM and CUT vegetation communities are present on and adjacent to the Subject Lands.	No – Presence of exposed or eroding banks, hills, steep slopes are not present on or adjacent to the Subject Lands.	No	N/A	Not Present
Colonial Bird Nesting Sites (tree/shrubs)	Yes – One SWD vegetation community is present within the Subject Lands.	No – SWD vegetation community is adjacent to actively managed wastewater treatment plant and Avonhead Road. Feature is disturbed from adjacent land uses and would not be attractive for nesting opportunities.	No	N/A	Not Present
Colonial Bird Nesting Sites (ground)	No – No rocky islands or peninsulas are present on or	N/A	No	N/A	Not Present

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
	adjacent to the Subject Lands.				
Migratory Butterfly Stopover Areas	No – Forested vegetation communities are absent from the Subject Lands; however, two FOD vegetation communities are present within the adjacent lands	No - minimum size criteria was not met (10 ha with a combination of field and forest habitat).	No	N/A	Not Present
Migratory Landbird Stopover Areas	Yes – One SWD vegetation community is present within the Subject Lands, and two FOD vegetation communities are present within the adjacent lands.	No – SWD and FOD vegetation community does not meet the minimum size criteria (>5 ha).	No	N/A	Not Present
Deer Winter Congregation Areas	No – Mapping from the MNRF LIO database did not depict any deer wintering areas on or adjacent to the Subject Lands.	N/A	No	N/A	Not Present
2. RARE VEGETATION COMMUNITIES OR SPECIALIZED HABITAT FOR WILDLIFE					
2a. Rare Vegetation Communities					
Rare Vegetation Types (cliffs, talus slopes, sand	No – Rare vegetation communities are not found on or adjacent to the Subject	N/A	No	N/A	Not Present

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
barrens, alvars, old-growth forests, savannahs, and tallgrass prairies)	Lands.				
Other Rare Vegetation Types (S1 to S3 communities)	No – All vegetation communities identified on or adjacent to the Subject Lands are culturally influenced.	N/A	No	N/A	Not Present
2b. Specialized Wildlife Habitat					
Waterfowl Nesting Area	Yes –SWD and MAM vegetation communities are present within and adjacent to the Subject Lands.	No – Subject Lands is actively managed wastewater treatment plant. All upland vegetation communities are highly disturbed from adjacent land uses.	No	N/A	Not Present
Bald Eagle and Osprey Habitats	Yes – SWD and FOD vegetation communities are present within and adjacent to the Subject Lands.	Candidate – While no large aquatic features are present within the Subject Lands, Lake Ontario is located adjacent to the FOD communities south of Lakeshore Road West.	Yes – within adjacent lands.	N/A	Candidate within adjacent lands
Woodland Raptor Nesting	Yes – One SWD vegetation	No – Minimum size	No	N/A	Not Present

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Habitat	community is present within the Subject Lands, and two FOD vegetation communities are present within the adjacent lands.	criteria is not met (>30 ha with >4ha interior forest habitat).			
Turtle Nesting Areas	No – Vegetation communities are absent from the Subject Lands and adjacent properties.	N/A	No	N/A	Not Present
Seeps and Springs	Yes – While forested ecosites are absent from the Subject Lands, two FOD vegetation communities are present within the adjacent lands.	Candidate	Yes – within adjacent lands	N/A	Candidate within adjacent lands
Woodland Amphibian Breeding Habitats (within or < 120m from woodland)	Yes – One SWD vegetation community is present within the Subject Lands and two FOD vegetation communities are present within the adjacent lands.	No – Presence of vernal pooling within the SWD and FOD vegetation communities are unknown; however, it is unlikely that minimum size criteria is met as no evidence of larger pools were visible within aerial imagery. Due to the location within the Subject Lands adjacent to an	No	N/A	Not Present

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
		actively managed wastewater treatment plant and Avonhead Road, it is unlikely that significance will be met.			
Wetland Amphibian Breeding Habitats (wetland >120m from woodland)	Yes – SWD and MAM vegetation communities are present within and adjacent to the Subject Lands.	No – Presence of vernal pooling within the SWD and adjacent MAM vegetation communities is unknown; however, it is unlikely that minimum size criteria is met as no evidence of larger pools were visible within aerial imagery. Due to the location within the Subject Lands adjacent to an actively managed wastewater treatment plant and Avonhead Road, it is unlikely that significance is met.	No	N/A	Not Present
Woodland Area-Sensitive Bird Breeding Habitat	Yes – One SWD vegetation community is present within the Subject Lands and two FOD vegetation communities	No – Minimum size criteria was not met (>30 ha). No interior habitat is present.	No	N/A	Not Present

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
	are present within the adjacent lands.				
3. SPECIES OF CONSERVATION CONCERN					
Marsh Bird Breeding Habitat	Yes – MAM and SWD vegetation communities are present on and adjacent to the Subject Lands.	No – Vegetation communities are adjacent to actively managed wastewater treatment plant and Avonhead Road. These communities are likely disturbed from adjacent land uses.	No	N/A	Not Present
Open Country Bird Breeding Habitat	Yes – CUM vegetation communities are present on and adjacent to the Subject Lands.	No – Minimum size criteria is not met (>30 ha).	No	N/A	Not Present
Shrub/Early Successional Bird Breeding Habitat	Yes – While these vegetation communities are absent from the Subject Lands; CUT and CUW vegetation communities are present within the adjacent lands.	No - Minimum size criteria was not met (10 ha).	No	N/A	Not Present
Terrestrial Crayfish	Yes – MAM and SWD vegetation communities are present within and adjacent to the Subject Lands.	Yes – no minimum size requirement.	Yes – any observation of crayfish chimneys will be documented	No terrestrial crayfish chimneys were observed despite survey effort.	Candidate within adjacent lands

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
			during ecological surveys within the Subject Lands.	No survey effort was completed on adjacent lands.	
Special Concern and Rare Wildlife Species					
(i) Peregrine Falcon (*Falco peregrinus*)	N/A	No – No tall structures are present to support perching or nesting.	No	N/A	Not Present
(ii) Common Nighthawk (*Chordeiles minor*)	N/A	Yes – CUM vegetation communities are present.	Yes	Two rounds of breeding bird surveys were completed in 2020 (see **Table 1, Appendix B** for survey dates and conditions). No Common Nighthawk were documented (see **Table 4, Appendix B** for survey results and **Figure 4, Appendix A** for point count locations). No Common Nighthawks were recorded incidentally on adjacent lands.	Not Present
(iii) Eastern Wood Pewee (*Contopus virens)*	N/A	Yes – One SWD vegetation community is present within the Subject Lands and FOD/CUW vegetation	Yes	Two rounds of breeding bird surveys were completed in 2020 (see **Table 1, Appendix B** for survey dates and conditions). No Eastern	Not Present

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
		communities are present within adjacent lands.		Wood Pewee were documented (see **Table 4, Appendix B** for survey results and **Figure 4, Appendix A** for point count locations). No Eastern Wood Pewee were recorded incidentally on adjacent lands.	
(iv) Wood Thrush (*Hylocichla mustelina)*	N/A	Yes – One SWD vegetation community is present within the Subject Lands and FOD/CUW vegetation communities are present within adjacent lands.	Yes	Two rounds of breeding bird surveys were completed in 2020 (see **Table 1, Appendix B** for survey dates and conditions). No Wood Thrush were documented (see **Table 4, Appendix B** for survey results and **Figure 4, Appendix A** for point count locations). No Wood Thrush were recorded incidentally on adjacent lands.	Not Present
(v) Purple Martin (*Progne subis*)	N/A	Yes – One SWD vegetation community is present within the Subject Lands and FOD/CUW vegetation communities are present within adjacent lands. Open areas to	Yes	Two rounds of breeding bird surveys were completed in 2020 (see **Table 1, Appendix B** for survey dates and conditions). No Purple Martin were documented (see **Table 4, Appendix B** for survey results and **Figure 4,**	Not Present

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
		support foraging are also present. It is likely that snags are present within the community to support nesting.		**Appendix A** for point count locations). No Purple Martins were recorded incidentally on adjacent lands.	
(vi) Red-necked Grebe (*Podiceps grisegena*)	N/A	No – While Lake Ontario is nearby no permanent aquatic habitats are present. Species is also sensitive to human activity and disturbance.	No	N/A	Not Present
(vii) Eastern Musk Turtle (*Sternotherus odoratus*)	N/A	No – MAM/SWD vegetation communities do not support overwintering habitat as they are dry for a majority of the year.	No	N/A	Not Present
(viii) Northern Map Turtle (*Graptemys geographica)*	N/A	No – MAM/SWD vegetation communities do not support overwintering habitat as they are dry for a majority of the year. No large watercourses	No	N/A	Not Present

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
		are present within the Subject Lands. It is unlikely that Lakeside Creek would support Northern Map Turtle given its small size.			
(ix) Snapping Turtle (*Chelydra serpentina)*	N/A	No – MAM/SWD vegetation communities do not support overwintering habitat as they are dry for a majority of the year.	No	N/A	Not Present
(x) Monarch (*Danaus plexxipus)*	N/A	No – While CUM vegetation communities are present within, no large abundances of Common Milkweed (*Asclepias syriaca)* were recorded. CUM vegetation communities are highly disturbed from adjacent land-use practices (active wastewater treatment plant).	No	N/A	Not Present

Table 6a: Significant Wildlife Habitat Assessment (7E)

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
4. ANIMAL MOVEMENT CORRIDORS					
Amphibian Movement Corridors	N/A	No – Amphibian breeding SWH types are absent from the Subject Lands.	No	N/A	Not Present

Table 6b: Significant Wildlife Habitat Review (Peel ROP Peel-Caledon Significant Wildlife Habitat Study 2009)

SWH Type	SWH Analysis
Seasonal Concentrations of Animals	
A1. Deer Wintering Area	**Not Present**
A2. Colonial Bird Nesting Sites	**Not Present**
A3. Waterfowl Nesting Habitat	**Not Present** One indicator species was recorded during breeding bird surveys (Mallard). This species was observed flying over the site; no breeding habitat was present on the site.
A4i. Migratory Landbird Stopover Areas	**Not applicable.** While the Subject Lands are located within 2 km of Lake Ontario, the property is excluded from this SWH type given that the lands have been permanently transformed for human services or infrastructure (through the operation of the wastewater treatment plant).
A4ii. Migratory Bat Stopover Areas	**Not applicable.** This is not considered an SWH type under the Province's ecoregional criteria (MNRF 2015).
A4iii. Migratory Butterfly Stopover Areas	**Not Present** As illustrated within **Table 6a (Appendix A)**, this SWH type was not met.
A4iv. Migratory Waterfowl Stopover and/or Staging (Terrestrial)	**None detected.** No evidence of flooded fields was identified on or in the vicinity of the Subject Lands. No aggregations of indicator species were observed on, or adjacent to, the Subject Lands.
A4v. Migratory Waterfowl Stopover and/or Staging (Aquatic)	**None detected.** No aquatic habitat was identified on or adjacent to the Subject Lands that is considered suitable to support large numbers of migratory waterfowl. Furthermore, there are no records of migratory stopover areas on the Subject Lands.

Table 6b: Significant Wildlife Habitat Review (Peel ROP Peel-Caledon Significant Wildlife Habitat Study 2009)

SWH Type	SWH Analysis
A4vi. Migratory Shorebird Stopover Areas	**None detected.** No suitable areas for shorebird migratory stopover areas were identified on the Subject Lands.
A5. Raptor Wintering Areas	**None detected.** Open field habitat and abandoned agricultural fields adjacent to the Subject Lands, do not meet minimum size criteria (>20 ha). Furthermore, indicator species were not observed in sufficient numbers to warrant SWH based on previous studies conducted on the adjacent lands.
A6. Snake Hibernacula	**None detected.** No suitable habitat is present within the Subject Lands.
A7. Bat Maternal Roosts and Hibernacula	**Candidate detected within SWD Community** Candidate bat maternity colonies have the potential to occur within the SWD vegetation community. No bat hibernacula habitat is present.
A8. Bullfrog Concentration Areas	**Not applicable.** The Peel-Caledon SWH Study (2009) incorporated this SWH type into criterion B8ii. This is not considered an SWH type under the Province's ecoregional criteria (MNRF 2015).
A9. Wild Turkey Winter Range	**Not applicable.** No threshold recommended, as Wild Turkey is no longer of conservation concern in Ontario, the Region of Peel or Town of Caledon. This is not considered an SWH type under the Province's ecoregional criteria (MNRF 2015).
A10. Turkey Vulture Summer Roosting Areas	**None detected.** Insufficient information to suggest specific threshold for this criterion; most preferred roosting areas would be protected through SWH Criteria B1 (rare vegetation communities) and B6 (cliffs and caves). This is not considered an SWH type under the Province's ecoregional criteria (MNRF 2015).
Rare vegetation communities or specialized habitat for wildlife	
B1. Rare Vegetation Communities	**None detected.**

Table 6b: Significant Wildlife Habitat Review (Peel ROP Peel-Caledon Significant Wildlife Habitat Study 2009)

SWH Type	SWH Analysis
B2. Forests Providing a High Diversity of Habitats	**Not applicable.** It is assumed that all forests providing a high diversity of habitats will be captured by the suite of significant woodland criteria. This is not considered an SWH type under the Province's ecoregional criteria (MNRF 2015).
B3. Old-Growth or Mature Forest Stands	**Not applicable.** It is assumed that all old-growth and mature forests will be captured by the significant woodlands criteria.
B4. Foraging Areas with Abundant Mast	**None detected.** This is not considered an SWH type under the Province's ecoregional criteria (MNRF 2015).
B5. Highly Diverse Areas	**Not applicable.** The Caledon-Peel SWH study consultant team provided a map to the Town for review regarding the most diverse patches in Caledon / the Region. This is not considered an SWH type under the Province's ecoregional criteria (MNRF 2015).
B6. Cliffs and Caves	**None detected.**
B7. Seeps and Springs	**None detected.** No seeps or springs detected within the SWD vegetation community on the Subject Lands.
B8i. Amphibian Breeding Habitat (Forested Sites)	**None detected.** Presence of vernal pooling within the SWD and FOD vegetation communities are unknown; however, it is unlikely that minimum size criteria is met as no evidence of larger pools were visible within aerial imagery. Due to the location within the Subject Lands adjacent to an actively managed wastewater treatment plant and Avonhead Road, it is unlikely that significance will be met.
B8ii. Amphibian Breeding Habitat (Non-Forested Sites)	**None detected.** Presence of vernal pooling within the SWD and adjacent MAM vegetation communities is unknown; however, it is unlikely that minimum size criteria is met as no evidence of larger pools were visible within aerial imagery.

Table 6b: Significant Wildlife Habitat Review (Peel ROP Peel-Caledon Significant Wildlife Habitat Study 2009)

SWH Type	SWH Analysis
	Due to the location within the Subject Lands adjacent to an actively managed wastewater treatment plant and Avonhead Road, it is unlikely that significance is met.
B9. Turtle Nesting Habitat and Turtle Overwintering Areas	**None detected.** Suitable ecosites are absent from the Subject Lands.
B10. Habitat for Area-Sensitive Forest Interior Breeding Bird Species	**None detected.** Mature forests (>60 years) with interior patch size greater than or equal to 4 ha are not present within the Subject Lands.
B11. Habitat for Open Country and Early Successional Breeding Bird Species	**None detected.** Minimum size criteria was not met (greater than or equal to 10 ha in size).
B12. Habitat for Wetland Breeding Bird Species	**None detected.** No indicator species were recorded.
B13i. Raptor Nesting Habitat (Raptors associated with wetlands, ponds, and rivers)	**None detected.** No Northern Harrier or Osprey nests were detected on, or adjacent to, the Subject Lands (indicator species from the Peel-Caledon study). The habitat size criteria (MNRF 2015) are also not met (i.e., woodland > 30 ha with > 10 ha interior that is 200m from the woodland edge).
B13ii. Raptor Nesting Habitat (Raptors associated with woodland habitats)	**None detected.** No nests or indicator species were recorded on, or adjacent to, the Subject Lands.
B14. Mink, River Otter, Marten and Fisher Denning Sites	**None detected.** Suitable habitat for these species is not present on, or adjacent to, the Subject Lands. This is not considered an SWH type under the Province's ecoregional criteria (MNRF 2015).
B15. Mineral Licks	**Not applicable.** Mineral licks are not recommended as an SWH type for the Region of Peel or

Table 6b: Significant Wildlife Habitat Review (Peel ROP Peel-Caledon Significant Wildlife Habitat Study 2009)

SWH Type	SWH Analysis
	the Town of Caledon. This is not considered an SWH type under the Province’s ecoregional criteria (MNRF 2015).
Species of Conservation Concern	
C1. Species Identified as Nationally Endangered or Threatened by COSEWIC which are not listed as Endangered or Threatened under Ontario’s *Endangered Species Act*	**None detected.** Thorough review of SAR and SAR habitat potential within the Subject Lands is provided within **Table 7** (**Appendix B**). Bank and Barn Swallow were recorded within the Subject Lands; however, no suitable breeding habitat is present. This is not considered an SWH type under the Province’s ecoregional criteria (MNRF 2015).
C2. Species Identified as Special Concern based on Species at Risk in Ontario List that is Periodically updated by OMNR	**None detected.** Thorough review of SAR and SAR habitat potential within the Subject Lands is provided within **Table 7** (**Appendix B**). Incidental observations of Peregrine Falcon were recorded; however, no suitable habitat is present within the Subject Lands.
C3. Species that are listed as Rare (S1-S3) or Historical in Ontario based NHIC	**None detected.**
C4. Species whose populations appear to be experiencing substantial declines in Ontario	**Not applicable.** The Peel-Caledon SWH Study (2009) does not provide a threshold for this criterion due to insufficient information. This is not considered an SWH type under the Province’s ecoregional criteria (MNRF 2015).
C5. Species that have a high percentage of their global population in Ontario and are Rare or Uncommon in the Region of Peel/ Town of Caledon	**Not applicable.** The Peel-Caledon SWH Study (2009) does not provide a threshold for this criterion due to insufficient information. This is not considered an SWH type under the Province’s ecoregional criteria (MNRF 2015).

Table 6b: Significant Wildlife Habitat Review (Peel ROP Peel-Caledon Significant Wildlife Habitat Study 2009)

SWH Type	SWH Analysis
C6. Species that are Rare within the Region of Peel or Town of Caledon, even though they may not be Provincially Rare	**None detected.** Six regionally rare plant species were recorded (as summarized within **Section 4.1** of the report). This is not considered an SWH type under the Province's ecoregional criteria (MNRF 2015).
C7. Species that are subjects of Recovery Programs	**None detected.** This is not considered an SWH type under the Province's ecoregional criteria (MNRF 2015).
C8. Species considered important to the Region of Peel/ Town of Caledon, based on recommendations from a Local Conservation Advisory Committee	**Not applicable.** No Conservation Advisory Committee currently exists in the Region. This is not considered an SWH type under the Province's ecoregional criteria (MNRF 2015).
Animal Movement Corridors	
D. Animal Movement Corridors	**None detected.** Due to the limited abundance of species habitats present on the Subject Lands, no animal movement corridors were identified on the Subject Lands.

Table 7: Species at Risk (SAR) Habitat Potential

Species Name	SARO RANKING	Habitat Preferences	Habitat Potential within Subject Lands?
SAR identified within the background wildlife review (section 3.0)			
Common Nighthawk (*Chordeiles minor*)	Special Concern	Open areas with little to no surrounding vegetation.	No – While nearby lakeshore habitat and pavement areas present, no Common Nighthawk habitat is present within the Subject Lands (**Table 4, Appendix B)**.
Eastern Wood-Pewee (*Contopus virens*)	Special Concern	Deciduous forests and woodlands.	No – Eastern Wood-Pewee were not identified within the Subject Lands during targeted breeding bird surveys (**Table 4, Appendix B).**
Peregrine Falcon (*Falco peregrinus*)	Special Concern	Associated with large riverine and wooded features.	No – While tall buildings and nearby lakeshore habitat are present, no suitable breeding habitat is present within the Subject Lands (**Table 4, Appendix B)**.
Wood Thrush (*Hylocichla mustelina*)	Special Concern	Mature deciduous and mixed forests.	No – Wood Thrush were not identified during targeted breeding bird surveys (**Table 4, Appendix B)**.
Northern Map Turtle (*Graptemys geographica*)	Special Concern	Riverine and lacustrine systems with deep, slow moving sections.	No – aquatic corridors required for movement from potential nesting habitat along beach are not present.
Snapping Turtle (*Chelydra serpentina*)	Special Concern	Open aquatic habitat with slow moving water and muddy substrate	No –small meadow marsh features are present, but do not retain water past July.

Table 7: Species at Risk (SAR) Habitat Potential

Species Name	SARO RANKING	Habitat Preferences	Habitat Potential within Subject Lands?
Monarch (*Danaus plexippus*)	Special Concern	Caterpillars are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats.	No – no large congregations of milkweed were identified within the Subject Lands.
Bank Swallow (*Riparia riparia*)	Threatened	Vertical cliffs or banks along natural bluffs or eroding streamside banks	No – streams or eroding banks are not present. Bank Swallow were observed foraging over the Subject Lands but no breeding habitat is present (**Table 4, Appendix B**).
Barn Swallow (*Hirundo rustica)*	Threatened	Forages in fields, parks and along edge habitats; Nests in anthropogenic structures (barns, sheds, bridges etc.)	No – Barn Swallow were observed foraging over the Subject Lands during targeted breeding bird surveys, however no breeding habitat was identified (**Table 4, Appendix B)**.
Bobolink (*Dolichonyx oryzivorus*)	Threatened	Tall grasslands, undercut pastures, overgrown fields and meadows.	No – While small pockets of cultural meadow habitat present, no Bobolink were identified within the Subject Lands during targeted breeding bird surveys (**Table 4, Appendix B)**.
Chimney Swift (*Chaetura pelagica*)	Threatened	Nest within chimneys and on other vertical surfaces.	No – no Chimney Swifts were identified within the Subject Lands during targeted breeding bird surveys (**Table 4, Appendix B)**.

Table 7: Species at Risk (SAR) Habitat Potential

Species Name	SARO RANKING	Habitat Preferences	Habitat Potential within Subject Lands?
Eastern Meadowlark	Threatened	Tall grasslands, undercut pastures, overgrown fields and meadows.	No – While small pockets of cultural meadow habitat present, no Bobolink were identified within the Subject Lands during targeted breeding bird surveys (**Table 4, Appendix B)**.
Blanding's Turtle (*Emydoidea blandingii*)	Threatened	Open aquatics, usually in large wetlands and shallow lakes.	No –small meadow marsh features are present, but do not retain water past July.
Little Brown Myotis	Endangered	Overwinters in cages and abandoned mines. Roosts in mature deciduous and mixed forests.	Yes – The small SWD vegetation community may support Little Brown Myotis. Targeted surveys required.
Henslow's Sparrow (*Ammodramus henslowii*)	Endangered	Tall grasslands, undercut pastures, overgrown fields and meadows.	No – While small pockets of cultural meadow habitat present, no Henslow's Sparrow were identified within the Subject Lands during targeted breeding bird surveys (**Table 4, Appendix B)**.
SAR identified during ecological field investigations (section 4.0)			
Peregrine Falcon (*Falco peregrinus*)	Special Concern	Associated with large bodies of water and wooded features.	No – while tall buildings and nearby lakeshore habitat are present, they are not present within the Subject Lands. No Peregrine Falcons were identified within the Subject Lands during targeted breeding bird

Table 7: Species at Risk (SAR) Habitat Potential

Species Name	SARO RANKING	Habitat Preferences	Habitat Potential within Subject Lands?
			surveys (**Table 4, Appendix B)**.
Bank Swallow (*Riparia riparia*)	Threatened	Vertical cliffs or banks along natural bluffs or eroding streamside banks	No – streams or eroding banks are not present. Bank Swallows were identified foraging during targeted breeding bird surveys, however no breeding habitat was identified (**Table 4, Appendix B)**.
Barn Swallow (*Hirundo rustica)*	Threatened	Forages in fields, parks and along edge habitats; Nests in anthropogenic structures (barns, sheds, bridges etc.)	No – structures would need to be screened for habitat suitability. Barn Swallows were identified foraging during targeted breeding bird surveys, however no breeding habitat was identified (**Table 4, Appendix B)**.

Appendix C – Agency Correspondence

From:	Park, Olivia
To:	Paudel, Elizabeth
Cc:	Lohnes, Shelley; Dania.Chehab@gmblueplan.ca; Laurie.Boyce@gmblueplan.ca
Subject:	RE: [External] Data Request - GE Booth Lakeview and Clarkson Wastewater Treatment Plants (SAV PN 2003025)
Date:	Wednesday, August 12, 2020 3:59:00 PM
Attachments:	image001.png Figure 1 - Location of SL.pdf Figure 1 - Location of SL (1).pdf

Hello Elizabeth,

Thank you very much for your message. We have two facilities that we are requesting information on – the GE Booth Lakeview wastewater treatment plant (WWTP) and the Clarkson WWTP. Please note they are under the same project number, as we have been retained to complete a fulsome review of both facilities by the Region of Peel. I have filled out the information below and attached approximate Subject Land mapping for both sites.

Detailed list of data requested:

- Savanta requests any and all publicly available ecological data be provided including all survey data specific to the WWTPs (terrestrial and aquatics – e.g., birds, amphibians, reptiles, mammals (including bats), insects, fish, benthics, vegetation, headwater drainage features, etc.)
- Savanta requests any and all publicly available ecological data for the Marie Curtis and Lakeside Parks
- Savanta requests any and all publicly available ecological data for the Jim Tovey Lakeview Conservation Area
- Any other relevant ecological data

Project Name: Two Schedule C Municipal Class EAs and Conceptual Designs
Proponent's Name: Peel Region
User's Name: Savanta Inc. – Environmental Consulting Firm
Intended use and publication: This information will be used to inform Phase 2 Characterization Reports for both WWTPs, in support of a Municipal Class Environmental Assessment.

Please let me know if you have any further questions or concerns!

Thank you very much,

Olivia

SAVANTA
A GEI Company

OLIVIA PARK
Intermediate Ecologist, CERP
Phone: 647.988.2849

From: Paudel, Elizabeth <Elizabeth.Paudel@cvc.ca>
Sent: Wednesday, August 12, 2020 3:46 PM
To: Park, Olivia <opark@savanta.ca>
Cc: Lohnes, Shelley <slohnes@savanta.ca>; Dania.Chehab@gmblueplan.ca; Laurie.Boyce@gmblueplan.ca

Subject: [EXT] RE: [External] Data Request - GE Booth Lakeview and Clarkson Wastewater Treatment Plants (SAV PN 2003025)

Hi Olivia,

Thank you for your email. In order to process the data request, I require the following information:

- Detailed list of data requested
- Map of the study area
- Project name
- Proponent's name
- User's name
- Intended use and publications

Please note that a Data Sharing Agreement will be required and the process can take up to 4 weeks from the date of receipt of the above information.

Regards,

Elizabeth Paudel, MES
Junior Planner (Acting) | Planning and Development Services | Credit Valley Conservation
905-670-1615 ext 236 | 1-800-668-5557
elizabeth.paudel@cvc.ca | cvc.ca

From: Park, Olivia <opark@savanta.ca>
Sent: Tuesday, August 4, 2020 12:48 PM
To: Paudel, Elizabeth <Elizabeth.Paudel@cvc.ca>
Cc: Lohnes, Shelley <slohnes@savanta.ca>; Dania Chehab - GM BluePlan <Dania.Chehab@gmblueplan.ca>; Laurie Boyce - GM BluePlan <Laurie.Boyce@gmblueplan.ca>
Subject: [External] Data Request - GE Booth Lakeview and Clarkson Wastewater Treatment Plants (SAV PN 2003025)

Hello Elizabeth,

Savanta has been retained to complete the ecological components associated with a Municipal Class Environmental Assessment for both GE Booth Lakeview and Clarkson Wastewater Treatment Plants (WWTPs) in the City of Mississauga. We would like to submit a data request to obtain any information associated with the WWTPs and adjacent lands (within 120 m). The Jim Tovey Lakeview Conservation Area is located immediately south of the Booth WWTP, and have read within the Lakeview Connection report that some detailed ecological work has been completed by CVC staff within the Booth WWTP previously.

We are working on preparing a characterization report due the end of the month, so if we can request a rush on this data request that would be appreciated.

Please let me know if you require any further information to process the data request.

Kindest regards,

Olivia

SAVANTA
A GEI Company

OLIVIA PARK
Intermediate Ecologist, CERP
Phone: 647.988.2849

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Cc:	Lohnes, Shelley; Dania.Chehab@gmblueplan.ca; Laurie.Boyce@gmblueplan.ca
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Proponent's Name: Peel Region
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Intended use and publication: This information will be used to inform Phase 2 Characterization Reports for both WWTPs, in support of a Municipal Class Environmental Assessment.

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SAVANTA
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OLIVIA PARK
Intermediate Ecologist, CERP
Phone: 647.988.2849

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Sent: Wednesday, August 12, 2020 3:46 PM
To: Park, Olivia <opark@savanta.ca>
Cc: Lohnes, Shelley <slohnes@savanta.ca>; Dania.Chehab@gmblueplan.ca; Laurie.Boyce@gmblueplan.ca

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- Detailed list of data requested
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- Project name
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Please note that a Data Sharing Agreement will be required and the process can take up to 4 weeks from the date of receipt of the above information.

Regards,

Elizabeth Paudel, MES
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Kindest regards,

Olivia

SAVANTA
A GEI Company

OLIVIA PARK
Intermediate Ecologist, CERP
Phone: 647.988.2849

Robinson, Olivia

From:	Ahmad, Iftekhar <Iftekhar.Ahmad@cvc.ca>
Sent:	Thursday, May 5, 2022 11:53 AM
To:	Benjamin.Peachman@gmblueplan.ca
Cc:	Kilis, Jakub; cindy.kambeitz@peelregion.ca; Laurie.Boyce@gmblueplan.ca; Robinson, Olivia; Lohnes, Shelley
Subject:	[EXT] CVC comments (natural heritage report) - EA 20/010 - EA Phase 3 recommendations for the Clarkson WWTP (GMBP#719051)

EXTERNAL EMAIL

Hi Benjamin,

CVC staff have reviewed the Natural Heritage Characterization Report of the Clarkson Wastewater Treatment Plant prepared by SAVANTA/GEI dated November 2020 and provide these ecology comments for your consideration.

CVC Ecology Comments

1. As is typical, please expand the report to include adjacent lands to 120m beyond the WWTP property (e.g. this is to include ELC and Candidate SWH layers and assessment as documented from the treatment plant property and as gleaned from air photos).

2. Please include the size of all ELC units on Table 2.

3. Please speak to the City of Mississauga's Significant Natural Areas (NAS) which are located within and beyond the property boundaries. Although identified on figures, the form and function of the NAS units is missing from the body of the report.

4. Please also identify the Headwater Drainage Feature (HDF) that flows onto the site from the north (from within the NAS) which is eventually piped through the Plant and discharges (presumably) at Lakeside Creek.

5. Please provide an assessment of the Migratory Bird Stopover Habitat as assessed using the comparative area of the onsite and offsite connected habitat (CVC staff have measured >16Ha woodland area when broadening the assessment to include the adjacent Peel Core Greenlands and onsite NAS). When presenting this analysis in the report, please also make reference to the Peel-Caledon Significant Woodland and Significant Wildlife Habitat Study Report (Peel, 2009).

6. Please speak to whether it is anticipated that the identified regionally rare plant species will be removed/impacted by the proposed expansion - is there an opportunity to relocate species?

7. In terms of the potential wildlife corridors, the report indicates that the roads "likely act as a barrier to movement". While they do pose some hindrances, it is well known that mammals and herptiles do cross roads. That said, numerous deer prints and north/south running deer paths were noted on the property immediately to the north of the Plant and within the north and north western limits of the Plant property. Given the highly trodden (more than a foot wide) path running parallel to the HDF feature (both of which are located along the center of the otherwise vegetated NAS), it can be concluded that this area gets a lot of wildlife foot traffic likely due to the Plant's location between the waterfront area, NAS and Peel Core Greenlands. Of note, numerous racoon prints were also observed along the well-trodden path. Subsequently, it is recommended that the Region seek opportunities to maintain a north/south running greenspace component to their development such that part of the

property can continue to act as a wildlife conduit between the lakefront and northern habitats particularly given the lack of any north/south connecting systems in the vicinity. Maintaining and/or enhancing a degree of wildlife permeability (best efforts) for the site will allow for better landscape level connectivity and geneflow and better prospects for the maintenance of the broader NHS in the long run.

If you have any questions, please contact me.

Thanks,

Best regards,
Iftekhar

I’m working remotely. The best way to reach me is by email or Microsoft Teams.

Iftekhar Ahmad | he/him/his
Planner, Environmental Assessment | Credit Valley Conservation
905-670-1615 ext 296
iftekhar.ahmad@cvc.ca | cvc.ca

View our privacy statement

From: Benjamin Peachman - GM BluePlan <Benjamin.Peachman@gmblueplan.ca>
Sent: Thursday, April 7, 2022 1:37 PM
To: Kilis, Jakub <Jakub.Kilis@cvc.ca>
Cc: cindy.kambeitz@peelregion.ca; Laurie Boyce - GM BluePlan <Laurie.Boyce@gmblueplan.ca>; Robinson, Olivia <orobinson@geiconsultants.com>; Lohnes, Shelley <slohnes@geiconsultants.com>; De Stefano, Matteo <matteo.destefano@cvc.ca>; Cook, Lori <lori.cook@cvc.ca>; Ahmad, Iftekhar <Iftekhar.Ahmad@cvc.ca>
Subject: [External] CVC Meeting Notes - EA Phase 3 recommendations for the Clarkson WWTP (GMBP#719051)

Good afternoon Jakub,

As a record of the meeting held between CVC and Peel Region (including the Region’s consultant team; GM BluePlan and GEI/Savanta) regarding the EA Phase 3 recommendations for the Clarkson WWTP, please see attached for a summary of the collected meeting notes. Feel free to let me know if there are any errors or omissions within the document.

In addition, as per CVC’s request, please follow the link below for the site’s Natural Heritage Characterization Report by GEI/Savanta.
https://savanta.egnyte.com/dl/oSeufv21ih (Password: KMm4ct6B)

Thanks,

Benjamin Peachman, P. Eng.
Infrastructure Planning

GM BluePlan Engineering Limited
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t: 416.703.0667 ext. 7216 | c: 437.328.5016
benjamin.peachman@gmblueplan.ca | www.gmblueplan.ca

From:	Laurie Boyce - GM BluePlan
To:	Dania Chehab - GM BluePlan; Park, Olivia
Cc:	Jasmine Biasi - GM BluePlan
Subject:	[EXT] FW: CVC Comments - Notices of Commencement - GE Booth WWTP EA (EA 20/009) and Clarkson WWTP EA (EA 20/010)
Date:	Monday, August 24, 2020 9:44:43 AM
Attachments:	Lakeside FMH-Tile 1 (17x11).pdf Serson FHM-Tile 1 (17x11).pdf Applewood FHM-Tile 1 (17x11).pdf

Comments from CVC on natural features – lots of mitigation will be necessary.

We will be arranging a meeting with them soon.

Laurie Boyce, B.Sc., M.A.
Strategic Planning and Project Advisor

GM BluePlan Engineering Limited
1266 South Service Rd, Unit C3-1 | Stoney Creek, ON | L8E 5R9
t: 905.643.6688 ext. 6334 | c: 416.471.0528
laurie.boyce@gmblueplan.ca | www.gmblueplan.ca

From: Kilis, Jakub <Jakub.Kilis@cvc.ca>
Sent: Friday, August 21, 2020 3:03 PM
To: Laurie Boyce - GM BluePlan <Laurie.Boyce@gmblueplan.ca>
Cc: cindy.kambeitz@peelregion.ca; Stewart, Rebecca <Rebecca.Stewart@cvc.ca>; Cook, Lori <lori.cook@cvc.ca>
Subject: CVC Comments - Notices of Commencement - GE Booth WWTP EA (EA 20/009) and Clarkson WWTP EA (EA 20/010)

Hi Laurie,

It is the understanding of CVC staff that the Region of Peel has initiated two Schedule 'C' Municipal Class Environmental Assessments (EAs) for the G.E. Booth Wastewater Treatment Plant (WWTP) and the Clarkson WWTP to identify the preferred solutions for wastewater treatment and biosolids management in the Region. We further understand that these two Class EA studies are integrated, as the preferred solutions will impact both facilities and that the Class EA process will evaluate alternatives to address capacity for future growth across the Region, to establish servicing, treatment and biosolids policy, and incorporate factors such as energy efficiency, climate resiliency, lifecycle planning and operational flexibility.

We have had an opportunity to review the Notices of Commencement and associated study areas and offer the following preliminary comments for your consideration:

General

1. As per the joint Notices of Commencement and the integrated nature of the EAs, CVC is providing our comments for both projects within this correspondence. The

correspondence is separated by location below.

GE Booth WWTP (CVC File No. EA 20/009)

2. Site Characteristics:
    a. REGULATED AREA - The subject property is located partially within the Regulated Area. A permit may be required from CVC for any grading or construction works within this area.
    b. WATERCOURSE - The subject property is traversed by Applewood and Serson Creeks. Any alteration to a watercourse requires a permit issued by CVC. Our concerns for new construction would include maintaining setbacks to address channel bank erosion, sediment control during construction, and to ensure no degradation to water quality.
    c. FLOODPLAIN - The subject property is located partially within the Regulatory Storm Floodplain. A permit may be required from CVC for any construction activity in this area. Our primary concern is the protection of life and property from the flood hazard. We have specific criteria and requirements for construction in the floodplain.
    d. VALLEY SLOPE - Based upon our existing mapping, the subject property is traversed by valley slopes. CVC does not support construction on a valley slopes, and typically requires setbacks from the top of slope for new construction or grading. This includes any overhangs or cantilevered structures and is to ensure that new development is protected from potential slope instability or erosion and to protect the environmental integrity of the valley system.
    e. CREDIT RIVER WATERSHED NATURAL HERITAGE SYSTEM - A portion of the subject property is located within the Credit River Watershed Natural Heritage System (CRWNHS). The CRWNHS consists of High Functioning and Supporting terrestrial and aquatic natural heritage features, buffers, and complementary natural heritage areas (Centres for Biodiversity). Based on a watershed scale, the CRWNHS is intended to support Provincial, Regional and local municipal natural heritage systems as identified in their respective Strategies or Plans. As a watershed based management agency and landowner, CVC intends to implement the CRWNHS by using it as a strategic program guidance tool; to inform further development of CVC projects and policies; to assist CVC staff in providing technical advice to landowners and stakeholders at a watershed scale; and to promote a more consistent approach to natural heritage system planning across CVC's jurisdiction. For more detailed information or questions please contact the undersigned to discuss further.
    f. WETLAND - The subject property contains wetlands. Wetlands are diverse and productive ecosystems that are hydrologically significant to a watershed. They store water during flood events and provide low flow augmentation during dry periods. The vegetation and organic soils of wetlands aid in the filtration of nutrients and sediments that enhances water quality and assists in the maintenance of cool water temperatures. Wetlands also provide habitat for diverse and uncommon species of flora and fauna. CVC does not support new development in wetlands, including buildings, structures, driveways, septic

systems, ponds, etc. An Environmental Impact Study Report may be required for new development located adjacent to wetlands, depending on potential impacts.

g. MUNICIPAL GREENLANDS - The subject property is partially within an area designated as Core Greenlands by the Region of Peel. It is the policy of the Region of Peel to protect the form and function of these natural areas. CVC provides technical support to the Region with respect to delineation of natural features and reviewing potential impacts from subsequent development within and adjacent to these lands. We suggest you discuss internally at the Region if you have questions on this matter.
h. LAKE ONTARIO SETBACKS - The subject property is located adjacent to Lake Ontario, and is therefore subject to the Lake Ontario Shoreline flooding and erosion hazards. In this regard, our primary concerns are related to ensuring that all new development is located outside of the hazards associated with the lake, including the 100 year erosion limit, the 100 year flood limit, wave uprush and stability hazards associated with the slope.
i. SOURCE WATER PROTECTION - The subject property may be subject to the Approved Source Protection Plan: CTC Source Protection Region. We recommend that you contact Therese Estephan, Risk Management Official for further information with respect to these policies to establish if and how the Protection Plan may apply. You may also refer to the CTC Source Water Protection website www.ctcswp.ca
j. MISSISSAUGA NATURAL HERITAGE SYSTEM & NATURAL AREAS SURVEY - The subject property is located within the City of Mississauga's Natural Heritage System and Urban Forest. The City's Natural Heritage System is made up of Significant Natural Areas, Natural Green Spaces, Special Management Areas, Residential Woodlands and Linkages as described in the City of Mississauga's Official Plan. The subject property is also located within the City of Mississauga's Natural Areas Survey and designated as LV1 and LV2. CVC provides technical support to the City of Mississauga with respect to the identification and delineation of natural heritage features or areas as well as reviewing proposals for potential negative impacts to the natural features or areas. For more detailed information or any questions on this matter we suggest you contact, the City of Mississauga to discuss further.

3. An increase in impervious area due to any proposed works being completed will require a stormwater management (SWM) investigation that adheres to all of CVC's criteria and applicable Provincial criteria. Therefore, please apply CVC's Stormwater Management Criteria for any proposed works, as applicable. Provide consideration and opportunity for a stormwater management strategy that incorporates a treatment train approach and the use of Low Impact Development (LID) measures where feasible. Further requirements may be identified through Section 4.0 of the Region of Peel's Draft Public Works Stormwater Design Criteria and Procedural Manual (June 2019). Please review and apply as appropriate in order to design the optimal SWM strategy.

4. Please find CVC's floodplain mapping for Applewood and Serson Creeks attached. CVC recommends that all proposed permanent infrastructure be located outside of the flood and erosion hazards associated with the regulated watercourses and Lake Ontario hazards. Please note that the regulatory floodplain is the greater of the 100-year and regional flood hazard.

5. The Lake Ontario Shoreline Hazards report completed by Shoreplan Engineering Limited (September 2005), provides a determination of the erosion hazard and flood hazard associated with Lake Ontario adjacent to the WWTP location. Please refer to Appendix B within this report. CVC is currently in the process of conducting a peer review of this report. The results of this peer review will be made available to the public soon and may impacts expectations within the report.

6. Based on today's conditions, the channel that flows under the access road and then under the WWTP is considered to be a watercourse. This is the baseflow of Serson Creek. In the future condition, as part of the ongoing projects adjacent to the GE Booth WWTP, Serson Creek baseflow will be re-routed and only storm water flow will drain through this culvert and under the WWTP. The proposed timing of the Region's project(s) compared to the timing of the Serson Creek re-alignment will need to be considered as part of this study process.

7. Note that there will be ongoing discussions with the adjacent development to the west of Serson Creek (Lakeview Village) in order to determine the ultimate floodplain (associated with Serson Creek) along both the development lands and the WWTP property. Ensure consultation is being maintained in order to move forward with the Environmental Assessment of the Wastewater Treatment Plant.

8. The subject site is located in the vicinity of the Lake Ontario Shoreline and as such the site's natural areas provide important ecological functions in terms of supporting local and migratory wildlife and movement corridor functions. Sensitive terrestrial woodland habitat occupies portions of the immediate site and surrounding lands. Species at Risk have also been located onsite and on adjacent lands. That said project planning and implementation will need to be mindful of associated construction and disturbance setbacks for each specific SAR and identified terrestrial features. Further, timing, duration, location of staging areas, and points of access to the works will need to be well thought out in order to minimize impacts and footprint at the implementation stage.

9. It is understood that a collaborative approach to development has been established with the adjacent development to the west (Lakeview Village) which is also favourable and beneficial from a regional development and ecosystem function perspective. All in all, a sensitive and integrative approach for planning and implementation will be key.

10. Please see below for a list of known site sensitivities/constraints. This is a preliminary list and will be discussed further at the project commences:

    Aquatics

    a. Fish Habitat – Lake Ontario to the south, Serson Creek to the west, and

Applewood Creek to the east.

b. Applewood Creek is comprised of small warmwater fish habitat, estuarine fish community.
c. Serson Creek is an engineered watercourse with an unclassified fish community under its current condition. As rehabilitation of this feature is in the planning stages, please address how this endeavor fits in with any proposed WWTP expansion timeline.

Terrestrial

d. Significant Natural Areas/Significant Woodlands LV1 and LV2 are located adjacent to and partially within the project area.
e. There is a small significant ground water recharge area within the eastern most property boundary near the confluence of Applewood Creek and Lake Ontario (to the west of Applewood Creek).
f. The entire surrounding area is comprised of a highly vulnerable aquifer.
g. CVC property exists to the south west of the project area (north east of and along the abandoned power plant intake channel.
h. Excepting to the immediate north, the property is entirely surrounded by SWH including all woodlands within the site boundary. The woodland could potentially support habitat for endangered bats.
i. Two large wetlands have recently been constructed to the south of the project area by CVC/TRCA as part of LWC project and meet PSW criteria.
j. Colonial Waterbird Nesting areas have been identified in the vicinity of the subject property.
k. The following species of concern have been identified in the vicinity of the project site: American Eel, Butternut, Barn Swallow, Bank Swallow and Peregrine Falcon, Bobolink, Eastern Meadowlark, Little Brown Myotis, Monarch butterfly, Blanding's Turtle and Chimney Crayfish.

11. As per usual, please contact, MNRF/MECP and DFO directly regarding project specific concerns regarding potential Species at Risk or alteration to fish habitat, and any associated mitigation or permit requirements.

Opportunities for coordination with Jim Tovey Lakeview Conservation Area (JTLCA) Project

12. The Jim Tovey Lakeview Conservation Area (JTLCA) is a joint project effort between the Region of Peel, Credit Valley Conservation (CVC) and the Toronto and Region Conservation Authority (TRCA). This project is currently underway and is located adjacent to the G.E. Booth Wastewater Treatment Plant (WWTP). The JTLCA project includes the creation of a new 26 ha conservation area along the eastern Mississauga shoreline. The intended purpose of this project is to enhance and re-create natural coastal habitats, build a natural park that encourages public access, use, and exploration along the waterfront, and facilitate sustainable city building. Some of the completed works include the completion of the east and western Serson wetlands, approximately 300 m of the Serson channel extension, which includes the outlet to Lake Ontario, construction of the Applewood wetland, the installation of aquatic plants in the Serson wetlands, the construction of confinement berms, earth filling,

completion of approximately 750 m of armourstone revetment, fine grading, topsoiling, seeding and terrestrial planting of several confinement cells and interim protection of rubble confinement berms for example.

-

Based on the close proximity of the G.E. Booth WWTP to this project, and with the commencement of the G.E. Booth WWTP Environmental Assessment, TRCA and CVC staff are interested in opportunities to coordinate efforts with the Region of Peel that would complement on-going work at the JTLCA. Given that the EA has just commenced, it is unclear at this time what the preferred solutions will be and how those solutions will impact the plant and surrounding area, if at all. As such, if there are any opportunities to further enhance the adjacent site staff are open to those discussions and would appreciate any future support.

-

Notwithstanding, as this project proceeds, it is recommended that opportunities to improve the local viewscapes be incorporated into the expansion project. The current park design screens the plant from conservation area visitors using a system of planted berms that also provide habitat. To augment the visual design and habitat elements of the park, please consider including the following commitments in the EA that relate to detailed design:

- Constructing a living wall around the perimeter of the plant at locations that are feasible with landscaping and plantings along the east side of Serson Creek to improve the viewscape for the future Lakeview Village residents.
- Increased plantings at the JTLCA as part of the public realm design and on the east portion of the G.E. Booth WWTP may provide additional screening and limit public access.

Additionally, opportunities to improve stormwater quality draining from the site, such as the installation of an oil-grit separator to treat discharge collected within the G.E. Booth WWTP from the existing storm sewer pipe that will outlet into the newly constructed Applewood wetland should be considered.

Staff will be happy to provide further information as it is requested and as the EA proceeds.

Clarkson WWTP (CVC File No. EA 20/010)

13. Site Characteristics:
    a. CREDIT RIVER WATERSHED NATURAL HERITAGE SYSTEM - A small portion of the subject site is located within the Credit River Watershed Natural Heritage System (CRWNHS) and the site is adjacent to other portions of the CRWNHS. The CRWNHS consists of High Functioning and Supporting terrestrial and aquatic natural heritage features, buffers, and complementary natural heritage areas (Centres for Biodiversity). Based on a watershed scale, the CRWNHS is intended to support Provincial, Regional and local municipal natural heritage systems as identified in their respective Strategies or Plans. As a watershed based management agency and landowner, CVC intends to implement the

CRWNHS by using it as a strategic program guidance tool; to inform further development of CVC projects and policies; to assist CVC staff in providing technical advice to landowners and stakeholders at a watershed scale; and to promote a more consistent approach to natural heritage system planning across CVC's jurisdiction. For more detailed information or questions please contact the undersigned to discuss further.

b. MISSISSAUGA NATURAL HERITAGE SYSTEM & NATURAL AREAS SURVEY - The subject property is located adjacent to the City of Mississauga's Natural Heritage System and Urban Forest. The City's Natural Heritage System is made up of Significant Natural Areas, Natural Green Spaces, Special Management Areas, Residential Woodlands and Linkages as described in the City of Mississauga's Official Plan. The subject property is also located adjacent to the City of Mississauga's Natural Areas Survey and designated as SD4 and SD7. CVC provides technical support to the City of Mississauga with respect to the identification and delineation of natural heritage features or areas as well as reviewing development proposals for potential negative impacts to the natural features or areas. For more detailed information or any questions on this matter we suggest you contact, the City of Mississauga to discuss further.

c. SOURCE WATER PROTECTION - The subject property may be subject to the Approved Source Protection Plan: CTC Source Protection Region. We recommend that you contact Therese Estephan, Risk Management Official for further information with respect to these policies to establish if and how the Protection Plan may apply. You may also refer to the CTC Source Water Protection website www.ctcswp.ca

14. An increase in impervious area due to any proposed works being completed will require a stormwater management (SWM) investigation that adheres to all of CVC's criteria and applicable Provincial criteria. Therefore, please apply CVC's Stormwater Management Criteria for any proposed works, as applicable. Provide consideration and opportunity for a stormwater management strategy that incorporates a treatment train approach and the use of Low Impact Development (LID) measures where feasible. Further requirements may be identified through Section 4.0 of the Region of Peel's Draft Public Works Stormwater Design Criteria and Procedural Manual (June 2019). Please review and apply as appropriate in order to design the optimal SWM strategy.

15. Please find CVC's floodplain mapping for Lakeside Creek attached. CVC recommends that all proposed permanent infrastructure be located outside of the flood and erosion hazards associated with the regulated watercourses. Please note that the regulatory floodplain is the greater of the 100-year and regional flood hazard. Further, the City of Mississauga is currently developing the Southdown District Stormwater Servicing and Environmental Management Plan which considers a new open by-pass channel for Lakeside Creek through the Clarkson WWTP. Please ensure proper coordination between the two studies, as required.

16. The subject site is located in the vicinity of the Lake Ontario Shoreline and as such the

site's natural areas provide important ecological functions in terms of supporting local and migratory wildlife and movement corridor functions. Sensitive terrestrial woodland habitat occupies portions to the northern and southern limits of the study area. Species at Risk have been located onsite and on adjacent lands. That said project planning and implementation will need to be mindful of associated construction and disturbance setbacks for each specific SAR and identified terrestrial features. Further, timing, duration, location of staging areas, and points of access to the works will need to be well thought out in order to minimize impacts and footprint at the implementation stage.

17. Please see below for a list of known site sensitivities/constraints. This is a preliminary list and will be discussed further at the project commences:

    Aquatics

    a. Fish Habitat – Lake Ontario to the south, Lakeside Creek.
    b. Lakeside Creek, located just south of the plant, is comprised of an intermittent warm water creek

    Terrestrial

    c. Significant Natural Areas SD4 and SD7 are located adjacent to and partially within the project area.
    d. Significant Natural Area SD7 is located along the waterfront along the southern limits of the study area and is comprised of cultural woodland, cultural meadow and deciduous forest ecosites.
    e. A portion (fingerlike projection) of SD4 extends onto the northern limits of the site and is comprised of cultural woodland and cultural savannah ecosites.
    f. The entire surrounding area is comprised of a highly vulnerable aquifer.
    g. Significant Wildlife habitat occurs along the southern waterfront limits of the property as well as the northern limits of the property boundary.
    h. The site is encompassed by Credit River Natural Heritage System along the Lake Ontario Shoreline, and the Peel Greenlands System to the west and north.
    i. The following species of concern have been identified in the vicinity of the project site: Peregrine Falcon, Bobolink, Eastern Meadowlark, Little Brown Myotis with Peregrine Falcon observed hunting within the property boundary.

18. The following general management directions have been identified fort his site*: Increase habitat diversity and improve habitat quality for migratory landbirds, investigate opportunities to improve north-south terrestrial connectivity to connect the Lake Ontario shoreline to the rail line and beyond.*

19. As per usual, please contact, MNRF/MECP and DFO directly regarding project specific concerns regarding potential Species at Risk or alteration to fish habitat, and any associated mitigation or permit requirements.

Given CVC's interest staff would like to be kept informed of future meetings and proceedings throughout the EA processes. We also request to be invited to participate on any Technical Advisory Committee(s) that may be formed for these EAs. Please forward any information or reports when available to ensure that this Authority's policy and program interests are reflected in the planning and design components for this project.

Please let me know if you have any questions about our comments above,
Jakub

Jakub Kilis, RPP
Manager, Infrastructure and Regulations | Credit Valley Conservation
905-670-1615 ext 287 | C: 647-212-6554 | 1-800-668-5557
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Appendix A:

Natural Heritage Reports

A2: Natural Heritage Impact Assessment Report

GEI Consultants
Savanta Division

Impact Assessment Report

Clarkson Water Resource Recovery Facility
Region of Peel, Mississauga, Ontario

OCTOBER 2022

Impact Assessment Report

Clarkson Water Resource Recovery Facility
Mississauga, Ontario

REPORT PREPARED FOR
The Region of Peel
C/O GM BluePlan
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Stoney Creek, ON
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REPORT PREPARED BY
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Markham, ON
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OCTOBER 2022

GEI FILE: 2003025

TABLE OF CONTENTS

1.0 INTRODUCTION

GEI Consultants Ltd., Savanta Division (GEI) was retained by the Region of Peel and GM BluePlan to prepare an Impact Assessment to understand whether any of the identified candidate and confirmed natural heritage features and functions found within the Clarkson Water Resource Recovery Facility (Clarkson WRRF) would be impacted as a result of the proposed expansion. A Municipal Class Environmental Assessment (Schedule C) is required to inform capacity expansion opportunities.

The property, herein referred to as the Subject Lands, is located north of the intersection of Lakeshore Road West and Avonhead Road, west of Southdown Road and north of Lake Ontario in Mississauga, Ontario (**Figure 1**, **Appendix A**). The Subject Lands currently host a wastewater treatment plant facility and is surrounded by commercial/industrial land-uses. Immediately south of Lakeshore Road west is Lakeside Park, which borders Lake Ontario.

GEI prepared a Preliminary Natural Heritage Characterization Report (October 2022; herein referred to as the Characterization Report) to assess the presence and extent of natural heritage features and functions within the Subject Lands. The Characterization Report was based on a mixture of secondary source information and ecological surveys that were completed in 2020 and 2022.

The following natural heritage features were identified within the Subject Lands in the Characterization Report:

- Two non-provincially significant wetlands;
  - Mineral Meadow Marsh (MAM2)
  - Green Ash Mineral Deciduous Swamp (SWD2-2)
- Candidate Significant Wildlife Habitat (SWH) for Bat Maternity Colonies within a SWD2-2 community;
- Candidate habitat for endangered species (Little Brown Myotis - *Myotis lucifugus*; and
- Indirect fish habitat.

Detailed investigations are required to confirm whether or not the SWH and/or Species at Risk (SAR) habitat may be present within the SWD2-2 vegetation community. Until detailed investigations are completed, the SWD2-2 community is considered a candidate Significant Natural Areas. A portion of the City of Mississauga's NAS was identified along the northern property boundary of the Subject Lands. The NAS was identified as part of a cultural meadow community (CUM1-1). This CUM1-1 vegetation community contained four Category 1 invasive species. No SAR or SWH were identified in association with these habitats. These areas should not be considered part of the City's Significant Natural Areas, given the absence of criteria identified within Chapter 20 of their Official Plan (2021 Office Consolidation). Under the City of Mississauga Official Plan, candidate SWH and SAR habitat may be present within the SWD2-2 and thus, this community could be considered a Significant Natural Area.

Under the Peel Region Official Plan (2021 Office Consolidation), the wetland communities (MAM2, SWD2-2) are considered both key natural heritage features and key hydrologic features. Moreover, the SWD2-2 community also contains candidate SWH and SAR habitat and thus, is considered a candidate key natural heritage feature.

The Subject Lands also contains two regulated wetland community types (SWD2-2, MAM2). One headwater drainage feature (HDF) with a Conservation management recommendation was identified within the northern portion of the Subject Lands, before being piped through the facility.

All natural heritage features (provincial, regional and local significance) are identified on **Figure 2**, **Appendix A**.

2.0 PROPOSED REDEVELOPMENT STRATEGY

The Subject Lands currently hosts an existing, active water resource recovery facility. The Region's Growth Management Process and 2020 Water and Wastewater Master Plan identified that there will be significant growth across the Region of Peel. With this approved growth to year 2041 and vision for growth beyond 2041, additional treatment capacity is required to meet the needs of the Region of Peel and to continue to protect the natural environment.

The Clarkson Water Resource Recovery Facility is proposed to be expanded from 350 MLD to 500 MLD. In addition to the increased wastewater treatment capacity, the expansion is proposed to include biosolids management. The overall preferred design concept includes an expansion of the wastewater treatment facility using the Biological Nutrient Removal (BNR) process, an expansion of the existing digestion system and construction of a new thermal drying facility to provide biosolids management, and a diversified approach to the biosolids management end uses to ensure operational flexibility and redundancy. The existing chlorination and dechlorination disinfection system and plant outfall are proposed to be maintained with additional chemical dosing provided to treat the additional flows.

The following new infrastructure is proposed to support and expand the existing functions of the facility:

- Plant 3 Aeration tanks;
- Plant 3 Blower building;
- Plant 3 Primary clarifiers;
- Plant 3 Secondary clarifiers;
- Sidestream treatment buildings and reactors;
- Six anaerobic digesters;
- Biosolids Drying Facility;
- Energy Centre;
- Headworks facility; and
- Additional transformers, sewers, channels, manholes and roadways.

The proposed site plan is shown on **Figure 3** (**Appendix A**).

3.0 IMPACT ASSESSMENT, AVOIDANCE AND MITIGATION MEASURES

The Characterization Report (October 2022) identified several provincial, regional and locally significant natural heritage features within the Subject Lands. This impact assessment will assess the potential effects on these natural heritage features and functions that could occur over various periods of time (short or long-term) following the implementation of the redevelopment plan (as shown on **Figure 3**, **Appendix A**).

The potential direct and indirect effects of the proposed redevelopment and a summary of general recommended mitigation and restoration strategies are provided below.

3.1 Non-Provincially Significant Wetlands

Two wetland communities were identified within the Subject Lands: MAM2 and SWD2-2. The MAM2 communities were described within the Characterization Report as being “frequently dominated by European Reed, with occasional herbaceous associations of Creeping Bentgrass, Purple Loosestrife, Bittersweet Nightshade and Riverbank Grape”. The SWD2-2 community was described as containing “many dead or dying Green Ash” and an understory of occasional occurrences of Green Ash saplings and European Buckthorn. No surface water was observed within any wetland features during summer botanical investigations.

0.15 ha of MAM2 habitat will be permanently removed as a result of the proposed redevelopment strategy to accommodate portions of the new site access road, digesters and biosolid dryers. Temporarily alteration of the MAM2 habitat will also occur to facilitate the construction of the site access roads and installation of an underground concrete encased power distribution system. The exact footprint of temporary disturbance has not been finalized; however, consideration to minimize the extent of grading and alteration within the retained portions of the MAM2 communities will be undertaken. Areas of temporary disturbance will be revegetated with native seed mix following grading activities to avoid additional loss of wetland. No candidate SWH or SAR habitat was identified within these MAM2 units. No removal of SWD2-2 habitat is proposed as a result of the proposed redevelopment strategy. Several site orientations were considered to accommodate the necessary expansion of the facility to meet ongoing Regional targets, while working to preserve existing natural heritage features and functions. Previous concepts reviewed by GEI included the removal of the SWD2-2 to allow for a different site access; however, this has since been adjusted to avoid alteration within this habitat. Given the abundance of invasives within the MAM2 communities, it was determined that the removal of a small amount of wetland was necessary. The extent of wetland removals was reduced to the extent feasible, while still meeting the plant’s capacity requirements.

Meadow marsh habitat will be recreated within the Subject Lands to ensure that no loss in wetland habitat occurs on site. The created wetlands will be planted with a variety of native plant species to provide increased wildlife function and habitat availability to terrestrial and semi-aquatic species, when compared to the existing riparian communities which are largely characterized by features dominated by invasive European Reed and Purple Loosestrife. A conceptual restoration plan for the created wetlands is provided within **Section 4**.

To mitigate the removal of the wetland features, wildlife rescues will be completed within all wetland features prior to their removal, as a precautionary approach. Removals should occur during the summer months when the features are dry to avoid dislodgement of sedimentation to downstream habitats. Opportunities for phasing will be considered to recreate wetlands ahead of the removal of existing wetlands within the Subject Lands to maintain functionality on the Subject Lands and to keep all rescued wildlife within the Subject Lands boundary. Relocation of wildlife will also be dependent on MNRF's permitting requirements.

Erosion and sediment control (ESC) measures should be installed along the boundary of the retained features to avoid negative impacts to the retained portions of the wetlands. ESC measures should be installed throughout construction to ensure that they are functioning as intended. Spill prevention and response measures should be enacted.

It is recognized that CVC recommends a 10 m setback is applied to non-provincially significant wetlands (in accordance with Section 6.2.1 of their Watershed Planning and Regulation Policies (2010). Given that this application is in support of a redevelopment project, some of these setbacks are not achievable. Where feasible, buffers will be applied to retained features in areas that are not currently developed. A 10 m native vegetated buffer will be created surrounding the created wetland.

With the implementation of the mitigation efforts and associated wildlife rescues of the features containing wildlife species, no negative impacts are expected. The created wetlands will increase native plant diversity within the site, while working to replicate the existing functions of the MAM2 communities on the property.

3.2 Indirect Fish Habitat

No permanent or intermittent watercourse features are present within the Subject Lands. One seasonal HDF was identified within the northern portion of the property. The HDF enters the Subject Lands from the adjacent northern land before flowing through a cultural meadow community, and then being piped underneath the existing facility. It is likely that this feature contributes allochthonous materials and flows to downstream habitats (Lakeside Creek).

A Conservation management recommendation will ensure that valued functions of the HDF are retained on the landscape; however, maintenance in place is not warranted given that the hydrology and the feature itself have been subject to several modifiers (e.g., downstream modification, existing road crossing). The feature also contains invasive European Reed. The upstream portion feature will be maintained on the landscape; however, the downstream extent of the feature will be removed and piped into the existing piped feature. Given that the downstream extent of the feature has previously been altered to facilitate the existing facility footprint and the feature is not identified as a regulated watercourse by CVC, modification of the downstream extent of the HDF is permitted, provided that flows to downstream receiving habitats are maintained. All flows will be conveyed via a pipe into the existing piped feature to maintain conveyance of flows and allochthonous materials to downstream habitats. There is a possibility in the future that this feature may be re-routed to an upgraded storm sewer along Avonhead Road since the pipes within the facility are currently undersized and cannot convey the 10-year flow, as discussed within the Southdown District Stormwater Servicing and Environmental Management Master Plan (T.Y. Lin 2022). Impacts associated with this rerouting should be reviewed as part of the upgraded storm sewer application.

The receiving watercourse downstream (Lakeside Creek) is approximately 190 m in length and drains into Lake Ontario. This HDF is expected to have relatively limited effect on overall fish habitat within such a short stretch of watercourse, particularly given the highly seasonal nature of the HDF. Removal of the feature should be completed when it is dry to avoid mobilization of sedimentation to receiving habitats.

Provided the above noted mitigative measures are enacted and monitored, no negative impacts are expected as a result of the proposed redevelopment strategy.

3.3 Candidate Significant Wildlife Habitat

Candidate SWH habitat for Bat Maternity Roosting was identified within the SWD2-2 community. No detailed assessments were completed to determine whether suitable habitat is present, or whether SWH indicator species were found within the feature.

No removal of the SWD2-2 community is proposed; rather, the feature will be retained in place. The existing site access road will be maintained and will continue to run south along the edge of the feature. Where possible, opportunities to plant buffer plantings surrounding the vegetation community on the east and south will be explored. Buffer plantings would provide further enhancement to the candidate habitats. The installation of ESC measures will work to further protect the feature during construction.

The existing SWD2-2 community is invaded by European Buckthorn, given that the ash trees within the community were impacted by Emerald Ash Borer. It is likely that this community will continue to decline in ecological function as the invasive European Buckthorn continues to establish and the native Green Ash trees continue to die as a result of the Emerald Ash Borer.

Given the existing anthropogenic location of the SWD2-2 community, any wildlife in this feature would adjust to the existing urban level of background noise and interference associated with existing industrial development and facility’s activity.

No negative impacts are expected to candidate SWH as a result of the proposed redevelopment strategy.

3.4 Candidate Species at Risk Habitat

Candidate SAR habitat associated with Little Brown Myotis was identified within the SWD2-2. This habitat is currently constrained on three sides with Avonhead Road (west), commercial parking lot (north) and a site access road (south). No targeted surveys have been completed within the SWD2-2 community to determine whether Little Brown Myotis and/or suitable SAR bat habitat is present within the feature. This vegetation community is quite disturbed given the abundance of dying Ash trees and prevalence of invasive European Buckthorn.

No removal of the SWD2-2 community is proposed; therefore, no negative impacts to candidate habitat are predicted. The existing site access will be maintained and, where feasible, buffer plantings will be provided surrounding the existing feature to further enhance the feature and its potential functions. The installation of ESC measures will work to further protect the feature during construction.

Given the existing anthropogenic location of the SWD2-2 community, any wildlife in this area is expected to have generally adjusted to the existing urban level of background noise and interference associated with existing industrial development and facility's activity.

No negative impacts to candidate SAR (Little Brown Myotis) are predicted as a result of the proposed redevelopment strategy.

3.5 City of Mississauga Official Plan (2021 Office Consolidation)

One candidate Significant Natural Area was identified within the Subject Lands given the candidate SWH and Habitat for Endangered Species. The candidate Significant Natural Area was associated with the SWD2-2 community.

Please refer to **Sections 3.3 and 3.4** for impacts, mitigation and restoration measures for candidate SWH and SAR habitat. No negative impacts are expected as a result of the proposed site development, so long as the above noted mitigative and restorative measures are enacted.

3.6 Region of Peel Official Plan (2021 Office Consolidation)

Several Key Natural Heritage and Hydrologic Features were identified within the Subject Lands:

- Non-provincially significant wetlands (MAM2, SWD2-2)
- Candidate SWH (Bat Maternal Roosts) and Habitat for Endangered Species (Little Brown Myotis) within the SWD2-2 community

Please refer to **Sections 3.1, 3.3 and 3.4** for impacts, mitigation and restoration measures for wetlands, candidate SWH and Candidate SAR habitat. No negative impacts are expected as a result of the proposed site development, so long as the above noted mitigative and restorative measures are enacted.

The following locally or regionally rare species will be removed as a result of the proposed redevelopment:

- Common Bedstraw (*Galium aparine*; R4 (native species locally rare) in Peel, U (uncommon native species) in the GTA, L in CVC/Peel) – found within the central cultural meadow (CUM1) community where a portion of the access road is proposed;
- Peach-leaved Willow (*Salix amygdaloides*; R6 in Peel, X (common native species or an introduced species that is present) in the GTA, L in CVC/Peel) – found within the western CUM1 near where the additional digesters and access road are proposed;
- Sandbar Willow (*Salix interior*; R5 in Peel, X in the GTA, L in CVC/Peel) – found within the developed/disturbed (DEV/DIST) area where Plant 3 expansions are proposed;
- White Spruce (*Picea glauca*; R3 in Peel, X, in the GTA, L in CVC/Peel) and Red Pine (*Pinus resinosa*; R1 in Peel, R (rare native species) in the GTA, R in CVC/Peel) – scattered plantings throughout the site; and
- Old Field Aster (*Symphyotrichum pilosum var. pilosum* ; R1 in Peel, R in the GTA, RL in CVC/Peel) – found within the DEV/DIST areas of the site and within portions of the CUM1 communities.

All species have low to medium coefficients of conservation except for Red Pine (coefficient of conservation = 8). It is likely that the White Spruce and Red Pine were cultivated and planted within the facility given their scattered plantings; they are common species associated with landscaping plans. Given that these species are relatively common and do not have high coefficients of wetness, transplanting/salvage is not warranted.

The proposed redevelopment is in alignment with Chapter 2 (The Natural Environment) of the Region's Official Plan.

3.7 CVC – Ontario Regulation 160/06

Two regulated wetland communities (MAM2 and SWD2-2) were identified within the Subject Lands. No other regulated features were identified within the property; however, one Conservation HDF was identified.

Please refer to **Sections 3.1 and 3.2** for impacts, mitigation and restoration measures for non-provincially significant wetlands and indirect fish habitat.

Provided that wetland creation can occur prior to the removal of the existing communities, no negative impacts to wetlands are expected. Section 7.1 (b) of CVC's Watershed Planning and Regulation Policies (2010) states that "CVC may permit interference with a wetland or watercourse or permit development (1) within a regulated area if, in the opinion of CVC, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected". Given that these wetlands do not have other hazard lands associated with them (e.g., like floodplains connected to regulated watercourses) and the total impacted area will be replicated at a 1:1 ratio, the proposed redevelopment plan is in compliance with CVC's policies. A permit will be required by CVC to permit this alteration.

3.8 Other Natural Heritage Considerations

Where trees are proposed for removal on the landscape (as determined within the Tree Preservation Plan), the following mitigation measures should be considered:

- All tree removals should occur outside of the active bat maternity window (April 1 to September 30) and the Migratory Bird window (early April to end of August);
- Tree removals should follow best arboricultural practices;
- ESC measures should be installed around nearby/receiving hydrologic features to reduce sedimentation inputs; and
- To slow the spread of invasive species (such as Emerald Ash Borer), all trees (not just Ash) should be disposed of locally to reduce transportation to other local municipalities.

Tree removal and protection measures should follow the Project Arborist's requirements.

4.0 RESTORATION AND ENHANCEMENT OPPORTUNITIES

Ecological offsetting is a mitigation strategy that is often considered in an effort to achieve a net ecological benefit to projects, subject to the approval of the planning authority. This compensation strategy quantifies the loss of natural features in order to provide compensation through habitat re-creation or alternative compensation process. Ecological offsetting approaches are typically applied as a last resort (after avoidance and mitigation have been considered). In this case, ecological offsetting is proposed as a means to achieve additional ecological benefit by meeting the replication requirement.

A review of CVC's Ecosystem Offsetting Guidelines (2020) was completed as it was determined that wetland removal was required to facilitate the expansion of the existing Clarkson WRRF. As discussed above, various options were explored to avoid and/or minimize the extent of removal; however, removals of wetland vegetation were unavoidable due to the size of expansion that was required to meet the Region's growth targets. The Ecosystem Offsetting Guideline (CVC 2020) was created to ensure that ecosystem functions and services are not lost through site alteration and development processes. CVC's land-based offsetting strategy strives to achieve a net gain in both ecosystem form and function (i.e., like for like). An Offsetting Plan will be prepared during the detailed design stage. Conceptual components are discussed below.

4.1 Conceptual Restoration Plan

4.1.1 Summary of Restoration Requirements

The preservation of all existing natural heritage features within the Subject Lands property cannot be achieved due to the facility's capacity requirements (as previously discussed within **Sections 2 and 3**).

As described in **Section 3**, the proposed development area will result in the permanent removal of 0.15 ha of MAM2 habitat. To compensate for the removal of the non-significant wetlands, one created wetland (0.15 ha in size) is proposed in the south-western corner of the property. This compensation will meet CVC's land-based offsetting requirements, as land will be replicated at a 1:1 ratio. A 10 m buffer will be provided surrounding the created wetland in accordance with CVC guidelines. Several opportunities and locations for wetland compensation were considered throughout the Subject Lands; however, this location was selected as it is not located within future expansion footprints given it is located overtop of the former ash lagoon. It is also located nearest to Lakeside Creek. The exact location within the southwest corner of the property will be identified during the detailed design stage, as there is ample space to accommodate the created wetland and associated buffer.

A conceptual restoration approach is outlined in this section to show how ecological features and functions will be replicated and/or enhanced within the created wetland area and associated buffer.

At the detailed design stage, an Offsetting Plan will be prepared for review by CVC, the Region and the City ahead of submitting the NHS planting plan drawings. The Offsetting Plan will provide specific details including the results of detailed hydroperiod investigations, plant species lists, proposed plant stock type and sizing, planting timing considerations, created wetland design parameters, and wildlife habitat structure details. Hydrological information will be available at the detailed design stage regarding feature depth and predicted water levels to guide the design of created wetland. This will also allow associated plant species lists to be developed that suit the hydrological conditions.

Once reviewing agencies have generally approved the proposed wetland compensation plan, a proposed monitoring plan will be prepared.

4.1.2 Restoration Goals and Objectives

The restoration goal is to recreate ecological features and functions, replicate total wetland area, and establish diverse and resilient vegetation communities along with wildlife habitat features at a local scale.

The restoration design includes wetland and terrestrial habitat elements. These vegetation communities will create a mosaic of habitats that are expected to create and mimic wildlife habitat functions found within the surrounding landscape. Ecological restoration objectives for the Subject Lands include:

- Replicate wetlands proposed for removal within the created wetland area at a 1:1 replication ratio (0.15 ha total area) with a 10 m vegetated buffer;
- Create floristically diverse and resilient wetland that will support a variety of native fauna;

- Stabilize soils through the application of an annual cover crop seed mix applied in conjunction with native perennial seed mixes (along with other ESC measures, as necessary); and
- Include nectaring plants and Milkweed species within groundcover planting areas to attract/support local insect populations including Monarch.

4.1.3 Restoration Planting Approach

The target community will be a MAM2 vegetation community, as this will replicate impacted vegetation community. A MAM2 is usually dominated by grasses or sedges and is located in mineral substrates (e.g., sand, clay, silt). This community was selected as a MAM2 community currently exist within this location; therefore, the created wetland will be installed adjacent to this existing feature. As previously discussed, there is ample space to accommodate the created wetland and the 10 m vegetated buffer within the southwestern corner. The exact location, orientation and shape of the wetland will be defined during the detailed design phase. This will expand the existing wetland community in proximity to Lakeside Creek and Lake Ontario.

Species selection will consider specific moisture, soil, and sun requirements. Some species (e.g., Ash, Elm) will not be selected due to pest and disease concerns that could impact their survivability. All plants will be selected from CVC's Plant Selection Guidelines (2018). Native plant materials should be sourced from native plant nurseries and seed suppliers within 100 km of the Subject Lands, if possible, to reduce transplant shock. All plant materials will be obtained and installed in accordance with the Canadian Nursery Stock Standard (Canadian Nursery Landscape Association 2014). As feasible, plant material and seed will be sourced from CVC's approved Native Plant Nurseries and Seed Suppliers (as detailed within their Guideline to Native Plant Nurseries & Seed Suppliers 2011). Native shrub and tree species will be selected to provide a diverse assemblage of plant species. Buffer plantings will include fast-growing and pioneer species more tolerant of harsher/variable growing conditions.

The type of planting stock is dependent on the species and their modes of reproduction, as well as practicality. The following plant stock will be considered within the created wetland:

- Herbs (forbs, graminoids): seeds, plugs;
- Shrubs: 1-gallon pots, stem cuttings, rootstock cuttings; and
- Tree saplings: seed, bareroot, ball and burlap, whips, potted seedlings.

Moreover, an appropriate seed mix will be proposed for the bioswale to increase native plant diversity.

<u>Invasive Species Consideration</u>

A review of the existing MAM2 in the south-western corner will be completed to understand the existing extent of invasives (e.g., European Buckthorn, European Reed) to determine whether management is warranted. If a high abundance of invasives is recorded within this community, the targeted community (MAM2) may be altered to create less idealized conditions (e.g., deeper pools of water, prolonged hydroperiods).

During grading/construction on-site, appropriate stockpile stabilization (including application of cover crop) is essential to ensure invasive species don't colonize the created wetland area. There is potential that non-native and invasive species could colonize the created vegetation communities.

Site Preparation

Further soil investigations are warranted within the proposed wetland compensation area given that this area historically hosted ash lagoons. Moreover, ahead of planting, site preparation is key to ensure that soil moisture capacity and nutrient content are suitable for native plant growth. Native plants generally require low soil nitrogen content and nutrient supplementation is not expected. The addition of mycorrhizal inoculants is generally helpful to facilitate native plant establishment.

CVC's Healthy Soil Guideline for the Natural Heritage System (2017) will be reviewed and incorporated into the Offsetting Plan.

4.1.4 Wildlife Considerations

Limited insect/pollinator habitat is currently present within the Subject Lands due to the limited diversity of native plant species.

Creation of pollinator habitat will be incorporated into the created wetland design. Peel Region's Significant Woodland and Significant Wildlife Habitat Guideline (North-South Environmental et al. 2009), states that "According to CVC, migratory butterfly congregations have been observed along the Lake Ontario shoreline (e.g., Lakeside Park and Rattray Marsh) during the fall)". Given that both Lakeside Park and Rattray Marsh are located within the immediate vicinity of the Subject Lands, the incorporation of pollinator habitat (specifically for butterflies) will support existing roosting migratory habitat by providing additional nectaring and breeding habitat.

Most common butterflies are generalist species with a larger variety of host plants (e.g., Painted Lady, Orange Sulphur, Question Mark, American Lady). Monarch and Red Admiral have one genus of host plant (Milkweeds and Nettles). A range of spring, summer and fall blooming plant species will be targeted to provide nectar sources throughout the breeding season. Native groundcover seed mixes applied within the created wetland will include Milkweed and Nettle species as well as other nectaring plants to help support local generalist butterflies. Selected seed mixes should provide pollinator breeding and foraging opportunities for butterflies through the targeted inclusion of nectaring species that flower from mid-spring to mid-fall.

The inclusion of this additional nectaring and breeding habitat immediately adjacent to documented migratory roosting habitats will strengthen butterfly and pollinator habitats.

5.0 CONCLUSIONS

A combination of secondary source information and targeted ecological field investigations were completed by GEI to determine the presence and extent of natural heritage features and associated functions within the Subject Lands. These results were summarized within the Characterization Report (October 2022). The following natural heritage features were identified within the Subject Lands in the Characterization Report:

- Two non-provincially significant wetlands;
  - MAM2
  - SWD2-2
- SWH for Bat Maternity Colonies within a SWD2-2 community;
- Candidate habitat for endangered species (Little Brown Myotis); and
- Indirect fish habitat.

This redevelopment application will support the proposed facility expansion in an effort to meet the significant growth targets as identified within the Region's Growth Management Process and 2020 Water and Wastewater Master Plan. To accommodate the projected growth to year 2041 and beyond, the additional treatment capacity will work to meet the growing population demands while continuing to protect the natural environment. Expansions within the existing facility include the addition of Plant 3 aeration tanks, blower buildings, primary and secondary clarifiers, side-stream treatment buildings and reactors, anaerobic digesters, biosolid drying facilities, energy centres, headworks facility and additional transformers, sewers, channels, manholes and roadways.

An impact assessment was completed to determine whether any potential impacts to existing natural heritage features as a result of the proposed redevelopment application were anticipated. Several mitigative and restorative measures were provided within **Sections 3 and 4** to minimize potential negative impacts to existing and retained natural heritage features. 0.15 ha of MAM2 wetland will be permanently removed to support the installation of new site access roads, digesters and biosolid dryers. Temporary alteration within the wetlands will occur as a result of grading associated with the roads and installation of an underground power distribution system. The extent of the temporary disturbance is currently not known; however, the impacts will be mitigated by revegetating the disturbed areas with native species. Several compensation locations were considered; however, the south-western corner was identified as the opportune location as it is located within an area that is not proposed for future development, it is located across the road from Lakeside Creek/Park and an existing MAM2 community is present adjacent to the proposed compensation wetland. A 1:1 ratio is warranted given that portions of the wetlands that are proposed for removal are already degraded and/or disturbed from physical and/or biological disturbances. The created wetland will increase native plant diversity to provide a net gain in ecological functions and resiliency of the system. In addition, the inclusion of pollinator nectaring and breeding habitat will support existing migratory roosting habitats located immediately adjacent to the Subject Lands. Pollinator habitat is currently limited within the Subject Lands. Hydroperiod modelling associated with the created wetland will be completed following initial discussions with reviewing agencies during the detailed design phase.

A conceptual restoration plan (**Section 4**) has been provided to illustrate how the created wetland area will support various biophysical functions (e.g., improve water quality, increase native vegetation species diversity, provide pollinator habitat). An Offsetting Plan will be prepared during the detailed design phase, which will provide specific details for the created wetland area (e.g., plant lists, planting timing considerations, wildlife habitat structure locations), as well as confirming hydrologic availability. A detailed monitoring plan will be prepared as part of the detailed design phase once it is understood whether reviewing agencies are supportive of the proposed wetland removal and compensation plans.

Considering the above, and as discussed within the impact assessment, redevelopment of the Subject Lands can be completed without negative impacts to the natural heritage features and associated functions both within the property boundaries and to adjacent (offsite) features. A net benefit will be provided to the overall ecological function of the site by creating a biologically diverse wetland near Lakeside Creek, which will offer pollinator breeding habitat that is currently limited within the Subject Lands.

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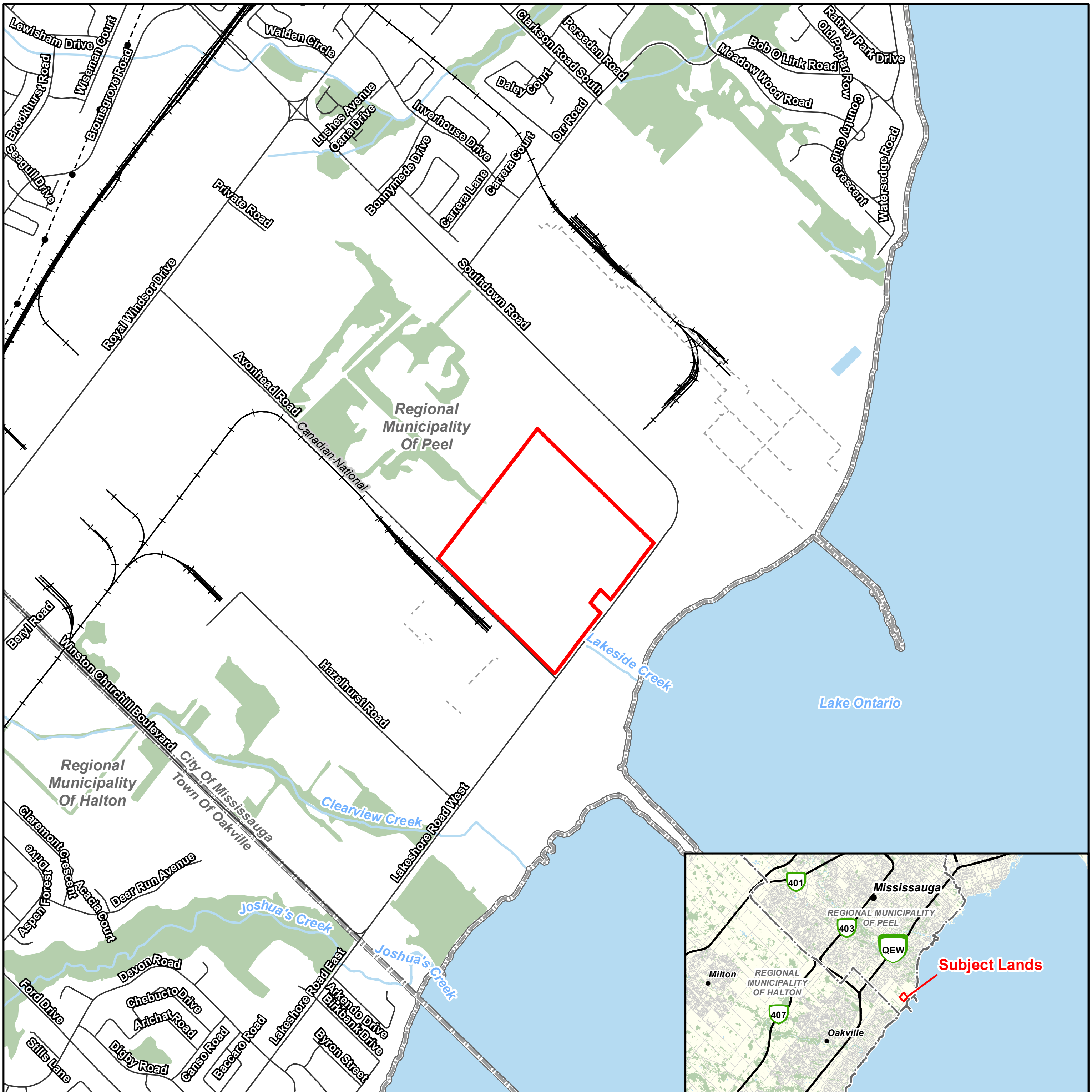
APPENDICES

Appendix A – Figures

Figure 1.0: Location of Subject Lands
Figure 2.0: Natural Heritage Features
Figure 3.0: Conceptual Site Plan



NOTES:
1. Coordinate System: NAD 1983 UTM Zone 17N.
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2022.

Legend

- Subject Lands
- Road
- Railway
- Hydro Line
- Unknown Pipeline
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary, Lower/Single Tier
- Municipal Boundary, Upper Tier

Project 2003025

Clarkson Wastewater Treatment Plan
GM BluePlan

Figure 1
Location of Subject Lands

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Savanta Division

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NOTES:
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Legend

Subject Lands
Railway
Watercourse

Provincial (Ontario)

Candidate Significant Wildlife Habitat (Bat Maternity Colonies)
Candidate Species at Risk Habitat (Little Brown Myotis)

Regional (Region of Peel)

Key Natural Heritage Features and Key Hydrologic Features (Non-Provincially Significant Wetlands)
Key Natural Heritage Feature (Candidate Significant Wildlife Habitat and Habitat for Endangered Species)

Local (City of Mississauga)

Candidate Significant Natural Area (Candidate Significant Wildlife Habitat and Habitat for Endangered Species)

Credit Valley Conservation

Regulated Wetlands
Conservation HDF

Project 2003025

Clarkson Wastewater Treatment Plan
GM BluePlan

Figure 2
Natural Heritage Features (Provincial, Regional and Local Significance)

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A GEI Company

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Legend

- Subject Lands
- Railway
- Site Plan
- Key Natural Heritage Features and Key Hydrologic Features
- Wetland Removal (0.15 ha)
- Conservation Headwater Drainage Feature

Project 2003025

Clarkson Wastewater Treatment Plan
GM BluePlan

Figure 3
Conceptual Site Plan

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GEI Consultants
Savanta Division

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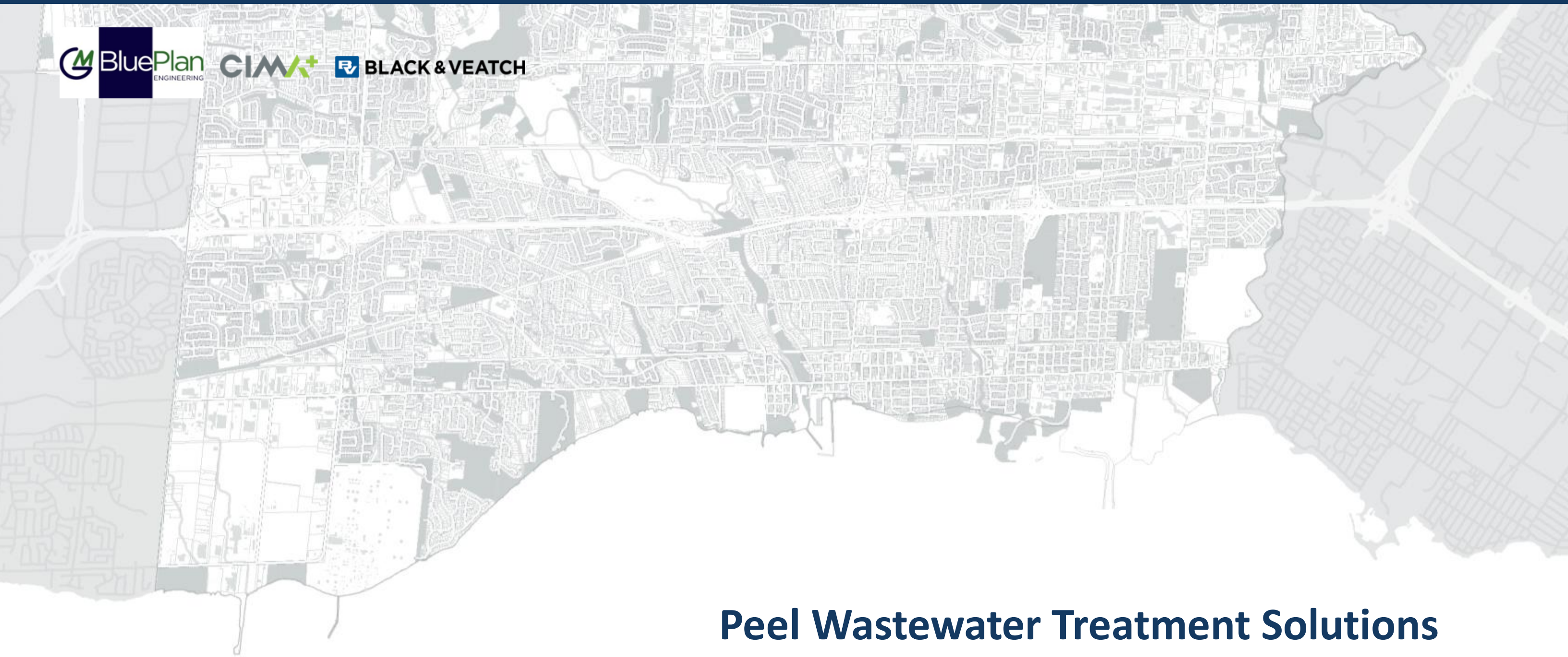
Appendix B:

Receiving Water Impact Assessment



Peel Wastewater Treatment Solutions

G.E. Booth Water Resource Recovery Facility Schedule C Class Environmental Assessments

G.E. Booth Water Resource Recovery Facility Receiving Water Impact Assessment

July 2023

1.0 Introduction

1.1 Background and Purpose

The Phase 2 recommended solution from the Schedule C Class Environmental Assessment (EA) for the G.E. Booth Water Resource Recovery Facility (WRRF), is to expand the plant's rated capacity from 518 MLD to 550 MLD by about the year 2041. In order to confirm the effluent limits for the expansion, a Receiving Water Impact Assessment (RWIA) was undertaken to meet the Ministry of Environment, Conservation, and Parks (MECP)'s Provincial Water Quality Objectives (PWQO). The results of the RWIA have been used in the evaluation of alternative treatment technologies and design concepts, and the development of the preferred design concept.

Baird was retained as part of the GMBP, CIMA+, and Black & Veatch team, to undertake the RWIA. A copy of Baird's Draft RWIA for the G.E. Booth WRRF is provided in **Appendix A**, with a summary of the Draft RWIA presented in this Technical Memorandum (TM).

1.2 Report Outline

This TM is organized into the following sections:

1.0 Introduction: This section describes the background, where we are in the Class EA, and the purpose and organization of the report.

2.0 Regulatory Requirements: This section describes the regulatory requirements for establishing future effluent requirements.

3.0 Existing Effluent Requirements: This section describes the existing effluent compliance limits and objectives established under Amended Environmental Compliance Approval (ECA) Number 9375-C4RKKZ (issued October 15th, 2021).

4.0 Existing Outfall Characteristics and Capacity: This section describes the outfall capacity based on a hydraulic assessment and the design characteristics of the outfall and diffuser.

5.0 Receiving Water Impact Assessment Results: **Appendix A** includes the Draft RWIA for the G.E. Booth WRRF prepared by Baird (November 2022), while Section 5 presents a summary of these results.

6.0 Proposed Effluent Objectives and Limits: The proposed effluent limits for Total Phosphorus (TP) and Total Ammonia Nitrogen (TAN) are presented in this section.

7.0 Communications with MECP: Four meetings have been held with the MECP to discuss and present the results of the RWIAs for the G.E. Booth and Clarkson WRRF EAs. A summary of the discussion items raised during these meetings is provided in Section 7.

8.0 Summary and Recommendations: This section presents a summary and recommendations for establishing future effluent limits and objectives.

2.0 Regulatory Requirements

Lake Ontario is shared between the Province of Ontario and New York State, with both provinces and countries sharing responsibility for its stewardship. Annually, the federal governments of Canada and the United States, under the Great Lakes Water Quality Agreement – (GLWQA), jointly publish an annual State of the Great Lakes Report (US EPA & Environment and Climate Change Canada, 2020) to document the condition of each of the Great Lakes with respect to the following indicators: Drinking water, Beaches, Fish consumption, Toxic chemicals, Habitat and species, Nutrients and algae, Invasive species, and Groundwater. Overall, the status and trend for Lake Ontario is fair and unchanging to improving.

In addition to the GLWQA, there are numerous other federal and provincial legislation governing the water quality in Lake Ontario. Federal legislation includes the Canada-Ontario Agreement (2014), Canada-wide Strategy for the Management of Municipal Wastewater Effluent and the Fisheries Act. Key provincial legislation include: The Environmental Protection Act, the Water Opportunities Act, Clean Water Act, the Environmental Protection Act, and the Ontario Water Act [administered by the Ontario Ministry of Environment, Conservation and Parks (MECP)] and the Lakes and Rivers Improvement Act [(administered by the Ontario Ministry of Natural Resources and Forestry (MNRF) and the Conservation Authorities]. Of key importance to this study is the MECP Water Management Policies, Guidelines, and Provincial Water Quality Objectives (PWQOs).

PWQO are numerical and narrative criteria which serve as chemical and physical representations of healthy populations of aquatic biota. These criteria represent an acceptable level of quality for surface waters, such as lakes, to protect all forms of aquatic biota and all aspects of the aquatic life cycles during indefinite exposures to the water. Water bodies are regulated according to two policies:

- Policy 1: “In areas which have water quality better than the Provincial Water Quality Objectives, water quality shall be maintained at or above the Objectives.”

- Policy 2: “Water quality which presently does not meet the Provincial Water Quality Objectives shall not be degraded further and all practical measures shall be taken to upgrade the water quality to the Objectives.”

Lake Ontario in the vicinity of the G.E. Booth WRRF outfall is a Policy 1 Receiver for the relevant water quality parameters. The critical parameters for receiving water in Ontario consists of Total Ammonia Nitrogen (TAN), Total Phosphorous (TP), Un-ionized Ammonia (UIA) and Escherichia Coli (*E. coli)*. These parameters with their corresponding PWQO are presented in **Table 2-1**. Wastewater effluent must be of high quality to ensure that Lake Ontario concentrations of the parameters noted in **Table 2-1** are not exceeded, outside an approved mixing zone. (Note: A mixing zone is an area of dilution that is influenced by an effluent point-source discharge. This area is an allocated impact zone, in which water quality criteria can be exceeded, so long as acutely toxic condition criteria are met. Policy 5 of the MECP’s Surface Water Quality Goal and Policies specifies that a mixing zone should be designed to be as small as possible, as to not interfere with beneficial uses of the surrounding water body, such as water supply intakes, other effluent discharges, recreational uses, fish spawning areas, or fish migration routes.)

Table 2-1 Water Quality Levels for Key Parameters

Parameter	PWQO/GLWQA Concentration Limit
Un-ionized ammonia (UIA)[1]	0.02 mg/L
Total ammonia nitrogen (TAN)[2]	0.5 mg/L
Total phosphorus (TP)[1]	0.02 mg/L
E. coli[1]	100 E. coli per 100 mL
[1] Provincial Water Quality Objective (PWQO) [2]Great Lakes Water Quality Agreement (GLWQA) Water Source Protection Objective	

The MECP requires that effluent discharges and lake ambient conditions be evaluated through lake modelling to meet the PWQOs. The modelling is undertaken on a "near field" and "far field" basis. Currently, there is no single model that assesses all scales and aspects of plume behavior as a single entity. Instead, near field and far field models are coupled.

The "near-field" zone describes the section within the incoming effluent plume that experiences strong initial mixing, as influenced by temperature, buoyancy, and momentum differences. This section typically extends from the effluent line diffuser outlets to the location where the discharged plume has effectively completed its initial mixing with the receiving water body. The modelling at this stage is specifically designed to assist in the prediction of plume mixing behaviour, which is controlled by the properties of the outfall under various lake and effluent conditions.

After the effluent has completed initial dilution and mixing in the near-field zone, the next procedure is to determine dilution of the effluent plume in the far-field zone. Dilution beyond the near-field zone is usually associated with ambient lake processes (offshore currents, dispersion, etc.) and tends to occur at a greatly reduced rate in comparison to the initial mixing within the near-field. Modelling the far-field effluent plume and associated dilution is accomplished using a whole lake model wherein the main purpose is to determine the portion of the zone where the PWQO is not achieved, and the plumes' potential effects on lake water quality and surrounding water uses (e.g., drinking water intakes, near shore recreation, etc.). The goal of the modelling is to aid in the development of treatment and outfall solutions that protect lake quality and water users.

Further discussion on the regulatory requirements, modelling approaches, and Lake Ontario background conditions are provided in **Appendix A**.

3.0 Existing Effluent Requirements

Table 3-1 outlines the approved design objectives and compliance limits for the existing G.E. Booth WRRF effluent. The G.E. Booth WRRF continues to meet the compliance limits for TSS, $CBOD_5$, TP and TAN, and E. coli. The plant effluent is also within the approved pH range of 6.5 to 9.0.

Table 3-1: G.E. Booth WRRF Design Objectives and Compliance Limits (Amended ECA NUMBER 9375-C4RKKZ)

Parameter	Effluent Design Objectives	Compliance Limits	
	Concentration	Concentration	Loading
Carbonaceous Biological Oxygen Demand ($CBOD_5$)[1]	15 mg/L	25 mg/L	
Total Suspended Solids (TSS)[1]	15 mg/L	25 mg/L	
Total Phosphorous (TP)[2]	0.7 mg/L	0.8 mg/L	394 kg/day[4]
Total Ammonia Nitrogen (TAN)[2]			
May 1st to May 31st	6.6 mg/L	13.2 mg/L	
June 1st to Sept 30th	4.9 mg/L	6.6 mg/L	
Oct 1st to Oct 31st	6.6 mg/L	13.2 mg/L	
Nov 1st to Apr 30th	14.0 mg/L	28.0 mg/L	
E. coli[3]	150 organisms per 100 mL	200 organisms per 100 mL	
Total Residual Chlorine (TRC)[2]	0.0 mg/L (non-detectable)	0.02 mg/L	
pH	6.5 to 8.5	6.0 to 9.5	

[1] Based on annual average effluent concentration values
[2] Based on monthly average effluent concentration values
[3] Based on the monthly geometric mean density
[4] Based on monthly average daily effluent loading
Note: The Amended ECA Number 9375-C4RKKZ (issued October 15th, 2021) mistakenly expressed Total Ammonia as Total Ammonia Nitrogen (TAN). The table above has been corrected accordingly, and the future amended ECA for the G.E. Booth WRRF will also be corrected.

4.0 Existing Outfall Characteristics and Capacity

4.1 Existing Outfall and Diffuser Configuration

The final effluent from the G.E. Booth WRRF is discharged to Lake Ontario through a 3.65-metre (3,650 mm) diameter and 1,435-metre length outfall with discharge port diffusers in the last 212 m section. The diffusers are an important element of the outfall because they are used to improve mixing by distributing effluent through a larger area and slowly integrate flows into the receiving water. The existing outfall has a rated peak capacity of 1,523 MLD (17,627 L/s) per Amended ECA Number 9375-C4RKKZ, (October 2021). The diffuser system details are presented in **Table 4-1**.

Table 4-1: Existing Outfall and Diffuser Characteristics

Parameter	Characteristic
ECA Rated Peak Flow Capacity	1,523 MLD (17,627 L/s)
Total Outfall (including diffuser) Length	1,435 m
Diameter of Outfall	3.65 m
Distance of Diffuser from Shore	1,223 m
Length of Diffusers	212 m
Water Depth at Diffuser	9 to 11 metres along diffuser length
Number of Diffuser Ports	35
Port Diameter	0.6 m
Flow Rate (at 518 MLD)	6.0 m^3/s
Flow Rate (at 550 MLD)	6.4 m^3/s

The existing chlorination/dechlorination disinfection system is integrated into the outfall with sodium hypochlorite injected at the outfall chamber and sodium bisulphite injected before the effluent discharges into Lake Ontario. This outfall structure allows the final effluent to be retained for long enough to be thoroughly disinfected and to discharge effluent to the lake over a large area. The treatment and outfall/diffuser structure are designed to achieve a high standard of treated wastewater quality to protect Lake Ontario.

4.2 Outfall Hydraulic Analysis

Lake levels are projected to increase in the future due to potential impacts related to climate change. Changing water levels in Lake Ontario may impact the hydraulic capacity of the existing outfalls at each respective plant. A summary of historical lake levels as well as lake level projections relative to the International Great Lakes Datum (IGLD) 1985 is presented in **Table 4-2**.

Table 4-2: Historical and Projected Lake Levels for Lake Ontario

Climate Condition	Climate Variable	Trend	Historical Baseline (1981-2010)	Climate Model Projections[1]	
				Mid-Century (2050s)	End of Century (2080s)
Water Level	Lake Ontario Water Level – high scenario (90th percentile), m IGLD	Increasing	74.77 m	75.55 m	76.02 m

[1] The study used state-of-the-science climate modelling recommended by the Intergovernmental Panel on Climate Change (IPCC) to obtain future climate conditions for the period of 2011-2100, resulting in three future time horizons: the 2020s, 2050s and 2080s.

The hydraulic capacity assessment was completed at lake levels of 75.65 m and 76.00 m. For each lake level, the following hydraulic capacity scenarios were examined for plant operation:

1. No flooding of the secondary clarifier weirs.
2. Maximum of 100 mm of flooding to the secondary clarifier weirs.

Results of the hydraulic analysis under each scenario are presented in **Table 4-3**. Based on the results of the hydraulic modelling, the existing outfall hydraulic capacity is slightly lower than the approved rated capacity of the outfall as identified in the ECA (i.e., 1,400 MLD), even when allowing for up to 100 mm of secondary clarifier weir submergence.

Table 4-3: Outfall Capacity at G.E. Booth WRRF

Secondary Clarifier Weir Flooding Scenario	High Lake Level (m)	Total Flow to Outfall Sewer (MLD)	Bottom Elevation of SC No.14 V-Notch (m)	Water Level Downstream of SC No.14 Weir (m)
No flooding	75.65	1,200	78.04	78.02
	76.00	1,200	78.04	78.02
100 mm flooding	75.65	1,482	78.04	78.14
	76.00	1,482	78.04	78.14

As shown in **Table 4-3**, under Scenario 1 (no flooding permitted), the maximum peak flow rate was 1,200 MLD to the outfall sewer, or an equivalent average day flow of 400 MLD (based on the identified peaking factor of 3). For Scenario 2 (100 mm of flooding permitted), the maximum peak flow to the outfall increased to 1,482 MLD, or an equivalent average day flow of 494 MLD. Different lake levels did not significantly affect the hydraulic capacity of the existing G.E. Booth outfall. As shown, the existing outfall will not meet future peak flow capacity requirements at a rated average flow capacity of 550 MLD.

5.0 Proposed Outfall Characteristics and Capacity

As noted in Section 4.2, the existing outfall is deficient in capacity to meet future peak flow requirements, therefore a new outfall will be designed to service the proposed increase in design flow from 500 MLD to 550 MLD. Initially, the first 250 metres of diffuser ports will be capped providing a peak flow capacity of 2,100 MLD. The capped ports would be opened as required to provide additional peak flow capacity beyond 2,100 MLD in the future. This higher peak flow capacity allows the Region the flexibility to meet longer term needs during the life space of the outfall (i.e., 75 to 100 years), as well as adapt to future conditions relating to climate change.

The proposed outfall consists of two components: the outfall/shaft location and the outfall alignment corridor which are described as follows:

- Plant outlet/outfall shaft location at the east end of the site, east of the existing disinfection building. This location allows for the connection of all treatment trains at an optimal location.

- Outfall alignment corridor is generally parallel to the existing outfall, from the plant outlet/outfall shaft location into Lake Ontario. This alignment corridor is located centrally between the nearby Intake Protection Zones (IPZ)-1 areas for the A.P. Kennedy and R.L. Clark WTPs, presents favourable bathymetry by reaching deeper waters efficiently, and is perpendicular to predominantly east-west currents.

The existing outfall, although not sufficient size or length to meet future demands, is structurally sound. As such, the goal is to maintain the existing outfall as well as construct and operate a new outfall. The existing outfall would be used for emergency purposes as required.

Table 5-1 provides the details of the proposed outfall and diffuser systems with the layout of the proposed outfall shaft and alignment corridor identified in **Figure 5-1**.

Table 5-1: Proposed Outfall and Diffuser Configuration

Parameter	Characteristic
Proposed Peak Flow Capacity	2,100 MLD (24,305 L/s)
Total Outfall (including diffuser) Length	3,000 m
Distance of Diffuser from Shore	2,000 m
Length of Diffusers	1,000 m (250 m of ports closest to shore capped)
Water Depth at Diffuser	18.5 to 20 metres along diffuser length
Number of Diffuser Ports	68 (first 250 metres of diffuser ports to be capped for future expansion)
Port Diameter	500 mm
Flow Rate (at 518 MLD)	6.0 m^3/s
Flow Rate (at 550 MLD)	6.4 m^3/s
Exit Velocity (ports uncapped/capped)	(0.48 m/s / 0.64 m/s)

Figure 5-1: Recommended Outfall Layout

6.0 Receiving Water Impact Assessment Results

The near-field mixing model CORMIX was used to evaluate the performance of the diffuser with respect to TP and TAN on a seasonal basis for the future (i.e., 550 MLD) scenario. The model assumed a conservative (worst-case) condition based on low current speeds (25th percentile) and high effluent concentrations (compliance limits of 75th percentile values) which is generally recognized by the MECP for assessing receiving water impacts. The far-field model MIKE3 was used to simulate the discharge and movement of the effluent to examine far-field impacts at the adjacent water treatment plant intakes, key locations along the shore, and to define mixing zones.

The calculated target dilutions required to meet PWQO were based on a compliance limit of 0.8 mg/L for TP (as per the existing ECA) and the 75th percentile concentration as shown in Table 7.1 of **Appendix A**. TP is the governing constituent in the spring, summer, and fall because it requires the highest dilutions to meet PWQO for the existing compliance limit, while TAN is the governing parameter in the winter. The findings of the near-field analysis shows that the proposed diffuser concept exceeded the target dilutions less than 100 m away from the diffuser. Predicted dilutions exceeded 100:1 mixing approximately 200 m away from the diffuser which suggests that the proposed diffuser performs well during all seasons and will meet or exceed PWQO for the governing constituents close to the diffuser.

The CORMIX modelling focused on a conservative (worst-case) condition to assess diffuser performance in the near-field region and at the half pipe length (1,300 m); however, the lake is dynamic and three dimensional in nature and requires the use of a far-field model such as MIKE3 to assess plume movement over a wider range of lake currents and temperature conditions, and to define the mixing zone.

The far-field MIKE3 model was used to define the mixing zones for key constituents (TP, UIA) and to predict impacts at key locations and at adjacent drinking water intakes (TP, TAN) for the future average daily flow (ADF) of 550 MLD. The MIKE3 model used a series of nested grids with higher resolution near the G.E. Booth WRRF and the adjacent shoreline. The model was run for a six-month period from April 15 to October 15, 2008 which is typical for RWIA studies on Lake Ontario. The model simulated TP, which was the governing constituent based on dilution, and TAN, which is of interest at the drinking water intakes and for calculating UIA. The 75th percentile values for TP and TAN (averaged over all seasons) were used to define the initial receiving water quality conditions in the lake.

The MIKE3 model predicted that the peak daily TP concentration did not exceed PWQO at any of the locations under the future ADF condition. The maximum instantaneous TP concentration was also below PWQO at all locations except for the A.P. Kennedy and R.L. Clark WTP intakes for a total of 36 hours and 17 hours, respectively, over the simulation period; this equates to 0.8% and 0.3% of the time.

TAN concentrations were assessed at the Lorne Park, A.P. Kennedy, and R.L. Clark water intakes with ammonia used as a surrogate measure of the conditions at the WTP intakes and as an indicator of effluent impacts on intake quality. TAN concentrations remained below the GLWQA source water protection objective of 0.5 mg/L for all locations and for all statistical metrics except for the instantaneous value at A.P. Kennedy, where it exceeded the 0.5 mg/L threshold for a total of 5 hours (0.1% of the time) over the course of the model simulation.

The future flow condition (i.e., 550 MLD) and a proposed TP limit of 0.8 mg/L, generates a mixing zone of approximately 0.2 km^2 as illustrated in **Figure 6-1**. The mixing zone generally covers the length of the

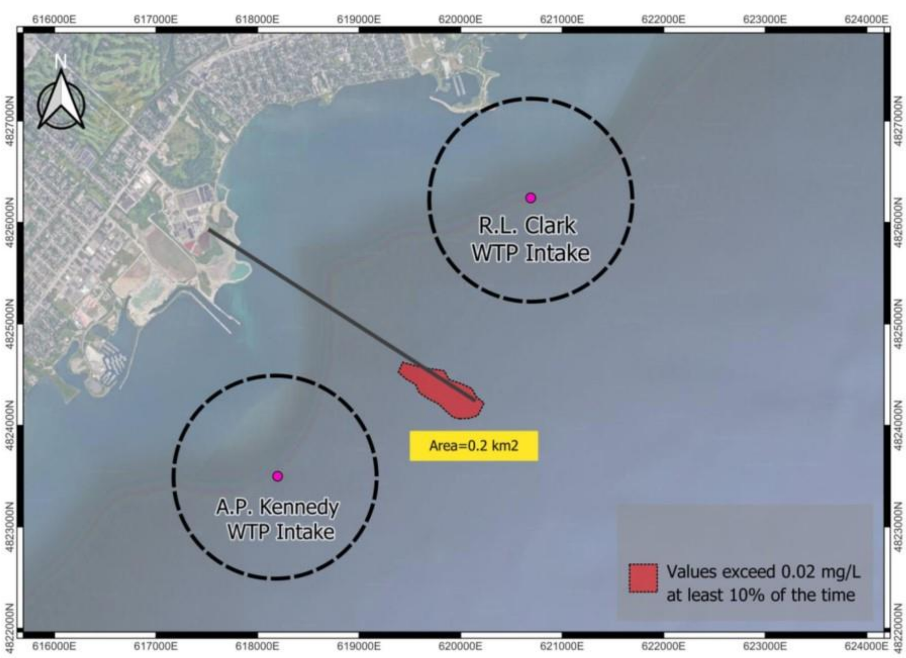


Figure 7.4: TP mixing zone: ADF = 550 MLD & TP limit = 0.8 mg/L

Figure 6-1: Total Phosphorus (TP) Mixing Zone at 550 MLD

diffuser and is approximately 300 m in width. The objective was to ensure a relatively small mixing zone given the proximity of the diffuser to the drinking water intakes located 2 km away on either side of the diffuser.

UIA was calculated using predicted hourly TAN concentrations and temperature values and applying a constant (75th) percentile value of 8.2 for Lake Ontario pH. **Figure 6-2** identifies that there is no far-field UIA mixing zone for the proposed diffuser under future ADF conditions based on the 10% exceedance contour as the largest percent exceedance for UIA was 5.2%.

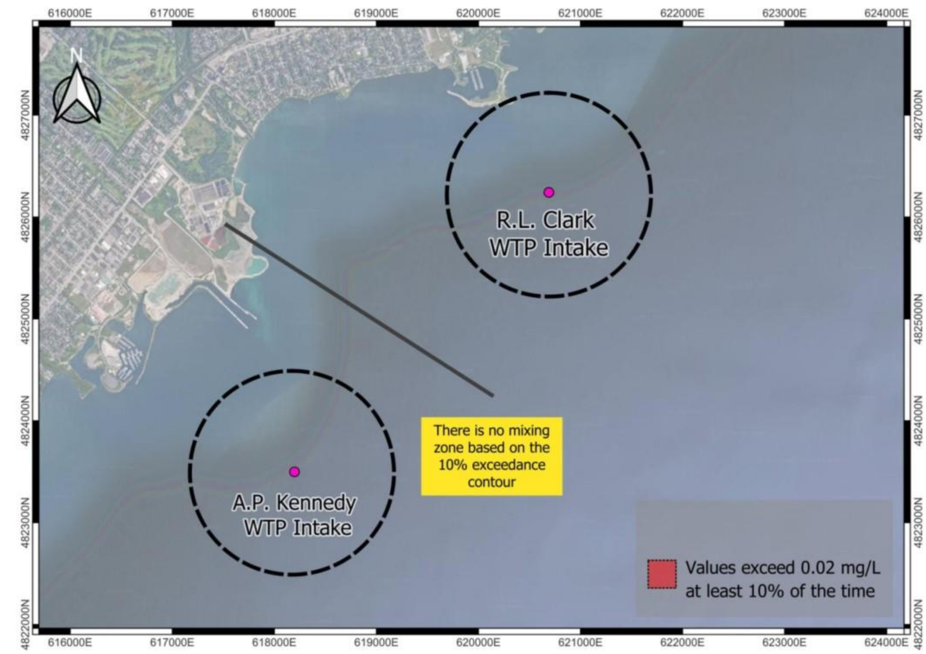


Figure 7.5: UIA mixing zone: ADF = 550 MLD & TAN limits (Variable)

Figure 6-2: Un-Ionized Ammonia (UIA) Mixing Zone at 550 MLD

Note: The red area represents the region where the TP PWQO is exceeded at least 10% of the time over the simulation period and is defined as the mixing zone.

7.0 Proposed Effluent Objectives and Limits

7.1 Total Phosphorus (TP)

For the future flow condition of 550 MLD, it is proposed to reduce the existing TP compliance limit of 0.80 mg/L to 0.75 mg/L and the existing effluent objective of 0.70 mg/L to 0.65 mg/L. These reductions are recommended to maintain the existing ECA approved loading limits of 394 kg/day. The target dilutions required to meet the PWQO based on the noted compliance limit for TP and the 75th percentile concentration are identified in Table 7.1 of **Appendix A**. Table 7.1 identifies that the proposed diffuser concept exceeded the target dilutions less than 100 m away from the diffuser, with dilutions exceeding 100:1 mixing approximately 200 m away from the diffuser. The mixing zone will be further reduced with the proposed lower TP limit.

7.2 Total Ammonia Nitrogen (TAN)

The proposed total ammonia nitrogen (TAN) limits and objectives were assessed based on achieving end-of pipe non-lethal effluent toxicity. Unionized ammonia (UIA) was determined leveraging 75th percentile seasonal effluent temperature and pH from the G.E. Booth WWTP. Recommended effluent limits were derived based on the worst case of the following:

- Existing ECA seasonal TAN objectives and effluent compliance limits for the G.E. Booth WRRF. Based on discussions with the MECP, while the ECA indicates TAN limits, these limits were incorrectly derived based on ammonia (NH_3) concentrations rather than total ammonia nitrogen (NH_3•N). As a result, the existing ECA TAN limits were reduced by a factor of 1.216 times.
- Objective limits to achieve unionized ammonia (UIA) concentrations of <0.1 mg/L at 75th percentile effluent temperature and pH.
- Compliance limits to achieve unionized ammonia (UIA) concentrations of <0.2 mg/L at 75th percentile effluent temperature and pH.

Overall, the controlling factors for determining TAN objectives and limits was the existing ECA (corrected to be 1.216 times lower). Seasons were selected to match those currently defined within the G.E. Booth WRRF ECA, namely:

- Winter November 1st – April 30th
- Spring May 1st – May 31st
- Summer June 1st – September 30th
- Fall October 1st – October 31st

Five (5) full years of effluent temperature and pH data from 2016 to 2020 inclusively was used to determine 75th percentile values. **Table 7-1** summarizes the proposed TAN objectives and limits for the G.E. Booth WRRF and the corresponding 75th percentile UIA concentrations, which are well below 0.1 mg/L and 0.2 mg/L, respectively. Overall, these concentrations are the more restrictive compared to the new outfall plume modelling results presented in Section 6.0 above.

Table 7-1: Confirmation of TAN Limits and Objectives

Period	No. Samples	75th percentile Effluent pH	75th percentile Effluent Temperature	Proposed TAN Objective (mg/L)	Proposed TAN Limit (mg/L)	75th perc. UIA at TAN Objective (mg/L)	75th perc. UIA at TAN Limit (mg/L)
Nov. 1 - Apr. 30	907	7.06	18.3	14.0	28.0	0.068	0.136
May 1 - May 31	155	7.12	19.8	6.6	13.2	0.041	0.082
June 1 - Sept 30	610	7.00	24.1	4.9	6.6	0.032	0.042
Oct 1 - Oct 31	155	6.92	21.5	6.6	13.2	0.029	0.059
					TARGET	**<0.1 mg/L**	**<0.2 mg/L**

*Note: Per the Baird report included in **Appendix A**, the RWIA assumes the winter months to include December to February, spring months to include March to May, summer months to include June to August, and the fall months to include September to November.*

For the future flow condition of 550 MLD, it is proposed to maintain the existing TAN compliance limits and objectives per the existing ECA for the G.E. Booth WRRF, as outlined in **Table 9-1**.

8.0 Communications with MECP

Four meetings were held with the MECP to discuss the EA and present and receive input on the Receiving Water Impact Assessment (RWIA) for the G.E. Booth and Clarkson WRRF EAs. At the first meeting, the Class EAs were introduced (October 7, 2020). At the second meeting (April 14, 2021), the overall approach to the assimilative capacity analysis was presented and discussed and the modelling parameters and approach were confirmed. The third and fourth meeting (November 22nd, 2021 and October 18th, 2022, respectively) were specific to the RWIA completed to support the Clarkson WRRF EA which ultimately concluded with the MECP being in general agreement with the RWIA findings and recommendations associated with the expansion of the Clarkson WRRF.

The MECP was also provided a copy of the Draft RWIA Technical Memorandum (TM), dated March 2023, for the G.E. Booth WRRF EA and provided comments in April 2023 which were used to update the RWIA TM. This Final RWIA and the proposed effluent criteria reflect the comments received by the MECP.

9.0 Summary and Recommendations

Based on the hydraulic analysis, expanding the G.E. Booth WRRF will require additional outfall capacity. Therefore, a new outfall with a peak flow capacity of 2,100 MLD will be constructed to service the proposed increase in design from 500 MLD to 550 MLD with additional peak flow capacity beyond 2,100 MLD available in the future. The new shaft location will be located at the east end of the site, east of the existing disinfection building, which provides an optimal location for connection of all treatment trains. The outfall alignment corridor will be generally parallel to the existing outfall, from the shaft location into Lake Ontario. The alignment corridor is centrally located between the IPZs for the A.P. Kennedy and R.L. Clark WTPs. The outfall will have a total length of 3,000 metres, with a 1,000 metres of diffusers at the end, although 250 metres of the diffusers closest to shore will be capped initially until required in the future.

Based on the receiving water assessment and discussions with the MECP, proposed effluent limits and objectives were established for the purpose of developing wastewater design alternatives. These proposed limits are presented in **Table 9-1**.

The proposed effluent objectives and limits are achievable through conventional secondary treatment without the need for tertiary filtration. Disinfection will be achieved at the G.E. Booth WRRF through a new ultraviolet (UV) facility to meet E. Coli limits in the effluent.

Table 9-1: Summary of Proposed Effluent Limits and Objectives for the G.E. Booth WRRF Expansion

Parameter	Existing ECA	Proposed Future Conditions
Effluent Limits		
$cBOD_5$	25 mg/L	25 mg/L
TSS	25 mg/L	25 mg/L
TAN	13.2 mg/L (May 1 – May 31) 6.6 mg/L (June 1 – Sept 30) 13.2 mg/L (Oct 1 - Oct 31) 28.0 mg/L (Nov 1 - Apr 30)	13.2 mg/L (May 1 – May 31) 6.6 mg/L (June 1 – Sept 30) 13.2 mg/L (Oct 1 - Oct 31) 28.0 mg/L (Nov 1 - Apr 30)
TP	0.80 mg/L	0.75 mg/L
Total Residual Chorine (TRC)	0.02 mg/L	0.02 mg/L
E. Coli	200 organisms per 100 mL	200 organisms per 100 mL
pH	6.0 – 9.5 inclusive	6.0 – 9.5 inclusive
Effluent Objectives		
$cBOD_5$	15 mg/L	15 mg/L
TSS	15 mg/L	15 mg/L
TAN	6.6 mg/L (May 1 – May 31) 4.9 mg/L (June 1 – Sept 30) 6.6 mg/L (Oct 1 - Oct 31) 14.0 mg/L (Nov 1 - Apr 30)	6.6 mg/L (May 1 – May 31) 4.9 mg/L (June 1 – Sept 30) 6.6 mg/L (Oct 1 - Oct 31) 14.0 mg/L (Nov 1 - Apr 30)
TP	0.70 mg/L	0.65 mg/L
TRC[1]	0.0 mg/L	0.0 mg/L
E. Coli	150 organisms per 100 mL	150 organisms per 100 mL
pH	6.5 – 8.5 inclusive	6.5 – 8.5 inclusive

Note 1: Total Residual Chlorine (TRC) shall be non-detectable as measured by a method with a sensitivity of at least 0.02 mg/L.

Region of Peel

Appendix A

G.E. Booth WRRF Receiving Water Impact Assessment Report

G.E. Booth Wastewater Treatment Plant

Receiving Water Impact Assessment

July 4, 2023 | 13344.101.R2.Rev1

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G.E. Booth Wastewater Treatment Plant

Receiving Water Impact Assessment

Prepared for: Prepared by:

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13344.101.R2.Rev1

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Revision	Date	Status	Comments	Prepared	Reviewed	Approved
Rev A	2022 11 03	Draft	For GMBP Review	DMF	FJLD	FJLD
Rev 0	2023 06 26	Final		DMF	FJLD	FJLD
Rev 1	2023 07 04	Final		DMF	FJLD	FJLD

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1. Introduction

1.1 Purpose of Assessment

A Receiving Water Impact Assessment (RWIA) was completed in support of the Schedule C Class Environmental Assessment (EA) of the G.E. Booth Wastewater Treatment Plant (WWTP). This RWIA was conducted to demonstrate that the proposed expansion and treatment alternatives meet the Ministry of the Environment, Conservation and Parks (MECP) regulatory requirements for surface water discharges based on the analysis undertaken, which included near-field and far-field modelling. This report describes the approach and methodology used to support the RWIA along with the findings from the technical analysis.

1.2 G.E. Booth WWTP

The G.E. Booth WWTP is located at 1300 Lakeshore Road East as shown in Figure 1.1. It is operated under MECP's Environmental Compliance Approval (ECA) #5461-AWWOUL. Existing compliance limits and objectives are summarized in Table 1.1.

The plant provides secondary treatment, phosphorus removal and seasonal disinfection and is designed to treat an average flow of 500 million litres per day (MLD). The plant is operating below its capacity limit of 500 MLD. The average flow from 2011 to 2017 was determined to be 485 MLD, which is 90% of the rated capacity. Treated effluent from the plant is discharged to Lake Ontario through an outfall pipe and multiport diffuser system. The existing outfall pipe extends 1223 m offshore in a south-southeast direction to a staged diffuser that is 212 m in length. The average water depth over the length of the diffuser is 9 m below Chart Datum.

In general, the plant is performing well with respect to CBOD5, TSS and TP removal as it consistently meets performance objectives as noted in the RFP (2020-030P). Phase 2 of the Class EA identified the preferred solution for treatment to include expansion of both the Clarkson and G.E. Booth WWTPs to accommodate growth in the Region of Peel. Specifically, the preferred solution includes expansion of the Clarkson WWTP from 350 MLD to 500 MLD and G.E. Booth WWTP from 500 MLD to 550 MLD. As described above, this RWIA focuses on the G.E. Booth WWTP only.

There are plans to construct a new outfall further offshore at the Booth WWTP as the existing plant and outfall diffuser system do not have adequate hydraulic capacity to manage the proposed increase in flow. There would also be concerns with water quality as the current length of the diffuser would most likely not generate the mixing required to meet Provincial Water Quality Objectives (PWQO). The location of the new diffuser system proposed for the Booth WWTP is also shown in Figure 1.1. It is situated between the R.L. Clark and A.P. Kennedy water treatment plant intakes. This RWIA is based on a proposed diffuser concept that is 1000 m long and located approximately 2 km offshore; however, only the last 750 m of the diffuser are considered in the RWIA. The ports on the first 250 m of the diffuser are assumed to be capped and can be opened to address future expansions to the treatment plant. Given the proximity of the proposed diffuser to the drinking water intakes, rapid mixing and dilutions will be required to minimize the potential impact on the intakes.

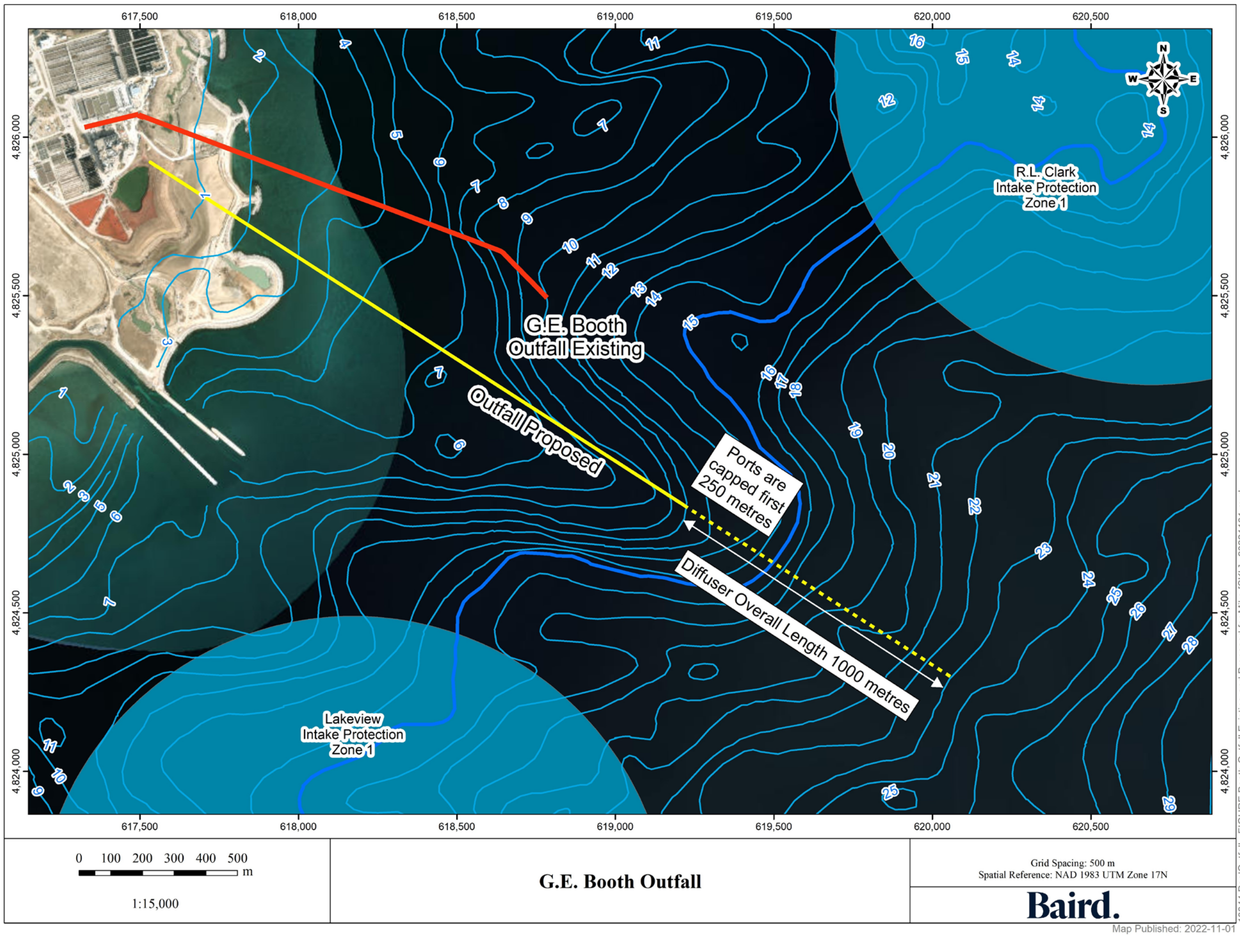

Figure 1.1: Location of G.E. Booth WWTP outfall and diffuser

Table 1.1: G.E. Booth WWTP existing compliance limits and objectives

Parameter	Averaging Calculator	ECA Objective (mg/L)	ECA Limit (mg/L)
CBOD (mg/L)	Annual Average Effluent Concentration	15.0	25.0
TSS (mg/L)	Annual Average Effluent Concentration	15.0	25.0
TP (mg/L)	Monthly Average Effluent Concentration	0.7	0.8
TAN (mg/L)	Monthly Average Effluent Concentration	6.6 (May 1 – May 31) 4.9 (June 1 – Sept 30) 6.6 (Oct 1 – Oct 31) 14.0 (Nov 1-Apr 30)	13.2 (May 1 – May 30) 6.6 (June 1 – Sept 30) 13.2 (Oct 1 – Oct 31) 28.0 (Nov 1 – Apr 30)

2. Regulatory Requirements

Approval for surface water discharges from wastewater treatment plants falls under the jurisdiction of the MECP. There are two key MECP documents that are applicable to the derivation of effluent requirements for outfalls. The ambient conditions and the new effluent discharge are evaluated relative to the MECP's Policies for Surface Water Quality Management (MECP, 1994a) and the MECP Guidelines for Deriving Effluent Requirements (MECP, 1994b). These regulatory requirements are discussed in this section. The regulatory requirement for non-lethal toxicity at end of pipe is not assessed in this study because that requirement is determined by the treatment process in the plant, not by the outfall.

2.1 Provincial Water Quality Objectives (PWQO)

Effluent requirements for surface water discharges are outlined in the MECP publication: Policies, Guidelines and Provincial Water Quality Objectives of the Ministry of Environment Conservation and Parks (1994a), which provides direction on the management of surface water and groundwater quantity and quality. With regards to surface water quality, the goal is to ensure that the water quality is satisfactory for aquatic life and recreation. The PWQO are set by the MECP at a level of water quality which is protective of all forms of aquatic life and all aspects of the aquatic life cycles during indefinite exposure to the water. The objectives for protection of recreational water uses are based on public health and aesthetic considerations.

The applicable policies with respect to surface water quality management, based on the water quality of the receiving water body, include:

- Policy 1 - In areas which have water quality better than the PWQO, water quality shall be maintained at or better than the objectives.
- Policy 2 - Water quality which presently does not meet the PWQO shall not be degraded further, and all practical measures shall be taken to upgrade the water quality to meet the objectives.

As will be shown in Section 3, Lake Ontario, in the vicinity of this project, is Policy 1 for the relevant water quality parameters.

MECP (1994a) provides specific numerical and descriptive criteria for a range of chemical, physical, and biological parameters that are protective of aquatic life and recreational water usage. Pollutant discharge limits can be determined based on the above policies for water quality and the existing physical, chemical, and biological conditions of the receiving water.

The water quality parameters that were the focus of the RWIA for the G.E. Booth WWTP include: Total Phosphorus (TP), Un-ionized Ammonia (UIA), and Escherichia Coli (*E. Coli*). These parameters are summarized in Table 2.1 along with their PWQO.

Total ammonia is used as the major surrogate for UIA from a mass balance perspective. Local background data for pH and temperature are also compiled as reference conditions and are summarized in Table 2.1.

Table 2.1: Summary of relevant Provincial Water Quality Objectives (MECP, 1994a)

Receiving Water Parameter	PWQO
Escherichia Coli (*E. Coli*)	100 counts/100 mL (geometric mean of at least five samples) at a designated beach.
pH	Maintained within range of 6.5-8.5.
Total Phosphorus (TP)	Concentrations should not exceed 0.02 mg/L for the ice-free period to avoid nuisance concentrations of algae.
Temperature	The temperature at the edge of the mixing zone shall not be more than 10°C above the natural ambient water temperature.
Un-ionized Ammonia (UIA)	0.02 mg/L at edge of near-field mixing zone, calculated using Formula 1 below.

UIA, which can be toxic above certain levels, can be calculated from the formula provided in MECP (1994a), adapted from Emerson et al. (1975).

- $f = 1/(10^{pKa - pH}) + 1)$; where (1)
- $pKa = 0.09018 + 2729.92/T$ (2)

where f is the fraction of UIA (NH_3) in total ammonia (NH_3+NH_4^+) and T is the ambient water temperature in Kelvins (K = °C + 273.16).

Ammonia is typically reported in terms of its nitrogen content as Total Ammonia-Nitrogen (TAN). NH_3+NH_4^+ can be calculated from TAN using a conversion factor of 1.216, which is the mass ratio of ammonia to nitrogen (Emerson et al., 1975). UIA is then calculated by multiplying the un-ionized fraction "f" by the total ammonia. The Great Lakes Water Quality Agreement (GLWQA) of 1978 states that total ammonia should not exceed 0.5 mg/L for the protection of public water supplies (International Joint Commission United States and Canada, 1989).

The PWQO for Dissolved Oxygen (DO) require that the concentrations should not be less than the values specified for cold water biota (e.g., salmonid fish communities) and warm water biota (e.g., centrarchid fish communities), listed in Table 2.2 as a function of temperature.

Table 2.2: PWQO for DO as a function of temperature (MECP, 1994a)

Temperature (°C)	Cold Water Biota		Warm Water Biota	
	% Saturation	Dissolved Oxygen Concentration (mg/L)	% Saturation	Dissolved Oxygen Concentration (mg/L)
0	54	8	47	7
5	54	7	47	6
10	54	6	47	5
15	54	6	47	5
20	57	5	47	4
25	63	5	48	4

2.2 Mixing Zone

The MECP publication titled Deriving Receiving-Water Based, Point-Source Effluent Requirements for Ontario Waters (1994b), provides guidance about the requirements for point-source discharges and the procedures for determining effluent requirements for an Environmental Compliance Approval (ECA). The process outlined for establishing effluent requirements includes:

- Site-specific receiving water assessments to be carried out to determine the effluent requirements based on the assimilative capacity of the receiving water.
- The effluent requirements will be compared to regulatory guidance for effluent discharges.
- Effluent dilution requirements must consider background concentrations in the receiving water body, as defined by 75th percentile values of measured data (25th percentile for dissolved oxygen). Seasonal and/or diurnal changes may need to be considered.

This study focused on the performance of the proposed diffuser concept and its ability to meet effluent mixing requirements and minimize the potential impacts on environmental endpoints such as, recreational uses, aquatic communities, and drinking water treatment plant intakes.

MECP (1994b) defines a mixing zone as an area of water contiguous to a point source or definable non-point source where water quality does not comply with one or more of the PWQO. Terms and conditions related to a mixing zone are designated on a case-by-case basis and may be specified in the ECA. Specific requirements of the mixing zone are as follows:

- The mixing zone is to be designed to be as small as possible.
- In the Great Lakes, initial mixing for discharge diffusers must have a minimum near field (initial mixing) ratio of 20:1.
- Mixing zones cannot interfere with other water uses such as drinking water supply or recreation.
- MECP terms of reference developed for previous wastewater treatment plant outfall receiving water impact assessments on Lake Ontario stated that the PWQO should be met at the edge of the near-field mixing zone, and as a minimum requirement the near-field mixing zone should be limited to half the distance between the off-shore length of the outfall and the nearest shore also referred to as the ‘half pipe distance’.

While it is recognized that the definition of a mixing zone is open to interpretation, the PWQO were assessed against predicted concentrations at various distances away from the point of discharge, including, the half pipe distance to shore criteria based on discussions with MECP (see Meeting Minutes from April 14 and Nov. 22, 2021). The half pipe distance for this study is shown in Figure 2.1 and was used to support the near-field assessment. Model predictions were also evaluated at other critical locations such as drinking water intakes, beaches, and selected shoreline locations; this was completed as part of the far-field assessment.

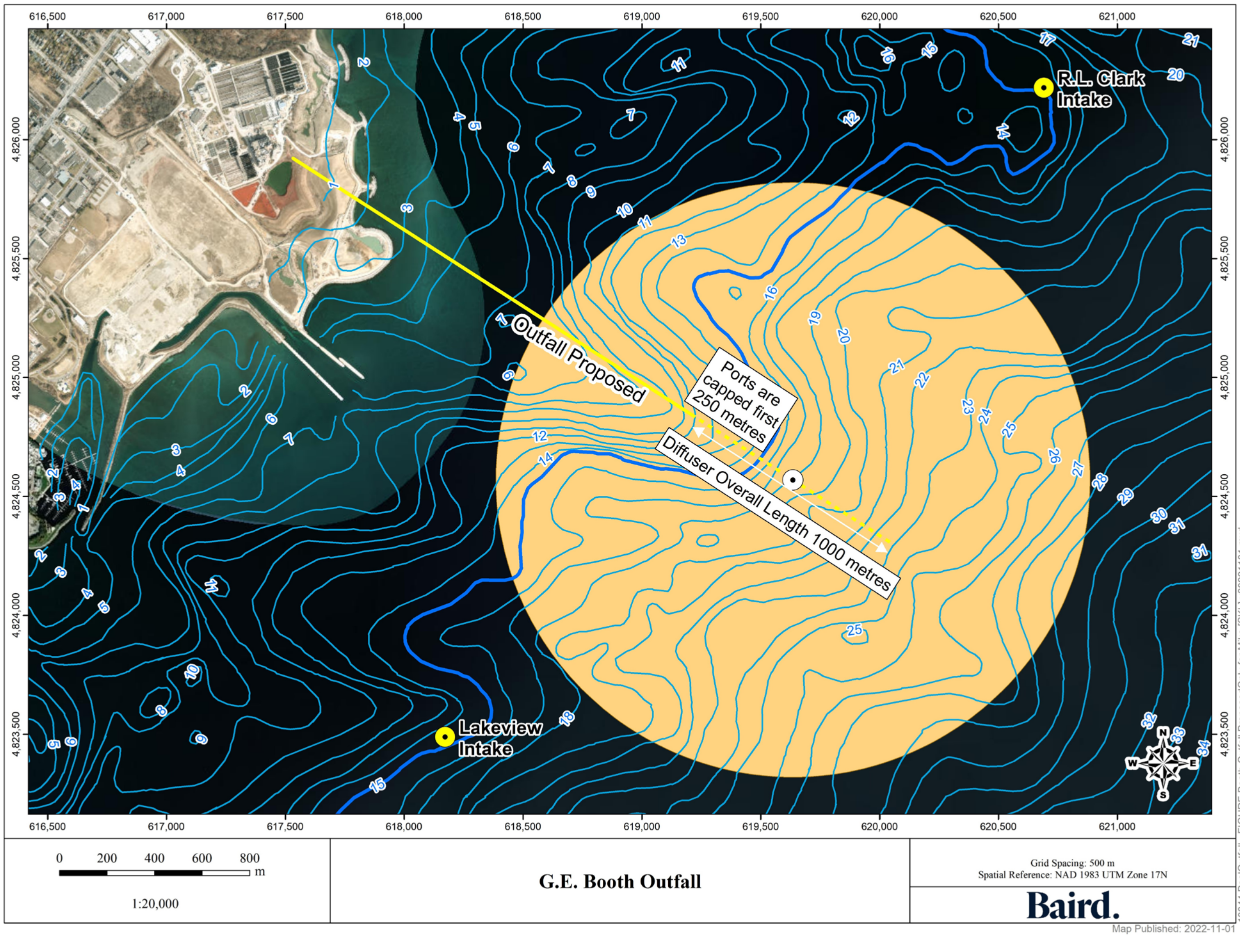

Figure 2.1: Half pipe distance for the proposed diffuser concept at G.E. Booth WWTP used to support near-field assessment

3. Lake Ontario Background Conditions

The data used to define the background concentrations and physical characteristics in Lake Ontario are shown in Figure 3.1 and summarized in Table 3.1. Water quality data were collected from MECP's Drinking Water Surveillance Program (DWSP), Environment Canada's Great Lakes Surveillance Program (GLSP) and raw water samples from adjacent drinking water treatment plants. Lake currents and water temperature data were collected from one of MECP's Acoustic Doppler Current Profilers (ADCP) and temperature strings that were deployed in 2018. The data collected were used to define background conditions at both the Clarkson and Booth WWTP's.

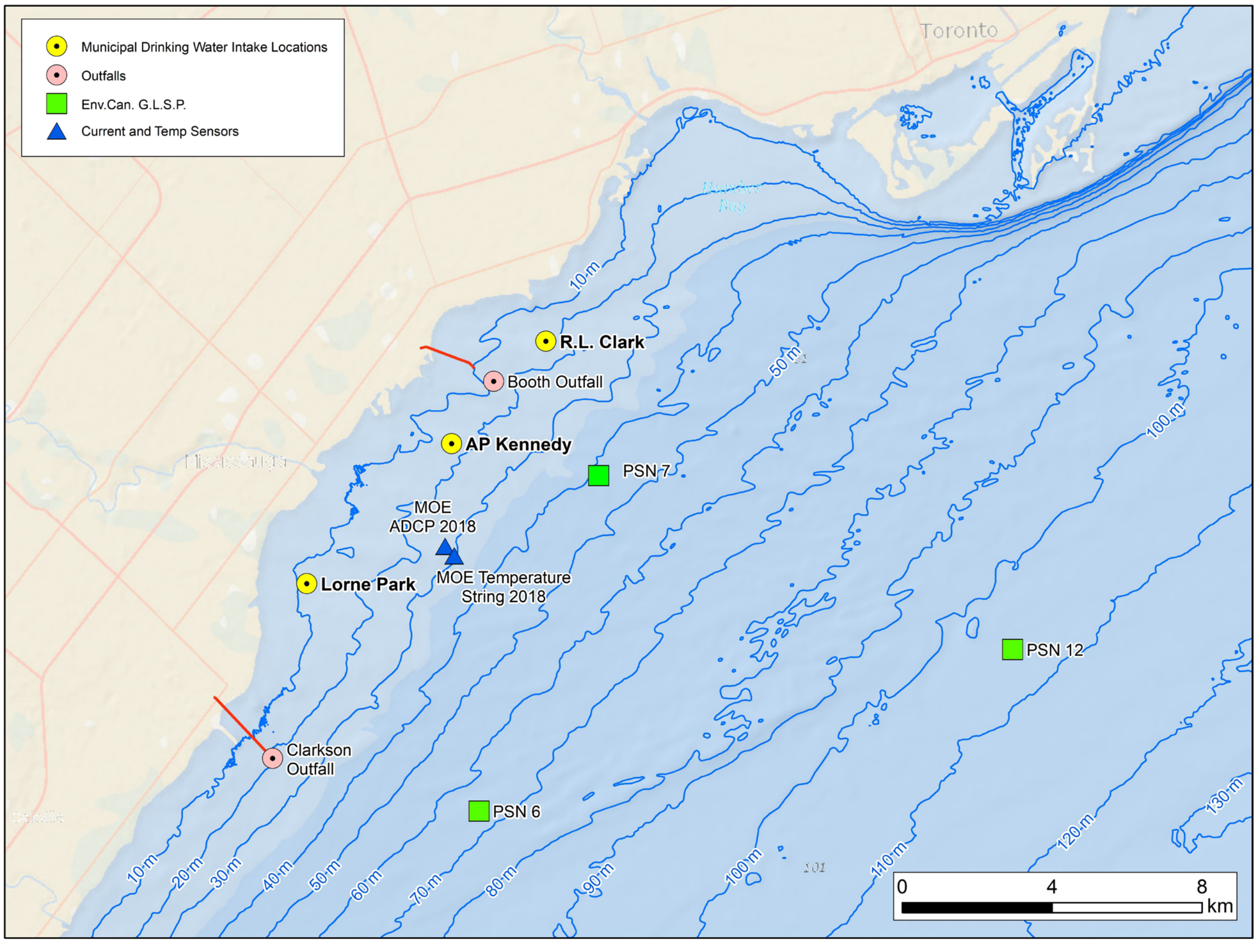

Figure 3.1: Location of data sources used to define the background conditions in Lake Ontario

Table 3.1: Summary of sampling frequency and period of coverage for key water quality parameters

Agency	Program	Station	Collection Period	Sampling Frequency	Measured Parameters
Lake Water Quality					
MECP	DWSP	Lakeview Lorne Park RL Clark	2013-2020	1 to 4 times per year	TP, pH, Ammonia
Environment Canada	GLSP	6, 7, 12	2001-2018	1-3 times per year	TP, DO, Ammonia
Municipal	WTP Raw Water Sampling	AP Kennedy Lorne Park	2015-2020	~ 2 days	E.coli
Physical Characteristics of Lake					
MECP	Temp String	GTA1	2018	Hourly	Temp
MECP	ADCP	Etobicoke	2018	30 min	Currents

The background conditions in the lake were summarized for the following key parameters: TP, TAN, UIA, E.coli, pH, and water temperature. The MECP publication titled Deriving Receiving-Water Based, Point-Source Effluent Requirements for Ontario Waters (MECP, 1994a), provides guidance regarding the requirements for point-source discharges and the procedures for determining effluent requirements for Environmental Compliance Approvals. The process outlined requires consideration of background concentrations in the receiving water body, defined by 75th percentile values of measured data (25th percentile for dissolved oxygen). Seasonal and/or diurnal changes may also need to be considered in the analysis. For this study, the data were analysed by season and the results are presented in Table 3.2. Current speed was also analysed based on depth-averaged currents derived from the ADCP, the 25th percentile value was calculated to support near-field modelling activities as low currents represent a "worst case" condition with respect to mixing.

Overall, the water quality conditions in the lake are below PWQO with respect to UIA, TAN, TP and E.coli making the lake a Policy 1 receiver; MECP therefore requires "water quality shall be maintained at or above the Objectives". Historically, higher concentrations tend to occur during the summer months but still below PWQO. The 25th percentile of the depth-averaged current speed was relatively consistent across all seasons. The data presented in Table 3.2 provides a characterization of the background conditions in Lake Ontario and was used to support numerical modelling activities.

Table 3.2: Summary of background conditions in Lake Ontario

Parameter	PWQO	All Data	Winter (Dec-Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
75th Percentile						
UIA (mg/L)[4]	0.02	0.0018	0.0009	0.0004	0.0052	0.0007
TAN (mg/L)[1,5]	0.5	0.029	0.038	0.014	0.041	0.021
TP (mg/L)[1]	0.02	0.008	0.006	0.007	0.010	0.010
E.coli (#/100mL)[3]	100	2	2	1	1	2
pH[1]	-	8.2	8.2	8.3	8.5	7.9
Temp (C)[2]	-	12.8	5.0	7.0	20.0	19.0
25th Percentile						
Current Speed (m/s)	-	0.04	0.04	0.04	0.04	0.04

[1]GLSP/DWSP
[2]AP Kennedy WTP/MECP
[3]AP Kennedy WTP
[4]Calculated
[5]GLWQA

4. Effluent Conditions

This section summarizes the effluent flow and quality from the wastewater treatment plant. This information was used to support both near-field and far-field modelling activities.

4.1 Effluent Flow

The current rated capacity of the G.E. Booth WWTP is 500 MLD. It is proposed that the rated capacity will be increased to 550 MLD to accommodate future growth in the Region of Peel, as indicated by the Class EA Phase 2 preferred solution.

4.2 Effluent Quality

Effluent quality is summarized in Table 4.1. The compliance limit and the 75th percentile values are presented for both TP and TAN. Calculation of the 75th percentile was based on raw water quality samples collected between 2016 and 2020. Samples of the effluent were collected daily for TP, temperature, pH and flow; TAN and E. coli were sampled weekly. Note that the seasonal limits for TAN do not match the seasons defined for this study. The limits shown in Table 4.1 are the calculated averages of the TAN limits based on the seasons used in this study. The geometric mean was used to define E. coli concentrations. The proposed future objective and limit for TP are 0.65 mg/L and 0.75 mg/L, respectively.

Table 4.1: Summary of G.E. Booth WWTP effluent quality and flow

WQ Parameter	Winter (Dec-Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
Based on 75th Percentile – Represents current operating conditions				
UIA (mg/L)[1]	0.0033	0.0027	0.0033	0.0024
TAN (mg/L)	1.2	0.7	0.7	0.6
TP (mg/L)	0.5	0.4	0.5	0.5
E.coli (counts/100mL)[2]	16	22	20	25
pH	7.0	7.1	7.0	7.0
Effluent temperature (°C)	18.1	18.4	24.3	22.4
Based on existing compliance limits for TAN and TP at 500 MLD				
TP (Existing Limit 0.8 mg/L)	0.8	0.8	0.8	0.8
TAN (mg/L)[3]	28.0	23.0	6.6	15.7
Proposed compliance limit for TAN and TP at 550 MLD				
TP (Proposed Limit of 0.75 mg/L)	0.75	0.75	0.75	0.75
TAN (mg/L)[3]	28.0	23.0	6.6	15.7
Average Design Flow (MLD)	Currently 500 MLD with proposed increase to 550 MLD			

[1]Calculated value using TAN, water temp and pH

[2]Geometric mean calculated instead of 75th percentile.

[3]Limits shown for TAN were averaged based on the seasons defined for this study

5. Calculation of Target Dilutions

MECP terms of reference for recent receiving water impact assessments on Lake Ontario (i.e., G.E. Booth (formerly Lakeview) WWTP, Clarkson WWTP, and Duffin Creek Water Pollution Control Plant) stated that the PWQO should be met at the edge of the near-field mixing zone, and as a minimum requirement, the extent of the near-field mixing zone should be limited to half the distance between the off-shore length of the outfall and shore. It is recognized that the definition of a mixing zone is open to interpretation but generally accepted as a starting point for evaluation by MECP; for the purpose of this study the mixing zone is defined based on the far-field model results discussed in the next section. Note that the half pipe distance was used in the near-field analysis to evaluate the performance of the outfall system in a region closer to the diffuser where rapid dilution occurs. An understanding of the dilutions required to achieve PWQO is needed to support this assessment; this was achieved using the following equation:

$$Dilution\ Ratio = \frac{C_{Eff} - C_{Amb}}{C_{WQO} - C_{Amb}}$$

Where:

C_{Eff} = effluent concentration (mg/L)
C_{Amb} = lake ambient concentration (mg/L)
C_{WQO} = water quality objective concentration (mg/L)

The required target dilutions were determined seasonally, and the analysis considered various effluent concentrations, including: the existing compliance limits for TP and TAN, the 75th percentile values based on effluent water quality data from 2016 to 2020, and the proposed future limit for TP and TAN, which has been reduced to 0.75 mg/L for TP but is the same as existing for TAN. The results are presented in Table 5.1.

Table 5.1: Seasonal dilution targets for key water quality parameters

WQ Parameter	Winter (Dec-Feb)	Spring (Mar-May)	Summer (Jun-Aug)	Fall (Sep-Nov)
Based on 75th Percentile – Represents current operating conditions				
UIA	<1:1	<1:1	<1:1	<1:1
TAN	3:1	>1:1	>1:1	>1:1
TP	32:1	32:1	44:1	48:1
E.coli	<1:1	<1:1	<1:1	<1:1
Based on proposed compliance limits for TAN and TP				
TP (Limit 0.75 mg/L)	53:1	58:1	72:1	71:1
TAN (vary by season)	61:1	47:1	14:1	33:1

The following observations are based on a review of the target dilutions presented in Table 5.1.

- The target dilutions shown for the 75th percentiles are based on actual measurements at the plant and are representative of current operating conditions. The geometric mean was used to represent E.coli.
- TP is the governing constituent for all seasons (based on the 75th percentile) with dilution values of 32:1 to 48:1.
- A review of target dilutions based on proposed compliance limits for TP and TAN showed that TP is the governing parameter in spring, summer and fall with values ranging from 58:1 to 72:1. TAN is the governing parameter in winter with a target dilution of 61:1.
- The target dilutions presented in Table 5.1 will be used to support an assessment of the performance of the proposed diffuser system; this is discussed in Section 7.0.

6. Outfall and Diffuser Configuration

As previously stated, a new outfall is proposed for the G.E. Booth WWTP as the existing treatment plant and diffuser system have inadequate capacity to service the proposed increase in design flow from 500 MLD to 550 MLD. Details on the existing and proposed diffuser systems are provided in Table 6.1. Note that the RWIA focused on the proposed diffuser concept, the existing diffuser information is provided for context only.

The proposed outfall extends approximately 2000 m from shore where it attaches to a 1000 m long multiport diffuser system. The average water depth over the length of the diffuser is 18.5 m below Chart Datum. There are 67 risers over the entire length of the diffuser with a port diameter of 0.5 m. Note that the ports on the first 250 m of the diffuser will be capped for future use leaving 51 ports open on the remaining 750 m of diffuser. The exit velocity from the open ports is 0.64 m/s assuming a design flow of 550 MLD.

All near-field and far-field modelling completed in this report assumed a diffuser length of 750 m with a total of 51 ports/risers. Optimization on the number of ports/risers will be completed during final design. The average water depth over this section of diffuser is 20 m.

Table 6.1: G.E. Booth WWTP diffuser system details

Diffuser System Details	Existing Diffuser	Proposed Diffuser
Length of outfall pipe from shore	1223 m	2000 m
Length of diffuser (ports uncapped/capped)	212 m	(1000 m)/(750 m)
Total length of outfall pipe and diffuser	1435 m	3000 m
Average depth over diffuser length (ports uncapped/capped)	9 m	(18.5 m)/(20 m)
Type of diffuser	Staged	Staged
Number of risers (ports uncapped/capped)	35	(67)/(51)
Number of ports (ports uncapped/capped)	35	(67)/(51)
Port spacing	6 m	15 m
Port diameter	0.6 m	0.5 m
Diffuser alignment angle	18 degrees	15 degrees
Vertical discharge angle	75 degrees	75 degrees
Design Flows	500 MLD	550 MLD
Exit velocity (ports uncapped/capped)	0.6 m/s	(0.48m/s)/(0.64 m/s)

7. Modelling to Support RWIA for G.E. Booth WWTP

The numerical modelling approach utilized both near-field and far-field modelling techniques. The two models used in this study were CORMIX and MIKE3. These models (described below) have been recently used to support other receiving water impact studies on Lake Ontario. The models and overall approach to the RWIA were presented to the MECP for comment and to ensure agreement on the methodology (see meeting minutes with MECP on April 14 and Nov 22, 2021).

7.1 Near-Field Model CORMIX

CORMIX is a United States Environmental Protection Agency (USEPA) approved software system for the analysis, prediction, and design of aqueous, toxic, or conventional pollutant discharges into diverse water bodies. CORMIX is a knowledge-based model that uses rule-based criteria to quantitatively define the geometry and dilution characteristics of the effluent plume. In regions characterized by relatively uniform currents, the model is also capable of predicting dilution estimates in the far-field where passive processes such as ambient currents dominate mixing and transport. The CORMIX model consists of three subsystems: CORMIX 1 is used to evaluate single port discharges, CORMIX 2 simulates multi-port discharges, and CORMIX 3 is used in the analysis of surface water discharges. The proposed outfall at G.E. Booth is a multiport diffuser system, therefore CORMIX 2 was used to assess initial dilution and mixing. Regulatory agencies such as the MECP generally require the use of a near-field model such as CORMIX to quantify dilution estimates in the mixing zone as part of a RWIA.

The CORMIX model was used to predict dilutions 200 m, 400 m, 1300 m, and 2000 m away from the proposed diffuser concept; the 200 m distance represents the (approximate) near-field region and 1300 m represents half the distance between the outfall system and the shore.

The strength of the model is in its ability to predict mixing and dilution where the momentum and buoyancy characteristics of the effluent jet dominate the mixing process. CORMIX cannot resolve complex shorelines or temporally and spatially varying meteorological conditions in a dynamic sense; the MIKE3 model was used to predict the movement of the effluent in the lake and its impact on beneficial uses such as water intakes, parks, and beaches.

7.2 Far-Field Model MIKE3

MIKE3 is a comprehensive software system designed for the simulation of 3D flows and environmental processes. Developed by the Danish Hydraulic Institute (DHI), the modelling package includes unsteady 3D flows considering density and temperature variations, variable bathymetry, and external forcing such as wind, pressure, water levels, and currents. MIKE3 has different configurations for its grid system, including the original regularly spaced finite difference grid with fixed vertical layers, and the more recently developed flexible mesh version with the option of sigma layers in the vertical. This study utilized the MIKE3 finite difference non-hydrostatic model due to its ability to simulate submerged buoyant discharges for extended periods (i.e., several months) in a reasonable period of time. Simulating the movement of the plume from April to October produces a more comprehensive receiving water assessment by dynamically accounting for variable wind and water temperatures as seasons change.

The strength of far-field models, such as MIKE3, is in evaluating the fate and transport of effluent plumes throughout the model domain where spatially varying current conditions may exist due to shoreline features, irregular bathymetry, and/or forcing mechanisms such as wind.

7.3 Near-Field Assessment

Multiport diffuser systems are an efficient design to convey effluent away from shore and generate conditions favourable for rapid dilution and dispersion. By distributing the flow to multiple ports along the diffuser, the total surface area for entrainment is increased compared to a single port, resulting in higher dilutions. The CORMIX 2 model (used for this assessment), assumes that the hydraulic discharge pattern from the risers can be represented as a uniform line source, where a constant flow distribution is achieved along the length of the diffuser. The model also assumes that the effluent plumes merge before the end of the near-field region.

The CORMIX model was set up to predict initial dilutions from the Booth diffuser system on a seasonal basis. Data provided in Table 4.1 and Table 6.1 were used to define the effluent water quality and geometric configuration of the multiport diffuser system respectively. Seasonal temperature and current conditions in the lake are defined in Table 3.2.

Output from the CORMIX model includes centerline dilution predictions at various distances away from the diffuser. Four distances were selected to evaluate the results, including, the half pipe length of 1300 m. The initial dilutions are based on low current speeds (25th percentile) and high effluent concentrations (compliance limits or 75th percentile values). This approach is generally recognized by the MECP for assessing receiving water impacts as it represents a conservative (worst case) condition with respect to mixing.

The dilution predictions from CORMIX for the proposed diffuser system are shown in Table 7.1. The calculated target dilutions required to meet PWQO based on the compliance limit for TP (0.75 mg/L) and the 75th percentile concentration are also provided in Table 7.1 for context. Recall that TP was identified as the governing constituent in spring, summer, and fall because it required the highest dilutions to meet PWQO for the existing compliance limits. TAN was the governing parameter in the winter.

Table 7.1: CORMIX initial dilution predictions for the proposed diffuser concept

Seasons	Target Dilutions[1]		CORMIX Dilution Predictions (Distance from diffuser)			
	TP Limit (0.75 mg/L)	TP 75th Percentile	200 m	400 m	1300 m	2000 m
Winter[1]	61:1	32:1	101:1	110:1	129:1	139:1
Spring[2]	58:1	32:1	101:1	110:1	129:1	139:1
Summer[2]	72:1	44:1	100:1	108:1	127:1	136:1
Fall[2]	71:1	48:1	100:1	106:1	123:1	132:1

[1] TAN is the governing parameter in winter at 61:1 (TP is 53:1)
[2] TP is the governing parameter in spring, summer, and fall

The findings from the nearfield analysis showed that the proposed diffuser concept for Booth exceeded the target dilutions less than 100 m away from the diffuser. Predicted dilutions exceeded 100:1 mixing approximately 200 m away from the diffuser. The results suggest the proposed diffuser performs very well during all seasons and will meet or exceed PWQO for the governing constituents close to the diffuser. The need for rapid dilution to occur quickly after discharge was a consideration in the design of the proposed diffuser given the close proximity of the R.L. Clark and A.P. Kennedy drinking water intakes.

As discussed, the CORMIX modelling focused on a conservative (worst case) condition to assess diffuser performance in the near-field region and at the half pipe length; however, the lake is dynamic and three-dimensional in nature and requires the use of a far-field model such as MIKE3 to assess plume movement over a wider range of lake currents and temperature conditions. While the half pipe length is a reasonable metric for evaluating the general performance of the diffuser, the mixing zone for this study was defined using the MIKE3 model. This is discussed further in the next section.

7.4 Far-Field Assessment

The 3D finite difference model MIKE3 FD was developed for this study and used to define the mixing zones for key constituents (TP, UIA) and to predict the impact at key locations near shore and at adjacent drinking water intakes (TP, TAN). The model was selected for its ability to simulate spatially varying meteorological conditions and submerged buoyant jets in complex regions near shore. The MIKE3 model was used to simulate hydrodynamic conditions in the lake from April to October 2008.

Developed by the Danish Hydraulic Institute (DHI), MIKE3 is a comprehensive state of the art software system designed for the simulation of 3D flows and environmental processes where stratification is of concern. The finite difference model is appropriate for Lake Ontario, which is subjected to 3D phenomena such as thermal stratification, thermal bars, up-welling, and down-welling events. The MIKE3 FD model has been used extensively by Baird and other users around the world to investigate receiving water impacts from submerged discharges.

The finite difference model uses a structured grid system to discretize the lakebed bathymetry and solve the governing partial differential equations. Higher resolution can be introduced into specific regions in the model domain using a nested grid approach. The MIKE3 model was developed using a series of nested grids with increased resolution along the Peel waterfront. Figure 7.1 shows the extent of the model domain and the location of the nested grids. All grids were rotated 25 deg.

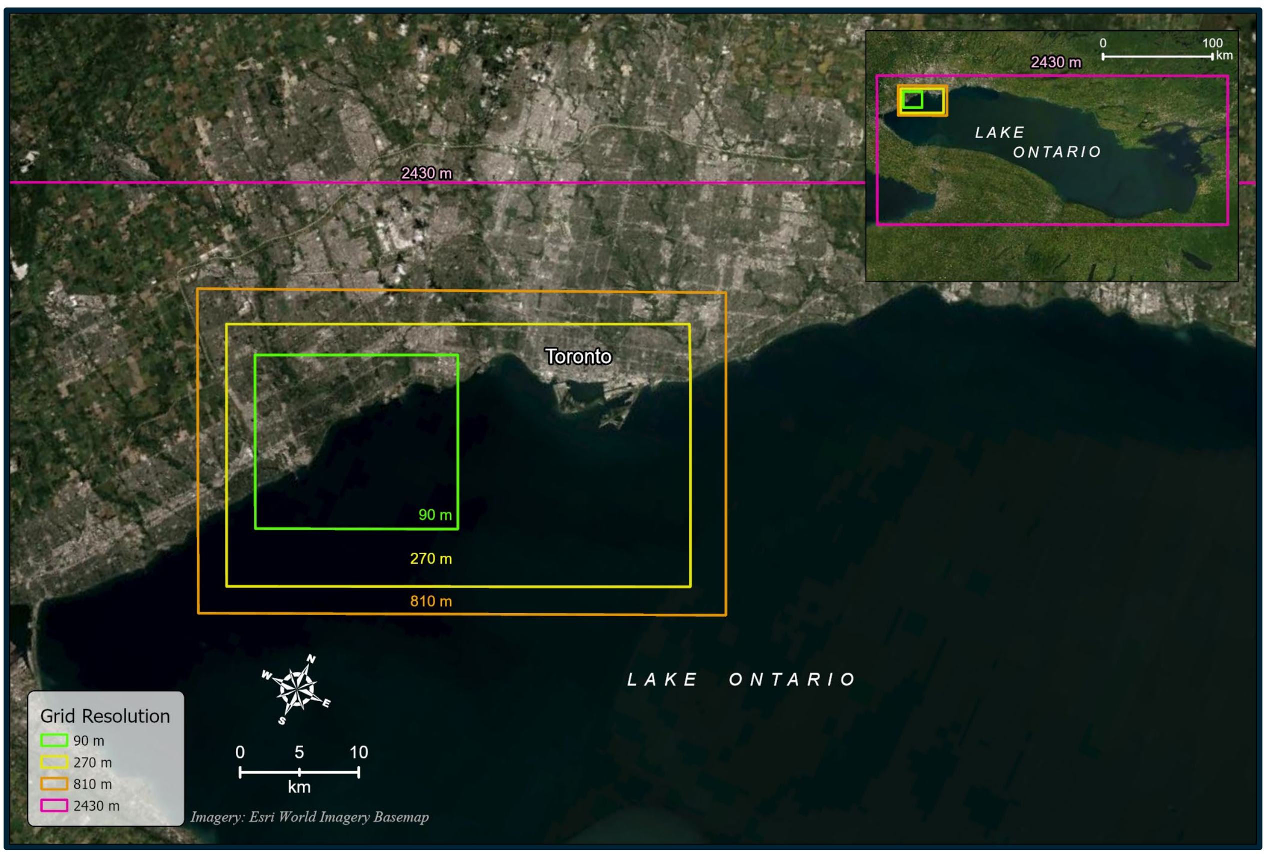

Figure 7.1: MIKE3 model domain and nested grids

The coarse outer grid has a resolution of 2,430 m and covers the entire lake. The first level of nested grid has a resolution of 810 m, the second level of nesting is 270 m. Both grids extend from Oakville to the east side of

Toronto and encompass the Peel shoreline; a 90 m grid resolves the area surrounding the G.E. Booth WWTP. The model used 40 vertical layers with 2 m spacing to discretize the water column.

The MIKE3 model was used to simulate the receiving water impacts from the G.E. Booth diffuser for an average daily flow (ADF) of 550 MLD. The receiving water assessment was completed based on a six-month period from April 15 to October 15, 2008. This period has been used in past RWIA studies on Lake Ontario. Starting the simulations in the spring allows the model to begin under constant isothermal temperature conditions in the lake and lets the thermal structure in the water column develop over the course of the summer and fall.

The primary driving mechanism in the model for hydrodynamics is wind. Spatial winds developed by NOAA on a 5 km grid spacing were used in the simulations; additional inputs such as air temperature, relative humidity, and cloud cover (clearness coefficient) were defined using recorded data from Pearson Airport. The model simulated TP, which was the governing constituent based on dilution, and TAN, which is of interest at the drinking water intakes and for calculating UIA. The 75th percentile values for TP and TAN (averaged over all seasons) were used to define the initial receiving water quality conditions in the lake. Table 7.2 provides a summary of the water quality conditions used in the model. Note that the TP limit of 0.75 mg/L was rounded up to 0.8 mg/L in the MIKE3 model to provide a level of conservatism in the receiving water assessment.

Table 7.2: Background and effluent conditions defined in the MIKE3 model

Background/Effluent Scenarios	Average Design Flow (MLD)	Total Phosphorus TP (mg/L)	Total Ammonia Nitrogen TAN (mg/L)
Background	NA	0.008	0.029
Effluent: Existing	550	0.75[1]	ECA Limits (refer to Table 1.1)[1]

[1] Proposed compliance limit for TP and TAN (same as existing limits)

Output from the MIKE3 model was used to predict water quality concentrations at locations near shore and at adjacent drinking water intakes; these locations are shown in Figure 7.2. The Oakville WTP intake was not considered in the far-field assessment as it is over 10 km away from the Booth outfall. Similarly, the Toronto intakes to the east are over 10 km away from G.E. Booth.

An example 2D plot showing a snapshot of predicted effluent (TP) concentrations during the model simulation is shown in Figure 7.3. In this case, the plume was subjected to north-westerly winds earlier in the day turning south-westerly in the afternoon pushing the plume to the north-east.

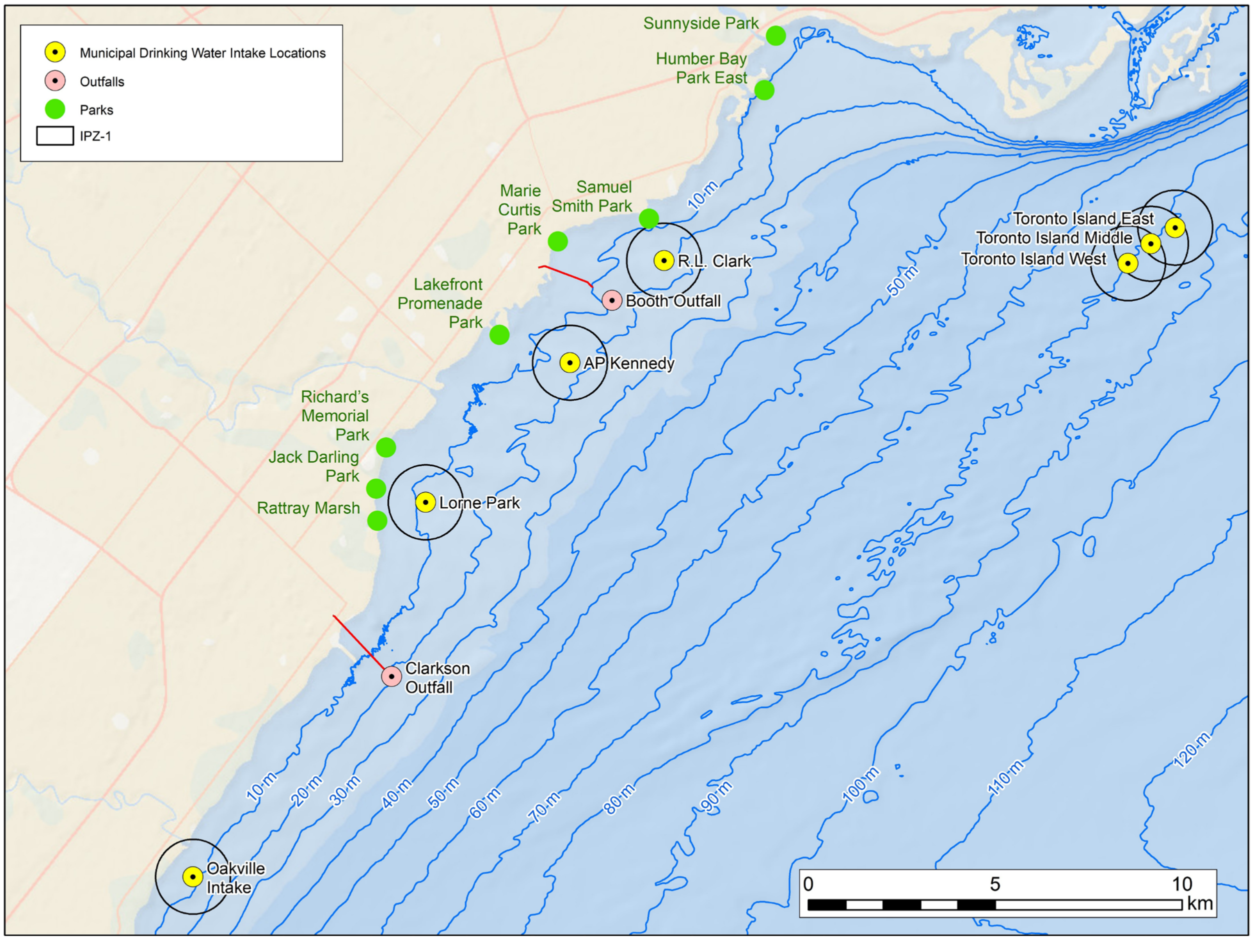

Figure 7.2: Fiducial markers used to assess water quality impacts

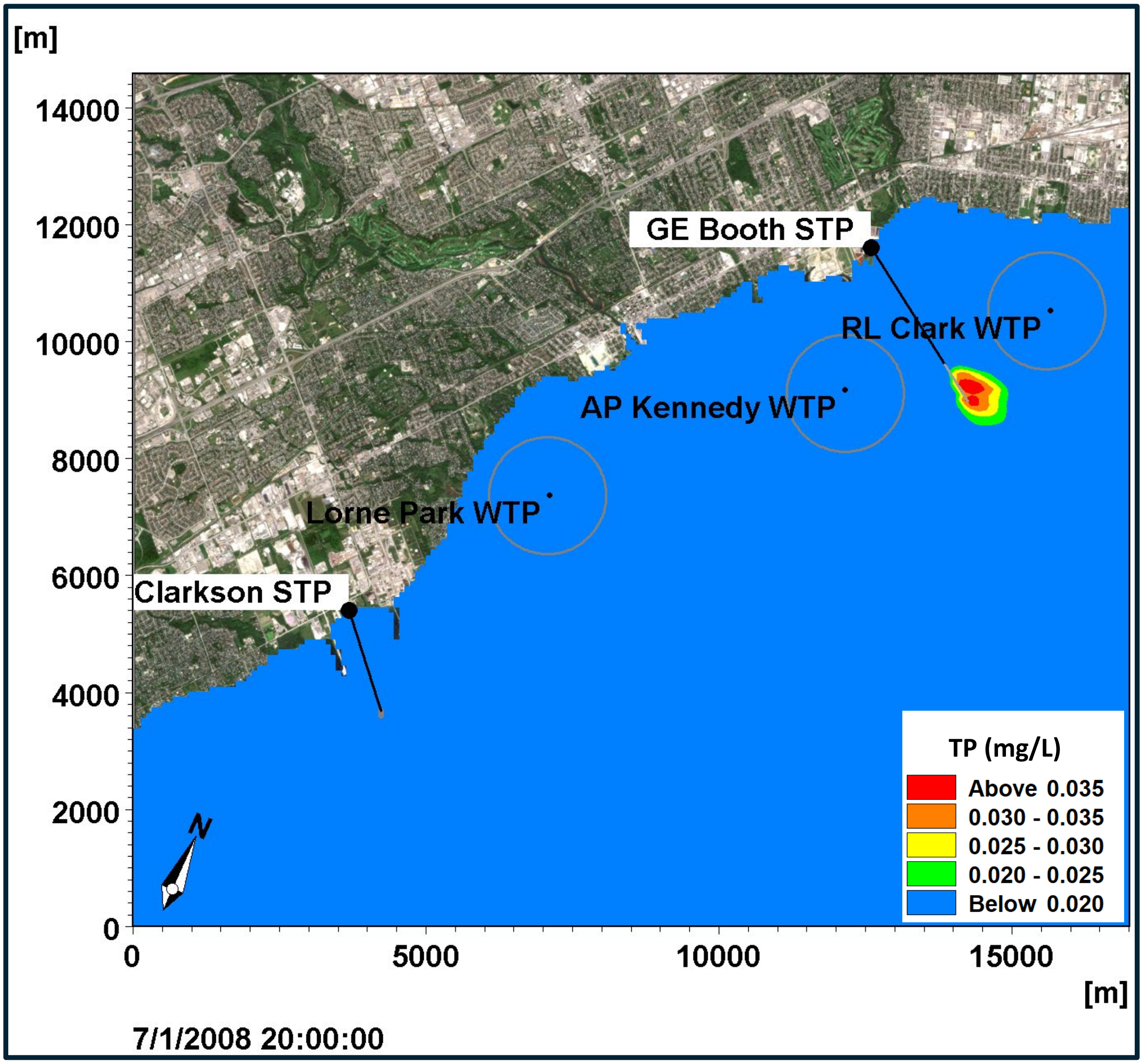

Figure 7.3: MIKE3 2D plot of TP concentration under south-westerly wind conditions

7.4.1 Effluent Impacts at Shore

The growth of algae, in particular epiphytic growth on rocks near shore, is stimulated by phosphorus. Table 7.3 provides a summary of the maximum instantaneous, the peak (average) daily, and the average concentration for TP at key locations used to assess water quality impacts along shore (see Figure 7.2 for locations). The peak daily concentration is based on a 24-hour rolling average as it is assumed that epiphytic growth is not driven by an instantaneous hourly measurement or prediction of phosphorus. The annual mean ambient TP concentration in the lake was defined as 0.008 mg/L in the model.

The model predicted that the peak daily TP concentration did not exceed PWQO at any of the locations under the future flow condition. Furthermore, the maximum instantaneous value was also below PWQO at all shoreline locations.

The maximum instantaneous TP concentrations exceeded PWQO at the A.P. Kennedy and R.L. Clark WTP intakes a total of 36 hours and 17 hours, respectively, over the simulation period; this equates to 0.8% and

0.3% of the time. The average TP concentration over the simulation period remained slightly above background concentrations at all locations.

Table 7.3: Predicted TP concentrations at shore and at drinking water intakes

Fiducial Markers	Inst. Max (mg/L)	Peak Day (mg/L)	Average (mg/L)
Drinking Water Intakes			
Lorne Park WTP	0.014	0.013	0.009
A.P. Kennedy WTP	0.029[1]	0.020	0.010
R.L. Clark WTP	0.025[2]	0.019	0.010
Locations at Shore			
Humber Bay Park	0.017	0.016	0.009
Sunnyside Park	0.015	0.015	0.009
Rattray Marsh	0.012	0.012	0.009
Jack Darling Park	0.012	0.012	0.009
Richard's Memorial Park	0.012	0.011	0.009
Lakefront Promenade Park	0.013	0.012	0.009
Marie Curtis Park	0.018	0.017	0.009
Samuel Smith Park	0.018	0.017	0.009

[1] TP exceeded PWQO (0.02 mg/L) a total of thirty-six hours over simulation (0.8% of time)

[2] TP exceeded PWQO (0.02 mg/L) a total of seventeen hours over simulation (0.3% of time)

7.4.2 Effluent Impacts at Drinking Water Intakes

TAN concentrations were assessed at the Lorne Park, A.P. Kennedy, and R.L. Clark water intakes. Ammonia was used as a surrogate measure of the conditions at the water filtration plant intakes and an indicator of effluent impacts on intake quality.

Table 7.4 provides a summary of the maximum instantaneous, the peak (average) daily, and the average concentration for TAN at all three intakes as well as shoreline locations over the six-month simulation. Predicted TAN concentrations remained below the GLWQA source water protection objective of 0.5 mg/L at all locations and for all statistical metrics except for the maximum instantaneous value at A.P. Kennedy. The TAN concentration exceeded the 0.5 mg/L threshold a total of five hours (0.1% of the time) over the course of the model simulation.

Table 7.4: Predicted TAN concentrations at shore and at drinking water intakes

Fiducial Markers	Inst. Max (mg/L)	Peak Day (mg/L)	Average (mg/L)
Drinking Water Intakes			
Lorne Park WTP	0.16	0.11	0.04
A.P. Kennedy WTP	0.56[1]	0.31	0.06
R.L. Clark WTP	0.26	0.22	0.05
Locations at Shore			
Humber Bay Park	0.11	0.11	0.04
Sunnyside Park	0.10	0.09	0.04
Rattray Marsh	0.07	0.06	0.04
Jack Darling Park	0.07	0.06	0.04
Richard's Memorial Park	0.07	0.06	0.04
Lakefront Promenade Park	0.08	0.08	0.04
Marie Curtis Park	0.12	0.11	0.04
Samuel Smith Park	0.11	0.11	0.04

[1] TAN exceeded GLWQA guidelines (0.50 mg/L) a total of five hours over simulation (0.1% of time)

7.4.3 Mixing Zones for TP and UIA

Figure 7.4 and Figure 7.5 show the predicted far-field mixing zone for TP and UIA under the future flow condition of 550 MLD (mixing zone is the red colour). Water quality concentrations were simulated hourly at every grid point over the entire six-month simulation. The percent of time that concentrations exceeded PWQO were then calculated for each grid point. The red area indicates those grid points where PWQO were exceeded at least 10% of the time. This approach, which directly accounts for the spatial and temporal variability in lake currents and thermal structure, has been used to define the far-field mixing zone for similar studies on Lake Ontario.

UIA is of concern to aquatic systems because of its link to toxicity to fish and other biota. UIA was calculated using predicted hourly TAN concentrations and temperature values and applying a constant (75th) percentile value of 8.2 for Lake Ontario pH.

The size of the mixing zone for TP was determined to be 0.2 km^2; this zone covers the length of the diffuser and is approximately 300 m wide. There is no UIA mixing zone for the proposed diffuser based on the 10 percent exceedance contour, the largest percent exceedance for UIA was 5.2%.

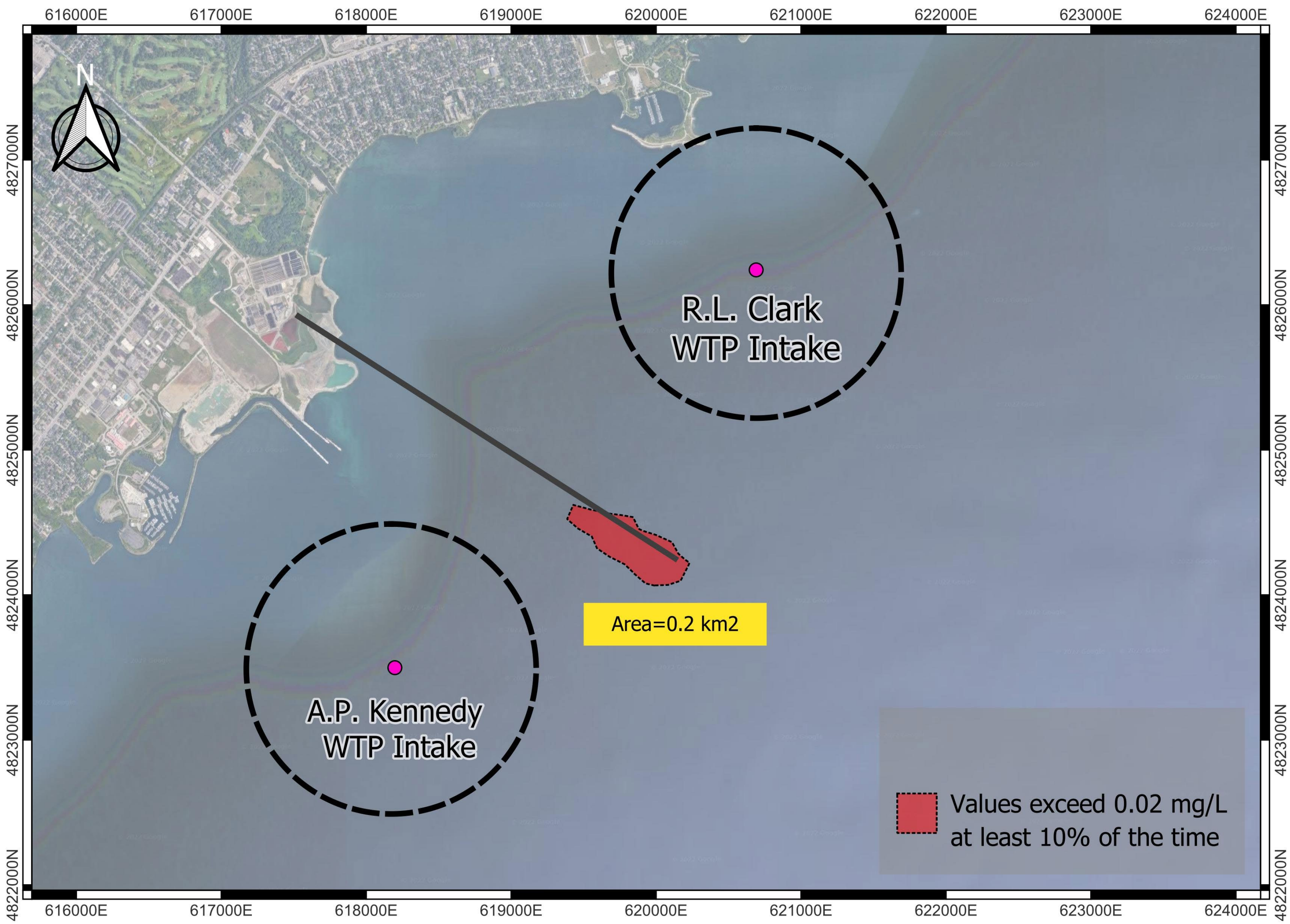

Figure 7.4: TP mixing zone for proposed future flow and TP limit.

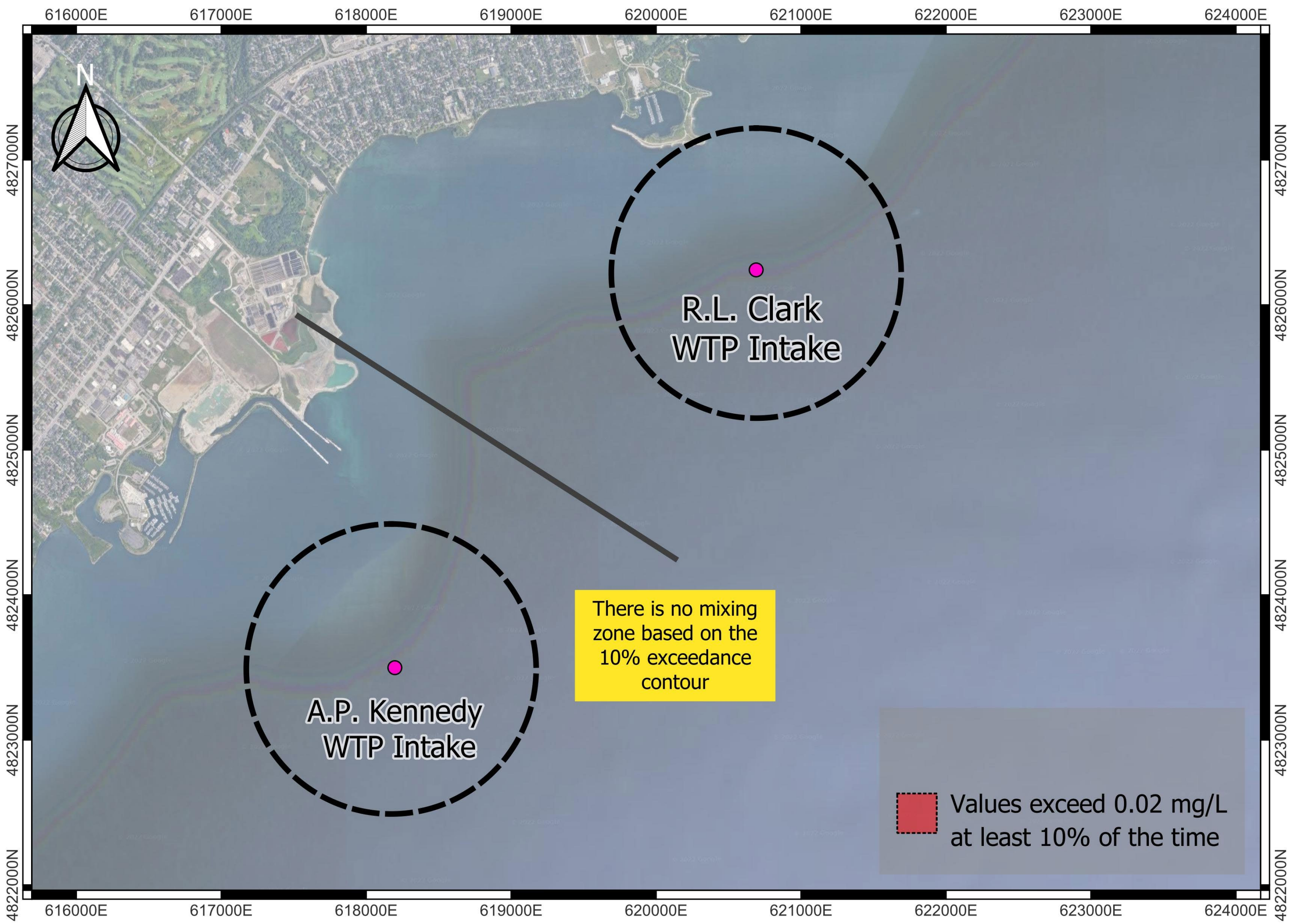

Figure 7.5: UIA mixing zone for future flow and TAN limits.

8. Conclusions

A Receiving Water Impact Assessment (RWIA) was completed for the G.E. Booth WWTP to demonstrate that the proposed expansion and diffuser concept meets the Ministry of the Environment, Conservation and Parks (MECP) regulatory requirements for surface water discharges based on the analysis undertaken, which included near-field and far-field modelling. The data and modelling analysis were completed by season (i.e., winter, spring, summer, and fall).

Lake Ontario is a Policy 1 receiver around the Booth outfall with respect to TP, pH, UIA, and *E. Coli* in which, according to MOE policy, "water quality shall be maintained at or above the Objectives". The assessment of the diffuser with respect to mixing focused on TP, TAN, and UIA which are the parameters of most concern.

A simple mixing formula was used to calculate the dilutions required to meet PWQO. It was determined that TP is the governing constituent for the spring, summer, and fall seasons based on a review of the existing effluent and lake water quality data as well as effluent compliance limits. TAN governs during the winter months. While this parameter was used as a surrogate measure of the conditions at the water filtration plant intakes as per GLWQA, the importance of TAN is in the calculation of un-ionized ammonia (UIA), which is of concern to aquatic systems because of its link to toxicity to fish and other biota. The target dilution was determined to be at least 72:1 to meet PWQO for all seasons and all constituents.

The mixing model CORMIX was used to evaluate the performance of the proposed diffuser for a future flow of 550 MLD. The proposed outfall extends approximately 2000 m from shore where it connects to a 1000 m long multiport diffuser system. The average water depth over the length of the diffuser is 18.5 m below Chart Datum. There are 67 risers over the entire length of the diffuser with a port diameter of 0.5 m. Note that the ports on the first 250 m of the diffuser will be capped for future use leaving 51 ports open on the remaining 750 m of diffuser. All near-field and far-field modelling completed in this report assumed a diffuser length of 750 m with a total of 51 ports/risers. The exit velocity from the open ports is 0.64 m/s assuming a design flow of 550 MLD. Optimization on the number of ports/risers will be completed during final design. The average water depth over this section of diffuser is 20 m.

The model assumed a conservative (worst-case) condition with respect to dilution; that is, the model was setup to simulate high effluent concentrations being discharged into the lake, which is characterized by high background concentrations and low lake current speeds. Output in the form of dilution estimates were summarized at various distances from the diffuser, including, the half pipe length which MECP does accept as a reasonable starting point for delineation of a mixing zone.

The findings from the nearfield analysis showed that the proposed diffuser concept for Booth met the target dilutions less than 100 m away from the diffuser. Predicted dilutions exceeded 100:1 approximately 200 m away from the diffuser. The need for rapid dilutions to occur quickly after discharge was a consideration in the design of the proposed diffuser given the close proximity of the R.L. Clark and A.P. Kennedy drinking water intakes.

The far-field model MIKE3 was used to assess the receiving water impacts from the proposed diffuser at Booth for an ADF of 550 MLD. The model was set up to simulate the discharge and movement of the effluent in the lake over a six-month period from April 15 to October 15, 2008. Spatial and temporally varying wind fields were used to drive model hydrodynamics and meteorological inputs were used to simulate the change in lake temperature over time. Output from the model were used to examine far-field impacts at adjacent water treatment plant intakes, key locations along shore, and to define mixing zones.

Output from the model showed that the movement of the plume is highly dynamic and strongly correlated with wind conditions. Shoreline impingement does occur for periods of time during the model simulations; in most cases, the plume was isolated to localized regions of the shoreline and was dependent on the wind direction.

The growth of algae, in particular epiphytic growth on rocks near shore, is stimulated by phosphorus. Predicted TP levels remained below PWQO at all locations based on the peak (average) daily concentration. This value was based on a 24-hour rolling average and used as a metric against PWQO as it is assumed that epiphytic growth is not driven by an instantaneous hourly measurement or prediction of phosphorus.

The maximum instantaneous TP concentrations exceeded PWQO at the A.P. Kennedy and R.L. Clark WTP intakes a total of 36 hours and 17 hours, respectively, over the simulation period, which is 4,777 hours in length; this equates to 0.8% and 0.3% of the time. The average TP concentration over the simulation period remained slightly above background concentrations at all locations.

Predicted TAN concentrations remained below the GLWQA source water protection objective of 0.5 mg/L at all locations and for all statistical metrics except for the maximum instantaneous value at A.P. Kennedy. The TAN concentration exceeded the 0.5 mg/L threshold a total of five hours (0.1% of the time) over the course of the 4,777-hour model simulation.

The mixing zones were defined by the 10% exceedance (or 90th percentile) contour throughout the model domain. That is, the mixing zones are defined as the region where PWQO were exceeded at least 10% of the time over the simulation period, this is shown as a red area in the images.

The mixing zone for TP is approximately 0.2 km^2 and generally covers the length of the diffuser and is approximately 300 m in width. The objective was to ensure a relatively small mixing zone given the proximity of the diffuser to the drinking water intakes located 2 km away on either side of the diffuser.

There is no UIA mixing zone for the proposed diffuser based on the 10 percent exceedance contour, the largest percent exceedance for UIA was 5.2%.

9. References

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Appendix C:

Air Quality Assessment Report

AIR QUALITY ASSESSMENT

SCHEDULE “C” CLASS ENVIRONMENTAL ASSESSMENT

G.E. BOOTH WATER RESOURCE RECOVERY FACILITY

REGIONAL MUNICIPALITY OF PEEL

PROJECT NO.: OAQC2166A
DECEMBER 2023

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EXECUTIVE SUMMARY

The Regional Municipality of Peel (Region of Peel)'s lake-based wastewater system consists of two major interconnected trunk sewer systems (East and West) which convey flows through sewage pumping stations, force mains, trunk sewers, and local gravity sanitary sewers, to the Clarkson Water Resource Recovery Facility (WRRF) and the G.E. Booth WRRF for final treatment and discharge to Lake Ontario. Both facilities are located within in the Region of Peel on the shore of Lake Ontario approximately 11 kilometres (km) apart from each other, as shown in Figure 1-1.

The G.E. Booth and Clarkson WRRFs are both conventional activated sludge facilities, with rated capacities of 518 million litres per day (MLD) and 350 MLD, respectively. The G.E. Booth WRRF is currently approaching its capacity limits, as the 5-year average day flow (ADF) to the G.E. Booth WRRF is approximately 450 MLD. Currently, the ADF to the Clarkson WRRF is approximately 220 MLD.

The Region of Peel proposes to expand operations (Project) at two Water Resource Recovery Facilities (WRRFs): the Clarkson WRRF (Project A) and the G.E. Booth WRRF (Project B), formerly known as the Clarkson Wastewater Treatment Plant and the G.E. Booth Wastewater Treatment Plant.

A Class Environmental Assessment (EA), pursuant to the *Ontario Environmental Assessment Act,* is required to be completed for both Projects A and B. The Air Quality Impact Assessment (AQIA) report for the Clarkson WRRF (Project A) was completed at the end of 2022 and following the review and comments from the Ministry of the Environment, Conservation and Parks (MECP) finalized in April 2023. This Air Quality Impact Assessment (AQIA) report is one of a series of Technical Support Documents (TSDs) prepared on behalf of Region of Peel to assess the potential effects of the operations expansions at the G.E. Booth WRRF (Project B) on air quality.

The facility is located at 1300 Lakeshore Road East in Mississauga, Ontario and processes the wastewater from homes and businesses in Bolton, Caledon East, Brampton, and the eastern parts of Mississauga.

The G.E. Booth WRRF Schedule C Class EA has developed a preferred regional solution for managing flows within the lake-based Peel wastewater collection system and a design concept for expanding the G.E. Booth WRRF to meet future wastewater treatment needs to the year 2041. The preferred design concept will help the Region respond to changing regulations and needs well into the future.

The preferred alternative includes:

- Expanding the existing G.E. Booth WRRF from a rated capacity of 518 MLD to 550 MLD by the year 2029. The expansion includes additional preliminary treatment, primary treatment by using the same technologies as the existing and providing additional secondary treatment capacity through the implementation of a Conventional Activated Sludge (CAS) facility. Disinfection will be provided through a new Ultraviolet (UV) disinfection facility.
- This will be achieved by Plant 1 Primary Building Extension, Plant 1 Blower Building Extension, New Disinfection Facility.
- Construction of new odour control facilities (OCFs) for Plants 1 and 2 with two stage treatment comprising biotrickling filters (BTFs) and granulated activated carbon (GAC) units and new exhaust stacks.
- Construction of new UV disinfection building.

- Installation of four (4) new egg-shaped anaerobic digesters in new Digester Control Building.
- Three (3) new Plant 3 Primary Clarifier Buildings complete with GAC odour control units and new exhaust stacks.

The G.E. Booth WRRF upgrade and expansion works also includes other new process equipment, as follows:

- New Ash Dewatering.
- New Outfall.
- New Biogas Dome.
- Four (4) standby diesel generators at the new energy center, each having a capacity of 3 MW.

The air quality assessment required quantification of air pollutant and odour emissions from all sources and activities at the G.E. Booth WRRF, and the use of air dispersion modelling to predict the resulting effects of WRRF emissions on air quality beyond the boundary of the facility. The air dispersion modelling was completed using the US EPA AERMOD, which is the approved regulatory model in Ontario. The AQIA included consideration of the existing background air concentrations of the air pollutants to compare the cumulative effects to the Ontario ambient air quality criteria.

The AQIA considered the following existing and proposed Project B air emissions sources:

- Criteria air contaminants emitted to the atmosphere from natural gas combustion sources at the G.E. Booth WRRF include oxides of nitrogen (NO_X) assessed as nitrogen dioxide (NO_2), carbon monoxide (CO), and negligible amounts of particulates and unburned hydrocarbons.
- Sulphur dioxide, hydrogen sulphide (H_2S) and ammonia (NH_3) are released to the air from the wastewater treatment processes.
- The operational expansion of G.E. Booth WRRF (Project B) is expected to emit to the atmosphere the same contaminants as at the current conditions plus additional, H_2S, NO_2, and ammonia from the proposed expansion, and additional nitrogen oxides from the standby diesel generators when these are tested.
- The emissions from the fluidized bed reactors (TOX-1, TOX-2, TOX-3, and TOX-4) which include the products of combustion of dewatered sewage sludge, metals in the sludge, and fuel.
- A new ash dewatering facility will be constructed and replace the use of the existing ash lagoons. The emissions of H_2S and NH_3 from the truck loading operation will be controlled by a scrubber and exhausted through a designated stack.

The key findings of the air quality assessment are as follows:

- The assessment determined that for the Project B scenario the modelled concentrations of all air pollutants were below the respective ambient air quality criteria, even with consideration of the existing background air concentrations.
- The contaminant with the highest level of air quality impact from the current configuration of the facility is sulphur dioxide (SO_2) at 92.5% and 34.7% of the ambient air quality criteria for 1-hour and annual averaging periods, respectively, noting that the comparisons are made against the new SO_2 standards that were brought into effect in 2023.

- For the upgraded facility (Project B), the contaminant with the highest air quality impact relative to its' criteria from the facility is also sulphur dioxide (SO_2). There are no changes to the modelled 1-hour average and annual SO_2 concentrations, which remain at 92.5% and 34.7% of the applicable criteria.
- For all air pollutants assessed, the predicted cumulative concentrations (ambient air concentrations plus Project B emissions) were found to be less than the respective criteria at all locations beyond the G.E. Booth WRRF property boundary and at all sensitive receptors.
- The current facility and Project B both have sources of odour emissions that require effective mitigation and management to prevent, or minimize, off-site effects. The odour impacts at identified sensitive receptors proximate to the G.E. Booth WRRF plant are expected to reduce significantly as a result of the planned upgrades and installation of the additional odour control equipment.
- Compliance with O. Reg. 419/05 applicable standards and criteria for the proposed Project B demonstrates that the Project B potentially meets the air quality requirements for obtaining a provincial Environmental Compliance Approval (ECA) - Air.

A series of mitigation measures, including air emission control systems, and specially designed enclosures, buildings were included in the project design to avoid and minimize adverse effects. In addition to these controls, the G.E. Booth WRRF will implement Odour Mitigation and Management Plan (OMMP) to minimize off-site odour impacts. This plan will include an odour complaint response protocol should an odour complaint be received for the operations of the expanded facility.

Regardless of the proposed expansion of the G.E. Booth WRRF, installation of odour and criteria contaminants control equipment/measures at the facility will result in decreased of point of impingement (POI) concentrations at the sensitive receptors in vicinity of the plant. The air dispersion modelling assessment predicts that the ambient air concentrations in the vicinity of the WRRF will continue to be lower than the ambient air quality criteria for all of the pollutants. Odour and hydrogen sulphide levels will be reduced compared to current baseline conditions with the significant mitigation improvements associated with the expansion and the upgrades at the facility that include:

- Decommissioning of the original Plant 1 facilities and construction of a new Plant 1 that included covered primary clarifiers and inlet channels complete with two-stage odour control (BTF and GAC).
- Covering of the Plant 2 inlet channels and primary clarifiers with two-stage odour control.
- Covering of the Plant 3 inlet channels and primary clarifiers and providing GAC based odour control.
- Upgrading of the existing Headworks and inlet sewer BTF odour control facility with two-stage odour control (i.e., add GAC polishing) together with an extended dispersion stack.

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APPENDICES

LIST OF ACRONYMS

AAQC	Ontario Ambient Air Quality Criteria
ACB	Air Contaminants Benchmark
ADF	Average daily flow
ADMGO	Guideline A-11: Air Dispersion Modelling Guideline for Ontario, v3.0, 2018
AERMOD	US EPA AERMOD version 19191, an MECP approved air quality dispersion model
AQIA	Air Quality Impact Assessment
CAAQS	Canadian Ambient Air Quality Standards
CAC	Criteria Air Contaminant
EA	Environmental Assessment
ECA	Ontario Environmental Compliance Approval
ECCC	Environment and Climate Change Canada
ESDM	Emission Summary Dispersion Modelling Report
km	kilometre
L	litres
m	metre
m^3	cubic metres
m^3/s	cubic metres per second
MECP	Ministry of the Environment, Conservation and Parks
MLD	million litres per day
NAPS	Canada's National Air Pollution Surveillance Program
NH_3	ammonia
NO	nitric oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
O_3	ozone
O. Reg.	Ontario Regulation
OU	odour unit
OU/m^3	odour unit per cubic metre
PM	particulate matter
POI	point of impingement
Project A	Clarkson WRRF upgrade
SO_2	sulphur dioxide
SO_3	sulphur trioxide
SOx	sulphur oxides
H_2S	hydrogen sulphide
TSD	Technical Support Document
US EPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
WRRF	Water Resource Recovery Facilities
°C	degrees Celsius
µg/m^3	micrograms (one-millionth of a gram) per cubic metre

1 INTRODUCTION AND PROJECT OVERVIEW

The Regional Municipality of Peel's (Region of Peel) lake-based wastewater system consists of two major interconnected trunk sewer systems (East and West) which convey flows through sewage pumping stations, force mains, trunk sewers, and local gravity sanitary sewers, to two treatment plants for final treatment and discharge to Lake Ontario.

The Region of Peel is proposing to upgrade and expand operations at these two Water Resource Recovery Facilities (WRRFs): the Clarkson WRRF (Project A) and the G.E. Booth WRRF (Project B). Both facilities are in the Region of Peel on the shore of Lake Ontario approximately 11 km apart (as shown in the Figure 1-1).

Figure 1-1: Project Location

A Class Environmental Assessment (EA) pursuant to the Ontario Environmental Assessment Act is required to be completed for the Project. This Air Quality Impact Assessment (AQIA) report is one of a series of Technical Support Documents (TSDs) prepared on behalf of Region of Peel to describe the potential air quality effects of the Project.

1.1 PURPOSE AND OBJECTIVES OF AIR QUALITY IMPACT ASSESSMENT

This AQIA Report has been prepared to assess the potential effects of the upgrades associated with Project B on air quality.

The objectives of the assessment are as follow:

- Identify the air contaminants that are expected to be emitted in notable quantities from operations at G.E. Booth WRRF, the key contaminants, for the current scenario and the Project B scenario with the upgrades and expansion completed.
- Prepare estimates of the air emissions of the key air contaminants from the Project, both point and area sources.
- Complete air dispersion modelling for key contaminants and odour to predict the resultant air quality effects on ambient air in the vicinity to allow for comparisons of the Project B effects to the current scenario, and to compare predicted air quality effects to the relevant air quality criteria.
- Identify mitigative measures to prevent, or minimize, off-site effects.
- Demonstrate compliance with the regulatory standards of Ontario Regulation (O. Reg.) 419/05 – Local Air Quality, as required to obtain in future an Environmental Compliance Approval (ECA) – Air and Noise.

1.2 OVERVIEW OF THE PROJECT

The G.E. Booth and Clarkson WRRFs are both conventional activated sludge facilities, with rated capacities of 518 million litres per day (MLD) and 350 MLD, respectively. The G.E. Booth WRRF is currently approaching its capacity limits, as the 5-year average day flow (ADF) to the G.E. Booth WRRF is approximately 450 MLD. Currently, the ADF to the Clarkson WRRF is approximately 220 MLD.

The East and West trunk sewer systems are approximately divided by the watershed boundary between the Etobicoke Creek and the Credit River. The two systems are currently connected via the West-to-East Sanitary Trunk Sewer, which can be used to divert some wastewater flows by gravity from the west trunk system to the east trunk system at Highway 407. In addition, an East-to-West Sanitary Trunk Sewer Diversion is currently being constructed, to help alleviate capacity challenges at the G.E. Booth WRRF, and allow the Region to better optimize wastewater flows and loading in their systems. The diversion is a deep gravity tunnelled trunk sewer of 2,400 mm diameter that extends 11 km between Spring Creek and the Credit River, aligned primarily along Derry Road. Construction of the gravity trunk sewer diversion is expected to be completed by 2026.

The Region's Growth Management process and 2020 Water and Wastewater Master Plan identified that there will be significant population and employment growth across the Region of Peel. With this approved growth to year 2041 and vision for growth beyond 2041, the WRRFs together will not have the capacity to meet the needs of Peel's citizens and to continue to protect the environment, even with the East-to-West Trunk Sewer Diversion in place. Additional treatment capacity will therefore be required at the G.E. Booth and Clarkson WRRFs.

Biosolids are the organic materials resulting from the physical, chemical and biological treatment of sewage sludge generated at Water Resource Recovery Facility. Currently, digested sludge generated at Clarkson WRRF is dewatered and hauled by trucks approximately 18 km to the G.E. Booth WRRF for incineration. The residual ash slurry from the incineration process is transferred to two on-site settling lagoons which are dredged regularly and stored on-site in the ash ponds and berms. The existing biosolids management program has challenges related to its capacity, long-term sustainability, cost effectiveness, and reliability.

The purpose this G.E. Booth WRRF EA is to document the process undertaken to identify a strategy for addressing immediate and long-term wastewater servicing needs in the Region, and to develop a preferred design concept for meeting these needs at the G.E. Booth WRRF.

The GE Booth WRRF Class EA will:

- Establish flow diversion requirements through the East-to-West Diversion Trunk Sewer.
- Develop a long-term sustainable program for managing biosolids in the Region.
- Identify and develop expansion needs at the G.E. Booth WRRF, including wastewater and biosolids treatment technologies and process requirements.
- Identify measures to avoid and mitigate impacts to the natural, social, cultural, and technical environments,
- Prepare an enhanced conceptual design.
- Develop an overall plan and schedule for implement infrastructure works.

The preferred alternative includes:

- Expanding the existing G.E. Booth WRRF from a rated capacity of 518 MLD to 550 MLD by the year 2029. The expansion includes additional preliminary treatment and primary treatment by using the same technologies as the existing and providing additional secondary treatment capacity through the implementation of a Conventional Activated Sludge (CAS) facility. Disinfection will be provided through a new Ultraviolet (UV) disinfection facility.
- This will be achieved by Plant 1 Primary Building Extension, Plant 1 Blower Building Extension, New Disinfection Facility.
- Decommissioning of existing Plant 1 and construction of new odour control facilities (OCFs) for Plants 1 and 2 with two stage treatment comprising biotrickling filters (BTFs) and granulated activated carbon (GAC) units and new exhaust stacks.
- Part of the Plant 3 upgrade construction of new UV disinfection building.
- Installation of four (4) new egg-shaped anaerobic digesters in new Digester Control Building.
- Three (3) new Plant 3 Primary Clarifier Buildings complete with GAC Odour Control systems and new exhaust stacks.

The G.E. Booth WRRF upgrade and expansion works also include new process equipment, as follows:

- New Ash Dewatering.
- New Outfall.
- New Biogas Dome.
- Four standby diesel generators at the new energy center, each having a capacity of 3 MW.

1.3 REGIONAL SETTING

The Project is located in a well-developed urban area of the Region of Peel within the boundary of the City of Mississauga. The civic address for the facility is 1300 Lakeshore Road East., Mississauga, Ontario, L5J 4B1.

The facility is surrounded by industrial lands with the closest residential receptors located in approximately 400 metres (m) to the north from the facility. The proposed changes to the GE Booth WRRF under the current EA assumed the property footprint of the facility will not change.

For the purposes of the AQIA, the term 'receptor' is defined as a location with human activity. It is recognized that the term 'receptor' in air quality assessments commonly refers to all computer-generated points where the modelling software computes concentrations of contaminants, independent of land use.

2 METHODOLOGY

2.1 STUDY AREA

The study area for air quality modelling is defined as an area approximately 10 km by 10 km centered at the G.E. Booth WRRF property, as illustrated in Figure 2-1. The impacts are expected in the vicinity of the facility where most of the air quality effects of the Project B are expected to occur and can be predicted or measured with a reasonable degree of accuracy.

2.2 TEMPORAL BOUNDARIES

The temporal boundaries of the air quality assessment correspond to those of the EA, and will span all phases of the Project:

- Current operations at the G.E. Booth WRRF (Current Scenario); and
- Operations at the G.E. Booth WRRF after changes proposed in the EA are implemented (Project B).

2.3 IDENTIFICATION OF MODELLED AIR CONTAMINANTS

The modelled air contaminants selected are those contaminants with air emissions and predicted ground level air concentrations that are relevant to the Current Scenario and Project B.

The modelled air contaminants selected are those contaminants identified in the Emission Summary and Dispersion Modelling (ESDM) Reports prepared for the G.E. Booth WRRF and approved by the Environmental Compliance Approval (ECA) granted by the Ministry of the Environment, Conservation and Parks (MECP) (ECA Number 4675-CAJSSL issued on September 19, 2022. The Project phase of the assessment is not expected to add any new contaminants which were not previously assessed for the Current Scenario, which is the operating scenario approved by MECP.

The air contaminants include the Criteria Air Contaminants (CACs) associated with natural gas combustion with nitrogen oxides (NO_X) were used as a surrogate for all CACs, and contaminants associated with wastewater treatment operations hydrogen sulfide (H_2S), sulphur dioxide (SO_2), ammonia (NH_3) and odour. The modelled contaminants are further described in Section 3.1 of this report.

2.4 PREDICTION OF EFFECTS

2.4.1 METHODOLOGY

The assessment of the potential air quality effects of the proposed Project was performed in accordance with the requirements stipulated in the MECP reference documents.

The prediction of effects involved the following steps:

- Identify emissions sources associated with the Current Scenario and Project B.
- Identify the key air contaminants emitted to the atmosphere from the identified sources.
- Summarize the baseline ambient air quality conditions in the absence of the Project for each of the key air contaminants.
- Identify the relevant regulatory air quality standards and criteria and establish the appropriate assessment criteria for the site in Ontario, noting that for some of the parameters there may be more than one applicable limit depending upon the air concentration averaging time.
- Estimate the air emission rates for each of the key air contaminants using appropriate estimation methods and established data sources.
- Prepare a source summary table that identifies sources at the Project site which may release one or more of the key air contaminants or odour emitted to the atmosphere in appreciable quantities and the corresponding compounds and emission rates.
- Perform air dispersion modelling using the U.S. Environmental Protection Agency (US EPA) AERMOD version 22112, the current regulatory air dispersion model used in Ontario.
- Compare the dispersion modelling output to the assessment criteria, comparing predicted offsite effects on ambient air quality with the corresponding air quality standard or criterion.

2.4.2 DISPERSION MODEL SELECTION

AERMOD, a steady-state Gaussian dispersion model, was determined to be the most appropriate model for assessment as it is capable of handling multiple sources of varying types such as point, area, and linear sources. The dispersion model was used to predict the concentrations (in µg/m^3) of the air contaminants identified in Section 3.1 at each receptor beyond the property boundary.

The input data used for AERMOD includes five years of local, hourly meteorological data, terrain elevations for the site and vicinity, and the characteristics of the buildings, and emission sources.

Although the immediate area surrounding the site does not have major topographical features such as mountains, valleys, or canyons, the topography was considered in the AERMOD modelling. Canadian Digital Elevation Data were publicly available as GeoTIFF files for the modelling domain.

2.4.3 METEOROLOGICAL DATA FOR AIR DISPERSION MODELLING

The site-specific meteorological data used for the AERMOD modelling consisted of five years (2013 to 2017) of surface meteorological data and upper air data processed and provided to WSP air quality team by the Ontario MECP.

The meteorological data included hourly wind speed, wind direction, temperature, and barometric pressure. The surrounding land use was used in processing the AERMET file to establish appropriate surface roughness, albedo, and Bowen ratio values for the modelling domain. These data allow for the determination of the mixing height and other parameters that influence air dispersion of emissions from sources at the WRRF.

The method outlined in the ADMGO was used to address the potential for meteorological anomalies to overly influence the results of air dispersion modelling (MECP 2017).

The wind data from the site-specific data set provided by the MECP is presented for the entire 5-year period (2013 to 2017) as wind roses in Figure 2-2. A wind rose is a useful frequency distribution plot that shows the wind speed and direction data in one plot. Each colour in the plot represents a wind speed range, and each segment extending out from the centre represents the frequency that wind is blowing from that direction. This is the wind speed and direction data used for the air dispersion modelling. It is noted that MECP modifies the wind speed data in the data set to replace all calm conditions with low wind speeds. As such, the wind rose does not show any calm conditions, which makes the dispersion modelling results more conservative.

Northeast winds were the most common and prevailing and the average wind speed for the data set was 4.82 metres per second (m^3/s).

2.4.4 AIR DISPERSION MODELLING FOR ODOUR AND HYDROGEN SULPHIDE

The MECP introduced in 2008 and finalized in 2016 the technical bulletin "Methodology for Modelling Assessments of Contaminants with 10 minute Average Standards and Guidelines under O. Reg. 419/05".

This methodology is relevant for modelling assessments of two contaminants emitted from G.E. Booth WRRF: Hydrogen Sulphide (H_2S) and odour. H_2S has an ambient air quality criterion (AAQC) for the 10-minute averaging time and an air quality standard under O. Reg. 419/05 based upon the potential for odour effects. Odour has a recommended 10-minute average benchmark of 1 odour unit per cubic metre (OU) in Ontario which is used to evaluate the likelihood of odour effects.

The MECP's guidelines consider nuisance odour effects that lead to complaints to be unlikely where a facility that emits a contaminant with a 10-minute odour-based standard or guideline and the modelling shows that at a sensitive receptor this benchmark is exceeded less than 0.5% of the time, which corresponds to approximately 44 hours per year. This means that 99.5% of the time in any given year, the 10-minute odour-based standards and guidelines will be met.

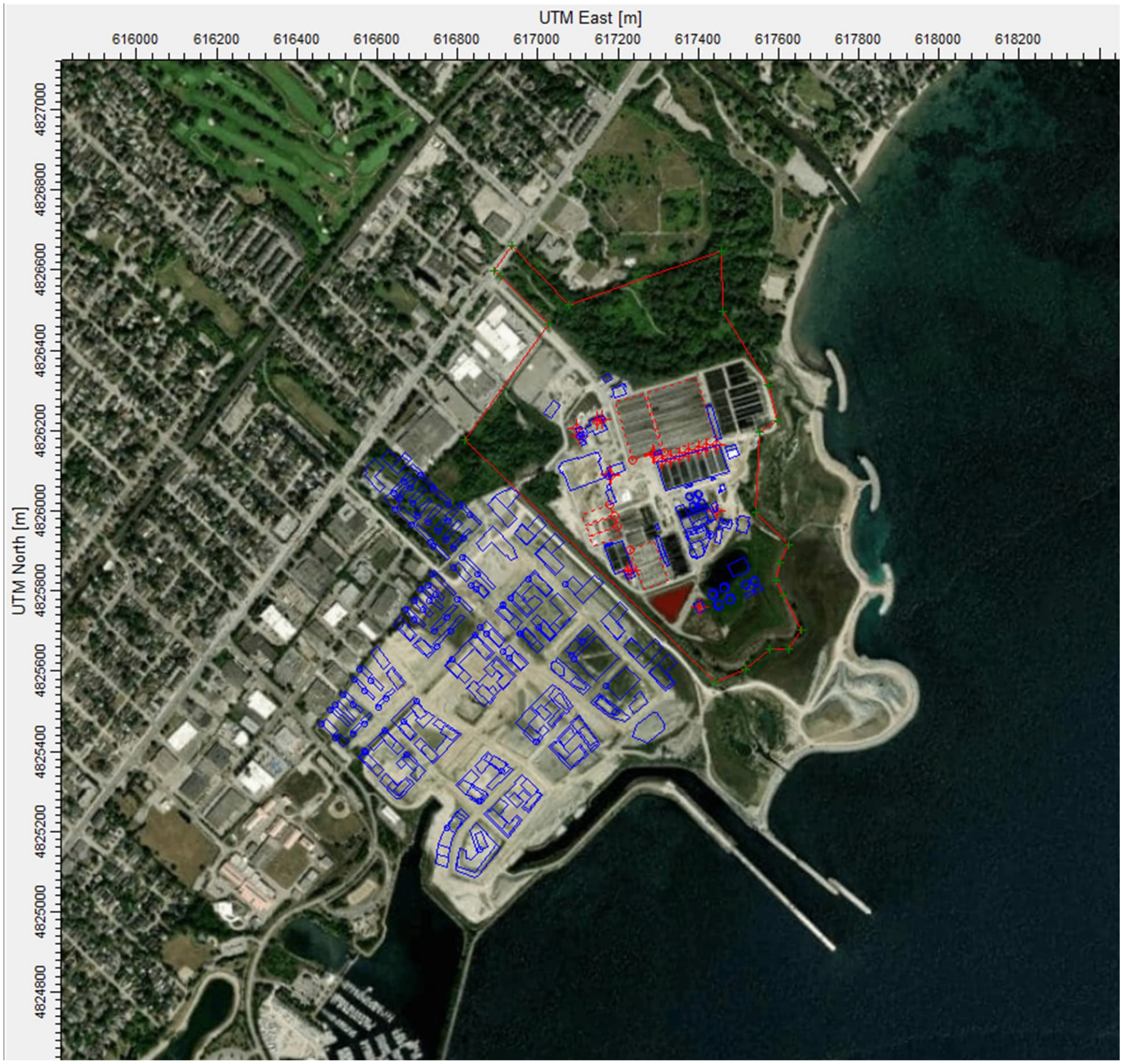

Figure 2-1: Air Quality Study Area with Future Residential Development

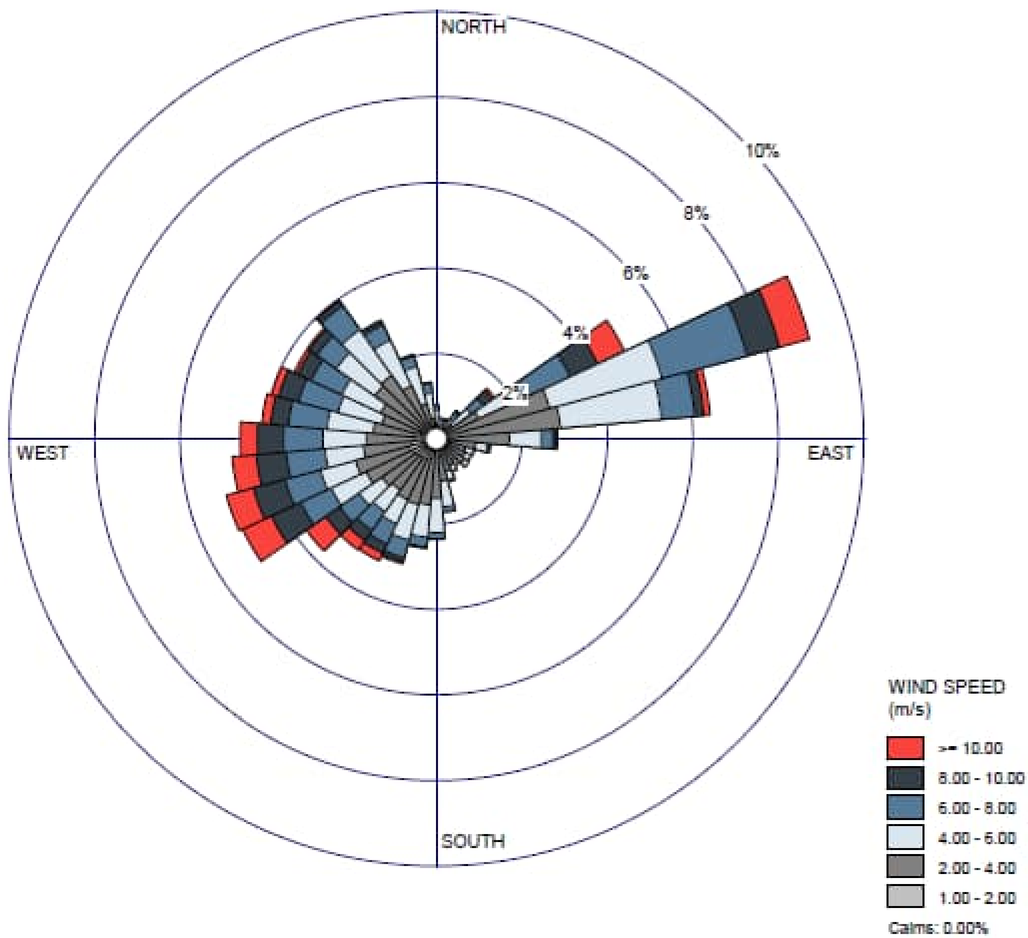

Figure 2-2: Five-Year Wind Rose – Site Specific (2013 to 2017)

3 ATMOSPHERIC EMISSIONS AND APPLICABLE CRITERIA

The air quality effects prediction study requires comparing the results of the dispersion modelling to applicable air quality criteria in order to determine whether there are potential adverse effects on the environment and human health from the release of the key contaminants to the air.

3.1 AIR POLLUTANTS ASSOCIATED WITH WASTEWATER TREATMENT

Emissions to the atmosphere of the following compounds are anticipated from the Project, which are considered to be the key contaminants for the assessment:

- Criteria Air Contaminants (CACs) associated with natural gas combustion, specifically oxides of nitrogen (NO_X), reported as nitrogen dioxide (NO_2).

  For natural gas combustion the emissions of sulphur dioxide, carbon monoxide, carbon dioxide, particulate matters, water and unburned hydrocarbons are considered insignificant because the impact of their emissions is very small when compared with the relevant standards (US EPA).

- Other contaminants associated with wastewater treatment processing:
  - Ammonia (NH_3);
  - Sulphur dioxide (SO_2);
  - Hydrogen sulphide (H_2S), and
  - Odour.
- Contaminants associated with biosolids incineration:
  - Criteria Air Contaminants (TSP, SO_2, NO_X, CO);
  - Volatile Organic Compounds (VOCs) and Hydrocarbons (as CH_4);
  - Polycyclic Aromatic Hydrocarbons PAHs (naphthalene, benzo(a)pyrene);
  - Trace Metals, including mercury, nickel, arsenic, cadmium, calcium, iron, manganese, potassium; and

Inorganic gases (hydrogen chloride HCl, hydrogen fluoride HF).

3.1.1 NITROGEN OXIDES

Nitrogen oxides (NO_X) are a mixture of compounds of oxygen and nitrogen, including primarily nitric oxide (NO), and nitrogen dioxide (NO_2). Environment and Climate Change Canada (ECCC) and the MECP have set standards for NO_2 concentrations; there is no standards for NO.

Since NO_2 has adverse effects at much lower concentrations than NO, and NO converts to NO_2 in ambient air, the standard and AAQC for nitrogen oxides is based on the health effects of NO_2. In the assessment of ambient air quality, NO_2, not NO_X, is the reference contaminant.

3.1.2 SULPHUR OXIDES

Sulphur oxides, or SOx, comprise sulphur dioxide (SO_2), sulphur trioxide (SO_3) and solid sulphate forms. SO_2 is a non-flammable, non-explosive colourless gas. In connection with fuel burning, where the majority is in the form of SO_2, SOx is normally expressed in terms of the equivalent mass concentration of SO_2.

SO_2 emissions from the G.E. Booth WRRF are expected from the incineration of the dewatered solids/cake/fuel at the four fluid-bed incinerators.

New, more stringent O. Reg. 419/05 air quality standards and AAQC are based upon potential health effects of SO_2, as well as potential effects on vegetation.

3.1.3 HYDROGEN SULPHIDE (H_2S)

Hydrogen sulphide (H_2S) gas is a colourless and odorous compound. It is formed in the wastewater collection system.

H_2S is one of the sulphur compounds of the Total Reduced Sulphur (TRS) group. Other TRS compounds are dimethyl sulphide, dimethyl disulphide and mercaptan. For the wastewater treatment facility H_2S is considered to be the predominant compound, so in this report it's introduced as a surrogate for TRS. In the emission summary table of the report the TRS compound is included for completeness based on the same modelling results as H_2S compound and the MECP POI limits for TRS are applied accordingly. Currently, the primary clarifiers in Plant 1, 2 and 3 are not covered. As part of the upgrades the Plant 1 and 2 Primary Clarifiers and Inlet Channels will be covered to allow H_2S gas to be treated by two-staged removal process, biotrickling filter (BTF) followed by granular activated carbon (GAC). The BTF system is the first stage of the odour treatment process. It will remove most of the H_2S from the odorous air. The GAC system will follow the BTF system and further reduce H_2S concentrations and remove trace odorous elements that the BTF system cannot remove such as methyl mercaptan, and dimethyl disulphide, and catch sudden peaks in odorous air to which the BTF is not acclimatized.

The Plant 3 Primary Clarifiers and Inlet Channels will also be covered as part of the proposed upgrades, to allow H_2S gas to be collected and treated by new granular activated carbon (GAC) units.

3.1.4 AMMONIA (NH_3)

Ammonia (NH_3) is an inorganic compound of nitrogen and hydrogen and is a colourless gas with a distinct odour. It is present in the wastewater and sewage sludge at the G.E. Booth WRRF facility, with air emissions from the Biosolids Truck Loading operations.

3.1.5 ODOUR

Odour emissions have the potential to become a nuisance to people who live near odour sources, or to people who frequent sports fields, community centres, or other sensitive land uses in the Study Area. Odour becoming a nuisance varies widely from person to person and there are varying degrees of sensitivity and opinions about what is considered offensive. Five factors that contribute to odour nuisance have been defined to help deal with the complex and subjective nature of odours, referred to as the FIDOL factors:

Frequency (F) – how often odour is detected;

Intensity (I) – how strong is the odour;

Duration (D) – are odours very brief or are episodes lengthy;

Offensiveness (O) - the hedonics or descriptors (putrid, solvent); and

Location (L) – is someone present to smell the odour.

Various combinations of these five factors may lead to odour complaints or adverse effects, and all five must be considered for effective odour management.

Odours from wastewater treatment facilities are generally caused by reduced sulphur compounds, ammonia, or certain volatile organics. Emissions of odour to the atmosphere, in odour units per second (OU/s), can be measured at a source of emissions like stacks or digesters/lagoons by taking a grab air sample and analyzing it by an odour panel, or by using devices that measure surrogate compounds.

The odour emission rates from various sources pertaining to the site were provided to WSP air quality team by the Class EA design team. No odour sampling was undertaken at the facility over the course of this AQIA report preparation.

3.2 AIR QUALITY STANDARDS AND CRITERIA

Various regulatory agencies set specific target criteria to be protective of human health and the environment. Criteria and standards can have different averaging times depending on the type of effect the compound may have. The averaging time is the duration of exposure to the air contaminant, and ranges from 10-minute averaging periods for odour-based criteria to evaluate acute effects, to annual averaging periods for long-term exposure effects (chronic).

The MECP has established AAQC for various parameters, including most of the target air contaminants identified for this air quality assessment. The AAQCs are set to determine a target concentration for a location, inclusive of all sources and background. The AAQC levels are not compliance standards but set to provide guidance for acceptable ambient air quality in Ontario. . The MECP has also developed Daily Assessment Values and Annual Assessment Values for contaminants with annual air quality standards such as nickel and benzo(a)pyrene.

In contrast, the O. Reg. 419/05 standards are used for the assessment of stationary sources, without considering the effects of deposition or plume depletion, and assuming that all NO_X is converted to NO_2 immediately. This assessment is also conducted in accordance with specific requirements of the Regulation, Guideline A-10: Procedure for Preparing an Emission Summary and Dispersion Modelling Report (MECP 2018), and Guideline A-11: Air Dispersion Modelling Guideline for Ontario (MECP 2017). The standards, as well as other Air Contaminants Benchmarks (ACBs) are used for permitting and compliance purposes; the ACBs include standards, guidelines and jurisdictional screening levels for more than 5,000 contaminants. In many cases, the AAQC criteria and the O. Reg. 419/05 standards or ACBs are numerically the same.

For this assessment, it was appropriate to compare the modelled effects to the respective AAQC with consideration of background air concentrations. In addition, the Project was assessed in accordance with O. Reg.

419/05 and the noted MECP Guidelines to establish whether the provincial requirements for obtaining an ECA can be met.

In addition to the provincial criteria, federal CAAQS for NO_2, and SO_2 have been adopted by the Canadian Council of Ministers of the Environment and were considered in this assessment. These CAAQS are intended as targets for air quality to determine appropriate air quality management actions for action within an air zone and not for local assessment or enforcement. The CAAQS are not directly comparable to the maximum modelled air concentrations but rather to the 3-year average of the 98th percentile for NO_2 and the 99th percentile for SO_2. As the CAAQS are not intended for the assessment of specific emission sources but rather to characterize air quality within a broader air zone, therefore the SO_2 and NO_2 effects were assessed against the AAQCs and standards under O.Reg.419/05.

A summary of the applicable AAQCs, ACBs, and CAAQS is provided in Table 3-1.

Table 3-1: Air Quality Standards and Criteria

Parameter	Averaging time	Unit of Measure	O. Reg. 419/05 Standards and Air Contaminants Benchmark (ACB)	Ambient Air Quality Criterion (AAQCS)	Canadian Ambient Air Quality Standard (2) (CAAQS)
Nitrogen Dioxide (NO_2)	1 hour	µg/m^3	400 (1)	400	84
	24 hours	µg/m^3	200 (1)	200	—
	Annual	µg/m^3	—	—	24
Nitrogen Dioxide (NO_2) - with Emergency Generators	½ hour	µg/m^3	1,880	—	—
Sulphur Dioxide (SO_2)	10-minute	µg/m^3	—	178	—
	1 hour	µg/m^3	100	106	173
	Annual	µg/m^3	10	10	10.6
$PM_{2.5}$	24 hours	µg/m^3	—	27	27
	Annual	µg/m^3	—	8.8	8.8
Hydrogen Sulphide (H_2S)	10-minute	µg/m^3	13	13	—
	24 hours	µg/m^3	7	7	—
Total reduced sulphur (TRS)	10-minute	µg/m^3	13	13	—
	24 hours	µg/m^3	7	7	—
Ammonia (NH_3)	24 hours	µg/m^3	100	100	—
Odour	10-minute	µg/m^3	1 (3)	—	—

Notes:

"—" indicates that there is no criterion or standard for the respective contaminant and/or averaging period.

1 NO_X expressed as NO_2.

2 2025 CAAQS for NO_2 and SO_2.

3. One odour unit is the odour concentration where 50% of the panelists on a trained odour panel can detect a difference between a blank sample and an odour sample.

4 EXISTING ENVIRONMENTAL CONDITIONS

4.1 BASELINE AIR QUALITY CONDITIONS (PROJECT BACKGROUND)

The air quality local to the Study Area is influenced by various sources that include traffic related air pollution from the major local arterial roads, railroads, residential, institutional, and commercial heating, and transboundary sources.

There are a number of air quality monitoring stations operated by the Ontario MECP and as part of the ECCC's National Air Pollution Surveillance (NAPS) program that are located within reasonable distances of the G.E. Booth WRRF. These stations were used to establish baseline air concentrations in the Study Area as the surrounding land uses are similar (suburban development, highways, arterial roads, commercial and industrial). The stations are also at similar distances from heavy industrialized centres such as Hamilton, Sarnia, and areas in the US such as the Ohio Valley.

For contaminants that are assessed for the 1-hour, and 24-hour averaging times, the 90th percentile of the measured concentrations were used as a representative baseline. The use of maximum measured ambient concentrations for the assessment of cumulative effects would be overly conservative for these shorter averaging periods, as the assumption would be that the worst-case emissions from the site would coincide with unfavorable weather conditions in the direction of the receptor and maximum contributions from all regional sources. For this reason, the 90th percentile concentration is frequently used as a conservative baseline, as a concentration that is expected to be exceeded only under certain weather conditions or other air quality influences. For contaminants that have AAQCs for the annual averaging period, the average of the monitoring data was used for the baseline.

A five-year dataset (2016-2020) was used to calculate the statistics used for the baseline concentrations. The monitoring stations used to establish regional baseline conditions for the Study Area are identified in Table 4-1 and Table 4-2. The selection of the stations was based on the proximity to the project area, similarity of land use, and most recent robust data set.

Table 4-1: MECP and NAPS Air Monitoring Stations

Station ID		UTM Coordinates		Distance from Study Area (km, direction)
NAPS ID	Name	X(m)	Y(m)	
60434	Mississauga 3359 Mississauga Road N.	608 329	4 822 435	9 km, SW
60430	Toronto West 125 Resources Road	617 350	4 840 819	14 km, NE

Note: UTM Coordinates – NAD83, Zone 17

Table 4-2: Baseline Concentrations

Compound	CAS Number	Averaging Time	Baseline Concentration	Reference for Baseline Concentration
Nitrogen dioxide (NO_2)	10102-44-0	1-hour	30.8 µg/m³	90th percentile of 1-hr averaging data measured at Mississauga, 2016-2020
		24-hour	24.9 µg/m³	90th percentile of 24-hr averaging data measured at Mississauga, 2016-2020
		Annual	14.1 µg/m³	Annual average measured at Mississauga, 2016-2020
Sulphur dioxide (SO_2)	7446-09-5	1-hour	1.8 µg/m³	90th percentile of 1-hr averaging data measured at Toronto West, 2016-2020
		24-hour	0.8 µg/m³	90th percentile of 24-hr averaging data measured at Toronto West, 2016-2020
		Annual	0.8 µg/m³	Annual average measured at Toronto West, 2016-2020
Carbon Monoxide (CO)	630-08-0	0.5-hour	263 µg/m³	90th percentile of 1-hr averaging data measured at Toronto West, 2016-2020
Naphthalene	91-20-3	24-hour	0.1244 µg/m³	90th percentile of 24-hr averaging data measured at Toronto West, 2017-2021
$PM_{2.5}$	NA	24-hour	12.8 µg/m³	90th percentile of 24-hr averaging data measured at Mississauga, 2016-2020
		Annual	6.9 µg/m³	Annual average measured at Mississauga, 2016-2020

4.2 TEMPERATURE AND PRECIPITATION

According to the Canadian Climate Normals (calendar years 1981 to 2010) for Toronto Pearson International Airport, the mean annual temperature was 8.2°C. The warmest month of the year is August with an average temperature of 20.6°C and the coldest month is January with an average temperature of -5.5°C. The meteorological station recorded a total average annual precipitation of 785.9 mm, of which 681.6 mm was rainfall. Precipitation is distributed throughout the year, with most of the rain occurring between April and October. Climate Normals for the Toronto Pearson International Airport station are summarized in Table 4-3.

Table 4-3: Temperature and Precipitation Climate Normals (Toronto Pearson International Airport)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature (°C)													
Daily Average	-5.5	-4.5	0.1	7.1	13.1	18.6	21.5	20.6	16.2	9.5	3.7	-2.2	8.2
Daily Maximum	-1.5	-0.4	4.6	12.2	18.8	24.2	27.1	26.0	21.6	14.3	7.6	1.4	13.0
Daily Minimum	-9.4	-8.7	-4.5	1.9	7.4	13.0	15.8	15.1	10.8	4.6	-0.2	-5.8	3.3
Precipitation													
Rainfall (mm)	25.1	24.3	32.6	63.0	74.3	71.5	75.7	78.1	74.5	60.6	68.0	34.0	681.6
Snowfall (cm)	29.5	24.0	17.7	4.5	0.0	0.0	0.0	0.0	0.0	0.4	7.5	24.9	108.5
Total (mm)	51.8	47.7	49.8	68.5	74.3	71.5	75.7	78.1	74.5	61.1	75.1	57.9	785.9

These parameters are relevant to discussions of potential fugitive dust and air quality effects as precipitation acts as a natural dust suppressant, and lower temperatures reduce the speed at which soils and aggregate materials dry following a precipitation event. Although this is not reflected in the air dispersion modelling, fugitive dust mitigation should be intensified during summer months and into October.

5 EMISSION SOURCES AND EMISSIONS RATE ESTIMATION

5.1 EMISSION SOURCES

G.E. Booth WRRF uses conventional wastewater treatment including the following stages:

- Grit and Screening;
- Primary Treatment;
- Secondary Treatment;
- Final Settling;
- Chlorination / Dechlorination;
- Thickening and Dewatering Centrifuges; and
- Incineration.

An overview summary of emission sources and potential emissions is provided in Table 5-1.

All sources pertaining to the facility were considered in the air dispersion modelling to assess effects on air quality for comparison against the air quality criteria.

Table 5-1: Source Summary

Source Information			Expected Contaminants
Source Description (Source ID)	Emission Control	General Location	
Existing Sources (Current Scenario)			
Boilers: Camus DFH 5000 Boiler (B-1) Camus DFH 5000 Boiler (B-2) Camus DFH 5000 Boiler (B-3) Camus DFH 5000 Boiler (B-4) Camus DFH 5000 Boiler (B-5)	No	Thermal oxidation facility	NO_X, CO
525kW Standby Diesel Generator (EGEN-1)	No	Headworks	PM, NO_X, SO_2, CO
800kW Standby Diesel Generator (N19)	No	Thermal conditioning facility	PM, NO_X, SO_2, CO
Carbon Units: Carbon Unit (C1) Carbon Unit (C2)	Carbon bed	Headworks	H_2S
Biotrickling Filters: BIO-TF1 BIO-TF2	Biotrickling filter	Headworks	H_2S

Source Information			Expected Contaminants
Source Description (Source ID)	Emission Control	General Location	
Biosolids Incinerators: Biosolids Incinerator #1 (TOX-1) Biosolids Incinerator #2 (TOX-2) Biosolids Incinerator #3 (TOX-3) Biosolids Incinerator #4 (TOX-4)	Scrubber Mercury reduction system	Biosolids building	CACs : TSP, SO_2, NO_X, CO, THC, VOCs, Dioxins/Furans (TEQ) PAHs: Naphthalene, benzo(a)pyrene Inorganic gases : hydrogen chloride, hydrogen fluoride Metals : mercury, nickel, arsenic, cadmium, calcium, iron, manganese, potassium, other trace metals
Plant 1 Primary Clarifiers (P1_CL1, P1_CL2, P1_CL3, and P1_CL4)	No	Plant 1	H_2S
Plant 2 Primary Clarifiers (P2_CL5, and P2_CL6)	No	Plant 2	H_2S
Plant 3 Primary Clarifiers (P3CL7, P3CL8, P3CL9, P3CL10, and P3CL11)	No	Plant 3	H_2S
Proposed Sources (Project B Additional Sources)			
Inlet Odour Control Facility Upgraded (BTF_GAC1) Inlet Odour Control Facility Upgraded (BTF_GAC2)	Combined scrubber and carbon bed	Adjacent to the Headworks building	H_2S
Portable Odour Control Unit (GEB_POU)	Carbon bed	Immediately south of the regenerative thermal oxidizer building	H_2S
Odour Control Facility – Plant 1 (OCF1_1) Odour Control Facility – Plant 1 (OCF1_2)	Combined scrubber and carbon bed	West of current Plant 3	H_2S
Odour Control Facility – Plant 2 (OCF2_1) Odour Control Facility – Plant 2 (OCF2_2)	Combined scrubber and carbon bed	West of Thermal Oxidation Building	H_2S
Odour Control Units: Odour Control Unit (Primary Clarifier 7) (OCU3_1) Odour Control Unit (Primary Clarifier 8) (OCU3_1) Odour Control Unit (Primary Clarifier 9) (OCU3_1) Odour Control Unit (Primary Clarifier 10) (OCU3_1 Odour Control Unit (Primary Clarifier 11) (OCU3_1) Odour Control Unit (Primary Clarifier 12) (OCU3_1) Odour Control Unit (Primary Clarifier 13) (OCU3_1)	Carbon bed	New Plant 3	H_2S
Carbon Units: Carbon Unit (OCF3_1, replacement of old C3) Carbon Unit (OCF3_2, replacement of old C4)	Carbon bed	New Plant 3	H_2S
Portable Germinable Endospore Biodosimetry (GEB) Portable Odour Unit (GEB_POU)	Carbon bed	Immediately south of the regenerative thermal oxidizer building	H_2S

Source Information			Expected Contaminants
Source Description (Source ID)	Emission Control	General Location	
Biosolids Truck Loading (SI-1)	Scrubber	Biosolids Truck Loading	H_2S, NH_3
Standby Diesel Generators: Standby Diesel Generator 1 (3MW) (SI-2) Standby Diesel Generator 2 (3MW) (SI-3) Standby Diesel Generator 3 (3MW) (SI-4) Standby Diesel Generator 4 (3MW) (SI-5)	No	Energy Center Area	NO_2
Biogas Burners: Biogas Burner #1 (SI-6) Biogas Burner #2 (SI-7)	No	Biogas Storage Area	NO_2

5.2 EMISSION RATE QUANTIFICATION

5.2.1 COMBUSTION SOURCES

The facility in the current configuration has five (5) boilers, and three (3) emergency generators.

Project B includes two (2) biogas burners, four (4) standby generators (capacity 3 MW each) in Energy Center Area as part of the proposed expansion.

The NO_X emission rates were calculated using emission factors for gas combustion published in the USEPA AP-42 emission factor compilation.

5.2.2 HYDROGEN SULPHIDE, AMMONIA AND ODOUR SOURCES

The following wastewater treatment processes at the WRRF have the potential to release H_2S, NH_3 and odour:

- Existing and proposed new headworks building.
- Screening channels and grit removal units.
- Existing primary clarifiers (Plants 1, 2and 3).
- Proposed two additional primary clarifiers in New Plant 1.
- Proposed expanded Plant 1 primary effluent channels.
- Emergency Biosolids truck loading area.

The facility implemented the following odour control measures:

- Upgrade the Headworks and Inlet Sewer BTF Odour Control units to 2-stage units with GAC polishing and a new higher exhaust stack.
- Decommission the old Plant 1 facility and uncovered primary clarifiers. The New Plant 1 facility includes covered primary clarifiers, inlet and outlet channels to collect fugitive emissions for treatment in a 2-stage odour control facility (BTF followed by GAC polishing).
- Covering of the Plant 2 Primary Clarifiers, inlet channels and outlet channels to collect fugitive emissions for treatment in a 2-stage odour control facility (BTF followed by GAC polishing).
- Carbon adsorption units related to screening channels/grit removal facilities.

- Covering of the existing Plant 3 Primary Clarifiers, inlet channels and outlet channels to collect fugitive emissions for treatment in radial flow dry media units.
- Portable GAC scrubber for emergency for biosolids truck loading when incineration capacity may not be available.

Emission rates of these air contaminants were calculated based on the manufacturer emission factors or source testing at a comparable facility. Odour emission rates were prorated from source testing data at a similar facility provided to the WSP air quality team by engineering design group of the project.

6 PREDICTION OF EFFECTS

All sources at the G.E. Booth WRRF were modelled using the US EPA AERMOD dispersion modelling program (AERMOD version 22112 and AERMET version 22112). The air dispersion was conducted in accordance with *Guideline A-11: Air Dispersion Modelling Guideline for Ontario* (ADMGO), Version 3.0, July 2016.

The location of the maximum offsite concentrations for a given pollutant is termed the maximum Point of Impingement (POI) concentration.

NO_X/ NO_2 chemical transformation was assumed in the current modelling assessment, as required for the AERMOD air dispersion modelling in support of the EA AQIA report. This means, the NO_2 emissions were modelled using the ozone limiting method (OLM). The seasonal ozone concentrations required for this modelling approach were derived from the recordings at the ambient air monitoring stations in the vicinity of the Project. The approach was selected in agreement with previous dispersion modelling performed for the facility in support of the ECA submissions, which require to model NO_X using the full atmospheric conversion method.

The source parameters modelled are provided in Appendix C.

A total of 2,362 discrete Cartesian receptors were modelled around the G.E. Booth WRRF, including 354 receptors along the WRRF boundary. The intermediate fenceline receptors were placed at 10 m intervals around the property line. A nested grid of receptors in accordance with O. Reg. 419/05 requirements was generated, covering the whole area of 10 km by 10 km around the facility.

For the H_2S (10-min average) and odour the dispersion modelling was done in accordance with the “Methodology for Modelling Assessments of Contaminants with 10-minute Average Standards and Guidelines under O. Reg. 419/05” considering twenty (20) sensitive receptors in the vicinity of the plant. This modelling assessment was done using the site-specific meteorological data for number of sensitive receptors located in close proximity to the G.E. Booth WRRF. For the current scenario ten (10) sensitive receptors were selected. For the future scenario the number of receptors was increased to twenty (20) in order to account for the proposed new residential development.

7 ASSESSMENT OF AIR QUALITY EFFECTS

The air dispersion modelling was used to predict the off-site effects as the air concentrations of the contaminants identified in Section 3 beyond the extent of the GE Booth property. The modelled air quality off-site effects for the Current Scenario and for Project B were compared against the AAQCs (with and without inclusion of background concentrations) as presented in Tables 7-1, 7-2 and 7-3.

All predicted air concentrations were below the ambient air quality criteria for all averaging times.

For the Current Scenario (Table 7-1), SO_2 had the highest concentration relative to the criterion at 92.5% for the 1-hour averaging time; this was based on assumption of the concurrent operation of all sources potentially releasing SO_2 emissions.

Air dispersion modeling for the Project B scenario also identified SO_2 as the air contaminant that had the highest modelled concentration relative to it's AAQC at 92.5% of the 1-hour AAQC; SO_2 was modelled assuming the concurrent operation of all sources potentially generating SO_2 emissions.

There were minor increases in the other key air contaminants when the Project B modelled concentrations were compared to those of the Current Scenario.

The modelled concentrations of NO_2 during emergency generator testing increased notably for the Project B scenario as the capacity of the new units at the Energy Center Area are bigger than the existing emergency generators at the site.

The H_2S concentrations at identified sensitive receptors proximate to the G.E. Booth WRRF plant are expected to reduce significantly as a result of the planned upgrades and installation of the additional odour control equipment. Odour effects are described in Section 7.1.

The air dispersion modelling output is also presented graphically as isopleths plots showing lines of equal air concentrations (Figures A-1, A-2 and A-3, Appendix A).

Table 7-1: Predicted Air Quality Effects (Current Scenario)

Contaminant	CAS No.	Total Emission Rate (g/s)	Max. POI Conc.(current) (µg/m³)	Averaging Period (hours)	MECP Criteria (µg/m³)	Limiting Effect	source	Percentage of MECP AAQC (%)
Carbon monoxide (CO)	630-08-0	0.78	48.68	0.5	6,000	Health	AAQC	0.8%
Nitrogen dioxide, as NO_2	10102-44-0	17.5	61.69	24	200	Health	AAQC	30.9%
			192.05	1	400	Health	AAQC	48.0%
NOx * from Emergency Generator	10102-44-0	24.7	565.70	30 min	1,880	Health	AAQC	30.1%
Particulate Matter ($PM_{2.5}$)	NA	0.76	2.74	24	27	Health	AAQC	10.2%
			0.35	Annual	8.8	Health	AAQC	4.0%
Sulphur dioxide SO_2	7446-09-5	7.46	92.54	1	100	Health	AAQC	92.5%
			3.47	Annual	10	Vegetation	AAQC	34.7%
Dioxins/Furans (TEQ)	NA	2.54E-10	0.000000001	24	0.0000001	Health	AAQC	0.5%
Hydrogen sulphide H_2S**	7783-06-4	4.56E-03	0.79	24	7	Health	AAQC	11.3%
			10.72	10 min	13	Odour	AAQC	82.5%
Total reduced sulphur (TRS)	NA	4.56E-03	0.79	24	7	Health	AAQC	11.3%
			10.72	10 min	13	Odour	AAQC	82.5%
Naphthalene	91-20-3	6.31E-05	0.0001	24	22.5	Health	AAQC	0.001%
			0.001	10 min	50	Odour	AAQC	0.003%
Benzo(a)pyrene	50-32-8	4.65E-07	0.00000011	Annual	0.00001	Health	AAQC	1.1%
			0.00000011	AAV	0.0001	NA	NA	0.1%
			0.0000009	DAV	0.005	NA	NA	0.02%
Hydrogen chloride HCl	7647-01-0	1.84E-02	0.04	24	20	Health	AAQC	0.2%
Hydrogen fluoride HF	7664-39-3	5.23E-03	0.01	24	0.86	Vegetation	AAQC	1.2%
Nickel	7440-02-0	9.43E-04	0.0002	Annual	0.04	Health	AAQC	0.6%
			0.0002	AAV	0.40	NA	NA	0.06%
			0.0019	DAV	2.00	NA	NA	0.1%
Mercury	7439-97-6	3.16E-03	0.006	24	2	Health	AAQC	0.2%
Arsenic	7440-38-2	1.99E-04	0.0004	24	0.3	Health	AAQC	0.1%
Cadmium	7440-43-9	2.52E-05	0.00005	24	0.025	Health	AAQC	0.2%
Calcium	1305-78-8	1.41E-02	0.03	24	10	Corrosion	AAQC	0.3%
Iron	7439-89-6	8.92E-03	0.02	24	4	Health	AAQC	0.5%
Manganese	7439-96-5	5.39E-04	0.001	24	0.4	Health	AAQC	0.3%
Potassium	7440-09-7	4.10E-03	0.01	24	1	Health	AAQC	0.8%

Notes:

* NOx emissions with the standby equipment. The emission rate includes all NOx sources, including emergency generators. The MECP 1/2 hour POI limit of 1,880 µg/m³ for this type of equipment (MECP PIBS 7976e, Emergency Generator Data Sheet, 2010/11).

** H_2S modelled at the receptors.

All particulate is released from combustion sources and is less than 2.5 microns in diameter. It is therefore compared against the AAQC for $PM_{2.5}$.

Table 7-2: Predicted Air Quality Effects (Project B)

Contaminant	CAS Number	Total Emission Rate (g/s)	Maximum POI Concentration (µg/m³)	Averaging Period (hours)	MECP Criterion (µg/m³)	Limiting Effect	Source	Percentage of MECP Criterion (%)
Carbon monoxide (CO)	630-08-0	0.78	48.7	0.5	6,000	Health	AAQC	0.8%
Nitrogen dioxide, as NO_2	10102-44-0	17.5	61.9	24	200	Health	AAQC	30.9%
			193.6	1	400	Health	AAQC	48.4%
Nitrogen oxides NO_X * from Emergency Generator	10102-44-0	24.7	1036	30 min	1,880	Health	NA	55.1%
Particulate matter ($PM_{2.5}$)	NA	0.76	2.74	24	27	Health	AAQC	10.2%
			0.35	Annual	8.8	Health	AAQC	4.0%
Sulphur dioxide SO_2	7446-09-5	7.46	3.47	Annual	10	Vegetation	AAQC	34.7%
			92.5	1	100	Health	AAQC	92.5%
Dioxins/Furans (TEQ)	NA	2.54E-10	0.000000001	24	0.0000001	Health	AAQC	1.1%
Hydrogen sulphide H_2S	7783-06-4	3.86E-02	0.41	24	7	Health	AAQC	5.8%
			3.25	10 min	13	Odour	AAQC	25.0%
Total reduced sulphur (TRS)	NA	3.86E-02	0.41	24	7	Health	AAQC	5.8%
			3.25	10 min	13	Odour	AAQC	25.0%
Naphthalene	91-20-3	6.31E-05	0.0003	24	22.5	Health	AAQC	0.001%
			0.002	10 min	50	Odour	AAQC	0.004%
Benzo(a)pyrene	50-32-8	4.65E-07	0.00000022	Annual	0.00001	Health	AAQC	2.2%
			0.00000022	AAV	0.0001	NA	NA	0.2%
			0.0000020	DAV	0.005	NA	NA	0.04%
Hydrogen chloride HCl	7647-01-0	1.84E-02	0.08	24	20	Health	AAQC	0.40%
Hydrogen fluoride HF	7664-39-3	5.23E-03	0.02	24	0.86	Vegetation	AAQC	2.7%
Nickel	7440-02-0	9.43E-04	0.0004	Annual	0.04	Health	AAQC	1.1%
			0.0004	AAV	0.40	NA	NA	0.1%
			0.0042	DAV	2.00	NA	NA	0.2%
Mercury	7439-97-6	3.16E-03	0.014	24	2	Health	AAQC	0.2%
Arsenic	7440-38-2	1.99E-04	0.001	24	0.3	Health	AAQC	0.3%
Cadmium	7440-43-9	2.52E-05	0.00012	24	0.025	Health	AAQC	0.5%
Calcium	1305-78-8	1.41E-02	0.06	24	10	Corrosion	AAQC	0.6%
Iron	7439-89-6	8.92E-03	0.04	24	4	Health	AAQC	1%
Manganese	7439-96-5	5.39E-04	0.002	24	0.4	Health	AAQC	0.6%
Potassium	7440-09-7	4.10E-03	0.08	24	1	Health	AAQC	7.5%
Ammonia (NH_3)	7664-41-7	7.80E-03	0.63	24	100	Health	AAQC	2.6%

Notes:

Project B incorporates existing sources which are carried over to the future scenario plus new sources for the expanded facility.

All particulate is released from combustion sources and is less than 2.5 microns in diameter. It is therefore compared against the AAQC for $PM_{2.5}$.

* NOx emissions with the standby equipment. The emission rate includes all NOx sources, including emergency generators. The MECP ½ hour limit of 1,880 µg/m³ for this type of equipment (MECP PIBS 7976e, Emergency Generator Data Sheet, 2010/11).

Table 7-3: Cumulative Effect of Project B and Background Air Concentrations

Contaminant	CAS Number	Total Emission Rate (g/s)	Maximum POI Concentration (µg/m³)	Background Concentration (µg/m³)	Cumulative = Project + Background (µg/m³)	Averaging Period (hours)	MECP Criterion (µg/m³)	Limiting Effect	Source	Percentage of MECP Criterion (%)
Carbon monoxide (CO)	630-08-0	0.78	48.69	263.00	311.69	0.5	6,000	Health	AAQC	5.2%
Nitrogen dioxide, as NO_2	10102-44-0	17.5	61.86	24.95	86.81	24	200	Health	AAQC	43.4%
			193.55	30.08	223.63	1	400	Health	AAQC	55.9%
Nitrogen oxides NO_X* from Emergency Generator	10102-44-0	24.7	1035.98	30.08	1066.06	30 min	1,880	Health	NA	56.7%
Particulate matter ($PM_{2.5}$)	NA	0.76	2.74	12.80	15.54	24	27	Health	AAQC	57.6%
			0.35	6.90	7.25	Annual	8.8	Health	AAQC	82.4%
Sulphur dioxide SO_2	7446-09-5	7.46	3.47	0.79	4.25	Annual	10	Vegetation	AAQC	42.6%
			92.54	1.83	94.38	1	100	Health	AAQC	94.4%
Dioxins/Furans (TEQ)	NA	2.54E-10	0.000000001	n/a	0.000000001	24	0.0000001	Health	AAQC	1.1%
Hydrogen sulphide H_2S	7783-06-4	3.86E-02	0.41	n/a	0.41	24	7	Health	AAQC	5.8%
			3.25	n/a	3.25	10 min	13	Odour	AAQC	25.0%
Total reduced sulphur (TRS)	NA	3.86E-02	0.41	n/a	0.41	24	7	Health	AAQC	5.8%
			3.25	n/a	3.25	10 min	13	Odour	AAQC	25.0%
Naphthalene	91-20-3	6.31E-05	0.0003	0.1244	0.1247	24	22.5	Health	AAQC	0.6%
			0.002	0.124	0.126	10 min	50	Odour	AAQC	0.3%
Benzo(a)pyrene	50-32-8	4.65E-07	0.00000022	n/a	0.00000022	Annual	0.00001	Health	AAQC	2.2%
			0.00000022	n/a	0.00000022	AAV	0.0001	NA	NA	0.2%
			0.0000020	n/a	0.0000020	DAV	0.005	NA	NA	0.04%
Hydrogen chloride HCl	7647-01-0	1.84E-02	0.08	n/a	0.08	24	20	Health	AAQC	0.4%
Hydrogen fluoride HF	7664-39-3	5.23E-03	0.02	n/a	0.02	24	0.86	Vegetation	AAQC	2.7%
Nickel	7440-02-0	9.43E-04	0.0004	n/a	0.0004	Annual	0.04	Health	AAQC	1.1%
			0.0004	n/a	0.0004	AAV	0.40	NA	NA	0.1%
			0.0042	n/a	0.0042	DAV	2.00	NA	NA	0.2%
Mercury	7439-97-6	3.16E-03	0.014	n/a	0.014	24	2	Health	AAQC	0.7%
Arsenic	7440-38-2	1.99E-04	0.001	n/a	0.001	24	0.3	Health	AAQC	0.3%
Cadmium	7440-43-9	2.52E-05	0.00012	n/a	0.00012	24	0.025	Health	AAQC	0.5%
Calcium	1305-78-8	1.41E-02	0.06	n/a	0.06	24	10	Corrosion	AAQC	0.6%
Iron	7439-89-6	8.92E-03	0.04	n/a	0.04	24	4	Health	AAQC	1%
Manganese	7439-96-5	5.39E-04	0.002	n/a	0.002	24	0.4	Health	AAQC	0.6%
Potassium	7440-09-7	4.10E-03	0.08	n/a	0.08	24	1	Health	AAQC	7.5%
Ammonia (NH_3)	7664-41-7	7.80E-03	0.63	n/a	0.63	24	100	Health	AAQC	0.6%

Notes:

NA not available

* NOx emissions with the standby equipment. The emission rate includes all NOx sources, including emergency generators. The MECP ½ hour limit of 1,880 µg/m³ for this type of equipment (MECP PIBS 7976e, Emergency Generator Data Sheet, 2010/11).

All particulate is released from combustion sources and is less than 2.5 microns in diameter. It is therefore compared against the AAQC for $PM_{2.5}$.

7.1 ODOUR EFFECTS

The modelled odour effects at existing receptors (Existing and Project B Scenarios) are provided in Table 7-4.

The results of the air dispersion modelling for odour are presented in Table 7-5 for the Project B Scenario.

The odour intensity (concentration) was modelled at the twenty (20) receptors proximate to the G.E. Booth WRRF. At 17 of these receptors, the odour concentration was higher than the 1 odour unit per cubic metre (OU/m³) benchmark. One odour unit is the odour concentration where 50% of the panelists on a trained odour panel can detect a difference between a blank sample and an odour sample, but the odour is not intense enough to assign descriptors. Exceeding 1OU identifies the potential for odour effects and the need for effective management but is not a direct indicator of the likelihood of nuisance effects or complaints.

For odour assessments, the frequency of exceedance together with the odour intensity helps to achieve informative decision-making. Based upon the air dispersion modelling, no sensitive receptor is predicted to have an odour concentration above 1OU for more than 4.2% in a given year (367 hours).

The location of the receptor with the highest modelled odour concentration for the Current Scenario is to the NW of the WRRF. For the Project B Scenario, the most impacted receptor is located to the SW of the WRRF in the area of the proposed new residential development.

There is a significant decrease in the maximum odour concentration modelled at all receptors, and in the number of hours per year that the odour concentration at the sensitive receptors is higher than 1OU, when the Project B scenario is compared to the Current Scenario.

Based upon the results of the air dispersion modelling for odour, and with consideration of the characteristics of odours from wastewater treatment, there is the potential for odour effects from the G.E. Booth WRRF under both the Current Scenario and the Project B Scenario, but the severity of odour impacts is significantly lower when Project B is implemented, as the proposed odour control measures will deliver more than 90% reduction of potential odour POIs at all sensitive receptors Effective odour control at the point of odour release, as well as the implementation of Odour Mitigation and Management Plan (OMMP), have been considered for Project B to minimize or prevent nuisance effects associated with the odour.

7.2 CRITERIA AIR CONTAMINANTS IMPACT AT RECEPTORS

The incremental differences of air quality impacts (Project B and the current scenario) at the sensitive receptors for the proposed changes at facility are presented in Tables 7-6, 7-7, 7-8 and 7-9.

The sensitive receptors are located further away from the facility than the property line receptors considered in the air dispersion modelling. The facility is demonstrating compliance with all applicable MECP criteria at the property line. The tables below are demonstrating changes of concentrations (current scenario vs. project B) at the same set of receptors used for the odour impact assessment.

It should be noted there are increases in some of the contaminant concentrations and modelled effects, mainly due to installation of additional combustion equipment in the Project B scenario; however, all contaminants are still well below the applicable MECP limits.

Table 7-4: Modelled Odour Effects at Existing Receptors (Existing and Project B Scenarios)

Receptor	Description	UTM Co-ordinate		Distance from the Facility	Maximum 10-minute Average Odour Concentration (OU/m³)		Percent Difference %
		X(m)	Y(m)	(m)	Current Scenario	Project B Scenario	
R1	House on Lakeshore Road and Hydro Road	616 496	4 826 107	565 m - NW	58.57	4.33	-93%
R2	Multifamily Residential on Lakeshore Road E	616 806	4 826 529	440 m - N	71.19	4.89	-93%
R3	Multifamily Residential on Lakeshore Road E	617 191	4 827 159	830 m - NE	51.43	3.23	-94%
R4	House on Lake Promenade Road	617 868	4 826 965	690 m - E	42.32	3.59	-92%
R5	Multifamily Residential on Orchard Road	616 705	4 826 385	420 m - N	82.52	5.28	-94%
R6	House on Haig Blvd	616 561	4 826 252	535 m - NW	69.41	4.78	-93%
R7	House on Forty Second Street	617 623	4 827 173	800 m - E	39.96	3.07	-92%
R8	House on Forty Second Street	617 458	4 827 311	970 m - N	34.79	2.40	-93%
R9	Townhouses on Lakeshore Road E	617 123	4 826 938	640 m - NE	62.07	4.31	-93%
R10	House on Waterfront Trail	616 487	4 824 846	1,180 m - W	7.32	0.43	-94%

Notes:

(1) UTM Coordinates per NAD-83, Zone 17

(2) The maximum odour concentration cited is the 44th highest modelled value; this approach is prescribed by the MECP to present a maximum odour concentration that is not unduly influenced by meteorological anomalies.

Table 7-5: Odour Effect Summary (Project B)

Receptor	Description	UTM Coordinate		Distance from the Facility	Maximum 10-minute Average Concentration	Number of Exceedances per Year	Exceedance >1OU % of Hours on an Annual Basis
		X(m)	Y(m)	(m)	OU/m³	(hrs)	
R1	House on Lakeshore Road and Hydro Road	616 496	4 826 107	565 m - NW	4.33	329	3.8%
R2	Multifamily Residential on Lakeshore Road E	616 806	4 826 529	440 m - N	4.89	142	1.6%
R3	Multifamily Residential on Lakeshore Road E	617 191	4 827 159	830 m - NE	3.23	92	1.1%
R4	House on Lake Promenade Road	617 868	4 826 965	690 m - E	3.59	135	1.5%
R5	Multifamily Residential on Orchard Road	616 705	4 826 385	420 m - N	5.28	181	2.1%
R6	House on Haig Blvd.	616 561	4 826 252	535 m - NW	4.78	196	2.2%
R7	House on Forty Second Street	617 623	4 827 173	800 m - E	3.07	102	1.2%
R8	House on Forty Second Street	617 458	4 827 311	970 m - N	2.40	80	0.9%
R9	Townhouses on Lakeshore Road E.	617 123	4 826 938	640 m - NE	4.31	118	1.3%
R10	House on Waterfront Trail	616 487	4 824 846	1,180 m - W	0.43	15	0.2%
R11	Multifamily Residential Building (Future Development)	616 805	4 826 016	125 m - SW	2.02	318	3.6%
R12	Multifamily Residential Building (Future Development)	616 911	4 825 919	120 m - W	2.04	161	1.8%
R13	Multifamily Residential Building (Future Development)	617 081	4 825 755	120 m - SW	2.49	145	1.7%
R14	Multifamily Residential Building (Future Development)	617 079	4 825 644	200 m - SW	0.33	4	0.0%
R15	Multifamily Residential Building (Future Development)	617 199	4 825 544	190 m - SW	1.62	99	1.1%
R16	Multifamily Residential Building (Future Development)	616 657	4 826 114	175 m - NW	0.47	9	0.1%
R17	Multifamily Residential Building (Future Development)	617 051	4 825 620	240 m - W	1.27	65	0.7%
R18	Multifamily Residential Building (Future Development)	617 052	4 825 556	285 m - SW	2.2	198	2.3%
R19	Multifamily Residential Building (Future Development)	617 111	4 825 481	295 m - SW	1.22	71	0.8%
R20	Multifamily Residential Building (Future Development)	616 757	4 825 796	320 m - W	3.27	367	4.2%

Notes:

(1) UTM Coordinates per NAD-83, Zone 17.

(2) The maximum odour concentration cited is the 44th highest modelled value; this approach is prescribed by the MECP to present a maximum odour concentration that is not unduly influenced by meteorological anomalies.

Table 7-6: Modelled Hydrogen Sulphide Concentrations, 10-minute Averaging Period (Existing and Project B Scenarios)

Receptor	Description	UTM Coordinate		Distance from the Facility	POI Concentration µg/m³ (10-min Averaging Period)		Percent Difference
		X(m)	Y(m)	(m)	Current Scenario	Project B Scenario	(+/-)
R1	House on Lakeshore Road and Hydro Road	616496	4826107	565 m - NW	9.74	2.46	-75%
R2	Multifamily Residential on Lakeshore Road E	616806	4826529	440 m - N	12.57	3.18	-75%
R3	Multifamily Residential on Lakeshore Road E	617191	4827159	830 m - NE	7.16	3.20	-55%
R4	House on Lake Promenade Road	617868	4826965	690 m - E	10.25	3.56	-65%
R5	Multifamily Residential on Orchard Road	616705	4826385	420 m - N	12.87	2.69	-79%
R6	House on Haig Blvd	616561	4826252	535 m - NW	11.45	3.40	-70%
R7	House on Forty Second Street	617623	4827173	800 m - E	6.63	3.91	-41%
R8	House on Forty Second Street	617458	4827311	970 m - N	6.19	3.66	-41%
R9	Townhouses on Lakeshore Road E	617123	4826938	640 m - NE	9.21	2.87	-69%
R10	House on Waterfront Trail	616487	4824846	1,180 m - W	5.71	3.63	-36%

Table 7-7: Modelled Hydrogen Sulphide Concentrations, 24-hour Averaging Period (Existing and Project B Scenarios)

Receptor	Description	UTM Coordinate		Distance from the Facility	POI Concentration µg/m³ (24-hour Averaging Period)		Percent Difference
		X(m)	Y(m)	(m)	Current Scenario	Project B Scenario	(+/-)
R1	House on Lakeshore Road and Hydro Road	616496	4826107	565 m - NW	0.88	0.27	-69%
R2	Multifamily Residential on Lakeshore Road E	616806	4826529	440 m - N	0.80	0.16	-80%
R3	Multifamily Residential on Lakeshore Road E	617191	4827159	830 m - NE	0.51	0.22	-57%
R4	House on Lake Promenade Road	617868	4826965	690 m - E	0.79	0.41	-48%
R5	Multifamily Residential on Orchard Road	616705	4826385	420 m - N	0.91	0.16	-82%
R6	House on Haig Blvd	616561	4826252	535 m - NW	0.69	0.17	-75%
R7	House on Forty Second Street	617623	4827173	800 m - E	0.58	0.23	-60%
R8	House on Forty Second Street	617458	4827311	970 m - N	0.44	0.25	-43%
R9	Townhouses on Lakeshore Road E	617123	4826938	640 m - NE	0.59	0.18	-69%
R10	House on Waterfront Trail	616487	4824846	1,180 m - W	0.27	0.15	-44%

Table 7-8: Modelled NOx Concentrations, 1-hr Averaging Period

Receptor	Description	UTM Coordinate		Distance from the facility	POI Concentration ($\mu g/m^3$, 1-hr Averaging Period)		Percent Difference
		X(m)	Y(m)	(m)	Current Scenario	Project B Scenario	(+/-)
R1	House on Lakeshore Road and Hydro Road	616496	4826107	565 m - NW	141.31	142.62	0.93%
R2	Multifamily Residential on Lakeshore Road E	616806	4826529	440 m - N	160.04	160.11	0.04%
R3	Multifamily Residential on Lakeshore Road E	617191	4827159	830 m - NE	197.04	197.08	0.02%
R4	House on Lake Promenade Road	617868	4826965	690 m - E	133.19	134.33	0.86%
R5	Multifamily Residential on Orchard Road	616705	4826385	420 m - N	135.93	136.17	0.18%
R6	House on Haig Blvd.	616561	4826252	535 m - NW	141.05	142.63	1.12%
R7	House on Forty Second Street	617623	4827173	800 m - E	110.44	111.55	1.01%
R8	House on Forty Second Street	617458	4827311	970 m - N	141.36	143.22	1.32%
R9	Townhouses on Lakeshore Road E.	617123	4826938	640 m - NE	159.84	160.06	0.14%
R10	House on Waterfront Trail	616487	4824846	1,180 m - W	75.77	76.35	0.77%

Table 7-9: Modelled NOx Concentrations, 24-hr Averaging Period

Receptor	Description	UTM Coordinate		Distance from the Facility	POI Concentration ($\mu g/m^3$, 24-hr Averaging Period)		Percent Difference
		X(m)	Y(m)	(m)	Current Scenario	Project B Scenario	(+/-)
R1	House on Lakeshore Road and Hydro Road	616496	4826107	565 m - NW	16.29	16.28	0.06%
R2	Multifamily Residential on Lakeshore Road E	616806	4826529	440 m - N	11.63	11.49	1.22%
R3	Multifamily Residential on Lakeshore Road E	617191	4827159	830 m - NE	12.31	12.17	1.15%
R4	House on Lake Promenade Road	617868	4826965	690 m - E	13.36	13.27	0.68%
R5	Multifamimly Residential on Orchard Road	616705	4826385	420 m - N	15.81	15.68	0.83%
R6	House on Haig Blvd,	616561	4826252	535 m - NW	15.76	15.25	3.34%
R7	House on Forty Second Street	617623	4827173	800 m - E	17.85	17.73	0.68%
R8	House on Forty Second Street	617458	4827311	970 m - N	11.66	11.54	1.04%
R9	Townhouses on Lakeshore Road E.	617123	4826938	640 m - NE	12.76	12.66	0.79%
R10	House on Waterfront Trail	616487	4824846	1,180 m - W	11.67	11.10	5.14%

8 ASSESSMENT FINDINGS

This Air Quality Assessment Report has been prepared as a Technical Support Document for the Environmental Assessment for the proposed upgrade at G.E. booth WRRF. The facility will be operated in accordance with all regulatory requirements, which include the requirements of a provincial ECA (Air).

The cumulative effect for this assessment, considered to be the combined effect of the background concentrations established for the Project and the effects predicted by the modelling, were considered for each key parameter.

The AQIA considered the following existing and proposed Project B air emissions sources:

- Criteria air contaminants emitted to the atmosphere from natural gas combustion sources at the G.E. Booth WRRF include oxides of nitrogen (NO_X), assessed in nitrogen dioxide (NO_2) form, CO, and negligible amounts of particulates and unburned hydrocarbons.
- Sulphur dioxide, H_2S and ammonia are released to the air from the wastewater treatment processes.
- The operational expansion of G.E. Booth WRRF (Project B) is expected to emit to the atmosphere the same contaminants as at the current conditions plus additional, H_2S, NO_2, and ammonia from the proposed, and additional nitrogen oxides from the standby diesel generators when these are tested.
- The emissions from the fluidized bed reactors (TOX-1, TOX-2, TOX-3, and TOX-4) are the products of combustion of dewatered sewage sludge, metals in the sludge, and fuel.
- A new ash dewatering facility will be constructed and replace the use of the existing ash lagoons. The emissions of H_2S and NH_3 from the truck loading operation will be controlled by a scrubber and exhausted through a designated stack.

The key findings of the air quality assessment were as follows:

- The assessment determined that the modelled concentrations of all air pollutants (Project B) were below the respective ambient air quality criteria, even with consideration of the existing background air concentrations.
- The contaminant with the highest level of air quality impact from the current configuration of the facility is sulphur dioxide (SO_2) at 92.54% and 34.69% of the ambient air quality criteria for 1-hour and annual averaging periods, respectively.
- For the upgraded facility (Project B), the contaminant with the highest level of air quality impact from the facility is also sulphur dioxide (SO_2). There are no changes to the modelled 1-hour average and annual SO_2 concentrations, which remain at 92.54% and 34.69% of the applicable criteria.
- For all air pollutants assessed, the predicted cumulative concentrations (ambient air concentrations plus Project B emissions) were found to be less than the respective criteria at all locations beyond the G.E. Booth WRRF property boundary and at all sensitive receptors.
- The current facility and Project B both have sources of odour emissions that require effective mitigation and management to prevent, or minimize, off-site effects. The odour impacts at identified sensitive receptors proximate to the G.E. Booth WRRF plant are expected to reduce significantly (more than 90%) as a result of the planned upgrades and installation of the additional odour control equipment.

- Compliance with O. Reg. 419/05 applicable standards and criteria for the proposed Project B demonstrates that the Project B potentially meets the air quality requirements for obtaining a provincial Environmental Compliance Approval for air.

A series of mitigation measures, including air emission control systems, were included in the project design to avoid and minimize adverse effects. In addition to these controls, the G.E, Booth WRRF will implement best management practices for the mitigation of air emissions and odour.

The air dispersion modelling assessment predicts that the ambient air concentrations in the vicinity of the WRRF will be lower than the ambient air quality criteria for all of the pollutants. Odour and hydrogen sulphide levels will be notably reduced when compared to current scenario with the significant mitigation associated with the expansion and the upgrades to be implemented at the facility. The emission rates and modelled effects of some criteria air contaminants were found to increase as a result of the installation of new combustion sources, however all were below the respective criteria.

9 MITIGATION MEASURES

The G.E. Booth WRRF Project B design incorporates a number of mitigation measures to prevent, or minimize, the potential effects on air quality associated with air emissions, including air emission and odour controls.

The facility is proposing to construct two odour control facilities (OCFs) at the Plant 1 and 2 to treat odorous air from primary clarifier effluent weirs. The proposed construction will include tank covers, new buildings, primary influent, and effluent channels. The treatment system combined with two-staged removal process, with biotrickling filter (BTF), followed by granular activated carbon (GAC). The BTF system is the first stage of the odour treatment process. It will remove most of the H_2S from the odorous air. The GAC system will follow the BTF system and further reduce H_2S concentrations and remove trace odorous elements that the BTF system cannot remove and catch sudden peaks in odorous air to which the BTF is not acclimatized. A mist eliminator will be installed upstream of each GAC filter to remove excess moisture from the BTF treated air to protect the media and extend the media life. The GAC treated air will be discharge to atmosphere via an individual stack.

For Plant 3, the odorous air from the primary clarifiers will be treated by GAC units. The proposed construction will include tank covers, new buildings, primary influent, and effluent channels.

Odorous air from sewage inlet conduits and headworks building will be treated by the existing BTFs followed by new granular activated carbon (GAC) units.

A preventive maintenance program is ongoing now and will continue to be employed at the facility that encompasses all pollution control equipment, diesel-fired engines (vehicle, equipment, and standby power generating), and all processes with the potential for meaningful environmental effects.

During operational phase of the Project B the existing emissions control equipment and proposed new control measures will be implemented.

Based on the assessment, primary clarifiers are found to be one of the major sources for odour impacts. The odour assessment methodology uses very conservative values associated with primary clarifiers' emissions and its characteristics. From the odour management and operational perspective, the following mitigations will be or have been implemented:

- The primary clarifier influent and effluent channels are aerated and covered to maintain dissolved oxygen in the wastewater and minimize settling. The air from the channels will be collected and treated with the existing odour control system prior to being discharged into the atmosphere.
- The primary clarifiers at the G.E. Booth WRRF have been operated very efficiently with a sludge blanket depth of up to 2.5 ft. This operational approach minimizes the septic potential at the primary sludge hoppers, resulting in minimal odour emissions.

With the above mitigation measures, the primary clarifiers' emissions are expected to lower than the values used in the dispersion model. This will result in a reduction of the anticipated odour exceedances at the sensitive receptors.

Construction activities during facility upgrade will contribute to a temporary increase in air emission levels at the Project A site typical of any industrial site development. For the most part this is unavoidable but is relatively short lived for any individual receptor such as residences near the site. Activities that could result in increased dust levels will be limited to a short period of the initial construction stage, as required by construction procedures to construct new industrial buildings and to install required process equipment. To prevent excessive dust levels during extended dry weather periods, watering will be undertaken on the construction unpaved roads (if any) at the G.E Booth WRRF. The construction site entrance will be wet swept periodically to minimize the build up of dirt. An Environmental Management Plan will be in place and ensure environmental supervision and implementation of the mitigation measures, which is beyond the scope of the current AQIA report assessment.

10 GREENHOUSE GAS (GHG) EMISSIONS

A key objective of the Class EA is energy efficiency and the reduction of greenhouse gas (GHG) emissions at the G.E. Booth WRRF, specifically through supporting Peel's stated GHG Reduction Goals.

Peel Region recently issued their Climate Change Master Plan (CCMP, 2020) which identified a goal of reducing corporate GHG emissions by 45% by 2031 relative to 2010 levels.

In order to ensure that the Class EA supported the Region's GHG Reduction Goals, the study included screening criteria for technologies related to meeting the stated goals. In addition, a detailed evaluation of the GHG emissions was completed for the project as a whole which included Scope 1 (direct emissions), Scope 2 (indirect emissions from purchased electricity, heating, etc.), and Scope 3 (other indirect emissions from materials required for the facilities such as chemicals, equipment, etc.). Each design alternative was evaluated based on the total GHG emissions.

The preferred design concept for expansion of the G.E. Booth WRRF offers opportunities to GHG emissions and increase energy recovery through implementation of the following processes:

- Ammonia-Based Aeration Control (ABAC) will reduce electricity consumption by the aeration system.
- Primary Sludge Thickening reduces anaerobic digestion heating requirements by increasing the solids concentrations prior to digestion.
- Biological Phosphorus Removal (BPR) process results in reduced chemical usage and lower aeration requirements.
- Sidestream Centrate Treatment reduces aeration needs and energy savings.
- Anaerobic Digestion generates electricity and heat for process operations.

In addition, beneficial use of the biosolids generated at the G.E. Booth WRRF provides the opportunity for Peel to receive carbon credits from beneficial use on land. Carbon sequestration and synthetic fertilizer replacement credits can be received from biosolids beneficial use on land.

Further details are presented in the Environmental Study Report (ESR) for the capacity expansion of G. E. Booth WRRF.

11 CLOSING

This Air Quality Impact Assessment Report was prepared for Regional Municipality of Peel by WSP Canada Inc. The quality of information, conclusions and environmental impact estimates contained herein is consistent with the level of effort involved in WSP's services and based on i) information available at the time of preparation; ii) data supplied by outside sources; and iii) the assumptions, conditions and qualifications set forth in this report.

12 REFERENCES

Emission Summary and Dispersion Modelling Report (ESDM). 2023. WSP Canada Inc.

Ministry of the Environment and Climate Change (MECP). 2017. Methodology for Modelling Assessments of Contaminants With 10-Minute Average Standards and Guidelines for Odour under O. Reg. 419/05.

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Ministry of the Environment and Climate Change (MECP). 2018. Guideline A-10: Procedure for Preparing an Emission Summary and Dispersion Modelling Report, Version 4.1.

Ministry of the Environment and Climate Change (MECP). 2020. Ambient Air Quality Criteria.

Ministry of the Environment and Climate Change (MECP). 2021 Air Quality Ontario Data. http://www.airqualityontario.com/history/index.php Accessed July 2021.

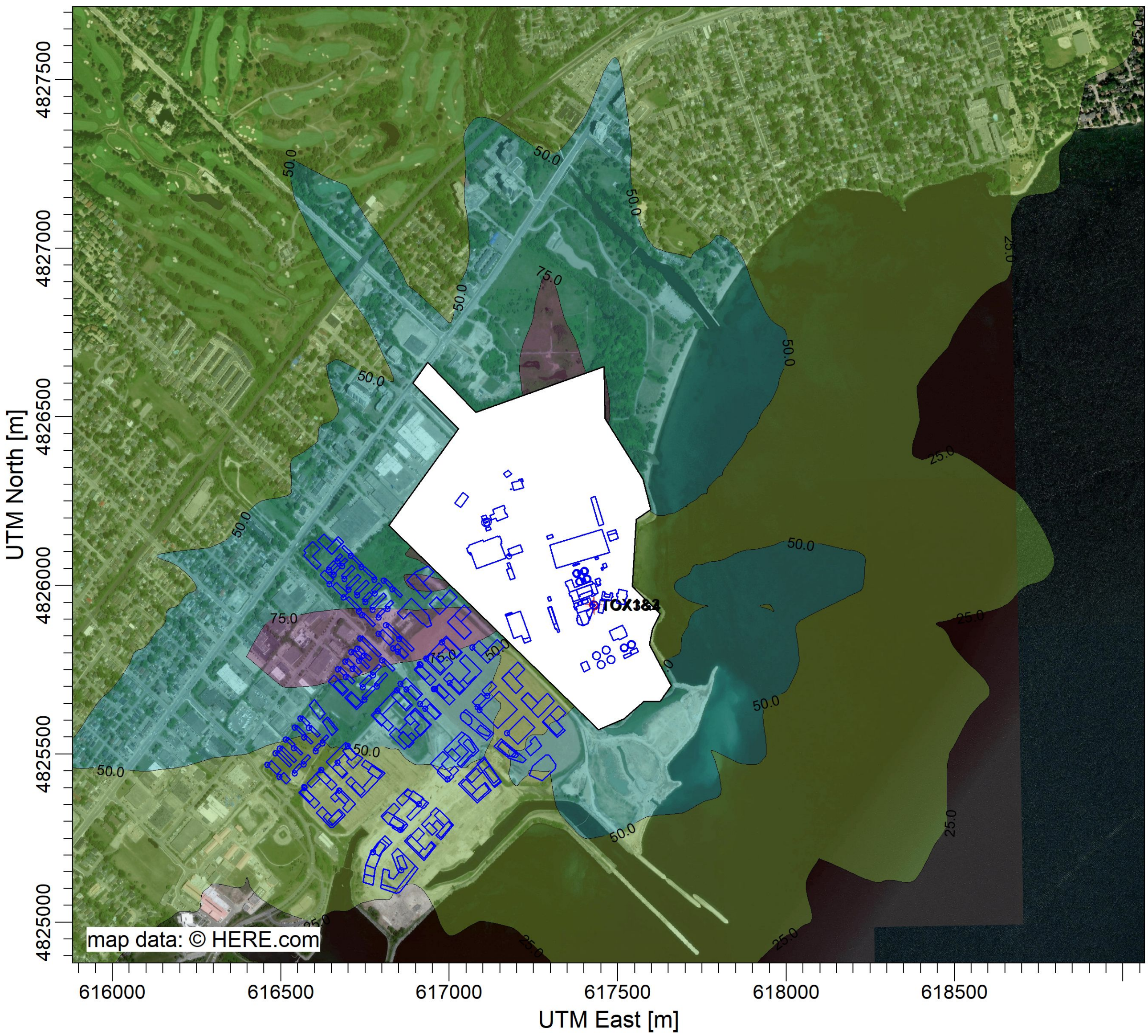
Ministry of the Environment and Climate Change (MECP). 2022. O. Reg. 419/05: Air Pollution - Local Air Quality.

Appendix A

Modelling Figures

Project Title:

GE Booth Wastewater Plant
Future Scenario - SO2 (1hr average)



PLOT FILE OF 1-HR VALUES SO2

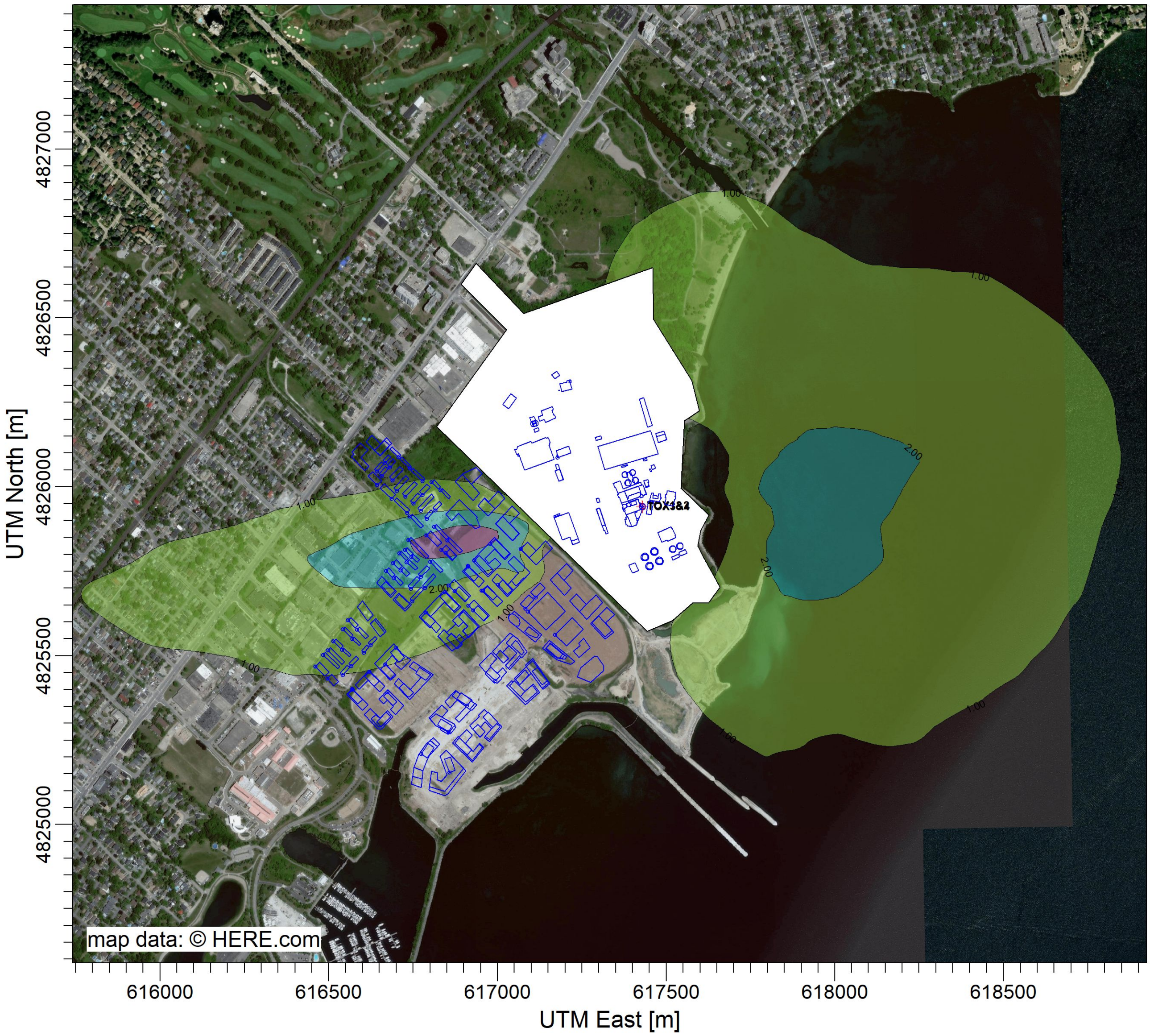
µg/m³

25.0 | 50.0 | 75.0

Comments:	Sources:	Consultant:	
ON AAQC = 100 µg/m³	**2**	**WSP E&I Canada Limited**	
	Receptors: **2362**	Modeller: **V.A**	
	Output Type: **Concentration**	SCALE: 1:20,000 (0 — 0.5 km)	
		Date: **11-Aug-23**	Figure Number: **A-1**

Project Title:

GE Booth Wastewater Plant
Future Scenario - SO2 (annual average)



PLOT FILE OF ANNUAL VALUES AVERAGED: SO2 µg/m³

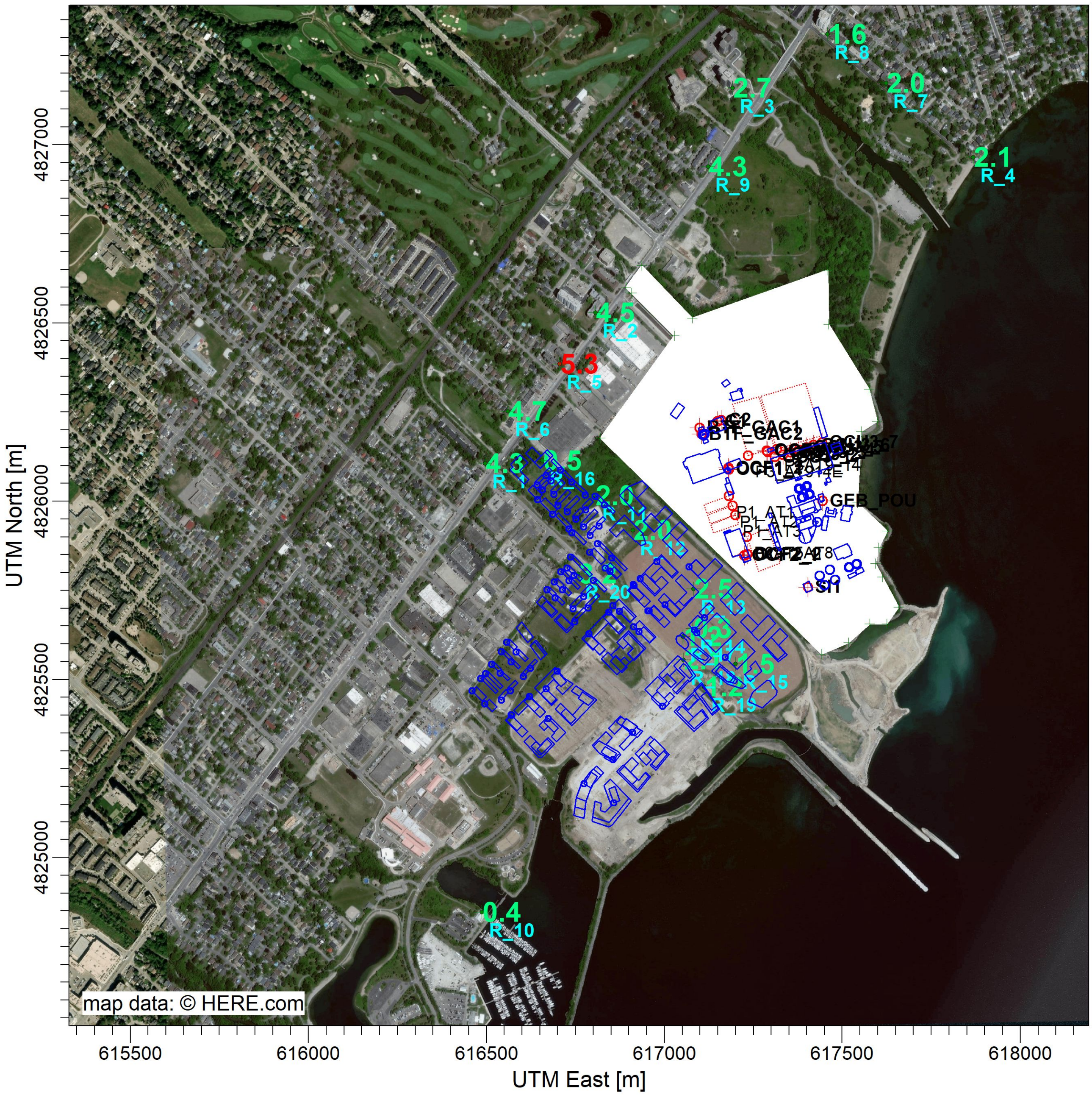
1	2	3

Comments:	Sources:	Consultant:	
ON AAQC = 10 µg/m³	**2**	**WSP E&I Canada Limited**	
	Receptors: **2362**	Modeller: **V.A**	WSP
	Output Type: **Concentration**	SCALE: 1:20,000 0 — 0.5 km	
		Date: **11-Aug-23**	Figure Number: **A-2**

AERMOD View - Lakes Environmental Software D:\Project\GE Booth\GEB_SO2E\GEB_SO2E.isc

Project Title:

GE Booth Wastewater Plant
Future Scenario - Odour Model (10-min average)



Comments:

Only the max year (2016) modelled is shown as the example.

Sources:

25

Consultant:

WSP E&I Canada Limited

Receptors:

41

Modeller:

V.A

Output Type:

Concentration

SCALE: 1:18,000

0 0.5 km

Date:

07-Sep-23

Figure Number:

A-3

Appendix B

Source and Emission Rate Summary Tables

TABLE B-1: SOURCE DATA TABLE

Current Scenario (Baseline)

SOURCE ID	DESCRIPTION		SOURCE DATA						
	BUILDING/AREA	PROCESS/MATERIAL	FLOWRATE (m^3/s)	VELOCITY (m/s)	TEMP (DEG. C)	DIAMETER (m)	HEIGHT ABOVE GRADE (m)	HEIGHT ABOVE ROOF (m)	SOURCE COORDINATES (X,Y) (m)
B-1	Thermal Oxidation facility	Camus DFH 5000 Boiler 5 Million BTU/hr (Nat. Gas)	1.1	8.8	250	0.40	29.5	1.0	617377, 4825877
B- 2	Thermal Oxidation facility	Camus DFH 5000 Boiler 5 Million BTU/hr (Nat. Gas)	1.10	8.8	250	0.40	29.5	1.0	617378, 4825875
B-3	Thermal Oxidation facility	Camus DFH 5000 Boiler 5 Million BTU/hr (Nat. Gas)	1.10	8.8	250	0.40	29.5	1.0	617379, 4825873
B-4	Thermal Oxidation facility	Camus DFH 5000 Boiler 5 Million BTU/hr (Nat. Gas)	1.1	8.8	250	0.40	29.50	1.0	617379, 4825871
B-5	Thermal Oxidation facility	Camus DFH 5000 Boiler 5 Million BTU/hr (Nat. Gas)	1.10	8.8	250	0.40	29.50	1.0	617376, 4825879
EGEN-1	Headworks	Standby Generator	2.19	44.6	474	0.25	11.00	3.0	617148, 4826233
EGEN-2	New outdoor backup diesel generator (beside storage complex building)	Standby Generator	0.75	48.7	520	0.14	4.06	NA	617182, 4826286
N19	Heating Building	Standby Generator	3.28	46.4	481	0.30	8.80	3.0	617344, 4826012
TOX-1 & TOX-2	Biosolids Building	Biosolids Incinerators #1 and #2	17.49	26.7	47.15	0.91	53.38	35.5	617427, 4825942
TOX-3 & TOX-4	Biosolids Building	Biosolids Incinerators #3 and #4	17.49	26.7	47.15	0.91	53.38	35.5	617429, 4825939
BIO-TF1	Adjacent to the headworks building	Biotrickling filter vessel 1	5.66	20.0	22	0.60	9.10	NA	617107, 4826186
BIO-TF2	Adjacent to the headworks building	Biotrickling filter vessel 2	5.66	20.0	22	0.60	9.10	NA	617112, 4826188
C1	Headworks	Carbon Unit	3.77	7.5	22	0.80	16.80	6.0	617148, 4826224
C2	Headworks	Carbon Unit	3.77	7.5	22	0.80	16.80	6.0	617159, 4826228
C3	Plant 3	Carbon Unit	3.77	7.5	22	0.80	13.00	NA	617289, 4826145
C4	Plant 3	Carbon Unit	3.77	7.5	22	0.80	13.00	NA	617291, 4826146
P1_CL1	Plant1	Primary Clarifier	NA	NA	NA	Length 26m x Width 10m	0	NA	617193, 4825985
P1_CL2	Plant1	Primary Clarifier	NA	NA	NA	Length 26m x Width 10m	0	NA	617197, 4825974
P1_CL3	Plant1	Primary Clarifier	NA	NA	NA	Length 26m x Width 10m	0	NA	617201, 4825963
P1_CL4	Plant1	Primary Clarifier	NA	NA	NA	Length 26m x Width 10m	0	NA	617206, 4825947
P2_CL5	Plant 2	Primary Clarifier	NA	NA	NA	Length 64 m x Width 20m	0	NA	617169, 4825906
P2_CL6	Plant 2	Primary Clarifier	NA	NA	NA	Length 64 m x Width 20m	0	NA	617191, 4825915
P3CL7	Plant 3	Primary Clarifier	NA	NA	NA	Length 64 m x Width 20m	0	NA	617300, 4826111
P3CL8	Plant 3	Primary Clarifier	NA	NA	NA	Length 64 m x Width 20m	0	NA	617324, 4826117
P3CL9	Plant 3	Primary Clarifier	NA	NA	NA	Length 64 m x Width 20m	0	NA	617346, 4826124
P3CL10	Plant 3	Primary Clarifier	NA	NA	NA	Length 64 m x Width 20m	0	NA	617368, 4826131
P3CL11	Plant 3	Primary Clarifier	NA	NA	NA	Length 64m x Width 20m	0	NA	617391, 4826138

NA - Not available

TABLE B-2: SOURCE DATA TABLE

Future Scenario (Project B)

SOURCE ID	DESCRIPTION		SOURCE DATA						
	BUILDING/AREA	PROCESS/MATERIAL	FLOWRATE (m^3/s)	VELOCITY (m/s)	TEMP (DEG. C)	DIAMETER (m)	HEIGHT ABOVE GRADE (m)	HEIGHT ABOVE ROOF (m)	SOURCE COORDINATES (X,Y) (m)
Existing Sources									
B-1	Thermal Oxidation facility	Camus DFH 5000 Boiler 5 Million BTU/hr (Nat. Gas)	1.1	8.8	250	0.40	29.5	1.0	617377, 4825877
B- 2	Thermal Oxidation facility	Camus DFH 5000 Boiler 5 Million BTU/hr (Nat. Gas)	1.10	8.8	250	0.40	29.5	1.0	617378, 4825875
B-3	Thermal Oxidation facility	Camus DFH 5000 Boiler 5 Million BTU/hr (Nat. Gas)	1.10	8.8	250	0.40	29.5	1.0	617379, 4825873
B-4	Thermal Oxidation facility	Camus DFH 5000 Boiler 5 Million BTU/hr (Nat. Gas)	1.1	8.8	250	0.40	29.50	1.0	617379, 4825871
B-5	Thermal Oxidation facility	Camus DFH 5000 Boiler 5 Million BTU/hr (Nat. Gas)	1.10	8.8	250	0.40	29.50	1.0	617376, 4825879
EGEN-1	Headworks	Standby Generator	2.19	44.6	474	0.25	11.00	3.0	617148, 4826233
EGEN-2	New outdoor backup diesel generator (beside storage complex building)	Standby Generator	0.75	48.7	520	0.14	4.06	NA	617182, 4826286
N19	Heating Building	Standby Generator	3.28	46.4	481	0.30	8.80	3.0	617344, 4826012
TOX-1 & TOX-2	Biosolids Building	Biosolids Incinerators #1 and #2	17.49	26.7	47.15	0.91	53.38	35.5	617427, 4825942
TOX-3 & TOX-4	Biosolids Building	Biosolids Incinerators #3 and #4	17.49	26.7	47.15	0.91	53.38	35.5	617429, 4825939
C1	Headworks	Carbon Unit	3.77	7.5	22	0.80	16.80	6.0	617148, 4826224
C2	Headworks	Carbon Unit	3.77	7.5	22	0.80	16.80	6.0	617159, 4826228
Project B Sources									
BTF_GAC1 (upgraded source, formerly BIO-TF1)	Adjacent to the headworks building	Biotrickling filter vessel 1, OCF Upgrade	5.66	12.8	22	0.75	15.00	NA	617097.8 , 4826206.2
BTF_GAC2 (upgraded souce, formerly BIO-TF1)	Adjacent to the headworks building	Biotrickling filter vessel 2, OCF Upgrade	5.66	12.8	22	0.75	15.00	NA	617104.4 , 4826188.4
OCF1_1	New Plant 1, Option A	Odour Control Facility Plant 1 (Stack 1)	8.50	13.4	22	0.90	15.00	NA	617181.2 , 4826089.4
OCF1_2	New Plant 1, Option A	Odour Control Facility Plant 1 (Stack 2)	8.50	13.4	22	0.90	15.00	NA	617179.7 , 4826093.5
OCF2_1	New Plant 2, Option A	Odour Control Facility Plant 2 (Stack 1)	8.50	13.4	22	0.90	15.00	NA	617223.9 , 4825848.6
OCF2_2	New Plant 2, Option A	Odour Control Facility Plant 2 (Stack 2)	8.50	13.4	22	0.90	15.00	NA	617231.8 , 4825851.4
OCU3_1	New Plant 3 - GAC unit 1 (Primary Clarifier 7)	Odour Control Unit Plant 3 (Primary Clarifier 7)	14.16	32.1	22	0.75	15.00	NA	617309, 4826124
OCU3_2	New Plant 3 - GAC unit 1 (Primary Clarifier 8)	Odour Control Unit Plant 3 (Primary Clarifier 8)	14.16	32.1	22	0.75	15.00	NA	617332, 4826131
OCU3_3	New Plant 3 - GAC unit 1 (Primary Clarifier 9)	Odour Control Unit Plant 3 (Primary Clarifier 9)	14.16	32.1	22	0.75	15.00	NA	617354, 4826137
OCU3_4	New Plant 3 - GAC unit 1 (Primary Clarifier 10)	Odour Control Unit Plant 3 (Primary Clarifier 10)	14.16	32.1	22	0.75	15.00	NA	617376, 4826144
OCU3_5	New Plant 3 - GAC unit 1 (Primary Clarifier 11)	Odour Control Unit Plant 3 (Primary Clarifier 11)	14.16	32.1	22	0.75	15.00	NA	617399, 4826151
OCU3_6	New Plant 3 - GAC unit 1 (Primary Clarifier 12)	Odour Control Unit Plant 3 (Primary Clarifier 12)	14.16	32.1	22	0.75	15.00	NA	617419, 4826157
OCU3_7	New Plant 3 - GAC unit 1 (Primary Clarifier 13)	Odour Control Unit Plant 3 (Primary Clarifier 13)	14.16	32.1	22	0.75	15.00	NA	617443, 4826165
OCF3_1 (replacement of old C3)	Plant 3	Carbon Unit	7.08	16.0	22	0.75	15.00	NA	617288, 4826139
OCF3_2 (replacement of old C4)	Plant 3	Carbon Unit	7.08	16.0	22	0.75	15.00	NA	617286, 4826142
GEB_POU	Immediately south of the regenerative thermal oxidizer building	Portable germinable endospore biodosimetry (GEB) portable odour unit	2.36	14.2	22	0.46	3.95	NA	617444, 4826001
SI-1	Scrubber	Biosolids Truck Loading	8.25	10.5	21	1.00	16.50	2.5	617403, 4825759
SI-2	Energy Center Area	Stanby Diesel Generator 1 (3MW)	3.28	46.4	481	0.30	7.50	3	617029, 4826234
SI-3	Energy Center Area	Stanby Diesel Generator 2 (3MW)	3.28	46.4	481	0.30	7.50	3	617035, 4826243
SI-4	Energy Center Area	Stanby Diesel Generator 3 (3MW)	3.28	46.4	481	0.30	7.50	3	617042, 4826251
SI-5	Energy Center Area	Stanby Diesel Generator 4 (3MW)	3.28	46.4	481	0.30	7.50	3	617048, 4826261
SI-6	Biogas Burner #1	Biogas Storage Area	16.9	17.8	1000	1.10	15.00	5.0	617520, 4825788
SI-7	Biogas Burner #2	Biogas Storage Area	16.9	17.8	1000	1.10	15.00	5.0	617525, 4825791

NA - Not available

TABLE B-3: EMISSION DATA TABLE

Current Scenario (Baseline)

SOURCE ID	EMISSION DATA						
	CONTAMINANTS	CAS #	EMISSION RATE (g/s)	AVERAGING PERIOD (HOURS)	ESTIMATION TECHNIQUE	DATA QUALITY	% OF OVERALL EMISSION
Existing Sources							
B-1	NOx	10102-44-0	6.18E-02	1	EF	Above-Average	0.35%
	CO	630-08-0	5.19E-02	1	EF	Above-Average	6.68%
B- 2	NOx	10102-44-0	6.18E-02	1	EF	Above-Average	0.35%
	CO	630-08-0	5.19E-02	1	EF	Above-Average	6.68%
B-3	NOx	10102-44-0	6.18E-02	1	EF	Above-Average	0.35%
	CO	630-08-0	5.19E-02	1	EF	Above-Average	6.68%
B-4	NOx	10102-44-0	6.18E-02	1	EF	Above-Average	0.35%
	CO	630-08-0	5.19E-02	1	EF	Above-Average	6.68%
B-5	NOx	10102-44-0	6.18E-02	1	EF	Above-Average	0.35%
	CO	630-08-0	5.19E-02	1	EF	Above-Average	6.68%
EGEN-1	NOx	10102-44-0	2.75E+00	1	EF	Marginal	NA
EGEN-2	NOx	10102-44-0	2.93E-01	1	EF	Marginal	NA
N19	NOx	10102-44-0	4.19E+00	1	EF	Marginal	NA
TOX-1 & TOX-2	PM	NA	3.79E-01	1	V-ST	Above average	50.00%
	SO_2	7446-09-5	3.73E+00	1	V-ST	Above average	50.00%
	NO_X	10102-44-0	8.57E+00	1	V-ST	Above average	49.12%
	CO	630-08-0	2.58E-01	1	V-ST	Above average	33.29%
	Naphthalene	91-20-3	3.15E-05	1	V-ST	Above average	50.00%
	Dioxins/Furans (TEQ)	NA	1.27E-10	1	V-ST	Above average	50.00%
	Mercury	7439-97-6	1.58E-03	1	EC	Average	50.00%
	Nickel	7440-02-0	4.72E-04	1	V-ST	Above average	50.00%
	Hydrogen chloride	7647-01-0	9.20E-03	1	V-ST	Above average	50.00%
	Hydrogen fluoride	7664-39-3	2.62E-03	1	V-ST	Above average	50.00%
	Benzo(a)pyrene	50-32-8	2.32E-07	1	V-ST	Above average	50.00%
	Arsenic	7440-38-2	9.97E-05	1	V-ST	Above average	50.00%
	Cadmium	7440-43-9	1.26E-05	1	V-ST	Above average	50.00%
	Calcium	1305-78-8	7.04E-03	1	V-ST	Above average	50.00%
	Iron	7439-89-6	4.46E-03	1	V-ST	Above average	50.00%
	Manganese	7439-96-5	2.70E-04	1	V-ST	Above average	50.00%
	Potassium	7440-09-7	2.05E-03	1	V-ST	Above average	50.00%
TOX-3 & TOX-4	PM	NA	3.79E-01	1	V-ST	Above average	50.00%
	SO_2	7446-09-5	3.73E+00	1	V-ST	Above average	50.00%
	NO_X	10102-44-0	8.57E+00	1	V-ST	Above average	49.12%
	CO	630-08-0	2.58E-01	1	V-ST	Above average	33.29%
	Naphthalene	91-20-3	3.15E-05	1	V-ST	Above average	50.00%
	Dioxins/Furans (TEQ)	NA	1.27E-10	1	V-ST	Above average	50.00%
	Mercury	7439-97-6	1.58E-03	1	EC	Average	50.00%
	Nickel	7440-02-0	4.72E-04	1	V-ST	Above average	50.00%
	Hydrogen chloride	7647-01-0	9.20E-03	1	V-ST	Above average	50.00%
	Hydrogen fluoride	7664-39-3	2.62E-03	1	V-ST	Above average	50.00%
	Benzo(a)pyrene	50-32-8	2.32E-07	1	V-ST	Above average	50.00%
	Arsenic	7440-38-2	9.97E-05	1	V-ST	Above average	50.00%
	Cadmium	7440-43-9	1.26E-05	1	V-ST	Above average	50.00%
	Calcium	1305-78-8	7.04E-03	1	V-ST	Above average	50.00%
	Iron	7439-89-6	4.46E-03	1	V-ST	Above average	50.00%
	Manganese	7439-96-5	2.70E-04	1	V-ST	Above average	50.00%
	Potassium	7440-09-7	2.05E-03	1	V-ST	Above average	50.00%
BIO-TF1	H_2S	7783-06-4	2.07E-03	1	EF	Average	12.69%
BIO-TF2	H_2S	7783-06-4	2.07E-03	1	EF	Average	12.69%
C1	H2S	7783-06-4	1.05E-04	1	EC	Average	0.64%
C2	H2S	7783-06-4	1.05E-04	1	EC	Average	0.64%
C3	H2S	7783-06-4	1.05E-04	1	EC	Average	0.64%
C4	H2S	7783-06-4	1.05E-04	1	EC	Average	0.64%
P1_CL1	H2S	7783-06-4	4.46E-04	1	EC	Average	2.73%
P1_CL2	H2S	7783-06-4	4.46E-04	1	EC	Average	2.73%
P1_CL3	H2S	7783-06-4	6.62E-04	1	EC	Average	4.05%
P1_CL4	H2S	7783-06-4	6.62E-04	1	EC	Average	4.05%
P2_CL5	H2S	7783-06-4	2.17E-03	1	EC	Average	13.27%
P2_CL6	H2S	7783-06-4	2.17E-03	1	EC	Average	13.27%
P3CL7	H2S	7783-06-4	1.04E-03	1	EC	Average	6.39%
P3CL8	H2S	7783-06-4	1.04E-03	1	EC	Average	6.39%
P3CL9	H2S	7783-06-4	1.04E-03	1	EC	Average	6.39%
P3CL10	H2S	7783-06-4	1.04E-03	1	EC	Average	6.39%
P3CL11	H2S	7783-06-4	1.04E-03	1	EC	Average	6.39%

NA - Not applicable
TEQ – Toxicity Equivalent

TABLE B-4: EMISSION DATA TABLE

Future Scenario (Project B)

SOURCE ID	EMISSION DATA						
	CONTAMINANTS	CAS #	EMISSION RATE (g/s)	AVERAGING PERIOD (HOURS)	ESTIMATION TECHNIQUE	DATA QUALITY	% OF OVERALL EMISSION
Existing Sources							
B-1	NOx	10102-44-0	6.18E-02	1	EF	Above-Average	0.35%
	CO	630-08-0	5.19E-02	1	EF	Above-Average	6.68%
B- 2	NOx	10102-44-0	6.18E-02	1	EF	Above-Average	0.35%
	CO	630-08-0	5.19E-02	1	EF	Above-Average	6.68%
B-3	NOx	10102-44-0	6.18E-02	1	EF	Above-Average	0.35%
	CO	630-08-0	5.19E-02	1	EF	Above-Average	6.68%
B-4	NOx	10102-44-0	6.18E-02	1	EF	Above-Average	0.35%
	CO	630-08-0	5.19E-02	1	EF	Above-Average	6.68%
B-5	NOx	10102-44-0	6.18E-02	1	EF	Above-Average	0.35%
	CO	630-08-0	5.19E-02	1	EF	Above-Average	6.68%
EGEN-1	NOx	10102-44-0	2.75E+00	1	EF	Marginal	NA
EGEN-2	NOx	10102-44-0	2.93E-01	1	EF	Marginal	NA
N19	NOx	10102-44-0	4.19E+00	1	EF	Marginal	NA
TOX-1 & TOX-2	PM	NA	3.79E-01	1	V-ST	Above average	50.00%
	SO_2	7446-09-5	3.73E+00	1	V-ST	Above average	50.00%
	NO_X	10102-44-0	8.57E+00	1	V-ST	Above average	47.93%
	CO	630-08-0	2.58E-01	1	V-ST	Above average	33.29%
	Naphthalene	91-20-3	3.15E-05	1	V-ST	Above average	50.00%
	Dioxins/Furans (TEQ)	NA	1.27E-10	1	V-ST	Above average	50.00%
	Mercury	7439-97-6	1.58E-03	1	EC	Average	50.00%
	Nickel	7440-02-0	4.72E-04	1	V-ST	Above average	50.00%
	Hydrogen chloride	7647-01-0	9.20E-03	1	V-ST	Above average	50.00%
	Hydrogen fluoride	7664-39-3	2.62E-03	1	V-ST	Above average	50.00%
	Benzo(a)pyrene	50-32-8	2.32E-07	1	V-ST	Above average	50.00%
	Arsenic	7440-38-2	9.97E-05	1	V-ST	Above average	50.00%
	Cadmium	7440-43-9	1.26E-05	1	V-ST	Above average	50.00%
	Calcium	1305-78-8	7.04E-03	1	V-ST	Above average	50.00%
	Iron	7439-89-6	4.46E-03	1	V-ST	Above average	50.00%
	Manganese	7439-96-5	2.70E-04	1	V-ST	Above average	50.00%
	Potassium	7440-09-7	2.05E-03	1	V-ST	Above average	50.00%
TOX-3 & TOX-4	PM	NA	3.79E-01	1	V-ST	Above average	50.00%
	SO_2	7446-09-5	3.73E+00	1	V-ST	Above average	50.00%
	NO_X	10102-44-0	8.57E+00	1	V-ST	Above average	47.93%
	CO	630-08-0	2.58E-01	1	V-ST	Above average	33.29%
	Naphthalene	91-20-3	3.15E-05	1	V-ST	Above average	50.00%
	Dioxins/Furans (TEQ)	NA	1.27E-10	1	V-ST	Above average	50.00%
	Mercury	7439-97-6	1.58E-03	1	EC	Average	50.00%
	Nickel	7440-02-0	4.72E-04	1	V-ST	Above average	50.00%
	Hydrogen chloride	7647-01-0	9.20E-03	1	V-ST	Above average	50.00%
	Hydrogen fluoride	7664-39-3	2.62E-03	1	V-ST	Above average	50.00%
	Benzo(a)pyrene	50-32-8	2.32E-07	1	V-ST	Above average	50.00%
	Arsenic	7440-38-2	9.97E-05	1	V-ST	Above average	50.00%
	Cadmium	7440-43-9	1.26E-05	1	V-ST	Above average	50.00%
	Calcium	1305-78-8	7.04E-03	1	V-ST	Above average	50.00%
	Iron	7439-89-6	4.46E-03	1	V-ST	Above average	50.00%
	Manganese	7439-96-5	2.70E-04	1	V-ST	Above average	50.00%
	Potassium	7440-09-7	2.05E-03	1	V-ST	Above average	50.00%
C1	H_2S	7783-06-4	1.05E-04	1	EC	Average	0.27%
C2	H_2S	7783-06-4	1.05E-04	1	EC	Average	0.27%
Project B sources							
BTF_GAC1 (formerly BIO-TF1)	H_2S	7783-06-4	2.08E-03	1	EF	Average	5.39%
BTF_GAC2 (formerly BIO-TF2)	H_2S	7783-06-4	2.08E-03	1	EF	Average	5.39%
OCF1_1	H_2S	7783-06-4	3.12E-03	1	EC	Average	8.08%
OCF1_2	H_2S	7783-06-4	3.12E-03	1	EC	Average	8.08%
OCF2_1	H_2S	7783-06-4	3.12E-03	1	EC	Average	8.08%
OCF2_2	H_2S	7783-06-4	3.12E-03	1	EC	Average	8.08%
OCU3_1	H_2S	7783-06-4	1.99E-03	1	EC	Average	5.15%
OCU3_2	H_2S	7783-06-4	1.99E-03	1	EC	Average	5.15%
OCU3_3	H_2S	7783-06-4	1.99E-03	1	EC	Average	5.15%
OCU3_4	H_2S	7783-06-4	1.99E-03	1	EC	Average	5.15%
OCU3_5	H_2S	7783-06-4	1.99E-03	1	EC	Average	5.15%
OCU3_6	H_2S	7783-06-4	1.99E-03	1	EC	Average	5.15%
OCU3_7	H_2S	7783-06-4	1.99E-03	1	EC	Average	5.15%
OCF3_1	H_2S	7783-06-4	9.94E-04	1	EC	Average	2.58%
OCF3_2	H_2S	7783-06-4	9.94E-04	1	EC	Average	2.58%
GEB_POU	H_2S	7783-06-4	3.31E-04	1	EF	Average	0.86%
SI-1	H_2S	7783-06-4	5.50E-03	1	EF	Average	14.26%
	Ammonia (NH_3)	7664-41-7	7.80E-03	1	EC	Average	100.00%
SI-2	NOx	10102-44-0	7.86E+00	1	EF	Marginal	NA
SI-3	NOx	10102-44-0	7.86E+00	1	EF	Marginal	NA
SI-4	NOx	10102-44-0	7.86E+00	1	EF	Marginal	NA
SI-5	NOx	10102-44-0	7.86E+00	1	EF	Marginal	NA
SI-6	NOx	10102-44-0	2.15E-01	1	EF	Above Average	1.20%
SI-7	NOx	10102-44-0	2.15E-01	1	EF	Above Average	1.20%

NA - Not applicable
TEQ – Toxicity Equivalent

TABLE B-5: ODOUR SOURCE SUMMARY TABLE

Existing Scenario (baseline)

SOURCE ID	DESCRIPTION		SOURCE DATA							Odour Emission Rate
	BUILDING/AREA	PROCESS/MATERIAL	FLOWRATE (m^3/s)	VELOCITY (m/s)	TEMP (DEG. C)	DIAMETER (m)	HEIGHT ABOVE GRADE (m)	HEIGHT ABOVE ROOF (m)	SOURCE COORDINATES (X,Y) (m)	OU/s
Point Type Sources										
BIO-TF1	Adjacent to the headworks building	Biotrickling filter vessel 1	5.66	20.0	22	0.60	9.10	NA	617097 , 4826206	5, 667
BIO-TF2	Adjacent to the headworks building	Biotrickling filter vessel 2	5.66	20.0	22	0.60	9.10	NA	617104, 4826188	5, 667
C1	Headworks	Carbon Unit	3.77	7.5	22	0.80	16.80	6.0	617148, 4826224	1,133
C2	Headworks	Carbon Unit	3.77	7.5	22	0.80	16.80	6.0	617159, 4826228	1,133
C3	Plant 3	Carbon Unit	3.77	7.5	22	0.80	13.00	NA	617289, 4826145	1,133
C4	Plant 3	Carbon Unit	3.77	7.5	22	0.80	13.00	NA	617291, 4826146	1,133
Area Type Sources										
										Odour Emission Rate [OU/(s-m2)]
P1_CL1, P1_CL2, P1_CL3, and P1_CL4	Plant 1 Primary Clarifiers 1 to 4	Primary Clarifiers	NA	NA	NA	NA	0.00	NA	617193, 4825985	0.85
P1WL1, and P1WL2	Plant 1 Primary Clarifier 1 to 2 Weirs and Launders	Primary Clarifiers	NA	NA	NA	NA	0.00	NA	617192, 4825985	3,433
P1WL3, and P1WL4	Plant 1 Primary Clarifier 3 to 4 Weirs and Launders	Primary Clarifiers	NA	NA	NA	NA	0.00	NA	617192, 4825985	3,433
P1_AT1 and P1_AT2	Plant 1 Aeration Tanks 1 and 2	Aeration	NA	NA	NA	NA	0.15	NA	617239, 4826001	0.35
P1_AT3 and P1_AT4	Plant 1 Aeration Tanks 3 and 4	Aeration	NA	NA	NA	NA	0.15	NA	617255, 4825957	0.35
P2_CL5	Plant 2 Primary Clarifier 5	Primary Clarifier	NA	NA	NA	NA	0.00	NA	617169, 4825906	0.78
P2_CL6	Plant 2 Primary Clarifier 6	Primary Clarifier	NA	NA	NA	NA	0.00	NA	617191, 4825915	0.78
P2_AT5 P2_AT8	Plant 2 Aeration Tanks T5 to T8	Aeration	NA	NA	NA	NA	0.15	NA	617231, 4825900	0.32
P3CL7_CL11	Plant 3 Primary Clarifiers #7 to #11	Primary Clarifier	NA	NA	NA	NA	0.15	NA	617300, 4826111	0.85
P3AT911AE	Plant 3 Aeration Tanks Extension #9A to #11A	Aeration	NA	NA	NA	NA	0.15	NA	617234, 4826128	0.35
P3AT9_14	Plant 3 Aeration Tanks #9 to #14	Aeration	NA	NA	NA	NA	0.15	NA	617315, 4826146	0.35

NA - Not available

TABLE B-6: ODOUR SOURCE SUMMARY TABLE

Future Scenario (Project B)

SOURCE ID	DESCRIPTION		SOURCE DATA							Odour Emission Rate
	BUILDING/AREA	PROCESS/MATERIAL	FLOWRATE (m^3/s)	VELOCITY (m/s)	TEMP (DEG. C)	DIAMETER (m)	HEIGHT ABOVE GRADE (m)	HEIGHT ABOVE ROOF (m)	SOURCE COORDINATES (X,Y) (m)	OU/s
Point Type Sources										
BTF_GAC1 (upgraded source, formerly BIO-TF1)	Adjacent to the headworks building	Biotrickling filter vessel 1, OCF Upgrade	5.66	12.82	10	0.75	15	NA	617097, 4826206	637
BTF_GAC2 (upgraded souce, formerly BIO-TF1)	Adjacent to the headworks building	Biotrickling filter vessel 2, OCF Upgrade	5.66	12.82	10	0.75	15	NA	617104, 4826188	637
C1	Headworks	Carbon Unit	3.77	7.5	22	0.80	16.80	6.0	617148, 4826224	1,133
C2	Headworks	Carbon Unit	3.77	7.5	22	0.80	16.80	6.0	617159, 4826228	1,133
OCF1_1	New Plant 1	Odour Control Facility Plant 1 (Stack 1)	8.50	13.4	10	0.90	15.00	NA	617181, 4826089	374
OCF1_2	New Plant 1	Odour Control Facility Plant 1 (Stack 2)	8.50	13.4	10	0.90	15.00	NA	617179, 4826093	374
OCF2_1	New Plant 2	Odour Control Facility Plant 2 (Stack 1)	8.50	13.35	10.00	0.90	15.00	NA	617223, 4825848	295
OCF2_2	New Plant 2	Odour Control Facility Plant 2 (Stack 2)	8.50	13.35	10.00	0.90	15.00	NA	617231, 4825851	295
OCU3_1	New Plant 3 - Primary Clarifiers	Odour Control Unit Plant 3 (Primary Clarifier 7)	14.16	32.05	22.00	0.75	15.00	NA	617309, 4826124	200
OCU3_2	New Plant 3 - Primary Clarifiers	Odour Control Unit Plant 3 (Primary Clarifier 8)	14.16	32.05	22.00	0.75	15.00	NA	617332, 4826131	200
OCU3_3	New Plant 3 - Primary Clarifiers	Odour Control Unit Plant 3 (Primary Clarifier 9)	14.16	32.05	22.00	0.75	15.00	NA	617354, 4826137	200
OCU3_4	New Plant 3 - Primary Clarifiers	Odour Control Unit Plant 3 (Primary Clarifier 10)	14.16	32.05	22.00	0.75	15.00	NA	617376, 4826144	200
OCU3_5	New Plant 3 - Primary Clarifiers	Odour Control Unit Plant 3 (Primary Clarifier 11)	14.16	32.05	22.00	0.75	15.00	NA	617399, 4826151	200
OCU3_6	New Plant 3 - Primary Clarifiers	Odour Control Unit Plant 3 (Primary Clarifier 12)	14.16	32.05	22.00	0.75	15.00	NA	617419, 4826157	200
OCU3_7	New Plant 3 - Primary Clarifiers	Odour Control Unit Plant 3 (Primary Clarifier 13)	14.16	32.05	22.00	0.75	15.00	NA	617443, 4826165	200
OCF3_1 (replacement of old C3)	New Plant 3 - inlet conduit channels	Odour Control Unit Plant 3 (inlet conduit channels)	7.08	16.03	22.00	0.75	15.00	NA	617288, 4826139	200
OCF3_2 (replacement of old C4)	New Plant 3 - inlet conduit channels	Odour Control Unit Plant 3 (inlet conduit channels)	7.08	16.03	22.00	0.75	15.00	NA	617286, 4826142	200
GEB_POU	Immediately south of the regenerative thermal oxidizer building	Portable germinable endospore biodosimetry (GEB) portable odour unit	2.36	14.2	22	0.46	3.95	NA	617444, 4826001	200
SI-1	Scrubber	Biosolids Truck Loading	8.25	10.5	21	1.00	16.50	2.5	617403, 4825759	12,000
Area Type Sources										
										Odour Emission Rate [OU/(s-m2)]
P1_AT1 and P1_AT2	Plant 1 Aeration Tanks 1 and 2	Aeration	NA	NA	NA	NA	0.00	NA	617239, 4826001	0.35
P1_AT3	Plant 1 Aeration Tanks 3	Aeration	NA	NA	NA	NA	0.00	NA	617255, 4825957	0.35
P2_AT5 to P2_AT8	Plant 2 Aeration Tanks T5 to T8	Aeration	NA	NA	NA	NA	0.00	NA	617231, 4825900	0.35
P3AT911AE	Plant 3 Aeration Tanks Extension #9A to #11A	Aeration	NA	NA	NA	NA	0.15	NA	617234, 4826128	0.27
P3AT9_14	Plant 3 Aeration Tanks #9 to #14	Aeration	NA	NA	NA	NA	0.15	NA	617315, 4826146	0.27

NA - Not available

Appendix C

Emission Rate Calculations and Supporting Information

Plant 3 - New Carbon Units (sources OCF3_1, and OCF3_2) Emission Calculations

Sample calculations for H_2S:

Outlet H_2S concentration = 0.10 ppm

Exhaust flow rate = 7.08 m^3/s

Contaminants	CAS No.	Max. exhaust gas concentration, ppm	Molecular Weight	Concentration, mg/m3	Emissions, g/s
H_2S	7783-06-4	0.10	34	0.14	0.00099

To convert concentrations in air (at 25 °C) from ppm to mg/m³: mg/m³ = (ppm) × (molecular weight of the compound)/(24.45)

Molar volume at temperature 22^{O}C

For Molar Volume at temperature t, other than 273^{O} K (0^{O}C)

V2 = V1/T1 * T2

Where

V2 = Molar volume at temperature 22^{O}C

= Molar volume at temperature 295.15^{O}K

V1 = Molar volume at temperature 0^{O}C

= Molar volume at temperature 273^{O}K

= 22.414 L/mole

V2 = (22.414*295.15)/273 L/mole

= 24.23 L/mole

Plant 3 - New Carbon Units Associated with the Primary Clarifiers (sources Sources OCU3_1, OCU3_2, OCU3_3, OCU3_4, OCU3_5, OCU3_6, and OCU3_7) Emission Calculations

Sample calculations for H_2S:

Outlet H_2S concentration = 0.10 ppm

Exhaust flow rate = 14.16 m^3/s

Contaminants	CAS No.	Max. exhaust gas concentration, ppm	Molecular Weight	Concentration, mg/m3	Emissions, g/s
H_2S	7783-06-4	0.10	34	0.14	0.00199

To convert concentrations in air (at 25 °C) from ppm to mg/m^3: mg/m^3 = (ppm) × (molecular weight of the compound)/(24.45)

Molar volume at temperature 22^{O}C

For Molar Volume at temperature t, other than 273^O K (0^{O}C)

V2 = V1/T1 * T2

Where

V2 = Molar volume at temperature 22^{O}C

= Molar volume at temperature 295.15^{O}K

V1 = Molar volume at temperature 0^{O}C

= Molar volume at temperature 273^{O}K

= 22.414 L/mole

V2 = (22.414*295.15)/273 L/mole

= 24.23 L/mole

Emission Calculations

Concentration Conversion	Value
ppm Concentration Value	0.25
Molecular Weight (H_2S)	34.1
Temperature (°C)	10
Atmospheric Pressure in mmHg (Use 760 If Unsure)	760
Outlet Concentration (µg/m^3)	**366.9**

Inlet OCF Upgrade (Sources BTF_GAC1, and BTF_GAC2)					
Stacks	Design Flow (CFM)	Design Flow (m³/s)	Outlet H2S (ppm)	Outlet H2S (µg/m³)	Emission Rate (g/s)
Stack 1	12000	5.663	0.25	366.9	2.08E-03
Stack 2	12000	5.663	0.25	366.9	2.08E-03

New Plant 1 OCF (Sources OCF1_1, and OCF1_2)					
Stacks	Design Flow (CFM)	Design Flow (m³/s)	Outlet H2S (ppm)	Outlet H2S (µg/m³)	Emission Rate (g/s)
Stack 1	18000	8.495	0.25	366.9	3.12E-03
Stack 2	18000	8.495	0.25	366.9	3.12E-03

New Plant 2 OCF (Sources OCF2_1, and OCF2_2)					
Stacks	Design Flow (CFM)	Design Flow (m³/s)	Outlet H2S (ppm)	Outlet H2S (µg/m³)	Emission Rate (g/s)
Stack 1	18000	8.495	0.25	366.9	3.12E-03
Stack 2	18000	8.495	0.25	366.9	3.12E-03

Portable GEB odour unit (Source GEB_POU) Emission Calculations

Sample calculations for H_2S:

Outlet H_2S concentration = 0.10 ppm

Exhaust flow rate = 2.36 m^3/s

Contaminants	CAS No.	Max. exhaust gas concentration, ppm	Molecular Weight	Concentration, mg/m3	Emissions, g/s
H_2S	7783-06-4	0.10	34	0.14	0.00033

To convert concentrations in air (at 25 °C) from ppm to mg/m³: mg/m³ = (ppm) × (molecular weight of the compound)/(24.45)

Molar volume at temperature 22°C

For Molar Volume at temperature t, other than 273° K (0°C)

V2 = V1/T1 * T2

Where
V2 = Molar volume at temperature 22°C
= Molar volume at temperature 295.15°K
V1 = Molar volume at temperature 0°C
= Molar volume at temperature 273°K
= 22.414 L/mole

V2 = (22.414*295.15)/273 L/mole
= 24.23 L/mole

Mercury emission calculations:

Mercury emission rate for TOX-1 & TOX-2:

	TOX-4 AVG **(g/s)**	**TOX-2** AVG **(g/s)**	**TOX-1** AVG **(g/s)**	MAX **(g/s)**
Mercury	3.01E-04	1.15E-04	5.14E-04	5.14E-04

Note: Mercury emission rates are from 2022 compliance source testing

Mercury emission rate (TOX-1 and TOX-2) = 5.14E-04 x 100/65 x 2 (assumed facility was running at 65% of production capacity)
= 1.58E-03 g/s

Standby generator (N19)

EMISSION CALCULATIONS:

New generator capacity =	1,000	KVA (provided by the client)
New generator capacity =	800	kW
=	1072.82	HP

Diesel engine

Contaminant	**Emissions** **(g/s)**	Emission factor (lb/HP-hr)	Emission factor rating	Source of data
PM	**0.30**	0.002	D	(AP-42)
NOx as NO_2	**4.19**	0.031	D	(AP-42)
SO2	**0.28**	0.002	D	(AP-42)
CO	**0.90**	0.007	D	(AP-42)

Source: US EPA AP-42 3.3-1, 10/96

Standby Generator (EGEN-1)

Power output (kw): 525

Diesel engine

Contaminant	**Emissions (g/s)**	**Emission factor (g/kw-hr)**	**Emission factor (lb/hp-hr)**	**Source of data**	**Emission factor rating**
NOx	2.75	18.848	0.031	(AP-42), Table 3.3-1	D

Sample calculations for NOx:

Emission factor for NOx from AP-42 table 3.3-1: 0.031 lb/hp-hr

NOx emission factor = 0.031 lb/hp-hr x 453.6g/1 lb x 1.34 hp/1 kw

= 18.848 g/kw-hr

Power output of the standby diesel generator = 525 kw

NOx emission rate = 525 kw x 18.848 g/kw-hr x 1hr/3600s

= 2.75 g/s

New Standby Generator (EGEN-2)

New generator capacity =	200	kW
=	268.20	HP

Diesel engine

Contaminant	Emission factor* (g/HP-hr)	**Emissions (g/s)**	Emission factor rating	Source of data
NOx as NO_2	3.93	**0.29**	D	US EPA Tier 3

*US EPA Tier 3 emission standards

Sample calculations for NOx:

Emission factor for NOx: 3.93 g/hp-hr

NOx emission rate = 268.20 hp x 3.93 g/hp-hr x 1hr/3600s

= 0.29 g/s

Emissions Calculations (Source B-1 to B-5):

Unit rating (MMBTU/hr) 5

Average gross heating value of natural gas: 1020 BTU/ft3

Contaminants	Emission Factor lb/MMBTU	Emission Rate g/s	Emission factor rating
CO	0.082	0.052	B
NOx	0.098	0.062	B

Emission factor for Nox from US EPA AP-42 table 1.4-1

NOx: 100 lb/10^6 ft^3

CO 84 lb/10^6 ft^3

Odour emission rate calculations

(a) baseline scenario

Odour emission rates for the sources are based on the odour report for the facility (dated January 08, 2019).

- Carbon units (source IDs: C1 and C2), odour emission rate = 1,133 OU/s; and
- Biotrickling filter vessels (source IDs: BIO-TF1, and BIO-TF2) = 5,667 OU/s

(b) Future Scenario (Project B)

Odour Control Facility Plant 1 - Stacks 1 and 2 (source IDs: OCF1_1, and OCF1_2)

Plant 1 – Primary Clarifier 1 - Surface Area

Odour emission rate = 1,560 OU/s (based on the odour testing performed at the facility in August 2018)

Control efficiency (with two stage treatment comprising biotrickling filter and granulated activated carbon) = 76% (assumed)

Odour emission rate (stack 1/stack 2) = 1,560 OU/s x (100-76)/100

= 374 OU/s

Appendix D

MECP Comments and Project Team's Responses

TO:	Chunmei Liu Regional Environmental Planner Environmental Assessments Branch Ontario Ministry of the Environment, Conservation and Parks
FROM:	Akhter Iqbal, P.Eng.; Alex Breido, P.Eng., WSP E&I Canada Limited
DATE:	December 1, 2023
PROJECT NO.:	OAQC2166A
SUBJECT:	Air Quality Assessment Report GE Booth Water Resource Recovery Facility (WRRF) Region of Peel Schedule C Municipal Class Environmental Assessment

On behalf of Region of Peel, please accept the following responses to your questions concerning the air quality assessment (AQA) report in support of Municipal Class Environmental Assessment for the GE Booth WRRF.

1. *Please clarify why the 10-minute SO_2 AAQC was not assessed in the AQA Report. For future assessments, the ministry recommends assessing air quality impacts against the 10-minute SO_2 AAQC.*

   Response: Noted, the 10-minute SO_2 AAQC criterion will be used to assess SO_2 in the future AQA reports in addition to the 1-hour AAQC.

2. *The ministry recommends conducting an assessment of Total Reduced Sulphur (TRS - dimethyl disulphide, dimethyl sulphide, hydrogen sulphide, and mercaptans) for the proposed undertaking. The final AQA Report should elaborate how TRS will comply with O. Reg. 409/05 Schedule 3 air standards.*

   Response: In the final revision of the AQA report the TRS compound will be added and assessed against the applicable MECP standards.

3. *Please note a correction is required on Table 3-1 "Air Quality Standards and Criteria" where it lists the 24-hour criteria for Hydrogen Sulphide (H_2S) as 14 µg/m^3 instead it should be 7 µg/m^3. Please revise Table 3-1 in the AQA Report accordingly.*

   Response: Noted, the final revision of the AQA report will be revised accordingly.

4. *Please clarify how the odour emission estimates were prorated. Please provide odour and H_2S sample calculations for each source type.*

   Response: Sample calculations for odour and H_2S will be provided in the final revision of the AQA report.

5. *Please clarify the methodology used in the dispersion modelling to evaluate the maximum H2S 10-minute point of impingement (POI) for the current and future scenarios. Table 7-6 reports the highest H_2S 10-minute concentration at 12.87 µg/m^3 (R5/discrete receptor) which is higher than the maximum H_2S POI (10.72 µg/m^3) reported in Table 7-1.*

The maximum POI is lower than the discrete receptor assessment, which should not be the case. The same is noted for the future undertaking on Table 7-2 where 3.25 µg/m^3 is reported as the maximum H_2S 10-minute POI which is lower than the H_2S 10-minute concentration reported on Table 7.6 (3.91 µg/m^3). Please clarify.

Response: The H_2S concentrations are lower in the Tables 7-1 and 7-2 than the concentrations in Table 7-6 because of the removal of meteorological anomalies on the full grid of receptors that was applied to the modelled POI concentration in accordance with the air dispersion modelling guideline for Ontario. For assessment of the individual impact at selected sensitive receptors this approach is not applicable, so these individual concentrations are higher than presented in tables 7-1 and 7-2.

6. *It should be noted that the H_2S 10-minute concentration (7.35 µg/m^3) on Table 7-3 does not match the H_2S 10-minute concentration on Table 7-2 (3.25 µg/m^3). Please revise Tables 7-2 and 7-3 accordingly.*

Response: This concentration will be revised in the final AQA report, the correct concentration is that in Table 7-2.

7. *The dispersion modelling results, and frequency of exceedance analysis (Table 7-5) predict odour concentrations higher than 1 OU occurring for 4.2% on an annual basis at existing and future sensitive receptors. This is greater than the 0.5% recommended in the ministry's Technical Bulletin (Methodology for Modelling Assessments of Contaminants With 10-Minute Average Standards and Guidelines for Odour under O. Reg. 419/05). It would be beneficial to develop a contingency plan for odour mitigation measures if proposed odour controls are not adequate.*

Response: GE Booth is required to have an Odour Management Plan as a regulatory condition of their Environmental Compliance Approval (ECA) Air and Noise. The odour control systems at the facility that are the subject of the AQA serve to reduce the odour effects, and are part of this broader odour management. It is also expected that the AQA presents a conservative odour scenario, and that actual odour emissions, and effects (intensity and frequency) will be lower than those predicted with the model.

8. *The meteorological data shows the predominant winds in the study area are mainly from east-northeast direction placing the proposed Lakeview development downwind of G.E. Booth WRRF. The nearest sensitive receptor is approximately 250 metres from the headworks, which is an odorous process from the facility. Completing a site-wide odour emission inventory would be beneficial using odour emission rates from this facility, instead of estimates. This will provide more accurate odour concentrations at the sensitive receptors. In addition, a review of the best available odour control technology is recommended to assist the proponent with odour mitigation measures to avoid adverse impacts.*

Response: Noted. The odour management strategies proposed at the facility will greatly reduce odour at the nearest sensitive receptors (the proposed Lakeview development).
The side-wide odour inventory will be decided at the later stage of the project when the proposed odour mitigation measures are designed and implemented at the facility.

9. *Table 7-5 notes that the odour results are the max. 44th highest modelled value as per the technical bulletin, however, please clarify if the meteorological anomalies were removed from the entire grid.*

Response: Meteorological anomalies were not removed for the odour modelling.

10. *The AQA report did not discuss how the proposed undertaking will comply with Guideline A-9 – NOx Emissions from Boilers and Heaters. The Final AQA Report should include a brief discussion on how the proposed future preferred alternative scenario (Project B) will comply with Guideline A-9.*

Response: The biogas burners are combusting by-products of wastewater treatment and may not be subject to Guideline A-9. The applicability of this guideline, and compliance if necessary, will be addressed at the equipment procurement stage with the vendor. The vendor will be required to provide the compliance statement (signed by a Professional Engineer) if Guideline A-9 applies.

11. *The following guidance documents should be considered when developing a preventive and odour best practices plan as noted in Sections 8 and 9 of the AQA report.*

    Draft Guideline to Address Odour Mixtures in Ontario (MECP, May 2021)
    https://ero.ontario.ca/notice/019-2768

    Draft Technical Bulletin Methodology for Completing an Odour Assessment for Odour Mixtures (MECP, March 2021)

    Section 5.5 - Best management practices for industrial sources of odour | ontario.ca

Response: The Odour Management Plan required by the ECA will follow the guidance of the Best Management Practices for industrial Sources of Odour.

With respect to the draft guidance documents, the MECP is not proceeding with the Draft Guideline to Address Odour Mixtures in Ontario at this time, as reflected in the updated Environmental Registry Policy Notice https://ero.ontario.ca/notice/019-2768#original-proposal, and the Draft Technical Bulletin Methodology for Completing an Odour Assessment for Odour Mixtures is still in development. The methodology used for the AQA, including consideration of the potential odour effects, reflects current standard practice in Ontario.

Sincerely,
WSP E&I Canada Limited

Prepared by:	Reviewed by:
Akhter Iqbal, P.Eng.	Alex Breido, Ph.D., P.Eng.
Senior Engineer, Air Quality	Senior Principal Engineer, Air Quality

Appendix D:

Acoustic Assessment Report

Acoustic Assessment Report

G.E. Booth Water Resource Recovery Facility
Mississauga, ON, L5E 3B8
Project # CA02694

Prepared for:

Regional Municipality of Peel

GM BluePlan Engineering Limited

December 2023

Wood Group Asset Integrity Solutions, Inc.
Vibration, Dynamics and Noise (VDN)
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December 18, 2023

Wood Reference No. CA02694

Cindy Kambeitz, Project Manager
Water & Wastewater Operations & Optimization
Region of Peel

Laurie Boyce, Strategic Planning and Project Advisor
GM BluePlan Engineering Limited
3300 Highway 7, Suite 402
Vaughan, Ontario
L4K 4M3

Dear Ms. Kambeitz & Ms. Boyce,

Re: Acoustic Assessment Report in Support of a Schedule "C" Class Environmental Assessment of G.E. Booth Water Resource Recovery Facility (WRRF) for Regional Municipality of Peel

Wood's Vibration Dynamics and Noise (Wood VDN) team is pleased to provide the attached Acoustic Assessment Report to be used in support of a Schedule "C" Class Environmental Assessment of G.E. Booth Water Resource Recovery Facility (WRRF). This report specifically addresses the noise impacts of the proposed capacity expansion of the G.E. Booth WRRF which requires the completion of Schedule C Municipal Class Environmental Assessments in accordance with the Municipal Engineers Association (MEA) Municipal Class EA (October 2000, as amended in 2007, 2011 and 2015), to meet Ontario EA Act requirements.

Should you have any questions regarding the study or its findings, please do not hesitate to contact us.

Sincerely,

Wood Group Asset Integrity Solutions, Inc.

Vibration, Dynamics and Noise (VDN)

Prepared by:

Anmol Bhardwaj, P.Eng.
Acoustics and Vibration Analyst

Reviewed by:

Henrik Olsen, M.Sc., INCE Bd. Cert.
Principal Consultant – Noise & Vibration

Acoustic Assessment Report

G.E. Booth Water Resource Recovery Facility
Mississauga, ON, L5E 3B8
Project # CA02694

Prepared for:

Regional Municipality of Peel
GM BluePlan Engineering Limited

Prepared by:

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December 18, 2023

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Executive Summary

The Regional Municipality of Peel (Region of Peel) lake-based wastewater system consists of two Water Resource Recovery Facilities (WRRFs): the Clarkson WRRF and the G.E. Booth WRRF, and two major interconnected trunk sewer systems (East and West) which convey flows through sewage pumping stations, force mains, trunk sewers, and local gravity sanitary sewers, to the treatment plants for final treatment and discharge to Lake Ontario. The WRRFs were formerly known as the Clarkson Wastewater Treatment Plant and the G.E. Booth Wastewater Treatment Plant. With the envisioned population and employment growth to year 2041 and vision for growth beyond 2041, the WRRFs together will not have the capacity to meet the needs of Peel's citizens and to continue to protect the environment, even with the East-to-West Trunk Sewer Diversion in place. Additional treatment capacity will therefore be required at the G.E. Booth and Clarkson WRRFs.

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood) who leveraged Wood's Vibration Dynamics and Noise (Wood VDN) team was retained by GM BluePlan Engineering Limited (GM BluePlan) to prepare an Acoustic Assessment Report (AAR) in support of a Schedule "C" Class Environmental Assessment of G.E Booth Water Resource Recovery Facility (WRRF) located at 1300 Lakeshore Road E, Mississauga, Ontario (the "Facility") for the Region of Peel.

The G.E. Booth WRRF processes wastewater from homes and businesses in the City of Toronto, Region of York, Bolton, Caledon East, Brampton and the eastern part of Mississauga. The wastewater processing design capacity of the Facility is 518 milliliters per day (MLD). The proposed expansion is projected to increase this capacity to 550 MLD by providing additional wastewater treatment capacity within the site boundaries.

This Acoustic Assessment Report (AAR) assesses the compliance of the existing condition of the Facility along with changes being planned and executed as part of the ongoing odour control design projects and also evaluates the cumulative impact from the source additions envisioned from the proposed capacity expansion against the applicable MECP NPC300 limits. Ten (10) representative Points of Reception (PORs) were identified and considered for this assessment which includes proposed development by the name of Lakeview Waterfront on the vacant unused lands west of the Facility. The Facility is surrounded by areas zoned for industrial use to the north, east and the west. Based on zoning and the Facility's proximity to other industrial facilities, the area is best described as a Class 1 area (urban) in accordance with the area classifications defined within NPC-300.

The receptor noise impacts associated with daily operations with the inclusion of additional sources part of the proposed capacity expansion were assesed through predictive acoustic modelling. The MECP exclusionary sound level limits were used as the criteria to assess the compliance of the Facility. The sound levels at the receptors reported represent the worst-case impact assuming all significant sound sources are operating simultaneously during daytime/evening and night time hours.

Under the predicable worst-case noise emission scenario's, the G.E. Booth WRRF is expected to be compliant with the MECP NPC-300 limits both in its existing condition and also after the proposed capacity expansion given that the noise specifications measures specified are implemented by the Region of Peel throughout the development phase of the expansion.

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1.0 Introduction

1.1 Project Description

The Regional Municipality of Peel (Region of Peel) lake-based wastewater system consists of two Water Resource Recovery Facilities (WRRFs): the Clarkson WRRF and the G.E. Booth WRRF, and two major interconnected trunk sewer systems (East and West) which convey flows through sewage pumping stations, force mains, trunk sewers, and local gravity sanitary sewers, to the treatment plants for final treatment and discharge to Lake Ontario. The WRRFs were formerly known as the Clarkson Wastewater Treatment Plant and the G.E. Booth Wastewater Treatment Plant.

Both the Clarkson and G.E. Booth WRRFs are conventional activated sludge facilities, with rated capacities of 350 million litres per day (MLD) and 518 MLD, respectively. The G.E. Booth WRRF is currently approaching its capacity limits, as the 5-year average day flow (ADF) to the G.E. Booth WRRF is approximately 450 MLD. Currently, the ADF to the Clarkson WRRF is approximately 220 MLD.

The East and West trunk sewer systems are approximately divided by the watershed boundary between the Etobicoke Creek and the Credit River. The two systems are currently connected via the West-to-East Sanitary Trunk Sewer, which can be used to divert some wastewater flows by gravity from the west trunk system to the east trunk system at Highway 407. In addition, an East-to-West Sanitary Trunk Sewer Diversion is currently being constructed, to help alleviate capacity challenges at the G.E. Booth WRRF, and allow the Region to better optimize wastewater flows and loading in their systems. The diversion is a deep gravity tunneled trunk sewer of 2400 mm diameter that extends 11 km between Spring Creek and the Credit River, aligned primarily along Derry Road. Construction of the gravity trunk sewer diversion is expected to be completed by 2026.

The Region's Growth Management process and 2020 Water and Wastewater Master Plan identified that there will be significant population and employment growth across the Region of Peel. With this approved growth to year 2041 and vision for growth beyond 2041, the WRRFs together will not have the capacity to meet the needs of Peel's citizens and to continue to protect the environment, even with the East-to-West Trunk Sewer Diversion in place. Additional treatment capacity will therefore be required at the G.E. Booth and Clarkson WRRFs.

Biosolids are the organic materials resulting from the physical, chemical and biological treatment of sewage sludge generated at Water Resource Recovery Facility. Currently, digested sludge generated at Clarkson WRRF is dewatered and hauled by truck approximately 18 km to the G.E. Booth WRRF for incineration. The residual ash slurry from the incineration process is transferred to two on-site settling lagoons which are dredged regularly and stored on-site in the ash ponds and berms. The existing biosolids management program has challenges related to its capacity, long-term sustainability, cost effectiveness, and reliability.

Increases in wastewater treatment capacity and management of biosolids require the completion of Schedule C Municipal Class Environmental Assessments in accordance with the Municipal Engineers Association (MEA) Municipal Class EA (October 2000, as amended in 2007, 2011 and 2015), to meet Ontario EA Act requirements.

1.2 Purpose and Requirements of the Acoustic Assessment Report

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood) who leveraged Wood's Vibration Dynamics and Noise (Wood VDN) team was retained by GM BluePlan Engineering Limited (GM BluePlan) to prepare an Acoustic Assessment Report (AAR) in support of a Schedule "C" Class Environmental Assessment of G.E. Booth Water Resource Recovery Facility (WRRF) located at 1300 Lakeshore Road E, Mississauga, Ontario (the "Facility") for the Region of Peel.

This AAR has been completed and documented in accordance with the guidance provided in the following Ministry of the Environment, Conservation and Parks (MECP) documents:

1. NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October 1995 [1]; and,
2. NPC-300 "'Noise Assessment Criteria for Stationary Sources and for Land Use Planning", August 2013 [2].

The purpose of this AAR was to establish baseline conditions i.e. assess existing operations of the facility at nearest receptor locations against the applicable NPC-300 limits and evaluate the compliance of the Facility with the inclusion of the source additions identified as part of the proposed capacity expansion. The draft of this AAR was provided to the MECP as part of the overall Environmental Study Report (ESR) for review in September 2023. No comments on the Draft AAR were received. The MECP indicated their satisfaction with the ESR report, and that with the implementation of appropriate mitigation measures, any adverse environmental effects will be avoided, or where avoidance is not possible, the impact would be minimized.

2.0 Facility Background

The G.E. Booth WRRF processes wastewater from homes and businesses in Bolton, Caledon East, Brampton and the eastern part of Mississauga. The Facility also receives some wastewater from the City of Toronto and Region of York. The wastewater processing design capacity of the Facility is 518 million litres per day (MLD). The proposed expansion is projected to increase this capacity to 550 MLD by providing additional wastewater treatment capacity within the site boundaries.

The Facility operates four fluidized bed sewage sludge incinerators at this location. Each incinerator is capable of reducing approximately 70 dry tonnes of sludge per day. The main treatment process equipment at the G.E. Booth WWTP include headworks, primary clarifiers, aeration tanks, secondary clarifiers, four (4) fluidized bed reactors for the combustion of dewatered biosolids and odour control units to treat odourous air from the underground wastewater collection system.

Two North American Industry Classification System (NAICS) codes are applicable to the Facility: 221320 - described as "Sewage Treatment Facilities" and 562210 - described as "Waste Treatment and Disposal", which covers the incineration operations.

A complete description of the Facility and its operations, including process flow diagrams, etc., can be found as part of the ESDM Report. The Facility operates continuously 24 hours per day, 7 days per week.

The following figure and appendices contain information on the Facility and the points of reception as well as the surrounding land uses:

- Figure 1: Aerial Map of the Site with Points of Receptions;
- Appendix A: Zoning Map of the Site and Surrounding Areas; and
- Appendix B: Facility Conceptual Site Plan.

3.0 Noise Source Summary

3.1 Baseline Conditions

The Facility is under the development and execution stage of odour control design projects where changes are currently being made to the existing layout of the Facility. The baseline conditions consider the envisioned state of the Facility after the implementation of the planned changes without the noise source additions predicted from the proposed expansion. Noise sources that have been identified as significant i.e. as emitting noise at a level where their cumulative impacts could be of concern, at the Facility before the proposed expansion have been categorized as per their locations on the existing structures or landmarks as shown in the site plan in Appendix B. The existing noise sources are summarized below:

- **Storage Facility:** The Storage Facility has a total of six (6) sources identified as significant in terms of noise emission. The building's roof layout consists of one (1) makeup air unit, two (2) rooftop units and one (1) energy recovery unit. There are also several exhaust openings on the south façade of the building, however only one (1) open pipe exhaust was identified as significant. The storage facility is equipped with an emergency standby diesel generator mounted on the ground directly in front of the west façade of the building. Sound pressure measurements of all sources except the makeup air unit and the energy recovery unit were measured by Wood VDN on March 22, 2023. Sound power level (PWL) calculations along with measurement details of these sources are provided in Appendix D.
  Sound power level of the make-up air unit was predicted using the equation documented in Chapter 11.5 of Engineering Noise Control, Theory and Practice by Bies and Hansen [13]. This equation yields a conservative sound power level of the unit based on the rated power of the supply air fan and assumes that the breakout noise radiating from the connected insulated ductwork would be negligible. The spectral profile of the sound power level was taken from the existing make-up air unit located on the roof of the existing Conditioning Building. The sound power level of the energy recovery unit was extracted from equipment shop drawings provided by the Region of Peel. Excerpts from the shop drawings highlighting the sound power level of equipment are provided in Appendix C.
- **Headworks:** There are a total of ten (10) sources identified as significant that are associated with the Headworks building. The roof layout consists of five (5) exhaust fans and two (2) carbon unit stacks. Headworks building is also equipped with a standby generator at the northeast corner of the building. Headworks building is also expected to receive ferrous chloride deliveries via tanker trucks that use a blower to extract the solution. Ferrous chloride deliveries are only expected to occur during daytime/evening hours. This assessment tests compliance based on the worst-case operational hour that considers the usage of equipment in a 60-minute window in a worst case scenario. The extraction is expected to take up the complete hour and therefore the assessment models the tanker truck with two points of noise emission points, truck blower and an idling truck

engine in the worst-case operational hour during daytime/evening. A garbage truck is also expected to come and go from this building during the worst-case hour. The movement of the two types of trucks associated with the Headworks building has been modelled around the Facility property as they enter and exit the Facility. Noise source measurements were conducted by Wood on July 21 and 22, 2016. Additional noise measurements were taken on April 23 and May 8, 2019 to capture the activity of chemical solution unloading from truck beds into storage tanks. Sound power calculations along with measurement details for previous site visits are provided separately in Appendix D.

- **Inlet OCF:** This structure is located directly west of the Headworks building with four (4) significant noise sources consisting of two (2) wall exhaust louvers and two (2) exhaust stacks. The sound power level of the exhaust louvers was calculated from sound pressure level measurements conducted onsite. The exhaust stacks were additions envisioned from the odour control design projects based on odour management strategy completed by Region of Peel that recommended upgrades to the Facility in three phases. CIMA+ was retained by the Region of Peel to provide the conceptual design for Phase 2 under CIMA+'s ongoing Contract 3 – New Plant 1 project. The upgrade to the Inlet odour control facility (OCF) consisted of integration of granulated activated carbon (GAC) scrubbers downstream of existing biotrickling filters (BTF) and new exhaust stacks. There was no manufacturer's sound data available for the OCF stacks. It is expected that the stack outlet of the OCF stacks will be insignificant as the biotrickling filter, consisting of multiple layers of restrictive media, is located after the OCF fans and before the stack outlet. However, for completeness, the OCF exhaust stacks were modelled with a maximum outlet sound power level of 85 dBA, which was also a specification for CIMA+ and the vendor to follow. The maximum outlet sound power level of 85 dBA is based on an estimate of 75 dBA provided by the vendor plus a 10 dB allowance. The sound power level spectrum for the OCF stacks were estimated using empirical equations.
- **Ferrous Chloride Facility:** The only source identified as significant is an open door on the east side of the building. The door is expected to be open during the worst-case operational hour for ventilation purposes and represents the noise propagating from the equipment operating inside the building through the door opening. Sound power level was calculated based on source measurements conducted onsite.
- **Plant 1 OCF:** This building is under development as part of Phase 2 under CIMA+'s ongoing Contract 3 – New Plant 1 project. There will be six (6) significant noise sources associated with the odour control facility consisting of three (3) wall mounted exhaust fans, one (1) make-up air unit located on the ground north of the building and two exhaust stacks similar to the Inlet OCF. Sound power level data for the exhaust fans and the make-up air unit was extracted from equipment shop drawings. Details are provided in Appendix C. The exhaust stacks were modelled similar to the Inlet OCF stacks with maximum outlet sound power level of 85 dBA based on an estimate of 75 dBA provided by the vendor plus a 10 dB allowance with spectral data estimated using empirical equations.
- **Plant 1 Primary Building:** Plant 1 Primary Building has a total of five (5) sources identified as significant. The building's roof layout is expected to consist of two (2) exhaust fans and two (2) makeup air units. There will also be an elbow intake located on the north façade of the building. This building is still in development at the time of writing this report as part of Phase 2 under CIMA+'s ongoing Contract 3 – New Plant 1 project. An AAR dated April 2022 covering 90% design of the project assessed all noise source additions envisioned from the upgrades. Maximum allowable sound power levels of a select few noise additions were specified to ensure compliance with the NPC-300 limits. The make-up air units were imposed a maximum allowable outdoor sound power level of 85 dBA. Sound power level data for the exhaust fans and the intake was extracted

from equipment shop drawings. The spectral data of the make-up air units was extracted from equipment shop drawings and normalized to fit the overall level of 85 dBA. Details are provided in Appendix C. Since the units are still under procurement, the maximum allowable sound power levels are commitments from CIMA+ and the Region of Peel to adhere to for environmental compliance.

- **Plant 1 Blower Building:** The Plant 1 Blower Building is also under development as part of Phase 2 under CIMA+'s ongoing Contract 3 – New Plant 1 project. The building is expected to have two (2) significant noise sources consisting of two (2) intake louvers for two different make-up air units expected to be installed at the building. Sound power data of the units was extracted from equipment shop drawings provided by the Region of Peel. Excerpts from the shop drawings highlighting the sound power level of equipment are provided in Appendix C.
- **Plant 2 Primary Building:** Plant 2 Primary Building has a total of four (4) sources identified as significant. The building's roof layout is expected to consist of two (2) exhaust fans and two (2) makeup air units. This building is still in development at the time of writing this report as part of Phase 2 under CIMA+'s ongoing Contract 3 – New Plant 1 project. An AAR dated April 2022 covering 90% design of the project assessed all noise source additions envisioned from the upgrades. Maximum allowable sound power levels of a select few noise additions were specified to ensure compliance with the NPC-300 limits. The exhaust fans and the make-up air units were imposed a maximum allowable outdoor sound power level of 85 dBA. The spectral data was extracted from equipment shop drawings and normalized to fit the overall level of 85 dBA. Details are provided in Appendix C. Since the units are still under procurement, the maximum allowable sound power levels are commitments from CIMA+ and the Region of Peel to adhere to for environmental compliance.
- **Plant 2 OCF:** This building is also under development as part of Phase 2 under CIMA+'s ongoing Contract 3 – New Plant 1 project located and envisioned to be directly south of the Plant 2 Primary Building. There will be five (6) significant noise sources associated with the odour control facility consisting of two (2) wall mounted exhaust fans, one (1) make-up air unit located on the ground south of the building and two exhaust stacks similar to the Inlet OCF and Plant 1 OCF. Sound power level data for the exhaust fans and the make-up air unit was extracted from equipment shop drawings. Details are provided in Appendix C. The exhaust stacks were modelled similar to the Inlet OCF stacks with maximum outlet sound power level of 85 dBA based on an estimate of 75 dBA provided by the vendor plus a 10 dB allowance with spectral data estimated using empirical equations. The make-up air unit was identified to be a potential source of exceedance in the AAR dated April 2022. A design requirement was imposed on the make-up air unit in the form of an enclosure to ensure compliance with the NPC-300 limits. The enclosure was specified to be L-shaped covering the east, south, west and the top of unit with a minimum height of four (4) metres above ground. Since the building is still under development, the enclosure requirement is a commitment from CIMA+ and the Region of Peel to adhere to for environmental compliance and is considered to be representative of baseline conditions to assess the impact of the proposed expansion addressed in this report.
- **Plant 3 Blower Building:** The Plant 3 Blower Building has a total of six (6) significant noise sources consisting of five (5) wall air intakes and one open door on the south side of the building. The door is expected to be open during the worst-case operational hour for ventilation purposes and represents the noise propagating from the equipment operating inside the building through the door opening. Sound power level for all sources in this building was calculated based on source measurements conducted onsite.
- **Plant 3 Aeration Tanks:** There is an odour control building for Plant 3 Aeration Tanks equipped with two (2) carbon unit stacks. These stacks were not directly measured onsite, however they are

predicted to be similar to the carbon unit stacks installed at the Headworks Building and are modelled using the same sound power level.

- **Effluent Pumping Station:** The Effluent Pumping Station (EWPS) is a newly installed building with six (6) significant noise sources. The roof layout of the building consists of one (1) air handling unit, two (2) exhaust fans and one (1) vanaxial fan. There is also one (1) air handling unit and one (1) condensing unit installed on the ground north of the newly installed building. Sound power level of the roof exhaust fans was calculated from onsite measurements. Sound data for the other sources at the EWPS was extracted from equipment shop drawings provided by the Region of Peel. The sound power level calculations for the measured sources were conducted in accordance with EEMUA Publication 140, "Noise Procedure Specification" [12] and are provided in Appendix D. Excerpts from equipment shop drawings highlighting the extracted sound data for the non-operational sources are provided in Appendix C.
- **Solids Receiving Building:** The only stationary source identified as significant is an open bay door on the east side of the building. The door is expected to be open during the worst-case operational hour for deliveries and represents the noise propagating from the equipment operating inside the building through the door opening. There are two types of trucks related operations that occur at this building. The building receives polymer deliveries via tanker trucks that use a blower to extract the solution. Polymer deliveries are only expected to occur during daytime/evening hours. This assessment tests compliance based on the worst-case operational hour that considers the usage of equipment in a 60-minute window in a worst case scenario. The extraction is expected to take up to 30 minutes and therefore the assessment models the tanker truck with two points of noise emission points, truck blower and an idling truck engine in the worst-case operational hour during daytime/evening for a period of 30 minutes of operation for each. A sludge receiving truck is also expected to come and go from this building at the north side of the building during the worst-case hour. The movement of the two types of trucks has been modelled around the Facility property as they enter and exit the Facility. The sound power level was calculated based on source measurements conducted onsite.
- **Disinfection Facility:** There are only two types of significant noise sources associated with this building. The Disinfection Facility receives sodium hypochlorite via tanker trucks that also use a blower to extract the solution. Sodium hypochlorite deliveries are only expected to occur during daytime/evening hours. This assessment tests compliance based on the worst-case operational hour that considers the usage of equipment in a 60-minute window in a worst case scenario. The extraction is expected to take up the complete hour and therefore the assessment models the tanker truck with two points of noise emission points, truck blower and an idling truck engine in the worst-case operational hour during daytime/evening. The movement of the tanker truck has been modelled around the Facility property as they enter and exit the Facility. This building is also modelled with an additional idling transport truck as a significant noise source to account for occasions where two truck deliveries might occur simultaneously. The sound power level was calculated based on source measurements conducted onsite.
- **Thermal Conditioning Building:** There are a total of eight (8) sources identified as significant at this building, consisting of four (4) exhaust fans and two (2) make-up air units on the roof. There are two (2) open bay doors on the north and south side of the building. These doors are expected to be open during the worst-case operational hour for ventilation and represent the noise propagating from the equipment operating inside the building through the door opening. This building is also equipped with a standby generator at the north-west corner of the building.
- **Thermal Oxidation Building:** There are thirty-two (33) significant noise sources located at this building. The roof layout consists of seventeen (17) roof exhaust fans and five (5) boiler exhausts.

There are also four (4) wall intake louvers, four (4) wall inlets and three (3) open bay doors, two on the east side of the building and one on the west side.

Along with noise sources associated with each structure/landmark specified above, there is a portable germinable endospore biodosimetry (GEB) portable odour unit, located east of the Thermal Conditioning Building. The noise emissions from the unit is represented in the noise model by the GEB Solids Exportation Portable Odour Unit (GEB_POU) point source. It has been assumed that the noise emitting from the stacks is the most dominant with insignificant casing noise from the unit on the ground, and as such the source height was defined at the stack height. The sound power level spectrum for of the GEB_POU was estimated using empirical equations to develop the spectrum curve in third octave bands from 63 Hz to 8000 Hz. The 31.5 Hz was assumed to have a sound power level of 3 dB lower than its neighboring 63 Hz third octave band. The overall sound power level was normalized to the overall specification provided by CIMA+. The specification is the sound pressure level being 67 dBA at 10ft from the unit. As sound pressure levels have not been provided by a manufacturer, the specifications are commitments from CIMA+ and the Region of Peel for environmental compliance. The specific sources of noise emissions from this unit should be confirmed through an in-person inspection once the equipment is operational.

A lab fume hood is located north of the Plant 2 Blower Building with two noise emission points, an exhaust fan and an exhaust stack on the ground. Measurements of both sources were conducted by Wood on March 22, 2022 which were used to calculate the sound power level from the stack and the fan.

An exhaust fan is also identified to be significant at the west side of the Facility south of existing Plant 1 Aeration Tanks. The sound power level of the exhaust fan was extracted from equipment shop drawings. Details are provided in Appendix C.

For the purposes of this acoustic assessment, stationary noise sources were assumed to operate 24 hours per day, unless specified otherwise. Currently, there are three standby diesel generators located at the Facility. The operation of the three generators was assessed separately and only during daytime for an hour of non-emergency testing as per the NPC-300 guideline. There are no impulsive sources of sound expected at Facility.

The MECP NPC-104 [5] noise guideline prescribes adjustments for sources with special qualities of sound. These are punitive adjustments, which apply to noise sources with subjectively annoying characteristics, including tonal sounds, quasi-impulsive sounds, and beating sounds (sounds with cyclically varying amplitudes). A tonality assessment was carried out in accordance with Annex K of ISO-1996-2; 2017 [6] and select sources currently at the Facility were identified to exhibit tonal and cyclic characteristics. As such, a 5 dB penalty was applied to these sources and are identified in Table 1.

Details of the existing noise sources can be found in the following table, figure and appendices:

- Table 1: Baseline Conditions - Noise Source Summary
- Figure 2-6: Significant Noise Source Locations
- Appendix E: List of Insignificant Noise Sources.

3.2 Proposed Capacity Expansion

The proposed capacity expansion is expected to add a total of seven (7) new structures at the Facility:

- Plant 1 Primary Building Extension;
- Plant 1 Blower Building Extension;
- Three (3) New Plant 3 Clarifier Buildings;
- New Ash Dewatering Facility;
- New UV Disinfection Facility;
- New Administration Building;
- New Dewatering Building;
- Four (4) New Anaerobic Digesters; and
- Two (2) New Biogas Spheres.

The noise additions envisioned from the new structures is as follows:

Plant 1 Primary Building Extension: The outdoor noise sources from this building extension are expected to be two (2) new exhaust fans and two (2) new make-up air units on the roof.

Plant 1 Blower Building Extension: The outdoor noise sources from this building extension are expected to be three (3) new exhaust fans and four (4) new make-up air units on the roof.

Three (3) New Plant 3 Clarifier Buildings: The outdoor noise sources expected from the three new buildings are seven (7) exhaust fans and seven (7) make-up air units.

New Ash Dewatering Facility: This building is assumed to be equipped with three (3) outdoor noise sources on the roof, consisting of two (2) exhaust fans and one (1) make-up air unit.

New UV Disinfection Facility: This building is assumed to be equipped with four (4) outdoor noise sources on the roof, consisting of two (2) exhaust fans and two (2) make-up air units.

New Administration Building: The outdoor noise sources expected from this building consist of four (4) make-up air units.

New Dewatering Building: The outdoor noise sources expected from this building consist of two (2) odour control fans located east of the building. A stack 16.5 metres above grade will also be installed at this building, discharging the treated air from the odour control vessels. There are six (6) trucks expected to be coming and going from this building during the day. The worst-case operational hour considers the movement of three (3) trucks leading to and from this building.

Four (4) New Anaerobic Digesters: The digesters are expected to have three (3) sludge mixer motors on each digester. The control building connecting the new four digesters is predicted to have two (2) exhaust fans and two (2) make-up air units on the roof.

Two (2) New Biogas Sphere: The biogas sphere/domes are predicted to have five (5) outdoor noise sources each. The spheres are expected to be equipped with three (3) wall exhausts and two (2) blowers on the ground.

Truck traffic is expected to be reduced once sludge treatment is implemented at the Clarkson WRRF and the amount of trucks transporting sludge to G.E. Boooth WRRF for incineration are reduced. However, for the purposes of a conservative assessment truck traffic was assumed to remain the same at the Facility with no trucks expected during nighttime (11:00pm to 7:00am) hours.

The expansion is expected to add four new 3 MW units in a centralized energy center. The existing three standby generators will be retained. The sound power level of the new 3 MW units was estimated using the procedure documented in Chapter 11.12 of Engineering Noise Control, Theory and Practice by Bies and Hansen [7]. The sound power level calculation is provided in Appendix C. The procedure considered the unmuffled engine exhaust noise as well as the engine casing noise.

Details of noise sources can be found in the following table, figure and appendices:

- Table 2: Proposed Capacity Expansion - Noise Source Summary
- Figure 2-6: Significant Noise Source Locations
- Appendix B: Site Plan

4.0 Existing Mitigation Measures

Existing source-based noise mitigation measures already installed on noise sources are not identified, listed or described within this AAR as the measured sound levels include the effects of any mitigation measures.

Wood has completed an AAR dated April 2022 under a separate cover as a part of an Environmental Compliance Approval (ECA) amendment application covering the 90% design of Phase 2 under CIMA+'s ongoing Contract 3 – New Plant 1 project which assessed all noise source additions and layout changes envisioned from upgrades at the Facility. A Noise Abatement Action Plan (NAAP) was proposed in that AAR to ensure compliance with the future receptors expected from the multi-phase development under the name of Lakeview Waterfront that has been proposed and approved upon the unused lands[1] located west of the Facility.

The proposed NAAP is summarized below. The assessment for the proposed expansion assumes that the mitigation measures listed below will be implemented at the Facility and therefore treated as representative of the baseline conditions. Sound power levels provided in Table 1 for existing Facility conditions are reflective of the listed mitigation measures.

4.1 Proposed Noise Abatement Action Plan

The noise control measures being proposed for the ECA amendment application to bring the Facility in its current condition into compliance with the MECP NPC-300 exclusionary limits are listed below.

1. Replace TOX 3 Exhaust Fan 1 (TOX3_EF1) with a unit that has a maximum total outlet sound power level of **84 dBA.**

2. Replace TOX 3 Exhaust Fans 3 and 5 (TOX3_EF3, TOX3_EF5) with units that each have a maximum total outlet sound power level of **78 dBA.**

[1] Current approved zoning map presented in Appendix B – City of Mississauga By-Law No. 0225-2007. Maps are publicly accessible from the City of Mississauga official website at: http://www.mississauga.ca/portal/residents/zoningbylaw

3. Replace TOX 3 Exhaust Fan 4 (TOX3_EF4) with a unit that has a maximum total outlet sound power level of **80 dBA.**

4. Replace TOX 4 Exhaust Fans 1-3 (TOX4_EF1, TOX4_EF2, TOX4_EF3) with units that each have a maximum total outlet sound power level of **87 dBA.**

   The replacement exhaust fans specified in NAAP items 1-4 should not exhibit tonal characteristics according to NPC-104 and ISO 1996-2:2007(E).

5. Replace the existing louvres used for the HVAC Intake Louvre 1 and 2 (TOX3) (TOX3_L1, TOX3_L2) and the TOX HVAC & Fluidized Air Blower Exhaust (TOX_BE) with acoustical louvres with the following minimum insertion losses:

Octave Band Centre Frequency (Hz)	**31**	**63**	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**
Insertion Loss (dB)	0	11	11	14	18	20	21	21	20

The prescribed equipment replacements should not exhibit audible tonal qualities, cyclic variations or quasi-steady impulsive sounds according to NPC-104 in order for the Facility to operate in compliance with the above specified maximum noise levels. The proposed equipment should also not be tonal according to the mathematical qualification found in ISO 1996-2:2007(E).

5.0 Point of Reception Summary

Noise sensitive receptors of interest as defined in the NPC-300 guideline include the following noise sensitive land uses:

- Permanent, seasonal, or rental residences;
- Hotels, motels and campgrounds;
- Schools, universities, libraries and daycare centres;
- Hospitals and clinics, nursing / retirement homes; and,
- Churches and places of worship.

Ten (10) representative Points of Reception (PORs 01 through 10) are considered for this assessment. POR01 to POR04 are existing points of reception. POR01 and POR04 are existing two-storey dwellings, and POR02 and POR03 are existing apartment buildings.

Wood acknowledges that a multi-phase development under the name of Lakeview Waterfront has been proposed upon the unused lands[2] located West of the Facility. At the time of writing this report,

[2] Current approved zoning map presented in Appendix B – City of Mississauga By-Law No. 0225-2007. Maps are publicly accessible from the City of Mississauga official website at: http://www.mississauga.ca/portal/residents/zoningbylaw

subdivision and rezoning applications[3] have been submitted and approved by the City of Mississauga (the City) to change the zoning designation from Utility (U-1)[4] to a variety of uses (e.g. residential, institutional, etc.). The official notice of the passing of a zoning by-law is provided in Appendix A.

PORs 05 and 07 are representative of the first row of buildings that are designated as Residential Medium Density under the latest Draft Plan of Subdivision dated September 27, 2021 (provided in Appendix H and herein referred to as the "Subdivision Plan") [7]. The latest Subdivision Plan does not have a corresponding zoning by-law amendment nor a concept plan illustrating building heights that is published online[5]. Therefore, building layouts and heights were obtained from Appendix 8 and 9, respectively, of the Corporate Report[6] dated October 15, 2021 with a meeting date of November 8, 2021, from the Commissioner of Planning & Building [8]. As per the Corporate Report, the buildings representative of PORs 05 and 07 are to be 4 and 8 storeys in height, respectively [9]. POR 06 is also located on the first row of Residential Medium Density blocks but is dedicated to a public elementary school and is to be three storeys in height.

PORs 08-10 are representative of the first rows of buildings designated as Mixed Use that are expected to have residential buildings. As per the latest available Draft Zoning By-law Amendment, posted in February of 2020, PORs 08 and 09 are in lots with a proposed zoning designation of C4-XX2 and POR 10 is in a lot with a proposed zoning designation of C4-XX1, both labelled Mainstreet Commercial – Exception. Both C4-XX1 and C4-XX2 permit residential use [10].

While there are two mixed use areas (Blocks 19 and 20 on the Subdivision Plan) that are adjacent to PORs 08 and 09 and are closer to the Facility, the blocks are designated as Mixed Use Cultural Hub on the Subdivision Plan and are there not expected to have any sensitive noise spaces.

At the time of writing this report, PORs 05-10 are in a conceptual planning stage and are therefore currently considered as vacant lots.

Development application documents for Lakeview Village have been made available on the City's website at: https://www.mississauga.ca/services-and-programs/building-and-renovating/development-applications/active-development-applications/, and the documents used for this study are included in Appendix H of this report. Planning updates are also published at https://www.mississauga.ca/projects-and-strategies/city-projects/inspiration-lakeview/.

As specific building locations may change as the development progresses, PORs 05-10 were placed at the extreme end of their respective lots closest to the Facility for conservatism. Nonetheless, it is

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[3] A copy of the rezoning and subdivision application documents used for this study is presented in Appendix H. The latest planning development application files are publicly accessible from the City of Mississauga Active Development Applications Website at: https://www.mississauga.ca/services-and-programs/building-and-renovating/development-applications/active-development-applications/

[4] Current usage designation is U-1 which allows for: utility building, water treatment Facility, sewage treatment plant, electric transformer and distribution Facility, with the following additional permitted uses: power generating Facility and outdoor storage accessory to a power generating Facility.

[5] Based on the August 2021 submission published online at: https://www.mississauga.ca/services-and-programs/building-and-renovating/development-applications/active-development-applications/

[6] Obtained from the City of Mississauga's inspiration lakeview website at: https://www.mississauga.ca/projects-and-strategies/city-projects/inspiration-lakeview/

recommended that an AAR update be completed when final building layouts and heights are available and approved by Council.

A brief description of representative receptors (Points of Reception; POR) considered in this assessment is listed below and summarized in Table 3:

- **POR01** is a 2-storey residential dwelling located approximately 560 metres (m) west of the Facility.
- **POR02** is a 7-storey apartment building located approximately 400 m north-west of the Facility.
- **POR03** is a 20-storey apartment building located approximately 825 m north of the Facility.
- **POR04** is a 2-storey residential dwelling located approximately 685 m north-east of the Facility.
- **POR05** represents a a 4-storey building on a vacant lot currently proposed for residential use, approximately 220 m west of the Facility.
- **POR06** represents a 3-storey building on a vacant lot currently proposed for an elementary school, approximately 140 m west of the Facility..
- **POR07** represents an 8-storey building on a vacant lot currently proposed for residential use, approximately 140 m west of the Facility.
- **POR08** represents a 22-storey building on a vacant lot currently proposed for mixed use, approximately 220 m west of the Facility.
- **POR09** represents a 12-storey building on a vacant lot currently proposed for mixed use, approximately 210 m west of the Facility.
- **POR10** represents a 15-storey building on a vacant lot currently proposed for mixed use, approximately 270 m west of the Facility.

The physical receptor location considered for the PORs is given below:

- For POR01, the receptor location is 4.5 m above ground representing 2nd storey plane of window.
- For POR02, the receptor location is 25.5 m above ground representing the 7th storey plane of window.
- For POR03, the receptor location is 7.5 m above ground representing the 3rd storey plane of window.
- For POR04, the receptor location is 4.5 m above ground representing 2nd storey plane of window.
- For POR05, the receptor location is 10.5 m above ground representing a conceptual 4th storey plane of window.
- For POR06, the receptor location is 7.5 m above ground representing a conceptual 3rd storey plane of window.
- For POR07, the receptor location is 22.5 m above ground representing a conceptual 8th storey plane of window.
- For POR08, the receptor location is 34.5 m above ground representing a conceptual 22nd storey plane of window.
- For POR09, the receptor location is 19.5 m above ground representing a conceptual 12th storey plane of window.

- For POR10, the receptor location is 64.5 m above ground representing a conceptual 22nd storey plane of window.

The representative and physical receptors assessed and reported here in this report are the worst-impacted receptor locations only. The location of the modeled receptors with respect to the Facility location is shown in Figure 1.

6.0 Applicable Noise Guidelines

The applicable noise guideline used to assess the Facility and proposed expansion is the MECP Environmental Noise Guideline NPC-300, *Noise Assessment Criteria for Stationary Sources and for Land Use Planning*. The guideline establishes four classes of acoustical environments based on the ambient background sound environments and establishes class specific sound level limit criteria. The MECP classes as per NPC-300 are described below:

- Class 1 Area: an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the urban hum.
- Class 2 Area: an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 Areas. Class 2 areas are characterized by the absence of urban hum, they have a relatively low ambient sound level, during early evening (i.e., between 19:00 and 23:00 hours) which is typically present within Class 1 Areas during the same time period.
- Class 3 Area: a rural area with an acoustical environment dominated by natural sounds having little or no road traffic. Examples are small communities with populations of less than 1,000, agricultural areas, rural recreational areas, such as a cottage or a resort area, and wilderness areas.
- Class 4 Area: an area that would otherwise be defined as Class 1 (urban) or Class 2 (suburban) which has relaxed sound level criteria compared to any other Class. This Class is intended to allow new sound-sensitive developments within or adjacent to industrial areas and to promote urban intensification. In contrast to the other classes this one must be implemented by the local land use planning authority to be recognized by the MECP.

The G.E. Booth WWTP is located in an area zoned for utility purpose and is surrounded by: a utility and business employment zoned land to the south and south-west, a business employment land and Lakeshore Road to the north-west with a mixed use and residential high density land beyond, a park to the north and a residential subdivision beyond, a vacant lot to the west and Lake Ontario to the east. Based on zoning and proximity to Lakeshore Road East and other commercial facilities, the area is best described as a Class 1 area (urban) in accordance with the area classifications defined within NPC-300.

NPC-300 states that steady one-hour sound levels ($L_{eq\text{-}1hr}$) from stationary noise sources in Class 1 areas shall meet the following sound level limits:

- The higher of the 50 dBA MECP exclusionary sound level limit or the existing background sound level at ***both outdoor and plane of window receptor locations*** during daytime hours (0:700 to 19:00).
- The higher of the 50 dBA MECP exclusionary sound level limit or the existing background sound level at ***both outdoor and plane of window receptor locations*** during early evening hours (19:00 to 23:00).

- The higher of the 45 dBA MECP exclusionary sound level limit or the existing background sound level at the ***plane of window receptor locations*** during night-time hours (23:00 to 07:00).

The NPC-300 guideline also stipulates that the assessment consider the potential sound impact during a predictable worse case hour of operation, which is defined as a situation when the normally busy activity of the sources coincides with a low hourly background sound level. The MECP exclusionary sound limits were used for this assessment.

Non-emergency operation of emergency equipment is assessed separately from the continuous regular operations of the Facility and is assessed with 55 dBA criterion limit as they are expected during daytime/evening hours only.

A copy of the NPC-300 document can be found at the MECP website at:
https://www.ontario.ca/page/ministry-environment-conservation-parks

7.0 Impact Assessment

The following sections of the report describes the noise impact modelling methodology and the associated modelling results.

7.1 Methodology

The noise assessment for the Facility was completed using a sound prediction software package, Cadna/A, published by Datakustik GmbH, which was configured to implement the ISO 9613-2 [6] environmental sound propagation algorithms. The Cadna/A noise modelling software is widely accepted by the consulting industry and the MECP. All steady noise sources were assumed to operate simultaneously to model the predictable worst-case scenario in their respective operational time periods. Sound levels from delivery trucks were distributed along the transportation route within the property boundary.

In order to provide an accurate prediction of sound levels at the receptors due to noise emissions from a specific source(s), the model took into account the following factors:

- Source sound power level and directivity;
- Distance attenuation;
- Source-receptor geometry, including heights and elevations;
- Barrier effects of buildings and tanks within the site perimeter; and,
- Ground and air (atmospheric) attenuation.

All building structures, excluding the digesters, were modelled as buildings in the noise model. These were assigned a reflection type of a smooth façade. The digesters were considered as a curved surface and were modelled with no reflection as a conservative approach. The heights of the structures summarized in Section 3.0 were extracted from the building elevation drawings provided by the Region of Peel. The elevations of the building structures additions envisioned from the expansions were provided by the design team. The industrial properties adjacent to the Facility were modelled as buildings in the noise model to account for the shielding provided by these properties.

The truck movements were modelled as line sources and their impact was considered only within the property footprint. Trucks were considered a part of the general traffic while moving along Lakeshore Road West to and from the Facility. The stationary sources were modelled as point sources. Bay doors were modelled as point sources and assumed to be open for the entire hour in the worst-case predictable hour of operation for all time periods of the day.

The generators located at the Headworks Building and the Thermal Conditioning Building were identified to be indoors with louvers on the walls for ventilation and combustion exhaust outdoors. The two generators were modelled as sources with discrete noise radiating parts in the assessment where the louvers and the exhausts were modelled as separate point sources. The generator located at the Storage Complex was also modelled as a source with discrete noise radiating parts. The casing noise was identified to be originating from the louvers installed on the north and south face of the unit and therefore modelled as two point sources on either side of the unit. The generator itself was modelled as a building with dimensions procured during the site visit. The combustion exhaust protruded 32” above the top façade of the generator and was modelled as a separate point source in the model. The generator’s impact was assessed separately as required by the MECP guideline with the other emergency equipment as part of the Non-emergency Testing Operations which are expected to occur only during daytime hours.

The ambient noise level was identified to be dominated by the noise equipment summarized in Table 1 and therefore the noise emitted from the water channels associated with clarifiers and aeration tanks was assumed to be insignificant in this assessment. This assumption was also applied to the proposed new Plant 3 clarifiers and aeration tanks. Since the ground within the Facility property boundary is mostly composed of reflective surfaces (ashpahlt roads, water channels etc.), a ground absorption coefficient of 0 was used within the Facility property boundary as per ISO 9613-2. The default ground absorption of the model was set to 0.5.

7.2 Modelling Results

7.2.1 Baseline Conditions

The combined steady sound levels ($L_{Aeq\text{-}1hr}$) for the predictable worst-case operations were calculated for the existing noise sources at the Facility. The cumulative impact of the simultaneous operation of all sources summarized in Table 1 was assessed at identified point of receptions, PORs 1 through 10.

The noise levels at the receptors reported as part of this acoustic assessment represent the predictable worst-case operational impact. A point of reception impact summary for daytime/evening and nighttime periods are presented in Table 4 and Table 5 respectively. The values provided in Tables 4 and Table 5 represent individual contributions at the receptor from each of the existing sources identified in Table 1.

The Facility was assessed for daytime/evening and nighttime periods. An acoustic assessment summary for baseline conditions is provided in Table 10. The noise contours for both the predictable worst-case operational scenarios for daytime/evening and nighttime were developed and are shown in Figure 7 and Figure 8, respectively.

Under the predicable worst-case noise emission scenario, the Facility is complaint with the MECP NPC-300 limits at all PORs for its baseline conditions. It is important to note that the assessment of baseline conditions assumed the Noise Abatement Action Plan (NAAP) specified in Section 4.1 will be implemented by the Facility. Key parameters included in the model and sample calculations are provided in Appendix F.

The three (3) identified standby generators in the building were assessed separately under the operational scenario of non-emergency testing, which assumed a simultaneous operation of all generators for 60 minutes in a worst-case predictable hour of operation. The sound levels ($L_{eq\text{-}1hr}$) in dBA values for the Facility's non-emergency testing operations were calculated at all the identified points of reception, POR1 through POR10. A point of reception impact summary for emergency testing operations is provided in Table 6.

Under the non-emergency testing operational scenario, the Facility is expected to operate in compliance with the applicable MECP NPC-300 limits at all PORs.

7.2.2 Proposed Capacity Expansion

Since the expansion is still in the design and planning stage, the equipment additions envisioned from the proposed capacity expansion have been assigned noise specifications i.e. recommended maximum allowable sound power levels for each source, for the Facility to stay compliant with the NPC-300 limits, and consistent with source levels predicted for its baseline conditions:

Plant 1 Primary Building Extension: The two (2) exhaust fans must not exceed a maximum outdoor sound power level of 80 dBA each. The two (2) make-up air units must not exceed a maximum outdoor sound power level of 85 dBA each.

Plant 1 Blower Building Extension: The three (3) exhaust fans must not exceed a maximum outdoor sound power level of 80 dBA each. The four (4) make-up air units must not exceed a maximum outdoor sound power level of 85 dBA each.

Three (3) New Plant 3 Clarifier Buildings: The seven (7) exhaust fans must not exceed a maximum outdoor sound power level of 80 dBA each. The seven (7) make-up air units must not exceed a maximum outdoor sound power level of 85 dBA each.

New Ash Dewatering Facility: The two (2) exhaust fans must not exceed a maximum outdoor sound power level of 80 dBA each. The one (1) make-up air unit must not exceed a maximum outdoor sound power level of 85 dBA each.

New UV Disinfection Facility: The two (2) exhaust fans must not exceed a maximum outdoor sound power level of 80 dBA each. The two (2) make-up air units must not exceed a maximum outdoor sound power level of 85 dBA each.

New Administration Building: The four (4) make-up air units must not exceed a maximum outdoor sound power level of 88 dBA each.

New Dewatering Building: The two (2) odour control fans must not exceed a maximum outdoor sound power level of 100 dBA each. The stack discharging the treated air is assumed to be an insignificant source of noise, both exit (noise propagating from the stack opening) and the breakout noise radiating from the entire stack.

Four (4) New Anaerobic Digesters: The three sludge mixer motors on each of the four new digesters must not exceed a resultant sound power level of 73 dBA. The two (2) exhaust fans and the two (2) make-up air units on the control building must not exceed a maximum outdoor sound power level of 80 and 85 dBA each, respectively.

Two (2) New Biogas Sphere: The three (3) wall exhausts on each of the two spheres must not exceed a maximum outdoor sound power level of 95 dBA each. The two (2) blowers on each of the two spheres must not exceed a maximum outdoor sound power level of 88 dBA.

The four (4) proposed 3 MW diesel generators need to be equipped with low pressure-drop combustion exhaust mufflers, casing mitigation, and combustion air inlet silencing to ensure that the maximum allowable sound power level does not exceed **107 dBA** for the diesel generator packages.

The envisioned equipment additions from the proposed expansion pose a significant impact in overall Facility noise emissions at the nearest POR locations. The equipment additions need to strictly adhere to the stipulated maximum allowable sound powers levels to ensure compliance with the NPC-300 limits. The introduction of these new sources is also predicted to prompt additional mitigation measures summarized in the section below.

7.2.3 Additional Mitigation Measures

The maximum allowable sound power levels proposed for the equipment additions were conceptualized based on both feasibility and practicality. This warranted multiple iterations of assessment to ensure compliance can be achieved in the most cost effective and feasible way. The existing impact (baseline conditions) of the Facility's is only compliant with the NPC-300 limits contingent on the assigned Noise Abatement Action Plan (NAAP) provided in Section 4.1. Therefore, introduction of the envisioned sources prompts the need for further mitigation to existing noise equipment at the Facility. The required mitigation is summarized as follows:

- Reduce the overall outdoor sound power level of three exhaust fans located on the roof of the Thermal Oxidation Building identified as TOX1&2 Exhaust Fan1 thru 3 (TOX1_2EF1, TOX1_2EF2, TOX1_2EF3) from 92 dBA to 85 dBA. This can be achieved by retrofitting silencers or complete unit replacements adhering to a maximum allowable sound power level of 85 dBA. The exhaust fans requiring mitigation are identified in Figure 4.

The proposed equipment additions and stipulated modifications should not exhibit audible tonal qualities, cyclic variations or quasi-steady impulsive sounds according to NPC-104 in order for the Facility to operate in compliance with the above specified maximum noise levels. The proposed equipment should also not be tonal according to the mathematical qualification found in ISO 1996-2:2007(E).

A summary of the noise source additions with stipulated maximum allowable sound power levels is provided in Table 2. If these levels are identified to be unfeasible during the equipment selection phase of the design, specific mitigation measures will need to be investigated and applied to the equipment additions to ensure the sound power level does not exceed the stipulated maximum resultant sound power levels. During this stage, a noise consultant is recommended to be consulted to select appropriate mitigation options for each piece of equipment. Noise measurements of all new equipment should be conducted after execution of the proposed capacity expansion to verify sound power levels and reevaluate impacts at the identified PORs.

The combined steady sound levels ($L_{Aeq-1hr}$) for the predictable worst-case operations were calculated for all sources envisioned after the proposed capacity expansion which includes existing noise sources at the Facility and new noise source additions. The cumulative impact of the simultaneous operation of all sources summarized in Table 1 and 2 was assessed at identified point of receptions, PORs 1 through 10.

The Facility was assessed for daytime/evening and nighttime periods. An acoustic assessment summary for proposed capacity expansion is provided in Table 11. The noise contours for both the predictable worst-case operational scenarios for daytime/evening and nighttime were developed and are shown in Figure 9 and Figure 10, respectively. A point of reception impact summary for daytime/evening and nighttime periods are presented in Table 7 and Table 8 respectively. The values provided in Tables 7 and Table 8 represent individual contributions at the receptor from each of the existing sources identified in Tables 1 and 2.

Under the predictable worst-case noise emission scenario for the proposed capacity expansion, the Facility is expected to be complaint with the MECP NPC-300 limits at all PORs with the stipulated maximum allowable sound power levels for the noise source additions and the implementation of additional mitigations measures proposed above.

The four (4) proposed 3 MW diesel generators with the existing three (3) generators at the Facility were assessed separately under the operational scenario of non-emergency testing, which assumed a simultaneous operation of all generators for 60 minutes in a worst-case predictable hour of operation. The sound levels (L_{eq-1hr}) in dBA values for the Facility's non-emergency testing operations were calculated at all the identified points of reception, POR1 through POR10. A point of reception impact summary for emergency testing operations is provided in Table 9.

Under the non-emergency testing operational scenario, the Facility is expected to operate in compliance with the applicable MECP NPC-300 limits at all PORs for the proposed capacity expansion adhering to the specified maximum allowable sound power level and mitigation options such as exhaust mufflers, casing mitigation, and combustion air inlet silencing.

8.0 Conclusions

An acoustic assessment report has been completed for The Region of Peel in support of a Schedule "C" Class Environmental Assessment of G.E Booth Water Resource Recovery Facility (WRRF) located at 1300 Lakeshore Road E, Mississauga, Ontario. Ten (10) representative points of reception were identified in the vicinity of the Facility and considered for this assessment.

The receptor noise impacts associated with baseline conditions and the proposed capacity expansion were assesed through predictive acoustic modelling. The MECP exclusionary sound level limits were used as the criteria to assess the compliance of the Facility for its baseline condition and after the proposed capacity expansion. The sound levels at the receptors reported represent the worst-case impact assuming all significant sound sources are operating simultaneously during all periods of the day.

The G.E. Booth WRRF is expected to be compliant with the MECP NPC-300 limits at all PORs for its baselines condition continegent on the implementation of the prescribed Noise Abatement Action Plan in Section 4.1 and after the proposed capacity expansion adhering to the maximum allowable sound power levels and additional mitigation measures summarized in Section 7.2.2 and 7.2.3 of this report.

9.0 Closure

This Acoustic Assessment Report was prepared by Wood for the sole benefit of GM BluePlan and Region of Peel in support of a Schedule "C" Class Environmental Assessment of G.E Booth Water Resource Recovery Facility (WRRF) located at 1300 Lakeshore Road E, Mississauga, Ontario. The quality of information, conclusions and estimates contained herein are consistent with the level of effort involved in Wood's services and based on: i) information available and conditions of the Facility at the time of preparation of this report, ii) data supplied by outside sources and iii) the assumptions, conditions and qualifications set forth in this document.

This report is intended to be used by GM BluePlan and Region of Peel. only, and its nominated representatives, subject to the terms and conditions of its contract with Wood. Any other use of, or reliance on, this report by any third party is at that party's sole risk. This report has been prepared in accordance with generally accepted industry-standard. No other warranty, expressed or implied, is made.

10.0 References

[1] Ontario Ministry of the Environment, Conservation and Parks (MECP) Publication NPC-233, *Information to be Submitted for Approval of Stationary Sources of Sound*, October 1995.

[2] Ontario Ministry of the Environment, Conservation and Parks (MECP), *Guide for Applying for Approval (Air & Noise) s.9 EPA*, February 2005.

[3] Ontario Ministry of the Environment, Conservation and Parks (MECP) Publication NPC-300, *Noise Assessment Criteria for Stationary Sources and for Land Use Planning*, August 2013.

[4] AHRAE, Handbook of Fundamentals, Chapter 42, 1991.

[5] Ontario Ministry of the Environment, Conservation and Parks (MECP) Publication NPC-104, *Sound Level Adjustments*, published under the Model Municipal Noise Control Bylaw, 1977.

[6] ISO-9613-2. *Acoustics – Attenuation of Sound during propagation outdoors*. *Part 2 – General method of calculation.*

[7] Engineering Noise Control, Theory and Practice., *David A. Bies and Colin H. Hansen*, published by Spon Press, 2003.

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Table 1: Existing - Noise Source Summary

Project: G.E. Booth WRRF
Location: Mississauga, ON

Source ID	Source Description	Sound Power Level [1] (dBA)	Sound Power Level Adjustment [2] (+dB)	Source Location [3] (I or O)	Sound Characteristics [4] (S,Q,I,B,T,C)	Noise Control Measures [5] (S,A,B,L,E,O,U)
BF_L1	Biofilter Building Louvre 1	79	0	O	S	U
BF_L2	Biofilter Building Louvre 1	75	0	O	S	U
BB_AI1	Blower Building Air Intake1	86	0	O	S	U
BB_AI2	Blower Building Air Intake2	86	0	O	S	U
BB_AI3	Blower Building Air Intake3	86	0	O	S	U
BB_AI4	Blower Building Air Intake4	86	0	O	S	U
BB_AI5	Blower Building Air Intake5	86	0	O	S	U
BB_OD	Blower Building Overhead Door	86	0	O	S	U
TOX_B1	Boiler Exhaust 1	85	5	O	S,T	U
TOX_B2	Boiler Exhaust 2	85	5	O	S,T	U
TOX_B3	Boiler Exhaust 3	85	5	O	S,T	U
TOX_B4	Boiler Exhaust 4	85	5	O	S,T	U
TOX_B5	Boiler Exhaust 5	85	5	O	S,T	U
CB_CU1	Condenser 1 - Centrifuge Bldg	84	0	O	S	U
SHCB_EF1	Exhaust fan 1 Solids Handling/Centrifuge Building	82	0	O	S	U
SHCB_EF2	Exhaust fan 2 Solids Handling/Centrifuge Building	82	0	O	S	U
SHCB_EF3	Exhaust fan 3 Solids Handling/Centrifuge Building	82	0	O	S	U
SHCB_EF4	Exhaust fan 4 Solids Handling/Centrifuge Building	82	0	O	S	U
FCB_OD	Ferrous Chloride Building Open Door	81	5	O	S,T	U
FC_TB	Ferrous Chloride Truck Blower	100	0	O	S	U
FC_TEI	Ferrous Chloride Truck Engine Idling	110	0	O	S	U
HW_CUS2	Headworks Carbon Unit Stack 2	88	0	O	S	U
HW_EF1	Headworks Exhaust Fan 1	95	0	O	S	U
HW_EF2	Headworks Exhaust Fan 2	95	0	O	S	U
HW_EF3	Headworks Exhaust Fan 3	93	0	O	S	U
HW_EF4	Headworks Exhaust Fan 4	93	0	O	S	U
HW_EF5	Headworks Exhaust Fan 5	97	0	O	S	U
HW_GenStackExh	Headworks Generator Exhaust Stack	88	0	O	S	U
HW_GenRadExh	Headworks Generator Radiator Exhaust	93	0	O	S	U
HW_GenIntake	Headworks Generator Room Intake	93	0	O	S	U
TOX3_L1M	HVAC Intake Louvre 1 (TOX3) Mitigated	84	0	O	S	U
TOX4_L	HVAC Intake Louvre 1 (TOX4)	95	5	O	S,T	U
TOX3_L2M	HVAC Intake Louvre 2 (TOX3) Mitigated	76	0	O	S	U
ITT	Idling Transport Truck	97	0	O	S	U
LFH_EF	Lab Fume Hood Exhaust Fan	87	0	O	S	U
LFH_ES	Lab Fume Hood Exhaust Stack	89	0	O	S	U
CB_MAU1	Makeup Air Unit 1 - Centrifuge Bldg	89	0	O	S	U
CB_MAU2	Makeup Air Unit 2 - Centrifuge Bldg	89	0	O	S	U
OUB_CUS1	Odour Unit Building Carbon Unit Stack 1	88	0	O	S	U
OUB_CUS2	Odour Unit Building Carbon Unit Stack 2	88	0	O	S	U
PO_TB	Polymer Truck Blower	101	5	O	S,T	U
PO_TEI	Polymer Truck Engine Idling	96	0	O	S	U
EF-250-01	Proposed Exhuast Fan (Plant 1 Aeration Access Stair)	83	0	O	S	U
IWOCF_ES1	Proposed Exhuast Stack (Inlet Works OCF Upgrade) 1	85	0	O	S	U

Table 1: Existing - Noise Source Summary

Project: G.E. Booth WRRF
Location: Mississauga, ON

Source ID	Source Description	Sound Power Level [1] (dBA)	Sound Power Level Adjustment [2] (+dB)	Source Location [3] (I or O)	Sound Characteristics [4] (S,Q,I,B,T,C)	Noise Control Measures [5] (S,A,B,L,E,O,U)
IWOCF_ES2	Proposed Exhuast Stack (Inlet Works OCF Upgrade) 2	85	0	O	S	U
P1OCF_ES1	Proposed Exhuast Stack (Plant 1 OCF) 1	85	0	O	S	U
P1OCF_ES2	Proposed Exhuast Stack (Plant 1 OCF) 2	85	0	O	S	U
P2OCF_ES1	Proposed Exhuast Stack (Plant 2 OCF) 1	85	0	O	S	U
P2OCF_ES2	Proposed Exhuast Stack (Plant 2 OCF) 2	85	0	O	S	U
GEB_POU	Proposed GEB Solids Exportation Portable Odour Unit	88	0	O	S	U
MUA-921-01_IN	Proposed Ground MUA-921-01 OA Intake (Plant 1 OCF)	90	0	O	S	U
MUA-922-01_IN	Proposed Ground MUA-922-01 OA Intake (Plant 2 OCF)	88	0	O	S	U
MUA-150-03_IN	Proposed MUA-150-03 OA Intake Elbow (Primary Clarifier 1)	84	0	O	S	U
MUA-300-01-02_II	Proposed MUA-300-01-02 OA Intake Louvre (Blower Building 1)	82	0	O	S	U
MUA-300-03_IN	Proposed MUA-300-03 OA Intake Louvre (Blower Building 1)	88	0	O	S	U
EF-152-01	Proposed Rooftop EF-120-01 (Plant 2)	85	0	O	S	U
EF-152-02	Proposed Rooftop EF-120-01 (Plant 2)	85	0	O	S	U
EF-150-01	Proposed Rooftop EF-150-01 (Plant 1)	93	0	O	S	U
EF-150-02	Proposed Rooftop EF-150-02 (Plant 1)	93	0	O	S	U
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	85	0	O	S	U
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	85	0	O	S	U
MUA-152-01_IN	Proposed Rooftop MUA-152-01 OA Intake (Plant 2)	85	0	O	S	U
MUA-152-02_IN	Proposed Rooftop MUA-152-02 OA Intake (Plant 2)	85	0	O	S	U
EF-921-01	Proposed Wall EF-921-01 (Plant 1 OCF)	84	0	O	S	U
EF-921-02	Proposed Wall EF-921-02 (Plant 1 OCF)	79	0	O	S	U
EF-921-03	Proposed Wall EF-921-03 (Plant 1 OCF)	79	0	O	S	U
EF-922-02	Proposed Wall EF-922-02 (Plant 2 OCF)	82	0	O	S	U
EF-922-03	Proposed Wall EF-922-03 (Plant 2 OCF)	82	0	O	S	U
SH_TB	Sodium Hypochlorite Truck Blower	103	0	O	S	U
SH_TEI	Sodium Hypochlorite Truck Engine Idling	100	0	O	S	U
SH_OD1	Solids Handling Overhead Door 1	99	0	O	S	U
SH_OD2	Solids Handling Overhead Door 2	99	0	O	S	U
SR_OD	Solids Receiving Overhead Door	90	5	O	S,T	U
TCF_GenStackExh	Thermal Conditioning Facility Generator Exhaust Stack	86	0	O	S	U
TCF_GenRadExh	Thermal Conditioning Facility Generator Radiator Exhaust	112	0	O	S	U
TCF_GenIntake	Thermal Conditioning Facility Generator Room Intake	105	0	O	S	U
TOX1_2Inlet1	TOX 1&2 Inlet 1	88	0	O	S	U
TOX1_2Inlet2	TOX 1&2 Inlet 2	88	0	O	S	U
TOX3_4Inlet1	TOX 3&4 Inlet 1 (West side)	88	0	O	S	U
TOX3_4Inlet2	TOX 3&4 Inlet 2 (North side)	88	0	O	S	U
TOX_BEM	TOX HVAC & Fluidized Air Blower Exhaust Mitigated	83	5	O	S,T	U

Table 1: Existing - Noise Source Summary

Project: G.E. Booth WRRF
Location: Mississauga, ON

Source ID	Source Description	Sound Power Level [1] (dBA)	Sound Power Level Adjustment [2] (+dB)	Source Location [3] (I or O)	Sound Characteristics [4] (S,Q,I,B,T,C)	Noise Control Measures [5] (S,A,B,L,E,O,U)
TOX1_2EF1	TOX1&2 Exhaust Fan1	85	0	O	S	U
TOX1_2EF2	TOX1&2 Exhaust Fan2	85	0	O	S	U
TOX1_2EF3	TOX1&2 Exhaust Fan3	85	0	O	S	U
TOX1_2EF4	TOX1&2 Exhaust Fan4	92	0	O	S	U
TOX1_2EF5	TOX1&2 Exhaust Fan5	92	0	O	S	U
TOX1_2EF6	TOX1&2 Exhaust Fan6	92	0	O	S	U
TOX1_2EF7	TOX1&2 Exhaust Fan7	92	0	O	S	U
TOX1_2EF8	TOX1&2 Exhaust Fan8	92	0	O	S	U
TOX1_2EF9	TOX1&2 Exhaust Fan9	92	0	O	S	U
TOX1_2_OD	TOX1&2 Overhead Door	92	0	O	S	U
TOX3_EF1M	TOX3 Exhaust Fan1 Mitigated	84	0	O	S	U
TOX3_EF2	TOX3 Exhaust Fan2	87	0	O	S	U
TOX3_EF3M	TOX3 Exhaust Fan3 Mitigated	78	0	O	S	U
TOX3_EF4M	TOX3 Exhaust Fan4 Mitigated	80	0	O	S	U
TOX3_EF5M	TOX3 Exhaust Fan5 Mitigated	78	0	O	S	U
TOX3_OD	TOX3 Overhead Door	84	0	O	S	U
TOX4_EF1M	TOX4 Exhaust Fan1 Mitigated	87	0	O	S	U
TOX4_EF2M	TOX4 Exhaust Fan2 Mitigated	87	0	O	S	U
TOX4_EF3M	TOX4 Exhaust Fan3 Mitigated	87	0	O	S	U
TOX4_OD	TOX4 Overhead Door	89	0	O	S	U
HW_CUS1	Headworks Carbon Unit Stack 1	88	0	O	S	U
EWPS_EF701	New EWPS Roof Exhaust Fan 1	83	0	O	S	U
EWPS_EF702	New EWPS Roof Exhaust Fan 2	83	0	O	S	U
EWPS_EF703	New EWPS Roof TCVX Vanaxial Exhaust Fan	90	0	O	S	U
EWPS_AHU_702I	New EWPS Air Handling Unit 2	87	0	O	S	U
EWPS_AHU_701	New EWPS Air Handling Unit 1	81	0	O	S	U
EWPS_CU_1	New EWPS Air-Cooled Condenser	69	0	O	S	U
SC_GEN	New Storage Complex 200 KW Diesel Standby Generator Exhaust	99	0	O	S	U
SC_GEN_C2	New Storage Complex 200 KW Diesel Standby Generator Casing (north)	99	0	O	S	U
SC_GEN_C1	New Storage Complex 200 KW Diesel Standby Generator Casing (south)	99	0	O	S	U
SC_RTU_1	New Storage Complex Trane 10 Ton Rooftop Unit 1	88	0	O	S	U
SC_RTU_2	New Storage Complex Trane 10 Ton Rooftop Unit 2	88	0	O	S	U
SC_ERV_1	New Storage Complex Energy Recovery Unit	92	0	O	S	U
SC_EF	New Storage Complex Wall Pipe Exhaust	84	0	O	S	U
SC_AHU_1	New Storage Complex Indirect Fired Make-up Air Unit	100	0	O	S	U
SHTP	Sodium Hypochlorite Truck Passby	92	0	O	S	U
FCTP	Ferrous Chloride Truck Passby	90	0	O	S	U
GTP	Garbage Truck Passby	91	0	O	S	U
PTP	Polymer Truck Passby	92	0	O	S	U
SRTP	Sludge Receiving Truck Passby	93	0	O	S	U

Notes on Table:

1. Sound Power Level of Source, in dBA, without sound characteristic adjustment per NPC-104.
2. Sound characteristic adjustment (addition to sound power level), as applicable to the source, per NPC-104.
3. Source Location: O = Outside of building, including the roof, I = Inside of building

Table 2: Proposed Capacity Expansion - Noise Source Summary

Project: G.E. Booth WRRF
Location: Mississauga, ON

Source ID	Source Description	Sound Power Level [1] (dBA)	Sound Power Level Adjustment [2] (+dB)	Source Location [3] (I or O)	Sound Characteristics [4] (S,Q,I,B,T,C)	Noise Control Measures [5] (S,A,B,L,E,O,U)
MUA_E_2	Proposed Expansion Rooftop MUA-2 (Plant 1 Primary Building Extension)	85	0	O	S	U
MUA_E_1	Proposed Expansion Rooftop MUA-1 (Plant 1 Primary Building Extension)	85	0	O	S	U
EF_E_1	Proposed Exansion Rooftop EF-1 (Plant 1 Primary Building Extension)	80	0	O	S	U
EF_E_2	Proposed Exansion Rooftop EF-2 (Plant 1 Primary Building Extension)	80	0	O	S	U
MUA_E_4	Proposed Exansion Rooftop MUA-4 (Plant 1 Primary Blower Building Extension)	85	0	O	S	U
MUA_E_3	Proposed Exansion Rooftop MUA-3 (Plant 1 Primary Blower Building Extension)	85	0	O	S	U
MUA_E_5	Proposed Exansion Rooftop MUA-5 (Plant 1 Primary Blower Building Extension)	85	0	O	S	U
MUA_E_6	Proposed Exansion Rooftop MUA-6 (Plant 1 Primary Blower Building Extension)	85	0	O	S	U
EF_E_3	Proposed Exansion Rooftop EF-3 (Plant 1 Primary Blower Building Extension)	80	0	O	S	U
EF_E_4	Proposed Exansion Rooftop EF-4 (Plant 1 Primary Blower Building Extension)	80	0	O	S	U
EF_E_5	Proposed Exansion Rooftop EF-5 (Plant 1 Primary Blower Building Extension)	80	0	O	S	U
D1_E_MM1	Proposed Exansion Digester 1 Mixer Motor 1	73	0	O	S	U
D1_E_MM2	Proposed Exansion Digester 1 Mixer Motor 2	73	0	O	S	U
D1_E_MM3	Proposed Exansion Digester 1 Mixer Motor 3	73	0	O	S	U
D2_E_MM1	Proposed Exansion Digester 2 Mixer Motor 1	73	0	O	S	U
D2_E_MM2	Proposed Exansion Digester 2 Mixer Motor 2	73	0	O	S	U
D2_E_MM3	Proposed Exansion Digester 2 Mixer Motor 3	73	0	O	S	U
D3_E_MM1	Proposed Exansion Digester 3 Mixer Motor 1	73	0	O	S	U
D3_E_MM2	Proposed Exansion Digester 3 Mixer Motor 2	73	0	O	S	U
D3_E_MM3	Proposed Exansion Digester 3 Mixer Motor 3	73	0	O	S	U
D4_E_MM1	Proposed Exansion Digester 4 Mixer Motor 1	73	0	O	S	U
D4_E_MM2	Proposed Exansion Digester 4 Mixer Motor 2	73	0	O	S	U

Table 2: Proposed Capacity Expansion - Noise Source Summary

Project: G.E. Booth WRRF
Location: Mississauga, ON

Source ID	Source Description	Sound Power Level [1] (dBA)	Sound Power Level Adjustment [2] (+dB)	Source Location [3] (I or O)	Sound Characteristics [4] (S,Q,I,B,T,C)	Noise Control Measures [5] (S,A,B,L,E,O,U)
D4_E_MM3	Proposed Exansion Digester 4 Mixer Motor 3	73	0	O	S	U
MUA_E_7	Proposed Exansion Rooftop MUA-7 (New Digester Control Building)	85	0	O	S	U
EF_E_6	Proposed Exansion Rooftop EF-6 (New Digester Control Building)	80	0	O	S	U
MUA_E_8	Proposed Exansion Rooftop MUA-8 (New Digester Control Building)	85	0	O	S	U
EF_E_7	Proposed Exansion Rooftop EF-7 (New Digester Control Building)	80	0	O	S	U
MUA_E_8	Proposed Exansion Rooftop MUA-8 (New UV Disinfection Facility)	85	0	O	S	U
EF_E_7	Proposed Exansion Rooftop EF-7 (New UV Disinfection Facility)	80	0	O	S	U
MUA_E_9	Proposed Exansion Rooftop MUA-9 (New UV Disinfection Facility)	85	0	O	S	U
EF_E_8	Proposed Exansion Rooftop EF-8 (New UV Disinfection Facility)	80	0	O	S	U
MUA_E_10	Proposed Exansion Rooftop MUA-10 (New Ash Dewatering Facility)	85	0	O	S	U
EF_E_9	Proposed Exansion Rooftop EF-9 (New Ash Dewatering Facility)	80	0	O	S	U
EF_E_10	Proposed Exansion Rooftop EF-10 (New Ash Dewatering Facility)	80	0	O	S	U
MUA_E_11	Proposed Exansion Rooftop MUA-11 (New Plant 3 Clarifier Building)	85	0	O	S	U
EF_E_11	Proposed Exansion Rooftop EF-11 (New Plant 3 Clarifier Building)	80	0	O	S	U
MUA_E_12	Proposed Exansion Rooftop MUA-12 (New Plant 3 Clarifier Building)	85	0	O	S	U
EF_E_12	Proposed Exansion Rooftop EF-12 (New Plant 3 Clarifier Building)	80	0	O	S	U
MUA_E_13	Proposed Exansion Rooftop MUA-13 (New Plant 3 Clarifier Building)	85	0	O	S	U
EF_E_13	Proposed Exansion Rooftop EF-13 (New Plant 3 Clarifier Building)	80	0	O	S	U
MUA_E_14	Proposed Exansion Rooftop MUA-14 (New Plant 3 Clarifier Building)	85	0	O	S	U
EF_E_14	Proposed Exansion Rooftop EF-14 (New Plant 3 Clarifier Building)	80	0	O	S	U
MUA_E_15	Proposed Exansion Rooftop MUA-15 (New Plant 3 Clarifier Building)	85	0	O	S	U
EF_E_15	Proposed Exansion Rooftop EF-15 (New Plant 3 Clarifier Building)	80	0	O	S	U
MUA_E_16	Proposed Exansion Rooftop MUA-16 (New Plant 3 Clarifier Building)	85	0	O	S	U
EF_E_16	Proposed Exansion Rooftop EF-16 (New Plant 3 Clarifier Building)	80	0	O	S	U

Table 2: Proposed Capacity Expansion - Noise Source Summary

Project: G.E. Booth WRRF
Location: Mississauga, ON

Source ID	Source Description	Sound Power Level [1] (dBA)	Sound Power Level Adjustment [2] (+dB)	Source Location [3] (I or O)	Sound Characteristics [4] (S,Q,I,B,T,C)	Noise Control Measures [5] (S,A,B,L,E,O,U)
MUA_E_17	Proposed Exansion Rooftop MUA-17 (New Plant 3 Clarifier Building)	85	0	O	S	U
EF_E_17	Proposed Exansion Rooftop EF-17 (New Plant 3 Clarifier Building)	80	0	O	S	U
D1_E_EX1	Proposed Exansion New Biogas Dome 1 Exhaust 1	95	0	O	S	U
D1_E_EX2	Proposed Exansion New Biogas Dome 1 Exhaust 2	95	0	O	S	U
D1_E_EX3	Proposed Exansion New Biogas Dome 1 Exhaust 3	95	0	O	S	U
D1_E_B1	Proposed Exansion New Biogas Dome 1 Blower 1	88	0	O	S	U
D1_E_B2	Proposed Exansion New Biogas Dome 1 Blower 2	88	0	O	S	U
D2_E_EX1	Proposed Exansion New Biogas Dome 2 Exhaust 1	95	0	O	S	U
D2_E_EX2	Proposed Exansion New Biogas Dome 2 Exhaust 2	95	0	O	S	U
D2_E_EX3	Proposed Exansion New Biogas Dome 2 Exhaust 3	95	0	O	S	U
D2_E_B1	Proposed Exansion New Biogas Dome 2 Blower 1	88	0	O	S	U
D2_E_B2	Proposed Exansion New Biogas Dome 2 Blower 2	88	0	O	S	U
MUA_E_18	Proposed Exansion Rooftop MUA-18 (New Adminstration Building)	88	0	O	S	U
MUA_E_19	Proposed Exansion Rooftop MUA-19 (New Adminstration Building)	88	0	O	S	U
MUA_E_20	Proposed Exansion Rooftop MUA-20 (New Adminstration Building)	88	0	O	S	U
MUA_E_21	Proposed Exansion Rooftop MUA-21 (New Adminstration Building)	88	0	O	S	U
G_E_1C	Proposed Exansion 3 MW Emergency Generator 1 (Casing)	107	0	O	S	U
G_E_1E	Proposed Exansion 3 MW Emergency Generator 1 (Exhaust)	107	0	O	S	U
G_E_2C	Proposed Exansion 3 MW Emergency Generator 2 (Casing)	107	0	O	S	U
G_E_2E	Proposed Exansion 3 MW Emergency Generator 2 (Exhaust)	107	0	O	S	U
G_E_3C	Proposed Exansion 3 MW Emergency Generator 3 (Casing)	107	0	O	S	U
G_E_3E	Proposed Exansion 3 MW Emergency Generator 3 (Exhaust)	107	0	O	S	U
G_E_4C	Proposed Exansion 3 MW Emergency Generator 4 (Casing)	107	0	O	S	U
G_E_4E	Proposed Exansion 3 MW Emergency Generator 4 (Exhaust)	107	0	O	S	U

Table 2: Proposed Capacity Expansion - Noise Source Summary

Project: G.E. Booth WRRF
Location: Mississauga, ON

Source ID	Source Description	Sound Power Level [1] (dBA)	Sound Power Level Adjustment [2] (+dB)	Source Location [3] (I or O)	Sound Characteristics [4] (S,Q,I,B,T,C)	Noise Control Measures [5] (S,A,B,L,E,O,U)
OCF_1	Proposed Exansion Dewatering Building Odour Control Fan 1	100	0	O	S	U
OCF_2	Proposed Exansion Dewatering Building Odour Control Fan 2	100	0	O	S	U
ADFTP	Ash Dewatering Facility Trucks Passby	97	0	O	S	U

Notes on Table:

1. Sound Power Level of Source, in dBA, without sound characteristic adjustment per NPC-104.
2. Sound characteristic adjustment (addition to sound power level), as applicable to the source, per NPC-104.
3. Source Location: O = Outside of building, including the roof, I = Inside of building
4. Sound Characteristic, per NPC-104
   S = Steady I = Impulsive T = Tonal
   Q = Quasi-Steady Impulsive B = Buzzing C = Cyclic
5. Noise Control Measures Included
   S = Silencer/Muffler L = Lagging O = Other
   A = Acoustic lining, plenum E = acoustic enclosure U = uncontrolled
   B = Barrier

Table 3: Points of Reception (PORs) Summary

Project: G.E. Booth WRRF
Location: Mississauga, ON

Point of Reception ID	Point of Reception Description	UTM Coordinates		Height Above Ground
		X	Y	(m)
POR01	2-Storey Dwelling West of the Facility	616496	4826107	4.5
POR02	7-Storey Apartment Bldg	616806	4826529	25.5
POR03	20-Storey Apartment Bldg North of the Facility	617191	4827159	7.5
POR04	2-Storey Dwelling North-East of the Facility	617868	4826965	4.5
POR05	Proposed Residential (Vacant Lot) 4th Floor	616805	4826016	10.5
POR06	Proposed Elementary School (Vacant Lot) 3rd Floor	616911	4825919	7.5
POR07	Proposed Residential (Vacant Lot) 8th Floor	617081	4825755	22.5
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	617079	4825644	64.5
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	617199	4825544	19.5
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	616657	4826114	43.5

Table 4: Point of Reception Noise Impact (Daytime/Evening, Baseline Conditions)

Project: G.E. Booth WRRF
Location: Mississauga, ON

POR	Point of Reception Description	X	Y	Z[2]
POR01	2-Storey Dwelling West of the Facility	616496	4826107	4.5
POR02	7-Storey Apartment Bldg	616806	4826529	25.5
POR03	20-Storey Apartment Bldg North of the Facility	617191	4827159	7.5
POR04	2-Storey Dwelling North-East of the Facility	617868	4826965	5
POR05	Proposed Elementary School (Vacant Lot) 3rd Floor	616805	4826016	10.5
POR06	Proposed Residential (Vacant Lot) 4th Floor	616911	4825919	7.5
POR07	Proposed Residential (Vacant Lot) 8th Floor	617081	4825755	22.5
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	617079	4825644	22.5
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	617199	4825544	19.5
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	616657	4826114	44

Source ID	Source Description	Point of Reception 1			Point of Reception 2			Point of Reception 3			Point of Reception 4			Point of Reception 5			Point of Reception 6			Point of Reception 7			Point of Reception 8			Point of Reception 9			Point of Reception 10		
		Distance (m)	Sound Level at PoR	Units[1] (dBA)	Distance (m)	Sound Level at PoR	Units[1] (dBA)	Distance (m)	Sound Level at PoR	Units[1] (dBA)	Distance (m)	Sound Level at PoR	Units[1] (dBA)	Distance (m)	Sound Level at PoR	Units[1] (dBA)	Distance (m)	Sound Level at PoR	Units[1] (dBA)	Distance (m)	Sound Level at PoR	Units[1] (dBA)	Distance (m)	Sound Level at PoR	Units[1] (dBA)	Distance (m)	Sound Level at PoR	Units[1] (dBA)	Distance (m)	Sound Level at PoR	Units[1] (dBA)
BF_L1	Biofilter Building Louvre 1	621	10	dBA	444	10	dBA	956	12	dBA	1073	-3	dBA	359	14	dBA	349	6	dBA	453	-4	dBA	563	2	dBA	668	-7	dBA	464	17	dBA
BF_L2	Biofilter Building Louvre 1	611	-6	dBA	448	2	dBA	971	-7	dBA	1088	-16	dBA	344	18	dBA	332	9	dBA	438	2	dBA	549	13	dBA	655	6	dBA	453	9	dBA
BB_AI1	Blower Building Air Intake1	947	16	dBA	718	21	dBA	999	13	dBA	884	4	dBA	658	23	dBA	594	17	dBA	565	21	dBA	655	23	dBA	690	14	dBA	788	21	dBA
BB_AI2	Blower Building Air Intake2	945	15	dBA	709	21	dBA	986	14	dBA	875	5	dBA	658	23	dBA	597	16	dBA	573	20	dBA	664	23	dBA	701	14	dBA	785	21	dBA
BB_AI3	Blower Building Air Intake3	942	16	dBA	699	22	dBA	972	14	dBA	865	5	dBA	658	23	dBA	600	13	dBA	581	20	dBA	673	23	dBA	713	17	dBA	783	21	dBA
BB_AI4	Blower Building Air Intake4	939	15	dBA	687	23	dBA	953	14	dBA	852	6	dBA	659	23	dBA	604	13	dBA	592	20	dBA	686	23	dBA	728	17	dBA	780	21	dBA
BB_AI5	Blower Building Air Intake5	937	15	dBA	676	23	dBA	937	15	dBA	842	8	dBA	660	23	dBA	609	16	dBA	602	19	dBA	697	22	dBA	741	18	dBA	778	21	dBA
BB_OD	Blower Building Overhead Door	958	2	dBA	734	5	dBA	1013	-6	dBA	888	18	dBA	666	8	dBA	600	15	dBA	564	20	dBA	653	22	dBA	684	9	dBA	799	11	dBA
TOX_B1	Boiler Exhaust 1	913	17	dBA	852	21	dBA	1268	13	dBA	1163	14	dBA	592	22	dBA	476	17	dBA	341	32	dBA	404	28	dBA	407	26	dBA	760	20	dBA
TOX_B2	Boiler Exhaust 2	914	17	dBA	853	21	dBA	1270	13	dBA	1164	14	dBA	593	22	dBA	477	17	dBA	341	31	dBA	404	28	dBA	407	23	dBA	761	20	dBA
TOX_B3	Boiler Exhaust 3	915	17	dBA	854	21	dBA	1271	13	dBA	1165	14	dBA	593	22	dBA	477	17	dBA	341	31	dBA	403	28	dBA	406	20	dBA	761	20	dBA
TOX_B4	Boiler Exhaust 4	916	19	dBA	856	18	dBA	1272	13	dBA	1166	14	dBA	594	22	dBA	478	17	dBA	341	31	dBA	403	23	dBA	405	16	dBA	762	20	dBA
TOX_B5	Boiler Exhaust 5	917	17	dBA	857	18	dBA	1274	13	dBA	1167	14	dBA	595	22	dBA	478	17	dBA	340	26	dBA	402	18	dBA	404	15	dBA	763	20	dBA
CB_CU1	Condenser 1 - Centrifuge Bldg	929	8	dBA	821	15	dBA	1201	9	dBA	1085	11	dBA	612	11	dBA	508	7	dBA	402	22	dBA	475	20	dBA	486	20	dBA	771	15	dBA
SHCB_EF1	Exhaust fan 1 Solids Handling/Centrifuge Building	942	11	dBA	822	13	dBA	1188	9	dBA	1063	10	dBA	626	11	dBA	526	3	dBA	425	17	dBA	498	18	dBA	508	18	dBA	784	13	dBA
SHCB_EF2	Exhaust fan 2 Solids Handling/Centrifuge Building	944	6	dBA	826	13	dBA	1192	9	dBA	1066	10	dBA	628	11	dBA	527	3	dBA	424	20	dBA	496	18	dBA	505	18	dBA	786	13	dBA
SHCB_EF3	Exhaust fan 3 Solids Handling/Centrifuge Building	945	6	dBA	828	13	dBA	1195	9	dBA	1068	10	dBA	629	11	dBA	528	3	dBA	423	20	dBA	495	18	dBA	503	18	dBA	787	13	dBA
SHCB_EF4	Exhaust fan 4 Solids Handling/Centrifuge Building	948	6	dBA	832	13	dBA	1200	9	dBA	1072	10	dBA	631	11	dBA	529	6	dBA	422	20	dBA	493	18	dBA	500	18	dBA	790	13	dBA
FCB_OD	Ferrous Chloride Building Open Door	629	2	dBA	478	7	dBA	990	11	dBA	1089	5	dBA	352	12	dBA	328	6	dBA	419	3	dBA	529	10	dBA	632	0	dBA	471	9	dBA
FC_TB	Ferrous Chloride Truck Blower	629	16	dBA	451	35	dBA	957	27	dBA	1068	2	dBA	365	27	dBA	352	21	dBA	452	19	dBA	562	30	dBA	665	23	dBA	472	26	dBA
FC_TEI	Ferrous Chloride Truck Engine Idling	628	37	dBA	445	46	dBA	952	39	dBA	1065	19	dBA	366	36	dBA	355	31	dBA	457	31	dBA	568	45	dBA	671	36	dBA	471	45	dBA
HW_CUS2	Headworks Carbon Unit Stack 2	668	16	dBA	459	25	dBA	930	18	dBA	1026	17	dBA	408	26	dBA	393	21	dBA	480	19	dBA	590	23	dBA	686	19	dBA	510	24	dBA
HW_EF1	Headworks Exhaust Fan 1	675	26	dBA	482	29	dBA	953	19	dBA	1035	15	dBA	406	35	dBA	382	32	dBA	459	27	dBA	569	33	dBA	663	28	dBA	516	33	dBA
HW_EF2	Headworks Exhaust Fan 2	640	26	dBA	459	35	dBA	958	25	dBA	1061	18	dBA	373	37	dBA	357	29	dBA	451	24	dBA	561	30	dBA	663	29	dBA	481	34	dBA
HW_EF3	Headworks Exhaust Fan 3	654	21	dBA	460	30	dBA	946	23	dBA	1045	22	dBA	390	31	dBA	374	26	dBA	463	23	dBA	574	28	dBA	672	27	dBA	495	29	dBA
HW_EF4	Headworks Exhaust Fan 4	671	21	dBA	468	30	dBA	939	23	dBA	1029	22	dBA	407	31	dBA	389	26	dBA	472	24	dBA	582	28	dBA	677	24	dBA	513	29	dBA
HW_EF5	Headworks Exhaust Fan 5	670	25	dBA	458	30	dBA	928	27	dBA	1023	25	dBA	410	30	dBA	396	22	dBA	482	19	dBA	592	26	dBA	689	21	dBA	512	30	dBA
HW_GenStackExh	Headworks Generator Exhaust Stack	676	0	dBA	467	0	dBA	933	0	dBA	1021	0	dBA	414	0	dBA	396	0	dBA	479	0	dBA	589	0	dBA	683	0	dBA	519	0	dBA
HW_GenRadExh	Headworks Generator Radiator Exhaust	678	0	dBA	467	0	dBA	931	0	dBA	1019	0	dBA	416	0	dBA	399	0	dBA	481	0	dBA	591	0	dBA	685	0	dBA	521	0	dBA
HW_GenIntake	Headworks Generator Room Intake	679	0	dBA	466	0	dBA	929	0	dBA	1017	0	dBA	417	0	dBA	400	0	dBA	483	0	dBA	593	0	dBA	687	0	dBA	522	0	dBA
TOX3_L1M	HVAC Intake Louvre 1 (TOX3) Mitigated	906	13	dBA	849	19	dBA	1271	-7	dBA	1170	-7	dBA	584	13	dBA	467	9	dBA	332	28	dBA	395	26	dBA	400	25	dBA	753	20	dBA
TOX4_L	HVAC Intake Louvre 1 (TOX4)	939	18	dBA	863	23	dBA	1260	20	dBA	1139	29	dBA	619	15	dBA	505	13	dBA	373	24	dBA	435	22	dBA	434	17	dBA	785	27	dBA
TOX3_L2M	HVAC Intake Louvre 2 (TOX3) Mitigated	907	5	dBA	851	11	dBA	1273	-13	dBA	1172	-13	dBA	585	6	dBA	468	3	dBA	331	20	dBA	394	18	dBA	399	18	dBA	754	12	dBA
ITT	Idling Transport Truck	979	2	dBA	882	2	dBA	1249	6	dBA	1104	15	dBA	660	6	dBA	550	8	dBA	422	12	dBA	482	14	dBA	474	12	dBA	824	3	dBA
LFH_EF	Lab Fume Hood Exhaust Fan	815	16	dBA	757	16	dBA	1210	-1	dBA	1162	-6	dBA	495	19	dBA	387	11	dBA	293	28	dBA	378	26	dBA	421	20	dBA	661	20	dBA
LFH_ES	Lab Fume Hood Exhaust Stack	815	18	dBA	756	17	dBA	1210	2	dBA	1162	-2	dBA	495	21	dBA	386	13	dBA	293	31	dBA	378	28	dBA	421	22	dBA	661	22	dBA
CB_MAU1	Makeup Air Unit 1 - Centrifuge Bldg	914	11	dBA	813	18	dBA	1203	12	dBA	1096	13	dBA	596	15	dBA	492	9	dBA	387	20	dBA	460	24	dBA	474	23	dBA	756	15	dBA
CB_MAU2	Makeup Air Unit 2 - Centrifuge Bldg	916	15	dBA	810	18	dBA	1197	12	dBA	1088	13	dBA	599	15	dBA	496	9	dBA	394	19	dBA	468	21	dBA	483	23	dBA	759	18	dBA
OUB_CUS1	Odour Unit Building Carbon Unit Stack 1	793	16	dBA	615	23	dBA	1017	17	dBA	1003	17	dBA	500	24	dBA	440	13	dBA	443	21	dBA	545	24	dBA	609	18	dBA	633	22	dBA
OUB_CUS2	Odour Unit Building Carbon Unit Stack 2	794	16	dBA	616	23	dBA	1016	17	dBA	1002	17	dBA	501	24	dBA	441	13	dBA	444	21	dBA	545	24	dBA	610	18	dBA	634	22	dBA
PO_TB	Polymer Truck Blower	995	6	dBA	879	9	dBA	1227	13	dBA	1071	31	dBA	677	11	dBA	571	13	dBA	452	15	dBA	515	15	dBA	508	16	dBA	838	7	dBA
PO_TEI	Polymer Truck Engine Idling	997	2	dBA	887	-1	dBA	1239	7	dBA	1082	21	dBA	679	5	dBA	571	6	dBA	448	9	dBA	508	17	dBA	499	15	dBA	841	2	dBA
EF-250-01	Proposed Exhuast Fan (Plant 1 Aeration Access Stair)	627	9	dBA	616	12	dBA	1166	5	dBA	1228	4	dBA	309	10	dBA	216	5	dBA	244	18	dBA	354	9	dBA	460	7	dBA	474	12	dBA
IWOCF_ES1	Proposed Exhaust Stack (Inlet Works OCF Upgrade) 1	610	13	dBA	435	23	dBA	957	15	dBA	1081	8	dBA	349	24	dBA	342	20	dBA	452	15	dBA	563	20	dBA	670	18	dBA	452	22	dBA
IWOCF_ES2	Proposed Exhaust Stack (Inlet Works OCF Upgrade) 2	614	13	dBA	453	22	dBA	974	14	dBA	1089	13	dBA	345	24	dBA	331	20	dBA	434	15	dBA	545	20	dBA	651	19	dBA	455	22	dBA
P1OCF_ES1	Proposed Exhaust Stack (Plant 1 OCF) 1	687	17	dBA	561	20	dBA	1045	14	dBA	1092	13	dBA	390	23	dBA	335	17	dBA	374	19	dBA	482	22	dBA	570	17	dBA	528	20	dBA
P1OCF_ES2	Proposed Exhaust Stack (Plant 1 OCF) 2	690	17	dBA	562	20	dBA	1044	14	dBA	1089	13	dBA	393	23	dBA	338	17	dBA	375	19	dBA	483	22	dBA	571	17	dBA	530	20	dBA
P2OCF_ES1	Proposed Exhaust Stack (Plant 2 OCF) 1	772	11	dBA	798	17	dBA	1310	7	dBA	1288	12	dBA	451	16	dBA	320	11	dBA	171	31	dBA	251	27	dBA	305	21	dBA	627	19	dBA
P2OCF_ES2	Proposed Exhaust Stack (Plant 2 OCF) 2	779	11	dBA	800	17	dBA	1308	12	dBA	1282	12	dBA	457	16	dBA	328	11	dBA	179	31	dBA	258	27	dBA	309	21	dBA	633	19	dBA
GEB_POU	Proposed GEB Solids Exportation Portable Odour Unit	954	-6	dBA	829	15	dBA	1185	17	dBA	1053	18	dBA	639	-1	dBA	539	0	dBA	439	2	dBA	511	5	dBA	519	2	dBA	797	1	dBA
MUA-921-01_IN	Proposed Ground MUA-921-01 OA Intake (Plant 1 OCF)	693	19	dBA	562	28	dBA	1040	17	dBA	1085	22	dBA	397	26	dBA	342	12	dBA	380	7	dBA	488	8	dBA	575	3	dBA	534	28	dBA
MUA-922-01_IN	Proposed Ground MUA-922-01 OA Intake (Plant 2 OCF)	791	0	dBA	821	4	dBA	1330	-6	dBA	1299	-6	dBA	470	6	dBA	337	8	dBA	173	21	dBA	244	19	dBA	288	15	dBA	647	3	dBA
MUA-150-03_IN	Proposed MUA-150-03 OA Intake Elbow (Primary Clarifier 1)	555	16	dBA	485	16	dBA	1057	9	dBA	1181	-5	dBA	264	23	dBA	238	12	dBA	358	4	dBA	469	17	dBA	586	7	dBA	397	18	dBA
MUA-300-01-02_I	Proposed MUA-300-01-02 OA Intake Louvre (Blower Building 1)	692	-6	dBA	612	10	dBA	1109	6	dBA	1142	12	dBA	381	-1	dBA	303	3	dBA	313	1	dBA	420	2	dBA	505	-5	dBA	534	-3	dBA
MUA-300-03_IN	Proposed MUA-300-03 OA Intake Louvre (Blower Building 1)	689	2	dBA	606	16	dBA	1104	12	dBA	1138	17	dBA	380	10	dBA	304	8	dBA	318	6	dBA	425	8	dBA	511	1	dBA	532	9	dBA
EF-152-01	Proposed Rooftop EF-120-01 (Plant 2)	710	11	dBA	721	17	dBA	1247	8	dBA	1258	12	dBA	388	12	dBA	268	8	dBA	186	26	dBA	286	26	dBA	368	19	dBA	561	19	dBA
EF-152-02	Proposed Rooftop EF-120-01 (Plant 2)	727	12	dBA	725	17	dBA	1240	8	dBA	1242	13	dBA	404	12	dBA	287	8	dBA	202	26	dBA	300	25	dBA	375	19	dBA	577	19	dBA
EF-150-01	Proposed Rooftop EF-150-01 (Plant 1)	573	24	dBA	485	28	dBA	1044	22	dBA	1161	16	dBA	284	33	dBA	257	25	dBA	368	18	dBA	479	29	dBA	592	22	dBA	414	30	dBA
EF-150-02	Proposed Rooftop EF-150-02 (Plant 1)	592	24	dBA	489	28	dBA	1035	22	dBA	1143	16	dBA	304	33	dBA	274	21	dBA	375	18	dBA	485	29	dBA	595	22	dBA	433	29	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	603	21	dBA	548	22	dBA	1098	16	dBA	1184	15	dBA	296	29	dBA	236	12	dBA	311	7	dBA	422	16	dBA	530	3	dBA	445	24	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	608	21	dBA	549	22	dBA	1096	16	dBA	1180	15	dBA	302	29	dBA	242	12	dBA	313	7	dBA	424	16	dBA	531	3	dBA	450	24	dBA
MUA-152-01_IN	Proposed Rooftop MUA-152-01 OA Intake (Plant 2)	751	12	dBA	779	19	dBA	1299	10	dBA	1289	10	dBA	429	13	dBA	300	9	dBA	163	29	dBA	250	28	dBA	316	8	dBA	606	21	dBA
MUA-152-02_IN	Proposed Rooftop MUA-152-02 OA Intake (Plant 2)	758	12	dBA	781	19	dBA	1296	10	dBA	1282	10	dBA	436	13	dBA	307	11	dBA	171	26	dBA	257	21	dBA	319	8	dBA	612	21	dBA
EF-921-01	Proposed Wall EF-921-01 (Plant 1 OCF)	681	19	dBA	571	26	dBA	1063	0	dBA	1110	-2	dBA	380	24	dBA	319	14	dBA	354	16	dBA	462	27	dBA	552	14	dBA	523	26	dBA
EF-921-02	Proposed Wall EF-921-02 (Plant 1 OCF)	687	8	dBA	564	18	dBA	1049	-6	dBA	1095	-3	dBA	389	18	dBA	332	6	dBA	370	16	dBA	478	18	dBA	566	12	dBA	528	12	dBA
EF-921-03	Proposed Wall EF-921-03 (Plant 1 OCF)	693	13	dBA	581	14	dBA	1066	-6	dBA	1105	-6	dBA	392	20	dBA	328	11	dBA	355	15	dBA	462	19	dBA	548	14	dBA	535	17	dBA
EF-922-02	Proposed Wall EF-922-02 (Plant 2 OCF)	785	11	dBA	808	16	dBA	1314	12	dBA	1285	7	dBA	464	12	dBA	333	6	dBA	180	25	dBA	256	18	dBA	304	8	dBA	640	18	dBA
EF-922-03	Proposed Wall EF-922-03 (Plant 2 OCF)	777	5	dBA	806	16	dBA	1317	7	dBA	1293	7	dBA	456	6	dBA	325	3	dBA	170	20	dBA	247	16	dBA	299	8	dBA	633	16	dBA
SH_TB	Sodium Hypochlorite Truck Blower	989	9	dBA	887	11	dBA	1247	18	dBA	1095	20	dBA	671	14	dBA	561	14	dBA	435	19	dBA	495	31	dBA	485	27	dBA	834	9	dBA
SH_TEI	Sodium Hypochlorite Truck Engine Idling	995	7	dBA	890	8	dBA	1248	15	dBA	1092	29	dBA	676	12	dBA	567	12	dBA	440	18	dBA	500	31	dBA	488	24	dBA	840	7	dBA
SH_OD1	Solids Handling Overhead Door 1	948	7	dBA	834	9	dBA	1202	5	dBA	1073	7	dBA	631	12	dBA	528	13	dBA	422	16	dBA	492	21	dBA	498	29	dBA	791	13	dBA
SH_OD2	Solids Handling Overhead Door 2	934	17	dBA	807	25	dBA	1171	30	dBA	1051	26	dBA	620	17	dBA	522	19	dBA	429	15	dBA	505	14	dBA	519	13	dBA	776	19	dBA
SR_OD	Solids Receiving Overhead Door	993	2	dBA	880	4	dBA	1232	6	dBA	1076	25	dBA	676	6	dBA	569	8	dBA	448	13	dBA	511	13	dBA	503	11	dBA	837	3	dBA
TCF_GenStackExh	Thermal Conditioning Facility Generator Exhaust Stack	864	0	dBA	761	0	dBA	1169	0	dBA	1093	0	dBA	548	0	dBA	449	0	dBA	367	0	dBA	450	0	dBA	482	0	dBA	707	0	dBA
TCF_GenRadExh	Thermal Conditioning Facility Generator Radiator Exhaust	862	0	dBA	763	0	dBA	1174	0	dBA	1098	0	dBA	546	0	dBA	447	0	dBA	362	0	dBA	445	0	dBA	477	0	dBA	706	0	dBA
TCF_GenIntake	Thermal Conditioning Facility Generator Room Intake	863	0	dBA	762	0	dBA	1171	0	dBA	1095	0	dBA	547	0	dBA	448	0	dBA	365	0	dBA	448	0	dBA	480	0	dBA	707	0	dBA
TOX1_2Inlet1	TOX 1&2 Inlet 1	903	13	dBA	841	19	dBA	1261	-10	dBA	1161	-8	dBA	582	11	dBA	467	8	dBA	336	30	dBA	402	28	dBA	409	27	dBA	750	17	dBA
TOX1_2Inlet2	TOX 1&2 Inlet 2	904	13	dBA	843	19	dBA	1262	-10	dBA	1162	-8	dBA	583	11	dBA	467	8	dBA	336	30	dBA	402	28	dBA	409	27	dBA	751	17	dBA
TOX3_4Inlet1	TOX 3&4 Inlet 1 (West side)	905	13	dBA	847	21	dBA	1267	-10	dBA	1166	-9	dBA	584	11	dBA	468	8	dBA	334	30	dBA	398	28	dBA	404	23	dBA	753	16	dBA
TOX3_4Inlet2	TOX 3&4 Inlet 2 (North side)	905	15	dBA	845	21	dBA	1265	-9	dBA	1165	-8	dBA	583	13	dBA	467	10	dBA	335	26	dBA	399	21	dBA	406	18	dBA	752	19	dBA
TOX_BEM	TOX HVAC & Fluidized Air Blower Exhaust Mitigated	905	16	dBA	846	22	dBA	1266	-7	dBA	1166	-6	dBA	584	14	dBA	467	11	dBA	334	31	dBA	398	29	dBA	404	29	dBA	752	19	dBA
TOX1_2EF1	TOX1&2 Exhaust Fan1	899	-3	dBA	825	3	dBA	1239	-2	dBA	1141	1	dBA	579	2	dBA	468	10	dBA	347	25	dBA	417	23	dBA	430	22	dBA	745	9	dBA
TOX1_2EF2	TOX1&2 Exhaust Fan2	904	1	dBA	828	9	dBA	1238	-2	dBA	1136	1	dBA	584	4	dBA	473	0	dBA	353	24	dBA	423	22	dBA	434	22	dBA	750	8	dBA
TOX1_2EF3	TOX1&2 Exhaust Fan3	911	3	dBA	831	15	dBA	1236	-2	dBA	1130	1	dBA	592	6	dBA	481	2	dBA	361	24	dBA	430	24	dBA	440	25	dBA	756	8	dBA
TOX1_2EF4	TOX1&2 Exhaust Fan4	916	12	dBA	833	8	dBA	1236	6	dBA	1128	8	dBA	596	15	dBA	485	9	dBA	366	32	dBA	434	31	dBA	443	32	dBA	760	17	dBA
TOX1_2EF5	TOX1&2 Exhaust Fan5	920	16	dBA	835	6	dBA	1234	6	dBA	1123	8	dBA	601	19	dBA	491	10	dBA	371	31	dBA	440	30	dBA	447	32	dBA	765	19	dBA
TOX1_2EF6	TOX1&2 Exhaust Fan6	901	17	dBA	819	11	dBA	1227	6	dBA	1128	8	dBA	582	22	dBA	472	14	dBA	357	22	dBA	429	24	dBA	443	30	dBA	746	20	dBA
TOX1_2EF7	TOX1&2 Exhaust Fan7	905	17	dBA	821	20	dBA	1226	1	dBA	1124	8	dBA	585	22	dBA	477	14	dBA	362	23	dBA	433	27	dBA	446	30	dBA	749	24	dBA
TOX1_2EF8	TOX1&2 Exhaust Fan8	916	17	dBA	825	9	dBA	1221	5	dBA	1113	7	dBA	597	27	dBA	489	14	dBA	376	26	dBA	446	32	dBA	457	29	dBA	760	19	dBA
TOX1_2EF9	TOX1&2 Exhaust Fan9	920	15	dBA	827	10	dBA	1221	5	dBA	1110	7	dBA	601	22	dBA	494	14	dBA	380	27	dBA	451	32	dBA	461	29	dBA	764	18	dBA
TOX1_2_OD	TOX1&2 Overhead Door	933	-1	dBA	835	-1	dBA	1219	-5	dBA	1100	-3	dBA	614	6	dBA	508	6	dBA	395	13	dBA	464	6	dBA	471	8	dBA	777	0	dBA
TOX3_EF1M	TOX3 Exhaust Fan1 Mitigated	910	9	dBA	843	17	dBA	1258	1	dBA	1154	4	dBA	589	13	dBA	474	8	dBA	344	24	dBA	410	22	dBA	416	23	dBA	756	16	dBA
TOX3_EF2	TOX3 Exhaust Fan2	908	12	dBA	838	14	dBA	1251	4	dBA	1148	6	dBA	587	17	dBA	473	12	dBA	347	27	dBA	414	25	dBA	422	25	dBA	753	19	dBA
TOX3_EF3M	TOX3 Exhaust Fan3 Mitigated	913	1	dBA	848	10	dBA	1263	-4	dBA	1158	-2	dBA	591	6	dBA	476	2	dBA	344	17	dBA	408	15	dBA	413	9	dBA	759	8	dBA
TOX3_EF4M	TOX3 Exhaust Fan4 Mitigated	929	3	dBA	856	6	dBA	1259	-2	dBA	1144	0	dBA	608	8	dBA	494	4	dBA	363	18	dBA	426	11	dBA	427	7	dBA	774	10	dBA
TOX3_EF5M	TOX3 Exhaust Fan5 Mitigated	923	3	dBA	847	1	dBA	1249	-5	dBA	1137	-4	dBA	603	8	dBA	491	2	dBA	364	16	dBA	429	14	dBA	433	5	dBA	769	9	dBA
TOX3_OD	TOX3 Overhead Door	905	10	dBA	844	19	dBA	1263	-11	dBA	1163	-10	dBA	584	8	dBA	468	6	dBA	336	27	dBA	401	25	dBA	408	20	dBA	752	15	dBA
TOX4_EF1M	TOX4 Exhaust Fan1 Mitigated	932	7	dBA	850	5	dBA	1246	2	dBA	1129	5	dBA	611	13	dBA	500	10	dBA	374	26	dBA	439	23	dBA	442	22	dBA	777	12	dBA
TOX4_EF2M	TOX4 Exhaust Fan2 Mitigated	936	8	dBA	852	2	dBA	1245	2	dBA	1126	6	dBA	616	11	dBA	504	10	dBA	379	25	dBA	444	22	dBA	446	17	dBA	781	12	dBA
TOX4_EF3M	TOX4 Exhaust Fan3 Mitigated	940	8	dBA	859	2	dBA	1253	3	dBA	1131	14	dBA	619	15	dBA	507	10	dBA	378	26	dBA	441	18	dBA	441	20	dBA	785	14	dBA

Table 4: Point of Reception Noise Impact (Daytime/Evening, Baseline Conditions)

Project: G.E. Booth WRRF
Location: Mississauga, ON

POR	Point of Reception Description	X	Y	Z [2]
POR01	2-Storey Dwelling West of the Facility	616496	4826107	4.5
POR02	7-Storey Apartment Bldg	616806	4826529	25.5
POR03	20-Storey Apartment Bldg North of the Facility	617191	4827159	7.5
POR04	2-Storey Dwelling North-East of the Facility	617868	4826965	5
POR05	Proposed Elementary School (Vacant Lot) 3rd Floor	616805	4826016	10.5
POR06	Proposed Residential (Vacant Lot) 4th Floor	616911	4825919	7.5
POR07	Proposed Residential (Vacant Lot) 8th Floor	617081	4825755	22.5
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	617079	4825644	22.5
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	617199	4825544	19.5
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	616657	4826114	44

Source ID	Source Description	Point of Reception 1			Point of Reception 2			Point of Reception 3			Point of Reception 4			Point of Reception 5		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
TOX4_OD	TOX4 Overhead Door	945	-6	dBA	855	-5	dBA	1242	-6	dBA	1117	17	dBA	625	-1	dBA
HW_CUS1	Headworks Carbon Unit Stack 1	657	16	dBA	453	26	dBA	934	18	dBA	1035	17	dBA	397	26	dBA
EWPS_EF701	New EWPS Roof Exhaust Fan 1	995	9	dBA	786	15	dBA	1060	11	dBA	905	13	dBA	697	15	dBA
EWPS_EF702	New EWPS Roof Exhaust Fan 2	975	9	dBA	766	15	dBA	1048	11	dBA	907	13	dBA	678	16	dBA
EWPS_EF703	New EWPS Roof TCVX Vanaxial Exhaust Fan	979	18	dBA	766	24	dBA	1045	18	dBA	902	23	dBA	682	24	dBA
EWPS_AHU_702I	New EWPS Air Handling Unit 2	992	13	dBA	771	16	dBA	1036	16	dBA	885	21	dBA	697	16	dBA
EWPS_AHU_701	New EWPS Air Handling Unit 1	974	7	dBA	763	16	dBA	1044	10	dBA	905	14	dBA	677	14	dBA
EWPS_CU_1	New EWPS Air-Cooled Condenser	990	-6	dBA	768	-6	dBA	1032	-1	dBA	883	3	dBA	696	-3	dBA
SC_GEN	New Storage Complex 200 KW Diesel Standby Generator Exhaust	708	0	dBA	448	0	dBA	874	0	dBA	965	0	dBA	463	0	dBA
SC_GEN_C2	New Storage Complex 200 KW Diesel Standby Generator Casing (north)	709	0	dBA	450	0	dBA	874	0	dBA	965	0	dBA	464	0	dBA
SC_GEN_C1	New Storage Complex 200 KW Diesel Standby Generator Casing (south)	709	0	dBA	449	0	dBA	873	0	dBA	964	0	dBA	464	0	dBA
SC_RTU_1	New Storage Complex Trane 10 Ton Rooftop Unit 1	730	15	dBA	453	24	dBA	855	17	dBA	940	12	dBA	487	23	dBA
SC_RTU_2	New Storage Complex Trane 10 Ton Rooftop Unit 2	729	15	dBA	459	24	dBA	863	17	dBA	944	16	dBA	484	23	dBA
SC_ERV_1	New Storage Complex Energy Recovery Unit	729	19	dBA	456	29	dBA	860	22	dBA	943	18	dBA	485	28	dBA
SC_EF	New Storage Complex Wall Pipe Exhaust	718	-3	dBA	458	6	dBA	875	-6	dBA	959	-4	dBA	470	23	dBA
SC_AHU_1	New Storage Complex Indirect Fired Make-up Air Unit	722	25	dBA	452	35	dBA	862	27	dBA	949	22	dBA	478	34	dBA
SHTP	Sodium Hypochlorite Truck Passby	-	17	dBA	-	30	dBA	-	20	dBA	-	19	dBA	-	25	dBA
FCTP	Ferrous Chloride Truck Passby	-	16	dBA	-	30	dBA	-	19	dBA	-	17	dBA	-	24	dBA
GTP	Garbage Truck Passby	-	18	dBA	-	31	dBA	-	21	dBA	-	19	dBA	-	26	dBA
PTP	Polymer Truck Passby	-	18	dBA	-	30	dBA	-	20	dBA	-	19	dBA	-	25	dBA
SRTP	Sludge Receiving Truck Passby	-	19	dBA	-	31	dBA	-	22	dBA	-	20	dBA	-	26	dBA

Source ID	Source Description	Point of Reception 6			Point of Reception 7			Point of Reception 8			Point of Reception 9			Point of Reception 10		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
TOX4_OD	TOX4 Overhead Door	515	1	dBA	391	9	dBA	455	3	dBA	456	5	dBA	790	-4	dBA
HW_CUS1	Headworks Carbon Unit Stack 1	384	22	dBA	475	19	dBA	585	23	dBA	684	20	dBA	499	24	dBA
EWPS_EF701	New EWPS Roof Exhaust Fan 1	621	10	dBA	564	18	dBA	646	15	dBA	665	9	dBA	835	14	dBA
EWPS_EF702	New EWPS Roof Exhaust Fan 2	605	11	dBA	554	16	dBA	639	17	dBA	663	9	dBA	815	14	dBA
EWPS_EF703	New EWPS Roof TCVX Vanaxial Exhaust Fan	609	18	dBA	560	4	dBA	645	11	dBA	668	1	dBA	819	24	dBA
EWPS_AHU_702I	New EWPS Air Handling Unit 2	626	5	dBA	578	11	dBA	662	14	dBA	685	-3	dBA	832	18	dBA
EWPS_AHU_701	New EWPS Air Handling Unit 1	604	10	dBA	555	-4	dBA	641	8	dBA	665	-8	dBA	814	12	dBA
EWPS_CU_1	New EWPS Air-Cooled Condenser	625	-7	dBA	579	-2	dBA	664	1	dBA	688	-23	dBA	831	-2	dBA
SC_GEN	New Storage Complex 200 KW Diesel Standby Generator Exhaust	455	0	dBA	540	0	dBA	650	0	dBA	741	0	dBA	554	0	dBA
SC_GEN_C2	New Storage Complex 200 KW Diesel Standby Generator Casing (north)	456	0	dBA	540	0	dBA	650	0	dBA	741	0	dBA	555	0	dBA
SC_GEN_C1	New Storage Complex 200 KW Diesel Standby Generator Casing (south)	456	0	dBA	541	0	dBA	651	0	dBA	742	0	dBA	555	0	dBA
SC_RTU_1	New Storage Complex Trane 10 Ton Rooftop Unit 1	480	14	dBA	562	17	dBA	671	21	dBA	760	15	dBA	575	22	dBA
SC_RTU_2	New Storage Complex Trane 10 Ton Rooftop Unit 2	475	13	dBA	554	18	dBA	663	21	dBA	752	15	dBA	575	22	dBA
SC_ERV_1	New Storage Complex Energy Recovery Unit	476	18	dBA	557	22	dBA	666	25	dBA	754	20	dBA	574	26	dBA
SC_EF	New Storage Complex Wall Pipe Exhaust	460	4	dBA	541	13	dBA	650	19	dBA	740	13	dBA	563	21	dBA
SC_AHU_1	New Storage Complex Indirect Fired Make-up Air Unit	471	23	dBA	553	26	dBA	662	31	dBA	752	25	dBA	568	32	dBA
SHTP	Sodium Hypochlorite Truck Passby	-	16	dBA	-	21	dBA	-	24	dBA	-	18	dBA	-	24	dBA
FCTP	Ferrous Chloride Truck Passby	-	15	dBA	-	13	dBA	-	20	dBA	-	14	dBA	-	23	dBA
GTP	Garbage Truck Passby	-	17	dBA	-	17	dBA	-	23	dBA	-	17	dBA	-	25	dBA
PTP	Polymer Truck Passby	-	16	dBA	-	24	dBA	-	26	dBA	-	21	dBA	-	24	dBA
SRTP	Sludge Receiving Truck Passby	-	18	dBA	-	22	dBA	-	25	dBA	-	19	dBA	-	25	dBA

Notes on Table:
1. dBA = 1-hour energy equivalent sound (L_{eq} (1-hr))
2. Height above local grade

Table 5: Point of Reception Noise Impact (Night, Baseline Conditions)

Project: G.E. Booth WRRF
Location: Mississauga, ON

POR	Point of Reception Description	X	Y	Z [2]
POR01	2-Storey Dwelling West of the Facility	616496	4826107	4.5
POR02	7-Storey Apartment Bldg	616806	4826529	25.5
POR03	20-Storey Apartment Bldg North of the Facility	617191	4827159	7.5
POR04	2-Storey Dwelling North-East of the Facility	617868	4826965	5
POR05	Proposed Elementary School (Vacant Lot) 3rd Floor	616805	4826016	10.5
POR06	Proposed Residential (Vacant Lot) 4th Floor	616911	4825919	7.5
POR07	Proposed Residential (Vacant Lot) 8th Floor	617081	4825755	22.5
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	617079	4825644	22.5
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	617199	4825544	19.5
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	616657	4826114	44

Source ID	Source Description	Point of Reception 1			Point of Reception 2			Point of Reception 3			Point of Reception 4		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
BF_L1	Biofilter Building Louvre 1	621	10	dBA	444	10	dBA	956	12	dBA	1073	-3	dBA
BF_L2	Biofilter Building Louvre 1	611	-6	dBA	448	2	dBA	971	-7	dBA	1088	-16	dBA
BB_AI1	Blower Building Air Intake1	947	16	dBA	718	21	dBA	999	13	dBA	884	4	dBA
BB_AI2	Blower Building Air Intake2	945	15	dBA	709	21	dBA	986	14	dBA	875	5	dBA
BB_AI3	Blower Building Air Intake3	942	16	dBA	699	22	dBA	972	14	dBA	865	5	dBA
BB_AI4	Blower Building Air Intake4	939	15	dBA	687	23	dBA	953	14	dBA	852	6	dBA
BB_AI5	Blower Building Air Intake5	937	15	dBA	676	23	dBA	937	15	dBA	842	8	dBA
BB_OD	Blower Building Overhead Door	958	2	dBA	734	5	dBA	1013	-6	dBA	888	18	dBA
TOX_B1	Boiler Exhaust 1	913	17	dBA	852	21	dBA	1268	13	dBA	1163	14	dBA
TOX_B2	Boiler Exhaust 2	914	17	dBA	853	21	dBA	1270	13	dBA	1164	14	dBA
TOX_B3	Boiler Exhaust 3	915	17	dBA	854	21	dBA	1271	13	dBA	1165	14	dBA
TOX_B4	Boiler Exhaust 4	916	19	dBA	856	18	dBA	1272	13	dBA	1166	14	dBA
TOX_B5	Boiler Exhaust 5	917	17	dBA	857	18	dBA	1274	13	dBA	1167	14	dBA
CB_CU1	Condenser 1 - Centrifuge Bldg	929	8	dBA	821	15	dBA	1201	9	dBA	1085	11	dBA
SHCB_EF1	Exhaust fan 1 Solids Handling/Centrifuge Building	942	11	dBA	822	13	dBA	1188	9	dBA	1063	10	dBA
SHCB_EF2	Exhaust fan 2 Solids Handling/Centrifuge Building	944	6	dBA	826	13	dBA	1192	9	dBA	1066	10	dBA
SHCB_EF3	Exhaust fan 3 Solids Handling/Centrifuge Building	945	6	dBA	828	13	dBA	1195	9	dBA	1068	10	dBA
SHCB_EF4	Exhaust fan 4 Solids Handling/Centrifuge Building	948	6	dBA	832	13	dBA	1200	9	dBA	1072	10	dBA
FCB_OD	Ferrous Chloride Building Open Door	629	2	dBA	478	7	dBA	990	11	dBA	1089	5	dBA
FC_TB	Ferrous Chloride Truck Blower	629	0	dBA	451	0	dBA	957	0	dBA	1068	0	dBA
FC_TEI	Ferrous Chloride Truck Engine Idling	628	0	dBA	445	0	dBA	952	0	dBA	1065	0	dBA
HW_CUS2	Headworks Carbon Unit Stack 2	668	16	dBA	459	25	dBA	930	18	dBA	1026	17	dBA
HW_EF1	Headworks Exhaust Fan 1	675	26	dBA	482	29	dBA	953	19	dBA	1035	15	dBA
HW_EF2	Headworks Exhaust Fan 2	640	26	dBA	459	35	dBA	958	25	dBA	1061	18	dBA
HW_EF3	Headworks Exhaust Fan 3	654	21	dBA	460	30	dBA	946	23	dBA	1045	22	dBA
HW_EF4	Headworks Exhaust Fan 4	671	21	dBA	468	30	dBA	939	23	dBA	1029	22	dBA
HW_EF5	Headworks Exhaust Fan 5	670	25	dBA	458	30	dBA	928	27	dBA	1023	25	dBA
HW_GenStackExh	Headworks Generator Exhaust Stack	676	0	dBA	467	0	dBA	933	0	dBA	1021	0	dBA
HW_GenRadExh	Headworks Generator Radiator Exhaust	678	0	dBA	467	0	dBA	931	0	dBA	1019	0	dBA
HW_GenIntake	Headworks Generator Room Intake	679	0	dBA	466	0	dBA	929	0	dBA	1017	0	dBA
TOX3_L1M	HVAC Intake Louvre 1 (TOX3) Mitigated	906	13	dBA	849	19	dBA	1271	-7	dBA	1170	-7	dBA
TOX4_L	HVAC Intake Louvre 1 (TOX4)	939	18	dBA	863	23	dBA	1260	20	dBA	1139	29	dBA
TOX3_L2M	HVAC Intake Louvre 2 (TOX3) Mitigated	907	5	dBA	851	11	dBA	1273	-13	dBA	1172	-13	dBA
ITT	Idling Transport Truck	979	2	dBA	882	2	dBA	1249	6	dBA	1104	15	dBA
LFH_EF	Lab Fume Hood Exhaust Fan	815	16	dBA	757	16	dBA	1210	-1	dBA	1162	-6	dBA
LFH_ES	Lab Fume Hood Exhaust Stack	815	18	dBA	756	17	dBA	1210	2	dBA	1162	-2	dBA
CB_MAU1	Makeup Air Unit 1 - Centrifuge Bldg	914	11	dBA	813	18	dBA	1203	12	dBA	1096	13	dBA
CB_MAU2	Makeup Air Unit 2 - Centrifuge Bldg	916	15	dBA	810	18	dBA	1197	12	dBA	1088	13	dBA
OUB_CUS1	Odour Unit Building Carbon Unit Stack 1	793	16	dBA	615	23	dBA	1017	17	dBA	1003	17	dBA
OUB_CUS2	Odour Unit Building Carbon Unit Stack 2	794	16	dBA	616	23	dBA	1016	17	dBA	1002	17	dBA
PO_TB	Polymer Truck Blower	995	0	dBA	879	0	dBA	1227	0	dBA	1071	0	dBA
PO_TEI	Polymer Truck Engine Idling	997	0	dBA	887	0	dBA	1239	0	dBA	1082	0	dBA
EF-250-01	Proposed Exhuast Fan (Plant 1 Aeration Access Stair)	627	9	dBA	616	12	dBA	1166	5	dBA	1228	4	dBA
IWOCF_ES1	Proposed Exhuast Stack (Inlet Works OCF Upgrade) 1	610	13	dBA	435	23	dBA	957	15	dBA	1081	8	dBA
IWOCF_ES2	Proposed Exhuast Stack (Inlet Works OCF Upgrade) 2	614	13	dBA	453	22	dBA	974	14	dBA	1089	13	dBA
P1OCF_ES1	Proposed Exhuast Stack (Plant 1 OCF) 1	687	17	dBA	561	20	dBA	1045	14	dBA	1092	13	dBA
P1OCF_ES2	Proposed Exhuast Stack (Plant 1 OCF) 2	690	17	dBA	562	20	dBA	1044	14	dBA	1089	13	dBA
P2OCF_ES1	Proposed Exhuast Stack (Plant 2 OCF) 1	772	11	dBA	798	17	dBA	1310	7	dBA	1288	12	dBA
P2OCF_ES2	Proposed Exhuast Stack (Plant 2 OCF) 2	779	11	dBA	800	17	dBA	1308	12	dBA	1282	12	dBA
GEB_POU	Proposed GEB Solids Exportation Portable Odour Unit	954	-6	dBA	829	15	dBA	1185	17	dBA	1053	18	dBA
MUA-921-01_IN	Proposed Ground MUA-921-01 OA Intake (Plant 1 OCF)	693	19	dBA	562	28	dBA	1040	17	dBA	1085	22	dBA
MUA-922-01_IN	Proposed Ground MUA-922-01 OA Intake (Plant 2 OCF)	791	0	dBA	821	4	dBA	1330	-6	dBA	1299	-6	dBA
MUA-150-03_IN	Proposed MUA-150-03 OA Intake Elbow (Primary Clarifier 1)	555	16	dBA	485	16	dBA	1057	9	dBA	1181	-5	dBA
MUA-300-01-02_I	Proposed MUA-300-01-02 OA Intake Louvre (Blower Building 1)	692	-6	dBA	612	10	dBA	1109	6	dBA	1142	12	dBA
MUA-300-03_IN	Proposed MUA-300-03 OA Intake Louvre (Blower Building 1)	689	2	dBA	606	16	dBA	1104	12	dBA	1138	17	dBA
EF-152-01	Proposed Rooftop EF-120-01 (Plant 2)	710	11	dBA	721	17	dBA	1247	8	dBA	1258	12	dBA
EF-152-02	Proposed Rooftop EF-120-01 (Plant 2)	727	12	dBA	725	17	dBA	1240	8	dBA	1242	13	dBA
EF-150-01	Proposed Rooftop EF-150-01 (Plant 1)	573	24	dBA	485	28	dBA	1044	22	dBA	1161	16	dBA
EF-150-02	Proposed Rooftop EF-150-02 (Plant 1)	592	24	dBA	489	28	dBA	1035	22	dBA	1143	16	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	603	21	dBA	548	22	dBA	1098	16	dBA	1184	15	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	608	21	dBA	549	22	dBA	1096	16	dBA	1180	15	dBA
MUA-152-01_IN	Proposed Rooftop MUA-152-01 OA Intake (Plant 2)	751	12	dBA	779	19	dBA	1299	10	dBA	1289	10	dBA
MUA-152-02_IN	Proposed Rooftop MUA-152-02 OA Intake (Plant 2)	758	12	dBA	781	19	dBA	1296	10	dBA	1282	10	dBA
EF-921-01	Proposed Wall EF-921-01 (Plant 1 OCF)	681	19	dBA	571	26	dBA	1063	0	dBA	1110	-2	dBA
EF-921-02	Proposed Wall EF-921-02 (Plant 1 OCF)	687	8	dBA	564	18	dBA	1049	-6	dBA	1095	-3	dBA
EF-921-03	Proposed Wall EF-921-03 (Plant 1 OCF)	693	13	dBA	581	14	dBA	1066	-6	dBA	1105	-6	dBA
EF-922-02	Proposed Wall EF-922-02 (Plant 2 OCF)	785	11	dBA	808	16	dBA	1314	12	dBA	1285	7	dBA
EF-922-03	Proposed Wall EF-922-03 (Plant 2 OCF)	777	5	dBA	806	16	dBA	1317	7	dBA	1293	7	dBA
SH_TB	Sodium Hypochlorite Truck Blower	989	0	dBA	887	0	dBA	1247	0	dBA	1095	0	dBA
SH_TEI	Sodium Hypochlorite Truck Engine Idling	995	0	dBA	890	0	dBA	1248	0	dBA	1092	0	dBA
SH_OD1	Solids Handling Overhead Door 1	948	7	dBA	834	9	dBA	1202	5	dBA	1073	7	dBA
SH_OD2	Solids Handling Overhead Door 2	934	17	dBA	807	25	dBA	1171	30	dBA	1051	26	dBA
SR_OD	Solids Receiving Overhead Door	993	2	dBA	880	4	dBA	1232	6	dBA	1076	25	dBA
TCF_GenStackExh	Thermal Conditioning Facility Generator Exhaust Stack	864	0	dBA	761	0	dBA	1169	0	dBA	1093	0	dBA
TCF_GenRadExh	Thermal Conditioning Facility Generator Radiator Exhaust	862	0	dBA	763	0	dBA	1174	0	dBA	1098	0	dBA
TCF_GenIntake	Thermal Conditioning Facility Generator Room Intake	863	0	dBA	762	0	dBA	1171	0	dBA	1095	0	dBA
TOX1_2Inlet1	TOX 1&2 Inlet 1	903	13	dBA	841	19	dBA	1261	-10	dBA	1161	-8	dBA
TOX1_2Inlet2	TOX 1&2 Inlet 2	904	13	dBA	843	19	dBA	1262	-10	dBA	1162	-8	dBA
TOX3_4Inlet1	TOX 3&4 Inlet 1 (West side)	905	13	dBA	847	21	dBA	1267	-10	dBA	1166	-9	dBA
TOX3_4Inlet2	TOX 3&4 Inlet 2 (North side)	905	15	dBA	845	21	dBA	1265	-9	dBA	1165	-8	dBA
TOX_BEM	TOX HVAC & Fluidized Air Blower Exhaust Mitigated	905	16	dBA	846	22	dBA	1266	-7	dBA	1166	-6	dBA
TOX1_2EF1	TOX1&2 Exhaust Fan1	899	-3	dBA	825	3	dBA	1239	-2	dBA	1141	1	dBA
TOX1_2EF2	TOX1&2 Exhaust Fan2	904	1	dBA	828	9	dBA	1238	-2	dBA	1136	1	dBA
TOX1_2EF3	TOX1&2 Exhaust Fan3	911	3	dBA	831	15	dBA	1236	-2	dBA	1130	1	dBA
TOX1_2EF4	TOX1&2 Exhaust Fan4	916	12	dBA	833	8	dBA	1236	6	dBA	1128	8	dBA
TOX1_2EF5	TOX1&2 Exhaust Fan5	920	16	dBA	835	6	dBA	1234	6	dBA	1123	8	dBA
TOX1_2EF6	TOX1&2 Exhaust Fan6	901	17	dBA	819	11	dBA	1227	6	dBA	1128	8	dBA
TOX1_2EF7	TOX1&2 Exhaust Fan7	905	17	dBA	821	20	dBA	1226	1	dBA	1124	8	dBA
TOX1_2EF8	TOX1&2 Exhaust Fan8	916	17	dBA	825	9	dBA	1221	5	dBA	1113	7	dBA
TOX1_2EF9	TOX1&2 Exhaust Fan9	920	15	dBA	827	10	dBA	1221	5	dBA	1110	7	dBA
TOX1_2_OD	TOX1&2 Overhead Door	933	-1	dBA	835	-1	dBA	1219	-5	dBA	1100	-3	dBA
TOX3_EF1M	TOX3 Exhaust Fan1 Mitigated	910	9	dBA	843	17	dBA	1258	1	dBA	1154	4	dBA
TOX3_EF2	TOX3 Exhaust Fan2	908	12	dBA	838	14	dBA	1251	4	dBA	1148	6	dBA
TOX3_EF3M	TOX3 Exhaust Fan3 Mitigated	913	1	dBA	848	10	dBA	1263	-4	dBA	1158	-2	dBA
TOX3_EF4M	TOX3 Exhaust Fan4 Mitigated	929	3	dBA	856	6	dBA	1259	-2	dBA	1144	0	dBA
TOX3_EF5M	TOX3 Exhaust Fan5 Mitigated	923	3	dBA	847	1	dBA	1249	-5	dBA	1137	-4	dBA
TOX3_OD	TOX3 Overhead Door	905	10	dBA	844	19	dBA	1263	-11	dBA	1163	-10	dBA
TOX4_EF1M	TOX4 Exhaust Fan1 Mitigated	932	7	dBA	850	5	dBA	1246	2	dBA	1129	5	dBA
TOX4_EF2M	TOX4 Exhaust Fan2 Mitigated	936	8	dBA	852	2	dBA	1245	2	dBA	1126	6	dBA
TOX4_EF3M	TOX4 Exhaust Fan3 Mitigated	940	8	dBA	859	2	dBA	1253	3	dBA	1131	14	dBA

Source ID	Point of Reception 5			Point of Reception 6			Point of Reception 7			Point of Reception 8			Point of Reception 9			Point of Reception 10		
	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
BF_L1	359	14	dBA	349	6	dBA	453	-4	dBA	563	2	dBA	668	-7	dBA	464	17	dBA
BF_L2	344	18	dBA	332	9	dBA	438	2	dBA	549	13	dBA	655	6	dBA	453	9	dBA
BB_AI1	658	23	dBA	594	17	dBA	565	21	dBA	655	23	dBA	690	14	dBA	788	21	dBA
BB_AI2	658	23	dBA	597	16	dBA	573	20	dBA	664	23	dBA	701	14	dBA	785	21	dBA
BB_AI3	658	23	dBA	600	13	dBA	581	20	dBA	673	23	dBA	713	17	dBA	783	21	dBA
BB_AI4	659	23	dBA	604	13	dBA	592	20	dBA	686	23	dBA	728	17	dBA	780	21	dBA
BB_AI5	660	23	dBA	609	16	dBA	602	19	dBA	697	22	dBA	741	18	dBA	778	21	dBA
BB_OD	666	8	dBA	600	15	dBA	564	20	dBA	653	22	dBA	684	9	dBA	799	11	dBA
TOX_B1	592	22	dBA	476	17	dBA	341	32	dBA	404	28	dBA	407	26	dBA	760	20	dBA
TOX_B2	593	22	dBA	477	17	dBA	341	31	dBA	404	28	dBA	407	23	dBA	761	20	dBA
TOX_B3	593	22	dBA	477	17	dBA	341	31	dBA	403	28	dBA	406	20	dBA	761	20	dBA
TOX_B4	594	22	dBA	478	17	dBA	341	31	dBA	403	23	dBA	405	16	dBA	762	20	dBA
TOX_B5	595	22	dBA	478	17	dBA	340	26	dBA	402	18	dBA	404	15	dBA	763	20	dBA
CB_CU1	612	11	dBA	508	7	dBA	402	22	dBA	475	20	dBA	486	20	dBA	771	15	dBA
SHCB_EF1	626	11	dBA	526	3	dBA	425	17	dBA	498	18	dBA	508	18	dBA	784	13	dBA
SHCB_EF2	628	11	dBA	527	3	dBA	424	20	dBA	496	18	dBA	505	18	dBA	786	13	dBA
SHCB_EF3	629	11	dBA	528	3	dBA	423	20	dBA	495	18	dBA	503	18	dBA	787	13	dBA
SHCB_EF4	631	11	dBA	529	6	dBA	422	20	dBA	493	18	dBA	500	18	dBA	790	13	dBA
FCB_OD	352	12	dBA	328	6	dBA	419	3	dBA	529	10	dBA	632	0	dBA	471	9	dBA
FC_TB	365	0	dBA	352	0	dBA	452	0	dBA	562	0	dBA	665	0	dBA	472	0	dBA
FC_TEI	366	0	dBA	355	0	dBA	457	0	dBA	568	0	dBA	671	0	dBA	471	0	dBA
HW_CUS2	408	26	dBA	393	21	dBA	480	19	dBA	590	23	dBA	686	19	dBA	510	24	dBA
HW_EF1	406	35	dBA	382	32	dBA	459	27	dBA	569	33	dBA	663	28	dBA	516	33	dBA
HW_EF2	373	37	dBA	357	29	dBA	451	24	dBA	561	30	dBA	663	29	dBA	481	34	dBA
HW_EF3	390	31	dBA	374	26	dBA	463	23	dBA	574	28	dBA	672	27	dBA	495	29	dBA
HW_EF4	407	31	dBA	389	26	dBA	472	24	dBA	582	28	dBA	677	24	dBA	513	29	dBA
HW_EF5	410	30	dBA	396	22	dBA	482	19	dBA	592	26	dBA	689	21	dBA	512	30	dBA
HW_GenStackExh	414	0	dBA	396	0	dBA	479	0	dBA	589	0	dBA	683	0	dBA	519	0	dBA
HW_GenRadExh	416	0	dBA	399	0	dBA	481	0	dBA	591	0	dBA	685	0	dBA	521	0	dBA
HW_GenIntake	417	0	dBA	400	0	dBA	483	0	dBA	593	0	dBA	687	0	dBA	522	0	dBA
TOX3_L1M	584	13	dBA	467	9	dBA	332	28	dBA	395	26	dBA	400	25	dBA	753	20	dBA
TOX4_L	619	15	dBA	505	13	dBA	373	24	dBA	435	22	dBA	434	17	dBA	785	27	dBA
TOX3_L2M	585	6	dBA	468	3	dBA	331	20	dBA	394	18	dBA	399	18	dBA	754	12	dBA
ITT	660	6	dBA	550	8	dBA	422	12	dBA	482	14	dBA	474	12	dBA	824	3	dBA
LFH_EF	495	19	dBA	387	11	dBA	293	28	dBA	378	26	dBA	421	20	dBA	661	20	dBA
LFH_ES	495	21	dBA	386	13	dBA	293	31	dBA	378	28	dBA	421	22	dBA	661	22	dBA
CB_MAU1	596	15	dBA	492	9	dBA	387	20	dBA	460	24	dBA	474	23	dBA	756	15	dBA
CB_MAU2	599	15	dBA	496	9	dBA	394	19	dBA	468	21	dBA	483	23	dBA	759	18	dBA
OUB_CUS1	500	24	dBA	440	13	dBA	443	21	dBA	545	24	dBA	609	18	dBA	633	22	dBA
OUB_CUS2	501	24	dBA	441	13	dBA	444	21	dBA	545	24	dBA	610	18	dBA	634	22	dBA
PO_TB	677	0	dBA	571	0	dBA	452	0	dBA	515	0	dBA	508	0	dBA	838	0	dBA
PO_TEI	679	0	dBA	571	0	dBA	448	0	dBA	508	0	dBA	499	0	dBA	841	0	dBA
EF-250-01	309	10	dBA	216	5	dBA	244	18	dBA	354	9	dBA	460	7	dBA	474	12	dBA
IWOCF_ES1	349	24	dBA	342	20	dBA	452	15	dBA	563	20	dBA	670	18	dBA	452	22	dBA
IWOCF_ES2	345	24	dBA	331	20	dBA	434	15	dBA	545	20	dBA	651	19	dBA	455	22	dBA
P1OCF_ES1	390	23	dBA	335	17	dBA	374	19	dBA	482	22	dBA	570	17	dBA	528	20	dBA
P1OCF_ES2	393	23	dBA	338	17	dBA	375	19	dBA	483	22	dBA	571	17	dBA	530	20	dBA
P2OCF_ES1	451	16	dBA	320	11	dBA	171	31	dBA	251	27	dBA	305	21	dBA	627	19	dBA
P2OCF_ES2	457	16	dBA	328	11	dBA	179	31	dBA	258	27	dBA	309	21	dBA	633	19	dBA
GEB_POU	639	-1	dBA	539	0	dBA	439	2	dBA	511	5	dBA	519	2	dBA	797	1	dBA
MUA-921-01_IN	397	26	dBA	342	12	dBA	380	7	dBA	488	8	dBA	575	3	dBA	534	28	dBA
MUA-922-01_IN	470	6	dBA	337	8	dBA	173	21	dBA	244	19	dBA	288	15	dBA	647	3	dBA
MUA-150-03_IN	264	23	dBA	238	12	dBA	358	4	dBA	469	17	dBA	586	7	dBA	397	18	dBA
MUA-300-01-02_I	381	-1	dBA	303	3	dBA	313	1	dBA	420	2	dBA	505	-5	dBA	534	-3	dBA
MUA-300-03_IN	380	10	dBA	304	8	dBA	318	6	dBA	425	8	dBA	511	1	dBA	532	9	dBA
EF-152-01	388	12	dBA	268	8	dBA	186	26	dBA	286	26	dBA	368	19	dBA	561	19	dBA
EF-152-02	404	12	dBA	287	8	dBA	202	26	dBA	300	25	dBA	375	19	dBA	577	19	dBA
EF-150-01	284	33	dBA	257	25	dBA	368	18	dBA	479	29	dBA	592	22	dBA	414	30	dBA
EF-150-02	304	33	dBA	274	21	dBA	375	18	dBA	485	29	dBA	595	22	dBA	433	29	dBA
MUA-150-01_IN	296	29	dBA	236	12	dBA	311	7	dBA	422	16	dBA	530	3	dBA	445	24	dBA
MUA-150-01_IN	302	29	dBA	242	12	dBA	313	7	dBA	424	16	dBA	531	3	dBA	450	24	dBA
MUA-152-01_IN	429	13	dBA	300	9	dBA	163	29	dBA	250	28	dBA	316	8	dBA	606	21	dBA
MUA-152-02_IN	436	13	dBA	307	11	dBA	171	26	dBA	257	21	dBA	319	8	dBA	612	21	dBA
EF-921-01	380	24	dBA	319	14	dBA	354	16	dBA	462	27	dBA	552	14	dBA	523	26	dBA
EF-921-02	389	18	dBA	332	6	dBA	370	16	dBA	478	18	dBA	566	12	dBA	528	12	dBA
EF-921-03	392	20	dBA	328	11	dBA	355	15	dBA	462	19	dBA	548	14	dBA	535	17	dBA
EF-922-02	464	12	dBA	333	6	dBA	180	25	dBA	256	18	dBA	304	8	dBA	640	18	dBA
EF-922-03	456	6	dBA	325	3	dBA	170	20	dBA	247	16	dBA	299	8	dBA	633	16	dBA
SH_TB	671	0	dBA	561	0	dBA	435	0	dBA	495	0	dBA	485	0	dBA	834	0	dBA
SH_TEI	676	0	dBA	567	0	dBA	440	0	dBA	500	0	dBA	488	0	dBA	840	0	dBA
SH_OD1	631	12	dBA	528	13	dBA	422	16	dBA	492	21	dBA	498	29	dBA	791	13	dBA
SH_OD2	620	17	dBA	522	19	dBA	429	15	dBA	505	14	dBA	519	13	dBA	776	19	dBA
SR_OD	676	6	dBA	569	8	dBA	448	13	dBA	511	13	dBA	503	11	dBA	837	3	dBA
TCF_GenStackExh	548	0	dBA	449	0	dBA	367	0	dBA	450	0	dBA	482	0	dBA	707	0	dBA
TCF_GenRadExh	546	0	dBA	447	0	dBA	362	0	dBA	445	0	dBA	477	0	dBA	706	0	dBA
TCF_GenIntake	547	0	dBA	448	0	dBA	365	0	dBA	448	0	dBA	480	0	dBA	707	0	dBA
TOX1_2Inlet1	582	11	dBA	467	8	dBA	336	30	dBA	402	28	dBA	409	27	dBA	750	17	dBA
TOX1_2Inlet2	583	11	dBA	467	8	dBA	336	30	dBA	402	28	dBA	409	27	dBA	751	17	dBA
TOX3_4Inlet1	584	11	dBA	468	8	dBA	334	30	dBA	398	28	dBA	404	23	dBA	753	16	dBA
TOX3_4Inlet2	583	13	dBA	467	10	dBA	335	26	dBA	399	21	dBA	406	18	dBA	752	19	dBA
TOX_BEM	584	14	dBA	467	11	dBA	334	31	dBA	398	29	dBA	404	29	dBA	752	19	dBA
TOX1_2EF1	579	2	dBA	468	10	dBA	347	25	dBA	417	23	dBA	430	22	dBA	745	9	dBA
TOX1_2EF2	584	4	dBA	473	0	dBA	353	24	dBA	423	22	dBA	434	22	dBA	750	8	dBA
TOX1_2EF3	592	6	dBA	481	2	dBA	361	24	dBA	430	24	dBA	440	25	dBA	756	8	dBA
TOX1_2EF4	596	15	dBA	485	9	dBA	366	32	dBA	434	31	dBA	443	32	dBA	760	17	dBA
TOX1_2EF5	601	19	dBA	491	10	dBA	371	31	dBA	440	30	dBA	447	32	dBA	765	19	dBA
TOX1_2EF6	582	22	dBA	472	14	dBA	357	22	dBA	429	24	dBA	443	30	dBA	746	20	dBA
TOX1_2EF7	585	22	dBA	477	14	dBA	362	23	dBA	433	27	dBA	446	30	dBA	749	24	dBA
TOX1_2EF8	597	27	dBA	489	14	dBA	376	26	dBA	446	32	dBA	457	29	dBA	760	19	dBA
TOX1_2EF9	601	22	dBA	494	14	dBA	380	27	dBA	451	32	dBA	461	29	dBA	764	18	dBA
TOX1_2_OD	614	6	dBA	508	6	dBA	395	13	dBA	464	6	dBA	471	8	dBA	777	0	dBA
TOX3_EF1M	589	13	dBA	474	8	dBA	344	24	dBA	410	22	dBA	416	23	dBA	756	16	dBA
TOX3_EF2	587	17	dBA	473	12	dBA	347	27	dBA	414	25	dBA	422	25	dBA	753	19	dBA
TOX3_EF3M	591	6	dBA	476	2	dBA	344	17	dBA	408	15	dBA	413	9	dBA	759	8	dBA
TOX3_EF4M	608	8	dBA	494	4	dBA	363	18	dBA	426	11	dBA	427	7	dBA	774	10	dBA
TOX3_EF5M	603	8	dBA	491	2	dBA	364	16	dBA	429	14	dBA	433	5	dBA	769	9	dBA
TOX3_OD	584	8	dBA	468	6	dBA	336	27	dBA	401	25	dBA	408	20	dBA	752	15	dBA
TOX4_EF1M	611	13	dBA	500	10	dBA	374	26	dBA	439	23	dBA	442	22	dBA	777	12	dBA
TOX4_EF2M	616	11	dBA	504	10	dBA	379	25	dBA	444	22	dBA	446	17	dBA	781	12	dBA
TOX4_EF3M	619	15	dBA	507	10	dBA	378	26	dBA	441	18	dBA	441	20	dBA	785	14	dBA

Table 5: Point of Reception Noise Impact (Night, Baseline Conditions)

Project: G.E. Booth WRRF

Location: Mississauga, ON

POR	Point of Reception Description	X	Y	Z [2]
POR01	2-Storey Dwelling West of the Facility	616496	4826107	4.5
POR02	7-Storey Apartment Bldg	616806	4826529	25.5
POR03	20-Storey Apartment Bldg North of the Facility	617191	4827159	7.5
POR04	2-Storey Dwelling North-East of the Facility	617868	4826965	5
POR05	Proposed Elementary School (Vacant Lot) 3rd Floor	616805	4826016	10.5
POR06	Proposed Residential (Vacant Lot) 4th Floor	616911	4825919	7.5
POR07	Proposed Residential (Vacant Lot) 8th Floor	617081	4825755	22.5
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	617079	4825644	22.5
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	617199	4825544	19.5
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	616657	4826114	44

Source ID	Source Description	Point of Reception 1			Point of Reception 2			Point of Reception 3			Point of Reception 4			Point of Reception 5		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
TOX4_OD	TOX4 Overhead Door	945	-6	dBA	855	-5	dBA	1242	-6	dBA	1117	17	dBA	625	-1	dBA
HW_CUS1	Headworks Carbon Unit Stack 1	657	16	dBA	453	26	dBA	934	18	dBA	1035	17	dBA	397	26	dBA
EWPS_EF701	New EWPS Roof Exhaust Fan 1	995	9	dBA	786	15	dBA	1060	11	dBA	905	13	dBA	697	15	dBA
EWPS_EF702	New EWPS Roof Exhaust Fan 2	975	9	dBA	766	15	dBA	1048	11	dBA	907	13	dBA	678	16	dBA
EWPS_EF703	New EWPS Roof TCVX Vanaxial Exhaust Fan	979	18	dBA	766	24	dBA	1045	18	dBA	902	23	dBA	682	24	dBA
EWPS_AHU_702I	New EWPS Air Handling Unit 2	992	13	dBA	771	16	dBA	1036	16	dBA	885	21	dBA	697	16	dBA
EWPS_AHU_701	New EWPS Air Handling Unit 1	974	7	dBA	763	16	dBA	1044	10	dBA	905	14	dBA	677	14	dBA
EWPS_CU_1	New EWPS Air-Cooled Condenser	990	-6	dBA	768	-6	dBA	1032	-1	dBA	883	3	dBA	696	-3	dBA
SC_GEN	New Storage Complex 200 KW Diesel Standby Generator Exhaust	708	0	dBA	448	0	dBA	874	0	dBA	965	0	dBA	463	0	dBA
SC_GEN_C2	New Storage Complex 200 KW Diesel Standby Generator Casing (north)	709	0	dBA	450	0	dBA	874	0	dBA	965	0	dBA	464	0	dBA
SC_GEN_C1	New Storage Complex 200 KW Diesel Standby Generator Casing (south)	709	0	dBA	449	0	dBA	873	0	dBA	964	0	dBA	464	0	dBA
SC_RTU_1	New Storage Complex Trane 10 Ton Rooftop Unit 1	730	15	dBA	453	24	dBA	855	17	dBA	940	12	dBA	487	23	dBA
SC_RTU_2	New Storage Complex Trane 10 Ton Rooftop Unit 2	729	15	dBA	459	24	dBA	863	17	dBA	944	16	dBA	484	23	dBA
SC_ERV_1	New Storage Complex Energy Recovery Unit	729	19	dBA	456	29	dBA	860	22	dBA	943	18	dBA	485	28	dBA
SC_EF	New Storage Complex Wall Pipe Exhaust	718	-3	dBA	458	6	dBA	875	-6	dBA	959	-4	dBA	470	23	dBA
SC_AHU_1	New Storage Complex Indirect Fired Make-up Air Unit	722	25	dBA	452	35	dBA	862	27	dBA	949	22	dBA	478	34	dBA
SHTP	Sodium Hypochlorite Truck Passby	-	-86	dBA	-	-73	dBA	-	-83	dBA	-	-84	dBA	-	-78	dBA
FCTP	Ferrous Chloride Truck Passby	-	-84	dBA	-	-70	dBA	-	-81	dBA	-	-84	dBA	-	-76	dBA
GTP	Garbage Truck Passby	-	-85	dBA	-	-72	dBA	-	-83	dBA	-	-84	dBA	-	-77	dBA
PTP	Polymer Truck Passby	-	-82	dBA	-	-70	dBA	-	-80	dBA	-	-82	dBA	-	-76	dBA
SRTP	Sludge Receiving Truck Passby	-	-84	dBA	-	-72	dBA	-	-81	dBA	-	-83	dBA	-	-77	dBA

Source ID	Source Description	Point of Reception 6			Point of Reception 7			Point of Reception 8			Point of Reception 9			Point of Reception 10		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
TOX4_OD	TOX4 Overhead Door	515	1	dBA	391	9	dBA	455	3	dBA	456	5	dBA	790	-4	dBA
HW_CUS1	Headworks Carbon Unit Stack 1	384	22	dBA	475	19	dBA	585	23	dBA	684	20	dBA	499	24	dBA
EWPS_EF701	New EWPS Roof Exhaust Fan 1	621	10	dBA	564	18	dBA	646	15	dBA	665	9	dBA	835	14	dBA
EWPS_EF702	New EWPS Roof Exhaust Fan 2	605	11	dBA	554	16	dBA	639	17	dBA	663	9	dBA	815	14	dBA
EWPS_EF703	New EWPS Roof TCVX Vanaxial Exhaust Fan	609	18	dBA	560	4	dBA	645	11	dBA	668	1	dBA	819	24	dBA
EWPS_AHU_702I	New EWPS Air Handling Unit 2	626	5	dBA	578	11	dBA	662	14	dBA	685	-3	dBA	832	18	dBA
EWPS_AHU_701	New EWPS Air Handling Unit 1	604	10	dBA	555	-4	dBA	641	8	dBA	665	-8	dBA	814	12	dBA
EWPS_CU_1	New EWPS Air-Cooled Condenser	625	-7	dBA	579	-2	dBA	664	1	dBA	688	-23	dBA	831	-2	dBA
SC_GEN	New Storage Complex 200 KW Diesel Standby Generator Exhaust	455	0	dBA	540	0	dBA	650	0	dBA	741	0	dBA	554	0	dBA
SC_GEN_C2	New Storage Complex 200 KW Diesel Standby Generator Casing (north)	456	0	dBA	540	0	dBA	650	0	dBA	741	0	dBA	555	0	dBA
SC_GEN_C1	New Storage Complex 200 KW Diesel Standby Generator Casing (south)	456	0	dBA	541	0	dBA	651	0	dBA	742	0	dBA	555	0	dBA
SC_RTU_1	New Storage Complex Trane 10 Ton Rooftop Unit 1	480	14	dBA	562	17	dBA	671	21	dBA	760	15	dBA	575	22	dBA
SC_RTU_2	New Storage Complex Trane 10 Ton Rooftop Unit 2	475	13	dBA	554	18	dBA	663	21	dBA	752	15	dBA	575	22	dBA
SC_ERV_1	New Storage Complex Energy Recovery Unit	476	18	dBA	557	22	dBA	666	25	dBA	754	20	dBA	574	26	dBA
SC_EF	New Storage Complex Wall Pipe Exhaust	460	4	dBA	541	13	dBA	650	19	dBA	740	13	dBA	563	21	dBA
SC_AHU_1	New Storage Complex Indirect Fired Make-up Air Unit	471	23	dBA	553	26	dBA	662	31	dBA	752	25	dBA	568	32	dBA
SHTP	Sodium Hypochlorite Truck Passby	-	-87	dBA	-	-82	dBA	-	-79	dBA	-	-85	dBA	-	-79	dBA
FCTP	Ferrous Chloride Truck Passby	-	-85	dBA	-	-87	dBA	-	-80	dBA	-	-86	dBA	-	-77	dBA
GTP	Garbage Truck Passby	-	-86	dBA	-	-86	dBA	-	-80	dBA	-	-86	dBA	-	-78	dBA
PTP	Polymer Truck Passby	-	-84	dBA	-	-76	dBA	-	-74	dBA	-	-80	dBA	-	-76	dBA
SRTP	Sludge Receiving Truck Passby	-	-85	dBA	-	-81	dBA	-	-78	dBA	-	-84	dBA	-	-78	dBA

Notes on Table:

1. dBA = 1-hour energy equivalent sound (L_{eq} (1-hr))
2. Height above local grade

Table 6: Point of Reception Noise Impact Non-Emergency Testing (Daytime/Evening, Baseline Conditions)

Project: G.E. Booth WRRF

Location: Mississauga, ON

POR	Point of Reception Description	X	Y	Z [2]
POR01	2-Storey Dwelling West of the Facility	616496	4826107	4.5
POR02	7-Storey Apartment Bldg	616806	4826529	25.5
POR03	20-Storey Apartment Bldg North of the Facility	617191	4827159	7.5
POR04	2-Storey Dwelling North-East of the Facility	617868	4826965	5
POR05	Proposed Elementary School (Vacant Lot) 3rd Floor	616805	4826016	10.5
POR06	Proposed Residential (Vacant Lot) 4th Floor	616911	4825919	7.5
POR07	Proposed Residential (Vacant Lot) 8th Floor	617081	4825755	22.5
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	617079	4825644	22.5
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	617199	4825544	19.5
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	616657	4826114	44

Source ID	Source Description	Point of Reception 1			Point of Reception 2			Point of Reception 3			Point of Reception 4			Point of Reception 5		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
HW_GenStackExh	Headworks Generator Exhaust Stack	621	-3	dBA	444	8	dBA	956	6	dBA	1073	1	dBA	359	4	dBA
HW_GenRadExh	Headworks Generator Radiator Exhaust	611	5	dBA	448	14	dBA	971	15	dBA	1088	5	dBA	344	11	dBA
HW_GenIntake	Headworks Generator Room Intake	947	5	dBA	718	30	dBA	999	26	dBA	884	25	dBA	658	10	dBA
TCF_GenStackExh	Thermal Conditioning Facility Generator Exhaust Stack	945	17	dBA	709	19	dBA	986	14	dBA	875	10	dBA	658	17	dBA
TCF_GenRadExh	Thermal Conditioning Facility Generator Radiator Exhaust	942	43	dBA	699	44	dBA	972	23	dBA	865	19	dBA	658	46	dBA
TCF_GenIntake	Thermal Conditioning Facility Generator Room Intake	939	35	dBA	687	36	dBA	953	34	dBA	852	29	dBA	659	39	dBA
SC_GEN	New Storage Complex 200 KW Diesel Standby Generator Exhaust	937	30	dBA	676	39	dBA	937	26	dBA	842	13	dBA	660	39	dBA
SC_GEN_C2	New Storage Complex 200 KW Diesel Standby Generator Casing (north)	958	24	dBA	734	31	dBA	1013	12	dBA	888	10	dBA	666	40	dBA
SC_GEN_C1	New Storage Complex 200 KW Diesel Standby Generator Casing (south)	913	32	dBA	852	41	dBA	1268	25	dBA	1163	13	dBA	592	33	dBA

Source ID	Point of Reception 6			Point of Reception 7			Point of Reception 8			Point of Reception 9			Point of Reception 10		
	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
HW_GenStackExh	349	3	dBA	453	4	dBA	563	8	dBA	668	1	dBA	464	5	dBA
HW_GenRadExh	332	10	dBA	438	9	dBA	549	15	dBA	655	7	dBA	453	11	dBA
HW_GenIntake	594	10	dBA	565	8	dBA	655	10	dBA	690	4	dBA	788	11	dBA
TCF_GenStackExh	597	13	dBA	573	26	dBA	664	23	dBA	701	19	dBA	785	19	dBA
TCF_GenRadExh	600	36	dBA	581	54	dBA	673	51	dBA	713	44	dBA	783	46	dBA
TCF_GenIntake	604	31	dBA	592	36	dBA	686	32	dBA	728	19	dBA	780	39	dBA
SC_GEN	609	24	dBA	602	23	dBA	697	31	dBA	741	27	dBA	778	37	dBA
SC_GEN_C2	600	24	dBA	564	22	dBA	653	35	dBA	684	29	dBA	799	38	dBA
SC_GEN_C1	476	21	dBA	341	17	dBA	404	21	dBA	407	17	dBA	760	35	dBA

Notes on Table:

1. dBA = 1-hour energy equivalent sound (L_{eq} (1-hr))
2. Height above local grade

Table 7: Point of Reception Noise Impact (Daytime/Evening, Proposed Capacity Expansion)

Project: G.E. Booth WRRF

Location: Mississauga, ON

POR	Point of Reception Description	X	Y	Z [2]
POR01	2-Storey Dwelling West of the Facility	616496	4826107	4.5
POR02	7-Storey Apartment Bldg	616806	4826529	25.5
POR03	20-Storey Apartment Bldg North of the Facility	617191	4827159	7.5
POR04	2-Storey Dwelling North-East of the Facility	617868	4826965	5
POR05	Proposed Elementary School (Vacant Lot) 3rd Floor	616805	4826016	10.5
POR06	Proposed Residential (Vacant Lot) 4th Floor	616911	4825919	7.5
POR07	Proposed Residential (Vacant Lot) 8th Floor	617081	4825755	22.5
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	617079	4825644	22.5
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	617199	4825544	19.5
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	616657	4826114	44

Source ID	Source Description	Point of Reception 1			Point of Reception 2			Point of Reception 3			Point of Reception 4			Point of Reception 5		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
BF_L1	Biofilter Building Louvre 1	621	10	dBA	444	3	dBA	956	12	dBA	1073	-3	dBA	359	14	dBA
BF_L2	Biofilter Building Louvre 1	611	-6	dBA	448	3	dBA	971	-7	dBA	1088	-16	dBA	344	18	dBA
BB_AI1	Blower Building Air Intake1	947	16	dBA	718	21	dBA	999	13	dBA	884	4	dBA	658	23	dBA
BB_AI2	Blower Building Air Intake2	945	15	dBA	709	21	dBA	986	14	dBA	875	5	dBA	658	23	dBA
BB_AI3	Blower Building Air Intake3	942	16	dBA	699	22	dBA	972	14	dBA	865	5	dBA	658	23	dBA
BB_AI4	Blower Building Air Intake4	939	15	dBA	687	23	dBA	953	14	dBA	852	6	dBA	659	23	dBA
BB_AI5	Blower Building Air Intake5	937	15	dBA	676	23	dBA	937	15	dBA	842	8	dBA	660	23	dBA
BB_OD	Blower Building Overhead Door	958	4	dBA	734	5	dBA	1013	-6	dBA	888	18	dBA	666	8	dBA
TOX_B1	Boiler Exhaust 1	913	17	dBA	852	21	dBA	1268	13	dBA	1163	14	dBA	592	22	dBA
TOX_B2	Boiler Exhaust 2	914	17	dBA	853	21	dBA	1270	13	dBA	1164	14	dBA	593	22	dBA
TOX_B3	Boiler Exhaust 3	915	17	dBA	854	21	dBA	1271	13	dBA	1165	14	dBA	593	22	dBA
TOX_B4	Boiler Exhaust 4	916	19	dBA	856	18	dBA	1272	13	dBA	1166	14	dBA	594	22	dBA
TOX_B5	Boiler Exhaust 5	917	17	dBA	857	18	dBA	1274	13	dBA	1167	14	dBA	595	22	dBA
CB_CU1	Condenser 1 - Centrifuge Bldg	929	8	dBA	821	15	dBA	1201	9	dBA	1085	11	dBA	612	11	dBA
SHCB_EF1	Exhaust fan 1 Solids Handling/Centrifuge Building	942	11	dBA	822	13	dBA	1188	9	dBA	1063	10	dBA	626	11	dBA
SHCB_EF2	Exhaust fan 2 Solids Handling/Centrifuge Building	944	6	dBA	826	13	dBA	1192	9	dBA	1066	10	dBA	628	11	dBA
SHCB_EF3	Exhaust fan 3 Solids Handling/Centrifuge Building	945	6	dBA	828	13	dBA	1195	9	dBA	1068	10	dBA	629	11	dBA
SHCB_EF4	Exhaust fan 4 Solids Handling/Centrifuge Building	948	6	dBA	832	13	dBA	1200	9	dBA	1072	10	dBA	631	11	dBA
FCB_OD	Ferrous Chloride Building Open Door	629	2	dBA	478	5	dBA	990	10	dBA	1089	5	dBA	352	12	dBA
FC_TB	Ferrous Chloride Truck Blower	629	16	dBA	451	30	dBA	957	27	dBA	1068	2	dBA	365	27	dBA
FC_TEI	Ferrous Chloride Truck Engine Idling	628	37	dBA	445	42	dBA	952	39	dBA	1065	19	dBA	366	36	dBA
HW_CUS2	Headworks Carbon Unit Stack 2	668	16	dBA	459	25	dBA	930	18	dBA	1026	17	dBA	408	26	dBA
HW_EF1	Headworks Exhaust Fan 1	675	26	dBA	482	29	dBA	953	19	dBA	1035	15	dBA	406	35	dBA
HW_EF2	Headworks Exhaust Fan 2	640	26	dBA	459	35	dBA	958	25	dBA	1061	18	dBA	373	37	dBA
HW_EF3	Headworks Exhaust Fan 3	654	21	dBA	460	31	dBA	946	23	dBA	1045	22	dBA	390	31	dBA
HW_EF4	Headworks Exhaust Fan 4	671	21	dBA	468	30	dBA	939	23	dBA	1029	22	dBA	407	31	dBA
HW_EF5	Headworks Exhaust Fan 5	670	25	dBA	458	30	dBA	928	27	dBA	1023	25	dBA	410	30	dBA
HW_GenStackExh	Headworks Generator Exhaust Stack	676	0	dBA	467	0	dBA	933	0	dBA	1021	0	dBA	414	0	dBA
HW_GenRadExh	Headworks Generator Radiator Exhaust	678	0	dBA	467	0	dBA	931	0	dBA	1019	0	dBA	416	0	dBA
HW_GenIntake	Headworks Generator Room Intake	679	0	dBA	466	0	dBA	929	0	dBA	1017	0	dBA	417	0	dBA
TOX3_L1M	HVAC Intake Louvre 1 (TOX3) Mitigated	906	13	dBA	849	19	dBA	1271	-7	dBA	1170	-7	dBA	584	13	dBA
TOX4_L	HVAC Intake Louvre 1 (TOX4)	939	18	dBA	863	23	dBA	1260	20	dBA	1139	29	dBA	619	15	dBA
TOX3_L2M	HVAC Intake Louvre 2 (TOX3) Mitigated	907	5	dBA	851	11	dBA	1273	-13	dBA	1172	-13	dBA	585	6	dBA
ITT	Idling Transport Truck	979	2	dBA	882	10	dBA	1249	6	dBA	1104	15	dBA	660	6	dBA
LFH_EF	Lab Fume Hood Exhaust Fan	815	13	dBA	757	16	dBA	1210	-1	dBA	1162	-6	dBA	495	18	dBA
LFH_ES	Lab Fume Hood Exhaust Stack	815	16	dBA	756	17	dBA	1210	2	dBA	1162	-2	dBA	495	21	dBA
CB_MAU1	Makeup Air Unit 1 - Centrifuge Bldg	914	11	dBA	813	18	dBA	1203	12	dBA	1096	13	dBA	596	15	dBA
CB_MAU2	Makeup Air Unit 2 - Centrifuge Bldg	916	15	dBA	810	18	dBA	1197	12	dBA	1088	13	dBA	599	15	dBA
OUB_CUS1	Odour Unit Building Carbon Unit Stack 1	793	16	dBA	615	23	dBA	1017	17	dBA	1003	17	dBA	500	24	dBA
OUB_CUS2	Odour Unit Building Carbon Unit Stack 2	794	16	dBA	616	23	dBA	1016	17	dBA	1002	17	dBA	501	24	dBA
PO_TB	Polymer Truck Blower	995	12	dBA	879	23	dBA	1227	13	dBA	1071	31	dBA	677	17	dBA
PO_TEI	Polymer Truck Engine Idling	997	7	dBA	887	16	dBA	1239	7	dBA	1082	21	dBA	679	9	dBA
EF-250-01	Proposed Exhaust Fan (Plant 1 Aeration Access Stair)	627	9	dBA	616	12	dBA	1166	5	dBA	1228	4	dBA	309	10	dBA
IWOCF_ES1	Proposed Exhaust Stack (Inlet Works OCF Upgrade) 1	610	13	dBA	435	23	dBA	957	15	dBA	1081	8	dBA	349	24	dBA
IWOCF_ES2	Proposed Exhaust Stack (Inlet Works OCF Upgrade) 2	614	13	dBA	453	22	dBA	974	14	dBA	1089	13	dBA	345	24	dBA
P1OCF_ES1	Proposed Exhaust Stack (Plant 1 OCF) 1	687	17	dBA	561	21	dBA	1045	14	dBA	1092	13	dBA	390	23	dBA
P1OCF_ES2	Proposed Exhaust Stack (Plant 1 OCF) 2	690	17	dBA	562	20	dBA	1044	14	dBA	1089	13	dBA	393	23	dBA
P2OCF_ES1	Proposed Exhaust Stack (Plant 2 OCF) 1	772	11	dBA	798	17	dBA	1310	7	dBA	1288	12	dBA	451	16	dBA
P2OCF_ES2	Proposed Exhaust Stack (Plant 2 OCF) 2	779	11	dBA	800	17	dBA	1308	12	dBA	1282	12	dBA	457	16	dBA
GEB_POU	Proposed GEB Solids Exportation Portable Odour Unit	954	0	dBA	829	15	dBA	1185	12	dBA	1053	18	dBA	639	5	dBA
MUA-921-01_IN	Proposed Ground MUA-921-01 OA Intake (Plant 1 OCF)	693	14	dBA	562	28	dBA	1040	17	dBA	1085	22	dBA	397	24	dBA
MUA-922-01_IN	Proposed Ground MUA-922-01 OA Intake (Plant 2 OCF)	791	0	dBA	821	4	dBA	1330	-6	dBA	1299	-6	dBA	470	6	dBA
MUA-150-03_IN	Proposed MUA-150-03 OA Intake Elbow (Primary Clarifier 1)	555	16	dBA	485	16	dBA	1057	9	dBA	1181	-5	dBA	264	23	dBA
MUA-300-01-02_I	Proposed MUA-300-01-02 OA Intake Louvre (Blower Building 1)	692	-7	dBA	612	9	dBA	1109	6	dBA	1142	12	dBA	381	-1	dBA
MUA-300-03_IN	Proposed MUA-300-03 OA Intake Louvre (Blower Building 1)	689	1	dBA	606	15	dBA	1104	12	dBA	1138	17	dBA	380	10	dBA
EF-152-01	Proposed Rooftop EF-120-01 (Plant 2)	710	11	dBA	721	17	dBA	1247	8	dBA	1258	12	dBA	388	12	dBA
EF-152-02	Proposed Rooftop EF-120-01 (Plant 2)	727	12	dBA	725	17	dBA	1240	8	dBA	1242	13	dBA	404	12	dBA
EF-150-01	Proposed Rooftop EF-150-01 (Plant 1)	573	24	dBA	485	28	dBA	1044	22	dBA	1161	16	dBA	284	33	dBA
EF-150-02	Proposed Rooftop EF-150-02 (Plant 1)	592	24	dBA	489	28	dBA	1035	22	dBA	1143	16	dBA	304	33	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	603	21	dBA	548	22	dBA	1098	16	dBA	1184	15	dBA	296	29	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	608	21	dBA	549	22	dBA	1096	16	dBA	1180	15	dBA	302	29	dBA
MUA-152-01_IN	Proposed Rooftop MUA-152-01 OA Intake (Plant 2)	751	12	dBA	779	19	dBA	1299	10	dBA	1289	10	dBA	429	13	dBA
MUA-152-02_IN	Proposed Rooftop MUA-152-02 OA Intake (Plant 2)	758	12	dBA	781	19	dBA	1296	10	dBA	1282	10	dBA	436	13	dBA
EF-921-01	Proposed Wall EF-921-01 (Plant 1 OCF)	681	14	dBA	571	22	dBA	1063	0	dBA	1110	-2	dBA	380	22	dBA
EF-921-02	Proposed Wall EF-921-02 (Plant 1 OCF)	687	8	dBA	564	18	dBA	1049	-6	dBA	1095	-3	dBA	389	18	dBA
EF-921-03	Proposed Wall EF-921-03 (Plant 1 OCF)	693	13	dBA	581	16	dBA	1066	-6	dBA	1105	-6	dBA	392	20	dBA
EF-922-02	Proposed Wall EF-922-02 (Plant 2 OCF)	785	11	dBA	808	16	dBA	1314	12	dBA	1285	7	dBA	464	12	dBA
EF-922-03	Proposed Wall EF-922-03 (Plant 2 OCF)	777	5	dBA	806	16	dBA	1317	7	dBA	1293	7	dBA	456	6	dBA
SH_TB	Sodium Hypochlorite Truck Blower	989	9	dBA	887	17	dBA	1247	18	dBA	1095	20	dBA	671	14	dBA
SH_TEI	Sodium Hypochlorite Truck Engine Idling	995	7	dBA	890	13	dBA	1248	15	dBA	1092	29	dBA	676	12	dBA
SH_OD1	Solids Handling Overhead Door 1	948	15	dBA	834	8	dBA	1202	5	dBA	1073	7	dBA	631	16	dBA
SH_OD2	Solids Handling Overhead Door 2	934	17	dBA	807	25	dBA	1171	25	dBA	1051	26	dBA	620	17	dBA
SR_OD	Solids Receiving Overhead Door	993	9	dBA	880	21	dBA	1232	6	dBA	1076	25	dBA	676	12	dBA
TCF_GenStackExh	Thermal Conditioning Facility Generator Exhaust Stack	864	0	dBA	761	0	dBA	1169	0	dBA	1093	0	dBA	548	0	dBA
TCF_GenRadExh	Thermal Conditioning Facility Generator Radiator Exhaust	862	0	dBA	763	0	dBA	1174	0	dBA	1098	0	dBA	546	0	dBA
TCF_GenIntake	Thermal Conditioning Facility Generator Room Intake	863	0	dBA	762	0	dBA	1171	0	dBA	1095	0	dBA	547	0	dBA
TOX1_2Inlet1	TOX 1&2 Inlet 1	903	13	dBA	841	19	dBA	1261	-10	dBA	1161	-8	dBA	582	11	dBA
TOX1_2Inlet2	TOX 1&2 Inlet 2	904	13	dBA	843	19	dBA	1262	-10	dBA	1162	-8	dBA	583	11	dBA
TOX3_4Inlet1	TOX 3&4 Inlet 1 (West side)	905	13	dBA	847	22	dBA	1267	-10	dBA	1166	-9	dBA	584	11	dBA
TOX3_4Inlet2	TOX 3&4 Inlet 2 (North side)	905	15	dBA	845	21	dBA	1265	-9	dBA	1165	-8	dBA	583	13	dBA
TOX_BEM	TOX HVAC & Fluidized Air Blower Exhaust Mitigated	905	16	dBA	846	22	dBA	1266	-7	dBA	1166	-6	dBA	584	14	dBA
TOX1_2EF1	TOX1&2 Exhaust Fan1	899	-3	dBA	825	3	dBA	1239	-2	dBA	1141	1	dBA	579	2	dBA
TOX1_2EF2	TOX1&2 Exhaust Fan2	904	1	dBA	828	9	dBA	1238	-2	dBA	1136	1	dBA	584	4	dBA
TOX1_2EF3	TOX1&2 Exhaust Fan3	911	3	dBA	831	15	dBA	1236	-2	dBA	1130	1	dBA	592	6	dBA
TOX1_2EF4	TOX1&2 Exhaust Fan4	916	12	dBA	833	8	dBA	1236	6	dBA	1128	8	dBA	596	15	dBA
TOX1_2EF5	TOX1&2 Exhaust Fan5	920	16	dBA	835	6	dBA	1234	6	dBA	1123	8	dBA	601	19	dBA
TOX1_2EF6	TOX1&2 Exhaust Fan6	901	17	dBA	819	11	dBA	1227	6	dBA	1128	8	dBA	582	22	dBA
TOX1_2EF7	TOX1&2 Exhaust Fan7	905	17	dBA	821	20	dBA	1226	1	dBA	1124	8	dBA	585	22	dBA
TOX1_2EF8	TOX1&2 Exhaust Fan8	916	17	dBA	825	9	dBA	1221	5	dBA	1113	7	dBA	597	27	dBA
TOX1_2EF9	TOX1&2 Exhaust Fan9	920	15	dBA	827	10	dBA	1221	5	dBA	1110	7	dBA	601	22	dBA
TOX1_2_OD	TOX1&2 Overhead Door	933	-1	dBA	835	16	dBA	1219	-5	dBA	1100	-3	dBA	614	6	dBA
TOX3_EF1M	TOX3 Exhaust Fan1 Mitigated	910	9	dBA	843	17	dBA	1258	1	dBA	1154	4	dBA	589	13	dBA
TOX3_EF2	TOX3 Exhaust Fan2	908	12	dBA	838	14	dBA	1251	4	dBA	1148	6	dBA	587	17	dBA
TOX3_EF3M	TOX3 Exhaust Fan3 Mitigated	913	1	dBA	848	10	dBA	1263	-4	dBA	1158	-2	dBA	591	6	dBA
TOX3_EF4M	TOX3 Exhaust Fan4 Mitigated	929	3	dBA	856	6	dBA	1259	-2	dBA	1144	0	dBA	608	8	dBA
TOX3_EF5M	TOX3 Exhaust Fan5 Mitigated	923	3	dBA	847	1	dBA	1249	-5	dBA	1137	-4	dBA	603	8	dBA
TOX3_OD	TOX3 Overhead Door	905	10	dBA	844	19	dBA	1263	-11	dBA	1163	-10	dBA	584	8	dBA
TOX4_EF1M	TOX4 Exhaust Fan1 Mitigated	932	7	dBA	850	5	dBA	1246	2	dBA	1129	5	dBA	611	13	dBA
TOX4_EF2M	TOX4 Exhaust Fan2 Mitigated	936	8	dBA	852	2	dBA	1245	2	dBA	1126	6	dBA	616	11	dBA
TOX4_EF3M	TOX4 Exhaust Fan3 Mitigated	940	8	dBA	859	2	dBA	1253	3	dBA	1131	14	dBA	619	15	dBA
TOX4_OD	TOX4 Overhead Door	945	-6	dBA	855	12	dBA	1242	-6	dBA	1117	17	dBA	625	-1	dBA
HW_CUS1	Headworks Carbon Unit Stack 1	657	16	dBA	453	26	dBA	934	18	dBA	1035	17	dBA	397	26	dBA

Source ID	Source Description	Point of Reception 6			Point of Reception 7			Point of Reception 8			Point of Reception 9			Point of Reception 10		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
BF_L1	Biofilter Building Louvre 1	349	6	dBA	453	-4	dBA	563	2	dBA	668	-7	dBA	464	17	dBA
BF_L2	Biofilter Building Louvre 1	332	9	dBA	438	2	dBA	549	13	dBA	655	6	dBA	453	9	dBA
BB_AI1	Blower Building Air Intake1	594	17	dBA	565	21	dBA	655	23	dBA	690	14	dBA	788	21	dBA
BB_AI2	Blower Building Air Intake2	597	15	dBA	573	20	dBA	664	23	dBA	701	14	dBA	785	21	dBA
BB_AI3	Blower Building Air Intake3	600	13	dBA	581	20	dBA	673	23	dBA	713	17	dBA	783	21	dBA
BB_AI4	Blower Building Air Intake4	604	13	dBA	592	20	dBA	686	23	dBA	728	17	dBA	780	21	dBA
BB_AI5	Blower Building Air Intake5	609	16	dBA	602	19	dBA	697	22	dBA	741	18	dBA	778	21	dBA
BB_OD	Blower Building Overhead Door	600	14	dBA	564	17	dBA	653	22	dBA	684	9	dBA	799	13	dBA
TOX_B1	Boiler Exhaust 1	476	17	dBA	341	32	dBA	404	28	dBA	407	26	dBA	760	20	dBA
TOX_B2	Boiler Exhaust 2	477	17	dBA	341	31	dBA	404	28	dBA	407	23	dBA	761	20	dBA
TOX_B3	Boiler Exhaust 3	477	17	dBA	341	31	dBA	403	28	dBA	406	20	dBA	761	20	dBA
TOX_B4	Boiler Exhaust 4	478	17	dBA	341	31	dBA	403	23	dBA	405	16	dBA	762	20	dBA
TOX_B5	Boiler Exhaust 5	478	17	dBA	340	26	dBA	402	18	dBA	404	15	dBA	763	20	dBA
CB_CU1	Condenser 1 - Centrifuge Bldg	508	7	dBA	402	22	dBA	475	20	dBA	486	20	dBA	771	15	dBA
SHCB_EF1	Exhaust fan 1 Solids Handling/Centrifuge Building	526	3	dBA	425	17	dBA	498	18	dBA	508	18	dBA	784	13	dBA
SHCB_EF2	Exhaust fan 2 Solids Handling/Centrifuge Building	527	3	dBA	424	20	dBA	496	18	dBA	505	18	dBA	786	13	dBA
SHCB_EF3	Exhaust fan 3 Solids Handling/Centrifuge Building	528	3	dBA	423	20	dBA	495	18	dBA	503	18	dBA	787	13	dBA
SHCB_EF4	Exhaust fan 4 Solids Handling/Centrifuge Building	529	6	dBA	422	20	dBA	493	18	dBA	500	18	dBA	790	13	dBA
FCB_OD	Ferrous Chloride Building Open Door	328	6	dBA	419	3	dBA	529	4	dBA	632	0	dBA	471	9	dBA
FC_TB	Ferrous Chloride Truck Blower	352	21	dBA	452	19	dBA	562	30	dBA	665	23	dBA	472	26	dBA
FC_TEI	Ferrous Chloride Truck Engine Idling	355	31	dBA	457	31	dBA	568	45	dBA	671	35	dBA	471	45	dBA
HW_CUS2	Headworks Carbon Unit Stack 2	393	21	dBA	480	19	dBA	590	23	dBA	686	19	dBA	510	24	dBA
HW_EF1	Headworks Exhaust Fan 1	382	32	dBA	459	27	dBA	569	33	dBA	663	28	dBA	516	33	dBA
HW_EF2	Headworks Exhaust Fan 2	357	29	dBA	451	24	dBA	561	30	dBA	663	29	dBA	481	34	dBA
HW_EF3	Headworks Exhaust Fan 3	374	26	dBA	463	23	dBA	574	28	dBA	672	27	dBA	495	29	dBA
HW_EF4	Headworks Exhaust Fan 4	389	26	dBA	472	24	dBA	582	28	dBA	677	24	dBA	513	29	dBA
HW_EF5	Headworks Exhaust Fan 5	396	22	dBA	482	19	dBA	592	26	dBA	689	21	dBA	512	30	dBA
HW_GenStackExh	Headworks Generator Exhaust Stack	396	0	dBA	479	0	dBA	589	0	dBA	683	0	dBA	519	0	dBA
HW_GenRadExh	Headworks Generator Radiator Exhaust	399	0	dBA	481	0	dBA	591	0	dBA	685	0	dBA	521	0	dBA
HW_GenIntake	Headworks Generator Room Intake	400	0	dBA	483	0	dBA	593	0	dBA	687	0	dBA	522	0	dBA
TOX3_L1M	HVAC Intake Louvre 1 (TOX3) Mitigated	467	9	dBA	332	28	dBA	395	26	dBA	400	25	dBA	753	20	dBA
TOX4_L	HVAC Intake Louvre 1 (TOX4)	505	13	dBA	373	24	dBA	435	22	dBA	434	17	dBA	785	27	dBA
TOX3_L2M	HVAC Intake Louvre 2 (TOX3) Mitigated	468	3	dBA	331	20	dBA	394	18	dBA	399	18	dBA	754	12	dBA
ITT	Idling Transport Truck	550	8	dBA	422	12	dBA	482	14	dBA	474	12	dBA	824	3	dBA
LFH_EF	Lab Fume Hood Exhaust Fan	387	11	dBA	293	28	dBA	378	26	dBA	421	20	dBA	661	15	dBA
LFH_ES	Lab Fume Hood Exhaust Stack	386	13	dBA	293	31	dBA	378	28	dBA	421	22	dBA	661	22	dBA
CB_MAU1	Makeup Air Unit 1 - Centrifuge Bldg	492	9	dBA	387	20	dBA	460	24	dBA	474	23	dBA	756	15	dBA
CB_MAU2	Makeup Air Unit 2 - Centrifuge Bldg	496	9	dBA	394	19	dBA	468	21	dBA	483	23	dBA	759	18	dBA
OUB_CUS1	Odour Unit Building Carbon Unit Stack 1	440	13	dBA	443	21	dBA	545	24	dBA	609	18	dBA	633	22	dBA
OUB_CUS2	Odour Unit Building Carbon Unit Stack 2	441	13	dBA	444	21	dBA	545	24	dBA	610	18	dBA	634	22	dBA
PO_TB	Polymer Truck Blower	571	17	dBA	452	19	dBA	515	15	dBA	508	16	dBA	838	17	dBA
PO_TEI	Polymer Truck Engine Idling	571	6	dBA	448	9	dBA	508	17	dBA	499	15	dBA	841	6	dBA
EF-250-01	Proposed Exhaust Fan (Plant 1 Aeration Access Stair)	216	5	dBA	244	18	dBA	354	9	dBA	460	7	dBA	474	12	dBA
IWOCF_ES1	Proposed Exhaust Stack (Inlet Works OCF Upgrade) 1	342	20	dBA	452	15	dBA	563	20	dBA	670	18	dBA	452	22	dBA
IWOCF_ES2	Proposed Exhaust Stack (Inlet Works OCF Upgrade) 2	331	20	dBA	434	15	dBA	545	20	dBA	651	19	dBA	455	22	dBA
P1OCF_ES1	Proposed Exhaust Stack (Plant 1 OCF) 1	335	17	dBA	374	19	dBA	482	22	dBA	570	17	dBA	528	20	dBA
P1OCF_ES2	Proposed Exhaust Stack (Plant 1 OCF) 2	338	17	dBA	375	19	dBA	483	22	dBA	571	17	dBA	530	20	dBA
P2OCF_ES1	Proposed Exhaust Stack (Plant 2 OCF) 1	320	11	dBA	171	31	dBA	251	27	dBA	305	21	dBA	627	19	dBA
P2OCF_ES2	Proposed Exhaust Stack (Plant 2 OCF) 2	328	11	dBA	179	31	dBA	258	27	dBA	309	21	dBA	633	19	dBA
GEB_POU	Proposed GEB Solids Exportation Portable Odour Unit	539	1	dBA	439	2	dBA	511	5	dBA	519	2	dBA	797	1	dBA
MUA-921-01_IN	Proposed Ground MUA-921-01 OA Intake (Plant 1 OCF)	342	12	dBA	380	7	dBA	488	7	dBA	575	3	dBA	534	23	dBA
MUA-922-01_IN	Proposed Ground MUA-922-01 OA Intake (Plant 2 OCF)	337	8	dBA	173	21	dBA	244	19	dBA	288	15	dBA	647	3	dBA
MUA-150-03_IN	Proposed MUA-150-03 OA Intake Elbow (Primary Clarifier 1)	238	12	dBA	358	4	dBA	469	17	dBA	586	7	dBA	397	18	dBA
MUA-300-01-02_I	Proposed MUA-300-01-02 OA Intake Louvre (Blower Building 1)	303	3	dBA	313	1	dBA	420	0	dBA	505	-5	dBA	534	-3	dBA
MUA-300-03_IN	Proposed MUA-300-03 OA Intake Louvre (Blower Building 1)	304	8	dBA	318	6	dBA	425	6	dBA	511	1	dBA	532	9	dBA
EF-152-01	Proposed Rooftop EF-120-01 (Plant 2)	268	8	dBA	186	26	dBA	286	26	dBA	368	19	dBA	561	19	dBA
EF-152-02	Proposed Rooftop EF-120-01 (Plant 2)	287	8	dBA	202	26	dBA	300	25	dBA	375	19	dBA	577	19	dBA
EF-150-01	Proposed Rooftop EF-150-01 (Plant 1)	257	25	dBA	368	18	dBA	479	29	dBA	592	22	dBA	414	30	dBA
EF-150-02	Proposed Rooftop EF-150-02 (Plant 1)	274	21	dBA	375	18	dBA	485	29	dBA	595	22	dBA	433	29	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	236	12	dBA	311	7	dBA	422	16	dBA	530	3	dBA	445	24	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	242	12	dBA	313	7	dBA	424	16	dBA	531	3	dBA	450	24	dBA
MUA-152-01_IN	Proposed Rooftop MUA-152-01 OA Intake (Plant 2)	300	9	dBA	163	29	dBA	250	28	dBA	316	8	dBA	606	21	dBA
MUA-152-02_IN	Proposed Rooftop MUA-152-02 OA Intake (Plant 2)	307	11	dBA	171	26	dBA	257	21	dBA	319	8	dBA	612	21	dBA
EF-921-01	Proposed Wall EF-921-01 (Plant 1 OCF)	319	12	dBA	354	16	dBA	462	27	dBA	552	14	dBA	523	21	dBA
EF-921-02	Proposed Wall EF-921-02 (Plant 1 OCF)	332	6	dBA	370	16	dBA	478	18	dBA	566	12	dBA	528	12	dBA
EF-921-03	Proposed Wall EF-921-03 (Plant 1 OCF)	328	11	dBA	355	15	dBA	462	19	dBA	548	14	dBA	535	17	dBA
EF-922-02	Proposed Wall EF-922-02 (Plant 2 OCF)	333	6	dBA	180	25	dBA	256	18	dBA	304	8	dBA	640	18	dBA
EF-922-03	Proposed Wall EF-922-03 (Plant 2 OCF)	325	3	dBA	170	20	dBA	247	16	dBA	299	8	dBA	633	16	dBA
SH_TB	Sodium Hypochlorite Truck Blower	561	14	dBA	435	19	dBA	495	31	dBA	485	27	dBA	834	9	dBA
SH_TEI	Sodium Hypochlorite Truck Engine Idling	567	12	dBA	440	18	dBA	500	31	dBA	488	24	dBA	840	7	dBA
SH_OD1	Solids Handling Overhead Door 1	528	17	dBA	422	16	dBA	492	21	dBA	498	29	dBA	791	23	dBA
SH_OD2	Solids Handling Overhead Door 2	522	19	dBA	429	15	dBA	505	14	dBA	519	13	dBA	776	19	dBA
SR_OD	Solids Receiving Overhead Door	569	12	dBA	448	13	dBA	511	13	dBA	503	11	dBA	837	11	dBA
TCF_GenStackExh	Thermal Conditioning Facility Generator Exhaust Stack	449	0	dBA	367	0	dBA	450	0	dBA	482	0	dBA	707	0	dBA
TCF_GenRadExh	Thermal Conditioning Facility Generator Radiator Exhaust	447	0	dBA	362	0	dBA	445	0	dBA	477	0	dBA	706	0	dBA
TCF_GenIntake	Thermal Conditioning Facility Generator Room Intake	448	0	dBA	365	0	dBA	448	0	dBA	480	0	dBA	707	0	dBA
TOX1_2Inlet1	TOX 1&2 Inlet 1	467	8	dBA	336	30	dBA	402	28	dBA	409	27	dBA	750	17	dBA
TOX1_2Inlet2	TOX 1&2 Inlet 2	467	8	dBA	336	30	dBA	402	28	dBA	409	27	dBA	751	17	dBA
TOX3_4Inlet1	TOX 3&4 Inlet 1 (West side)	468	8	dBA	334	30	dBA	398	28	dBA	404	23	dBA	753	16	dBA
TOX3_4Inlet2	TOX 3&4 Inlet 2 (North side)	467	10	dBA	335	26	dBA	399	21	dBA	406	18	dBA	752	19	dBA
TOX_BEM	TOX HVAC & Fluidized Air Blower Exhaust Mitigated	467	11	dBA	334	31	dBA	398	29	dBA	404	29	dBA	752	19	dBA
TOX1_2EF1	TOX1&2 Exhaust Fan1	468	10	dBA	347	25	dBA	417	23	dBA	430	22	dBA	745	9	dBA
TOX1_2EF2	TOX1&2 Exhaust Fan2	473	0	dBA	353	24	dBA	423	22	dBA	434	22	dBA	750	8	dBA
TOX1_2EF3	TOX1&2 Exhaust Fan3	481	2	dBA	361	24	dBA	430	24	dBA	440	25	dBA	756	8	dBA
TOX1_2EF4	TOX1&2 Exhaust Fan4	485	9	dBA	366	32	dBA	434	31	dBA	443	32	dBA	760	17	dBA
TOX1_2EF5	TOX1&2 Exhaust Fan5	491	10	dBA	371	31	dBA	440	30	dBA	447	32	dBA	765	19	dBA
TOX1_2EF6	TOX1&2 Exhaust Fan6	472	14	dBA	357	22	dBA	429	24	dBA	443	30	dBA	746	20	dBA
TOX1_2EF7	TOX1&2 Exhaust Fan7	477	14	dBA	362	23	dBA	433	27	dBA	446	30	dBA	749	24	dBA
TOX1_2EF8	TOX1&2 Exhaust Fan8	489	14	dBA	376	26	dBA	446	32	dBA	457	29	dBA	760	19	dBA
TOX1_2EF9	TOX1&2 Exhaust Fan9	494	14	dBA	380	27	dBA	451	32	dBA	461	29	dBA	764	18	dBA
TOX1_2_OD	TOX1&2 Overhead Door	508	6	dBA	395	13	dBA	464	6	dBA	471	8	dBA	777	0	dBA
TOX3_EF1M	TOX3 Exhaust Fan1 Mitigated	474	8	dBA	344	24	dBA	410	22	dBA	416	23	dBA	756	16	dBA
TOX3_EF2	TOX3 Exhaust Fan2	473	12	dBA	347	27	dBA	414	25	dBA	422	25	dBA	753	19	dBA
TOX3_EF3M	TOX3 Exhaust Fan3 Mitigated	476	2	dBA	344	17	dBA	408	15	dBA	413	9	dBA	759	8	dBA
TOX3_EF4M	TOX3 Exhaust Fan4 Mitigated	494	4	dBA	363	18	dBA	426	11	dBA	427	7	dBA	774	10	dBA
TOX3_EF5M	TOX3 Exhaust Fan5 Mitigated	491	2	dBA	364	16	dBA	429	14	dBA	433	5	dBA	769	9	dBA
TOX3_OD	TOX3 Overhead Door	468	6	dBA	336	27	dBA	401	25	dBA	408	20	dBA	752	15	dBA
TOX4_EF1M	TOX4 Exhaust Fan1 Mitigated	500	10	dBA	374	26	dBA	439	23	dBA	442	22	dBA	777	12	dBA
TOX4_EF2M	TOX4 Exhaust Fan2 Mitigated	504	10	dBA	379	25	dBA	444	22	dBA	446	17	dBA	781	12	dBA
TOX4_EF3M	TOX4 Exhaust Fan3 Mitigated	507	10	dBA	378	26	dBA	441	18	dBA	441	20	dBA	785	14	dBA
TOX4_OD	TOX4 Overhead Door	515	1	dBA	391	9	dBA	455	3	dBA	456	5	dBA	790	-4	dBA
HW_CUS1	Headworks Carbon Unit Stack 1	384	22	dBA	475	19	dBA	585	23	dBA	684	20	dBA	499	24	dBA

Table 7: Point of Reception Noise Impact (Daytime/Evening, Proposed Capacity Expansion)

Project: G.E. Booth WRRF

Location: Mississauga, ON

	Point of Reception Description	Point of reception coordinates X	Y	Z [2]
POR01	2-Storey Dwelling West of the Facility	616496	4826107	4.5
POR02	7-Storey Apartment Bldg	616806	4826529	25.5
POR03	20-Storey Apartment Bldg North of the Facility	617191	4827159	7.5
POR04	2-Storey Dwelling North-East of the Facility	617868	4826965	5
POR05	Proposed Elementary School (Vacant Lot) 3rd Floor	616805	4826016	10.5
POR06	Proposed Residential (Vacant Lot) 4th Floor	616911	4825919	7.5
POR07	Proposed Residential (Vacant Lot) 8th Floor	617081	4825755	22.5
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	617079	4825644	22.5
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	617199	4825544	19.5
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	616657	4826114	44

Source ID	Source Description	Point of Reception 1			Point of Reception 2			Point of Reception 3			Point of Reception 4			Point of Reception 5		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
EWPS_EF701	New EWPS Roof Exhaust Fan 1	995	9	dBA	786	15	dBA	1060	11	dBA	905	13	dBA	697	15	dBA
EWPS_EF702	New EWPS Roof Exhaust Fan 2	975	9	dBA	766	15	dBA	1048	11	dBA	907	13	dBA	678	16	dBA
EWPS_EF703	New EWPS Roof TCVX Vanaxial Exhaust Fan	979	18	dBA	766	24	dBA	1045	18	dBA	902	23	dBA	682	24	dBA
EWPS_AHU_702I	New EWPS Air Handling Unit 2	992	12	dBA	771	16	dBA	1036	16	dBA	885	21	dBA	697	16	dBA
EWPS_AHU_701	New EWPS Air Handling Unit 1	974	7	dBA	763	16	dBA	1044	10	dBA	905	14	dBA	677	14	dBA
EWPS_CU_1	New EWPS Air-Cooled Condenser	990	-7	dBA	768	-6	dBA	1032	-1	dBA	883	3	dBA	696	-4	dBA
SC_GEN	New Storage Complex 200 KW Diesel Standby Generator Exhaust	708	0	dBA	448	0	dBA	874	0	dBA	965	0	dBA	463	0	dBA
SC_GEN_C2	New Storage Complex 200 KW Diesel Standby Generator Casing (north)	709	0	dBA	450	0	dBA	874	0	dBA	965	0	dBA	464	0	dBA
SC_GEN_C1	New Storage Complex 200 KW Diesel Standby Generator Casing (south)	709	0	dBA	449	0	dBA	873	0	dBA	964	0	dBA	464	0	dBA
SC_RTU_1	New Storage Complex Trane 10 Ton Rooftop Unit 1	730	15	dBA	453	24	dBA	855	17	dBA	940	12	dBA	487	23	dBA
SC_RTU_2	New Storage Complex Trane 10 Ton Rooftop Unit 2	729	15	dBA	459	24	dBA	863	17	dBA	944	16	dBA	484	23	dBA
SC_ERV_1	New Storage Complex Energy Recovery Unit	729	19	dBA	456	29	dBA	860	22	dBA	943	18	dBA	485	28	dBA
SC_EF	New Storage Complex Wall Pipe Exhaust	718	-3	dBA	458	6	dBA	875	-6	dBA	959	-4	dBA	470	23	dBA
SC_AHU_1	New Storage Complex Indirect Fired Make-up Air Unit	722	25	dBA	452	35	dBA	862	27	dBA	949	22	dBA	478	34	dBA
SHTP	Sodium Hypochlorite Truck Passby	-	17	dBA	-	30	dBA	-	20	dBA	-	19	dBA	-	24	dBA
FCTP	Ferrous Chloride Truck Passby	-	15	dBA	-	30	dBA	-	19	dBA	-	17	dBA	-	24	dBA
GTP	Garbage Truck Passby	-	17	dBA	-	31	dBA	-	21	dBA	-	19	dBA	-	25	dBA
PTP	Polymer Truck Passby	-	17	dBA	-	30	dBA	-	20	dBA	-	19	dBA	-	24	dBA
SRTP	Sludge Receiving Truck Passby	-	18	dBA	-	31	dBA	-	21	dBA	-	20	dBA	-	25	dBA
MUA_E_2	Proposed Expansion Rooftop MUA-2 (Plant 1 Primary Building Extension)	-	21	dBA	-	23	dBA	-	12	dBA	-	16	dBA	-	28	dBA
MUA_E_1	Proposed Expansion Rooftop MUA-1 (Plant 1 Primary Building Extension)	-	21	dBA	-	23	dBA	-	12	dBA	-	16	dBA	-	28	dBA
EF_E_1	Proposed Exansion Rooftop EF-1 (Plant 1 Primary Building Extension)	-	10	dBA	-	16	dBA	-	5	dBA	-	8	dBA	-	19	dBA
EF_E_2	Proposed Exansion Rooftop EF-2 (Plant 1 Primary Building Extension)	-	10	dBA	-	16	dBA	-	4	dBA	-	8	dBA	-	19	dBA
MUA_E_4	Proposed Exansion Rooftop MUA-4 (Plant 1 Primary Blower Building Extension)	-	16	dBA	-	17	dBA	-	6	dBA	-	6	dBA	-	18	dBA
MUA_E_3	Proposed Exansion Rooftop MUA-3 (Plant 1 Primary Blower Building Extension)	-	16	dBA	-	17	dBA	-	6	dBA	-	11	dBA	-	18	dBA
MUA_E_5	Proposed Exansion Rooftop MUA-5 (Plant 1 Primary Blower Building Extension)	-	16	dBA	-	17	dBA	-	6	dBA	-	11	dBA	-	17	dBA
MUA_E_6	Proposed Exansion Rooftop MUA-6 (Plant 1 Primary Blower Building Extension)	-	16	dBA	-	9	dBA	-	1	dBA	-	11	dBA	-	17	dBA
EF_E_3	Proposed Exansion Rooftop EF-3 (Plant 1 Primary Blower Building Extension)	-	13	dBA	-	16	dBA	-	3	dBA	-	3	dBA	-	14	dBA
EF_E_4	Proposed Exansion Rooftop EF-4 (Plant 1 Primary Blower Building Extension)	-	12	dBA	-	13	dBA	-	3	dBA	-	8	dBA	-	13	dBA
EF_E_5	Proposed Exansion Rooftop EF-5 (Plant 1 Primary Blower Building Extension)	-	12	dBA	-	8	dBA	-	1	dBA	-	8	dBA	-	13	dBA
D1_E_MM1	Proposed Exansion Digester 1 Mixer Motor 1	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	1	dBA
D1_E_MM2	Proposed Exansion Digester 1 Mixer Motor 2	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	1	dBA
D1_E_MM3	Proposed Exansion Digester 1 Mixer Motor 3	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	1	dBA
D2_E_MM1	Proposed Exansion Digester 2 Mixer Motor 1	-	-4	dBA	-	2	dBA	-	-7	dBA	-	0	dBA	-	0	dBA
D2_E_MM2	Proposed Exansion Digester 2 Mixer Motor 2	-	-4	dBA	-	1	dBA	-	-7	dBA	-	0	dBA	-	0	dBA
D2_E_MM3	Proposed Exansion Digester 2 Mixer Motor 3	-	-4	dBA	-	0	dBA	-	-7	dBA	-	0	dBA	-	1	dBA
D3_E_MM1	Proposed Exansion Digester 3 Mixer Motor 1	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	0	dBA
D3_E_MM2	Proposed Exansion Digester 3 Mixer Motor 2	-	-4	dBA	-	2	dBA	-	-7	dBA	-	0	dBA	-	0	dBA
D3_E_MM3	Proposed Exansion Digester 3 Mixer Motor 3	-	-4	dBA	-	2	dBA	-	-3	dBA	-	0	dBA	-	0	dBA
D4_E_MM1	Proposed Exansion Digester 4 Mixer Motor 1	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	0	dBA
D4_E_MM2	Proposed Exansion Digester 4 Mixer Motor 2	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	0	dBA
D4_E_MM3	Proposed Exansion Digester 4 Mixer Motor 3	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	0	dBA
MUA_E_7	Proposed Exansion Rooftop MUA-7 (New Digester Control Building)	-	7	dBA	-	13	dBA	-	3	dBA	-	10	dBA	-	11	dBA
EF_E_6	Proposed Exansion Rooftop EF-6 (New Digester Control Building)	-	3	dBA	-	9	dBA	-	1	dBA	-	7	dBA	-	8	dBA
MUA_E_8	Proposed Exansion Rooftop MUA-8 (New Digester Control Building)	-	7	dBA	-	12	dBA	-	3	dBA	-	10	dBA	-	11	dBA
EF_E_7	Proposed Exansion Rooftop EF-7 (New Digester Control Building)	-	3	dBA	-	9	dBA	-	0	dBA	-	7	dBA	-	8	dBA
MUA_E_8	Proposed Exansion Rooftop MUA-8 (New UV Disinfection Facility)	-	7	dBA	-	12	dBA	-	3	dBA	-	10	dBA	-	11	dBA
EF_E_7	Proposed Exansion Rooftop EF-7 (New UV Disinfection Facility)	-	3	dBA	-	9	dBA	-	0	dBA	-	7	dBA	-	8	dBA
MUA_E_9	Proposed Exansion Rooftop MUA-9 (New UV Disinfection Facility)	-	8	dBA	-	5	dBA	-	9	dBA	-	12	dBA	-	11	dBA
EF_E_8	Proposed Exansion Rooftop EF-8 (New UV Disinfection Facility)	-	4	dBA	-	3	dBA	-	7	dBA	-	9	dBA	-	8	dBA
MUA_E_10	Proposed Exansion Rooftop MUA-10 (New Ash Dewatering Facility)	-	4	dBA	-	14	dBA	-	10	dBA	-	12	dBA	-	5	dBA
EF_E_9	Proposed Exansion Rooftop EF-9 (New Ash Dewatering Facility)	-	-1	dBA	-	10	dBA	-	7	dBA	-	9	dBA	-	0	dBA
EF_E_10	Proposed Exansion Rooftop EF-10 (New Ash Dewatering Facility)	-	0	dBA	-	10	dBA	-	7	dBA	-	9	dBA	-	1	dBA
MUA_E_11	Proposed Exansion Rooftop MUA-11 (New Plant 3 Clarifier Building)	-	12	dBA	-	17	dBA	-	12	dBA	-	8	dBA	-	19	dBA
EF_E_11	Proposed Exansion Rooftop EF-11 (New Plant 3 Clarifier Building)	-	8	dBA	-	13	dBA	-	9	dBA	-	5	dBA	-	13	dBA
MUA_E_12	Proposed Exansion Rooftop MUA-12 (New Plant 3 Clarifier Building)	-	11	dBA	-	18	dBA	-	12	dBA	-	9	dBA	-	18	dBA
EF_E_12	Proposed Exansion Rooftop EF-12 (New Plant 3 Clarifier Building)	-	8	dBA	-	14	dBA	-	9	dBA	-	8	dBA	-	13	dBA
MUA_E_13	Proposed Exansion Rooftop MUA-13 (New Plant 3 Clarifier Building)	-	12	dBA	-	17	dBA	-	12	dBA	-	8	dBA	-	18	dBA
EF_E_13	Proposed Exansion Rooftop EF-13 (New Plant 3 Clarifier Building)	-	9	dBA	-	14	dBA	-	9	dBA	-	5	dBA	-	15	dBA
MUA_E_14	Proposed Exansion Rooftop MUA-14 (New Plant 3 Clarifier Building)	-	12	dBA	-	16	dBA	-	12	dBA	-	8	dBA	-	18	dBA
EF_E_14	Proposed Exansion Rooftop EF-14 (New Plant 3 Clarifier Building)	-	9	dBA	-	14	dBA	-	9	dBA	-	5	dBA	-	15	dBA
MUA_E_15	Proposed Exansion Rooftop MUA-15 (New Plant 3 Clarifier Building)	-	10	dBA	-	14	dBA	-	12	dBA	-	8	dBA	-	19	dBA
EF_E_15	Proposed Exansion Rooftop EF-15 (New Plant 3 Clarifier Building)	-	9	dBA	-	13	dBA	-	9	dBA	-	6	dBA	-	13	dBA
MUA_E_16	Proposed Exansion Rooftop MUA-16 (New Plant 3 Clarifier Building)	-	10	dBA	-	15	dBA	-	12	dBA	-	8	dBA	-	19	dBA
EF_E_16	Proposed Exansion Rooftop EF-16 (New Plant 3 Clarifier Building)	-	7	dBA	-	10	dBA	-	9	dBA	-	5	dBA	-	15	dBA
MUA_E_17	Proposed Exansion Rooftop MUA-17 (New Plant 3 Clarifier Building)	-	14	dBA	-	14	dBA	-	12	dBA	-	8	dBA	-	19	dBA
EF_E_17	Proposed Exansion Rooftop EF-17 (New Plant 3 Clarifier Building)	-	11	dBA	-	13	dBA	-	9	dBA	-	5	dBA	-	15	dBA
D1_E_EX1	Proposed Exansion New Biogas Dome 1 Exhaust 1	-	17	dBA	-	10	dBA	-	13	dBA	-	21	dBA	-	20	dBA
D1_E_EX2	Proposed Exansion New Biogas Dome 1 Exhaust 2	-	18	dBA	-	3	dBA	-	9	dBA	-	13	dBA	-	20	dBA
D1_E_EX3	Proposed Exansion New Biogas Dome 1 Exhaust 3	-	17	dBA	-	2	dBA	-	9	dBA	-	22	dBA	-	20	dBA
D1_E_B1	Proposed Exansion New Biogas Dome 1 Blower 1	-	13	dBA	-	2	dBA	-	8	dBA	-	16	dBA	-	16	dBA
D1_E_B2	Proposed Exansion New Biogas Dome 1 Blower 2	-	13	dBA	-	2	dBA	-	5	dBA	-	16	dBA	-	16	dBA
D2_E_EX1	Proposed Exansion New Biogas Dome 2 Exhaust 1	-	12	dBA	-	6	dBA	-	13	dBA	-	21	dBA	-	12	dBA
D2_E_EX2	Proposed Exansion New Biogas Dome 2 Exhaust 2	-	9	dBA	-	5	dBA	-	13	dBA	-	21	dBA	-	9	dBA
D2_E_EX3	Proposed Exansion New Biogas Dome 2 Exhaust 3	-	9	dBA	-	4	dBA	-	5	dBA	-	21	dBA	-	10	dBA
D2_E_B1	Proposed Exansion New Biogas Dome 2 Blower 1	-	12	dBA	-	1	dBA	-	6	dBA	-	13	dBA	-	16	dBA
D2_E_B2	Proposed Exansion New Biogas Dome 2 Blower 2	-	13	dBA	-	1	dBA	-	5	dBA	-	13	dBA	-	16	dBA
MUA_E_18	Proposed Exansion Rooftop MUA-18 (New Adminstration Building)	-	16	dBA	-	28	dBA	-	16	dBA	-	13	dBA	-	25	dBA
MUA_E_19	Proposed Exansion Rooftop MUA-19 (New Adminstration Building)	-	16	dBA	-	28	dBA	-	16	dBA	-	14	dBA	-	24	dBA
MUA_E_20	Proposed Exansion Rooftop MUA-20 (New Adminstration Building)	-	16	dBA	-	27	dBA	-	16	dBA	-	14	dBA	-	24	dBA
MUA_E_21	Proposed Exansion Rooftop MUA-21 (New Adminstration Building)	-	16	dBA	-	27	dBA	-	16	dBA	-	14	dBA	-	25	dBA
G_E_1C	Proposed Exansion 3 MW Emergency Generator 1 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_1E	Proposed Exansion 3 MW Emergency Generator 1 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_2C	Proposed Exansion 3 MW Emergency Generator 2 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_2E	Proposed Exansion 3 MW Emergency Generator 2 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_3C	Proposed Exansion 3 MW Emergency Generator 3 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_3E	Proposed Exansion 3 MW Emergency Generator 3 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_4C	Proposed Exansion 3 MW Emergency Generator 4 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_4E	Proposed Exansion 3 MW Emergency Generator 4 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
OCF_1	Proposed Exansion Dewatering Building Odour Control Fan 1	-	1	dBA	-	21	dBA	-	6	dBA	-	23	dBA	-	6	dBA
OCF_2	Proposed Exansion Dewatering Building Odour Control Fan 2	-	1	dBA	-	10	dBA	-	7	dBA	-	-1	dBA	-	6	dBA
ADFTP	Ash Dewatering Facility Trucks Passby	-	22	dBA	-	35	dBA	-	25	dBA	-	23	dBA	-	29	dBA

Source ID	Source Description	Point of Reception 6			Point of Reception 7			Point of Reception 8			Point of Reception 9			Point of Reception 10		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
EWPS_EF701	New EWPS Roof Exhaust Fan 1	621	10	dBA	564	18	dBA	646	15	dBA	665	9	dBA	835	14	dBA
EWPS_EF702	New EWPS Roof Exhaust Fan 2	605	11	dBA	554	16	dBA	639	17	dBA	663	9	dBA	815	14	dBA
EWPS_EF703	New EWPS Roof TCVX Vanaxial Exhaust Fan	609	18	dBA	560	4	dBA	645	11	dBA	668	1	dBA	819	24	dBA
EWPS_AHU_702I	New EWPS Air Handling Unit 2	626	5	dBA	578	11	dBA	662	14	dBA	685	-3	dBA	832	18	dBA
EWPS_AHU_701	New EWPS Air Handling Unit 1	604	10	dBA	555	-4	dBA	641	8	dBA	665	-8	dBA	814	12	dBA
EWPS_CU_1	New EWPS Air-Cooled Condenser	625	-11	dBA	579	-3	dBA	664	1	dBA	688	-23	dBA	831	-2	dBA
SC_GEN	New Storage Complex 200 KW Diesel Standby Generator Exhaust	455	0	dBA	540	0	dBA	650	0	dBA	741	0	dBA	554	0	dBA
SC_GEN_C2	New Storage Complex 200 KW Diesel Standby Generator Casing (north)	456	0	dBA	540	0	dBA	650	0	dBA	741	0	dBA	555	0	dBA
SC_GEN_C1	New Storage Complex 200 KW Diesel Standby Generator Casing (south)	456	0	dBA	541	0	dBA	651	0	dBA	742	0	dBA	555	0	dBA
SC_RTU_1	New Storage Complex Trane 10 Ton Rooftop Unit 1	480	14	dBA	562	17	dBA	671	21	dBA	760	15	dBA	575	22	dBA
SC_RTU_2	New Storage Complex Trane 10 Ton Rooftop Unit 2	475	13	dBA	554	18	dBA	663	21	dBA	752	15	dBA	575	22	dBA
SC_ERV_1	New Storage Complex Energy Recovery Unit	476	18	dBA	557	22	dBA	666	25	dBA	754	20	dBA	574	26	dBA
SC_EF	New Storage Complex Wall Pipe Exhaust	460	4	dBA	541	13	dBA	650	19	dBA	740	13	dBA	563	21	dBA
SC_AHU_1	New Storage Complex Indirect Fired Make-up Air Unit	471	23	dBA	553	26	dBA	662	31	dBA	752	25	dBA	568	32	dBA
SHTP	Sodium Hypochlorite Truck Passby	-	15	dBA	-	21	dBA	-	25	dBA	-	18	dBA	-	24	dBA
FCTP	Ferrous Chloride Truck Passby	-	14	dBA	-	13	dBA	-	20	dBA	-	14	dBA	-	23	dBA
GTP	Garbage Truck Passby	-	16	dBA	-	16	dBA	-	23	dBA	-	17	dBA	-	24	dBA
PTP	Polymer Truck Passby	-	15	dBA	-	25	dBA	-	26	dBA	-	21	dBA	-	24	dBA
SRTP	Sludge Receiving Truck Passby	-	17	dBA	-	22	dBA	-	26	dBA	-	19	dBA	-	25	dBA
MUA_E_2	Proposed Expansion Rooftop MUA-2 (Plant 1 Primary Building Extension)	-	12	dBA	-	16	dBA	-	25	dBA	-	18	dBA	-	23	dBA
MUA_E_1	Proposed Expansion Rooftop MUA-1 (Plant 1 Primary Building Extension)	-	12	dBA	-	19	dBA	-	25	dBA	-	19	dBA	-	24	dBA
EF_E_1	Proposed Exansion Rooftop EF-1 (Plant 1 Primary Building Extension)	-	11	dBA	-	6	dBA	-	16	dBA	-	10	dBA	-	16	dBA
EF_E_2	Proposed Exansion Rooftop EF-2 (Plant 1 Primary Building Extension)	-	11	dBA	-	7	dBA	-	16	dBA	-	10	dBA	-	16	dBA
MUA_E_4	Proposed Exansion Rooftop MUA-4 (Plant 1 Primary Blower Building Extension)	-	9	dBA	-	13	dBA	-	18	dBA	-	15	dBA	-	18	dBA
MUA_E_3	Proposed Exansion Rooftop MUA-3 (Plant 1 Primary Blower Building Extension)	-	9	dBA	-	19	dBA	-	22	dBA	-	16	dBA	-	18	dBA
MUA_E_5	Proposed Exansion Rooftop MUA-5 (Plant 1 Primary Blower Building Extension)	-	10	dBA	-	20	dBA	-	22	dBA	-	16	dBA	-	18	dBA
MUA_E_6	Proposed Exansion Rooftop MUA-6 (Plant 1 Primary Blower Building Extension)	-	9	dBA	-	19	dBA	-	25	dBA	-	18	dBA	-	18	dBA
EF_E_3	Proposed Exansion Rooftop EF-3 (Plant 1 Primary Blower Building Extension)	-	6	dBA	-	7	dBA	-	13	dBA	-	1	dBA	-	15	dBA
EF_E_4	Proposed Exansion Rooftop EF-4 (Plant 1 Primary Blower Building Extension)	-	6	dBA	-	17	dBA	-	19	dBA	-	12	dBA	-	15	dBA
EF_E_5	Proposed Exansion Rooftop EF-5 (Plant 1 Primary Blower Building Extension)	-	6	dBA	-	15	dBA	-	19	dBA	-	15	dBA	-	15	dBA
D1_E_MM1	Proposed Exansion Digester 1 Mixer Motor 1	-	-4	dBA	-	12	dBA	-	11	dBA	-	8	dBA	-	3	dBA
D1_E_MM2	Proposed Exansion Digester 1 Mixer Motor 2	-	-4	dBA	-	12	dBA	-	11	dBA	-	4	dBA	-	3	dBA
D1_E_MM3	Proposed Exansion Digester 1 Mixer Motor 3	-	-4	dBA	-	12	dBA	-	11	dBA	-	1	dBA	-	3	dBA
D2_E_MM1	Proposed Exansion Digester 2 Mixer Motor 1	-	-4	dBA	-	11	dBA	-	10	dBA	-	11	dBA	-	3	dBA
D2_E_MM2	Proposed Exansion Digester 2 Mixer Motor 2	-	-3	dBA	-	11	dBA	-	10	dBA	-	10	dBA	-	3	dBA
D2_E_MM3	Proposed Exansion Digester 2 Mixer Motor 3	-	1	dBA	-	11	dBA	-	10	dBA	-	6	dBA	-	3	dBA
D3_E_MM1	Proposed Exansion Digester 3 Mixer Motor 1	-	-5	dBA	-	11	dBA	-	10	dBA	-	12	dBA	-	3	dBA
D3_E_MM2	Proposed Exansion Digester 3 Mixer Motor 2	-	-5	dBA	-	11	dBA	-	10	dBA	-	11	dBA	-	3	dBA
D3_E_MM3	Proposed Exansion Digester 3 Mixer Motor 3	-	-5	dBA	-	11	dBA	-	10	dBA	-	11	dBA	-	2	dBA
D4_E_MM1	Proposed Exansion Digester 4 Mixer Motor 1	-	-5	dBA	-	12	dBA	-	11	dBA	-	12	dBA	-	3	dBA
D4_E_MM2	Proposed Exansion Digester 4 Mixer Motor 2	-	-5	dBA	-	12	dBA	-	11	dBA	-	12	dBA	-	3	dBA
D4_E_MM3	Proposed Exansion Digester 4 Mixer Motor 3	-	-5	dBA	-	12	dBA	-	11	dBA	-	13	dBA	-	3	dBA
MUA_E_7	Proposed Exansion Rooftop MUA-7 (New Digester Control Building)	-	6	dBA	-	23	dBA	-	22	dBA	-	23	dBA	-	14	dBA
EF_E_6	Proposed Exansion Rooftop EF-6 (New Digester Control Building)	-	3	dBA	-	19	dBA	-	18	dBA	-	19	dBA	-	10	dBA
MUA_E_8	Proposed Exansion Rooftop MUA-8 (New Digester Control Building)	-	6	dBA	-	23	dBA	-	22	dBA	-	23	dBA	-	13	dBA
EF_E_7	Proposed Exansion Rooftop EF-7 (New Digester Control Building)	-	3	dBA	-	19	dBA	-	18	dBA	-	19	dBA	-	10	dBA
MUA_E_8	Proposed Exansion Rooftop MUA-8 (New UV Disinfection Facility)	-	6	dBA	-	23	dBA	-	22	dBA	-	23	dBA	-	13	dBA
EF_E_7	Proposed Exansion Rooftop EF-7 (New UV Disinfection Facility)	-	3	dBA	-	19	dBA	-	18	dBA	-	19	dBA	-	10	dBA
MUA_E_9	Proposed Exansion Rooftop MUA-9 (New UV Disinfection Facility)	-	5	dBA	-	22	dBA	-	20	dBA	-	1	dBA	-	14	dBA
EF_E_8	Proposed Exansion Rooftop EF-8 (New UV Disinfection Facility)	-	2	dBA	-	18	dBA	-	16	dBA	-	0	dBA	-	8	dBA
MUA_E_10	Proposed Exansion Rooftop MUA-10 (New Ash Dewatering Facility)	-	2	dBA	-	12	dBA	-	21	dBA	-	11	dBA	-	7	dBA
EF_E_9	Proposed Exansion Rooftop EF-9 (New Ash Dewatering Facility)	-	-6	dBA	-	17	dBA	-	15	dBA	-	4	dBA	-	5	dBA
EF_E_10	Proposed Exansion Rooftop EF-10 (New Ash Dewatering Facility)	-	-6	dBA	-	17	dBA	-	15	dBA	-	4	dBA	-	5	dBA
MUA_E_11	Proposed Exansion Rooftop MUA-11 (New Plant 3 Clarifier Building)	-	12	dBA	-	16	dBA	-	18	dBA	-	13	dBA	-	16	dBA
EF_E_11	Proposed Exansion Rooftop EF-11 (New Plant 3 Clarifier Building)	-	9	dBA	-	12	dBA	-	15	dBA	-	9	dBA	-	12	dBA
MUA_E_12	Proposed Exansion Rooftop MUA-12 (New Plant 3 Clarifier Building)	-	8	dBA	-	18	dBA	-	19	dBA	-	2	dBA	-	17	dBA
EF_E_12	Proposed Exansion Rooftop EF-12 (New Plant 3 Clarifier Building)	-	6	dBA	-	15	dBA	-	15	dBA	-	-1	dBA	-	14	dBA
MUA_E_13	Proposed Exansion Rooftop MUA-13 (New Plant 3 Clarifier Building)	-	12	dBA	-	16	dBA	-	18	dBA	-	13	dBA	-	16	dBA
EF_E_13	Proposed Exansion Rooftop EF-13 (New Plant 3 Clarifier Building)	-	9	dBA	-	13	dBA	-	15	dBA	-	10	dBA	-	13	dBA
MUA_E_14	Proposed Exansion Rooftop MUA-14 (New Plant 3 Clarifier Building)	-	8	dBA	-	17	dBA	-	19	dBA	-	14	dBA	-	16	dBA
EF_E_14	Proposed Exansion Rooftop EF-14 (New Plant 3 Clarifier Building)	-	6	dBA	-	14	dBA	-	15	dBA	-	9	dBA	-	14	dBA
MUA_E_15	Proposed Exansion Rooftop MUA-15 (New Plant 3 Clarifier Building)	-	12	dBA	-	18	dBA	-	19	dBA	-	13	dBA	-	16	dBA
EF_E_15	Proposed Exansion Rooftop EF-15 (New Plant 3 Clarifier Building)	-	9	dBA	-	13	dBA	-	15	dBA	-	10	dBA	-	13	dBA
MUA_E_16	Proposed Exansion Rooftop MUA-16 (New Plant 3 Clarifier Building)	-	10	dBA	-	17	dBA	-	19	dBA	-	15	dBA	-	16	dBA
EF_E_16	Proposed Exansion Rooftop EF-16 (New Plant 3 Clarifier Building)	-	8	dBA	-	15	dBA	-	16	dBA	-	10	dBA	-	13	dBA
MUA_E_17	Proposed Exansion Rooftop MUA-17 (New Plant 3 Clarifier Building)	-	8	dBA	-	18	dBA	-	20	dBA	-	15	dBA	-	16	dBA
EF_E_17	Proposed Exansion Rooftop EF-17 (New Plant 3 Clarifier Building)	-	5	dBA	-	14	dBA	-	16	dBA	-	11	dBA	-	13	dBA
D1_E_EX1	Proposed Exansion New Biogas Dome 1 Exhaust 1	-	4	dBA	-	10	dBA	-	13	dBA	-	18	dBA	-	23	dBA
D1_E_EX2	Proposed Exansion New Biogas Dome 1 Exhaust 2	-	15	dBA	-	16	dBA	-	13	dBA	-	10	dBA	-	23	dBA
D1_E_EX3	Proposed Exansion New Biogas Dome 1 Exhaust 3	-	13	dBA	-	21	dBA	-	15	dBA	-	13	dBA	-	20	dBA
D1_E_B1	Proposed Exansion New Biogas Dome 1 Blower 1	-	12	dBA	-	9	dBA	-	13	dBA	-	17	dBA	-	18	dBA
D1_E_B2	Proposed Exansion New Biogas Dome 1 Blower 2	-	12	dBA	-	11	dBA	-	13	dBA	-	15	dBA	-	18	dBA
D2_E_EX1	Proposed Exansion New Biogas Dome 2 Exhaust 1	-	13	dBA	-	16	dBA	-	21	dBA	-	26	dBA	-	18	dBA
D2_E_EX2	Proposed Exansion New Biogas Dome 2 Exhaust 2	-	8	dBA	-	30	dBA	-	19	dBA	-	16	dBA	-	17	dBA
D2_E_EX3	Proposed Exansion New Biogas Dome 2 Exhaust 3	-	8	dBA	-	31	dBA	-	17	dBA	-	13	dBA	-	17	dBA
D2_E_B1	Proposed Exansion New Biogas Dome 2 Blower 1	-	12	dBA	-	10	dBA	-	14	dBA	-	25	dBA	-	17	dBA
D2_E_B2	Proposed Exansion New Biogas Dome 2 Blower 2	-	12	dBA	-	11	dBA	-	14	dBA	-	19	dBA	-	18	dBA
MUA_E_18	Proposed Exansion Rooftop MUA-18 (New Adminstration Building)	-	14	dBA	-	13	dBA	-	18	dBA	-	12	dBA	-	24	dBA
MUA_E_19	Proposed Exansion Rooftop MUA-19 (New Adminstration Building)	-	14	dBA	-	13	dBA	-	18	dBA	-	12	dBA	-	24	dBA
MUA_E_20	Proposed Exansion Rooftop MUA-20 (New Adminstration Building)	-	15	dBA	-	13	dBA	-	18	dBA	-	13	dBA	-	24	dBA
MUA_E_21	Proposed Exansion Rooftop MUA-21 (New Adminstration Building)	-	15	dBA	-	13	dBA	-	18	dBA	-	12	dBA	-	24	dBA
G_E_1C	Proposed Exansion 3 MW Emergency Generator 1 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_1E	Proposed Exansion 3 MW Emergency Generator 1 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_2C	Proposed Exansion 3 MW Emergency Generator 2 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_2E	Proposed Exansion 3 MW Emergency Generator 2 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_3C	Proposed Exansion 3 MW Emergency Generator 3 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_3E	Proposed Exansion 3 MW Emergency Generator 3 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_4C	Proposed Exansion 3 MW Emergency Generator 4 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_4E	Proposed Exansion 3 MW Emergency Generator 4 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
OCF_1	Proposed Exansion Dewatering Building Odour Control Fan 1	-	9	dBA	-	18	dBA	-	18	dBA	-	14	dBA	-	12	dBA
OCF_2	Proposed Exansion Dewatering Building Odour Control Fan 2	-	9	dBA	-	18	dBA	-	29	dBA	-	14	dBA	-	9	dBA
ADFTP	Ash Dewatering Facility Trucks Passby	-	20	dBA	-	30	dBA	-	32	dBA	-	26	dBA	-	29	dBA

Notes on Table:

1. dBA = 1-hour energy equivalent sound (L_{eq} (1-hr))
2. Height above local grade

Table 8: Point of Reception Noise Impact (Night, Proposed Capacity Expansion)

Project: G.E. Booth WRRF

Location: Mississauga, ON

POR	Point of Reception Description	X	Y	Z [2]
POR01	2-Storey Dwelling West of the Facility	616496	4826107	4.5
POR02	7-Storey Apartment Bldg	616806	4826529	25.5
POR03	20-Storey Apartment Bldg North of the Facility	617191	4827159	7.5
POR04	2-Storey Dwelling North-East of the Facility	617868	4826965	5
POR05	Proposed Elementary School (Vacant Lot) 3rd Floor	616805	4826016	10.5
POR06	Proposed Residential (Vacant Lot) 4th Floor	616911	4825919	7.5
POR07	Proposed Residential (Vacant Lot) 8th Floor	617081	4825755	22.5
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	617079	4825644	22.5
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	617199	4825544	19.5
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	616657	4826114	44

Source ID	Source Description	Point of Reception 1			Point of Reception 2			Point of Reception 3			Point of Reception 4			Point of Reception 5		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
BF_L1	Biofilter Building Louvre 1	621	10	dBA	444	3	dBA	956	12	dBA	1073	-3	dBA	359	14	dBA
BF_L2	Biofilter Building Louvre 1	611	-6	dBA	448	3	dBA	971	-7	dBA	1088	-16	dBA	344	18	dBA
BB_AI1	Blower Building Air Intake1	947	16	dBA	718	21	dBA	999	13	dBA	884	4	dBA	658	23	dBA
BB_AI2	Blower Building Air Intake2	945	15	dBA	709	21	dBA	986	14	dBA	875	5	dBA	658	23	dBA
BB_AI3	Blower Building Air Intake3	942	16	dBA	699	22	dBA	972	14	dBA	865	5	dBA	658	23	dBA
BB_AI4	Blower Building Air Intake4	939	15	dBA	687	23	dBA	953	14	dBA	852	6	dBA	659	23	dBA
BB_AI5	Blower Building Air Intake5	937	15	dBA	676	23	dBA	937	15	dBA	842	8	dBA	660	23	dBA
BB_OD	Blower Building Overhead Door	958	4	dBA	734	5	dBA	1013	-6	dBA	888	18	dBA	666	8	dBA
TOX_B1	Boiler Exhaust 1	913	17	dBA	852	21	dBA	1268	13	dBA	1163	14	dBA	592	22	dBA
TOX_B2	Boiler Exhaust 2	914	17	dBA	853	21	dBA	1270	13	dBA	1164	14	dBA	593	22	dBA
TOX_B3	Boiler Exhaust 3	915	17	dBA	854	21	dBA	1271	13	dBA	1165	14	dBA	593	22	dBA
TOX_B4	Boiler Exhaust 4	916	19	dBA	856	18	dBA	1272	13	dBA	1166	14	dBA	594	22	dBA
TOX_B5	Boiler Exhaust 5	917	17	dBA	857	18	dBA	1274	13	dBA	1167	14	dBA	595	22	dBA
CB_CU1	Condenser 1 - Centrifuge Bldg	929	8	dBA	821	15	dBA	1201	9	dBA	1085	11	dBA	612	11	dBA
SHCB_EF1	Exhaust fan 1 Solids Handling/Centrifuge Building	942	11	dBA	822	13	dBA	1188	9	dBA	1063	10	dBA	626	11	dBA
SHCB_EF2	Exhaust fan 2 Solids Handling/Centrifuge Building	944	6	dBA	826	13	dBA	1192	9	dBA	1066	10	dBA	628	11	dBA
SHCB_EF3	Exhaust fan 3 Solids Handling/Centrifuge Building	945	6	dBA	828	13	dBA	1195	9	dBA	1068	10	dBA	629	11	dBA
SHCB_EF4	Exhaust fan 4 Solids Handling/Centrifuge Building	948	6	dBA	832	13	dBA	1200	9	dBA	1072	10	dBA	631	11	dBA
FCB_OD	Ferrous Chloride Building Open Door	629	2	dBA	478	5	dBA	990	10	dBA	1089	5	dBA	352	12	dBA
FC_TB	Ferrous Chloride Truck Blower	629	0	dBA	451	0	dBA	957	0	dBA	1068	0	dBA	365	0	dBA
FC_TEI	Ferrous Chloride Truck Engine Idling	628	0	dBA	445	0	dBA	952	0	dBA	1065	0	dBA	366	0	dBA
HW_CUS2	Headworks Carbon Unit Stack 2	668	16	dBA	459	25	dBA	930	18	dBA	1026	17	dBA	408	26	dBA
HW_EF1	Headworks Exhaust Fan 1	675	26	dBA	482	29	dBA	953	19	dBA	1035	15	dBA	406	35	dBA
HW_EF2	Headworks Exhaust Fan 2	640	26	dBA	459	35	dBA	958	25	dBA	1061	18	dBA	373	37	dBA
HW_EF3	Headworks Exhaust Fan 3	654	21	dBA	460	31	dBA	946	23	dBA	1045	22	dBA	390	31	dBA
HW_EF4	Headworks Exhaust Fan 4	671	21	dBA	468	30	dBA	939	23	dBA	1029	22	dBA	407	31	dBA
HW_EF5	Headworks Exhaust Fan 5	670	25	dBA	458	30	dBA	928	27	dBA	1023	25	dBA	410	30	dBA
HW_GenStackExh	Headworks Generator Exhaust Stack	676	0	dBA	467	0	dBA	933	0	dBA	1021	0	dBA	414	0	dBA
HW_GenRadExh	Headworks Generator Radiator Exhaust	678	0	dBA	467	0	dBA	931	0	dBA	1019	0	dBA	416	0	dBA
HW_GenIntake	Headworks Generator Room Intake	679	0	dBA	466	0	dBA	929	0	dBA	1017	0	dBA	417	0	dBA
TOX3_L1M	HVAC Intake Louvre 1 (TOX3) Mitigated	906	13	dBA	849	19	dBA	1271	-7	dBA	1170	-7	dBA	584	13	dBA
TOX4_L	HVAC Intake Louvre 1 (TOX4)	939	18	dBA	863	23	dBA	1260	20	dBA	1139	29	dBA	619	15	dBA
TOX3_L2M	HVAC Intake Louvre 2 (TOX3) Mitigated	907	5	dBA	851	11	dBA	1273	-13	dBA	1172	-13	dBA	585	6	dBA
ITT	Idling Transport Truck	979	2	dBA	882	10	dBA	1249	6	dBA	1104	15	dBA	660	6	dBA
LFH_EF	Lab Fume Hood Exhaust Fan	815	13	dBA	757	16	dBA	1210	-1	dBA	1162	-6	dBA	495	18	dBA
LFH_ES	Lab Fume Hood Exhaust Stack	815	16	dBA	756	17	dBA	1210	2	dBA	1162	-2	dBA	495	21	dBA
CB_MAU1	Makeup Air Unit 1 - Centrifuge Bldg	914	11	dBA	813	18	dBA	1203	12	dBA	1096	13	dBA	596	15	dBA
CB_MAU2	Makeup Air Unit 2 - Centrifuge Bldg	916	15	dBA	810	18	dBA	1197	12	dBA	1088	13	dBA	599	15	dBA
OUB_CUS1	Odour Unit Building Carbon Unit Stack 1	793	16	dBA	615	23	dBA	1017	17	dBA	1003	17	dBA	500	24	dBA
OUB_CUS2	Odour Unit Building Carbon Unit Stack 2	794	16	dBA	616	23	dBA	1016	17	dBA	1002	17	dBA	501	24	dBA
PO_TB	Polymer Truck Blower	995	0	dBA	879	0	dBA	1227	0	dBA	1071	0	dBA	677	0	dBA
PO_TEI	Polymer Truck Engine Idling	997	0	dBA	887	0	dBA	1239	0	dBA	1082	0	dBA	679	0	dBA
EF-250-01	Proposed Exhuast Fan (Plant 1 Aeration Access Stair)	627	9	dBA	616	12	dBA	1166	5	dBA	1228	4	dBA	309	10	dBA
IWOCF_ES1	Proposed Exhuast Stack (Inlet Works OCF Upgrade) 1	610	13	dBA	435	23	dBA	957	15	dBA	1081	8	dBA	349	24	dBA
IWOCF_ES2	Proposed Exhuast Stack (Inlet Works OCF Upgrade) 2	614	13	dBA	453	22	dBA	974	14	dBA	1089	13	dBA	345	24	dBA
P1OCF_ES1	Proposed Exhuast Stack (Plant 1 OCF) 1	687	17	dBA	561	21	dBA	1045	14	dBA	1092	13	dBA	390	23	dBA
P1OCF_ES2	Proposed Exhuast Stack (Plant 1 OCF) 2	690	17	dBA	562	20	dBA	1044	14	dBA	1089	13	dBA	393	23	dBA
P2OCF_ES1	Proposed Exhuast Stack (Plant 2 OCF) 1	772	11	dBA	798	17	dBA	1310	7	dBA	1288	12	dBA	451	16	dBA
P2OCF_ES2	Proposed Exhuast Stack (Plant 2 OCF) 2	779	11	dBA	800	17	dBA	1308	12	dBA	1282	12	dBA	457	16	dBA
GEB_POU	Proposed GEB Solids Exportation Portable Odour Unit	954	0	dBA	829	15	dBA	1185	12	dBA	1053	18	dBA	639	5	dBA
MUA-921-01_IN	Proposed Ground MUA-921-01 OA Intake (Plant 1 OCF)	693	14	dBA	562	28	dBA	1040	17	dBA	1085	22	dBA	397	24	dBA
MUA-922-01_IN	Proposed Ground MUA-922-01 OA Intake (Plant 2 OCF)	791	0	dBA	821	4	dBA	1330	-6	dBA	1299	-6	dBA	470	6	dBA
MUA-150-03_IN	Proposed MUA-150-03 OA Intake Elbow (Primary Clarifier 1)	555	16	dBA	485	16	dBA	1057	9	dBA	1181	-5	dBA	264	23	dBA
MUA-300-01-02_I	Proposed MUA-300-01-02 OA Intake Louvre (Blower Building 1)	692	-7	dBA	612	9	dBA	1109	6	dBA	1142	12	dBA	381	-1	dBA
MUA-300-03_IN	Proposed MUA-300-03 OA Intake Louvre (Blower Building 1)	689	1	dBA	606	15	dBA	1104	12	dBA	1138	17	dBA	380	10	dBA
EF-152-01	Proposed Rooftop EF-120-01 (Plant 2)	710	11	dBA	721	17	dBA	1247	8	dBA	1258	12	dBA	388	12	dBA
EF-152-02	Proposed Rooftop EF-120-01 (Plant 2)	727	12	dBA	725	17	dBA	1240	8	dBA	1242	13	dBA	404	12	dBA
EF-150-01	Proposed Rooftop EF-150-01 (Plant 1)	573	24	dBA	485	28	dBA	1044	22	dBA	1161	16	dBA	284	33	dBA
EF-150-02	Proposed Rooftop EF-150-02 (Plant 1)	592	24	dBA	489	28	dBA	1035	22	dBA	1143	16	dBA	304	33	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	603	21	dBA	548	22	dBA	1098	16	dBA	1184	15	dBA	296	29	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	608	21	dBA	549	22	dBA	1096	16	dBA	1180	15	dBA	302	29	dBA
MUA-152-01_IN	Proposed Rooftop MUA-152-01 OA Intake (Plant 2)	751	12	dBA	779	19	dBA	1299	10	dBA	1289	10	dBA	429	13	dBA
MUA-152-02_IN	Proposed Rooftop MUA-152-02 OA Intake (Plant 2)	758	12	dBA	781	19	dBA	1296	10	dBA	1282	10	dBA	436	13	dBA
EF-921-01	Proposed Wall EF-921-01 (Plant 1 OCF)	681	14	dBA	571	22	dBA	1063	0	dBA	1110	-2	dBA	380	22	dBA
EF-921-02	Proposed Wall EF-921-02 (Plant 1 OCF)	687	8	dBA	564	18	dBA	1049	-6	dBA	1095	-3	dBA	389	18	dBA
EF-921-03	Proposed Wall EF-921-03 (Plant 1 OCF)	693	13	dBA	581	16	dBA	1066	-6	dBA	1105	-6	dBA	392	20	dBA
EF-922-02	Proposed Wall EF-922-02 (Plant 2 OCF)	785	11	dBA	808	16	dBA	1314	12	dBA	1285	7	dBA	464	12	dBA
EF-922-03	Proposed Wall EF-922-03 (Plant 2 OCF)	777	5	dBA	806	16	dBA	1317	7	dBA	1293	7	dBA	456	6	dBA
SH_TB	Sodium Hypochlorite Truck Blower	989	0	dBA	887	0	dBA	1247	0	dBA	1095	0	dBA	671	0	dBA
SH_TEI	Sodium Hypochlorite Truck Engine Idling	995	0	dBA	890	0	dBA	1248	0	dBA	1092	0	dBA	676	0	dBA
SH_OD1	Solids Handling Overhead Door 1	948	15	dBA	834	8	dBA	1202	5	dBA	1073	7	dBA	631	16	dBA
SH_OD2	Solids Handling Overhead Door 2	934	17	dBA	807	25	dBA	1171	25	dBA	1051	26	dBA	620	17	dBA
SR_OD	Solids Receiving Overhead Door	993	9	dBA	880	21	dBA	1232	6	dBA	1076	25	dBA	676	12	dBA
TCF_GenStackExh	Thermal Conditioning Facility Generator Exhaust Stack	864	0	dBA	761	0	dBA	1169	0	dBA	1093	0	dBA	548	0	dBA
TCF_GenRadExh	Thermal Conditioning Facility Generator Radiator Exhaust	862	0	dBA	763	0	dBA	1174	0	dBA	1098	0	dBA	546	0	dBA
TCF_GenIntake	Thermal Conditioning Facility Generator Room Intake	863	0	dBA	762	0	dBA	1171	0	dBA	1095	0	dBA	547	0	dBA
TOX1_2Inlet1	TOX 1&2 Inlet 1	903	13	dBA	841	19	dBA	1261	-10	dBA	1161	-8	dBA	582	11	dBA
TOX1_2Inlet2	TOX 1&2 Inlet 2	904	13	dBA	843	19	dBA	1262	-10	dBA	1162	-8	dBA	583	11	dBA
TOX3_4Inlet1	TOX 3&4 Inlet 1 (West side)	905	13	dBA	847	22	dBA	1267	-10	dBA	1166	-9	dBA	584	11	dBA
TOX3_4Inlet2	TOX 3&4 Inlet 2 (North side)	905	15	dBA	845	21	dBA	1265	-9	dBA	1165	-8	dBA	583	13	dBA
TOX_BEM	TOX HVAC & Fluidized Air Blower Exhaust Mitigated	905	16	dBA	846	22	dBA	1266	-7	dBA	1166	-6	dBA	584	14	dBA
TOX1_2EF1	TOX1&2 Exhaust Fan1	899	-3	dBA	825	3	dBA	1239	-2	dBA	1141	1	dBA	579	2	dBA
TOX1_2EF2	TOX1&2 Exhaust Fan2	904	1	dBA	828	9	dBA	1238	-2	dBA	1136	1	dBA	584	4	dBA
TOX1_2EF3	TOX1&2 Exhaust Fan3	911	3	dBA	831	15	dBA	1236	-2	dBA	1130	1	dBA	592	6	dBA
TOX1_2EF4	TOX1&2 Exhaust Fan4	916	12	dBA	833	8	dBA	1236	6	dBA	1128	8	dBA	596	15	dBA
TOX1_2EF5	TOX1&2 Exhaust Fan5	920	16	dBA	835	6	dBA	1234	6	dBA	1123	8	dBA	601	19	dBA
TOX1_2EF6	TOX1&2 Exhaust Fan6	901	17	dBA	819	11	dBA	1227	6	dBA	1128	8	dBA	582	22	dBA
TOX1_2EF7	TOX1&2 Exhaust Fan7	905	17	dBA	821	20	dBA	1226	1	dBA	1124	8	dBA	585	22	dBA
TOX1_2EF8	TOX1&2 Exhaust Fan8	916	17	dBA	825	9	dBA	1221	5	dBA	1113	7	dBA	597	27	dBA
TOX1_2EF9	TOX1&2 Exhaust Fan9	920	15	dBA	827	10	dBA	1221	5	dBA	1110	7	dBA	601	22	dBA
TOX1_2_OD	TOX1&2 Overhead Door	933	-1	dBA	835	16	dBA	1219	-5	dBA	1100	-3	dBA	614	6	dBA
TOX3_EF1M	TOX3 Exhaust Fan1 Mitigated	910	9	dBA	843	17	dBA	1258	1	dBA	1154	4	dBA	589	13	dBA
TOX3_EF2	TOX3 Exhaust Fan2	908	12	dBA	838	14	dBA	1251	4	dBA	1148	6	dBA	587	17	dBA
TOX3_EF3M	TOX3 Exhaust Fan3 Mitigated	913	1	dBA	848	10	dBA	1263	-4	dBA	1158	-2	dBA	591	6	dBA
TOX3_EF4M	TOX3 Exhaust Fan4 Mitigated	929	3	dBA	856	6	dBA	1259	-2	dBA	1144	0	dBA	608	8	dBA
TOX3_EF5M	TOX3 Exhaust Fan5 Mitigated	923	3	dBA	847	1	dBA	1249	-5	dBA	1137	-4	dBA	603	8	dBA
TOX3_OD	TOX3 Overhead Door	905	10	dBA	844	19	dBA	1263	-11	dBA	1163	-10	dBA	584	8	dBA
TOX4_EF1M	TOX4 Exhaust Fan1 Mitigated	932	7	dBA	850	5	dBA	1246	2	dBA	1129	5	dBA	611	13	dBA
TOX4_EF2M	TOX4 Exhaust Fan2 Mitigated	936	8	dBA	852	2	dBA	1245	2	dBA	1126	6	dBA	616	11	dBA
TOX4_EF3M	TOX4 Exhaust Fan3 Mitigated	940	8	dBA	859	2	dBA	1253	3	dBA	1131	14	dBA	619	15	dBA
TOX4_OD	TOX4 Overhead Door	945	-6	dBA	855	12	dBA	1242	-6	dBA	1117	17	dBA	625	-1	dBA
HW_CUS1	Headworks Carbon Unit Stack 1	657	16	dBA	453	26	dBA	934	18	dBA	1035	17	dBA	397	26	dBA

Source ID	Source Description	Point of Reception 6			Point of Reception 7			Point of Reception 8			Point of Reception 9			Point of Reception 10		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
BF_L1	Biofilter Building Louvre 1	349	6	dBA	453	-4	dBA	563	2	dBA	668	-7	dBA	464	17	dBA
BF_L2	Biofilter Building Louvre 1	332	9	dBA	438	2	dBA	549	13	dBA	655	6	dBA	453	9	dBA
BB_AI1	Blower Building Air Intake1	594	17	dBA	565	21	dBA	655	23	dBA	690	14	dBA	788	21	dBA
BB_AI2	Blower Building Air Intake2	597	15	dBA	573	20	dBA	664	23	dBA	701	14	dBA	785	21	dBA
BB_AI3	Blower Building Air Intake3	600	13	dBA	581	20	dBA	673	23	dBA	713	17	dBA	783	21	dBA
BB_AI4	Blower Building Air Intake4	604	13	dBA	592	20	dBA	686	23	dBA	728	17	dBA	780	21	dBA
BB_AI5	Blower Building Air Intake5	609	16	dBA	602	19	dBA	697	22	dBA	741	18	dBA	778	21	dBA
BB_OD	Blower Building Overhead Door	600	14	dBA	564	17	dBA	653	22	dBA	684	9	dBA	799	13	dBA
TOX_B1	Boiler Exhaust 1	476	17	dBA	341	32	dBA	404	28	dBA	407	26	dBA	760	20	dBA
TOX_B2	Boiler Exhaust 2	477	17	dBA	341	31	dBA	404	28	dBA	407	23	dBA	761	20	dBA
TOX_B3	Boiler Exhaust 3	477	17	dBA	341	31	dBA	403	28	dBA	406	20	dBA	761	20	dBA
TOX_B4	Boiler Exhaust 4	478	17	dBA	341	31	dBA	403	23	dBA	405	16	dBA	762	20	dBA
TOX_B5	Boiler Exhaust 5	478	17	dBA	340	26	dBA	402	18	dBA	404	15	dBA	763	20	dBA
CB_CU1	Condenser 1 - Centrifuge Bldg	508	7	dBA	402	22	dBA	475	20	dBA	486	20	dBA	771	15	dBA
SHCB_EF1	Exhaust fan 1 Solids Handling/Centrifuge Building	526	3	dBA	425	17	dBA	498	18	dBA	508	18	dBA	784	13	dBA
SHCB_EF2	Exhaust fan 2 Solids Handling/Centrifuge Building	527	3	dBA	424	20	dBA	496	18	dBA	505	18	dBA	786	13	dBA
SHCB_EF3	Exhaust fan 3 Solids Handling/Centrifuge Building	528	3	dBA	423	20	dBA	495	18	dBA	503	18	dBA	787	13	dBA
SHCB_EF4	Exhaust fan 4 Solids Handling/Centrifuge Building	529	6	dBA	422	20	dBA	493	18	dBA	500	18	dBA	790	13	dBA
FCB_OD	Ferrous Chloride Building Open Door	328	6	dBA	419	3	dBA	529	4	dBA	632	0	dBA	471	9	dBA
FC_TB	Ferrous Chloride Truck Blower	352	0	dBA	452	0	dBA	562	0	dBA	665	0	dBA	472	0	dBA
FC_TEI	Ferrous Chloride Truck Engine Idling	355	0	dBA	457	0	dBA	568	0	dBA	671	0	dBA	471	0	dBA
HW_CUS2	Headworks Carbon Unit Stack 2	393	21	dBA	480	19	dBA	590	23	dBA	686	19	dBA	510	24	dBA
HW_EF1	Headworks Exhaust Fan 1	382	32	dBA	459	27	dBA	569	33	dBA	663	28	dBA	516	33	dBA
HW_EF2	Headworks Exhaust Fan 2	357	29	dBA	451	24	dBA	561	30	dBA	663	29	dBA	481	34	dBA
HW_EF3	Headworks Exhaust Fan 3	374	26	dBA	463	23	dBA	574	28	dBA	672	27	dBA	495	29	dBA
HW_EF4	Headworks Exhaust Fan 4	389	26	dBA	472	24	dBA	582	28	dBA	677	24	dBA	513	29	dBA
HW_EF5	Headworks Exhaust Fan 5	396	22	dBA	482	19	dBA	592	26	dBA	689	21	dBA	512	30	dBA
HW_GenStackExh	Headworks Generator Exhaust Stack	396	0	dBA	479	0	dBA	589	0	dBA	683	0	dBA	519	0	dBA
HW_GenRadExh	Headworks Generator Radiator Exhaust	399	0	dBA	481	0	dBA	591	0	dBA	685	0	dBA	521	0	dBA
HW_GenIntake	Headworks Generator Room Intake	400	0	dBA	483	0	dBA	593	0	dBA	687	0	dBA	522	0	dBA
TOX3_L1M	HVAC Intake Louvre 1 (TOX3) Mitigated	467	9	dBA	332	28	dBA	395	26	dBA	400	25	dBA	753	20	dBA
TOX4_L	HVAC Intake Louvre 1 (TOX4)	505	13	dBA	373	24	dBA	435	22	dBA	434	17	dBA	785	27	dBA
TOX3_L2M	HVAC Intake Louvre 2 (TOX3) Mitigated	468	3	dBA	331	20	dBA	394	18	dBA	399	18	dBA	754	12	dBA
ITT	Idling Transport Truck	550	8	dBA	422	12	dBA	482	14	dBA	474	12	dBA	824	3	dBA
LFH_EF	Lab Fume Hood Exhaust Fan	387	11	dBA	293	28	dBA	378	26	dBA	421	20	dBA	661	15	dBA
LFH_ES	Lab Fume Hood Exhaust Stack	386	13	dBA	293	31	dBA	378	28	dBA	421	22	dBA	661	22	dBA
CB_MAU1	Makeup Air Unit 1 - Centrifuge Bldg	492	9	dBA	387	20	dBA	460	24	dBA	474	23	dBA	756	15	dBA
CB_MAU2	Makeup Air Unit 2 - Centrifuge Bldg	496	9	dBA	394	19	dBA	468	21	dBA	483	23	dBA	759	18	dBA
OUB_CUS1	Odour Unit Building Carbon Unit Stack 1	440	13	dBA	443	21	dBA	545	24	dBA	609	18	dBA	633	22	dBA
OUB_CUS2	Odour Unit Building Carbon Unit Stack 2	441	13	dBA	444	21	dBA	545	24	dBA	610	18	dBA	634	22	dBA
PO_TB	Polymer Truck Blower	571	0	dBA	452	0	dBA	515	0	dBA	508	0	dBA	838	0	dBA
PO_TEI	Polymer Truck Engine Idling	571	0	dBA	448	0	dBA	508	0	dBA	499	0	dBA	841	0	dBA
EF-250-01	Proposed Exhuast Fan (Plant 1 Aeration Access Stair)	216	5	dBA	244	18	dBA	354	9	dBA	460	7	dBA	474	12	dBA
IWOCF_ES1	Proposed Exhuast Stack (Inlet Works OCF Upgrade) 1	342	20	dBA	452	15	dBA	563	20	dBA	670	18	dBA	452	22	dBA
IWOCF_ES2	Proposed Exhuast Stack (Inlet Works OCF Upgrade) 2	331	20	dBA	434	15	dBA	545	20	dBA	651	19	dBA	455	22	dBA
P1OCF_ES1	Proposed Exhuast Stack (Plant 1 OCF) 1	335	17	dBA	374	19	dBA	482	22	dBA	570	17	dBA	528	20	dBA
P1OCF_ES2	Proposed Exhuast Stack (Plant 1 OCF) 2	338	17	dBA	375	19	dBA	483	22	dBA	571	17	dBA	530	20	dBA
P2OCF_ES1	Proposed Exhuast Stack (Plant 2 OCF) 1	320	11	dBA	171	31	dBA	251	27	dBA	305	21	dBA	627	19	dBA
P2OCF_ES2	Proposed Exhuast Stack (Plant 2 OCF) 2	328	11	dBA	179	31	dBA	258	27	dBA	309	21	dBA	633	19	dBA
GEB_POU	Proposed GEB Solids Exportation Portable Odour Unit	539	1	dBA	439	2	dBA	511	5	dBA	519	2	dBA	797	1	dBA
MUA-921-01_IN	Proposed Ground MUA-921-01 OA Intake (Plant 1 OCF)	342	12	dBA	380	7	dBA	488	7	dBA	575	3	dBA	534	23	dBA
MUA-922-01_IN	Proposed Ground MUA-922-01 OA Intake (Plant 2 OCF)	337	8	dBA	173	21	dBA	244	19	dBA	288	15	dBA	647	3	dBA
MUA-150-03_IN	Proposed MUA-150-03 OA Intake Elbow (Primary Clarifier 1)	238	12	dBA	358	4	dBA	469	17	dBA	586	7	dBA	397	18	dBA
MUA-300-01-02_I	Proposed MUA-300-01-02 OA Intake Louvre (Blower Building 1)	303	3	dBA	313	1	dBA	420	0	dBA	505	-5	dBA	534	-3	dBA
MUA-300-03_IN	Proposed MUA-300-03 OA Intake Louvre (Blower Building 1)	304	8	dBA	318	6	dBA	425	6	dBA	511	1	dBA	532	9	dBA
EF-152-01	Proposed Rooftop EF-120-01 (Plant 2)	268	8	dBA	186	26	dBA	286	26	dBA	368	19	dBA	561	19	dBA
EF-152-02	Proposed Rooftop EF-120-01 (Plant 2)	287	8	dBA	202	26	dBA	300	25	dBA	375	19	dBA	577	19	dBA
EF-150-01	Proposed Rooftop EF-150-01 (Plant 1)	257	25	dBA	368	18	dBA	479	29	dBA	592	22	dBA	414	30	dBA
EF-150-02	Proposed Rooftop EF-150-02 (Plant 1)	274	21	dBA	375	18	dBA	485	29	dBA	595	22	dBA	433	29	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	236	12	dBA	311	7	dBA	422	16	dBA	530	3	dBA	445	24	dBA
MUA-150-01_IN	Rooftop MUA-150-01 OA Intake (Primary Clarifier 1)	242	12	dBA	313	7	dBA	424	16	dBA	531	3	dBA	450	24	dBA
MUA-152-01_IN	Proposed Rooftop MUA-152-01 OA Intake (Plant 2)	300	9	dBA	163	29	dBA	250	28	dBA	316	8	dBA	606	21	dBA
MUA-152-02_IN	Proposed Rooftop MUA-152-02 OA Intake (Plant 2)	307	11	dBA	171	26	dBA	257	21	dBA	319	8	dBA	612	21	dBA
EF-921-01	Proposed Wall EF-921-01 (Plant 1 OCF)	319	12	dBA	354	16	dBA	462	27	dBA	552	14	dBA	523	21	dBA
EF-921-02	Proposed Wall EF-921-02 (Plant 1 OCF)	332	6	dBA	370	16	dBA	478	18	dBA	566	12	dBA	528	12	dBA
EF-921-03	Proposed Wall EF-921-03 (Plant 1 OCF)	328	11	dBA	355	15	dBA	462	19	dBA	548	14	dBA	535	17	dBA
EF-922-02	Proposed Wall EF-922-02 (Plant 2 OCF)	333	6	dBA	180	25	dBA	256	18	dBA	304	8	dBA	640	18	dBA
EF-922-03	Proposed Wall EF-922-03 (Plant 2 OCF)	325	3	dBA	170	20	dBA	247	16	dBA	299	8	dBA	633	16	dBA
SH_TB	Sodium Hypochlorite Truck Blower	561	0	dBA	435	0	dBA	495	0	dBA	485	0	dBA	834	0	dBA
SH_TEI	Sodium Hypochlorite Truck Engine Idling	567	0	dBA	440	0	dBA	500	0	dBA	488	0	dBA	840	0	dBA
SH_OD1	Solids Handling Overhead Door 1	528	17	dBA	422	16	dBA	492	21	dBA	498	29	dBA	791	23	dBA
SH_OD2	Solids Handling Overhead Door 2	522	19	dBA	429	15	dBA	505	14	dBA	519	13	dBA	776	19	dBA
SR_OD	Solids Receiving Overhead Door	569	12	dBA	448	13	dBA	511	13	dBA	503	11	dBA	837	11	dBA
TCF_GenStackExh	Thermal Conditioning Facility Generator Exhaust Stack	449	0	dBA	367	0	dBA	450	0	dBA	482	0	dBA	707	0	dBA
TCF_GenRadExh	Thermal Conditioning Facility Generator Radiator Exhaust	447	0	dBA	362	0	dBA	445	0	dBA	477	0	dBA	706	0	dBA
TCF_GenIntake	Thermal Conditioning Facility Generator Room Intake	448	0	dBA	365	0	dBA	448	0	dBA	480	0	dBA	707	0	dBA
TOX1_2Inlet1	TOX 1&2 Inlet 1	467	8	dBA	336	30	dBA	402	28	dBA	409	27	dBA	750	17	dBA
TOX1_2Inlet2	TOX 1&2 Inlet 2	467	8	dBA	336	30	dBA	402	28	dBA	409	27	dBA	751	17	dBA
TOX3_4Inlet1	TOX 3&4 Inlet 1 (West side)	468	8	dBA	334	30	dBA	398	28	dBA	404	23	dBA	753	16	dBA
TOX3_4Inlet2	TOX 3&4 Inlet 2 (North side)	467	10	dBA	335	26	dBA	399	21	dBA	406	18	dBA	752	19	dBA
TOX_BEM	TOX HVAC & Fluidized Air Blower Exhaust Mitigated	467	11	dBA	334	31	dBA	398	29	dBA	404	29	dBA	752	19	dBA
TOX1_2EF1	TOX1&2 Exhaust Fan1	468	10	dBA	347	25	dBA	417	23	dBA	430	22	dBA	745	9	dBA
TOX1_2EF2	TOX1&2 Exhaust Fan2	473	0	dBA	353	24	dBA	423	22	dBA	434	22	dBA	750	8	dBA
TOX1_2EF3	TOX1&2 Exhaust Fan3	481	2	dBA	361	24	dBA	430	24	dBA	440	25	dBA	756	8	dBA
TOX1_2EF4	TOX1&2 Exhaust Fan4	485	9	dBA	366	32	dBA	434	31	dBA	443	32	dBA	760	17	dBA
TOX1_2EF5	TOX1&2 Exhaust Fan5	491	10	dBA	371	31	dBA	440	30	dBA	447	32	dBA	765	19	dBA
TOX1_2EF6	TOX1&2 Exhaust Fan6	472	14	dBA	357	22	dBA	429	24	dBA	443	30	dBA	746	20	dBA
TOX1_2EF7	TOX1&2 Exhaust Fan7	477	14	dBA	362	23	dBA	433	27	dBA	446	30	dBA	749	24	dBA
TOX1_2EF8	TOX1&2 Exhaust Fan8	489	14	dBA	376	26	dBA	446	32	dBA	457	29	dBA	760	19	dBA
TOX1_2EF9	TOX1&2 Exhaust Fan9	494	14	dBA	380	27	dBA	451	32	dBA	461	29	dBA	764	18	dBA
TOX1_2_OD	TOX1&2 Overhead Door	508	6	dBA	395	13	dBA	464	6	dBA	471	8	dBA	777	0	dBA
TOX3_EF1M	TOX3 Exhaust Fan1 Mitigated	474	8	dBA	344	24	dBA	410	22	dBA	416	23	dBA	756	16	dBA
TOX3_EF2	TOX3 Exhaust Fan2	473	12	dBA	347	27	dBA	414	25	dBA	422	25	dBA	753	19	dBA
TOX3_EF3M	TOX3 Exhaust Fan3 Mitigated	476	2	dBA	344	17	dBA	408	15	dBA	413	9	dBA	759	8	dBA
TOX3_EF4M	TOX3 Exhaust Fan4 Mitigated	494	4	dBA	363	18	dBA	426	11	dBA	427	7	dBA	774	10	dBA
TOX3_EF5M	TOX3 Exhaust Fan5 Mitigated	491	2	dBA	364	16	dBA	429	14	dBA	433	5	dBA	769	9	dBA
TOX3_OD	TOX3 Overhead Door	468	6	dBA	336	27	dBA	401	25	dBA	408	20	dBA	752	15	dBA
TOX4_EF1M	TOX4 Exhaust Fan1 Mitigated	500	10	dBA	374	26	dBA	439	23	dBA	442	22	dBA	777	12	dBA
TOX4_EF2M	TOX4 Exhaust Fan2 Mitigated	504	10	dBA	379	25	dBA	444	22	dBA	446	17	dBA	781	12	dBA
TOX4_EF3M	TOX4 Exhaust Fan3 Mitigated	507	10	dBA	378	26	dBA	441	18	dBA	441	20	dBA	785	14	dBA
TOX4_OD	TOX4 Overhead Door	515	1	dBA	391	9	dBA	455	3	dBA	456	5	dBA	790	-4	dBA
HW_CUS1	Headworks Carbon Unit Stack 1	384	22	dBA	475	19	dBA	585	23	dBA	684	20	dBA	499	24	dBA

Table 8: Point of Reception Noise Impact (Night, Proposed Capacity Expansion)

Project: G.E. Booth WRRF

Location: Mississauga, ON

	POR01	POR02	POR03	POR04	POR05	POR06	POR07	POR08	POR09	POR10
Point of Reception Description	2-Storey Dwelling West of the Facility	7-Storey Apartment Bldg	20-Storey Apartment Bldg North of the Facility	2-Storey Dwelling North-East of the Facility	Proposed Elementary School (Vacant Lot) 3rd Floor	Proposed Residential (Vacant Lot) 4th Floor	Proposed Residential (Vacant Lot) 8th Floor	Proposed Mixed Use (Vacant Lot) 22nd Floor	Proposed Mixed Use (Vacant Lot) 12th Floor	Proposed Mixed Use (Vacant Lot) 15th Floor
Point of reception coordinates X	616496	616806	617191	617868	616805	616911	617081	617079	617199	616657
Point of reception coordinates Y	4826107	4826529	4827159	4826965	4826016	4825919	4825755	4825644	4825544	4826114
Point of reception coordinates Z [2]	4.5	25.5	7.5	5	10.5	7.5	22.5	22.5	19.5	44

Source ID	Source Description	Point of Reception 1			Point of Reception 2			Point of Reception 3			Point of Reception 4			Point of Reception 5			Point of Reception 6			Point of Reception 7			Point of Reception 8			Point of Reception 9			Point of Reception 10		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
EWPS_EF701	New EWPS Roof Exhaust Fan 1	995	9	dBA	786	15	dBA	1060	11	dBA	905	13	dBA	697	15	dBA	621	10	dBA	564	18	dBA	646	15	dBA	665	9	dBA	835	14	dBA
EWPS_EF702	New EWPS Roof Exhaust Fan 2	975	9	dBA	766	15	dBA	1048	11	dBA	907	13	dBA	678	16	dBA	605	11	dBA	554	16	dBA	639	17	dBA	663	9	dBA	815	14	dBA
EWPS_EF703	New EWPS Roof TCVX Vanaxial Exhaust Fan	979	18	dBA	766	24	dBA	1045	18	dBA	902	23	dBA	682	24	dBA	609	18	dBA	560	4	dBA	645	11	dBA	668	1	dBA	819	24	dBA
EWPS_AHU_702I	New EWPS Air Handling Unit 2	992	12	dBA	771	16	dBA	1036	16	dBA	885	21	dBA	697	16	dBA	626	5	dBA	578	11	dBA	662	14	dBA	685	-3	dBA	832	18	dBA
EWPS_AHU_701	New EWPS Air Handling Unit 1	974	7	dBA	763	16	dBA	1044	10	dBA	905	14	dBA	677	14	dBA	604	10	dBA	555	-4	dBA	641	8	dBA	665	-8	dBA	814	12	dBA
EWPS_CU_1	New EWPS Air-Cooled Condenser	990	-7	dBA	768	-6	dBA	1032	-1	dBA	883	3	dBA	696	-4	dBA	625	-11	dBA	579	-3	dBA	664	1	dBA	688	-23	dBA	831	-2	dBA
SC_GEN	New Storage Complex 200 KW Diesel Standby Generator Exhaust	708	0	dBA	448	0	dBA	874	0	dBA	965	0	dBA	463	0	dBA	455	0	dBA	540	0	dBA	650	0	dBA	741	0	dBA	554	0	dBA
SC_GEN_C2	New Storage Complex 200 KW Diesel Standby Generator Casing (north)	709	0	dBA	450	0	dBA	874	0	dBA	965	0	dBA	464	0	dBA	456	0	dBA	540	0	dBA	650	0	dBA	741	0	dBA	555	0	dBA
SC_GEN_C1	New Storage Complex 200 KW Diesel Standby Generator Casing (south)	709	0	dBA	449	0	dBA	873	0	dBA	964	0	dBA	464	0	dBA	456	0	dBA	541	0	dBA	651	0	dBA	742	0	dBA	555	0	dBA
SC_RTU_1	New Storage Complex Trane 10 Ton Rooftop Unit 1	730	15	dBA	453	24	dBA	855	17	dBA	940	12	dBA	487	23	dBA	480	14	dBA	562	17	dBA	671	21	dBA	760	15	dBA	575	22	dBA
SC_RTU_2	New Storage Complex Trane 10 Ton Rooftop Unit 2	729	15	dBA	459	24	dBA	863	17	dBA	944	16	dBA	484	23	dBA	475	13	dBA	554	18	dBA	663	21	dBA	752	15	dBA	575	22	dBA
SC_ERV_1	New Storage Complex Energy Recovery Unit	729	19	dBA	456	29	dBA	860	22	dBA	943	18	dBA	485	28	dBA	476	18	dBA	557	22	dBA	666	25	dBA	754	20	dBA	574	26	dBA
SC_EF	New Storage Complex Wall Pipe Exhaust	718	-3	dBA	458	6	dBA	875	-6	dBA	959	-4	dBA	470	23	dBA	460	4	dBA	541	13	dBA	650	19	dBA	740	13	dBA	563	21	dBA
SC_AHU_1	New Storage Complex Indirect Fired Make-up Air Unit	722	25	dBA	452	35	dBA	862	27	dBA	949	22	dBA	478	34	dBA	471	23	dBA	553	26	dBA	662	31	dBA	752	25	dBA	568	32	dBA
SHTP	Sodium Hypochlorite Truck Passby	-	-86	dBA	-	-73	dBA	-	-83	dBA	-	-85	dBA	-	-79	dBA	-	-88	dBA	-	-82	dBA	-	-78	dBA	-	-85	dBA	-	-79	dBA
FCTP	Ferrous Chloride Truck Passby	-	-85	dBA	-	-70	dBA	-	-81	dBA	-	-84	dBA	-	-76	dBA	-	-86	dBA	-	-87	dBA	-	-80	dBA	-	-86	dBA	-	-77	dBA
GTP	Garbage Truck Passby	-	-87	dBA	-	-72	dBA	-	-83	dBA	-	-84	dBA	-	-78	dBA	-	-87	dBA	-	-87	dBA	-	-80	dBA	-	-86	dBA	-	-79	dBA
PTP	Polymer Truck Passby	-	-83	dBA	-	-70	dBA	-	-80	dBA	-	-82	dBA	-	-76	dBA	-	-85	dBA	-	-76	dBA	-	-74	dBA	-	-80	dBA	-	-76	dBA
SRTP	Sludge Receiving Truck Passby	-	-85	dBA	-	-72	dBA	-	-82	dBA	-	-83	dBA	-	-78	dBA	-	-86	dBA	-	-81	dBA	-	-77	dBA	-	-84	dBA	-	-78	dBA
MUA_E_2	Proposed Expansion Rooftop MUA-2 (Plant 1 Primary Building Extension)	-	21	dBA	-	23	dBA	-	12	dBA	-	16	dBA	-	28	dBA	-	12	dBA	-	16	dBA	-	25	dBA	-	18	dBA	-	23	dBA
MUA_E_1	Proposed Expansion Rooftop MUA-1 (Plant 1 Primary Building Extension)	-	21	dBA	-	23	dBA	-	12	dBA	-	16	dBA	-	28	dBA	-	12	dBA	-	19	dBA	-	25	dBA	-	19	dBA	-	24	dBA
EF_E_1	Proposed Exansion Rooftop EF-1 (Plant 1 Primary Building Extension)	-	10	dBA	-	16	dBA	-	5	dBA	-	8	dBA	-	19	dBA	-	11	dBA	-	6	dBA	-	16	dBA	-	10	dBA	-	16	dBA
EF_E_2	Proposed Exansion Rooftop EF-2 (Plant 1 Primary Building Extension)	-	10	dBA	-	16	dBA	-	4	dBA	-	8	dBA	-	19	dBA	-	11	dBA	-	7	dBA	-	16	dBA	-	10	dBA	-	16	dBA
MUA_E_4	Proposed Exansion Rooftop MUA-4 (Plant 1 Primary Blower Building Extension)	-	16	dBA	-	17	dBA	-	6	dBA	-	6	dBA	-	18	dBA	-	9	dBA	-	13	dBA	-	18	dBA	-	15	dBA	-	18	dBA
MUA_E_3	Proposed Exansion Rooftop MUA-3 (Plant 1 Primary Blower Building Extension)	-	16	dBA	-	17	dBA	-	6	dBA	-	11	dBA	-	18	dBA	-	9	dBA	-	19	dBA	-	22	dBA	-	16	dBA	-	18	dBA
MUA_E_5	Proposed Exansion Rooftop MUA-5 (Plant 1 Primary Blower Building Extension)	-	16	dBA	-	17	dBA	-	6	dBA	-	11	dBA	-	17	dBA	-	10	dBA	-	20	dBA	-	22	dBA	-	16	dBA	-	18	dBA
MUA_E_6	Proposed Exansion Rooftop MUA-6 (Plant 1 Primary Blower Building Extension)	-	16	dBA	-	9	dBA	-	1	dBA	-	11	dBA	-	17	dBA	-	9	dBA	-	19	dBA	-	25	dBA	-	18	dBA	-	18	dBA
EF_E_3	Proposed Exansion Rooftop EF-3 (Plant 1 Primary Blower Building Extension)	-	13	dBA	-	16	dBA	-	3	dBA	-	3	dBA	-	14	dBA	-	6	dBA	-	7	dBA	-	13	dBA	-	1	dBA	-	15	dBA
EF_E_4	Proposed Exansion Rooftop EF-4 (Plant 1 Primary Blower Building Extension)	-	12	dBA	-	13	dBA	-	3	dBA	-	8	dBA	-	13	dBA	-	6	dBA	-	17	dBA	-	19	dBA	-	12	dBA	-	15	dBA
EF_E_5	Proposed Exansion Rooftop EF-5 (Plant 1 Primary Blower Building Extension)	-	12	dBA	-	8	dBA	-	1	dBA	-	8	dBA	-	13	dBA	-	6	dBA	-	15	dBA	-	19	dBA	-	15	dBA	-	15	dBA
D1_E_MM1	Proposed Exansion Digester 1 Mixer Motor 1	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	1	dBA	-	-4	dBA	-	12	dBA	-	11	dBA	-	8	dBA	-	3	dBA
D1_E_MM2	Proposed Exansion Digester 1 Mixer Motor 2	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	1	dBA	-	-4	dBA	-	12	dBA	-	11	dBA	-	4	dBA	-	3	dBA
D1_E_MM3	Proposed Exansion Digester 1 Mixer Motor 3	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	1	dBA	-	-4	dBA	-	12	dBA	-	11	dBA	-	1	dBA	-	3	dBA
D2_E_MM1	Proposed Exansion Digester 2 Mixer Motor 1	-	-4	dBA	-	2	dBA	-	-7	dBA	-	0	dBA	-	0	dBA	-	-4	dBA	-	11	dBA	-	10	dBA	-	11	dBA	-	3	dBA
D2_E_MM2	Proposed Exansion Digester 2 Mixer Motor 2	-	-4	dBA	-	1	dBA	-	-7	dBA	-	0	dBA	-	0	dBA	-	-3	dBA	-	11	dBA	-	10	dBA	-	10	dBA	-	3	dBA
D2_E_MM3	Proposed Exansion Digester 2 Mixer Motor 3	-	-4	dBA	-	0	dBA	-	-7	dBA	-	0	dBA	-	1	dBA	-	1	dBA	-	11	dBA	-	10	dBA	-	6	dBA	-	3	dBA
D3_E_MM1	Proposed Exansion Digester 3 Mixer Motor 1	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	0	dBA	-	-5	dBA	-	11	dBA	-	10	dBA	-	12	dBA	-	3	dBA
D3_E_MM2	Proposed Exansion Digester 3 Mixer Motor 2	-	-4	dBA	-	2	dBA	-	-7	dBA	-	0	dBA	-	0	dBA	-	-5	dBA	-	11	dBA	-	10	dBA	-	11	dBA	-	3	dBA
D3_E_MM3	Proposed Exansion Digester 3 Mixer Motor 3	-	-4	dBA	-	2	dBA	-	-3	dBA	-	0	dBA	-	0	dBA	-	-5	dBA	-	11	dBA	-	10	dBA	-	11	dBA	-	2	dBA
D4_E_MM1	Proposed Exansion Digester 4 Mixer Motor 1	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	0	dBA	-	-5	dBA	-	12	dBA	-	11	dBA	-	12	dBA	-	3	dBA
D4_E_MM2	Proposed Exansion Digester 4 Mixer Motor 2	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	0	dBA	-	-5	dBA	-	12	dBA	-	11	dBA	-	12	dBA	-	3	dBA
D4_E_MM3	Proposed Exansion Digester 4 Mixer Motor 3	-	-4	dBA	-	2	dBA	-	-7	dBA	-	-1	dBA	-	0	dBA	-	-5	dBA	-	12	dBA	-	11	dBA	-	13	dBA	-	3	dBA
MUA_E_7	Proposed Exansion Rooftop MUA-7 (New Digester Control Building)	-	7	dBA	-	13	dBA	-	3	dBA	-	10	dBA	-	11	dBA	-	6	dBA	-	23	dBA	-	22	dBA	-	23	dBA	-	14	dBA
EF_E_6	Proposed Exansion Rooftop EF-6 (New Digester Control Building)	-	3	dBA	-	9	dBA	-	1	dBA	-	7	dBA	-	8	dBA	-	3	dBA	-	19	dBA	-	18	dBA	-	19	dBA	-	10	dBA
MUA_E_8	Proposed Exansion Rooftop MUA-8 (New Digester Control Building)	-	7	dBA	-	12	dBA	-	3	dBA	-	10	dBA	-	11	dBA	-	6	dBA	-	23	dBA	-	22	dBA	-	23	dBA	-	13	dBA
EF_E_7	Proposed Exansion Rooftop EF-7 (New Digester Control Building)	-	3	dBA	-	9	dBA	-	0	dBA	-	7	dBA	-	8	dBA	-	3	dBA	-	19	dBA	-	18	dBA	-	19	dBA	-	10	dBA
MUA_E_8	Proposed Exansion Rooftop MUA-8 (New UV Disinfection Facility)	-	7	dBA	-	12	dBA	-	3	dBA	-	10	dBA	-	11	dBA	-	6	dBA	-	23	dBA	-	22	dBA	-	23	dBA	-	13	dBA
EF_E_7	Proposed Exansion Rooftop EF-7 (New UV Disinfection Facility)	-	3	dBA	-	9	dBA	-	0	dBA	-	7	dBA	-	8	dBA	-	3	dBA	-	19	dBA	-	18	dBA	-	19	dBA	-	10	dBA
MUA_E_9	Proposed Exansion Rooftop MUA-9 (New UV Disinfection Facility)	-	8	dBA	-	5	dBA	-	9	dBA	-	12	dBA	-	11	dBA	-	5	dBA	-	22	dBA	-	20	dBA	-	1	dBA	-	14	dBA
EF_E_8	Proposed Exansion Rooftop EF-8 (New UV Disinfection Facility)	-	4	dBA	-	3	dBA	-	7	dBA	-	9	dBA	-	8	dBA	-	2	dBA	-	18	dBA	-	16	dBA	-	0	dBA	-	8	dBA
MUA_E_10	Proposed Exansion Rooftop MUA-10 (New Ash Dewatering Facility)	-	4	dBA	-	14	dBA	-	10	dBA	-	12	dBA	-	5	dBA	-	2	dBA	-	12	dBA	-	21	dBA	-	11	dBA	-	7	dBA
EF_E_9	Proposed Exansion Rooftop EF-9 (New Ash Dewatering Facility)	-	-1	dBA	-	10	dBA	-	7	dBA	-	9	dBA	-	0	dBA	-	-6	dBA	-	17	dBA	-	15	dBA	-	4	dBA	-	5	dBA
EF_E_10	Proposed Exansion Rooftop EF-10 (New Ash Dewatering Facility)	-	0	dBA	-	10	dBA	-	7	dBA	-	9	dBA	-	1	dBA	-	-6	dBA	-	17	dBA	-	15	dBA	-	4	dBA	-	5	dBA
MUA_E_11	Proposed Exansion Rooftop MUA-11 (New Plant 3 Clarifier Building)	-	12	dBA	-	17	dBA	-	12	dBA	-	8	dBA	-	19	dBA	-	12	dBA	-	16	dBA	-	18	dBA	-	13	dBA	-	16	dBA
EF_E_11	Proposed Exansion Rooftop EF-11 (New Plant 3 Clarifier Building)	-	8	dBA	-	13	dBA	-	9	dBA	-	5	dBA	-	13	dBA	-	9	dBA	-	12	dBA	-	15	dBA	-	9	dBA	-	12	dBA
MUA_E_12	Proposed Exansion Rooftop MUA-12 (New Plant 3 Clarifier Building)	-	11	dBA	-	18	dBA	-	12	dBA	-	9	dBA	-	18	dBA	-	8	dBA	-	18	dBA	-	19	dBA	-	2	dBA	-	17	dBA
EF_E_12	Proposed Exansion Rooftop EF-12 (New Plant 3 Clarifier Building)	-	8	dBA	-	14	dBA	-	9	dBA	-	8	dBA	-	13	dBA	-	6	dBA	-	15	dBA	-	15	dBA	-	-1	dBA	-	14	dBA
MUA_E_13	Proposed Exansion Rooftop MUA-13 (New Plant 3 Clarifier Building)	-	12	dBA	-	17	dBA	-	12	dBA	-	8	dBA	-	18	dBA	-	12	dBA	-	16	dBA	-	18	dBA	-	13	dBA	-	16	dBA
EF_E_13	Proposed Exansion Rooftop EF-13 (New Plant 3 Clarifier Building)	-	9	dBA	-	14	dBA	-	9	dBA	-	5	dBA	-	15	dBA	-	9	dBA	-	13	dBA	-	15	dBA	-	10	dBA	-	13	dBA
MUA_E_14	Proposed Exansion Rooftop MUA-14 (New Plant 3 Clarifier Building)	-	12	dBA	-	16	dBA	-	12	dBA	-	8	dBA	-	18	dBA	-	8	dBA	-	17	dBA	-	19	dBA	-	14	dBA	-	16	dBA
EF_E_14	Proposed Exansion Rooftop EF-14 (New Plant 3 Clarifier Building)	-	9	dBA	-	14	dBA	-	9	dBA	-	5	dBA	-	15	dBA	-	6	dBA	-	14	dBA	-	15	dBA	-	9	dBA	-	14	dBA
MUA_E_15	Proposed Exansion Rooftop MUA-15 (New Plant 3 Clarifier Building)	-	10	dBA	-	14	dBA	-	12	dBA	-	8	dBA	-	19	dBA	-	12	dBA	-	18	dBA	-	19	dBA	-	13	dBA	-	16	dBA
EF_E_15	Proposed Exansion Rooftop EF-15 (New Plant 3 Clarifier Building)	-	9	dBA	-	13	dBA	-	9	dBA	-	6	dBA	-	13	dBA	-	9	dBA	-	13	dBA	-	15	dBA	-	10	dBA	-	13	dBA
MUA_E_16	Proposed Exansion Rooftop MUA-16 (New Plant 3 Clarifier Building)	-	10	dBA	-	15	dBA	-	12	dBA	-	8	dBA	-	19	dBA	-	10	dBA	-	17	dBA	-	19	dBA	-	15	dBA	-	16	dBA
EF_E_16	Proposed Exansion Rooftop EF-16 (New Plant 3 Clarifier Building)	-	7	dBA	-	10	dBA	-	9	dBA	-	5	dBA	-	15	dBA	-	8	dBA	-	15	dBA	-	16	dBA	-	10	dBA	-	13	dBA
MUA_E_17	Proposed Exansion Rooftop MUA-17 (New Plant 3 Clarifier Building)	-	14	dBA	-	14	dBA	-	12	dBA	-	8	dBA	-	19	dBA	-	8	dBA	-	18	dBA	-	20	dBA	-	15	dBA	-	16	dBA
EF_E_17	Proposed Exansion Rooftop EF-17 (New Plant 3 Clarifier Building)	-	11	dBA	-	13	dBA	-	9	dBA	-	5	dBA	-	15	dBA	-	5	dBA	-	14	dBA	-	16	dBA	-	11	dBA	-	13	dBA
D1_E_EX1	Proposed Exansion New Biogas Dome 1 Exhaust 1	-	17	dBA	-	10	dBA	-	13	dBA	-	21	dBA	-	20	dBA	-	4	dBA	-	10	dBA	-	13	dBA	-	18	dBA	-	23	dBA
D1_E_EX2	Proposed Exansion New Biogas Dome 1 Exhaust 2	-	18	dBA	-	3	dBA	-	9	dBA	-	13	dBA	-	20	dBA	-	15	dBA	-	16	dBA	-	13	dBA	-	10	dBA	-	23	dBA
D1_E_EX3	Proposed Exansion New Biogas Dome 1 Exhaust 3	-	17	dBA	-	2	dBA	-	9	dBA	-	22	dBA	-	20	dBA	-	13	dBA	-	21	dBA	-	15	dBA	-	13	dBA	-	20	dBA
D1_E_B1	Proposed Exansion New Biogas Dome 1 Blower 1	-	13	dBA	-	2	dBA	-	8	dBA	-	16	dBA	-	16	dBA	-	12	dBA	-	9	dBA	-	13	dBA	-	17	dBA	-	18	dBA
D1_E_B2	Proposed Exansion New Biogas Dome 1 Blower 2	-	13	dBA	-	2	dBA	-	5	dBA	-	16	dBA	-	16	dBA	-	12	dBA	-	11	dBA	-	13	dBA	-	15	dBA	-	18	dBA
D2_E_EX1	Proposed Exansion New Biogas Dome 2 Exhaust 1	-	12	dBA	-	6	dBA	-	13	dBA	-	21	dBA	-	12	dBA	-	13	dBA	-	16	dBA	-	21	dBA	-	26	dBA	-	18	dBA
D2_E_EX2	Proposed Exansion New Biogas Dome 2 Exhaust 2	-	9	dBA	-	5	dBA	-	13	dBA	-	21	dBA	-	9	dBA	-	8	dBA	-	30	dBA	-	19	dBA	-	16	dBA	-	17	dBA
D2_E_EX3	Proposed Exansion New Biogas Dome 2 Exhaust 3	-	9	dBA	-	4	dBA	-	5	dBA	-	21	dBA	-	10	dBA	-	8	dBA	-	31	dBA	-	17	dBA	-	13	dBA	-	17	dBA
D2_E_B1	Proposed Exansion New Biogas Dome 2 Blower 1	-	12	dBA	-	1	dBA	-	6	dBA	-	13	dBA	-	16	dBA	-	12	dBA	-	10	dBA	-	14	dBA	-	25	dBA	-	17	dBA
D2_E_B2	Proposed Exansion New Biogas Dome 2 Blower 2	-	13	dBA	-	1	dBA	-	5	dBA	-	13	dBA	-	16	dBA	-	12	dBA	-	11	dBA	-	14	dBA	-	19	dBA	-	18	dBA
MUA_E_18	Proposed Exansion Rooftop MUA-18 (New Adminstration Building)	-	16	dBA	-	28	dBA	-	16	dBA	-	13	dBA	-	25	dBA	-	14	dBA	-	13	dBA	-	18	dBA	-	12	dBA	-	24	dBA
MUA_E_19	Proposed Exansion Rooftop MUA-19 (New Adminstration Building)	-	16	dBA	-	28	dBA	-	16	dBA	-	14	dBA	-	24	dBA	-	14	dBA	-	13	dBA	-	18	dBA	-	12	dBA	-	24	dBA
MUA_E_20	Proposed Exansion Rooftop MUA-20 (New Adminstration Building)	-	16	dBA	-	27	dBA	-	16	dBA	-	14	dBA	-	24	dBA	-	15	dBA	-	13	dBA	-	18	dBA	-	13	dBA	-	24	dBA
MUA_E_21	Proposed Exansion Rooftop MUA-21 (New Adminstration Building)	-	16	dBA	-	27	dBA	-	16	dBA	-	14	dBA	-	25	dBA	-	15	dBA	-	13	dBA	-	18	dBA	-	12	dBA	-	24	dBA
G_E_1C	Proposed Exansion 3 MW Emergency Generator 1 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_1E	Proposed Exansion 3 MW Emergency Generator 1 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_2C	Proposed Exansion 3 MW Emergency Generator 2 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_2E	Proposed Exansion 3 MW Emergency Generator 2 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_3C	Proposed Exansion 3 MW Emergency Generator 3 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_3E	Proposed Exansion 3 MW Emergency Generator 3 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_4C	Proposed Exansion 3 MW Emergency Generator 4 (Casing)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
G_E_4E	Proposed Exansion 3 MW Emergency Generator 4 (Exhaust)	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA	-	0	dBA
OCF_1	Proposed Exansion Dewatering Building Odour Control Fan 1	-	1	dBA	-	21	dBA	-	6	dBA	-	23	dBA	-	6	dBA	-	9	dBA	-	18	dBA	-	18	dBA	-	14	dBA	-	12	dBA
OCF_2	Proposed Exansion Dewatering Building Odour Control Fan 2	-	1	dBA	-	10	dBA	-	7	dBA	-	-1	dBA	-	6	dBA	-	9	dBA	-	18	dBA	-	29	dBA	-	14	dBA	-	9	dBA
ADFTP	Ash Dewatering Facility Trucks Passby	-	-83	dBA	-	-70	dBA	-	-80	dBA	-	-81	dBA	-	-76	dBA	-	-85	dBA	-	-75	dBA	-	-73	dBA	-	-78	dBA	-	-76	dBA

Notes on Table:

1. dBA = 1-hour energy equivalent sound (L_{eq} (1-hr))
2. Height above local grade

Table 9: Point of Reception Noise Impact (Non-Emergency Testing, Proposed Capacity Expansion)

Project: G.E. Booth WRRF

Location: Mississauga, ON

POR	Point of Reception Description	X	Y	Z [2]
POR01	2-Storey Dwelling West of the Facility	616496	4826107	4.5
POR02	7-Storey Apartment Bldg	616806	4826529	25.5
POR03	20-Storey Apartment Bldg North of the Facility	617191	4827159	7.5
POR04	2-Storey Dwelling North-East of the Facility	617868	4826965	5
POR05	Proposed Elementary School (Vacant Lot) 3rd Floor	616805	4826016	10.5
POR06	Proposed Residential (Vacant Lot) 4th Floor	616911	4825919	7.5
POR07	Proposed Residential (Vacant Lot) 8th Floor	617081	4825755	22.5
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	617079	4825644	22.5
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	617199	4825544	19.5
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	616657	4826114	44

Source ID	Source Description	Point of Reception 1			Point of Reception 2			Point of Reception 3			Point of Reception 4			Point of Reception 5		
		Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
HW_GenStackExh	Headworks Generator Exhaust Stack	621	-3	dBA	444	8	dBA	956	6	dBA	1073	1	dBA	359	4	dBA
HW_GenRadExh	Headworks Generator Radiator Exhaust	611	5	dBA	448	14	dBA	971	15	dBA	1088	5	dBA	344	11	dBA
HW_GenIntake	Headworks Generator Room Intake	947	5	dBA	718	30	dBA	999	26	dBA	884	25	dBA	658	10	dBA
TCF_GenStackExh	Thermal Conditioning Facility Generator Exhaust Stack	945	17	dBA	709	19	dBA	986	14	dBA	875	10	dBA	658	17	dBA
TCF_GenRadExh	Thermal Conditioning Facility Generator Radiator Exhaust	942	40	dBA	699	44	dBA	972	23	dBA	865	19	dBA	658	43	dBA
TCF_GenIntake	Thermal Conditioning Facility Generator Room Intake	939	34	dBA	687	36	dBA	953	29	dBA	852	29	dBA	659	38	dBA
SC_GEN	New Storage Complex 200 KW Diesel Standby Generator Exhaust	937	30	dBA	676	39	dBA	937	26	dBA	842	13	dBA	660	39	dBA
SC_GEN_C2	New Storage Complex 200 KW Diesel Standby Generator Casing (north)	958	24	dBA	734	31	dBA	1013	12	dBA	888	10	dBA	666	40	dBA
SC_GEN_C1	New Storage Complex 200 KW Diesel Standby Generator Casing (south)	913	32	dBA	852	41	dBA	1268	25	dBA	1163	13	dBA	592	33	dBA
G_E_1C	Proposed Exansion 3 MW Emergency Generator 1 (Casing)	914	35	dBA	853	44	dBA	1270	35	dBA	1164	33	dBA	593	45	dBA
G_E_1E	Proposed Exansion 3 MW Emergency Generator 1 (Exhaust)	915	37	dBA	854	45	dBA	1271	36	dBA	1165	36	dBA	593	46	dBA
G_E_2C	Proposed Exansion 3 MW Emergency Generator 2 (Casing)	916	35	dBA	856	40	dBA	1272	35	dBA	1166	33	dBA	594	45	dBA
G_E_2E	Proposed Exansion 3 MW Emergency Generator 2 (Exhaust)	917	37	dBA	857	44	dBA	1274	38	dBA	1167	36	dBA	595	46	dBA
G_E_3C	Proposed Exansion 3 MW Emergency Generator 3 (Casing)	929	34	dBA	821	38	dBA	1201	35	dBA	1085	33	dBA	612	45	dBA
G_E_3E	Proposed Exansion 3 MW Emergency Generator 3 (Exhaust)	942	37	dBA	822	42	dBA	1188	38	dBA	1063	36	dBA	626	46	dBA
G_E_4C	Proposed Exansion 3 MW Emergency Generator 4 (Casing)	944	35	dBA	826	37	dBA	1192	36	dBA	1066	33	dBA	628	44	dBA
G_E_4E	Proposed Exansion 3 MW Emergency Generator 4 (Exhaust)	945	37	dBA	828	41	dBA	1195	38	dBA	1068	36	dBA	629	46	dBA

Source ID	Point of Reception 6			Point of Reception 7			Point of Reception 8			Point of Reception 9			Point of Reception 10		
	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)	Distance (m)	Sound Level at PoR	Units [1] (dBA)
HW_GenStackExh	349	3	dBA	453	4	dBA	563	8	dBA	668	1	dBA	464	5	dBA
HW_GenRadExh	332	10	dBA	438	9	dBA	549	15	dBA	655	7	dBA	453	11	dBA
HW_GenIntake	594	10	dBA	565	8	dBA	655	10	dBA	690	4	dBA	788	11	dBA
TCF_GenStackExh	597	13	dBA	573	26	dBA	664	23	dBA	701	19	dBA	785	19	dBA
TCF_GenRadExh	600	36	dBA	581	54	dBA	673	51	dBA	713	44	dBA	783	46	dBA
TCF_GenIntake	604	30	dBA	592	36	dBA	686	32	dBA	728	19	dBA	780	39	dBA
SC_GEN	609	24	dBA	602	23	dBA	697	31	dBA	741	27	dBA	778	37	dBA
SC_GEN_C2	600	24	dBA	564	22	dBA	653	35	dBA	684	29	dBA	799	38	dBA
SC_GEN_C1	476	21	dBA	341	17	dBA	404	21	dBA	407	17	dBA	760	35	dBA
G_E_1C	477	32	dBA	341	28	dBA	404	38	dBA	407	30	dBA	761	43	dBA
G_E_1E	477	37	dBA	341	34	dBA	403	40	dBA	406	34	dBA	761	45	dBA
G_E_2C	478	32	dBA	341	28	dBA	403	38	dBA	405	32	dBA	762	43	dBA
G_E_2E	478	37	dBA	340	34	dBA	402	40	dBA	404	34	dBA	763	44	dBA
G_E_3C	508	32	dBA	402	28	dBA	475	38	dBA	486	32	dBA	771	42	dBA
G_E_3E	526	37	dBA	425	34	dBA	498	40	dBA	508	34	dBA	784	44	dBA
G_E_4C	527	31	dBA	424	28	dBA	496	38	dBA	505	33	dBA	786	42	dBA
G_E_4E	528	37	dBA	423	34	dBA	495	40	dBA	503	34	dBA	787	44	dBA

Notes on Table:

1. dBA = 1-hour energy equivalent sound (L_{eq} (1-hr))

2. Height above local grade

Table 10: Acoustic Assessment Summary - Baseline Conditions

Project: G.E. Booth WRRF
Location: Mississauga, ON

Point of Reception ID	Point of Reception Description	Time Period [1]	Total Sound Level at POR [2] (dBA)	Verified by Acoustic Audit [3] (Yes/No)	Performance Limit [4] (dBA)	Performance Limit Source [5] (C / M/ D)	Compliance with Performance Limit (Yes/No)
POR01	2-Storey Dwelling West of the Facility	Daytime	40	No	50	D	Yes
		Evening	40	No	50	D	Yes
		Nighttime	37	No	45	D	Yes
		Non-emergency Testing	44	No	55	D	Yes
POR02	7-Storey Apartment Bldg	Daytime	49	No	50	D	Yes
		Evening	49	No	50	D	Yes
		Nighttime	43	No	45	D	Yes
		Non-emergency Testing	47	No	55	D	Yes
POR03	20-Storey Apartment Bldg North of the Facility	Daytime	41	No	50	D	Yes
		Evening	41	No	50	D	Yes
		Nighttime	36	No	45	D	Yes
		Non-emergency Testing	36	No	55	D	Yes
POR04	2-Storey Dwelling North-East of the Facility	Daytime	38	No	50	D	Yes
		Evening	38	No	50	D	Yes
		Nighttime	36	No	45	D	Yes
		Non-emergency Testing	31	No	55	D	Yes
POR05	Proposed Residential (Vacant Lot) 4th Floor	Daytime	45	No	50	D	Yes
		Evening	45	No	50	D	Yes
		Nighttime	44	No	45	D	Yes
		Non-emergency Testing	48	No	55	D	Yes
POR06	Proposed Elementary School (Vacant Lot) 3rd Floor	Daytime	39	No	50	D	Yes
		Evening	39	No	50	D	Yes
		Nighttime	38	No	45	D	Yes
		Non-emergency Testing	38	No	55	D	Yes
POR07	Proposed Residential (Vacant Lot) 8th Floor	Daytime	45	No	50	D	Yes
		Evening	45	No	50	D	Yes
		Nighttime	45	No	45	D	Yes
		Non-emergency Testing	54	No	55	D	Yes
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	Daytime	48	No	50	D	Yes
		Evening	48	No	50	D	Yes
		Nighttime	45	No	45	D	Yes
		Non-emergency Testing	51	No	55	D	Yes
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	Daytime	44	No	50	D	Yes
		Evening	44	No	50	D	Yes
		Nighttime	43	No	45	D	Yes
		Non-emergency Testing	44	No	55	D	Yes
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	Daytime	47	No	50	D	Yes
		Evening	47	No	50	D	Yes
		Nighttime	43	No	45	D	Yes
		Non-emergency Testing	48	No	55	D	Yes

Notes on Table:

1 Daytime occurs from 07:00 to 19:00. Evening occurs from 19:00 to 23:00. Nighttime occurs from 23:00 to 07:00.

2 Worst-case cumulative sound level from all applicable sources operating.

3 Has an acoustic audit (as defined in Publication NPC-233) been conducted with the source in place and operating?

4 Applicable NPC-300 sound level limit.

5 Performance limit (aka guideline limit) based on following:

C = Calculated based on road traffic volumes in compliance with NPC-206 requirements.

M = Measured based on monitoring for a minimum 48 hour period, in accordance with NPC-233 requirements.

D = Default guideline minima per NPC-300, as applicable (e.g., 50 dBA daytime for Class 2 Area)

Table 11: Acoustic Assessment Summary - Proposed Capacity Expansion

Project: G.E. Booth WRRF
Location: Mississauga, ON

Point of Reception ID	Point of Reception Description	Time Period [1]	Total Sound Level at POR [2] (dBA)	Verified by Acoustic Audit [3] (Yes/No)	Performance Limit [4] (dBA)	Performance Limit Source [5] (C / M/ D)	Compliance with Performance Limit (Yes/No)
POR01	2-Storey Dwelling West of the Facility	Daytime	41	No	50	D	Yes
		Evening	41	No	50	D	Yes
		Nighttime	37	No	45	D	Yes
		Non-emergency Testing	47	No	55	D	Yes
POR02	7-Storey Apartment Bldg	Daytime	47	No	50	D	Yes
		Evening	47	No	50	D	Yes
		Nighttime	44	No	45	D	Yes
		Non-emergency Testing	53	No	55	D	Yes
POR03	20-Storey Apartment Bldg North of the Facility	Daytime	41	No	50	D	Yes
		Evening	41	No	50	D	Yes
		Nighttime	36	No	45	D	Yes
		Non-emergency Testing	46	No	55	D	Yes
POR04	2-Storey Dwelling North-East of the Facility	Daytime	39	No	50	D	Yes
		Evening	39	No	50	D	Yes
		Nighttime	37	No	45	D	Yes
		Non-emergency Testing	44	No	55	D	Yes
POR05	Proposed Residential (Vacant Lot) 4th Floor	Daytime	46	No	50	D	Yes
		Evening	46	No	50	D	Yes
		Nighttime	45	No	45	D	Yes
		Non-emergency Testing	55	No	55	D	Yes
POR06	Proposed Elementary School (Vacant Lot) 3rd Floor	Daytime	39	No	50	D	Yes
		Evening	39	No	50	D	Yes
		Nighttime	38	No	45	D	Yes
		Non-emergency Testing	45	No	55	D	Yes
POR07	Proposed Residential (Vacant Lot) 8th Floor	Daytime	46	No	50	D	Yes
		Evening	46	No	50	D	Yes
		Nighttime	45	No	45	D	Yes
		Non-emergency Testing	54	No	55	D	Yes
POR08	Proposed Mixed Use (Vacant Lot) 22nd Floor	Daytime	48	No	50	D	Yes
		Evening	48	No	50	D	Yes
		Nighttime	45	No	45	D	Yes
		Non-emergency Testing	53	No	55	D	Yes
POR09	Proposed Mixed Use (Vacant Lot) 12th Floor	Daytime	44	No	50	D	Yes
		Evening	44	No	50	D	Yes
		Nighttime	43	No	45	D	Yes
		Non-emergency Testing	46	No	55	D	Yes
POR10	Proposed Mixed Use (Vacant Lot) 15th Floor	Daytime	48	No	50	D	Yes
		Evening	48	No	50	D	Yes
		Nighttime	43	No	45	D	Yes
		Non-emergency Testing	54	No	55	D	Yes

Notes on Table:

1. Daytime occurs from 07:00 to 19:00. Evening occurs from 19:00 to 23:00. Nighttime occurs from 23:00 to 07:00.
2. Worst-case cumulative sound level from all applicable sources operating.
3. Has an acoustic audit (as defined in Publication NPC-233) been conducted with the source in place and operating?
4. Applicable NPC-300 sound level limit.
5. Performance limit (aka guideline limit) based on following:
   - C = Calculated based on road traffic volumes in compliance with NPC-206 requirements.
   - M = Measured based on monitoring for a minimum 48 hour period, in accordance with NPC-233 requirements.
   - D = Default guideline minima per NPC-300, as applicable (e.g., 50 dBA daytime for Class 2 Area)

Figure 1: Aerial Map with Points of Reception Locations

Acoustical Assessment Report: G.E. Booth WWTP

1300 Lakeshore Rd E, Mississauga ON	P.No. CA02694	Date: 08/2023

Legend

● POR

Notes:

- Imagery obtained from Google Earth
- Concept plan obtained from the City of Mississauga
- Coordinate system: WGS84 UTM 17
- Not to scale

N

wood.

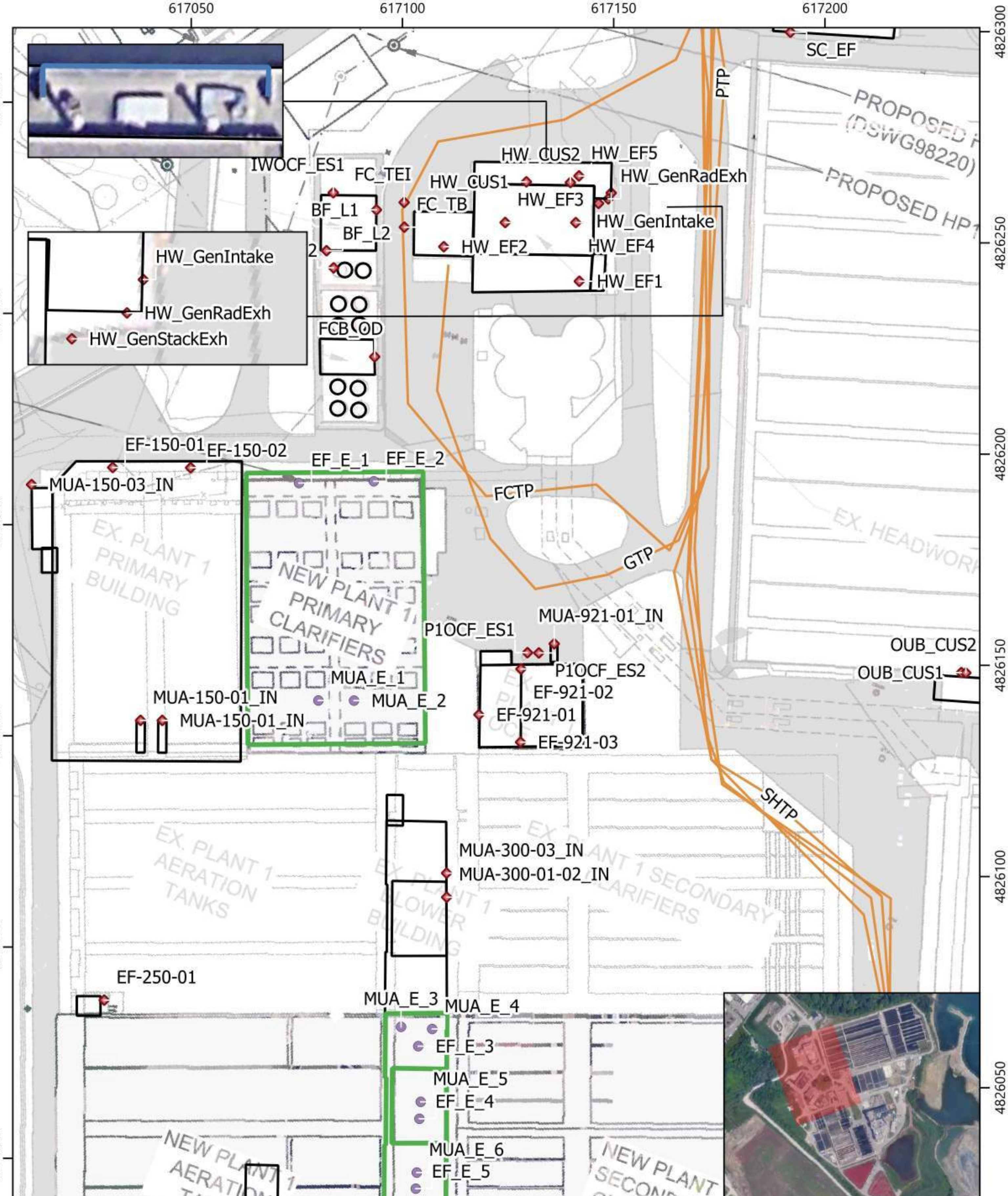


Figure 2: Locations of Significant Noise Sources (Partial)

Acoustical Assessment Report: G.E. Booth WWTP

1300 Lakeshore Rd E, Mississauga ON	P.No. CA02694	Date: 08/2023

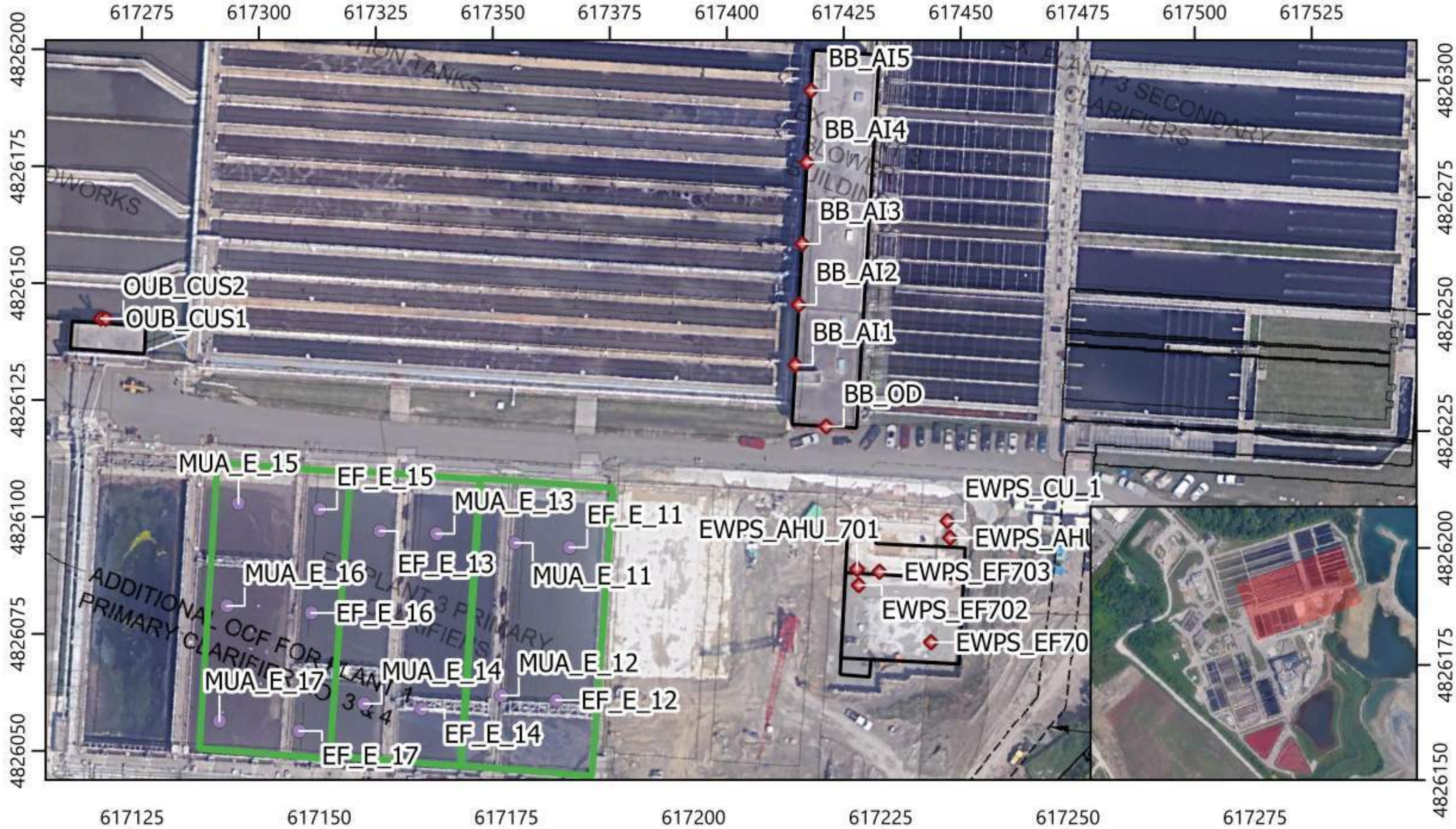
Legend
- Existing Facility Buildings
- Existing Noise Sources
- Barrier
- Proposed Noise Source Additions
- Proposed New Buildings

Notes:

- Imagery obtained from Google Earth
- Coordinate system: WGS84 UTM 17
- Not to scale

N

wood.



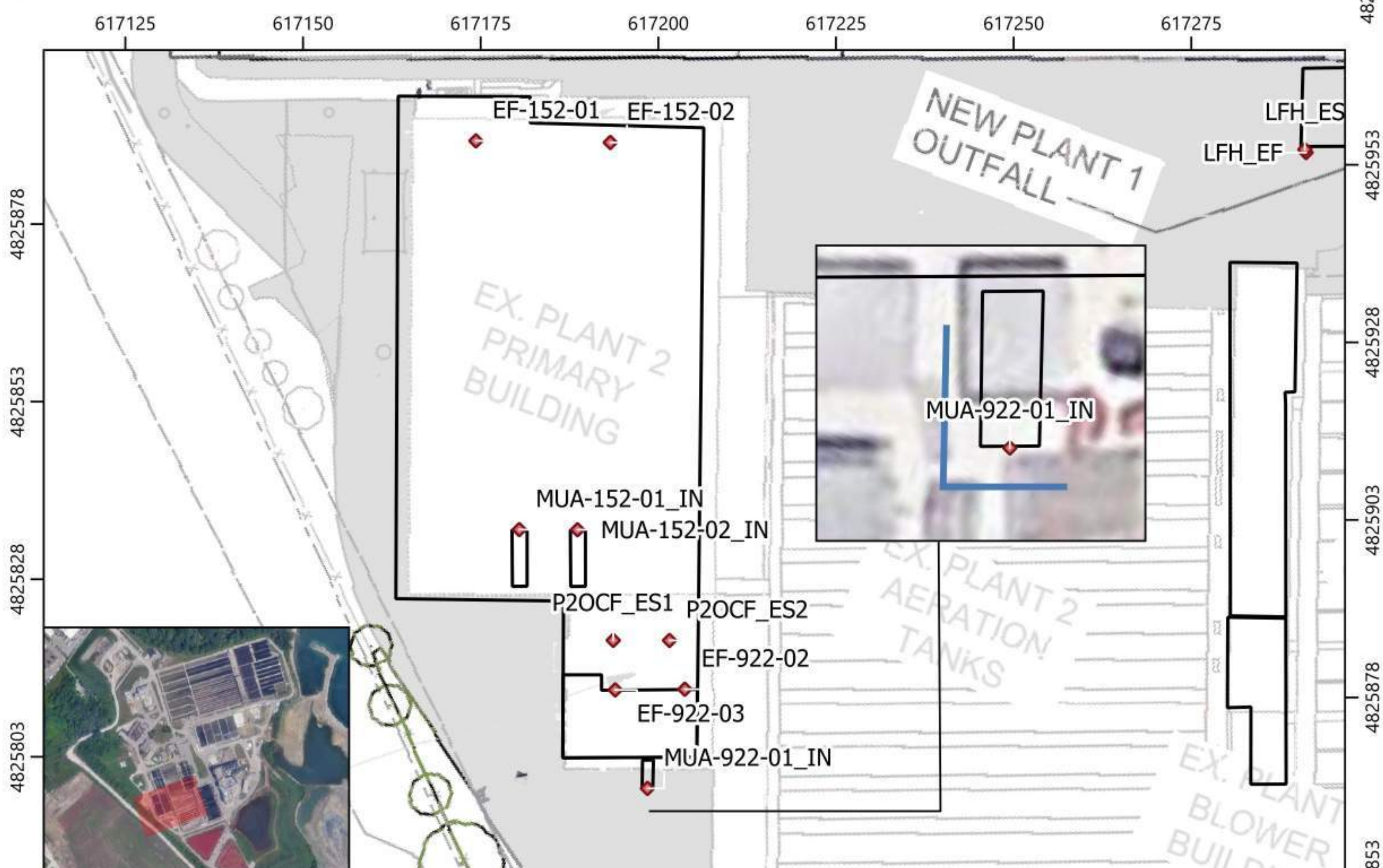


Figure 3: Locations of Significant Noise Sources (Partial)

Acoustical Assessment Report: G.E. Booth WWTP

1300 Lakeshore Rd E, Mississauga ON | P.No. CA02694 | Date: 08/2023

Legend

- Proposed Enclosure
- Existing Facility Buildings
- Existing Noise Sources
- Proposed Noise Source Additions
- Proposed New Buildings

Notes:
- Imagery obtained from Google Earth
- Coordinate system: WGS84 UTM 17
- Not to scale
- See Section 3.1 of report for complete MUA-922-01 enclosure requirements

N

wood.

Figure 4: Locations of Significant Noise Sources (Partial)			Legend	Notes:	
Acoustical Assessment Report: G.E. Booth WWTP			Existing Facility Buildings; Proposed New Buildings; Existing Noise Sources; Mitigation Required; Proposed Noise Source Additions	- Imagery obtained from Google Earth - Coordinate system: WGS84 UTM 17 - Not to scale	N
1300 Lakeshore Rd E, Mississauga, ON	P.No. CA02694	Date: 08/2023			wood.

Figure 5: Locations of Significant Noise Sources (Partial)

Acoustical Assessment Report: G.E. Booth WWTP

1300 Lakeshore Rd E, Mississauga, ON	P.No. CA02694	Date: 08/2023

Legend
- Existing Facility Buildings
- Existing Noise Sources
- Proposed Noise Source Additions
- Proposed New Buildings

Notes:

- Imagery obtained from Google Earth
- Coordinate system: WGS84 UTM 17
- Not to scale

N

wood.

Figure 6: Locations of Significant Noise Sources (Partial)

Acoustical Assessment Report: G.E. Booth WWTP

1300 Lakeshore Rd E, Mississauga ON	P.No. CA02694	Date: 08/2023

Legend

- Existing Facility Buildings
- Existing Noise Sources
- Proposed New Buildings
- Future Truck Movement Addition
- Proposed Noise Sources

Notes:

- Imagery obtained from Google Earth
- Concept plan obtained from the City of Mississauga
- Coordinate system: WGS84 UTM 17
- Not to scale

N

wood.

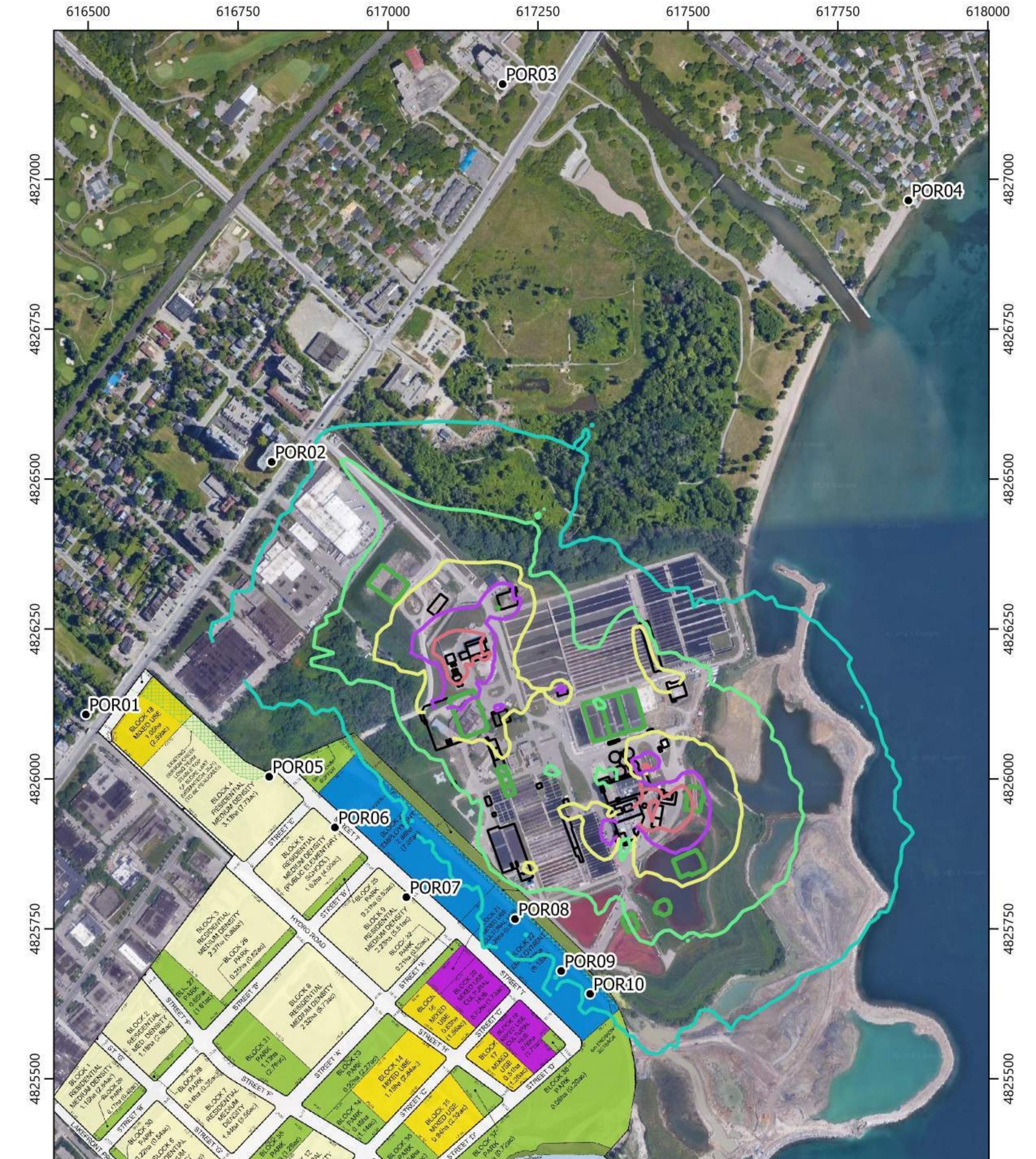


Figure 7: Noise Contours for Existing Predictable Worst-Case Operations - Daytime/Evening

Acoustical Assessment Report: G.E. Booth WWTP

1300 Lakeshore Rd E, Mississauga ON	P.No. CA02694	Date: 09/2023

- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA

Legend

- Existing Facility Buildings
- Proposed New Buildings
- POR

Notes:
- Imagery obtained from Google Earth
- Concept plan obtained from the City of Mississauga
- Coordinate system: WGS84 UTM 17
- Not to scale
- Contour height: 16.5 m above grade

N

wood.

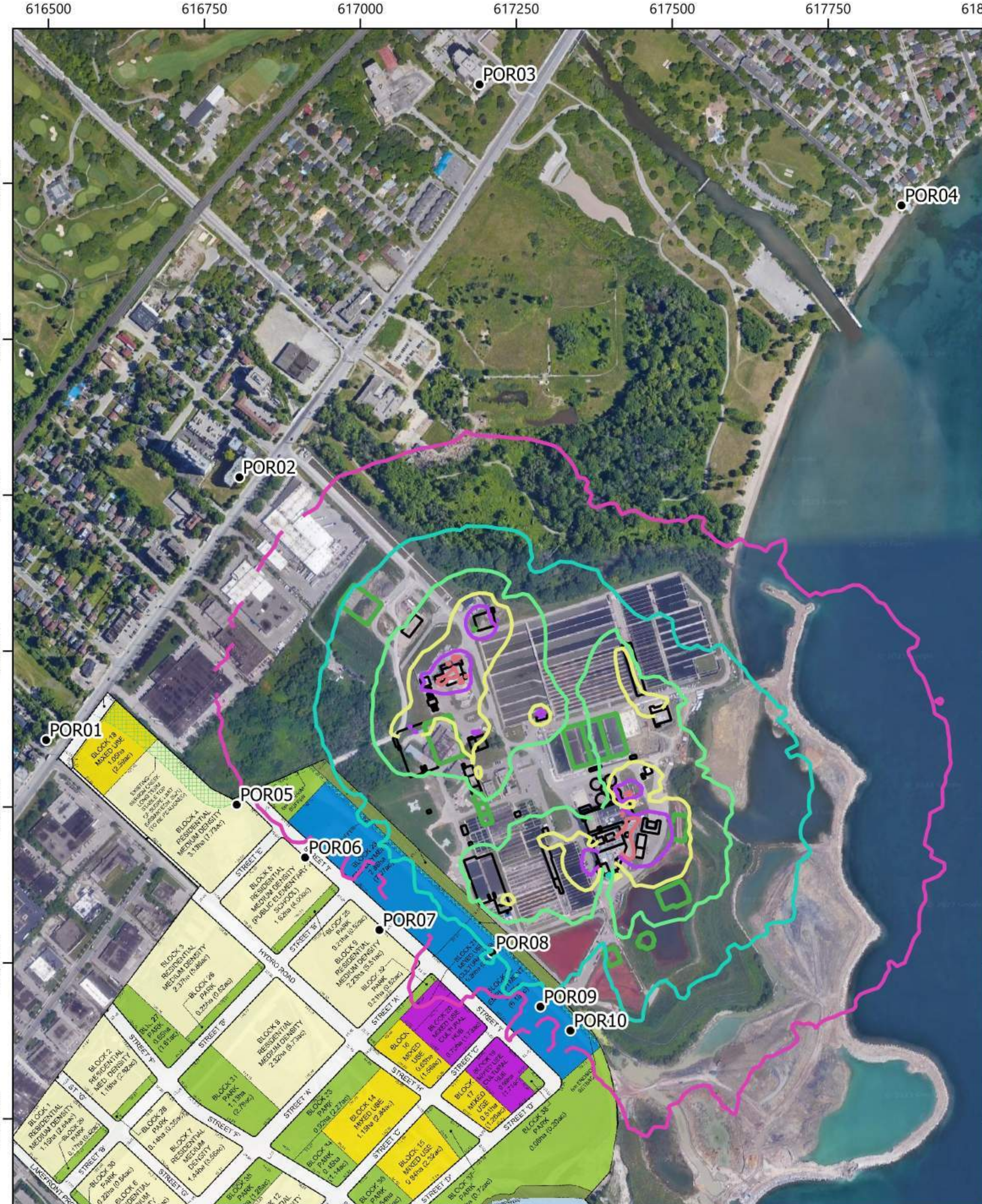


Figure 8: Noise Contours for Existing Predictable Worst-Case Operations - Night

Acoustical Assessment Report: G.E. Booth WWTP

1300 Lakeshore Rd E, Mississauga ON | P.No. CA02694 | Date: 09/2023

Legend
- Existing Facility Buildings
- Proposed New Buildings
- POR

Notes:
- Imagery obtained from Google Earth
- Concept plan obtained from the City of Mississauga
- Coordinate system: WGS84 UTM 17
- Not to scale
- Contour height: 16.5 m above grade

N

wood.

Figure 9: Noise Contours for Future Predictable Worst-Case Operations - Daytime/Evening

Acoustical Assessment Report: G.E. Booth WWTP

1300 Lakeshore Rd E, Mississauga ON	P.No. CA02694	Date: 09/2023

50 dBA
55 dBA
60 dBA
65 dBA
70 dBA

Legend
Existing Facility Buildings
Proposed New Buildings
POR

Notes:
- Imagery obtained from Google Earth
- Concept plan obtained from the City of Mississauga
- Coordinate system: WGS84 UTM 17
- Not to scale
- Contour height: 16.5 m above grade

N

wood.

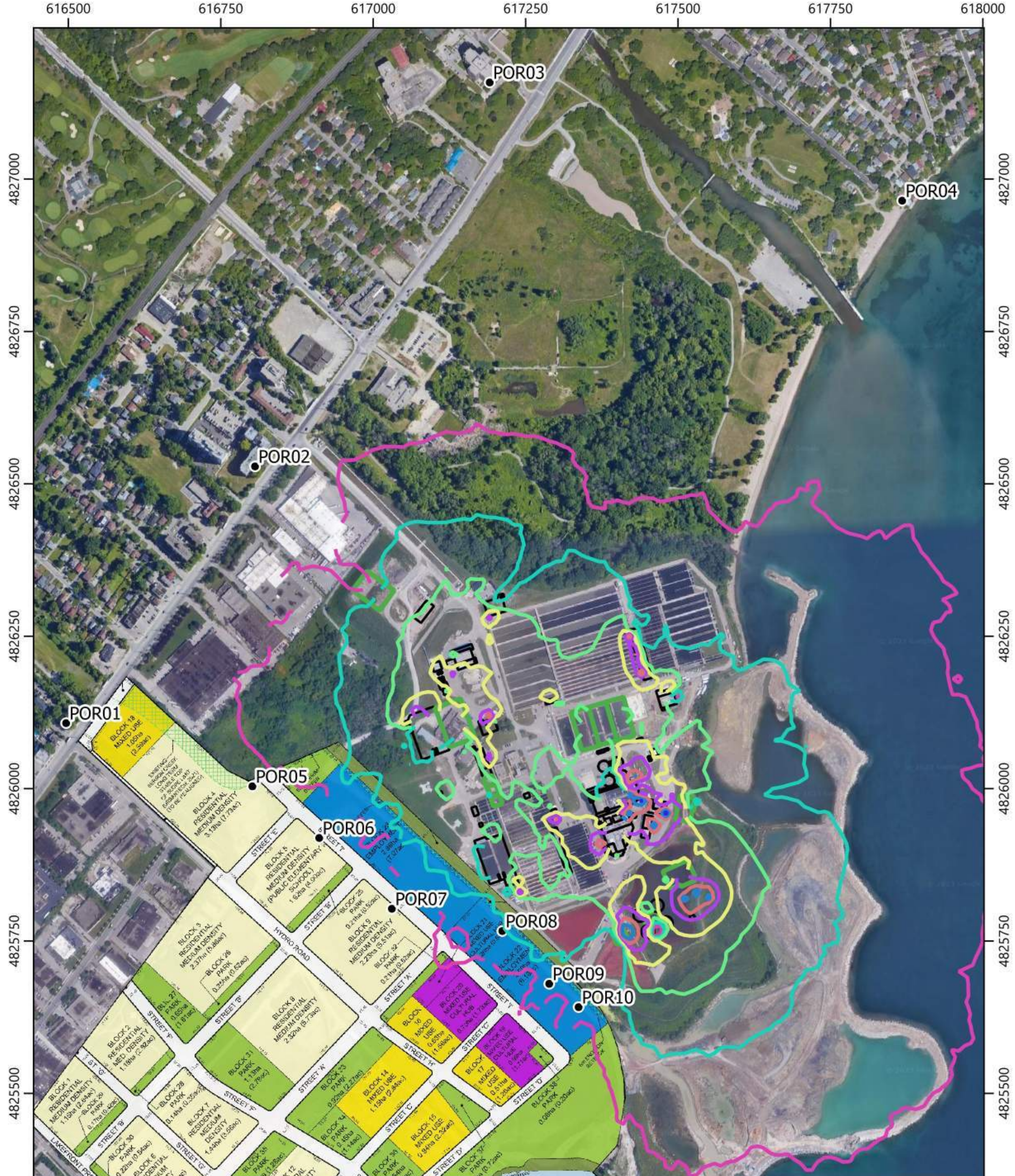


Figure 10: Noise Contours for Future Predictable Worst-Case Operations - Night

Acoustical Assessment Report: G.E. Booth WWTP

1300 Lakeshore Rd E, Mississauga ON	P.No. CA02694	Date: 09/2023

45 dBA, 55 dBA, 65 dBA
50 dBA, 60 dBA, 70 dBA

Legend
Existing Facility Buildings
Proposed New Buildings
POR

Notes:
- Imagery obtained from Google Earth
- Concept plan obtained from the City of Mississauga
- Coordinate system: WGS84 UTM 17
- Not to scale
- Contour height: 16.5 m above grade

N

wood.

Appendix A

Zoning Map of the Site and Surrounding Areas

MISSISSAUGA

NOTICE OF THE PASSING OF A ZONING BY-LAW

DATE OF NOTICE	June 16, 2022	
BY-LAW NUMBER	0119-2022	
DATE PASSED BY COUNCIL	June 8, 2022	
LAST DATE TO FILE APPEAL	July 6, 2022	
FILE NUMBER	OZ 19/003	Ward 1
APPLICANT	Glen Schnarr and Associates	
PROPERTY	South side of Lakeshore Road East, east of Lakefront Promenade, in the City of Mississauga.	

TAKE NOTICE that the Council of the Corporation of the City of Mississauga passed the above noted Zoning By-law, under Section 34 of the Planning Act, R.S.O., 1990, c.P.13. Council has considered the written and oral submissions from the public on this matter.

THE PURPOSE AND EFFECT of this By-law is to permit a mixed use waterfront community containing employment, commercial, park, open space, cultural and residential uses in apartment and townhouse form up to a maximum of 8,050 residential units. This By-law amends the zoning of the property outlined on the attached Schedule "A" from "G1" (Greenlands - Natural Hazards) and "U-1" (Utility - Exception) to "H-RM9-3" (Back to Back and Stacked Townhouses - Exception with a Holding Provision), "H-RA5-59" (Apartments - Exception with a Holding Provision), "H-C4-76" (Mainstreet Commercial - Exception with a Holding Provision), "H-C4-77" (Mainstreet Commercial - Exception with a Holding Provision), "H-C4-78" (Mainstreet Commercial - Exception with a Holding Provision), "H-E1-29" (Employment in Nodes - Exception with a Holding Provision), "H-E1-30" (Employment in Nodes - Exception with a Holding Provision), "H-OS2-18" (Open Space – City Park - Exception with a Holding Provision), "H-G1" (Greenlands - Natural Hazards with a Holding Provision) "H-G1-19" (Greenlands - Natural Hazards - Exception with a Holding Provision), "H-G2-5" (Greenlands - Natural Features – Exception with a Holding Provision). A description of the lands to which the By-law applies and/or a key map showing the location of the lands to which the By-law applies are attached.

IF YOU WISH TO APPEAL to the Ontario Land Tribunal, a copy of an appeal form is available from the OLT website at https://olt.gov.on.ca/. An appeal may be filed by registered mail or courier addressed to the Clerk of the City of Mississauga, Attention: Diana Rusnov, 300 City Centre Drive, Mississauga, ON L5B 3C1, no later than **July 6, 2022**.

Only individuals, corporations and public bodies may appeal to the Ontario Land Tribunal. A notice of appeal may not be filed by an unincorporated association or group. However, a notice of appeal may be filed in the name of an individual who is a member of the association or the group on its behalf.

No person or public body shall be added as a party to the hearing of the appeal unless, before the by-law was passed, the person or public body made oral submissions at a public meeting or written submissions to the Council c/o the Planning and Building Department or, in the opinion of the Ontario Land Tribunal, there are reasonable grounds to add the person or public body as a party.

The Notice of Appeal must:

1) set out reasons for the appeal;
2) be accompanied by the fee prescribed under the *Ontario Land Tribunal Act* in the amount of $1,100.00 per application, payable by certified cheque or money order to the Minister of Finance. A copy of the Ontario Land Tribunal Fee Schedule may be found at https://olt.gov.on.ca/appeals-process/fee-chart/
3) be accompanied by a fee in the amount of $300.00, payable to the City of Mississauga.

MORE INFORMATION: A copy of the Zoning By-law in its entirety can be found at www.mississauga.ca/portal/cityhall/publicnotices, or from **David Breveglieri** of the City of Mississauga, Planning and Building Department at (905) 615-3200 X**5551.**

S. Smith

Sacha Smith,
Manager & Deputy Clerk
City of Mississauga, Legislative Services
300 City Centre Drive
Mississauga, Ontario L5B 3C1

THE CORPORATION OF THE CITY OF MISSISSAUGA

BY-LAW NUMBER 0119-2022

A by-law to amend By-law Number 0225-2007, as amended.

WHEREAS pursuant to sections 34 and 36 of the *Planning Act*, R.S.O. 1990, c.P.13, as amended, the council of a local municipality may pass a zoning by-law which includes a holding provision;

NOW THEREFORE the Council of The Corporation of the City of Mississauga ENACTS as follows:

1. By-law Number 0225-2007, as amended, being a City of Mississauga Zoning By-law, is amended by adding Subsection 2.1.33 to Section 2.1 as follows:

2.1.33 **Lakeview Village Neighbourhood**

The following regulations shall apply to lands in the Lakeview Village Neighbourhood, as located within the boundary area identified on Schedule 2.1.33 of this By-law.

2.1.33.1 The provisions of Article 1.1.4.1, Lines 1.0 and 3.0 contained in Table 2.1.2.1.1, Subsections 2.1.14 and 2.1.30 of this By-law shall not apply.

2.1.33.2 A maximum of 8 050 **dwelling units** shall be permitted on all lands, excluding lands zoned C4-78.

2.1.33.3 The maximum permitted **floor space index (FSI) - apartment zone** shall comply with Schedule 2.1.33 of this By-law where identified.

2.1.33.4 For the purposes of the Lakeview Village Neighbourhood, each block identified on Schedule 2.1.33 of this By-law shall be considered one **lot**, excluding minimum **amenity area** and **landscaped area** requirements.

2.1.33.5 A **building** or **structure** required for the purpose of delivering heating and cooling, piped services for heating and cooling and/or piped services for waste collection is permitted within any zone, provided that the **building** or **structure** complies with the regulations of the zone in which it is situated. A **building** or **structure** measuring less than or equal to 5.0 m² shall not be subject to the zone regulations.

2.1.33.6 The Lakeview Village Neighbourhood lands are required to provide such facilities, services and matters, in accordance with section 37 of the *Planning Act*, as it read on the day before section 9 of Schedule 12 to the *More Homes, More Choices Act, 2019* came into force, and the terms and conditions of a section 37 agreement executed and registered on title to the lands.

2.1.33.7 Pursuant to section 36 of the *Planning Act* R.S.O, 1990, c.P13, as amended, the Lakeview Village Boundary area identified on Schedule 2.1.33 of this By-law is subject to holding provisions H1 to H6. Each holding provision restricts the **use** of the lands to **uses**, **buildings** and **structures** as identified until the relevant conditions are satisfied:

(1) Until such time as the H1 holding provision is removed, only **uses existing** on the date of the passing of this By-law shall be permitted.

The H1 holding provision shall not be removed from the lands within the Lakeview Village Boundary identified on Schedule 2.1.33 of this By-law until such time as:

(1) the delivery of an executed agreement for the provision of certain facilities, services or matters pursuant to section 37 of the *Planning Act*, as it read on the day before section 9 of Schedule 12 to the *More Homes, More Choices Act, 2019* came into force, in a form and on terms satisfactory to the City of Mississauga ("City").

(2) Notwithstanding Sentence 2.1.33.7(1) of this By-law, where a minor variance has been approved by the Committee of Adjustment on or before June 8, 2022, those **uses** will continue to be permitted.

(3) Until such time as the H2 holding provision is removed, a maximum of 6 800 **dwelling units** shall be permitted on all lands.

The H2 holding provision shall not be removed from the lands within the Lakeview Village Boundary identified on Schedule 2.1.33 of this By-law until such time as:

(1) fulfilment of the community benefits obligations identified in the section 37 community benefits agreement to the satisfaction of the City.

(2) submission of a transportation study and confirmation that the necessary traffic infrastructure improvements have been secured to adequately accommodate increased traffic volumes to the satisfaction of the Region of Peel ("Region") and the City.

(4) Until such time as the H3 holding provision is removed, a maximum of 7 500 **dwelling units** shall be permitted.

The H3 holding provision shall not be removed from the lands within the Lakeview Village Boundary identified on Schedule 2.1.33 of this By-law until such time as:

(1) submission of a transportation study and confirmation that the necessary traffic infrastructure improvements have been constructed to adequately accommodate increased traffic volumes to the satisfaction of the Region and the City.

(5) Until such time as the H4 holding provision is removed, only **uses existing** on the date of the passing of this By-law shall be permitted.

The H4 holding provision shall not be removed from the lands within the Lakeview Village Boundary identified on Schedule 2.1.33 of this By-law until such time as:

(1) confirmation from the Region that the necessary upgrades have been completed to the G.E. Booth wastewater treatment facility such that odour dispersion has been mitigated to levels compatible to sensitive land uses and is in keeping with the modelling projection conducted by the Region.

(6) Until such time as the H5 holding provision is removed, only **uses existing** on the date of the passing of this By-law shall be permitted.

The H5 holding provision shall not be removed from the lands within the Lakeview Village Boundary identified on Schedule 2.1.33 of this By-law until such time as:

(1) confirmation through the submission of a revised noise report that noise mitigation measures have been put in place for the noise generated from the properties at 1062 Rangeview Road, 1180 Lakeshore Road East and any zoned properties that exceed Class 4 limits in order to bring noise levels into compliance to the Class 4 area limits of the NPC-300 guidelines.

(7) Until such time as the H6 holding provision is removed, the maximum **gross floor area - non-residential** shall be 92 900 m^2.

The H6 holding provision shall not be removed from the lands within the Lakeview Village Boundary identified on Schedule 2.1.33 of this By-law until such time as:

(1) submission of a satisfactory transportation study and confirmation that the necessary traffic infrastructure improvements have been constructed to adequately accommodate increased traffic volumes all to the satisfaction of the Region and the City.

2.1.33.8 **Motor vehicle** parking for residential **uses** shall be provided in accordance with Part 3 of this By-law and Table 2.1.33.8 - Required Number of Parking Spaces for Residential Uses.

Table 2.1.33.8 - Required Number of Parking Spaces for Residential Uses

Column	A	B
Line 1.0	TYPE OF USE	MINIMUM NUMBER OF PARKING SPACES
2.0	**Apartment** including **back to back** and **stacked townhouses** constructed as part of an **apartment building**	1.0 resident space per unit 0.15 visitor spaces per unit
3.0	**Townhouse, townhouse** on a **CEC - road, back to back townhouse** on a **condominium road, back to back townhouse** on a **CEC - road** and **stacked townhouse** without exclusive use **garage** and **driveway**	1.4 resident spaces per unit 0.15 visitor spaces per unit
4.0	**Retirement Building**	0.4 spaces per unit

2.1.33.9 **Motor vehicle** parking for non-residential **uses** shall be provided in accordance with Part 3 of this By-law and Table 2.1.33.9 - Required Number of Parking Spaces for Non-Residential Uses.

Table 2.1.33.9 - Required Number of Parking Spaces for Non-Residential Uses

Column	A	B
Line 1.0	**TYPE OF USE**	**MINIMUM NUMBER OF PARKING SPACES**
2.0	**Animal Care Establishment,** Art Gallery, Museum, **Repair Establishment, Retail Store** and **Service Establishment**	3.0 spaces per 100 m^2 **GFA - non-residential**
3.0	**Financial Institution**	4.85 spaces per 100 m^2 **GFA - non-residential**
4.0	**Financial institution; restaurant** and **take-out restaurant** less than or equal to 220 m^2 **GFA - non-residential** (in C4-77 and C4-78 zones)	3.0 spaces per 100 m^2 **GFA - non-residential**
5.0	**Office**:	
5.1	**Office**	2.5 spaces per 100 m^2 **GFA - non-residential**
5.2	**Medical Office, Medical Office - Restricted**	4.85 spaces per 100 m^2 **GFA - non-residential**
6.0	**Restaurants**:	
6.1	**Restaurant**	9.0 spaces per 100 m^2 **GFA - non-residential**
6.2	**Restaurant** greater than 220 m^2 **GFA - non-residential** (in C4-77 and C4-78 zones)	6.0 spaces per 100 m^2 **GFA - non-residential**
6.3	Brewery Restaurant (in a C4-77 zone)	2.3 per 100 m^2 **GFA - non-residential**
6.4	**Take-out Restaurant**	4.85 spaces per 100 m^2 **GFA - non-residential**
7.0	**Science and Technology Facility**	2.5 spaces per 100 m^2 **GFA - non-residential**

2.1.33.10 For the purposes of Table 2.1.33.9 - Required Number of Parking Spaces for Non-Residential Uses, a brewery restaurant means a **building, structure** or part thereof, used for the purpose of manufacturing alcoholic beverages and shall contain a **restaurant** with a maximum **gross floor area - non-residential** of 220 m^2 or 50% of the total **gross floor area - non-residential** whichever is lesser.

2.1.33.11 For the purposes of Article 3.1.2.4 - Mixed Use Development Shared Parking, of this By-law, the following formula in Table 2.1.33.11 - Mixed Use Development Shared Parking Formula, shall apply.

Table 2.1.33.11 - Mixed Use Development Shared Parking Formula

Column	A	B	C	D	E
Line 1.0	TYPE OF USE	PERCENTAGE OF PEAK PERIOD (WEEKDAY)			
		Morning	Noon	Afternoon	Evening
1.1	**Financial Institution**	70	75	100	80
1.2	**Office/Medical Office**	100	90	95	10
1.3	**Retail Store/Service Establishment**	50	50	70	75
1.4	**Restaurant/Take-out Restaurant**	25	65	25	100
1.5	**Overnight Accommodation**	50	25	25	65
1.6	Residential - Resident (1) Residential - Visitor	90 20	65 20	90 50	100 100
2.0	**TYPE OF USE**	**PERCENTAGE OF PEAK PERIOD (WEEKEND)**			
		Morning	Noon	Afternoon	Evening
2.1	**Financial Institution**	90	90	90	20
2.2	**Office/Medical Office**	10	10	10	10
2.3	**Retail Store/Service Establishment**	50	75	100	10
2.4	**Restaurant/Take-out Restaurant**	20	90	50	100
2.5	**Overnight Accommodation**	70	25	25	50
2.6	Residential - Resident (1) Residential - Visitor	90 20	65 20	90 60	100 100

NOTE: (1) See Sentence 3.1.2.3.1 of this By-law.

2.1.33.12 For the visitor component, a shared parking arrangement may be used for the calculation of required visitor/non-residential parking in accordance with the following:

the greater of 0.15 visitor spaces per unit

or

Parking required for all non-residential **uses**, located in the same **building** or on the same **lot** as the residential **use**, except **restaurant** and **take-out restaurant**. Parking for **restaurant and take-out restaurant** shall not be included in the above shared parking arrangement and shall be provided in accordance with applicable regulations contained in Table 2.1.33.9 of this By-law.

2.1.33.13 Notwithstanding Sentence 3.1.6.1.1 of this By-law, off-street **bicycle parking spaces** shall be required for the construction of new **buildings** or portions thereof, in accordance with Subsection 3.1.6 contained in Section 3.1 of this By-law.

2. By-law Number 0225-2007, as amended, is further amended by adding Schedule 2.1.33 to Section 2.1, as attached to this By-law.

3. By-law Number 0225-2007, as amended, is further amended by adding the following Exception Table:

4.14.2.3	Exception: RM9-3	Map # 01	By-law:
In a RM9-3 zone the permitted **uses** and applicable regulations shall be as specified for a RM9 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Uses			
4.14.2.3.1	(1) **Back to back townhouse** on a **condominium road** (2) **Back to back townhouse** on a **CEC - road** (3) **Townhouse** (4) **Townhouse** on a **CEC - road**		
Regulations			
4.14.2.3.2	The provisions of Lines 9.0 and 9.2 contained in Table 4.14.1 of this By-law shall not apply		
4.14.2.3.3	Minimum **exterior side yard**		3.5 m
4.14.2.3.4	Minimum **interior side yard**		3.5 m
4.14.2.3.5	Maximum projection of a **balcony**, awning, **porch** or **deck**, exclusive of stairs, from the outermost face of the front wall of the **building**		2.4 m
4.14.2.3.6	Maximum projection of an awning, **porch** or **deck**, located at and accessible from the **first storey** or below the **first storey**, inclusive of stairs from the outermost face of the rear wall of the **building**		4.5 m
4.14.2.3.7	Maximum encroachment of an awning, **porch** or **deck**, located at and accessible from the **first storey** or below the **first storey**, inclusive of stairs, into the required **rear yard**		4.5 m
4.14.2.3.8	Minimum setback from a **garage face** to a **street**, **condominium road**, **CEC - road**, sidewalk or walkway		6.0 m
4.14.2.3.9	Minimum setback from the front wall of a **building** to an abutting condominium **rear lot line** or **interior side lot line**		7.5 m
4.14.2.3.10	Minimum setback from a rear wall of a **building** to a side wall of another **building** on the same **lot**		9.0 m
4.14.2.3.11	Minimum setback from a side wall of a **building** to an abutting condominium **rear lot line**		3.5 m
4.14.2.3.12	Minimum setback from a side wall of a **building** to a **condominium road**, **CEC - road**, **CEC - amenity area**, sidewalk, walkway or **parking space**		2.5 m
4.14.2.3.13	Minimum setback from the front or rear wall of a **building** to an abutting OS2-18 zone		4.5 m
4.14.2.3.14	Minimum setback of all **buildings** and **structures** to a G2-5 zone		3.5 m
4.14.2.3.15	Maximum **driveway** width		3.0 m
4.14.2.3.16	Minimum setback between a surface **parking space** and an **interior side lot line** or **rear lot line**		2.0 m
4.14.2.3.17	Minimum setback of a **parking structure** constructed above or partially above finished grade to any **lot line**		4.5 m

4.14.2.3	Exception: RM9-3	Map # 01	By-law:
4.14.2.3.18	Minimum setback of a **parking structure** constructed completely below finished grade to any **lot line**		1.0 m
4.14.2.3.19	Notwithstanding Sentence 4.14.2.3.18 of this Exception, minimum setback of a **parking structure** constructed completely below finished grade to an OS2-18 zone		1.5 m
4.14.2.3.20	Required **parking areas** located in an underground **parking structure**, **amenity area** and **landscaped area** are permitted to be shared with abutting lands zoned RA5-59 and C4-76		
4.14.2.3.21	Minimum width of a **condominium road**		6.1 m
4.14.2.3.22	**Landscaped areas** and **landscaped soft areas** may include **decks** and patios		
4.14.2.3.23	Minimum **landscaped buffer** abutting lands zoned OS2-18		1.5 m
4.14.2.3.24	A **stacked townhouse** shall comply with the following regulations:		
	(1)	minimum **dwelling unit width**	4.5 m
	(2)	minimum **front yard**	4.5 m
	(3)	minimum setback from the front wall of a **townhouse** to a **street line**, **condominium road**, sidewalk, walkway or visitor **parking space**	4.5 m
	(4)	minimum setback from the rear wall of a **townhouse** to a **street line**, **lot line**, **condominium road**, sidewalk, walkway or visitor **parking space**	6.0 m
	(5)	maximum encroachment of a **balcony**, **porch**, awning or **deck**, exclusive of stairs into the required **front yard**	2.4 m
	(6)	minimum **landscaped area**	30%
4.14.2.3.25	A **back to back townhouse** on a **condominium road** shall comply with the following regulations:		
	(1)	minimum **dwelling unit width**	4.5 m
	(2)	minimum **front yard**	3.5 m
	(3)	minimum setback from the front wall of a **townhouse** to a **street line**, **condominium road**, sidewalk, walkway or visitor **parking space**	3.5 m
	(4)	maximum encroachment of a **balcony**, **porch** awning or **deck**, exclusive of stairs into the required **front yard**	2.4 m
	(5)	minimum **landscaped area**	30%

4.14.2.3	Exception: RM9-3		Map # 01	By-law:
4.14.2.3.26	A **back to back townhouse** on a **CEC - road** shall comply with the following regulations:			
	(1)	the provisions of Lines 3.0 and 15.1 contained in Table 4.14.1 of this By-law shall not apply		
	(2)	minimum **dwelling unit width**		4.8 m
	(3)	minimum **front yard**		4.5 m
	(4)	minimum **interior side yard** - attached side		0.0 m
	(5)	minimum **interior side yard** - unattached side		1.5 m
	(6)	minimum **interior side yard** where the **interior side lot line** abuts a CEC - **landscaped buffer**		3.5 m
	(7)	minimum **exterior side yard** where the **exterior side lot line** abuts a **CEC - road** or CEC - sidewalk		2.5 m
	(8)	maximum encroachment of a **balcony**, **porch**, awning or **deck** inclusive of stairs located at and accessible from the **first storey** or below the **first storey** into the required **front** and **exterior side yards**		1.5 m
	(9)	minimum CEC - **landscaped buffer** abutting any side and **rear lot line**		3.0 m
	(10)	minimum contiguous **CEC - amenity area**		The greater of 2.8 m^2 per **dwelling unit** or 5% of the **lot area**
4.14.2.3.27	A **townhouse** shall comply with the following regulations:			
	(1)	minimum **dwelling unit width**		4.8 m
	(2)	minimum **front yard**		3.5 m
	(3)	minimum setback from the front wall of a **townhouse** to a **street line, condominium road**, sidewalk, walkway or visitor **parking space**		3.5 m
	(4)	minimum setback from the rear wall of a **townhouse** to any **lot line, condominium road**, sidewalk, walkway, or visitor **parking space**		6.0 m
	(5)	maximum encroachment of a **balcony**, **porch**, awning or **deck**, exclusive of stairs into the required **front yard**		2.4 m
	(6)	minimum **landscaped area**		30%

4.14.2.3	Exception: RM9-3		Map # 01	By-law:
4.14.2.3.28	A **townhouse on a CEC - road** shall comply with the following regulations:			
	(1)	the provisions of Line 3.0 contained in Table 4.14.1 of this By-law shall not apply		
	(2)	minimum **dwelling unit width**		4.8 m
	(3)	minimum **front yard**		4.5 m
	(4)	minimum **interior side yard** - unattached side		0.0 m
	(5)	minimum **interior side yard** - attached side		1.5 m
	(6)	minimum **interior side yard** where **interior side lot line** is the **rear lot line** of an abutting parcel		2.5 m
	(7)	minimum **exterior side yard** where the **exterior side lot line** abuts a **CEC - road** or CEC - sidewalk		2.5 m
	(8)	minimum **rear yard**		6.0 m
	(9)	maximum encroachment of a **balcony**, **porch** awning or **deck** inclusive of stairs located at and accessible from the **first storey** or below the **first storey** into the required **front** and **exterior side yards**		1.5 m
	(10)	minimum **landscaped area**		20%
4.14.2.3.29	A **public school** shall comply with the provisions contained in Table 2.1.9.1 of this By-law except that:			
	(1)	minimum **front**, side and **rear yard** - **public school**		3.0 m
	(2)	maximum **height** - **public school**		25.0 m
	(3)	minimum amount of required parking to be located underground		80%
Holding Provision				
	The holding symbol H is to be removed from the whole or any part of the lands zoned H-RM9-3 by further amendment to Map 01 of Schedule B contained in Part 13 of this By-law, as amended, upon satisfaction of the following requirement:			
	(1)	the provisions contained in Article 2.1.33.7 of this By-law as they relate to lands zoned H-RM9-3 and subject to holding provisions H1, H2, H3, H4 and H5.		

4. By-law Number 0225-2007, as amended, is further amended by adding the following Exception Table:

4.15.6.59	Exception: RA5-59	Map #01	By-law:
In a RA5-59 zone the permitted **uses** and applicable regulations shall be as specified for a RA5 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Uses			
4.15.6.59.1	(1) **Townhouse** (2) **Stacked Townhouse** (3) **Restaurant** (4) **Take-out restaurant** (5) Outdoor patio accessory to a **restaurant** or **take-out restaurant** (6) **Animal Care Establishment**		
Regulations			
4.15.6.59.2	**Uses** contained in Clauses 4.15.6.59.1(1) and 4.15.6.59.1(2) of this Exception shall be attached to an **apartment**		
4.15.6.59.3	**Animal care establishments**, **restaurants** and **take-out restaurants** shall only be permitted within the **first storey** of a **building**		
4.15.6.59.4	Minimum **gross floor area - non-residential** located within the **first storey** of each **building** abutting Street 'F', between Street 'A' and Street 'B' identified on Schedule RA5-59 of this Exception		450 m^2
4.15.6.59.5	Maximum height of a podium		6 **storeys** and 21.0 m
4.15.6.59.6	For the purposes of calculating **height**, **townhouse** and **stacked townhouse** shall be measured from **established grade**		
4.15.6.59.7	Minimum **front** and **exterior side yards** for that portion of the dwelling with a **height** up to and including six **storeys**		4.0 m
4.15.6.59.8	Minimum **front** and **exterior side yards** for that portion of the dwelling with a **height** greater than six **storeys**		7.0 m
4.15.6.59.9	Minimum setback of a **streetwall** abutting Street 'D' with a **height** greater than four **storeys** identified on Schedule RA5-59 of this Exception		7.0 m
4.15.6.59.10	Minimum setback for that portion of the dwelling with a **height** greater than six **storeys** and facing the **lot line** abutting Street 'D'		25.0 m
4.15.6.59.11	Minimum **interior side yard** for that portion of the dwelling with a **height** up to and including six **storeys**		4.5 m
4.15.6.59.12	Minimum **interior side yard** for that portion of the dwelling with a **height** greater than six **storeys**		7.5 m
4.15.6.59.13	Minimum **rear yard** for that portion of the dwelling with a **height** up to and including six **storeys**		7.5 m
4.15.6.59.14	Minimum **rear yard** for that portion of the dwelling with a **height** greater than six **storeys**		10.5 m
4.15.6.59.15	Notwithstanding Sentences 4.15.6.59.11 and 4.15.6.59.13 of this Exception, minimum **interior** or **rear yard** when abutting an OS2-18 zone		5.0 m

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4.15.6.59	Exception: RA5-59	Map #01	By-law:
4.15.6.59.16	Minimum above grade separation between **buildings** for that portion of dwelling with a **height** greater than eight **storeys**		30.0 m
4.15.6.59.17	Maximum encroachment of a **balcony** located above the **first storey** into a required **yard**		2.4 m
4.15.6.59.18	Maximum projection of a **balcony** located above the **first storey** measured from the outermost face or faces of the **building** from which the **balcony** projects		2.4 m
4.15.6.59.19	Notwithstanding Sentence 4.15.6.59.18 of this Exception, a **balcony** shall not have a maximum projection provided it does not extend beyond the outermost face or faces of the **storey** supporting the **balcony**		
4.15.6.59.20	Minimum setback from a **parking structure** above or partially above finished grade to a **front** or **exterior lot line**		4.0 m
4.15.6.59.21	Minimum setback from a **parking structure** above or partially above finished grade to an **interior lot line**		4.5 m
4.15.6.59.22	Minimum setback from a **parking structure** above or partially above finished grade to a **rear lot line**		7.5 m
4.15.6.59.23	Minimum setback from a **parking structure** completely below finished grade, inclusive of external access stairwells, to any **lot line**		1.0 m
4.15.6.59.24	Notwithstanding Sentence 4.15.6.59.23 of this Exception, minimum setback from a **parking structure** completely below finished grade, inclusive of external access stairwells, to the **lot line** abutting Street 'H' on Blocks 3 and 8 identified on Schedule 2.1.33 of this By-law		3.0 m
4.15.6.59.25	Notwithstanding Sentence 4.15.6.59.23 of this Exception, minimum setback for external access stairwells abutting a **lot line** that is a **street line**		2.0 m
4.15.6.59.26	Notwithstanding Sentence 4.15.6.59.23, minimum setback from a **parking structure** completely below finished grade to all lands zoned OS2-18		1.5 m
4.15.6.59.27	Minimum setback from a **sight triangle**		2.0 m
4.15.6.59.28	Minimum width of a **condominium road**		6.1 m
4.15.6.59.29	Minimum **landscaped area**		30%
4.15.6.59.30	Minimum depth of a **landscaped buffer** abutting a **lot line** that is a **street line**		2.0 m
4.15.6.59.31	Minimum depth of a **landscaped buffer** abutting lands with an Open Space Zone		1.5 m
4.15.6.59.32	Minimum **amenity area**		The greater of 4.0 m^2 per **dwelling unit** or 10% of the site area
4.15.6.59.33	Minimum percentage of total required **amenity area** to be provided in one contiguous area		35%
4.15.6.59.34	Maximum amount of required resident **parking spaces** that may be tandem		10%

4.15.6.59	Exception: RA5-59	Map #01	By-law:
4.15.6.59.35	**Condominium roads** and **aisles** are permitted to be shared with abutting lands zoned C4-76 and C4-77		
4.15.6.59.36	**Parking areas**, **amenity areas** and **landscaped areas** are permitted to be shared with abutting lands zoned RM9-3, C4-76 and C4-77		
4.15.6.59.37	Notwithstanding any other provisions of this By-law, the calculation of **height** for **apartment**, **long-term care** and **retirement buildings**, shall be exclusive of an enclosed rooftop amenity area provided that the enclosed amenity area does not occupy more than 30% of the rooftop, is setback a minimum of 3.0 m from the outermost edge of the rooftop and that the **height** of such element is no higher than 4.5 m above the **height** limit otherwise applicable		
4.15.6.59.38	"Height of a Podium" means the vertical distance between the **established grade** and the highest point of the roof surface of the podium		
4.15.6.59.39	"Podium" means the base of a **building** or **structure** located at or above **established grade**, that projects from the **building**		
4.15.6.59.40	All site development plans shall comply with Schedule RA5-59 of this Exception		
Holding Provisions			
	The holding symbol H is to be removed from the whole or any part of the lands zoned H-RA5-59 by further amendment to Map 01 of Schedule B contained in Part 13 of this By-law, as amended, upon satisfaction of the following requirements: (1) the provisions contained in Article 2.1.33.7 of this By-law as they relate to lands zoned H-RA5-59 and subject to holding provisions H1, H2, H3, H4 and H5.		

5. By-law Number 0225-2007, as amended, is further amended by adding the following Exception Table:

6.2.5.76	Exception: C4-76	Map #01	By-law:
In a C4-76 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Uses			
6.2.5.76.1	(1) **Long-Term Care Building** (2) **Retirement Building** (3) Outdoor patio accessory to a **restaurant** or **take-out restaurant**		
Uses Not Permitted			
6.2.5.76.2	(1) **Funeral Establishment** (2) **Private Club** (3) University/College		

6.2.5.76	Exception: C4-76	Map #01	By-law:
Regulations			
6.2.5.76.3	Residential **uses** shall not be permitted on the **first storey** facing Lakeshore Road East		
6.2.5.76.4	Maximum **gross floor area - apartment zone** per **storey** for each **storey** above 12 **storeys**		1 000 m^2
6.2.5.76.5	The **lot line** abutting Lakeshore Road East shall be deemed to be the **front lot line**		
6.2.5.76.6	Minimum **front yard** for the portion of the **building** with a **height** less than or equal to 15.0 m		4.0 m
6.2.5.76.7	Minimum **front yard** for the portion of the **building** with a **height** greater than 15.0 m		7.0 m
6.2.5.76.8	Minimum **exterior side yard** for the portion of the **building** with a **height** less than or equal to 15.0 m		2.0 m
6.2.5.76.9	Minimum **exterior side yard** for the portion of the **building** with a **height** less than or equal to 15.0 m		5.0 m
6.2.5.76.10	Minimum **exterior side yard** for the portion of the **building** containing residential **uses** and with a **height** less than or equal to 15.0 m		4.0 m
6.2.5.76.11	Minimum **exterior side yard** for the portion of the **building** containing residential **uses** and with a **height** greater than 15.0 m		7.0 m
6.2.5.76.12	Minimum **rear yard**		7.5 m
6.2.5.76.13	Maximum **height**		52.5 m and 15 **storeys**
6.2.5.76.14	Notwithstanding Sentence 6.2.5.76.7 of this Exception, minimum setback for that portion of the dwelling with a **height** greater than eight **storeys** and facing the **lot line** abutting Lakeshore Road East		25.0 m
6.2.5.76.15	Notwithstanding Sentence 6.2.5.76.3 of this Exception, maximum length of a **building streetwall** on the **first storey** facing Lakeshore Road East that may be used for accessing residential **uses** located above the **first storey**		15%
6.2.5.76.16	Minimum setback of all **buildings** and above grade **structures** to all lands zoned G2-5		5.0 m
6.2.5.76.17	Minimum depth of a **landscaped buffer** measured to a G2-5 zone		2.0 m
6.2.5.76.18	Minimum setback of **parking areas**, **driveways**, **loading spaces**, other paved areas to a G2-5 zone		2.0 m
6.2.5.76.19	Minimum setback of an underground **parking structure** to a G2-5 zone		3.0 m
6.2.5.76.20	Minimum **gross floor area - non-residential** located on the **first storey**		4 000 m^2
6.2.5.76.21	Minimum setback from a **parking structure** below finished grade, inclusive of external access stairwells, to a **lot line**		1.0 m
6.2.5.76.22	Notwithstanding Sentence 6.2.5.76.21 of this Exception, minimum setback from a **parking structure** below finished grade, inclusive of external access stairwells, to the **front lot line** abutting Lakeshore Road East		3.0 m

6.2.5.76	Exception: C4-76	Map #01	By-law:
6.2.5.76.23	**Driveways**, **aisles** and **parking areas** may be shared with abutting lands zoned RM9-3 and RA5-59		
6.2.5.76.24	Maximum amount of required resident **parking spaces** that may be tandem		10%
Holding Provision			
	The holding symbol H is to be removed from the whole or any part of the lands zoned H-C4-76 by further amendment to Map 01 of Schedule B contained in Part 13 of this By-law, as amended, upon satisfaction of the following requirement: (1) the provisions contained in Article 2.1.33.7 of this By-law as they relate to lands zoned H-C4-76 and subject to holding provisions H1, H2, H3 and H5.		

6. By-law Number 0225-2007, as amended, is further amended by adding the following Exception Table:

6.2.5.77	Exception: C4-77	Map #01	By-law:
In a C4-77 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Uses			
6.2.5.77.1	(1) **Retirement Building** (2) Brewery Restaurant (3) Outdoor patio accessory to a **restaurant**, brewery restaurant or **take-out restaurant**		
Uses Not Permitted			
6.2.5.77.2	(1) **Funeral Establishment** (2) **Private Club**		
Regulations			
6.2.5.77.3	Residential **uses** shall not be permitted on the **first storey**		
6.2.5.77.4	Maximum **gross floor area - non-residential** of a **retail store**		550 m^2
6.2.5.77.5	Maximum **gross floor area - non-residential** of a **recreational establishment**		300 m^2
6.2.5.77.6	Minimum **front** and **exterior side yards** on the **first storey**		3.0 m
6.2.5.77.7	Minimum **front yard** for that portion of the dwelling with a **height** greater than six **storeys** facing Street 'D'		15.0 m
6.2.5.77.8	Minimum **rear yard** for that portion of the dwelling with a **height** greater than six **storeys**		7.5 m
6.2.5.77.9	Minimum **interior side yard** on the **first storey** abutting an OS2-19 zone		3.0 m
6.2.5.77.10	Minimum **interior side yard** above the **first storey** and below the seventh **storey** abutting an OS2-19 zone		0.0 m

6.2.5.77	Exception: C4-77	Map #01	By-law:
6.2.5.77.11	Minimum **interior side yard** for that portion of the dwelling with a **height** greater than six **storeys** abutting an OS2-19 zone		3.0 m
6.2.5.77.12	Minimum **interior side** and **rear yards** for that portion of the dwelling with a **height** up to an including six **storeys** abutting a C4-78 zone		4.5 m
6.2.5.77.13	Minimum **interior side yard** for that portion of the dwelling with a **height** greater than six **storeys** abutting a C4-78 zone		7.5 m
6.2.5.77.14	Maximum **height**		42.5 m and 12 **storeys**
6.2.5.77.15	Notwithstanding Sentence 6.2.5.77.14 of this Exception, maximum **height** for a **building** at the southeast corner of Street 'A' and Street 'H' identified on Schedule 2.1.33 of this By-law		75.5 m and 22 **storeys**
6.2.5.77.16	Minimum above grade separation between **buildings** for that portion of the dwelling with a **height** greater than eight **storeys**		30.0 m
6.2.5.77.17	Notwithstanding Sentence 6.2.5.77.3 of this Exception, maximum length of a **building streetwall** on the **first storey** that may be used for accessing residential **uses** located above the **first storey**		15%
6.2.5.77.19	Minimum setback from a **parking structure** below finished grade, inclusive of stairwells, to a **lot line**		1.0 m
6.2.5.77.20	Minimum depth of a **landscaped buffer** abutting the **lot line** of an OS2-19 zone		0.0 m
6.2.5.77.21	**Driveways**, **aisles** and **parking areas** may be shared with abutting lands zoned C4-78 and RA5-59		
6.2.5.77.22	Maximum amount of required resident **parking spaces** that may be tandem		10%
6.2.5.77.23	"Brewery Restaurant" means a **building**, **structure** or part thereof, used for the purpose of manufacturing alcoholic beverages and shall contain a **restaurant** with a maximum **gross floor area - non-residential** of 220 m^2 or 50% of the total **gross floor area - non-residential** whichever is lesser		
Holding Provision			
	The holding symbol H is to be removed from the whole or any part of the lands zoned H-C4-77 by further amendment to Map 01 of Schedule B contained in Part 13 of this By-law, as amended, upon satisfaction of the following requirement: (1) the provisions contained in Article 2.1.33.7 of this By-law as they relate to lands zoned H-C4-77 and subject to holding provisions H1, H2 and H3.		

7. By-law Number 0225-2007, as amended, is further amended by adding the following Exception Table:

6.2.5.78	Exception: C4-78	Map #01	By-law:
In a C4-78 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Uses			
6.2.5.78.1	(1) **Science and Technology Facility** (2) **Banquet Hall/Conference Centre/ Convention Centre** (3) **Custom Workshop** (4) Live/Work Unit (5) Outdoor patio accessory to a **restaurant** or a **take-out restaurant** (6) Contractor's yard operated on or on behalf of a **public authority** (7) Community Cultural Centre		
Uses Not Permitted			
6.2.5.78.2	(1) **Funeral Establishment** (2) **Private Club**		
Regulations			
6.2.5.78.3	Apartment **dwelling units** shall only be permitted above the **first storey** of a **building**		
6.2.5.78.4	Maximum **height**		29.5 m and **8 storeys**
6.2.5.78.5	Maximum length of a **building streetwall** on the **first storey** that may be used for accessing residential **uses** located above the **first storey**		15%
6.2.5.78.6	Maximum **gross floor area - non-residential** of a **retail store**		250 m^2
6.2.5.78.7	**Driveways** and **aisles** may be shared with abutting lands zoned C4-77		
6.2.5.78.8	Required parking may be located on lands zoned C4-78 or E1-30		
6.2.5.78.9	"Community Cultural Centre" means a **building**, **structure** or part thereof, for the provision of community activities, such as, but not limited to, recreation, arts, crafts, museums, social and charitable activities		
6.2.5.78.10	"Live/Work Unit" means a **townhouse** used partly for residential purposes and partly for an **office**, **retail store**, **service establishment**, **custom workshop** or **repair establishment**		
Holding Provision			
	The holding symbol H is to be removed from the whole or any part of the lands zoned H-C4-78 by further amendment to Map 01 of Schedule B contained in Part 13 of this By-law, as amended, upon satisfaction of the following requirement: (1) the provisions contained in Article 2.1.33.7 of this By-law as they relate to lands zoned H-C4-78 and subject to holding provisions H1, H2 and H3.		

8. By-law Number 0225-2007, as amended, is further amended by adding the following Exception Table:

8.2.2.29	Exception: E1-29	Map #01	By-law:
In an E1-29 zone the permitted **uses** and applicable regulations shall be as specified for an E1 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Use			
8.2.2.29.1	(1) **Broadcasting/Communication Facility**		
Uses Not Permitted			
8.2.2.29.2	(1) **Overnight Accommodation** (2) **Active Recreational Use** (3) **Entertainment Establishment** (4) Courier/Messenger Service		
Regulations			
8.2.2.29.3	Maximum total **gross floor area - non-residential** for each of the following **uses**: (1) **Warehouse/Distribution Facility** (2) **Financial institution** (3) **Banquet Hall/Conference Centre/ Convention Centre** (4) **Recreational Establishment**		20% per **building**
8.2.2.29.4	Minimum **lot frontage**		20.0 m
8.2.2.29.5	Minimum **front yard**		3.0 m
8.2.2.29.6	Minimum **height**		**3 storeys**
8.2.2.29.7	Minimum **interior side yard** to a **building** or **structure** required for the purposes of providing water, stormwater and wastewater management facilities or piped services		0.0 m
8.2.2.29.8	Notwithstanding Sentence 8.2.2.29.6 of this Exception, minimum **height** of a **building** or **structure** required for the purposes of providing water, stormwater and wastewater management facilities or piped services		2 **storeys**
8.2.2.29.9	Minimum setback of all **buildings** and **structures** to lands zoned G2-5		5.0 m
8.2.2.29.10	Minimum setback of a **parking structure** constructed completely below finished grade to all lands zoned G2-5		3.0 m
8.2.2.29.11	Minimum depth of a **landscaped buffer** abutting a **lot line** that is a **street line**		0.0 m
8.2.2.29.12	Minimum depth of a **landscaped buffer** abutting lands zoned G2-5		2.0 m
8.2.2.29.13	Minimum setback of **parking areas, driveways, loading spaces** and other paved areas to a G2-5 zone		2.0 m
8.2.2.29.14	Minimum distance from a surface **parking space** to a **lot line** that is a **street line**		40.0 m
8.2.2.29.15	Maximum amount of required **parking spaces** to be provided as surface parking on site except for a pumping station		10%

8.2.2.29	Exception: E1-29	Map #01	By-law:
8.2.2.29.16	**Driveways** and **aisles** may be shared with abutting lands zoned E1-30		
Holding Provision			
	The holding symbol H is to be removed from the whole or any part of the lands zoned H-E1-29 by further amendment to Map 01 of Schedule B contained in Part 13 of this By-law, as amended, upon satisfaction of the following requirement: (1) the provisions contained in Article 2.1.33.7 of this By-law as they relate to lands zoned H-E1-29 and subject to holding provisions H1, H2, H3 and H6.		

9. By-law Number 0225-2007, as amended, is further amended by adding the following Exception Table:

8.2.2.30	Exception: E1-30	Map #01	By-law:
In an E1-30 zone the permitted **uses** and applicable regulations shall be as specified for an E1 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Uses			
8.2.2.30.1	(1) **Power generating facility** associated with a district energy system (2) **Waste transfer station** exclusively for a vacuum waste collection system (3) Community Cultural Centre (4) **Broadcasting/Communication Facility** (5) **Parking Lot**		
Uses Not Permitted			
8.2.2.30.2	(1) Courier/Messenger Service (2) **Overnight Accommodation** (3) **Active Recreational Use** (4) **Entertainment Establishment**		
Regulations			
8.2.2.30.3	Maximum total **gross floor area - non-residential** for each of the following **uses**: (1) **Warehouse/Distribution Facility** (2) **Financial institution** (3) **Banquet Hall/Conference Centre/ Convention Centre** (4) **Recreational Establishment**		20% per **building**
8.2.2.30.4	Minimum **front yard**		3.0 m
8.2.2.30.5	Minimum **height**		3 **storeys**
8.2.2.30.6	Notwithstanding Sentence 8.2.2.30.5 of this Exception, minimum **height** of a **building** containing two or more **uses** contained in Clauses 8.2.2.30.1(1) and 8.2.2.30.1(2) of this Exception, a pumping station and **office**		2 **storeys**

8.2.2.30	Exception: E1-30	Map #01	By-law:
8.2.2.30.7	Minimum **interior side yard** to a **building** containing both the **uses** in Clauses 8.2.2.30.1(1) and 8.2.2.30.1(2) of this Exception		0.0 m
8.2.2.30.8	Minimum setback of all **buildings** and **structures** to lands zoned G2-5		5.0 m
8.2.2.30.9	Minimum depth of a **landscaped buffer** abutting a **lot line** that is a **street line**		0.0 m
8.2.2.30.10	Minimum depth of a **landscaped buffer** abutting lands zoned G2-5		2.0 m
8.2.2.30.11	Minimum setback of **parking areas**, **driveways**, **loading spaces** and other paved areas to a G2-5 zone		2.0 m
8.2.2.30.12	Minimum distance from a surface **parking space** to a **lot line** that is a **street line**		40.0 m
8.2.2.30.13	Maximum amount of required **parking spaces** to be provided as surface **parking** on site except for **uses** contained in Clauses 8.2.2.30.1(1) and 8.2.2.30.1(2) of this Exception		10%
8.2.2.30.14	Required parking may be located on lands zoned C4-78		
8.2.2.30.15	Minimum setback of a **parking structure** constructed completely below finished **grade** to lands zoned G2-5		3.0 m
8.2.2.30.16	**Driveways** and **aisles** may be shared with abutting lands zoned E1-29		
8.2.2.30.17	"Community Cultural Centre" means a **building**, **structure** or part thereof, for the provision of community activities, such as, but not limited to, recreation, arts, crafts, museums, social and charitable activities		
Holding Provision			
	The holding symbol H is to be removed from the whole or any part of the lands zoned H-E1-30 by further amendment to Map 01 of Schedule B contained in Part 13 of this By-law, as amended, upon satisfaction of the following requirement: (1) the provisions contained in Article 2.1.33.7 of this By-law as they relate to lands zoned H-E1-30 and subject to holding provisions H1, H2, H3 and H6.		

10. By-law Number 0225-2007, as amended, is further amended by adding the following Exception Table:

9.2.3.18	Exception: OS2-18	Map #01	By-law:
In an OS2-18 zone the permitted **uses** and applicable regulations shall be as specified for an OS2 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Uses			
9.2.3.18.1	(1) **Restaurant** (2) **Take-out Restaurant** (3) **Retail Store** (4) Outdoor Market (5) Community Cultural Centre (6) Outdoor patio accessory to a **restaurant** or **take-out restaurant** (7) Tent and/or Stage (8) **Entertainment Establishment** (9) **Banquet Hall/Conference Centre/ Convention Centre**		
Regulations			
9.2.3.18.2	The regulations of Lines 4.0, 5.0 and 7.0 contained in Table 9.2.1 of this By-law shall not apply		
9.2.3.18.3	Parking shall not be required for any **use** permitted in the OS2-18 zone		
9.2.3.18.4	"Community Cultural Centre" means a **building**, **structure** or part thereof, for the provision of community activities, such as, but not limited to, recreation, arts, crafts, museums, social and charitable activities		
Holding Provision			
	The holding symbol H is to be removed from the whole or any part of the lands zoned H-OS2-18 by further amendment to Map 01 of Schedule B contained in Part 13 of this By-law, as amended, upon satisfaction of the following requirement: (1) the provisions contained in Article 2.1.33.7 of this By-law as they relate to lands zoned H-OS2-18 and subject to holding provisions H1, H2 and H3.		

11. By-law Number 0225-2007, as amended, is further amended by adding the following Exception Table:

9.2.3.19	Exception: OS2-19	Map #01	By-law:
In an OS2-19 zone the permitted **uses** and applicable regulations shall be as specified for an OS2 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Uses			
9.2.3.19.1	(1) **Take-out Restaurant** (2) Outdoor patio associated with a **take-out restaurant** (3) **Retail Store** (5) Outdoor Market (6) Tent and/or Stage (7) Municipal Contractor's Yard (8) Community Cultural Centre		
Regulations			
9.2.3.19.2	The regulations of Lines 4.0, 5.0 and 7.0 contained in Table 9.2.1 of this By-law shall not apply		
9.2.3.19.3	Parking shall not be required for any **use** permitted in the OS2-19 zone		
9.2.3.19.4	"Community Cultural Centre" means a **building**, **structure** or part thereof, for the provision of community activities, such as, but not limited to, recreation, arts, crafts, museums, social and charitable activities		
Holding Provision			
	The holding symbol H is to be removed from the whole or any part of the lands zoned H-OS2-19 by further amendment to Map 01 of Schedule B contained in Part 13 of this By-law, as amended, upon satisfaction of the following requirement: (1) the provisions contained in Article 2.1.33.7 of this By-law as they relate to lands zoned H-OS2-19 and subject to holding provisions H1, H2 and H3.		

12. By-law Number 0225-2007, as amended, is further amended by adding the following Exception Table:

10.2.2.19	Exception: G1-19	Map #01	By-law:
In a G1-19 zone the permitted **uses** and applicable regulations shall be as specified for a G1 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Uses			
10.2.2.19.1	(1) Outdoor Market (2) Tent Structure (3) Shade structure, **accessory building** and/or **structure** (4) Public Washrooms (5) **Passive Recreational Use**		
Regulation			
10.2.2.19.2	Parking shall not be required for any **use** permitted in a G1-19 zone		
Holding Provision			
	The holding symbol H is to be removed from the whole or any part of the lands zoned H-G1-19 by further amendment to Map 01 of Schedule B contained in Part 13 of this By-law, as amended, upon satisfaction of the following requirement: (1) the provisions contained in Article 2.1.33.7 of this By-law as they relate to lands zoned H-G1-19 and subject to holding provisions H1, H2 and H3.		

13. By-law Number 0225-2007, as amended, is further amended by adding the following Exception Table:

10.2.3.5	Exception: G2-5	Map #01	By-law:
In a G2-5 zone the permitted **uses** and applicable regulations shall be as specified for a G2 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Use			
10.2.3.5.1	(1) **Trail**		
Holding Provision			
	The holding symbol H is to be removed from the whole or any part of the lands zoned H-G2-5 by further amendment to Map 01 of Schedule B contained in Part 13 of this By-law, as amended, upon satisfaction of the following requirement: (1) the provisions contained in Article 2.1.33.7 of this By-law as they relate to lands zoned H-G2-5 and subject to holding provisions H1, H2 and H3.		

14. Map Number 01 of Schedule "B" to By-law Number 0225-2007, as amended, being a City of Mississauga Zoning By-law, is amended by changing thereon from "G1" and "U-1" to "H-RM9-3", "H-RA5-59", "H-C4-76", "H-C4-77", "H-C4-78", "H-E1-29", "H-E1-30", "H-OS2-18", "H-OS2-19", "H-G1", "H-G1-19" and "H-G2-5", the zoning of Part of Lots 7, 8 and 9, Concession 3, South of Dundas Street, in the City of Mississauga, PROVIDED HOWEVER THAT the "H-RM9-3", "H-RA5-59", "H-C4-76", "H-C4-77", "H-C4-78", "H-E1-29", "H-E1-30", "H-OS2-18", "H-OS2-19", "H-G1", "H-G1-19" and "H-G2-5" zoning shall only apply to the lands which are shown on the attached Schedule "A", which is deemed to be an integral part of this By-law, outlined in the heaviest broken line with the "H-RM9-3", "H-RA5-59", "H-C4-76", "H-C4-77", "H-C4-78", "H-E1-29", "H-E1-30", "H-OS2-18", "H-OS2-19", "H-G1", "H-G1-19" and "H-G2-5"zoning indicated thereon.

15. This By-law shall not come into force until Mississauga Official Plan Amendment Number 125 is in full force and effect.

ENACTED and PASSED this 8th day of June 2022.

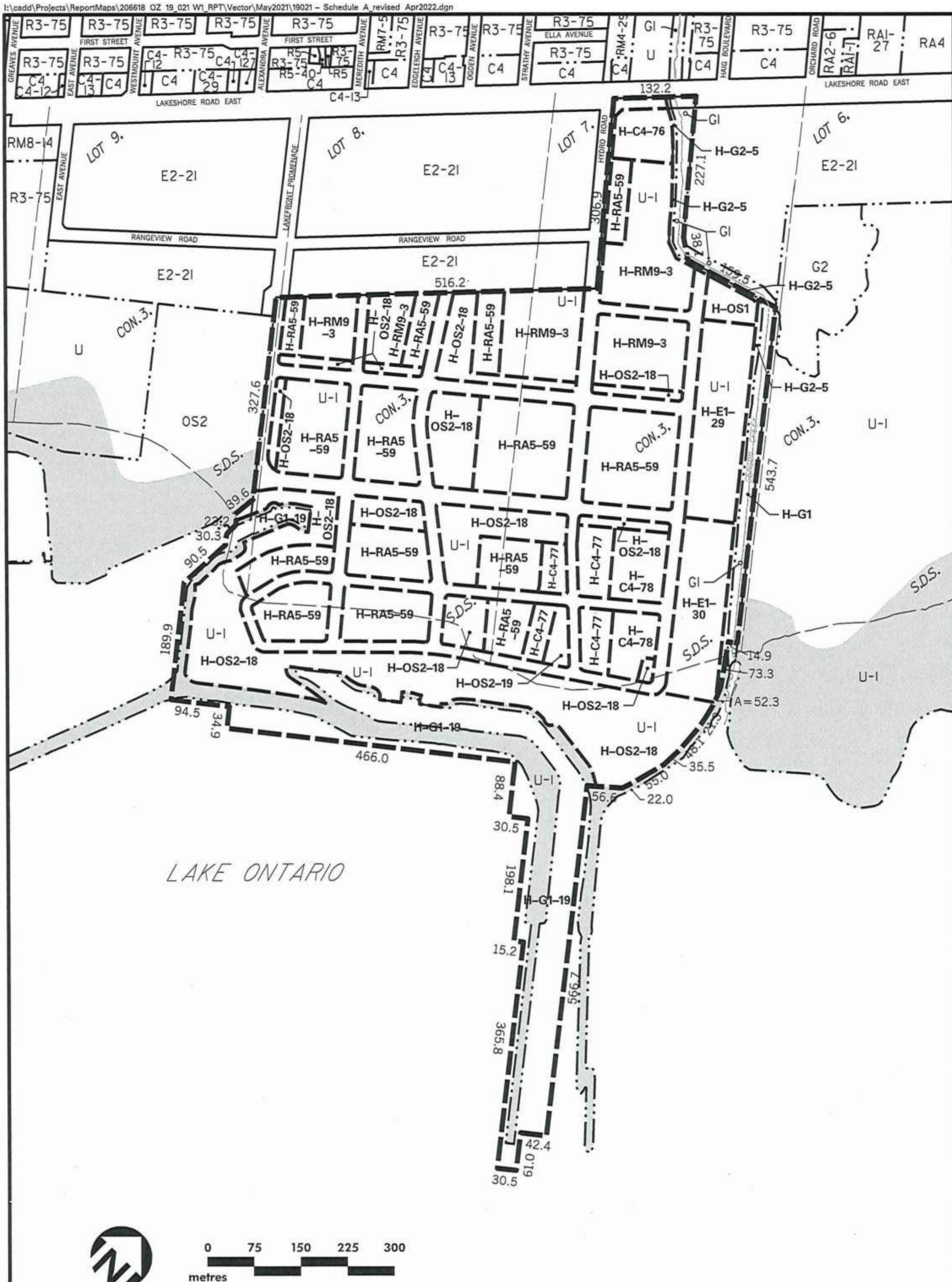
Approved by Legal Services **City Solicitor** City of Mississauga
Lia Magi
Lia Magi
Date: June 3, 2022
File: OZ 19/003 W1

Bonnie Crombie
MAYOR

[signature]
CLERK

FORM 309

I:\cadd\Projects\ReportMaps\206618 OZ 19_021 W1_RPT\Vector\May2021\19021 - Schedule A_revised Apr2022.dgn



GREENLANDS OVERLAY

ARROW FOR EXISTING ZONING

ARROW FOR PROPOSED ZONING

This is not a Plan of Survey. Dimensions shown taken from Survey prepared by J.D. Barnes Ltd. (OLS) dated April 7, 2017 and Reference Plan 43R–39584.

CITY OF MISSISSAUGA

THIS IS SCHEDULE "A" TO

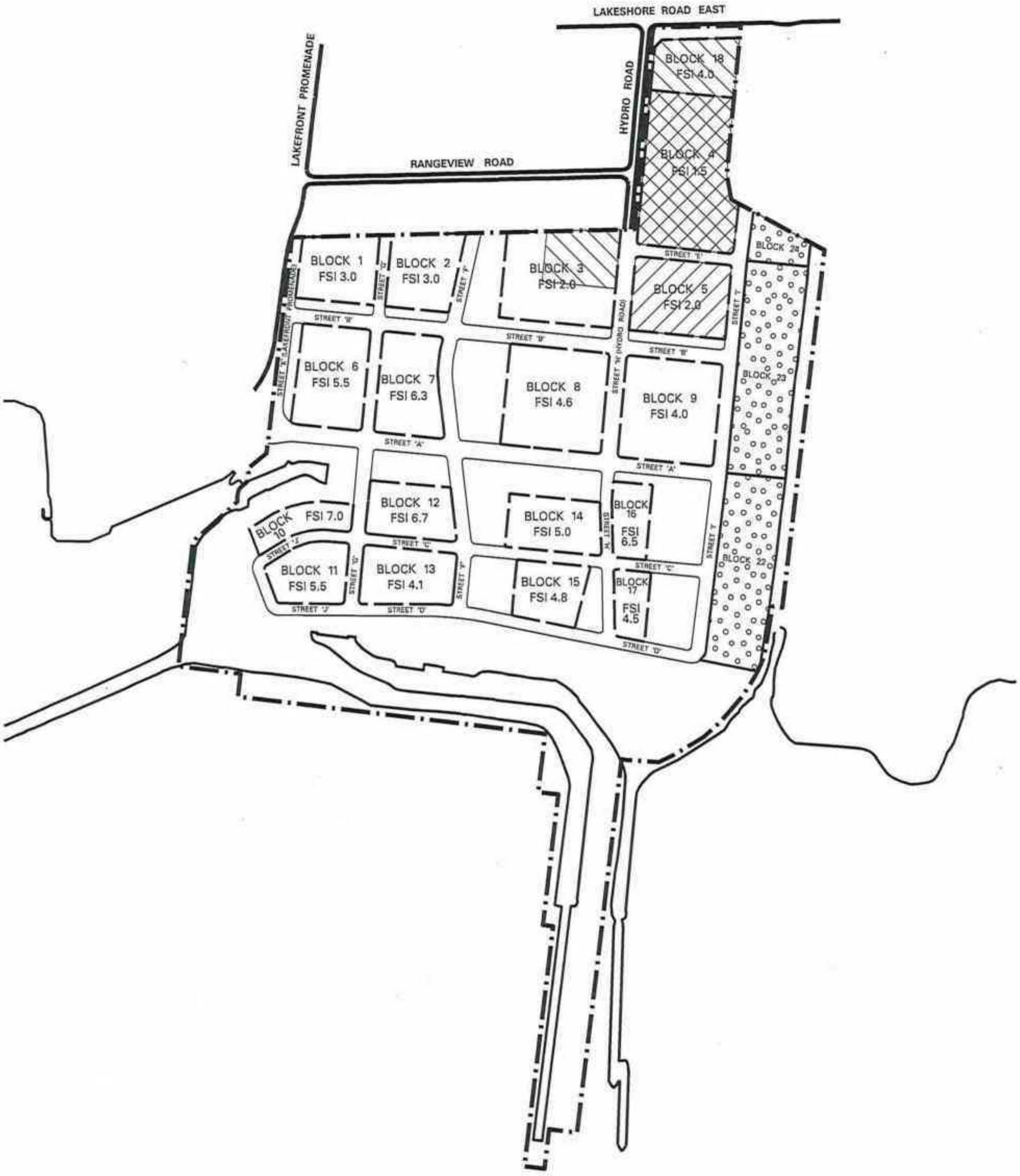
BY–LAW 0119-2022

PASSED BY COUNCIL ON

June 8, 2022

Z–1 B.R.

OZ 19/021 W1



HOLDING ZONES

H4 | H5 | H4 & H5 | H6

LAKEVIEW VILLAGE BOUNDARY

H1 | H2 | H3

MAXIMUM FLOOR SPACE INDEX BOUNDARY

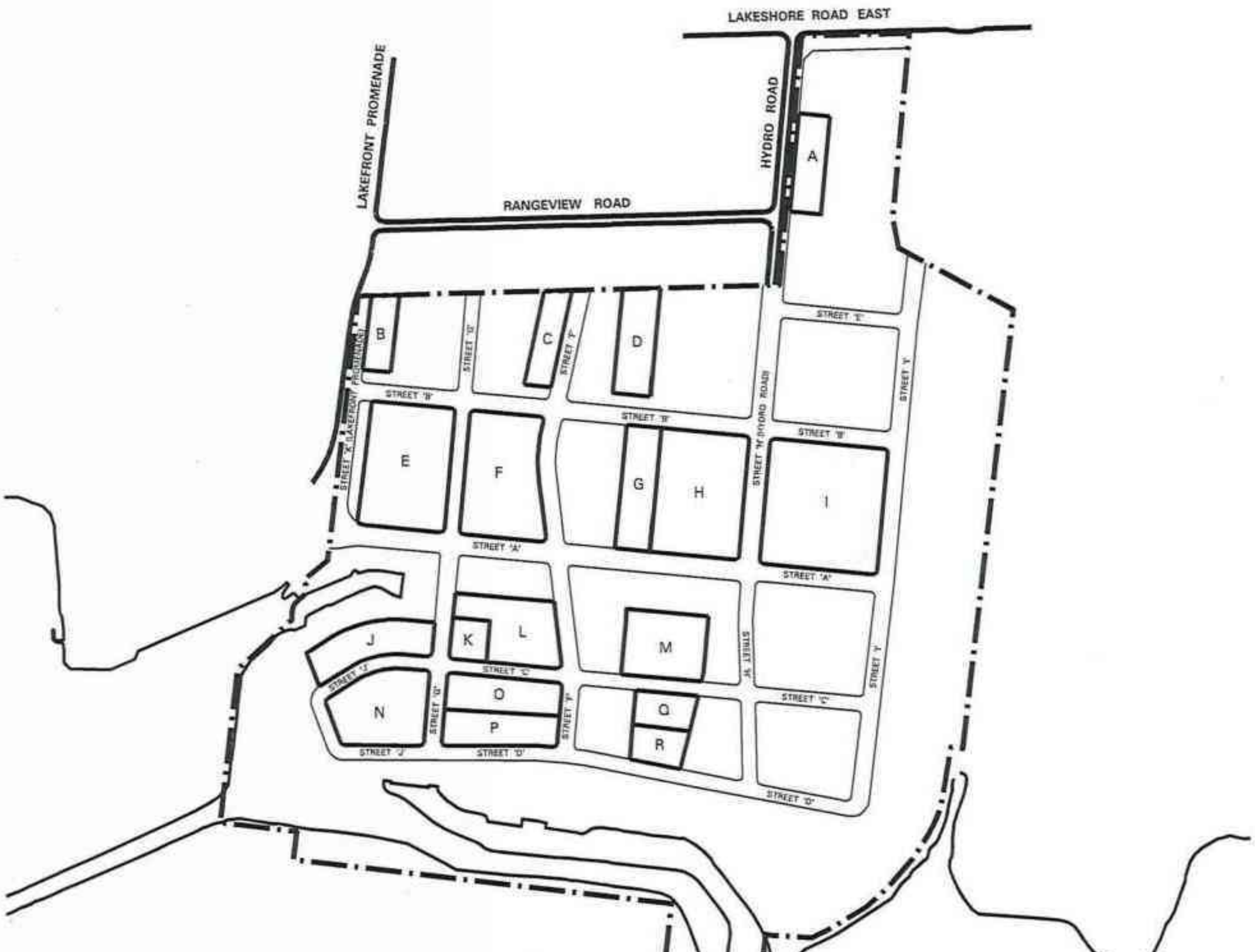
Note:
All measurements are in metres and are minimum setbacks, unless otherwise noted.

This is not a Plan of Survey.

THIS IS SCHEDULE 2.1.33
LAKEVIEW VILLAGE BOUNDARY AND FLOOR SPACE INDEX

AS ATTACHED TO BY-LAW 0119-2022

PASSED BY COUNCIL ON June 8, 2022



Area	Minimum Podium Heights	Maximum Heights*
A, P, R	3 storeys	6 storeys and 21.0 m
B	3 storeys	15 storeys and 51.0 m
C	n/a	12 storeys and 41.0 m
D	3 storeys	6 storeys + 1 tower of 10 storeys and 34.5 m + 1 tower of 18 storeys and 61.0 m
E	n/a	19 storeys and 64.0 m
F	3 storeys	6 storeys + 1 tower of 25 storeys and 84.0 m + 1 tower of 21 storeys and 70.5 m + 1 tower of 17 storeys and 57.5 m + 1 tower of 12 storeys and 41.0 m
G	3 storeys	6 storeys + 1 tower of 28 storeys and 94.0 m + 1 tower of 23 storeys and 77.5 m
H	3 storeys	8 storeys and 28.0 m
I	3 storeys	8 storeys + 1 tower of 12 storeys and 41.0 m
J	3 storeys	8 storeys + 1 tower of 29 storeys and 97.0 m
K	3 storeys	1 tower of 40 storeys and 133.5 m
L	3 storeys	8 storeys + 1 tower of 15 storeys and 51.0 m
M	3 storeys	8 storeys + 1 tower of 17 storeys and 57.5m
N	3 storeys	6 storeys + 1 tower of 24 storeys and 80.5 m
O	3 storeys	6 storeys + 1 tower of 9 storeys and 31.0 m + 1 tower of 10 storeys and 34.5 m + 1 tower of 12 storeys and 41.0 m
Q	3 storeys	6 storeys + 1 tower of 11 storeys and 37.5m

* Tower heights to include podium

Note:
All measurements are in metres and are minimum setbacks, unless otherwise noted.

This is not a Plan of Survey.

THIS IS SCHEDULE "RA5-59"

AS ATTACHED TO BY-LAW 0119-2022

PASSED BY COUNCIL ON June 8, 2022

APPENDIX "A" TO BY-LAW NUMBER 0119-2022

Explanation of the Purpose and Effect of the By-law

The purpose of this By-law is to permit a mixed use waterfront community containing employment, commercial, park, open space, cultural and residential uses in apartment and townhouse form up to a maximum of 8,050 residential units.

This By-law amends the zoning of the property outlined on the attached Schedule "A" from "G1" (Greenlands - Natural Hazards) and "U-1" (Utility - Exception) to "H-RM9-3" (Back to Back and Stacked Townhouses - Exception with a Holding Provision), "H-RA5-59" (Apartments - Exception with a Holding Provision), "H-C4-76" (Mainstreet Commercial - Exception with a Holding Provision), "H-C4-77" (Mainstreet Commercial - Exception with a Holding Provision), "H-C4-78" (Mainstreet Commercial - Exception with a Holding Provision), "H-E1-29" (Employment in Nodes - Exception with a Holding Provision), "H-E1-30" (Employment in Nodes - Exception with a Holding Provision), "H-OS2-18" (Open Space – City Park - Exception with a Holding Provision), "H-G1" (Greenlands - Natural Hazards with a Holding Provision) "H-G1-19" (Greenlands - Natural Hazards - Exception with a Holding Provision), "H-G2-5" (Greenlands - Natural Features – Exception with a Holding Provision).

"G1" permits flood control, stormwater and erosion management and natural heritage features and areas conservation.

"U-1" permits water and sewage treatment facilities, electric transform and distribution facilities and utility buildings.

The proposed zones permit a range of uses including townhouses, back to back and stacked townhouses, mixed use residential/commercial buildings, apartments, employment buildings, schools and parks with a range of heights, densities parking requirements and other development standards. A maximum of 8,050 residential units are permitted.

Location of Lands Affected

South side of Lakeshore Road East, east of Lakefront Promenade, in the City of Mississauga, as shown on the attached Map designated as Schedule "A".

Further information regarding this By-law may be obtained from David Breveglieri of the City Planning and Building Department at 905-615-3200 ext. 5551.

http://teamsites.mississauga.ca/sites/18/bylaws/oz 19 003 w1.by-law.db.jmcc.docx

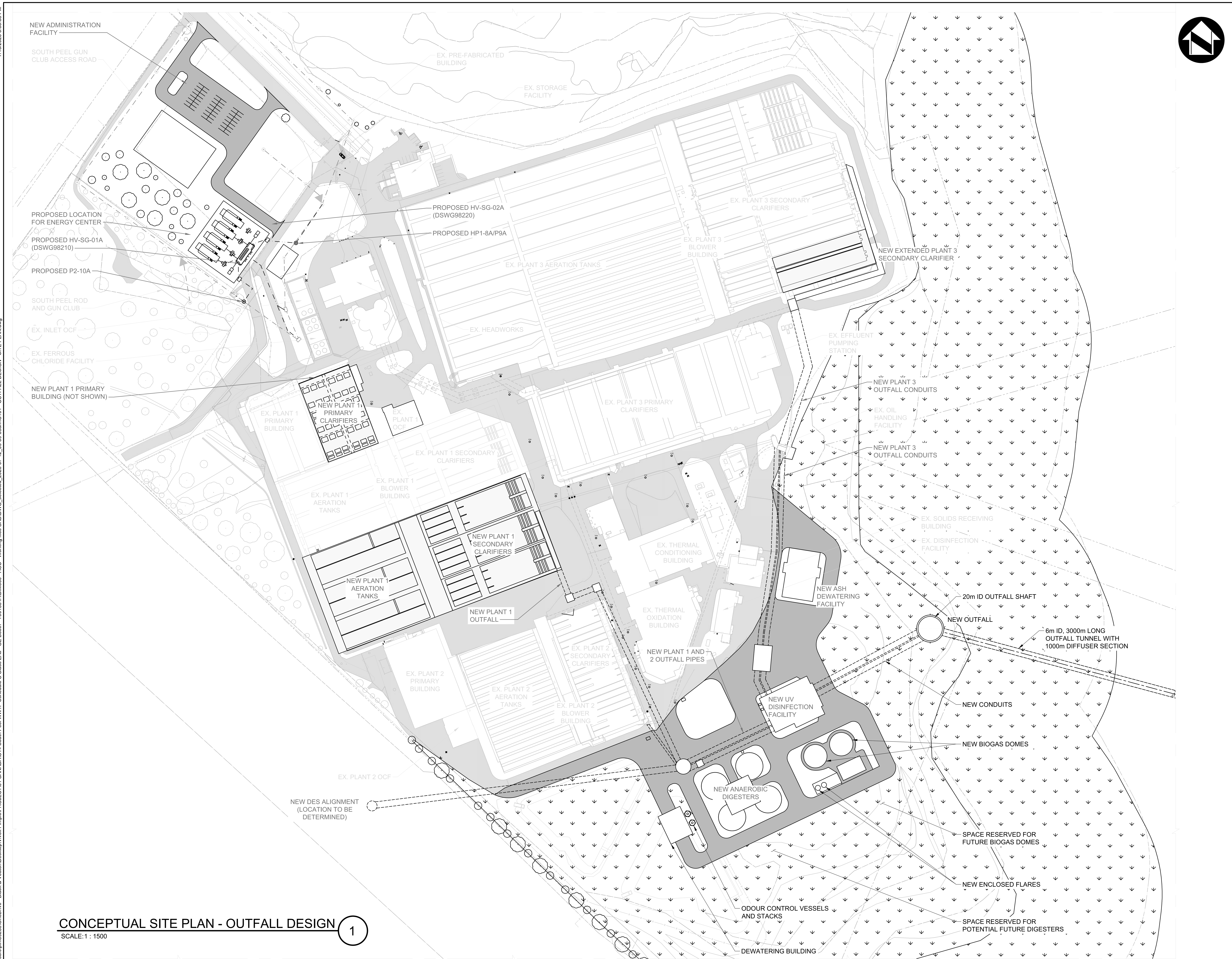
Appendix B

Facility Site Plan

TTLB v2023.03.08 INFO v2023.03.08

7/13/2023 6:35:38 PM

C:\Users\pm59285\OneDrive - Black & Veatch\Desktop\Vivek Pimple\PROJECT\01 CANADA\C14 South Peel WWTP Schedule C Class EAs - GE Booth - T001381A\BIM360 - ACC - Working files CAD\DWG_selected_2023-07-12_09-39-39am\C101 - OUTFALL DESIGN - SITE PLAN.dwg

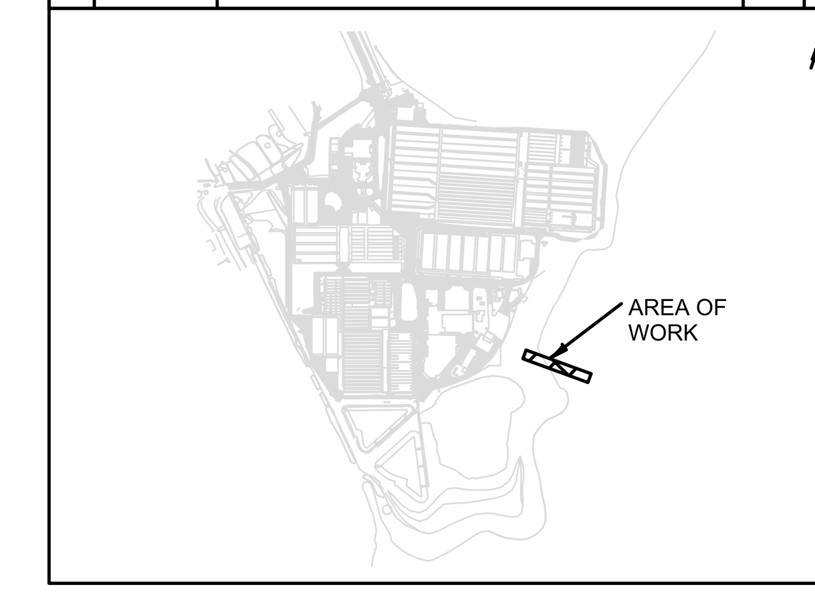


CONCEPTUAL SITE PLAN - OUTFALL DESIGN 1

SCALE:1 : 1500

REVISIONS

NO.	DATE	DESCRIPTION	BY	APVD
A	MAY 2023	ISSUED FOR CONCEPTUAL DESIGN	R.H.	G.A.



LEGEND:

- PROPERTY LINE
- EXISTING FENCE LINE
- EXISTING AERIAL POWER DISTRIBUTION
- EXISTING UNDERGROUND POWER DISTRIBUTION
- PROPOSED AERIAL POWER DISTRIBUTION
- PROPOSED UNDERGROUND POWER DISTRIBUTION
- ENVIRONMENTAL SENSITIVE AREA

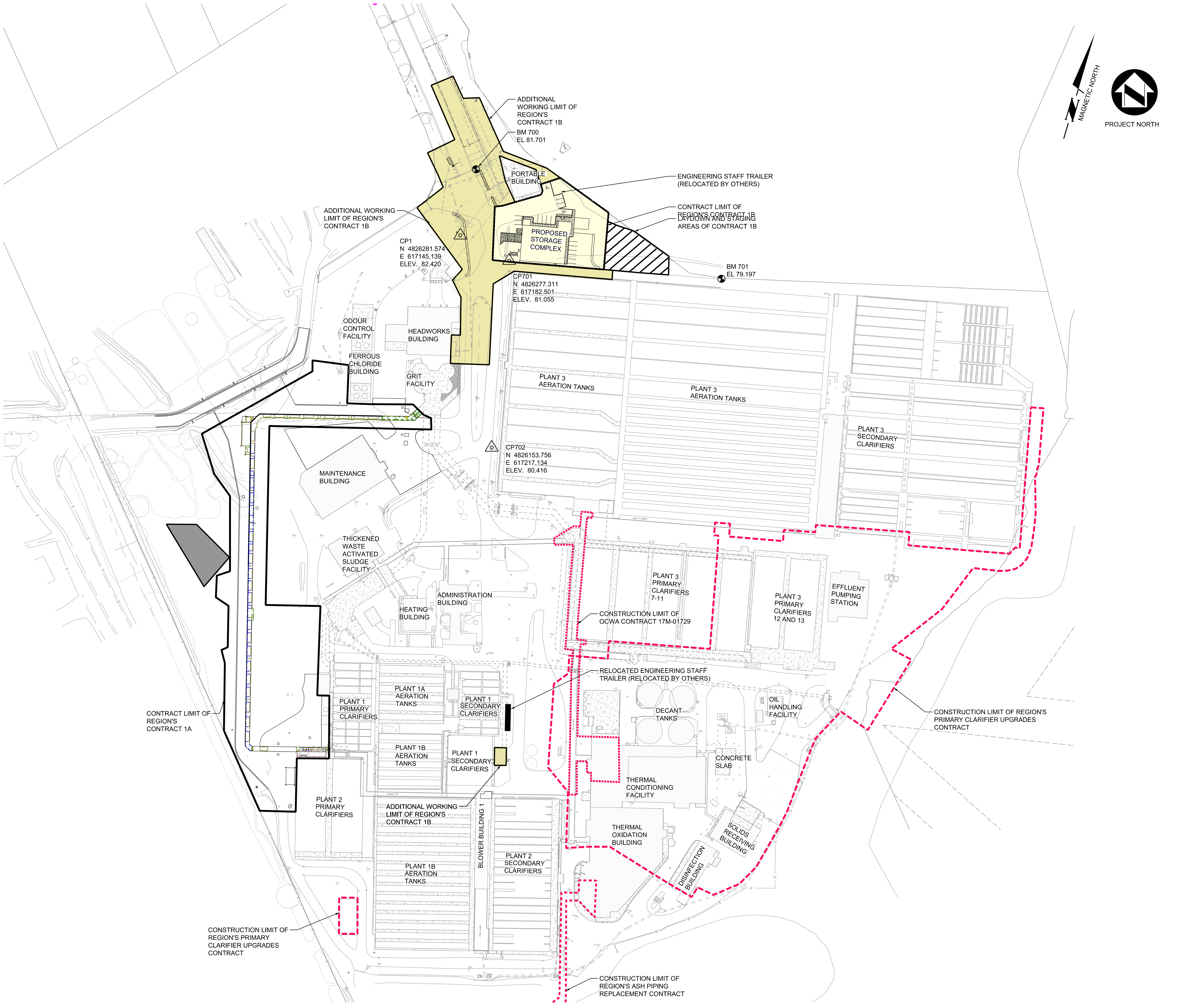
.\GMBLogo.jpg

.\ROP-NEW-LOGO.jpg

GEB WRRF
CLASS EA AND CONCEPTUAL DESIGN
CIVIL
OUTFALL DESIGN - SITE PLAN

Dwg No. C101	Area Z-01	Project No. T0001381A
Checked by F.B.B.	Drawn by R.M.R.	
Date MAY 2023	Sheet of	Plan No.

PLOTTED ON 6/21/2019



T000976A-000-1B-C-2001.dgn

REVISIONS

NO.	DATE	DESCRIPTION	BY	APVD
0	FEB 2019	ISSUED FOR TENDER	J.H.	A.R.
1	JUN 2019	ISSUED FOR CONSTRUCTION	J.H.	A.R.

LEGEND

- EX. DRIVEWAY LINE
- EX. FENCE LINE
- EX. STORM MAINTENANCE HOLE
- EX. STORM CBMH
- EX. CATCH BASIN
- EX. SANITARY MAINTENANCE HOLE
- EX. WATER VALVE
- EX. VALVE CHAMBER
- EX. FIRE HYDRANT
- EX. BOLLARD
- EX. HYDRO POLE
- EX. LIGHT STANDARD
- EX. SIGN
- EX. ELECT SWITCH GEAR
- EX. ELECT TRANSFORMER
- EX. BUILDINGS
- NEW ASPHALT ROAD
- PROPOSED STORM MAINTENANCE HOLE
- PROPOSED STORM CBMH
- PROPOSED CATCH BASIN
- BENCHMARK
- CONTROL POINT
- CONTRACT LIMIT OF REGION'S CONTRACT 1A
- CONTRACT LIMIT OF REGION'S CONTRACT 1B
- ADDITIONAL WORKING LIMIT OF REGION'S CONTRACT 1B
- CONSTRUCTION LIMIT OF REGION'S PRIMARY CLARIFIER UPGRADES CONTRACT
- CONSTRUCTION LIMIT OF OCWA CONTRACT 17M-01729
- CONSTRUCTION LIMIT OF REGION'S ASH PIPING REPLACEMENT CONTRACT

LICENSED PROFESSIONAL ENGINEER
06/24/2019
M. I. WOODBECK
100126447
PROVINCE OF ONTARIO

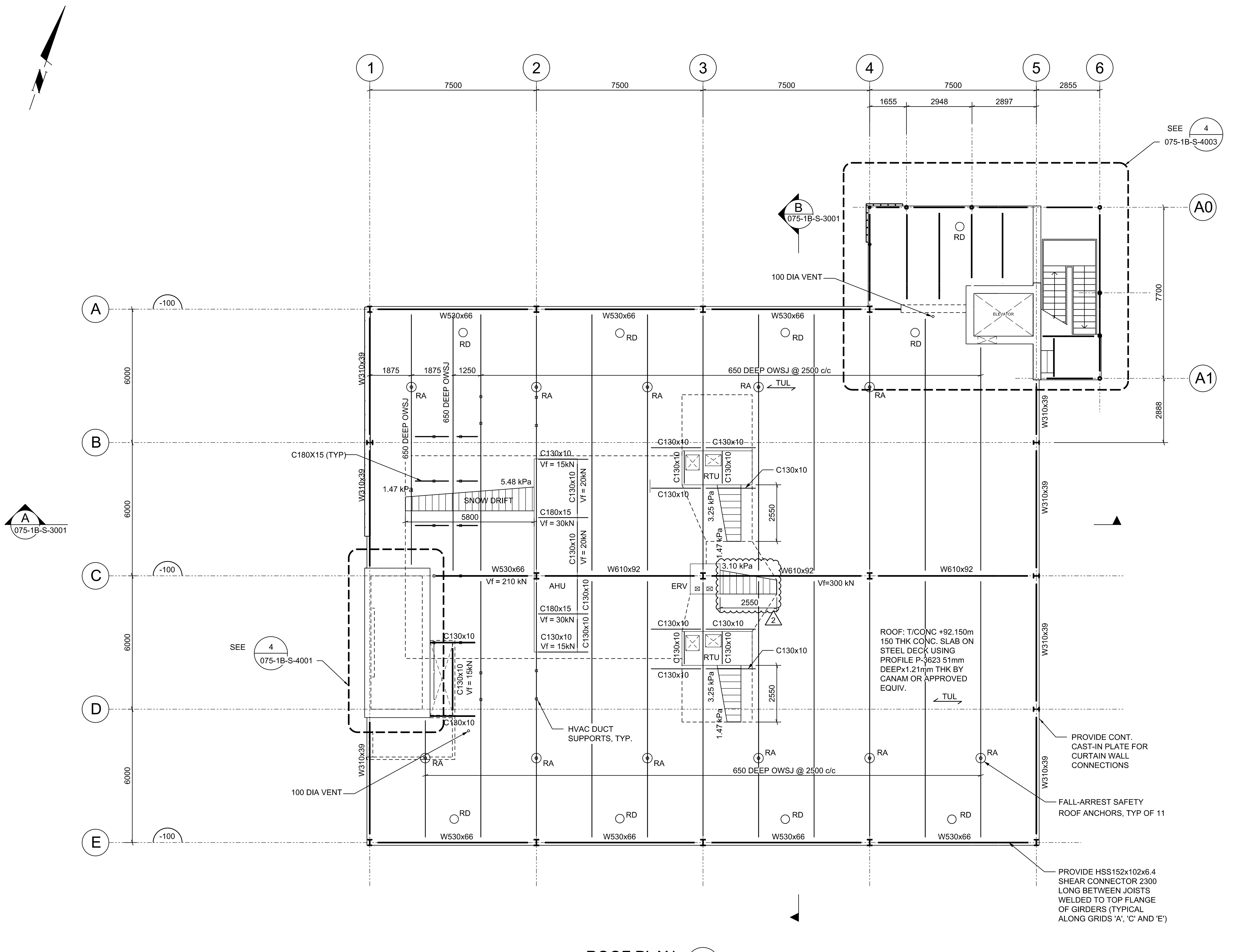
CIMA+

T 905-695-1005, F 905-695-0525
500–5935 Airport Rd, Mississauga, ON L4V 1W5 CANADA

Region of Peel
working with you

GE BOOTH WWTP
CONTRACT 1B - STORAGE COMPLEX
CIVIL
OVERALL SITE CONSTRUCTION LIMITS

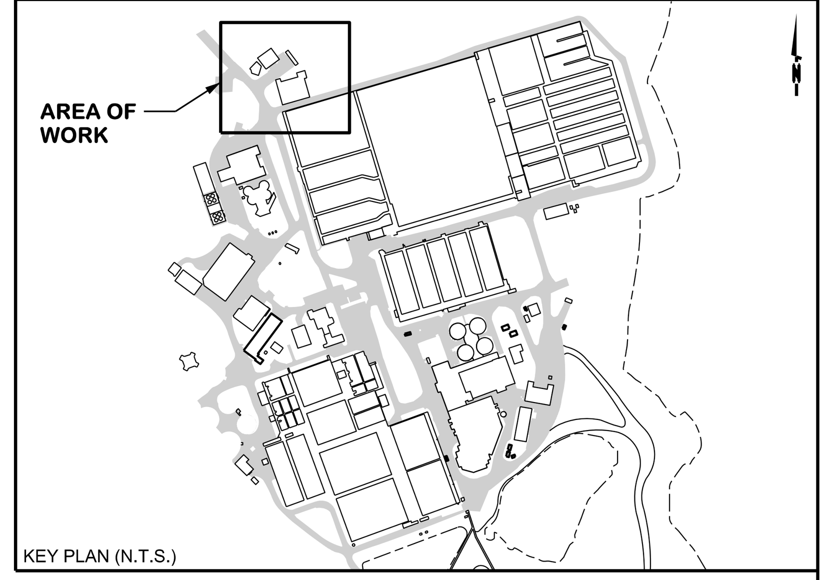
Dwg No.	000-1B-C-2001	Area	Z-01	Project No.	17-2926
Checked by	A.R.	Drawn by	J.H.	Plan No.	67567-D
Date	FEBRUARY 2019	Sheet	3 of 106		



ROOF PLAN (4)
SCALE: 1:100
TOP OF OWSJ EL. 92.000

REVISIONS

NO.	DATE	DESCRIPTION	BY	APVD
0	FEB 2019	ISSUED FOR TENDER	E.Z.	T.B.
1	JUN 2019	ISSUED FOR CONSTRUCTION	E.Z.	T.B.
2	APR 2020	ISSUED FOR APPROVALS	E.Z.	T.B.



KEY PLAN (N.T.S.)

ROOF METAL DECKING NOTES:
1. CONC. ON METAL DECKING USED AS FLOOR DIAPHRAGM.
2. SIDE LAP CONNECTIONS: USE MECHANICAL BUTTON PUNCH AT 600mm O.C, TYP.
3. SUPPORT CONNECTIONS: USE 19mm DIA. PUDDLE WELDS PATTERN 36/4, TYP. MARK LOCATION OF JOISTS/GIRDERS ON THE STEEL DECK PRIOR TO WELDING WORKS.
4. COORDINATE SIZE AND LOCATION OF ALL OPENINGS WITH MECHANICAL AND REINFORCE THE DECK AS REQUIRED.
5. MAXIMUM DIAPHRAGM SHEAR DUE TO SEISMIC = 25 kN/m ON BOTH DIRECTIONS.
6. THE MAXIMUM CONSTRUCTION LIVE LOAD WHILE CONCRETE IS CURING = 1.0 kPa.
7. LIVE LOAD DEFLECTION LIMIT: SPAN/360

ROOF OPEN WEB STEEL JOISTS NOTES:
1. DESIGN ALL FLOOR JOISTS FOR A MINIMUM UNFACTORED LOAD ADDITIONAL POINT LOAD OF 1.0 kN APPLIED AT ANY TOP OR BOTTOM CHORD PANEL POINT.
2. LIVE LOAD DEFLECTION LIMIT = SPAN/360
3. TOP AND BOTTOM CHORD BRIDGING ARE NOT SHOWN FOR CLARITY. SUPPLIER IS RESPONSIBLE TO SUPPLY AND DESIGN THE BRIDGING TO PROVIDE CHORD STABILITY DURING ERECTION AND FINAL STAGE OF JOISTS. NO CONSTRUCTION LOADS SHALL BE APPLIED UNTIL THE BRIDGING SYSTEM IS COMPLETELY INSTALLED. PROVIDE MINIMUM ONE HORIZONTAL BRIDGING ALONG THE TOP AND BOTTOM CHORD FOR EACH JOIST. PROVIDE THREE DIAGONAL BRIDGING ALONG THE MONORAIL BEAM.
4. TO SATISFY VIBRATION CRITERIA, MINIMUM MOMENT OF INERTIA FOR THE JOISTS SHALL BE 500x10^6 mm^4, UNLESS NOTED OTHERWISE.

ROOF DESIGN LOADS (IMPORTANCE FACTOR: HIGH):

DEAD LOADS EXCLUDING STEEL SELFWEIGHT:
METAL DECKING w/ 150 THK CONC. = 3.06 kPa
ROOFING = 0.15 kPa
INSULATION = 0.10 kPa
ACOUSTIC CEILING TILES w/ CHANNEL SYSTEM = 0.25 kPa
MECHL, ELEC and PLUMBING SERVICES = 0.50 kPa
TOTAL DEAD LOAD = 4.06 kPa
FUTURE PARTITION ALLOWANCE = 1.0 kPa
LIVE LOADS:
ROOF MAINTENANCE LOAD = 1.0 kPa
RTU = 10 kN EACH. MAX. CORNER POINT LOAD = 2.5 kN
AHU = 60 kN OR 3.65 kPa
2 ERV = 10 kN
FUTURE OFFICE = 2.4 kPa
SNOW LOADS:
BASIC SNOW LOAD = 1.47 kPa
SEE PLAN FOR SNOW DRIFTING LOADS
WIND LOADS:
UPLIFT = 1.60 kPa

ROOF SAFETY ANCHORS:
ULTIMATE LOAD OF 22 KN APPLIED AT ANY DIRECTION. REFER TO ARCH FOR NUMBER AND LOCATION AND CONNECTION DETAIL

LICENSED PROFESSIONAL ENGINEER
05/06/2020
W. S. CHING
100221878
PROVINCE OF ONTARIO

HVAC DUCT SUPPORTS

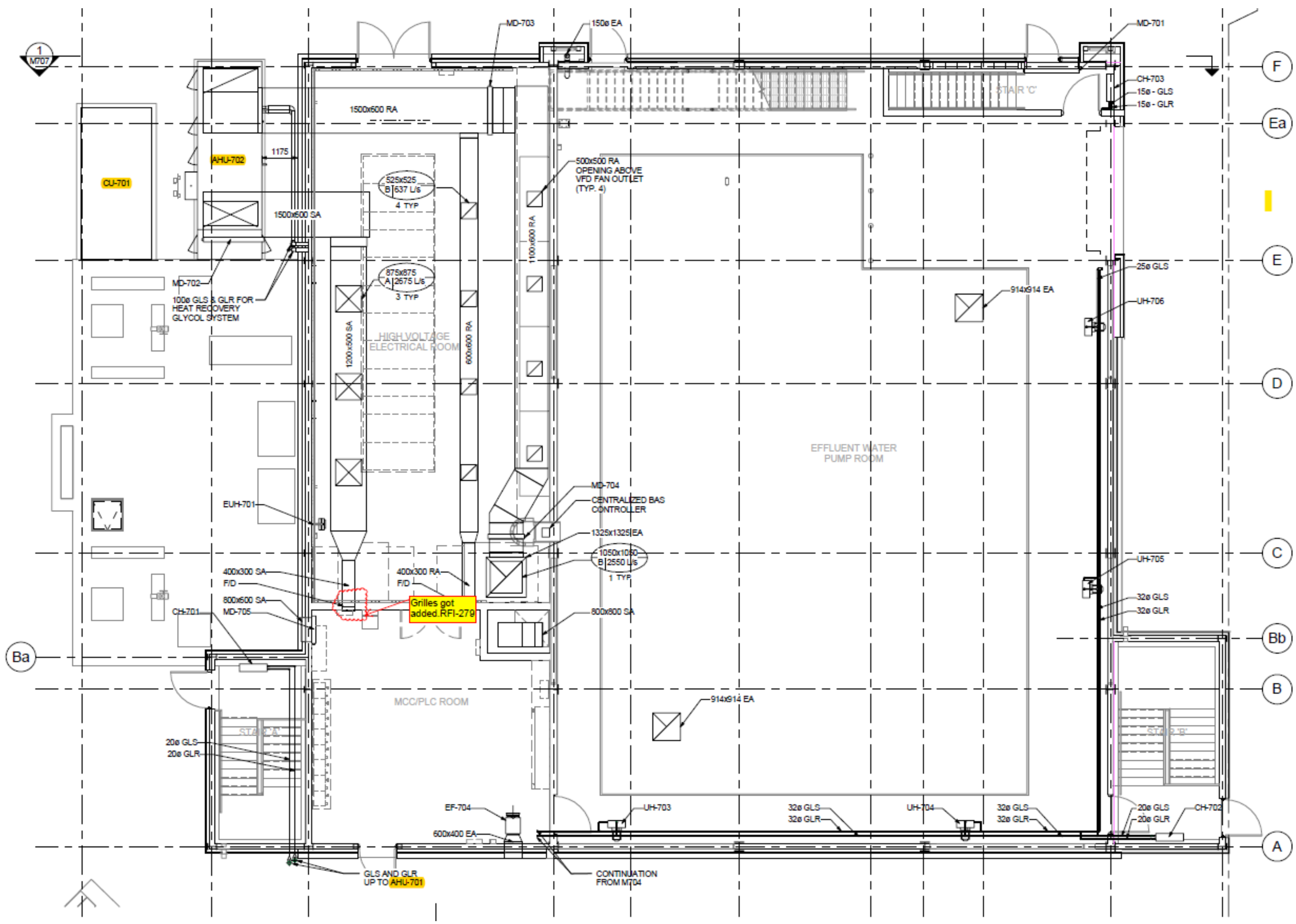
1. DESIGN AND SUPPLY DUCT SUPPORTS STAMPED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE PROVINCE OF ONTARIO. REFER TO DIV 15 SPECS.
2. DUCT SUPPORTS SHALL INCLUDE NON-PENETRATING, UV-PROTECTED HIGH DENSITY POLYURETHANE PLASTIC BASE ON EACH LEG.
3. TOTAL SUPPORTS = 9 FRAMED SUPPORTS (2 LEGS EACH)
4. MAX. SLS POINT LOAD ON EACH LEG = 15kN
5. FINAL NUMBER AND LOCATION OF SUPPORTS TO BE COORDINATED WITH DUCT SUPPLIER.
6. THE DUCT SUPPORT DESIGN SHALL RESIST UPLIFT LOADS DUE TO WIND.

CIMA+
T 905-695-1005, F 905-695-0525
500–5935 Airport Rd, Mississauga, ON L4V 1W5 CANADA

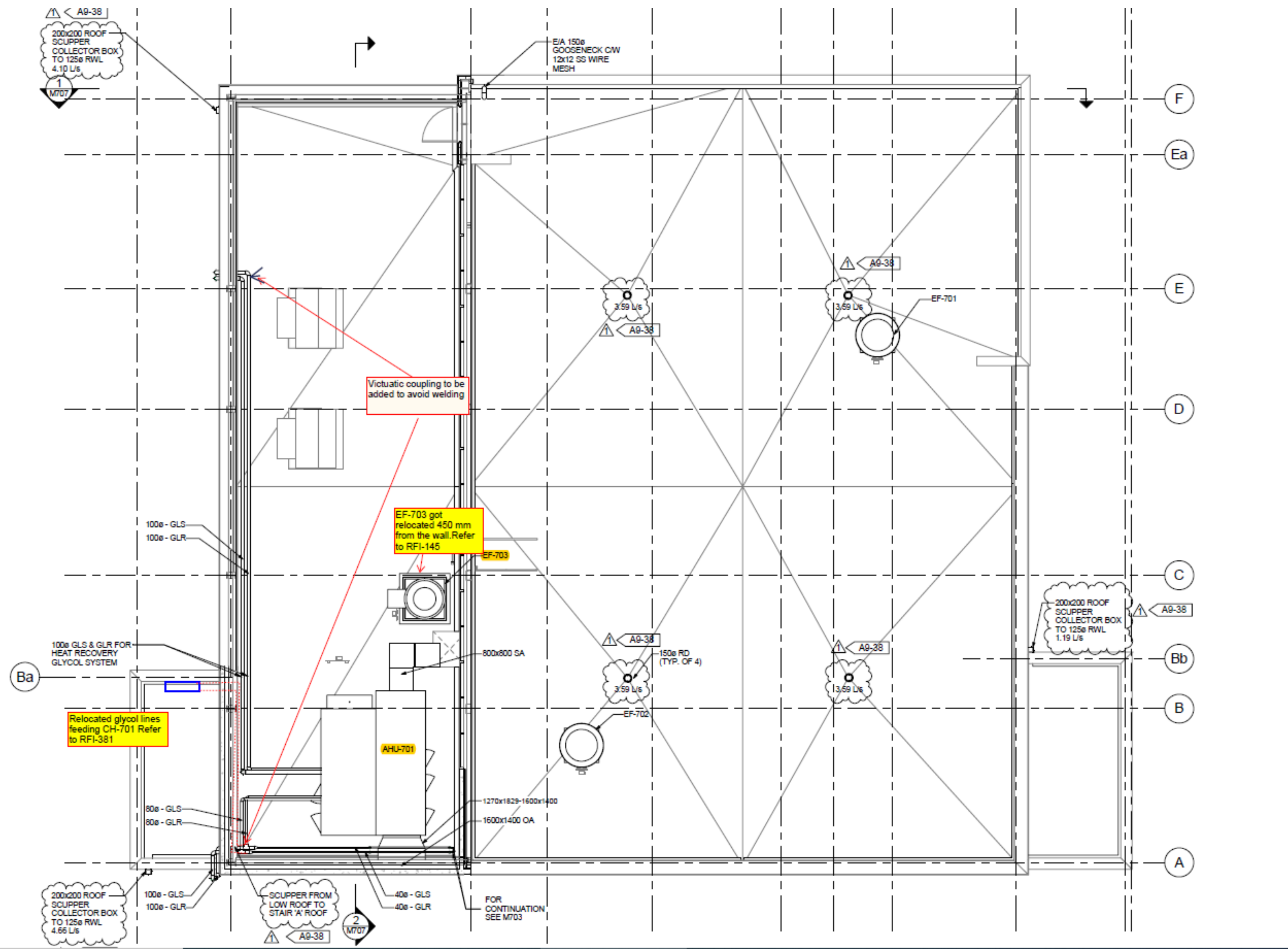
Region of Peel
working with you

GE BOOTH WWTP
CONTRACT 1B - STORAGE COMPLEX
STRUCTURAL
ROOF PLAN

Dwg No.	075-1B-S-2201	Area	Z-01	Project No.	17-2926
Checked by	W.C.	Drawn by	E.Z.	Plan No.	67580-D
Date	FEBRUARY 2019	Sheet	016 of 106		



Page 39: CU-701, AHU-701/702 (EWPS)



Page 41: EF-703 (EWPS)

Appendix C

Equipment Specification Sheets

EngA® ENGINEERED AIR®

Unit Sound Data

June 2, 2021

JOB NAME: GE BOOTH WWTP

JOB NUMBER: N1-22-8

INSTALLATION:

UNIT TAG: MUA-300-01 & MUA-300-02

UNIT CONSTRUCTION:

CASING METAL:	18 ga	INSULATION DEPTH:	2 in
LINER METAL:	22 Thru-out	INSULATION DENSITY	3.0 lbs /cu.ft.

SOUND SOURCE DATA:

Blower	Make	Type	Size	Qty	Total CFM	TSP ("wc)	Speed (rpm)	BHP (hp)	Sound Power Data	63	125	250	500	1000	2000	4000	8000
S/A	Lau	FC DIDW	12/12	1	2900	1.7	1051	1.32	Inlet	85	83	79	78	77	75	73	71
									Outlet	85	83	79	78	77	75	73	71

UNIT S/A OUTLET:

CENTER FREQUENCY (Hz)	63	125	250	500	1000	2000	4000	8000	A-weighted
SOUND POWER Lw (dB)	82.3	83.0	79.0	78.0	77.0	75.0	73.0	71.0	82.4

UNIT O/A INLET:

CENTER FREQUENCY (Hz)	63	125	250	500	1000	2000	4000	8000	A-weighted
SOUND POWER Lw (dB)	83.1	83.0	79.0	78.0	77.0	75.0	73.0	71.0	82.4

UNIT CASING *:

CENTER FREQUENCY (Hz)	63	125	250	500	1000	2000	4000	8000	A-weighted
SOUND POWER Lw (dB)	69.7	64.8	57.7	53.7	48.0	42.2	40.2	38.2	56.0

* Unit casing sound includes casing breakout and sound sources outside the air streams only. Sound from openings are not included in unit casing sound.

Note:

Unit sound data are calculated for the specified unit construction and operating condition as shown above.

EngA ENGINEERED AIR

Unit Sound Data

June 2, 2021

JOB NAME: GE BOOTH WWTP

JOB NUMBER: N1-22-8

INSTALLATION:

UNIT TAG: MUA-300-03

UNIT CONSTRUCTION:

CASING METAL:	18 ga	INSULATION DEPTH:	2 in
LINER METAL:	22 Thru-out	INSULATION DENSITY	3.0 lbs /cu.ft.

SOUND SOURCE DATA:

Blower	Make	Type	Size	Qty	Total CFM	TSP ("wc)	Speed (rpm)	BHP (hp)	Sound Power Data								
										63	125	250	500	1000	2000	4000	8000
S/A	Lau	FC DIDW	15/15	1	6000	1.72	921	1.32	Inlet	90	89	85	83	82	80	78	76
									Outlet	90	89	85	83	82	80	78	76

UNIT S/A OUTLET:

CENTER FREQUENCY (Hz)	63	125	250	500	1000	2000	4000	8000	A-weighted
SOUND POWER Lw (dB)	87.5	89.0	85.0	83.0	82.0	80.0	78.0	76.0	87.5

UNIT O/A INLET:

CENTER FREQUENCY (Hz)	63	125	250	500	1000	2000	4000	8000	A-weighted
SOUND POWER Lw (dB)	88.4	89.0	85.0	83.0	82.0	80.0	78.0	76.0	87.5

UNIT CASING *:

CENTER FREQUENCY (Hz)	63	125	250	500	1000	2000	4000	8000	A-weighted
SOUND POWER Lw (dB)	75.6	71.6	64.6	59.6	52.5	46.7	44.7	42.7	61.9

* Unit casing sound includes casing breakout and sound sources outside the air streams only. Sound from openings are not included in unit casing sound.

Note:

Unit sound data are calculated for the specified unit construction and operating condition as shown above.

SOUND POWER LEVELS

Sound calculations are based on ASHRAE equations for attenuation of sound from lined plenums. To match actual test data, adjustments are made in the lower bands to account for sound reflection by the plenums.

Haakon casing sound absorption coefficients and transmission loss values used in the calculations have been obtained by an independent sound testing laboratory. The fan sound data is based on AMCA 300 testing.

UNIT	OPEN	SOUND POWER LEVELS (db)								
		BAND	1	2	3	4	5	6	7	8
		FREQ	63	125	250	500	1000	2000	4000	8000
MUA-150_2-01_2	SA		78	81	89	84	80	79	69	60
MUA-150_2-01_2	PURGE		78	81	89	84	79	78	68	60
MUA-150_2-01_2	OA		88	93	99	95	90	89	79	69
MUA-920-01	SA		72	67	78	74	71	68	63	60
MUA-920-01	PURGE		73	69	79	76	72	69	64	60
~~MUA-920-01~~ MUA-921-01	OA		85	83	91	88	84	81	76	68
MUA-922-01	SA		73	69	79	75	72	69	63	60
MUA-922-01	PURGE		74	71	81	77	73	70	64	60
MUA-922-01	OA		82	80	90	86	82	79	73	66

MUA-150-01, MUA-150-02, MUA-152-01, MUA-152-02

PROJECT: GE BOOTH PLANT

DRAWN BY	TN	JOB NO.	62612	DWG NO	62612DT45
DATE	2021-05-19	UNITS	IMPERIAL	REVISION	

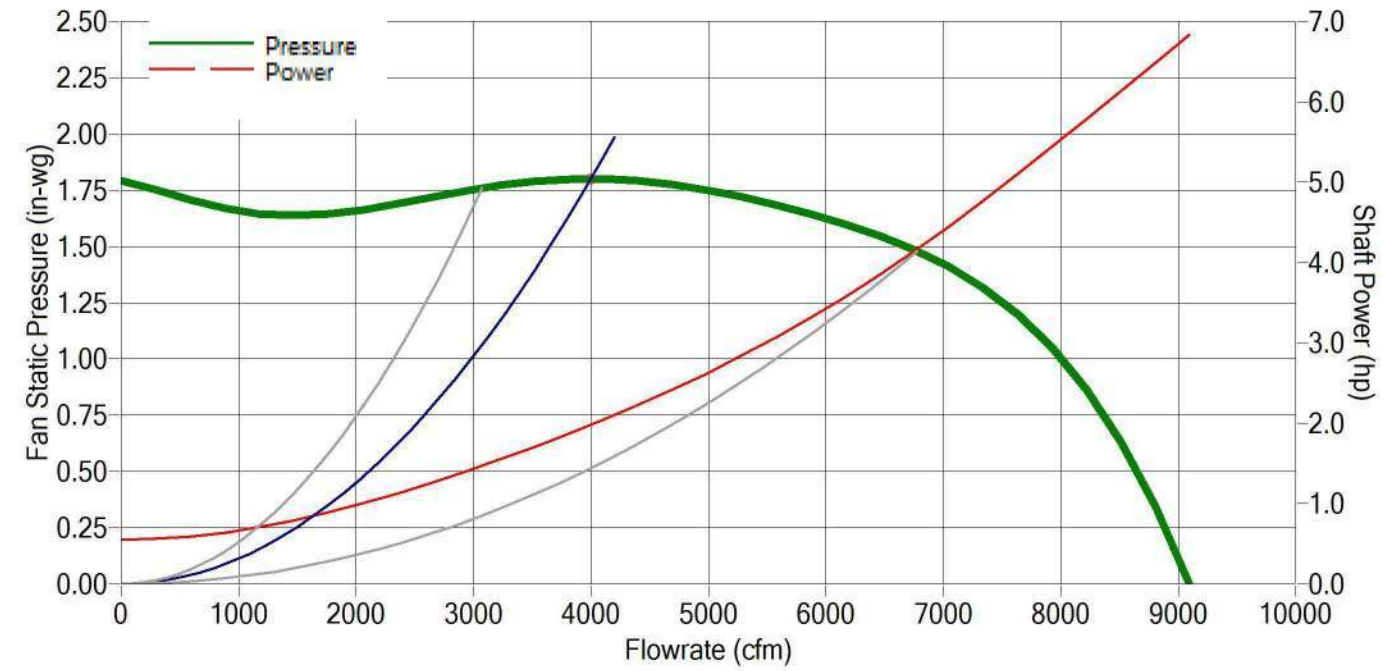
HAAKON INDUSTRIES

Job Name	Submitted by/notes
GE Booth WWTP New Plant 1	

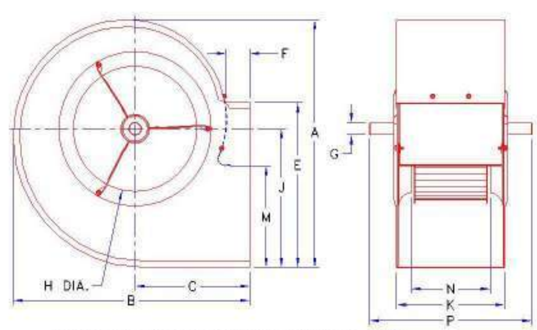
Model	Flow	Pressure (Ps)	Temperature	Altitude	Density	Q Derate	P Derate	VAV Set Point	Date
MODEL A15-15A	4000 CFM	1.80 in-wg	70 °F	0 ft	0.075 lb/ft³	0 cfm	0.00 in-wg	0.00 in-wg	04-08-2020

Fan Tag	Flow	Pressure (Ps)	Power	Static Efficiency	Total Efficiency	Speed	Outlet Velocity	Efficiency Rating	
~~**MUA-150-01**~~ MUA-150-03	4000 CFM	1.80 in-wg	1.98 hp	57.3 %	65.1 %	893 rpm	1990 fpm		
	Impeller Dia	Outlet Area	Max Speed	AMCA Class	Drive	Blades	P Volume	Turndown	
	15.0 in	2.01 ft²	1600 rpm	I	Belt Drive	51	7.3 ft³	100 %	

Performance



Sound (Lwi)	63	125	250	500	1000	2000	4000	8000	Lw	LwA
	86	85	81	79	78	76	74	73	90	84



DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

Options Available

Available Bore: 3/4, 1 and 1-3/16 inch
Center disc lock style: Preslok
Three Piece bearing bracket (Max 3HP) available for 9 - 15" blowers
One piece bearing bracket (Max 10HP) available for 12 - 18" blowers
Standard motor mounting bracket (3/4HP Max) or Reinforced motor mounting bracket(1 1/2Hp Max)

A	B	C	E	F	G	H	J	K	M	N	P
24.25	22.69	10.50	15.88	1.50	1.00	12.62	13.56	18.62	9.69	15.88	23.00

Dimensions in inches

Notes: Airflow performance data are obtained in accordance with AMCA 210-07. Installed performance will vary depending on extent of cabinet geometry

Sound data are estimated from industry experience for the type of product selected. Data should be used for comparison purposes only and do not represent installed values.

EF-150-01/02, EF-152-01/02

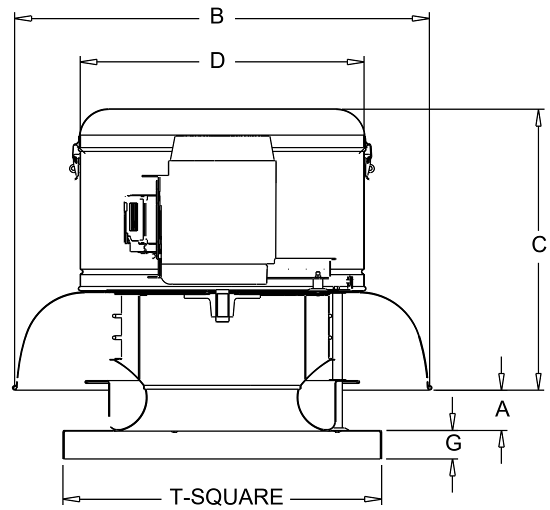
MARK: ~~EF-150-02/03~~	
PROJECT: T000976A-PC ODOUR	
DATE: 10/26/2020	

ACE-D

Downblast Centrifugal Exhaust Ventilator Roof Mounted/Direct Drive

STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches (sizes 120 - 300) - Welded curb cap corners - Birdscreen - Permanently lubricated ball bearing motors - Corrosion resistant fasteners - Transit tested packaging.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	FEI	Speed Ctrl/Hz
2	180C17D	6000	.500	1739	2.79	67	.56	VFD/60

Altitude (ft): 275 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	VFD Rated
3	1725	575/3/60	ODP -PE	3.9	Yes

FLA based on NEC (2014) Table 430.250

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
87	93	94	92	86	82	77	71	93	81	35

Accessories:

Premium Efficiency Motor (Min. 89.5%)
REINFORCED WHEEL
DISCONNECT NEMA 3
BDM-24 MTR DPR 115V
ROOF CURB RCG 28-13.5H SLP .24/12
EPOXY POWDER W/UV
ALUMINUM BIRDSCREEN

Dimensions (inches)

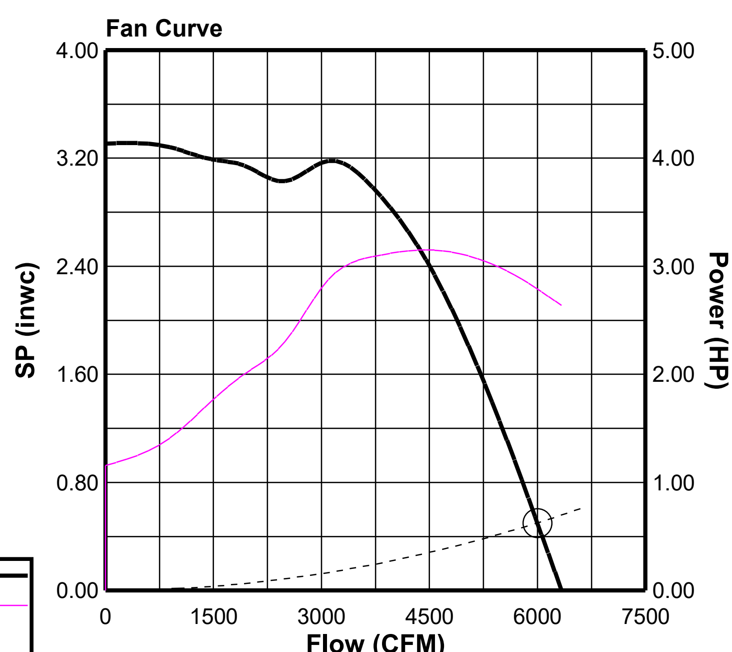
A	3-5/16
B O.D.	37-11/16
C	33-15/16
D O.D.	26-1/8
G	3
T Sq.	30
Roof Open. Sq.*	25-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)* **	**Shipping**	269	**Unit**	156

* Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	
CFM vs HP	
Point of Operation	
System Curve	

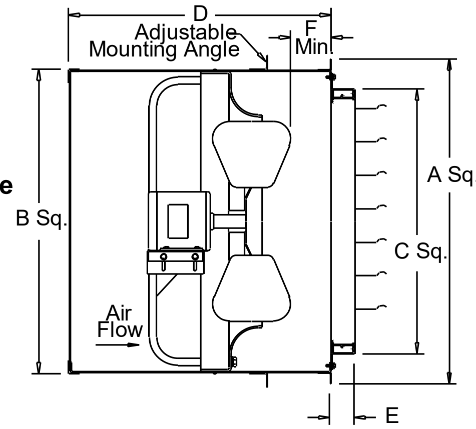
MARK: NEW EF-922-02/03
PROJECT: OCF_2
DATE: 11/2/2020

XPHD

Packaged Wall Fan
Heavy Duty
Aluminum Propeller
Direct Drive

STANDARD CONSTRUCTION FEATURES:

Aluminum propeller blades attached to a steel hub - Plated steel motor mount/wire guard - Spun steel venturi/wall base - Galvanized steel wall housing - Galvanized steel exhaust shutter - 1/2 inch mesh galvanized screen on inlet - Corrosion resistant fasteners - Welded wall base corners. NOTE: Mounting angle is 2 pieces, shipped loose.



Note: Correct propeller rotation is CCW when viewing from inlet side.

Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG
2	16XPH26D17	2312	.250	1725	.339	n/a(<1HP)

Altitude (ft): 823   Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	VFD Rated
1/2	1725	575/3/60	XPROOF-SE	0.9	Yes

FLA based on NEC (2014) Table 430.250

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
76	88	84	80	75	70	66	62	82	70	18.8

Accessories:

- DISCONNECT X-PROOF
- GRAV SHUTTER ALUM
- EPOXY POWDER W/UV
- WEATHER HOOD-STL 45D

Dimensions (inches)

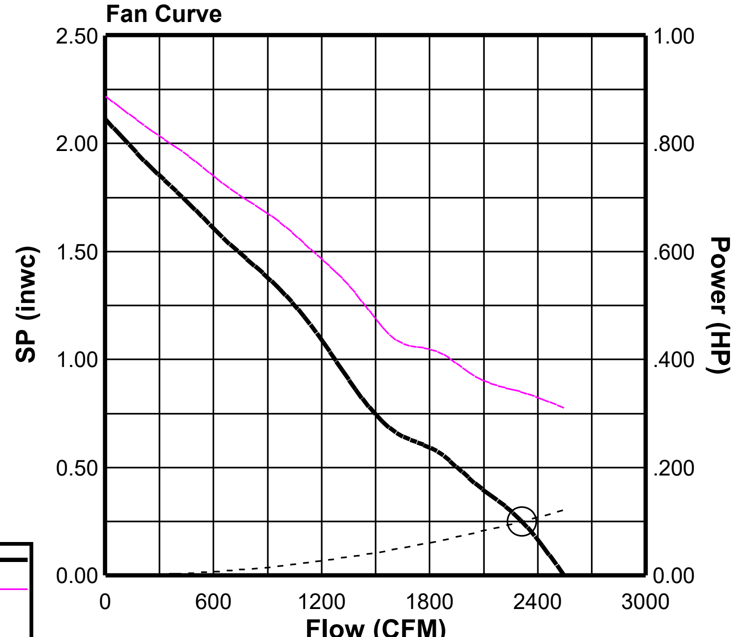
A Sq.	23-1/2
B Sq.*	21
C Sq.	18
D*	22-1/4
E	3
F	7
Wall Opening	21-1/4

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	244	Unit	168

*B and D dimensions are to the outside of fasteners on wall housing
***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	———
CFM vs HP	———
Point of Operation	○
System Curve	-----------

v10.1.162.14617

COOK

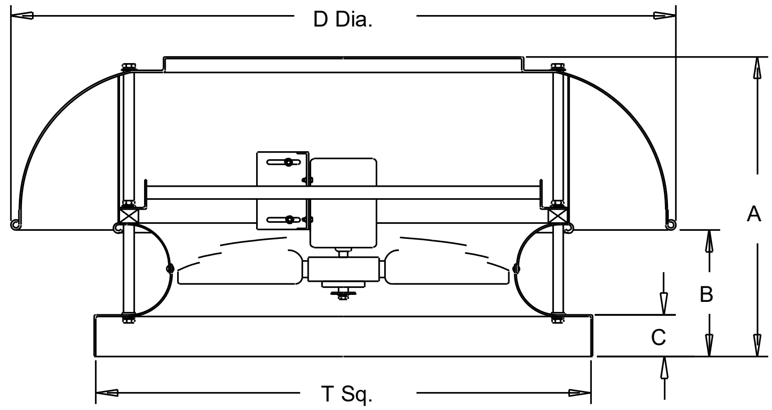
NEW TAG:
FAN38151

MARK: EF-250-01	
PROJECT: T000976A	
DATE: 8/31/2020	

AQD

Downblast Propeller Exhaust Ventilator Roof Mounted/Direct Drive

STANDARD CONSTRUCTION FEATURES:
Cast aluminum propeller - Spun aluminum topcap - Aluminum curb cap w/welded corners - Aluminum inlet venturi - Corrosion resistant fasteners.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	Speed Ctrl/Hz
1	24AQ11D	3000	.500	1065	.584	n/a(<1HP)	VFD/56

Altitude (ft): 260 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	VFD Rated
3/4	1140	575/3/60	TEFC -SE	1.3	Yes

FLA based on NEC (2014) Table 430.250

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
89	87	83	78	74	70	77	65	82	71	22

Accessories:
BIRDSCREEN

Dimensions (inches)

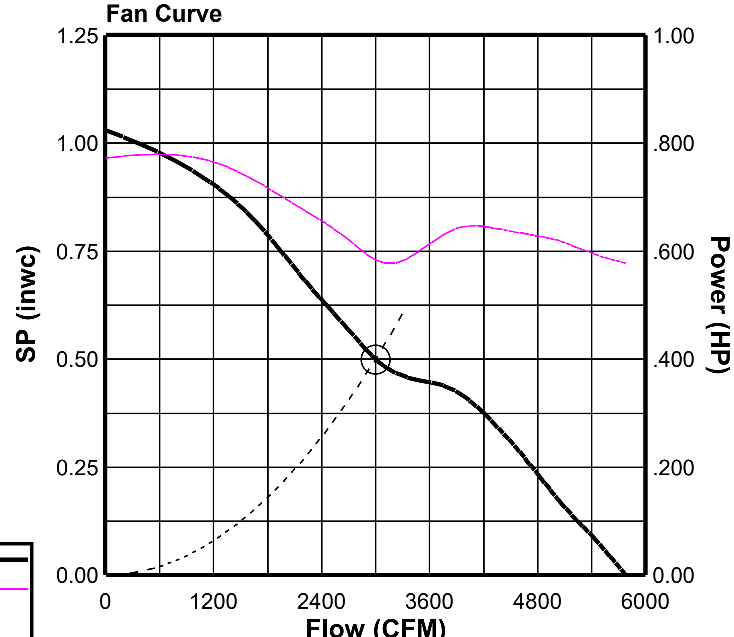
A	21-5/8
B	9-1/8
C	3
D Dia.	47-1/2
T Sq.	36
Roof Open. Sq.*	31-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	197	Unit	48

* Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	
CFM vs HP	
Point of Operation	
System Curve	

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COOK

MARK: FAN16881	
PROJECT: OCF_1	
DATE: 3/10/2021	

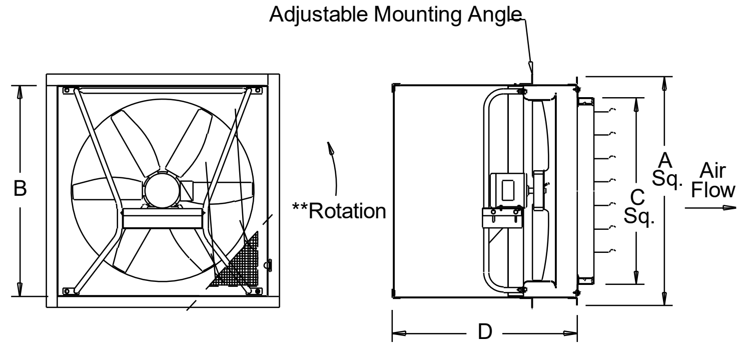
APD

Axia-Pac Wall Exhaust Fan
Cast Aluminum Propeller
Direct Drive

STANDARD CONSTRUCTION FEATURES:

Cast aluminum propeller - Spun steel Venturi/wall base - Heavy duty steel power assembly - Welded wall base corners - Galvanized steel wall housing - Galvanized steel exhaust shutter - 1/2" mesh galvanized screen on inlet - Propellers are statically and dynamically balanced - Corrosion resistant fasteners. Note: Mounting angle is 2 pieces, shipped loose.

** Correct propeller rotation is CCW when viewing from inlet side.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG
1	16P17D	1088	.250	1725	.217	n/a(<1HP)

Altitude (ft): 823 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	VFD Rated
1/3	1725	208/3/60	XPROOF-SE	1.6	Yes

FLA based on NEC (2014) Table 430.250

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
90	92	86	83	77	71	65	61	84	73	22

Accessories:

DISCONNECT X-PROOF

Dimensions (inches)

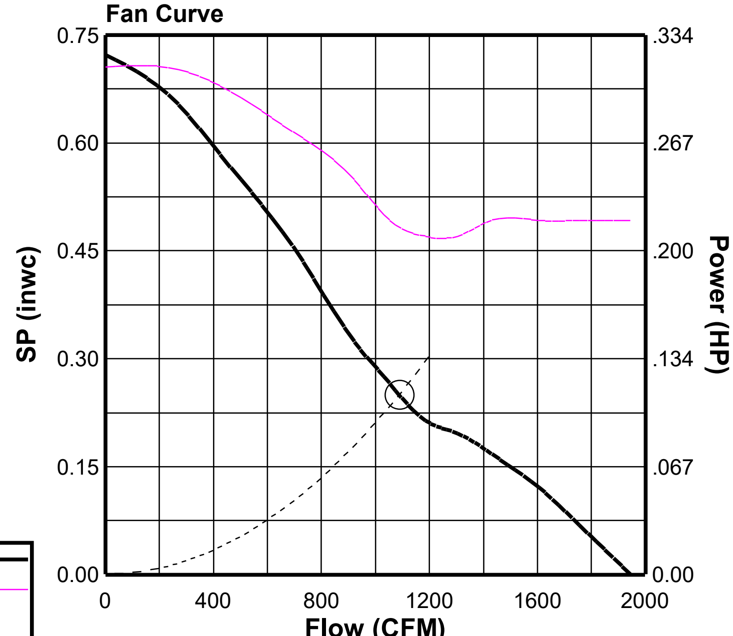
A Sq.	23-1/2
B*	21
C Sq.	18
D*	22-1/8
Wall Opening	21-1/4

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	158	Unit	99

*B and D dimension are to the outside of fasteners on wall housing.
***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	
CFM vs HP	
Point of Operation	
System Curve	

v10.1.162.14617

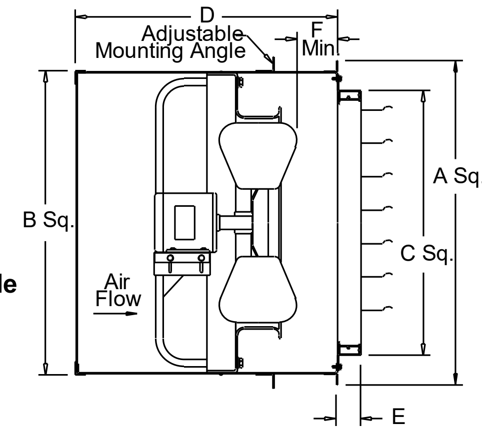
COOK

MARK: NEW EF-921-02/03
PROJECT: OCF_1
DATE: 11/2/2020

XPHD

Packaged Wall Fan
Heavy Duty
Aluminum Propeller
Direct Drive

STANDARD CONSTRUCTION FEATURES:
Aluminum propeller blades attached to a steel hub - Plated steel motor mount/ wire guard - Spun steel venturi/wall base - Galvanized steel wall housing - Galvanized steel exhaust shutter - 1/2 inch mesh galvanized screen on inlet - Corrosion resistant fasteners - Welded wall base corners. NOTE: Mounting angle is 2 pieces, shipped loose.



Note: Correct propeller rotation is CCW when viewing from inlet side.

Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG
2	20XPH32D11	2916	.250	1140	.299	n/a(<1HP)

Altitude (ft): 823   Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	VFD Rated
1/3	1140	575/3/60	XPROOF-SE	0.6	Yes

FLA based on NEC (2014) Table 430.250

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
77	86	79	77	73	67	61	53	79	67	15.8

Accessories:
DISCONNECT X-PROOF
EPOXY POWDER W/UV
WEATHER HOOD-STL 45D

Dimensions (inches)

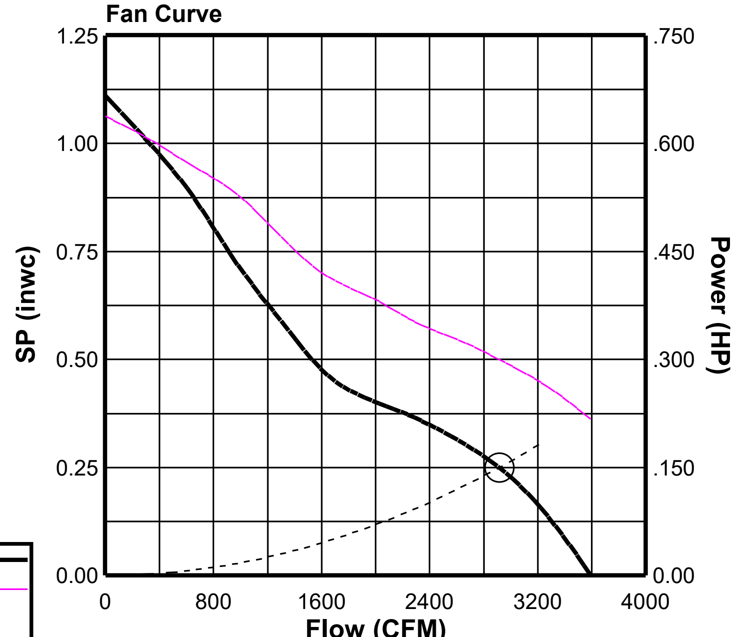
A Sq.	27-1/2
B Sq.*	25
C Sq.	22
D*	23-1/4
E	3
F	7
Wall Opening	25-1/4

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	309	Unit	213

*B and D dimensions are to the outside of fasteners on wall housing
***Includes fan, motor & accessories.

Fan Curve



Fan Curve Legend

CFM vs SP	
CFM vs HP	
Point of Operation	
System Curve	

MITSUBISHI ELECTRIC
Changes for the Better

Insignificant Noise Source

P-SERIES

SUBMITTAL DATA: PKA-A18HA7 & PUY-A18NKA7

18,000 BTU/H WALL-MOUNTED AIR-CONDITIONING SYSTEM

Job Name:	Engineer:
Purchaser:	Application: ☐ Std. Cooling ☐ Ultra Low Ambient Cooling
Submitted To:	For: ☐ Reference ☐ Approval ☐ Construction
Submitted By:	Location:
System Designation:	Schedule No.:

Indoor Unit: PKA-A18HA7

Outdoor Unit: PUY-A18NKA7 (-BS)

UNIT OPTION:

☐ Standard Model..PUY-A18NKA7
☐ Seacoast (BS) Model..PUY-A18NKA7-BS

ACCESSORIES:

Controls

☐ Wireless Controller (MHK1)
☐ Advanced Wired Controller (PAR-32MAA / PAR-33MAA)
☐ Simple Wired Controller (PAC-YT53CRAU)
☐ Wireless Remote Controller (PAR-FL32MA)
☐ Thermostat Interface (PAC-US444CN)
☐ M-NET Adapter (PAC-SJ19MA-E)

Outdoor Unit

☐ Front Wind Guard (PFR-12-18)
☐ Rear Wind Guard (PRE-12-18)
☐ Side Wind Guard (PSD-12-18)

Note: Mitsubishi Electric (MESCA) supports the use of only MESCA supplied and approved Snow Guard / Wind Deflectors / Windscreens and accessories for proper functioning of the unit/s. Use of non-MESCA supported Snow Guard / Wind Deflectors / Windscreens and accessories will affect warranty coverage.

SPECIFICATIONS:

Rated Conditions (Capacity / Input)*		
Cooling	Btu/h / W	18,000 / 1,820

* Rating Conditions per AHRI Standard:
Cooling | Indoor: 80°F (27°C) DB / 67°F (19°C) WB
Cooling | Outdoor: 95°F (35°C) DB / 75°F (24°C) WB

Capacity Range		
Cooling	Btu/h	8,000 - 18,000

Operating Range	
Cooling	-40F** (-40.0°C) to 115°F (46°C) DB

** Windscreens required for cooling operation below 23°F (-5°C)

AHRI Efficiency Rating	
EER	9.9
SEER	18.5

Electrical Power Requirements	208 / 230V, 1-Phase, 60 Hz		
Minimum Circuit Ampacity (MCA) *		Breaker Size	MOCP (Outdoor)
Indoor 1 AMP	Outdoor 11 AMP	15 AMP	28 AMP

***All electrical work shall comply with National (CEC) and local codes and regulations.**

Indoor Unit		
Fan Motor (ECM)	F.L.A.	0.33
Fan Motor Output	W	30
SHF / Moisture Removal		0.68 / 5.2 pt./h
Field Drainpipe Size O.D.	In.(mm)	5/8 (16)

Outdoor Unit		
Compressor		DC INVERTER-driven Twin Rotary
Fan Motor (ECM)	F.L.A.	0.5
Fan Motor Power	W	46

Airflow Rate (Low-Mid-Hi)			
Indoor (Cooling)	DRY	CFM	320-370-425
	WET		290-335-380
Outdoor	DRY		1,590

Sound Pressure Level			
Indoor (Low-Mid-Hi)		dB(A)	36-40-43
Outdoor	Cooling		44

External Dimensions		
Indoor (H x W x D)	In.(mm)	11-5/8 x 35-3/8 x 9-13/16 (295 x 898 x 249)
Outdoor (H x W x D)		24-13/16 x 31-13/16 + 7/16 x 11-3/16 (630 x 809 + 62 x 300)

Net Weight		
Indoor	Lbs.(kg)	29 (13)
Outdoor		99 (44)

External Finish	
Indoor	White Munsel No. 1.0Y 9.2/0.2
Outdoor	Ivory Munsell No. 3Y 7.8 / 1.1

Refrigerant	R410A ; 4lbs.,14oz. (2.2kg)

Refrigerant Piping (Flared)		
Liquid (High Pressure)	In.(mm)	1/4 (6.35)
Gas (Low Pressure)		1/2 (12.7)
Maximum Total Refrigerant Pipe Length	Ft. (m)	165 (50)
Maximum Vertical Separation	Ft. (m)	100 (30)

Should this document be altered or changed without MESCA's permission, it becomes null and void. MESCA assumes no responsibility for any consequences in such cases.

Specifications are subject to change without notice.

MITSUBISHI ELECTRIC
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Insignificant Noise Source

P-SERIES

SUBMITTAL DATA: PKA-A36KA7 & PUY-A36NKA7

36,000 BTU/H WALL-MOUNTED AIR-CONDITIONING SYSTEM

Job Name:	Engineer:
Purchaser:	Application: ☐ Std. Cooling ☐ Ultra Low Ambient Cooling
Submitted To:	For: ☐ Reference ☐ Approval ☐ Construction
Submitted By:	Location:
System Designation:	Schedule No.:

Indoor Unit: PKA-A36KA7

Outdoor Unit: PUY-A36NKA7 (-BS)

UNIT OPTION:

☐ Standard Model...PUY-A36NKA7
☐ Seacoast (BS) Model..PUY-A36NKA7-BS

ACCESSORIES:

Controls

☐ Wireless Controller (MHK1)
☐ Advanced Wired Controller (PAR-32MAA / PAR-33MAA)
☐ Simple Wired Controller (PAC-YT53CRAU)
☐ Wireless Remote Controller (PAR-FL32MA)
☐ Thermostat Interface (PAC-US444CN)
☐ M-NET Adapter (PAC-SF83MA-E)

Outdoor Unit

☐ Rear Snow Guard (SG-1-RE)
☐ Side Snow Guard (SG-1-SD)
☐ Front Wind Deflector (x2 required) (CM-S-FR-NKMU)
☐ Front Wind Blocker (x2 per box) (CM-S-BLK-NKMU)

Note: Mitsubishi Electric (MESCA) supports the use of only MESCA supplied and approved Snow Guard / Wind Deflectors / Windscreens and accessories for proper functioning of the unit/s. Use of non-MESCA supported Snow Guard / Wind Deflectors / Windscreens and accessories will affect warranty coverage.

SPECIFICATIONS:

Rated Conditions (Capacity / Input)*		
Cooling	Btu/h / W	36,000 / 3,330

* Rating Conditions per AHRI Standard:
Cooling | Indoor: 80°F (27°C) DB / 67°F (19°C) WB
Cooling | Outdoor: 95°F (35°C) DB / 75°F (24°C) WB

Capacity Range		
Cooling	Btu/h	16,000 - 36,000

Operating Range	
Cooling	-40F** (-40.0°C) to 115°F (46°C) DB

** Windscreens required for cooling operation below 23°F (-5°C)

AHRI Efficiency Rating	
EER	10.8
SEER	18.8

Electrical Power Requirements	208 / 230V, 1-Phase, 60 Hz		

Minimum Circuit Ampacity (MCA) *		Breaker Size	MOCP (Outdoor)
Indoor 1 AMP	Outdoor 25 AMP	30 AMP	31 AMP

***All electrical work shall comply with National (CEC) and local codes and regulations.**

Indoor Unit		
Fan Motor (ECM)	F.L.A.	0.57
Fan Motor Output	W	56
SHF / Moisture Removal		0.70 / 9.7 pt./h
Field Drainpipe Size O.D.	In.(mm)	5/8 (16)

Outdoor Unit		
Compressor		DC INVERTER-driven Twin Rotary
Fan Motor (ECM)	F.L.A.	0.5 + 0.5
Fan Motor Power	W	74

Airflow Rate (Low-Mid-Hi)			
Indoor (Cooling)	DRY	CFM	705-810-920
	WET		635-730-830
Outdoor	DRY		3,880

Sound Pressure Level			
Indoor (Low-Mid-Hi)		dB(A)	43-46-49
Outdoor	Cooling		52

External Dimensions		
Indoor (H x W x D)	In.(mm)	14 3/8 x 46 1/16 x 11 5/8 (365 x 1170 x 295)
Outdoor (H x W x D)		52-11/16 x 41-5/16 x 13 + 1-3/16 (1,338 x 1050 x 330 + 30)

Net Weight		
Indoor	Lbs.(kg)	46 (21)
Outdoor		211 (96)

External Finish	
Indoor	White Munsel No. 1.0Y 9.2/0.2
Outdoor	Ivory Munsell No. 3Y 7.8 / 1.1

Refrigerant	R410A ; 10lbs., 6oz. (4.7kg)

Refrigerant Piping (Flared)		
Liquid (High Pressure)	In.(mm)	3/8 (9.52)
Gas (Low Pressure)		5/8 (15.88)
Maximum Total Refrigerant Pipe Length	Ft. (m)	225 (69)
Maximum Vertical Separation	Ft. (m)	100 (30)

Specifications are subject to change without notice.

Insignificant Noise Source

CITY MULTI Model: PUMY-P60NKMU3 (-BS)

MITSUBISHI ELECTRIC Heating and Cooling

Job Name:

Schedule Reference: | Date:

OUTDOOR VRF SYSTEM FEATURES

- Single-phase outdoor unit with variable refrigerant flow (VRF) zoning technology
- Inverter-driven (variable speed) compressor
- Total refrigerant piping length of 492' (150 m)
- Connects up to 12 indoor units
- Uses CITY MULTI indoor units and Controls Network
- Low ambient cooling operation down to - 40°C available as an option(*5 *6)

UNIT OPTION

☐ Standard Model……....…………….....PUMY-P60NKMU3
☐ Sea Coast (-BS) Model……..........PUMY-P60NKMU3-BS

OPTIONAL PARTS

☐ Branch Joint (T-Branch) CMY-Y62-G-E
☐ Header - Four Branch CMY-Y64-G-E
☐ Header - Eight Branch CMY-Y68-G-E
☐ Base Heater PAC-SJ20BH-E

☐ Snow/Wind Guard (x2) .... CM-S-FR-NKMU
☐ Snow/Wind Guard Rear SG-1-RE
☐ Snow/Wind Guard Side SG-1-SD
☐ Snow/Wind Guard Blocker .... CM-S-BLK-NKMU

Note: Mitsubishi Electric (MESCA) supports the use of only MESCA supplied and approved Snow Guard / Wind Deflectors / Windscreens and accessories for proper functioning of the unit(s). Use of non-MESCA supported Snow Guard / Wind Deflectors / Windscreens and accessories will affect warranty coverage.

Specifications		Model Name
Unit Type		PUMY-P60NKMU3 (-BS)
Nominal Cooling Capacity	Btu/h *1 (kW)	60,000 (17.6)
Nominal Heating Capacity	Btu/h *2 (kW)	66,000 (19.3)
Operating Temperature Range	Cooling (Outdoor) *3 *4	23°F ~ 115°F (-5°C ~ +46°C) DB
	Heating (Outdoor)	-13°F ~ +59°F (-25°C ~ +15°C) WB
External Dimensions (H x W x D)	In. / mm	52-11/16 x 41-11/32 x 13 (+1) / 1,338 x 1050 x 330 (+25)
External Finish / Colour		Galvanized sheets (+power coating for -BS type) / Munsell No.3Y 7.8/1.1
Net Weight	Lbs. / kg	295 / 134
Electrical Power Requirements	Voltage, Phase, Hertz	208 / 230V, 1-phase, 60Hz
Minimum Circuit Ampacity (MCA) *	A	36
Maximum Overcurrent Protection	A	45
Piping Diameter (Flared) (In. / mm)	Liquid (High Pressure)	3/8 / 9.52
	Gas (Low Pressure)	3/4 / 19.05
Indoor Unit	Total Capacity	50 to 130% of Outdoor Unit Capacity
	Model / Quantity	P05 to P72 / 1 to 12
Sound Pressure Levels	dB(A) Clg / Htg	58 / 59
Fan		
Type x Quantity (kW)		Propeller Fan x 2 - (0.2 + 0.2)
Airflow Rate	CFM (m3/min)	4,879 (138)
Compressor Operating Range	Cooling	29% to 100%
	Heating	24% to 100%
Compressor Type x Quantity		INVERTER-driven Scroll Hermetic x 1
Compressor Motor Output	kW	3.9
Refrigerant		R410A: 11lbs. + 4oz. (5.1kg)
Lubricant		FVC68D (2.3 liters)
High-pressure Protection Device		High pressure Switch, High pressure Sensor
Compressor Protection Device		Compressor thermistor, Overcurrent detection
Inverter Circuit Protection Device		Overcurrent detection, Overheat detection (Heat sink thermistor)
AHRI Ratings Ducted / Non-Ducted	EER	11.1 / 13.3
	SEER	17.8 / 20.0
	COP	NA
	HSPF	10.7 / 12.0
Blue Fin Anti-corrosion Protection: Cellulose- and polyurethane-resin coating treatment applied to condenser coil that protects it from air contaminants; ≥1μm thick; Salt Spray Test Method - no unusual rust development to 960 hours.		

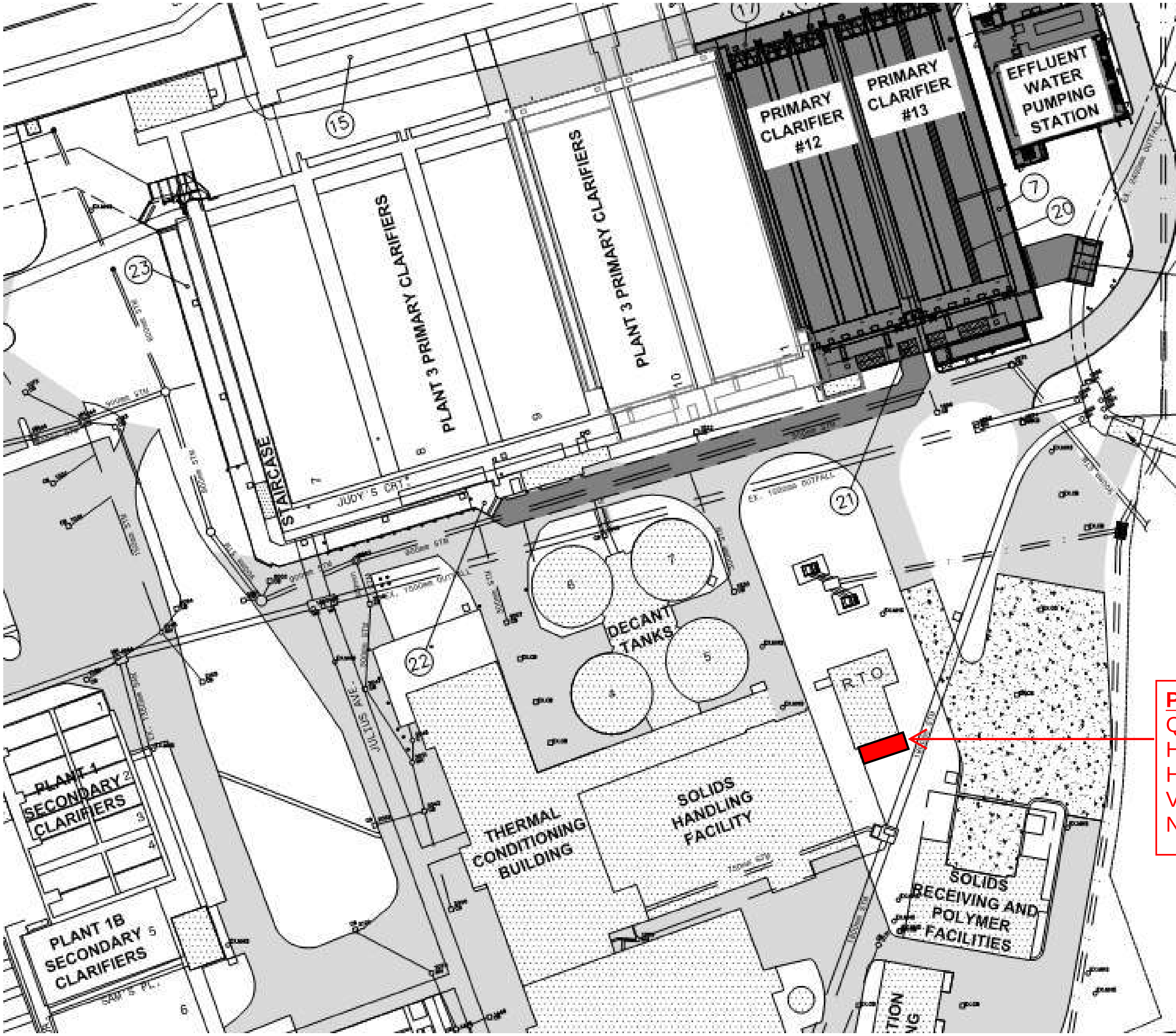
Notes:
*1. Nominal cooling conditions (subject to ISO 15042)
Indoor: 27°CD.B./19°CW.B. (81°FD.B./66°FW.B.), Outdoor: 35°CD.B. (95°FD.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
*2. Nominal heating conditions (subject to ISO 15042)
Indoor: 20°CD.B. (68°FD.B.), Outdoor: 7°CD.B./6°CW.B. (45°FD.B./43°FW.B.)
Pipe length: 7.5 m (24-9/16 ft.), Level difference: 0 m (0 ft.)
*3. 50 to 115°F (10 to 46°C)D.B.: When connecting PKFY-P06NBMU, PKFY-P08NHMU, PFFY-P06/08/12NEMU, and PFFY-P06/08/12NRMU type indoor unit.
*4. 5 to 115°F (-15 to 46°C)D.B.: When using an optional front wind baffle.
However, this condition does not apply to the indoor units listed in *3.
*5. For - 40°C cooling ONLY operation a low ambient kit is required along with a front wind deflector. Heating operation is not permitted.
*6. For Low-Ambient Cooling operation, dip switch SW 3 #1 must be switched to the ON position in the indoor unit to disable heating mode.

* All electrical work shall comply with National (CEC) and local codes and regulations.

"Should this document be altered or changed without MESCA's permission, it becomes null and void. MESCA assumes no responsibility for any consequences in such cases"

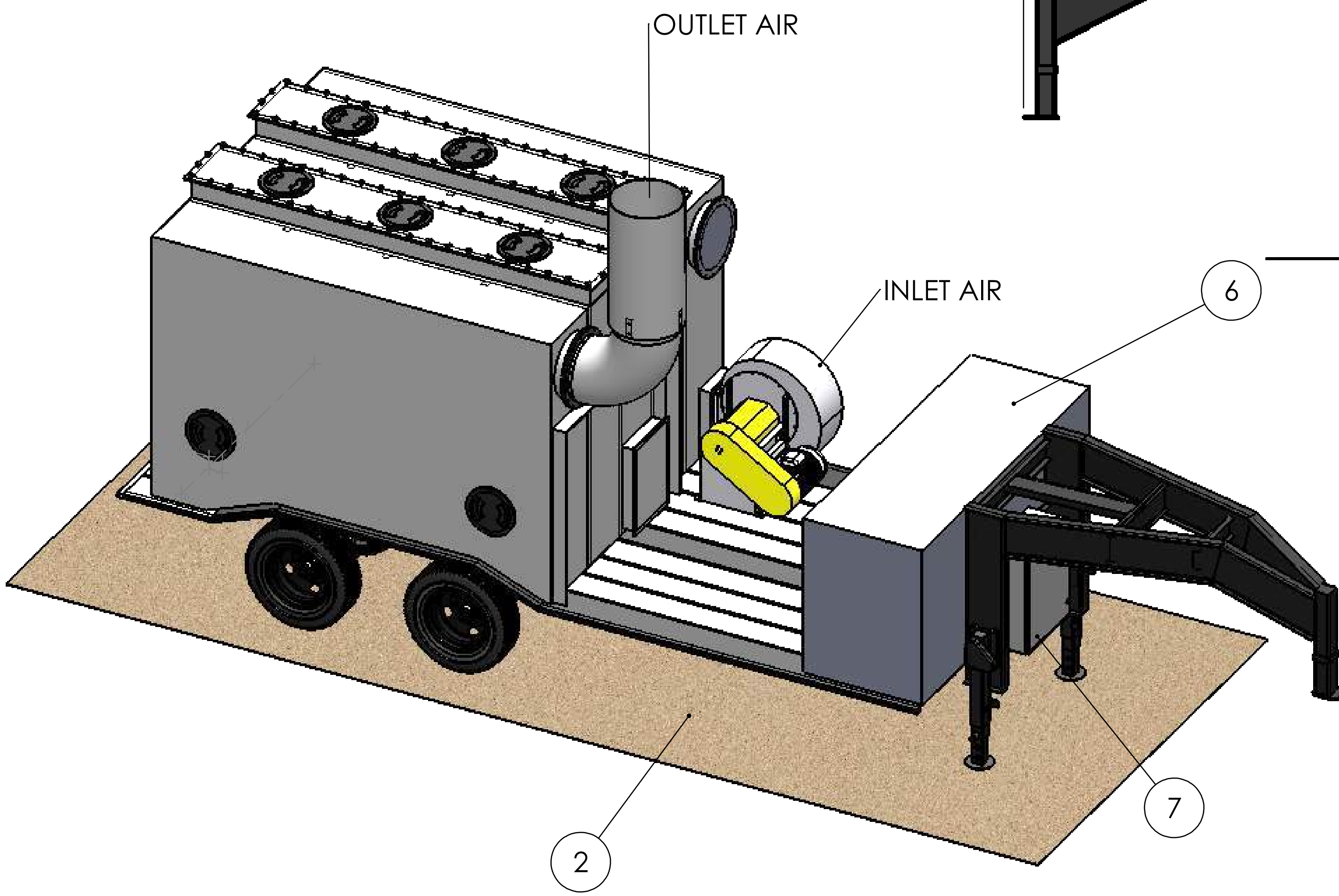
Specifications are subject to change without notice.

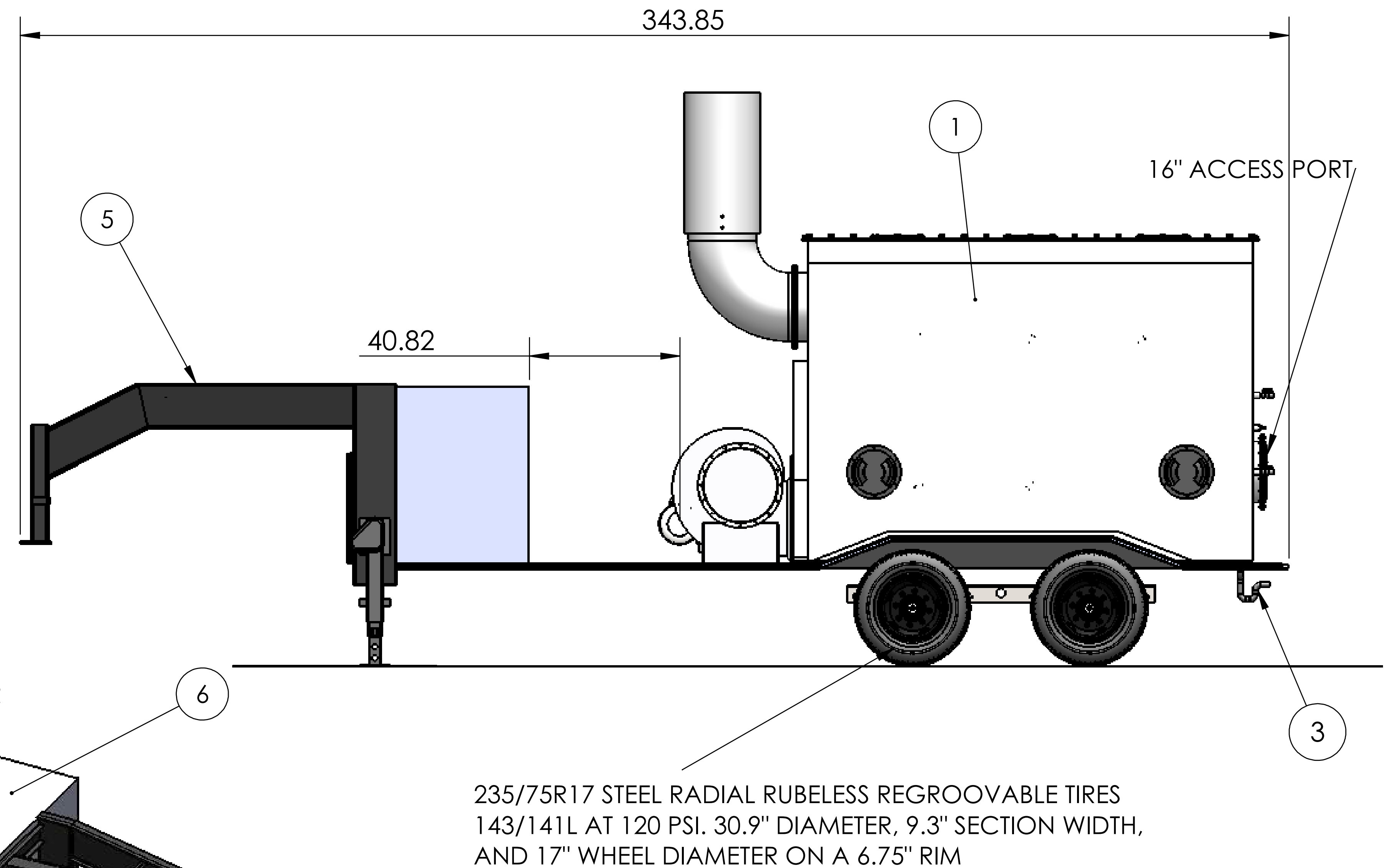
PORTABLE ODOUR UNIT



PORTABLE UNIT
Q - 8495m3/hr
H2S - 0.1ppm
Ht - 3.945m
Vel - 12m/s
Noise - 67dBA at 10ft

ITEM NO.	PART NUMBER	DESCRIPTION	DUAL BED/QTY.
1	4318-VPTS-02	VAPORPAC ASSY	1
2	-	FINISHED GRADE	1
3	-	DRAIN PLUMBING	1
4	-	FA FAN	1
5	-	TRAILER	1
6	-	GENERATOR	1
7	-	CONTROL PANEL	1





5,000 CFM CAPACITY

REV	DESCRIPTION	BY	CHKD	DATE
0	INITIAL RELEASE	RRJ	-	-

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/4"
ANGULAR: ± 3° BEND ±
TWO PLACE DECIMAL ± .125
THREE PLACE DECIMAL ± .060

PROPRIETARY AND CONFIDENTIAL

	NAME	DATE
DRAWN	RRJ	1/3/19
CHECKED		
PROJ MGR	KH	
MATERIAL		

ECS ENVIRONMENTAL SOLUTIONS

CUSTOMER:
JOB:
TITLE: VAPORPAC TEMPORARY SYSTEM
SIZE B | PART NUMBER: DUAL BED-OAL | REV 1
SCALE: 1:64 | DO NOT SCALE DRAWING | SHEET 1 OF 2

SYSTEM NOTES

FAN

1) STAINLESS STEEL / EXPOXY COATED SIZE 18 NYB FAN
2) CAPACITY:5,000 CFM CAPACITY @ 8 W.C.
3) INLET DIAMETER: 20"
4) MOTOR: 10HP

8495m3/hr

MEDIA

1) EQUIPPED WITH TWO (2) VERTICAL MEDIA BEDS. TOTAL CAPACITY 240 CUBIC FEET
2) DESIGNED TO UTILIZE 4MM EXTRUDED PELLETS, 4X8 MESH GRANULAR CARBON

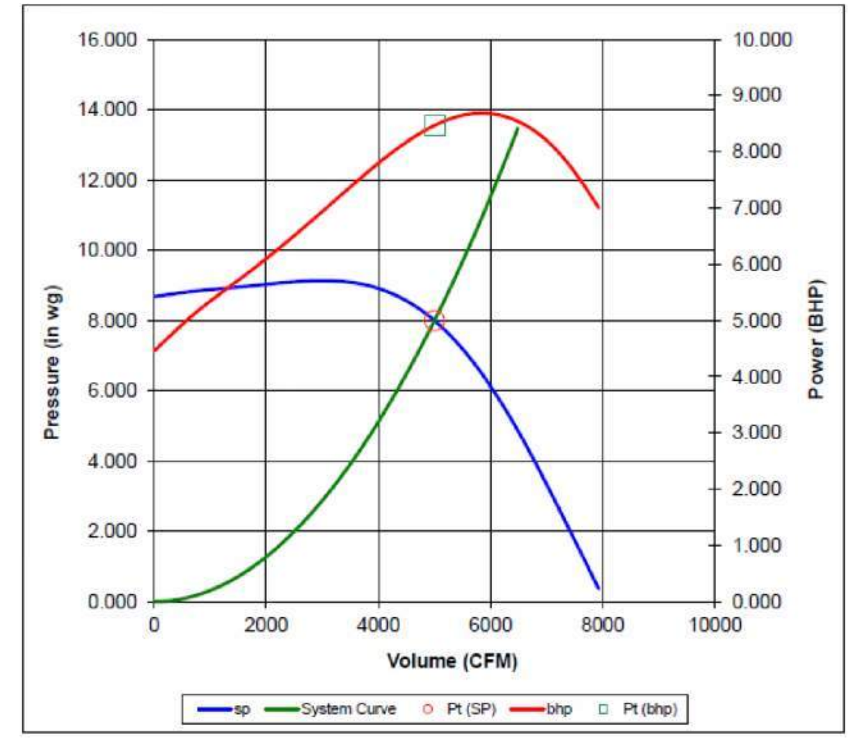
WEIGHT

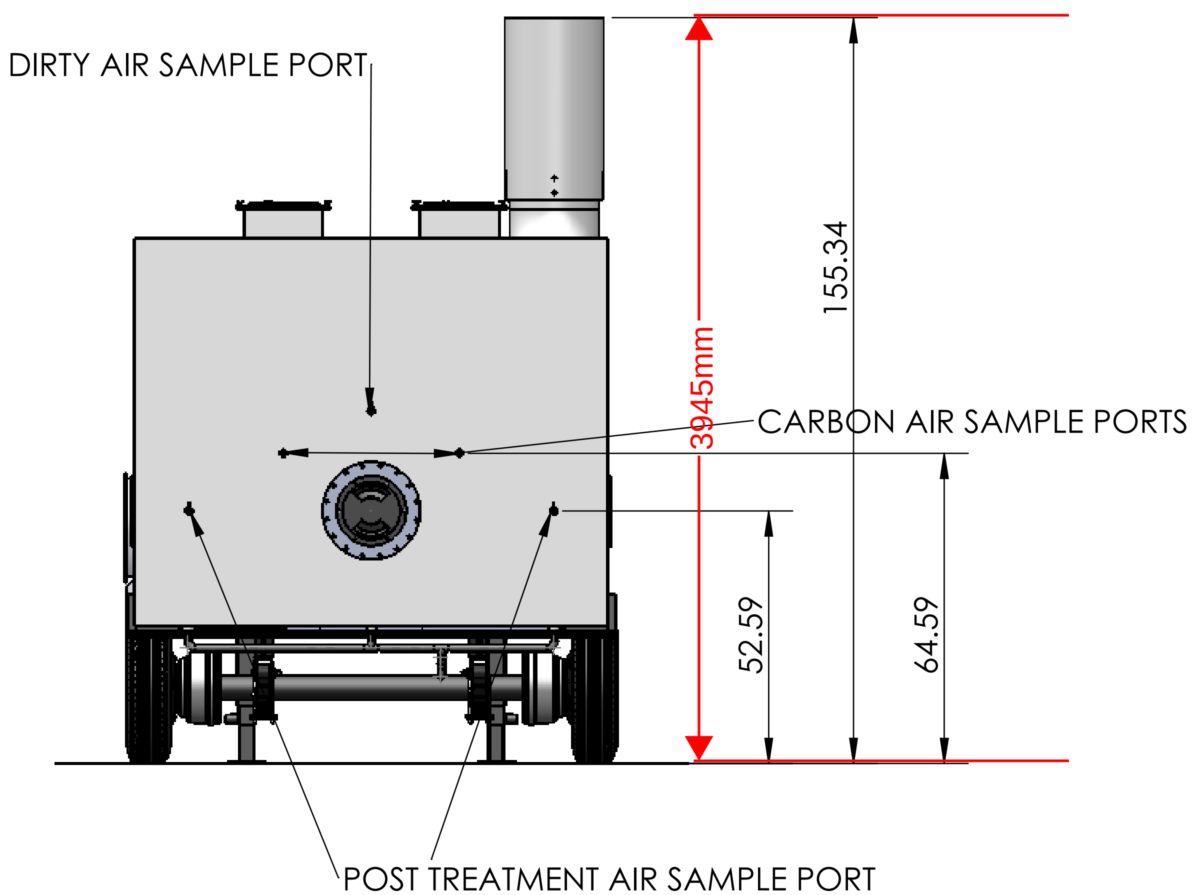
1) EMPTY SYSTEM~5,500LBS. CARBON LOADED~10,600 LBS.

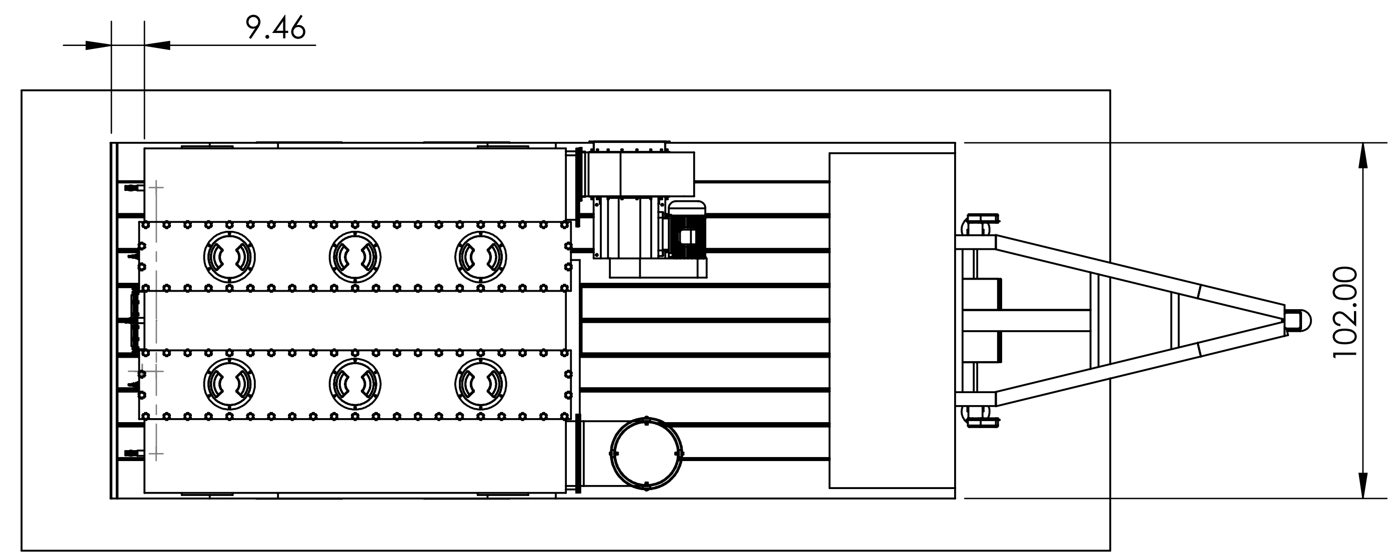
CONTROL PANEL

1) 3-PHASE AT 60Hz WITH A 480V MCB HARDWARE WITH CONTROL TRANSFORMER
2) VFD DRIVE

BACKWARD INCLINDED SWSI-PLR SIZE 18 FAN CURVE







5,000 CFM CAPACITY

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL± 1/4" ANGULAR:± 3° BEND ± TWO PLACE DECIMAL ± .125 THREE PLACE DECIMAL ± .060	DRAWN	RRJ	1/3/19
	CHECKED		
	PROJ MGR	KH	
	MATERIAL		

PROPRIETARY AND CONFIDENTIAL

ECS ENVIRONMENTAL SOLUTIONS

CUSTOMER:

JOB:

TITLE: VAPORPAC TEMPORARY SYSTEM

SIZE	PART NUMBER:	REV
B	4318-OAL	1

SCALE: 1:64 | DO NOT SCALE DRAWING | SHEET 2 OF 2

HIRA LTD.

GENERAL CONTRACTORS

63 Gaylord Road,
St. Thomas, Ontario, N5P 3R9

Phone: 519-633-2670
Fax: 519-631-9154

TRANSMITTAL OF CONTRACTOR'S SUBMITTAL

DATE: MAY 08, 2020

To: David Osborne – CIMA+

Contract Administrator
CIMA+
500-5935 Airport Road
Mississauga, Ontario
L4V 1W5
David.Osbourne@cima.ca

Project: **GE Booth WWTP Contract 1B – Storage Complex**

Project No.: **2019-065T C1B**

HIRA Project #: **4805**

CIMA+ Tag: **15732-02R2**

From: Tom Dedyna – HIRA Ltd.
Project Manager
63 Gaylord Road, St. Thomas, ON.
(226) 980-6310
tom@hira.ca

SUBMITTAL TYPE: ☒ Shop Drawing ☐ Sample ☐ Informational

☐ New Submittal ☒ Resubmittal

SUBMITTAL NAME: 15732-02R2 – Rooftop Units (LAB-RTU-01) – 15732 – Package Rooftop HVAC Units

Description of Item(s) Submitted	Specification Section Reference	Contract Drawing Ref.
Rooftop Units (LAB-RTU-01) – Revised as per REV 1 comments	**15732**	**325-1B-M-2001**

HIRA LTD. GENERAL CONTRACTORS

This review by HIRA Ltd. is intended only to check fo[r] general conformance [o]f these submitted Shop Drawings with the design in the Contract Documents. It consti[...] Design presented in the Shop Drawings, which desi[...] Documents. HIRA Ltd. is not authorized to waive th[...] submitting THIS SHOP DRAWING remains respons[...] dimensions, qualities and details necessary for fabri[...] according to the Contract.

■ We have verified that the material or equip[...] specified.

☐ We have verified that the material or equip[...] specified except for the following deviatio[...]

By: Tom Dedyna
Tom Dedyna, Project Manager

CIMA+

SUBMITTAL REVIEW

NATURE AND EXTENT OF REVIEW:
This document has been reviewed to verify conformity with the Contract Plans and Specifications.
THE DESIGN OF THE PRODUCT DESCRIBED ON THIS DOCUMENT HAS NOT BEEN VERIFIED.
The review of this document does not relieve the contractor or his engineer, if applicable, of their responsibilities regarding dimensions, quantities, and workmanship which must satisfy the requirements of the Contract.

DATE (dd/mm/yyyy) 11/06/2020

REMARKS
See remarks on the document (if any)

NO COMMENT ☐
AS NOTED ☒
REVISE AND RESUBMIT ☐
REJECTED ☐

REVIEWER'S NAME: MG, SCB, DO

REV. NO.: **2 REVISED**

SIGNATURE: Amanda Pelogue

Malfar Mechanical Inc.
144 Woodstream Boulevard, Woodbridge, Ontario L4L 7Y3
Tel: (905) 850-1242 - Fax: (905) 850-2630 - www.malfar.ca

Submittal

19-10 — GE Booth WWTP Contract 1B - Storage Complex **Subject : Roof Top Unit LAB-RTU-01**

To

Thomas Dedyna
HIRA Limited
63 Gaylord Road
St. Thomas, ON N5P 3R9
Phone No: 1-519-633-2670 Ext 236
Mobile: 1-226-980-6310
tom@hira.ca

Return To

Benjamin Yan
Malfar Mechanical
Mobile: 905-850-1242
benjaminy@malfar.ca

Copy To

Number :	**37**
Spec Section No :	15732
Submittal Rev No:	**2**
Submittal Number:	37
Date Sent :	5/7/2020
Type :	Submittal Revision
Method Sent :	Email
Reason For Sending :	For Approval
Status :	To Be Submitted

Details

none

Notes

Please find attached REVISED SELECTION addressing the concerns/comments made in the shop drawings.

*Please return submitted items by **5/21/2020**.*

Signed By: ______________________________ **Dated:** 5/7/2020

Unit Report For RTU-1

Project: Malfar Mechanical -GE Booth — 05/07/2020
Prepared By: — 01:43PM

Unit Parameters

Unit Model:........................ **50GC-P05A3A5-0ACC0**
Unit Size:..**05 (4 Tons)**
Volts-Phase-Hertz:.................................... **208-3-60**
Heating Type:... **Electric**
Duct Cfg:... **Horizontal Supply / Horizontal Return**
No Heat
Two Stage Cooling With Low Ambient Controls

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length:...**6' 2.375"**
Unit Width:..**3' 10.625"**
Unit Height: ....**2' 9.375"**
*** Total Operating Weight: .... **561** lb

*** Weights and Dimensions are approximate. Weight does not include unit packaging. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Lines and Filters

Return Air Filter Type: .... **Throwaway**
Return Air Filter Quantity:....................................... **2**
Return Air Filter Size: ....**16 x 25 x 2**

Unit Configuration

Direct Drive - EcoBlue - High Static
Al/Cu - Al/Cu
Base controls set up for field installed air management device
Foil Faced Insulation
Non-Fused Disconnect
Standard Packaging

Warranty Information

5-Year compressor parts (STD.)
1-Year parts (STD.)
Complete Unit 1st Year Carrier CCS Labor

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
50GC-P05A3A5-0ACC0	Rooftop Unit	1
	Base Unit	
	Direct Drive - EcoBlue - High Static	
	Foil Faced Insulation	
	Non-Fused Disconnect	
Accessories	**For field installation**	
CRMANDPR001A03	Outdoor Air Damper Package *(shipped loose)*	1
33CSCPACHP-01	Comfort Pro programmable *(shipped loose)*	1
CRHEATER331A00	15.8/19.3 kW 208/230-1/3-60 Volt Electric Heater *(shipped loose)*	1
CRSINGLE038A00	Single Point Kit *(shipped loose)*	1
	20-AMP Convenience Outlet *(shipped loose)*	1

NOTES:

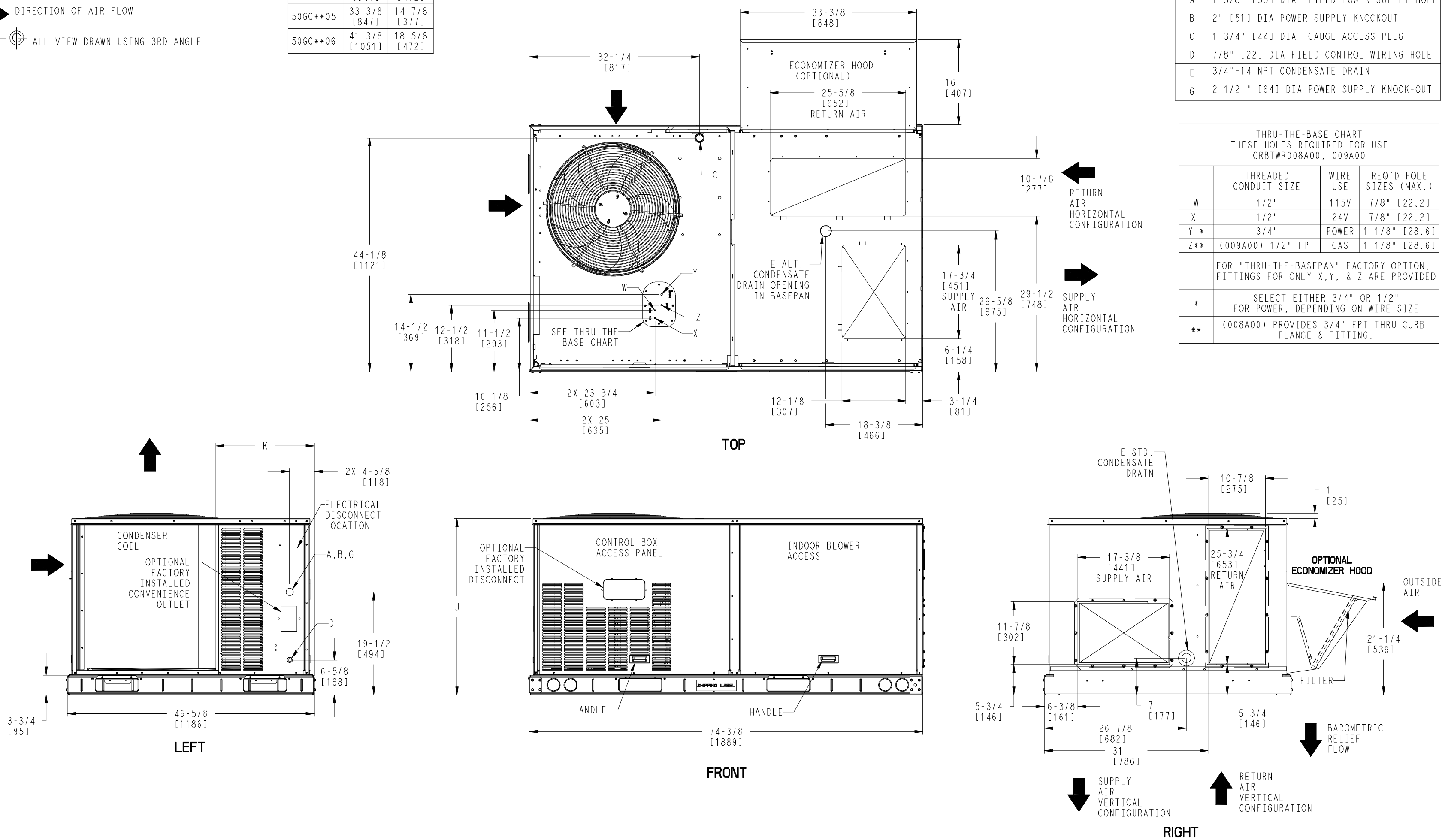
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW
4. ALL VIEW DRAWN USING 3RD ANGLE

UNIT	J	K
50GC**04	33 3/8 [847]	18 5/8 [472]
50GC**05	33 3/8 [847]	14 7/8 [377]
50GC**06	41 3/8 [1051]	18 5/8 [472]

	CONNECTION SIZES
A	1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B	2" [51] DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [44] DIA GAUGE ACCESS PLUG
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
G	2 1/2 " [64] DIA POWER SUPPLY KNOCK-OUT

THRU-THE-BASE CHART
THESE HOLES REQUIRED FOR USE
CRBTWR008A00, 009A00

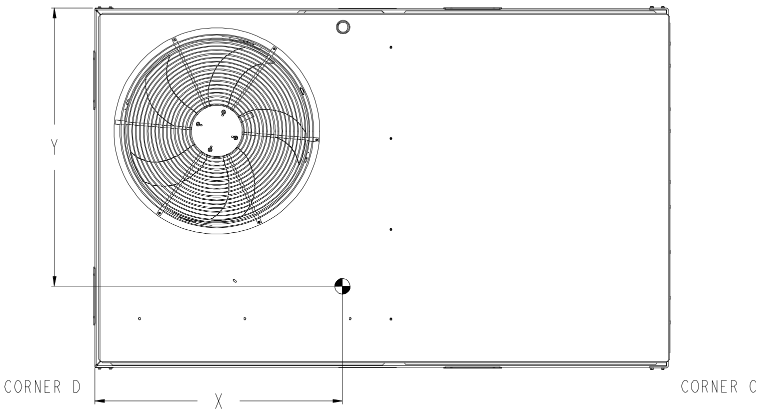
	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	115V	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y *	3/4"	POWER	1 1/8" [28.6]
Z**	(009A00) 1/2" FPT	GAS	1 1/8" [28.6]
	FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X,Y, & Z ARE PROVIDED		
*	SELECT EITHER 3/4" OR 1/2" FOR POWER, DEPENDING ON WIRE SIZE		
**	(008A00) PROVIDES 3/4" FPT THRU CURB FLANGE & FITTING.		



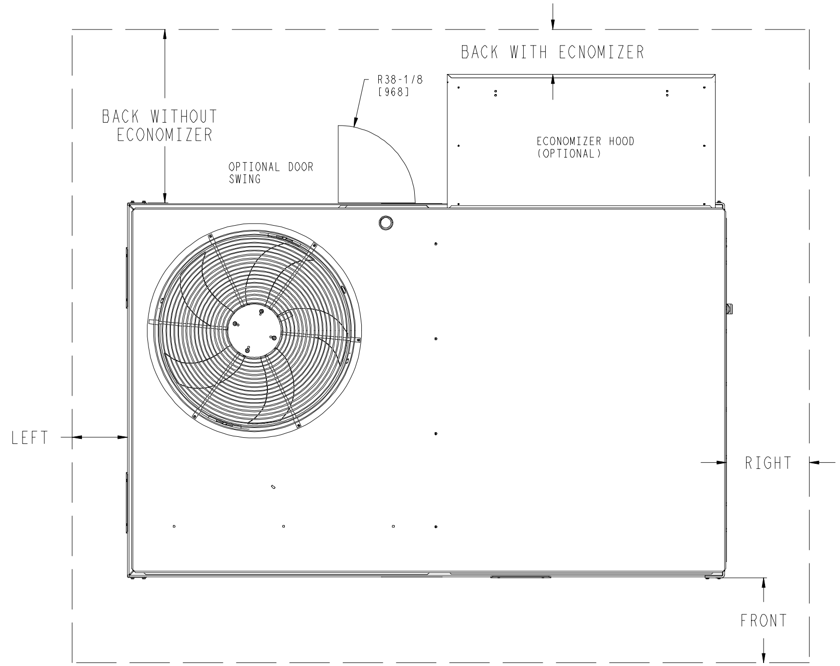
ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	1 OF 3	09/07/18	08/03/18	50GC 04-06 SINGLE PACKAGE ELECTRICAL COOLING WITH ELECTRIC HEAT	48TC003100	B

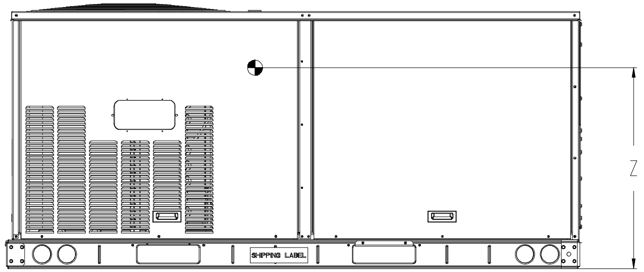
UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		HEIGHT
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
50GC**04	468	212	128	58	117	53	106	48	116	53	35 1/2 [902]	22 1/4 [565]	18 3/8 [467]
50GC**05	510	231	140	64	128	58	116	53	127	58	35 1/2 [902]	22 1/4 [565]	18 3/8 [467]
50GC**06	555	252	152	69	135	61	126	57	141	64	35 [889]	22 1/2 [572]	19 1/2 [495]

*- STANDARD UNIT WEIGHT IS WITHOUT ELECTRIC HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES REFER TO THE PRODUCT DATA CATALOG.



TOP





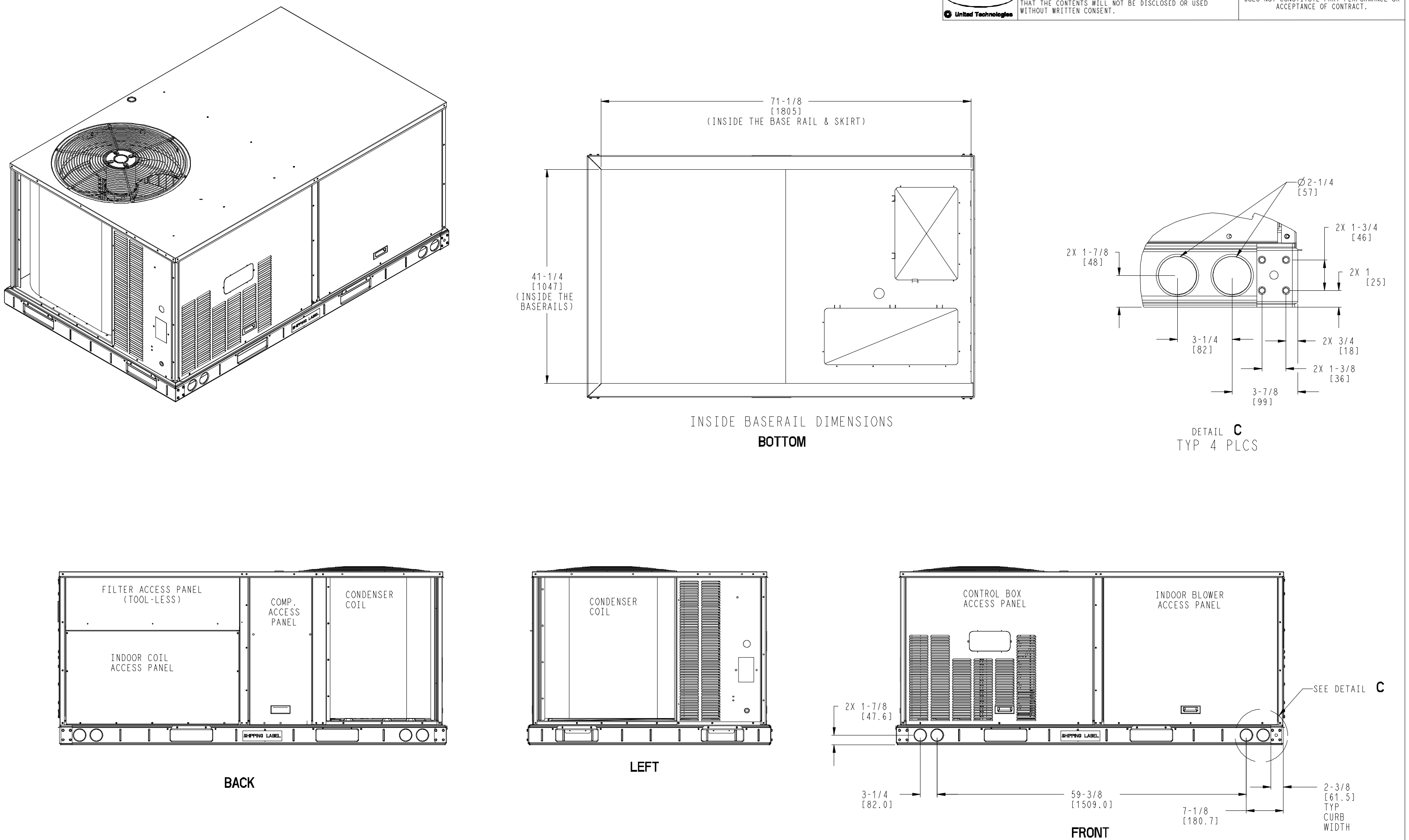
FRONT

NOTE:

1. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

CLEARANCE			
	SERVICE WITH:	SERVICE WITH:	OPERATING
SURFACE	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER	CLEARANCE
FRONT	48 [1219mm]	36 [914mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK W/O ECON	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK W/ECON	36 [914mm]	36 [914mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	2 OF 3	09/07/18	08/03/18	50GC 04-06 SINGLE PACKAGE ELECTRICAL COOLING WITH ELECTRIC HEAT	48TC003100	B



ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	3 OF 3	09/07/18	08/03/18	50GC 04-06 SINGLE PACKAGE ELECTRICAL COOLING WITH ELECTRIC HEAT	48TC003100	B

Performance Summary For RTU-1

Project: Malfar Mechanical -GE Booth 05/07/2020
Prepared By: 01:43PM

Part Number:50GC-P05A3A5-0ACC0

ARI SEER:	**16.00**	
Base Unit Dimensions		
Unit Length:	**74.4**	in
Unit Width:	**46.6**	in
Unit Height:	**33.4**	in
Operating Weight		
Base Unit Weight:	**510**	lb
Two Stage Cooling With Low Ambient Controls:	**9**	lb
Direct Drive - EcoBlue - High Static:	**5**	lb
Non-Fused Disconnect:	**5**	lb
Accessories		
Outdoor Air Damper Package:	**12**	lb
15.8/19.3 kW 208/230-1/3-60 Volt Electric Heater:	**10**	lb
Single Point Kit:	**10**	lb
Total Operating Weight:	**561**	lb
Unit		
Unit Voltage-Phase-Hertz:	**208-3-60**	
Air Discharge:	**Horizontal**	
Fan Drive Type:	**Direct**	
Actual Airflow:	**1648**	CFM
Site Altitude:	**568**	ft
Cooling Performance		
Condenser Entering Air DB:	**87.0**	F
Evaporator Entering Air DB:	**78.8**	F
Evaporator Entering Air WB:	**65.9**	F
Entering Air Enthalpy:	**30.89**	BTU/lb
Evaporator Leaving Air DB:	**57.0**	F
Evaporator Leaving Air WB:	**55.7**	F
Evaporator Leaving Air Enthalpy:	**23.77**	BTU/lb
Gross Cooling Capacity:	**51.72**	MBH
Gross Sensible Capacity:	**38.06**	MBH
Compressor Power Input:	**2.97**	kW
Coil Bypass Factor:	**0.092**	
Mixed Air		
Outdoor Air Airflow:	**420**	CFM
Outdoor Air DB:	**87.0**	F
Outdoor Air WB:	**71.0**	F
Outdoor Air Htg. Temp.:	**-4.0**	F
Return Air DB:	**76.0**	F
Return Air WB:	**64.0**	F
Return Air Htg. Temp.:	**70.0**	F
Heating Performance		
Heating Airflow:	**1648**	CFM
Entering Air Temp:	**51.1**	F
Leaving Air Temp:	**82.1**	F
Electric Heating Capacity:	**15.80**	kW
Supply Fan		
External Static Pressure:	**1.00**	in wg
Options / Accessories Static Pressure		
Electric Heaters:	**0.15**	in wg
Total Application Static (ESP + Unit Opts/Acc.):	**1.15**	in wg

Fan RPM: **2226**
Fan Power: **0.70** BHP
NOTE: **Selected IFM RPM Range: 1022 - 2660**

Electrical Data

Voltage Range: **187 - 253**
Compressor #1 RLA: **14**
Compressor #1 LRA: **83**
Actual Electric Heater kW: **15.8**
Electric Heater FLA: **43.8**
Indoor Fan Motor Type: **HIGH**
Indoor Fan Motor FLA: **5.1**
Power Supply MCA: **62**
Power Supply MOCP (Fuse or HACR): **70**
Disconnect Size FLA: **56**
Disconnect Size LRA: **94**
Electrical Convenience Outlet: **None**
Outdoor Fan [Qty / FLA (ea)]: **1 / 1.5**
Electric Heater Part Number: **331A**
Electric Heater Number of Stages: **2**

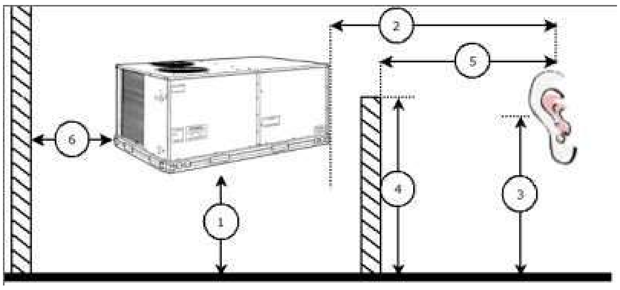
Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Acoustics

Sound Power Levels, db re 10E-12 Watts

	Discharge	Inlet	Outdoor
63 Hz	94.8	49.5	85.6
125 Hz	84.2	80.7	84.7
250 Hz	78.4	73.7	80.5
500 Hz	73.3	64.0	76.0
1000 Hz	68.7	67.1	72.4
2000 Hz	87.1	76.0	68.0
4000 Hz	62.5	51.5	62.8
8000 Hz	60.4	59.2	59.3
A-Weighted	88.6	78.2	79.0

Advanced Acoustics



Advanced Accoustics Parameters

1. Unit height above ground: **30.0** ft
2. Horizontal distance from unit to receiver: **50.0** ft
3. Receiver height above ground: **5.7** ft
4. Height of obstruction: **0.0** ft
5. Horizontal distance from obstruction to receiver: **0.0** ft
6. Horizontal distance from unit to obstruction: **0.0** ft

Performance Summary For RTU-1

Project: Malfar Mechanical -GE Booth 05/07/2020
Prepared By: 01:43PM

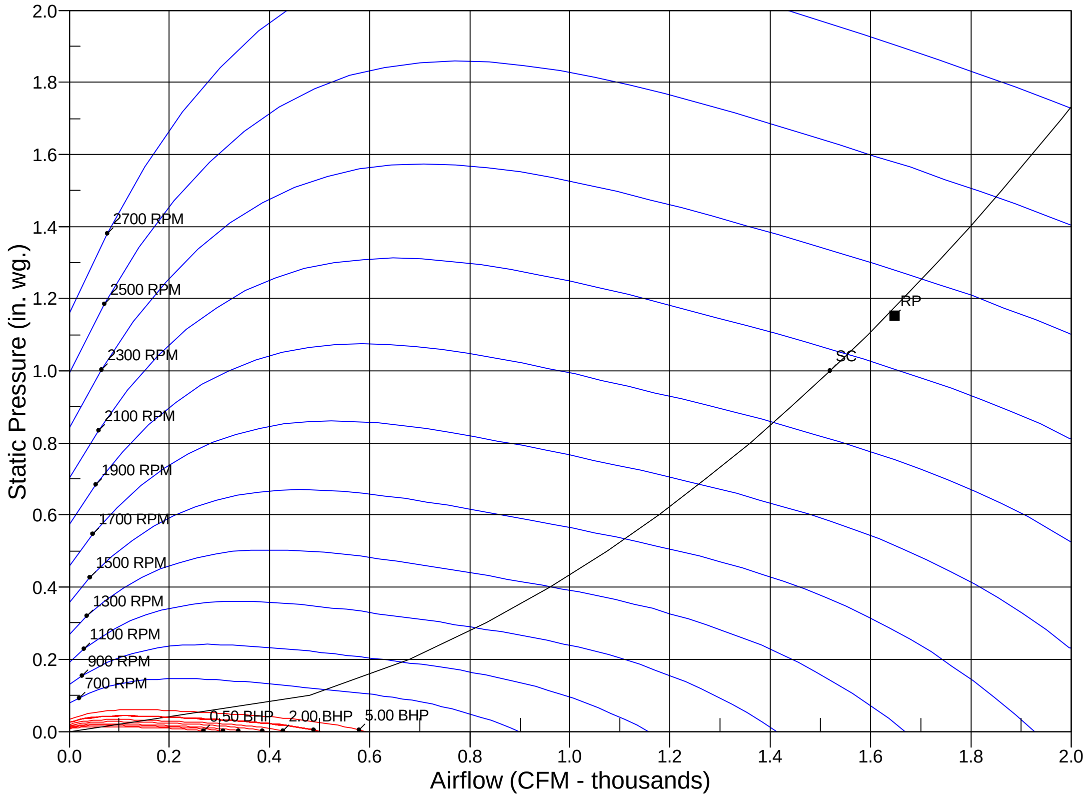
Detailed Acoustics Information

Octave Band Center Freq. Hz	63	125	250	500	1k	2k	4k	8k	Overall
A	85.6	84.7	80.5	76.0	72.4	68.0	62.8	59.3	89.2 Lw
B	59.4	68.6	71.9	72.8	72.4	69.2	63.8	58.2	78.5 LwA
C	53.2	52.3	48.1	43.6	40.0	35.6	30.4	26.9	56.8 Lp
D	27.0	36.2	39.5	40.4	40.0	36.8	31.4	25.8	46.1 LpA

Legend
A Sound Power Levels at Unit's Acoustic Center, Lw
B A-Weighted Sound Power Levels at Unit's Acoustic Center, LwA
C Sound Pressure Levels at Specific Distance from Unit, Lp
D A-Weighted Sound Pressure Levels at Specific Distance from Unit, LpA

Calculation methods used in this program are patterned after the ASHRAE Guide; other ASHRAE Publications and the AHRI Acoustical Standards. While a very significant effort has been made to insure the technical accuracy of this program, it is assumed that the user is knowledgeable in the art of system sound estimation and is aware of the tolerances involved in real world acoustical estimation. This program makes certain assumptions as to the dominant sound sources and sound paths which may not always be appropriate to the real system being estimated. Because of this, no assurances can be offered that this software will always generate an accurate sound prediction from user supplied input data. If in doubt about the estimation of expected sound levels in a space, an Acoustical Engineer or a person with sound prediction expertise should be consulted.

Fan Curve



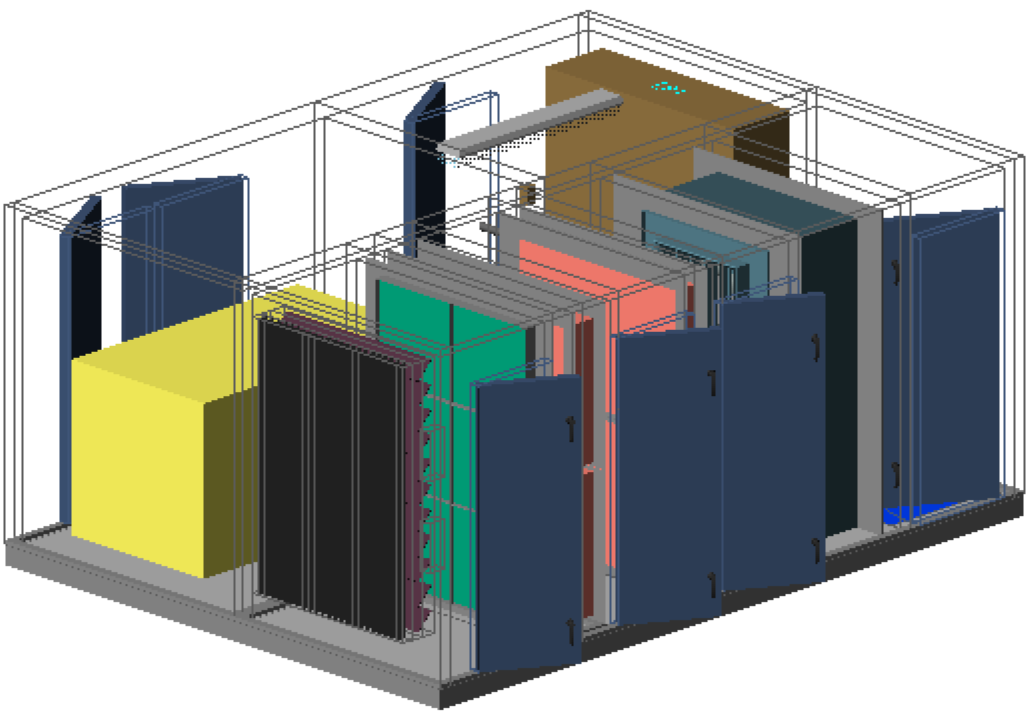
RPM = 2226 BHP = 0.70 Maximum RPM = 2660 Maximum BHP = 3.00
SC - System Curve RP - Rated Point

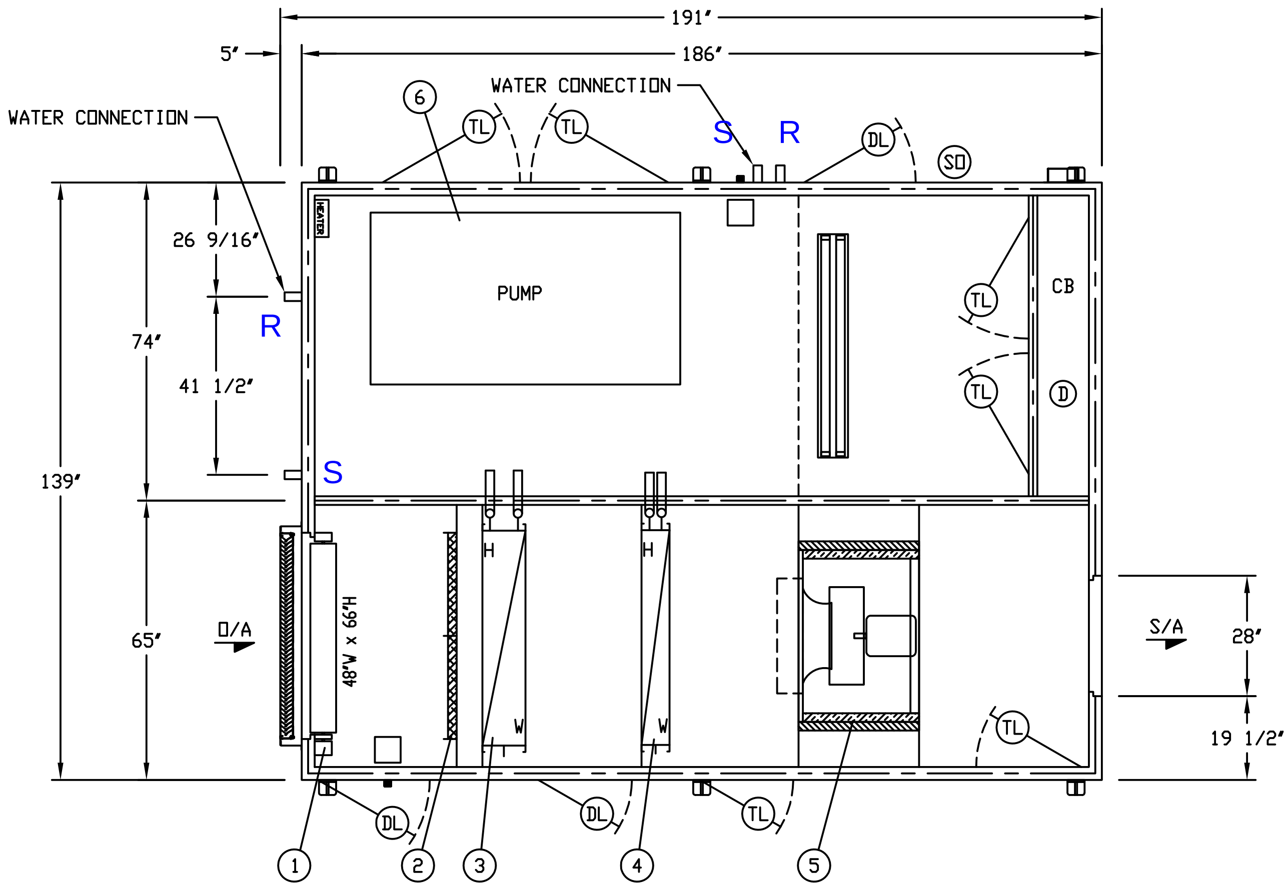
NORTEK AIR SOLUTIONS VENMAR

PROJECT	GE Booth WWTP
JOB NUMBER	SO036624-01
UNIT TAG	AHU-701
QUANTITY	1

Revision History

Date	Rev	Revision Description





PLAN VIEW

ITEM:

1 - OUTSIDE AIR DAMPER
2 - OUTSIDE AIR PRE-FILTERS
3 - PRE-HEATING COIL
4 - HEATING COIL
5 - SUPPLY FAN & MOTOR
6 - PUMP

AIR STREAMS:

- O/A = OUTSIDE AIR
- S/A = SUPPLY AIR

LEGEND:

- DL : DOORS WITH LATCHES
- TL : TOOLED ACCESS DOORS WITH LATCHES
- CB : CONTROL BOX, 63"W. X 60"H. X 12"D.
- D : DISCONNECT SWITCH
- ¤ : DRAIN WITHOUT CAP
- SO : MANUAL SWITCH AND ELECTRIC OUTLET, 120V.
- OO : FLUORESCENT, 120V.

NOTES:

- WEATHERHOODS AND LOUVERS MAY BE SHIPPED LOOSE FOR FIELD INSTALLATION BY OTHERS
- THE DIMENSIONS DO NOT INCLUDE ACCESSORIES THAT EXTEND BEYOND THE UNIT CASING
- FRESH AIR INTAKE MUST BE POSITIONED IN A DIRECTION OPPOSITE TO PREVAILING WINDS
- MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING DUCT AND DOOR LOCATIONS

APPROVAL:	
STANDARD TOLERANCES:	X/X ± 1/4 — UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.
TITLE:	EnergyPack A-1-12e-WX-HW-X-X-P
PROJECT:	GE BOOTH WWTP
TAG:	AHU-701
DRAWING NO.:	SO036624-01
DRAWN BY:	D. LAVIGNE
DATE:	04-01-2019
CHECKED BY:	J. DALLAIRE
DATE:	----
SCALE:	NONE
SHEET:	1 OF 3
MATERIAL:	

VENMAR CES
a Nortek Air Solutions Brand

REV.	BY	DESCRIPTION	DATE
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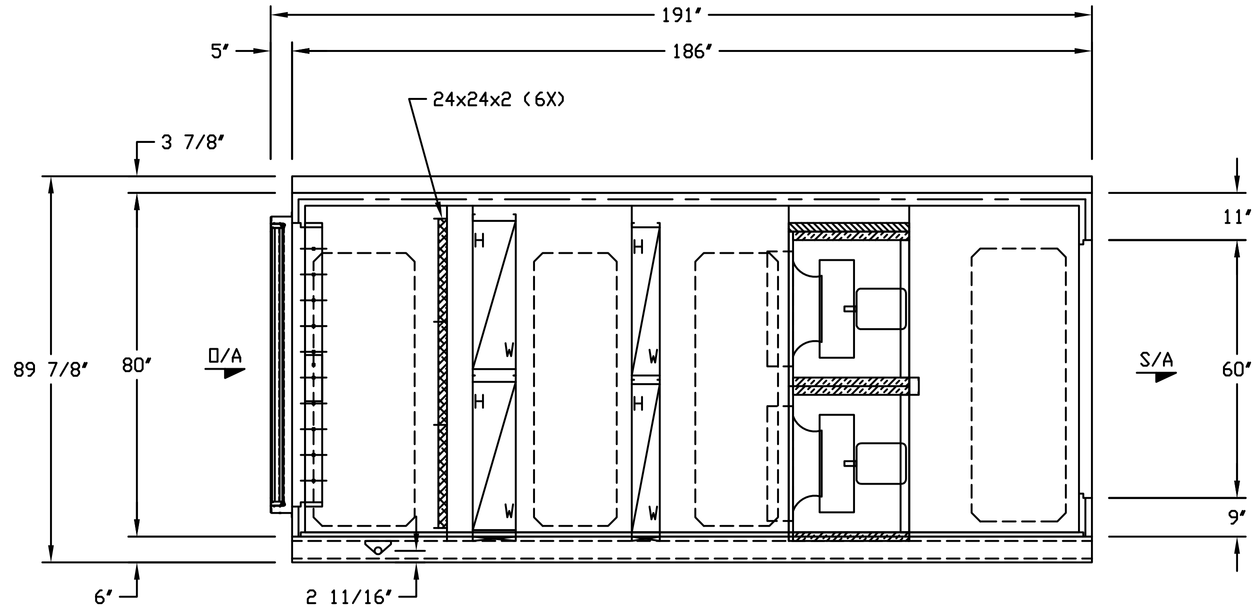
----	----	----	----
----	----	----	----
E	GC	CENTERED CONTROL BOX DOOR	03-10-2020



ELEVATION VIEW (FRONT SIDE)

APPROVAL:	STANDARD TOLERANCES: X/X ± 1/4 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.	TITLE: EnergyPack A-1-12e-WX-HW-X-X-P	PROJECT: GE BOOTH WWTP	TAG: AHU-701	DRAWING NO.: SO036624-01	VENMAR CES a Nortek Air Solutions Brand	
DRAWN BY: D. LAVIGNE	DATE: 04-01-2019	CHECKED BY: J. DALLAIRE	DATE: ----	SCALE: NONE	SHEET: 2 OF 3	MATERIAL:	

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REV.	BY	DESCRIPTION	DATE
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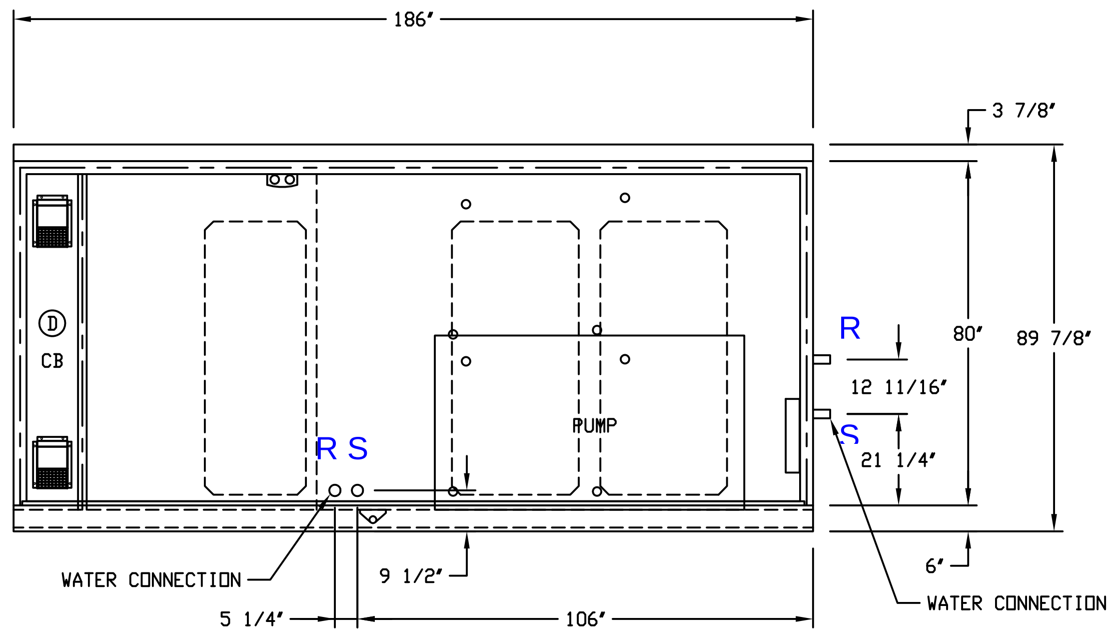
E	GC	CENTERED CONTROL BOX DOOR	03-10-2020



ELEVATION VIEW (REAR SIDE)

APPROVAL:	STANDARD TOLERANCES: X/X ± 1/4 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.	TITLE: EnergyPack A-1-12e-WX-HW-X-X-P	DRAWN BY: D. LAVIGNE — DATE: 04-01-2019
		PROJECT: GE BOOTH WWTP	CHECKED BY: J. DALLAIRE — DATE: ----
		TAG: AHU-701 — DRAWING NO.: SO036624-01	SCALE: NONE — SHEET: 3 OF 3 — MATERIAL:

VENMAR CES
a Nortek Air Solutions Brand

REV.	BY	DESCRIPTION	DATE
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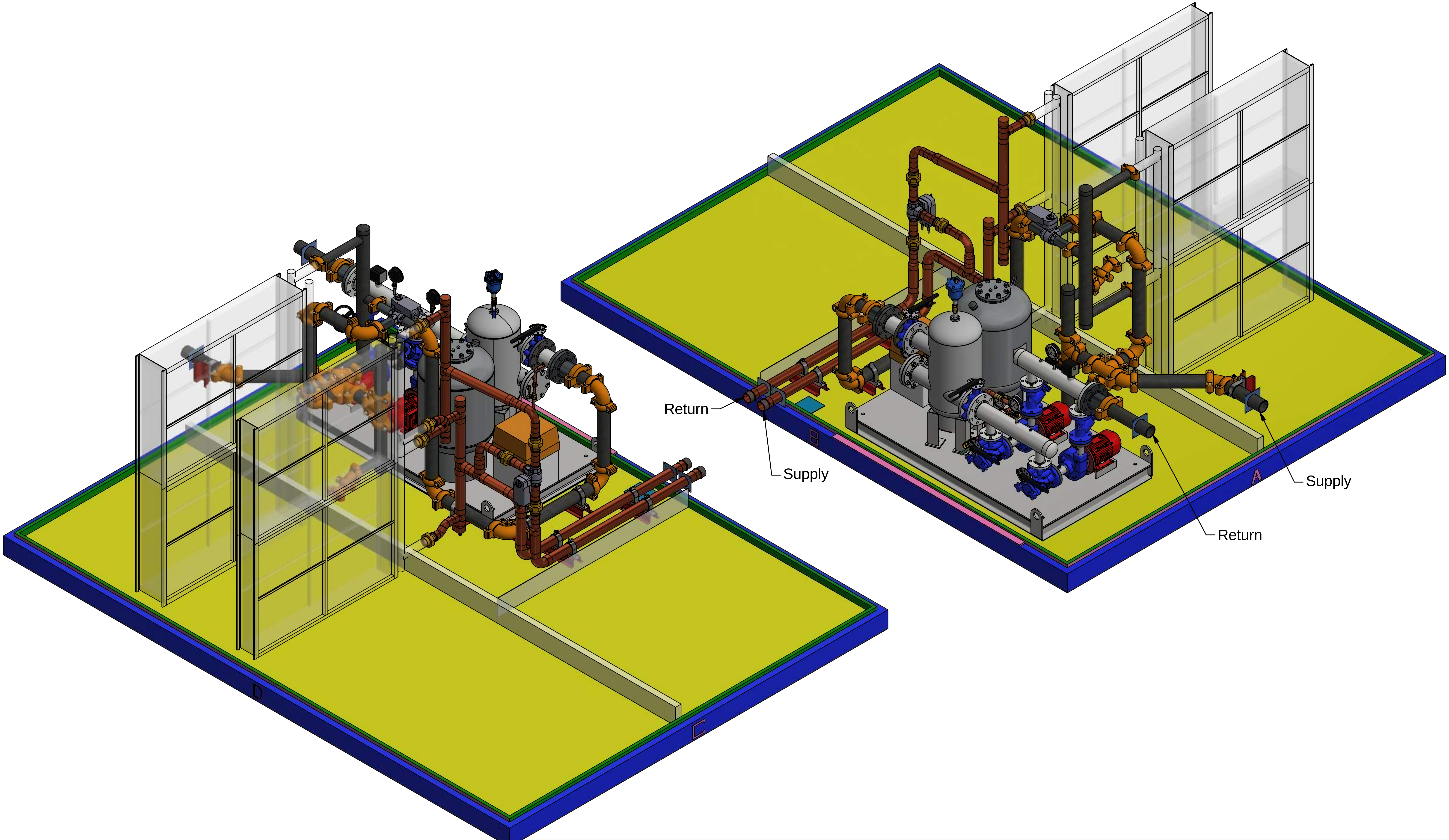
E	GC	CENTERED CONTROL BOX DOOR	03-10-2020

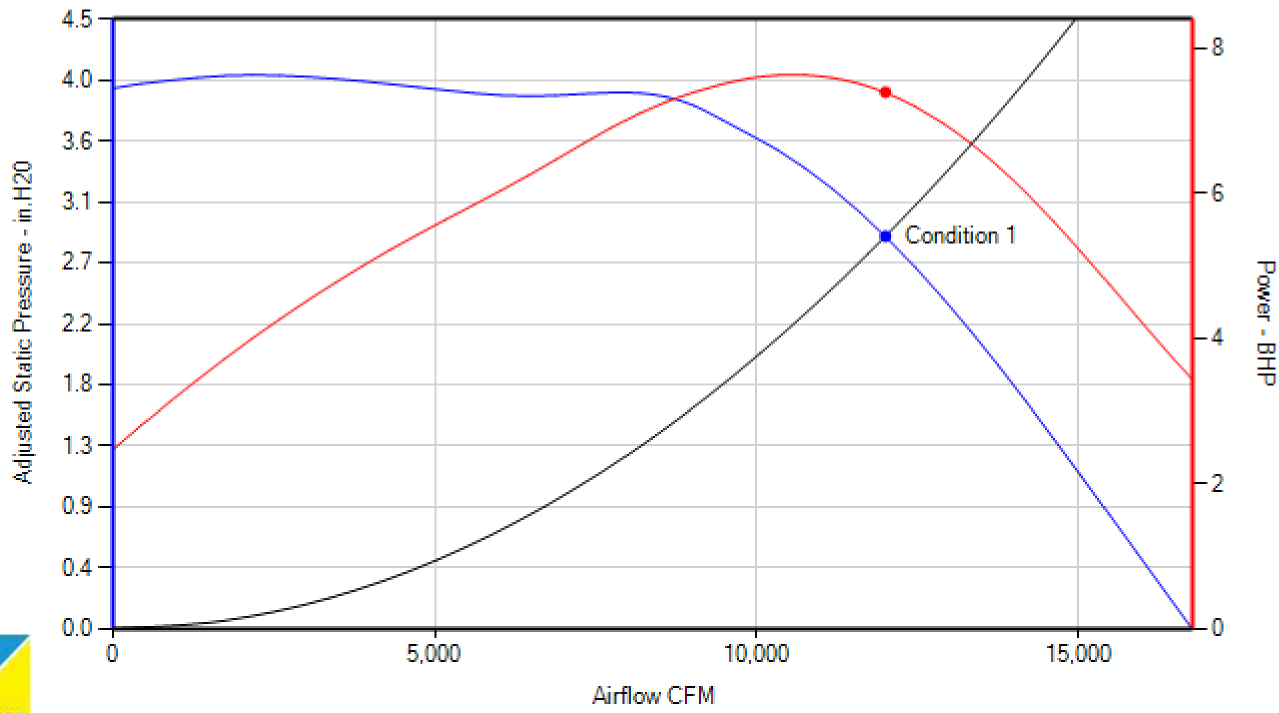


G:\Dossier\SO036K\SO036624\SO036624-01\Dessin\Piping\SO036624-01 EnergyPack Piping Eau.idw

V£RIFICATION:	TOL£RANCES G£N£RALES: X/X Ñ 1/32 ∠ Ñ 1Á SAUF INDICATION CONTRAIRE, TOUTES LES DIMENSIONS SONT EN POUCES.	TITRE: G®n®ral	VENMAR CES	DESSINATEUR: Nicolas Thibault	DATE: 02-28-20
		PROJET: SO036624-01		V£RIFICATEUR: Kevin Lemay	DATE: 03-06-20
		SYST. TAG:	NO. DESSIN: SO036624-01 EnergyPack Piping Eau	£CHELLE:	PAGE: 1 DE 15
			CE DESSIN EST LA PROPRI£T£ DE VENMAR CES INC. TOUTE REPRODUCTION OU DIVULGATION SANS LE CONSENTEMENT £CRIT DE VENMAR CES INC. EST INTERDIT.	MAT£RIEL:	

R£V	PAR	DESCRIPTION	DATE
3	£.B.	Ajout de notes Supply et Return	05-05-20
2	N.T	Ajout d' unions dans le circuit cuivre.	03-23-20
1	N.T	Ajout de mix valve et unions	03-18-2020

4 FANWALL 1 (Supply) : FWT1 : Box 1 (Continued) 22-85 - 182T - 36 x 40 x 28 - B1



AMCA Licensed for Sound and Air Performance Without Appurtenances (Accessories).
Performance certified is for installation type A: Free Inlet/Free Outlet
Power [bhp] excludes drives

4.8 Operating Conditions

Operating Condition	Usage (%)	CFM	SP (in.H20)		Cell Qty			RPM	Hz	Fanwheel BHP		Vel. (ft/min)	Watts	FEG % Off Peak
			Input	Adj.	On	Off	Fail			Each	Total			
Condition 1	100	12,000	2.52	2.87	2	0	0	1,662	57.31	3.70	7.40	750	6,391	FEG85 0%

4.9 Bare Fan Sound Power with Coplanar Silencer (dB re: 10E-12 watts)

Operating Condition		63	125	250	500	1k	2k	4k	8k	LwA	Lw
Condition 1	Inlet	74	73	93	77	76	76	72	69	86	93
	Outlet	79	75	86	76	75	71	67	55	81	88

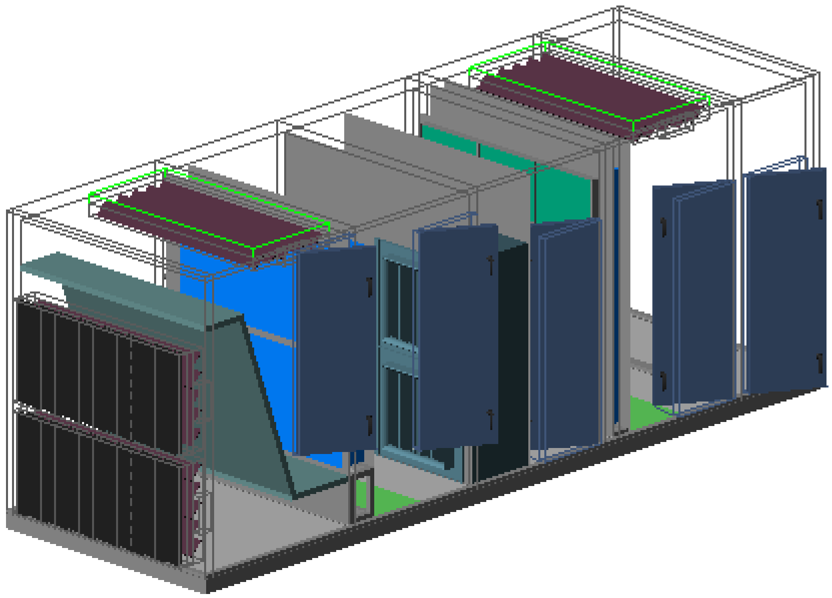
PROJECT GE Booth WWTP

JOB NUMBER SO036624-02

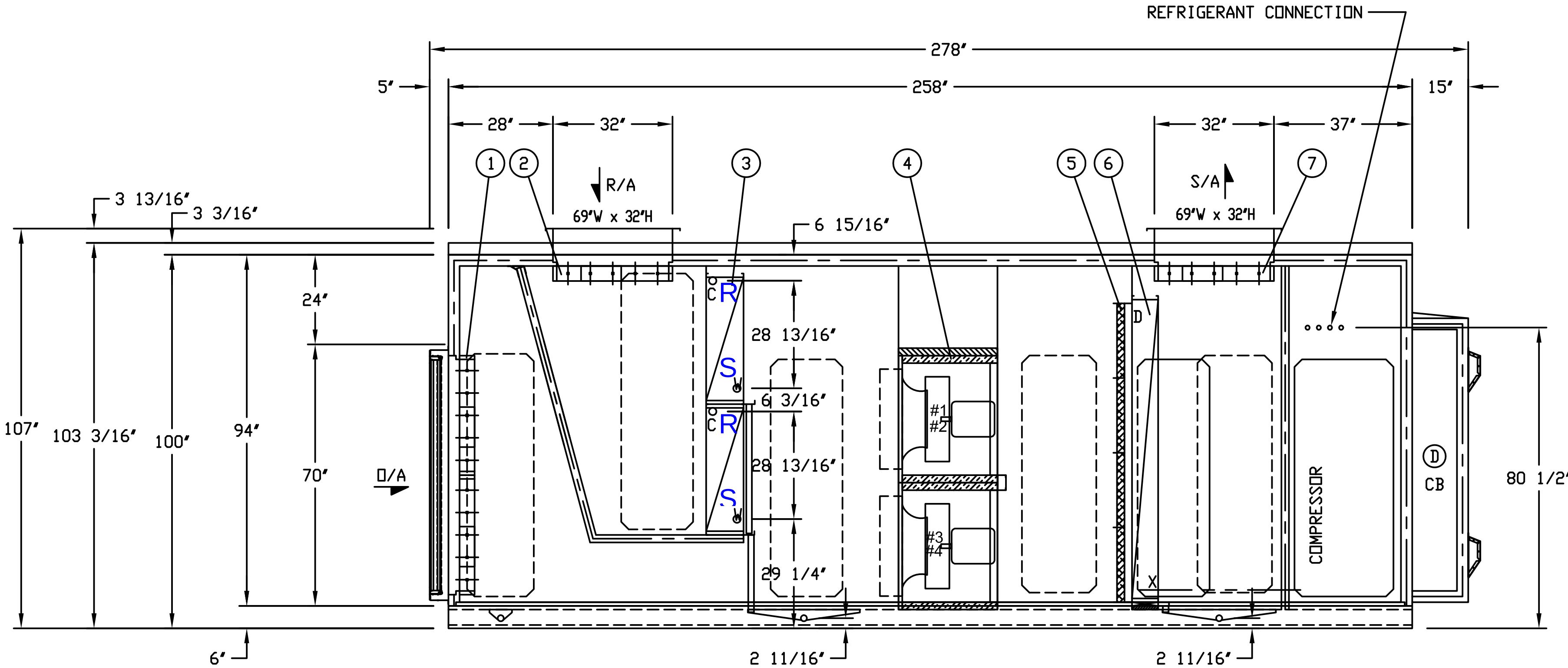
UNIT TAG AHU-702

QUANTITY 1

Revision History		
Date	Rev	Revision Description
12-06-17	A	



200 rue Carter, St. Leonard d'Aston, QC J0C 1M0, Canada
(819) 399-2175 Toll Free 1-866-483-6627 FAX (819) 399-2612



ELEVATION VIEW

ITEM:

1 - OUTSIDE AIR DAMPER
2 - RETURN AIR DAMPER
3 - COOLING COIL
4 - SUPPLY FAN & MOTOR
5 - SUPPLY AIR PRE-FILTERS
6 - DX COIL
7 - SUPPLY AIR DAMPER

AIR STREAMS:

- O/A = OUTSIDE AIR
- S/A = SUPPLY AIR
- R/A = RETURN AIR

LEGEND:

- DL : DOORS WITH LATCHES
- TL : TOOLED ACCESS DOORS WITH LATCHES
- CB : CONTROL BOX, 60"W. X 60"H. X 12"D.
- D : DISCONNECT SWITCH
- ¤ : DRAIN WITHOUT CAP

NOTES:

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- THE DIMENSIONS DO NOT INCLUDE ACCESSORIES THAT EXTEND BEYOND THE UNIT CASING
- FRESH AIR INTAKE MUST BE POSITIONED IN A DIRECTION OPPOSITE TO PREVAILING WINDS
- MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING DUCT AND DOOR LOCATIONS

APPROVAL:

STANDARD TOLERANCES: X/X ± 1/4
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.

TITLE: EnergyPack A-2-18e-WX-X-ACCU0504-X-P
PROJECT: GE BOOTH WWTP
TAG: AHU-702
DRAWING NO.: SO036624-02

VENMAR CES
a Nortek Air Solutions Brand

DRAWN BY: D. LAVIGNE — DATE: 03-29-2019
CHECKED BY: J. DALLAIRE — DATE: ----
SCALE: NONE — SHEET: 1 OF 3
MATERIAL:

REV.	BY	DESCRIPTION	DATE
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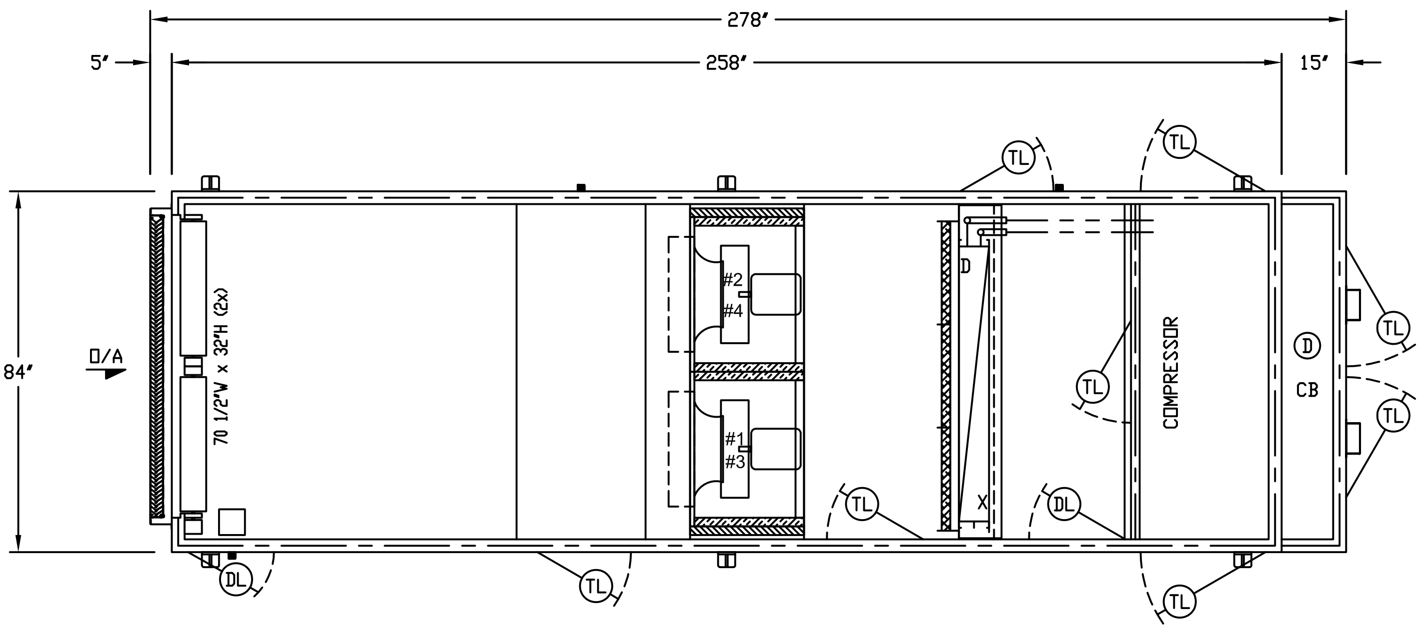
C	EA	DX COIL BASE, DOOR AND SHELF	03-06-2020



PLAN VIEW (LOWER SECTION)

APPROVAL:	STANDARD TOLERANCES: X/X ± 1/4 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.	
TITLE: EnergyPack A-2-18e-WX-X-ACCU0504-X-P		
PROJECT: GE BOOTH WWTP		
TAG: AHU-702	DRAWING NO.: SO036624-02	
DRAWN BY: D. LAVIGNE	DATE: 03-29-2019	
CHECKED BY: J. DALLAIRE	DATE: ----	
SCALE: NONE	SHEET: 2 OF 3	
MATERIAL:		

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a Nortek Air Solutions Brand

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REV.	BY	DESCRIPTION	DATE
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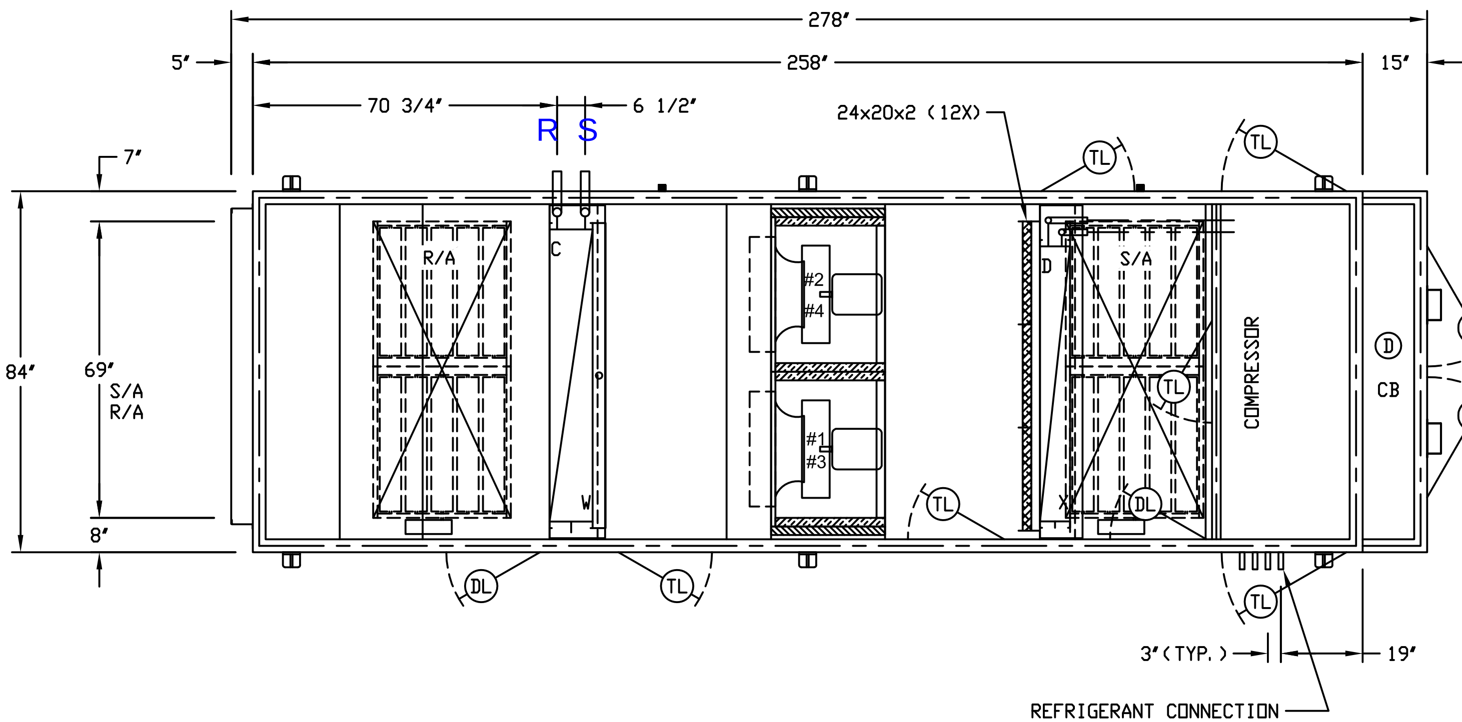
C	EA	DX COIL BASE, DOOR AND SHELF	03-06-2020



PLAN VIEW (UPPER SECTION)

APPROVAL:	STANDARD TOLERANCES: X/X ± 1/4 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.	TITLE: EnergyPack A-2-18e-WX-X-ACCU0504-X-P	VENMAR CES a Nortek Air Solutions Brand	DRAWN BY: D. LAVIGNE	DATE: 03-29-2019
		PROJECT: GE BOOTH WWTP		CHECKED BY: J. DALLAIRE	DATE: ----
		TAG: AHU-702	DRAWING NO.: SO036624-02	SCALE: NONE	SHEET: 3 OF 3
			THIS DRAWING IS CONFIDENTIAL AND THE PROPERTY OF NORTEK AIR SOLUTIONS. ITS CONTENT IS PROPRIETARY AND CANNOT BE COPIED OR REVEALED OUTSIDE PARTIES WITHOUT THE WRITTEN CONSENT OF NORTEK AIR SOLUTIONS.	MATERIAL:	

REV.	BY	DESCRIPTION	DATE
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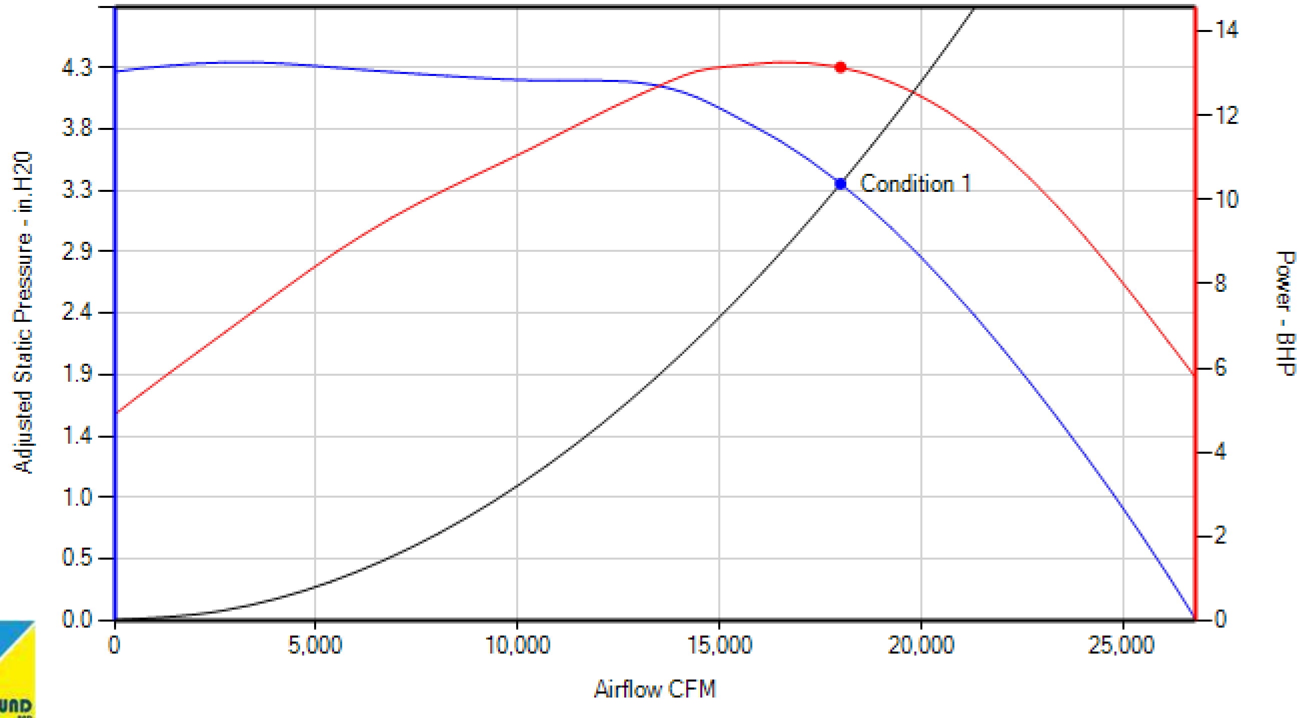
C	EA	DX COIL BASE, DOOR AND SHELF	03-06-2020

Project Name: GE Booth WWTP
Unit Tag: AHU-702

Quote #: 19-0068
Job #: SO036624-02



AMCA Licensed for Sound and Air Performance Without Appurtenances (Accessories).
Performance certified is for installation type A: Free Inlet/Free Outlet
Power [bhp] excludes drives

Operating Conditions														
Operating Condition	Usage *(%)*	CFM	SP (in.H20)		Cell Qty			RPM	Hz	Fanwheel BHP		Vel *(ft/min)*	Watts	FEG
			Input	Adj	On	Off	Fail			Each	Total			% Off Peak
Condition 1	100	18,000	3.13	3.38	4	0	0	1,731	59.3	3.29	13.15	675	11,289	FEG80 0%

Bare Fan Sound Power with Coplanar Silencer (dB re: 10E-12 watts)										
Operating Condition		63	125	250	500	1K	2K	4K	8K	LwA	Lw
Condition 1	Inlet	78	76	93	80	78	78	76	73	87	94
	Outlet	83	78	87	77	76	74	70	59	82	89

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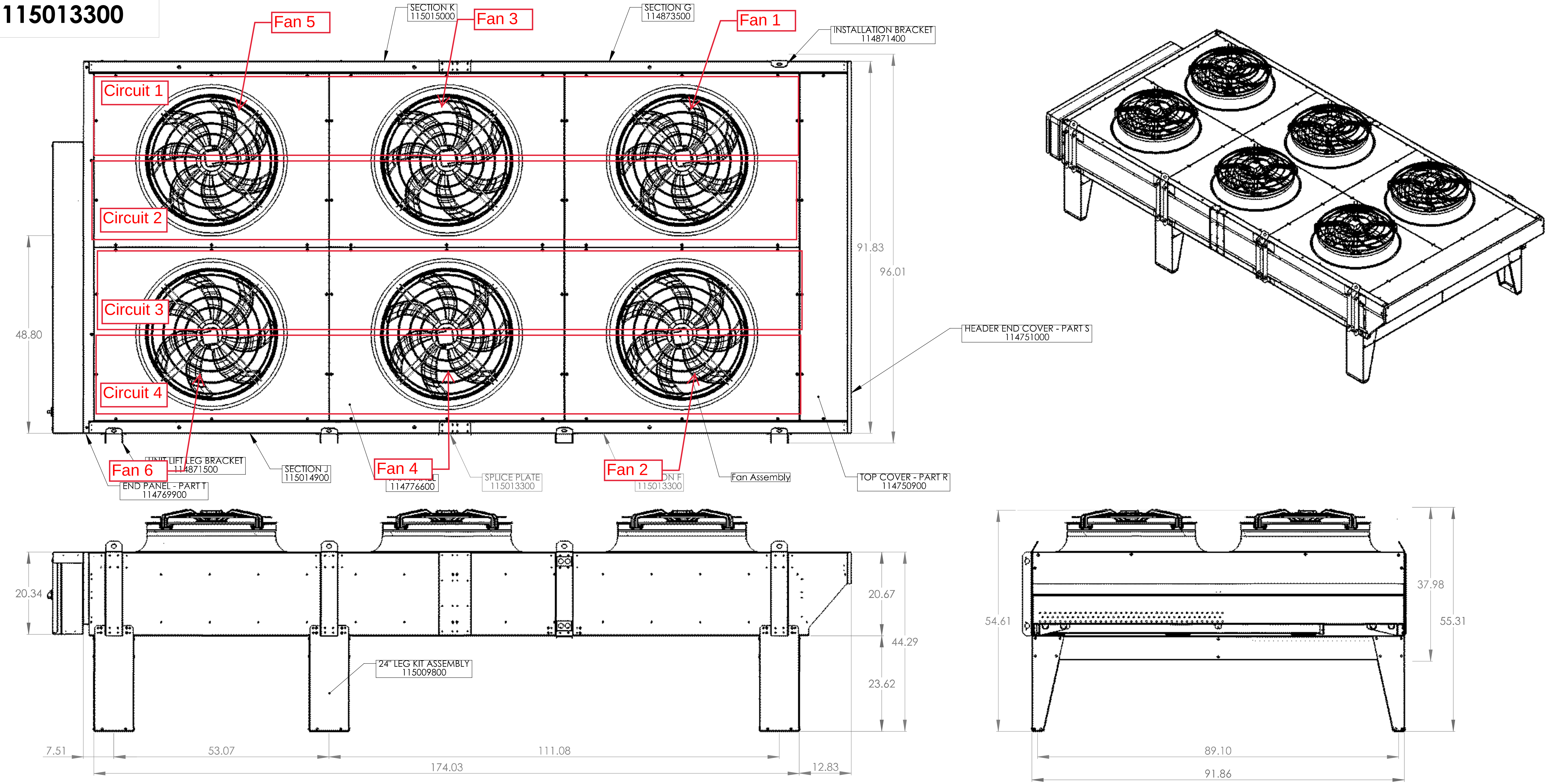
115013300



WAS	DATE	BY	LTR	FFF

MATERIAL DESCRIPTION

COOLER TYPE: LCS8023

DASH	COIL NUMBER	COIL DESCRIPTION
- 44	114997600	3CY1003H - 87.50 x 174.00
- 52	114997700	3CY1004H - 87.50 x 174.00

LUVATA

2 x 3 UNIT
COOLER ASSEMBLY

122

DRAWING NUMBER	SIZE	BY	DATE
115013300	D	V.C.	11/29/2010

TOLERANCES DO NOT APPLY TO MATERIAL GAUGES OR TO COMMERCIAL FEATURES OR PARTS. TOLERANCES ARE NON-CUMULATIVE.
TOLERANCE UNLESS OTHERWISE SPECIFIED
2 DECIMAL PLACES = ±.03
3 DECIMAL PLACES = ±.005
ANGULARITY = ±2°

REFERENCE PRODUCTION NOTES #059550A-00
DO NOT SCALE THIS DRAWING-WORK TO DIMENSIONS

Modine CIS Remote Air-Cooled Condenser
Model LCU8823-036-5B

EFI Concepts
GE Booth Revision 1
4/29/2019

	575/3/60 VAC
Design Specifications	
Refrigerant	R-410A
Ambient Temp (F)	95
Temperature Difference (F)	25
Required THR (MBH/1F TD)	31.7
Other	4 Equal Circuits

Model Specifications	Total Condenser	Per Circuit
Capacity (MBH/1F TD)	33.4	8.35
Ambient Temp (F)	95	95
Actual TD (F)	23.7	23.7
Motor Quantity	6	
Motor HP (each)	0.5	
Unit MCA	5.0	
Unit FLA	6 x 0.8	
Unit MOPD	15	
SCCR	5 kA	
Unit Power Use (kW)	2.3	
Sound Pressure (dBA @ 6m)	45.3	
Fan Speed (RPM)	500	
Total Air Flow (CFM)	38,130	
Coil Type	CU Tube/AL Fin	
Fin Spacing (FPI)	8	

Overall Length (In.)	196.9	
Overall Width (In.)	91.9	
Overall Height (In.)	54.6	
Mounting Length (In.)	164.2	
Mounting Width (In.)	89.2	
Inlet Connections (In.)	(4) 2 1/8	
Outlet Connections (In.)	(4) 1 5/8	
Approximate weight (Lbs. Dry)	3,150	
Reference Drawing	115013300	

SUBMITTAL

Job Name: GE Booth EF-703

Tag:	Axial 2019-4-1
Customer:	EFI Concepts
Job ID:	A180711-EF-703-2019-2-25
Date:	April 01, 2019

TCVX - Vaneaxial Fan, Adjustable Pitch Blades

Construction Features

- Manually adjustable blades allow for custom-set blade positions without loosening or removal of any hardware.
- Cast aluminum rotor has been painstakingly developed to provide the highest efficiency and lowest noise possible.
- Varying hub-to-tip ratios allow for different pressure and efficiency characteristics and the option of having several different wheels for a set diameter.
- Housings are constructed from one-piece, heavy-gauge, hot-rolled steel.
- Flanges are provided on both the inlet and outlet and are punched for attachment to ductwork or accessories as necessary.
- All units are fitted with airflow straightening guide vanes.

Description	Qty	Model	Size	Angle	Wt (lb.)
	1	TCVX	32B4	35°	984

Approximate weight each, includes fan, motor and accessories.

RVA: Coordinate opening with roofing. Provide gooseneck with discharge 2400mm above finished roof.

Configuration	Class	Rotation	Arr	Disch	M. Pos	Disch Dir
	I	N/A	9	VRM	--	Vertical

Performance	CFM	SP (in WC)	RPM	Oper. BHP
	17,011	1.750	1,942	9.09

8027 L/s 435 Pa 6.77 kW

Temperature: 70 °F Altitude: 0 ft

Department of Energy	FEI	FEP (KW)	System FEI	System FEP (KW)
	1.19	7.68	N/A	N/A

Note that the Fan Energy Index (FEI) is an overall efficiency (wire-to-air) metric which includes not only the impact of the fan efficiency, but also each of the drive components used to operate the fan. The Fan Electrical Input Power (FEP) is the amount of power of a given fan at an operating point characterized by a value of flow and pressure.

Motor Data	HP	RPM	Volt/Ph/Hz	Enclosure
	15	1,800	575V/3/60	TEFC

11 kW Motor

Efficiency: Premium

Sound Data	Octave Bands	1	2	3	4	5	6	7	8	LwA	dBA	Sones
	Level at Inlet	87	88	92	88	85	79	76	76	90	76	30

LwA: The overall (single value) fan sound power level in dB re. 10^{-12} Watts, 'A' weighted.

dBA: Estimated sound pressure level (re:0.0002 microbar) based on a single ducted installation at 5 ft., using a directivity factor of 1.

Includes 37 Pa for stack loss

Ventilation summary

Design Temperature - Winter		
Outdoor temperature (DB)	-7,9	°F
Outdoor air (WB)	-8	°F
Indoor air (DB)	72	°F
Indoor air (WB)	54	°F

Design Temperature - Summer		
Outdoor air (DB)	89,8	°F
Outdoor air (WB)	82,6	°F
Indoor air (DB)	75	°F
Indoor air (WB)	63	°F

Fresh Air circuit		
Air flow	1400	CFM
External static Pressure	1	in H2O
Fan speed	1589	RPM

Exhaust Air circuit		
Air flow	1400	CFM
External static Pressure	1	in H2O
Fan speed	1548	RPM

Heating Capacity		
Recovered energy	112,1	MBH
Heating Capacity	N/A	
Sensible Efficiency	76,9	%
Latent Efficiency	71,0	%
Total Efficiency	75,6	%

Cooling Capacity		
Recovered energy	6,6	Tons
Cooling Capacity	N/A	
Sensible Efficiency	76,4	%
Latent Efficiency	70,7	%
Total Efficiency	72	%

Supply Temperature - Winter		
New air (DB)	51,2	°F
New air (WB)	41,7	°F

Supply Temperature - Summer		
New air (DB)	78,5	°F
New air (WB)	69,4	°F

Electrical Load

Fresh Air Motor		
Power	1,5	HP
Motor's Voltage	575/3/60	
FLA	1,6	A
Rotational speed	1800	RPM
Starter	Magnetic	

Exhaust Air Motor		
Power	1,5	HP
Motor's Voltage	575/3/60	
FLA	1,6	A
Rotational speed	1800	RPM
Starter	Magnetic	

Unit's main Voltage	
	Main Disc
Voltage	575/3/60
FLA	3,3
MCA	4,2
MOP	5

Motor for the Wheel		
Power	0,05	HP
Motor's Voltage	575/3/60	
FLA (to the main)	0,14	A
Rotational speed	1800	RPM

Cabinet	
Cabinet type	Double-wall
Exterior Steel Gauge	22 ga prepaint steel
Interior Steel Gauge	22 ga galvanized steel
Access	Doors with quarter-turn handles
Insulation	1 in
Duct configuration	Vertical

OUTDOOR installation	
Mount	14 in Insulatd Roof Curb

Fresh Air Blower Model G9-7	
Type	Forward-curved
Bearing	Permanently sealed and lubricated
Width	7 in
Diameter	9 in
Shaft diameter	0,75 in
Drive	Power transmission by adjustable pulleys and belts

Exhaust Air Blower Model G9-7	
Type	Forward-curved
Bearing	Permanently sealed and lubricated
Width	7 in
Diameter	9 in
Shaft diameter	0,75 in
Drive	Power transmission by adjustable pulleys and belts

Fresh Air Motor	
Power	1,5 HP
Type	ODP, Inverter Ready
Efficiency	PREMIUM
Frame	145T
Speed(s)	1
Mount	None

Exhaust Air Motor	
Power	1,5 HP
Type	ODP, Inverter Ready
Efficiency	PREMIUM
Frame	145T
Speed(s)	1
Mount	None

Fresh Air Filters	
Type	MERV13
Quantity per circuit	2
Dimensions	16 x 16 x 2 in

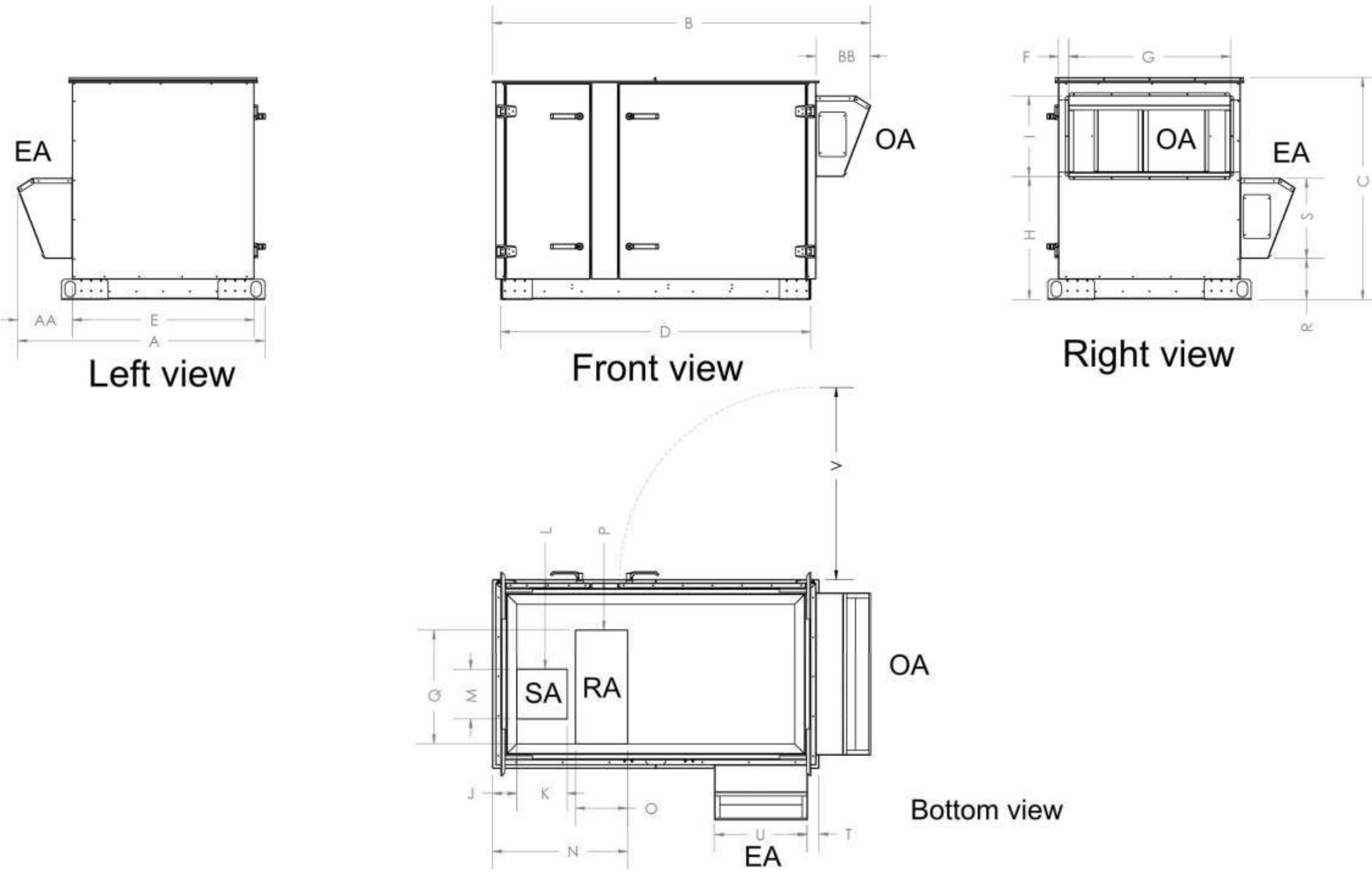
Exhaust Air Filters	
Type	MERV8
Quantity per circuit	2
Dimensions	16 x 16 x 2 in

Recovery Core	
Quantity	1
Type	Enthalpy wheel

Warranty	
Core	2-year limited
Unit	2-year limited

Certification	
Intertek	CSA 22,2 No.236-11 UL 1995

Unit's general dimensions



Cabinet dimensions (In)

A	B	C	D	E	F
50,25	76,25	44,75	62,50	34,50	1,00

G	H	I	J	K	L
32,00	25,00	16,25	0,75	18,75	17,50

M	N	O	P	Q	R
16,25	16,25	10,00	9,50	10,00	8,50

S	T	U	V	W	X
23,00	36,75	10,50	40,00	N/A	N/A

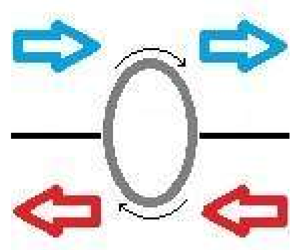
Y	Z	AA	BB
N/A	N/A	11,00	11,00

Estimated unit weight: 900 lb

Core Performance

Model	Enthalpy wheel	Mechanical purge	5 °
Model No	ERC-3014C		
Diameter	30 in.		
Motor Power	0,05 hp		

	Entering Fresh Air T1		Leaving Fresh Air T2	
	Summer	Winter	Summer	Winter
Net Air Flow (CFM)			1400	1400
Plenum Air Flow (CFM)	1523	1523	1408	1408
Temperature Dry Bulb (°F)	89,8	-7,9	78,5	51,2
Temperature Wet Bulb (°F)	82,6	-8	69,4	41,7
Relative humidity (%)	74,1	95,7	64,0	43,4
Enthalpy (BTU/lb)	46,4	-1,2	33,6	16



	Leaving Exhaust Air T4		Entering Exhaust Air T3	
	Summer	Winter	Summer	Winter
Net Air Flow (CFM)			1400	1400
Plenum Air Flow (CFM)	1523	1523	1408	1408
Temperature Dry Bulb (°F)	86,2	10,4	75	72
Temperature Wet Bulb (°F)	77,9	10,4*	63	54
Relative humidity (%)	69,4	100,0*	51,7	29,0
Enthalpy (BTU/lb)	32,9	4,1	28,5	22,5

Warning, frost may occur

Performance

	Summer	Winter
Fresh Air Pressure Drop (in H2O)	0,90	0,90
Exhaust Air Pressure Drop (in H2O)	0,90	0,90
Sensible Efficiency (%)	76,4	76,9
Latent Efficiency (%)	70,7	71
Total Efficiency (%)	72	75,6
Recovered energy (Tons)	6,6	
Recovered energy (MBH)		112,1
EATR		0,50
OACF		1,10

Fresh Air Blower Performance

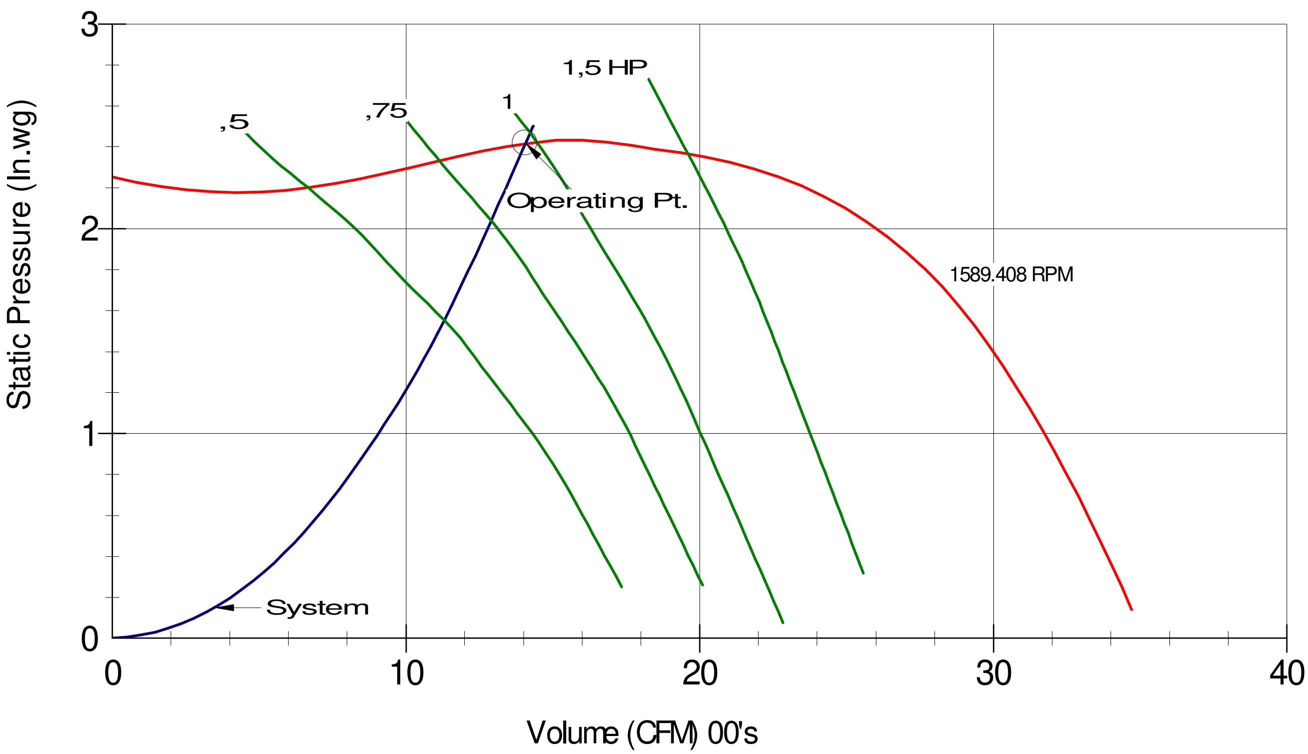
Information

Model	G9-7	No	
Air flow	1408 CFM	Shaft Diameter	0,75 in
Total static pressure	2,42 in H2O	Static Efficiency	55,2 %
Rotation speed	1589 RPM	Elevation	253 ft
Power	0,97 HP	Temperature	70 °F

Sound data

	63	125	250	500	1000	2000	4000	8000	(Hz)	LwA: 93
Sound Power Level @ Frequency, re: 10^-12 Watts	91	95	92	91	86	83	80	77	(dB)	Sones: 36

DELHI Model G9-7
CFM=1408 SP=2,42 BHP=1, S. Eff=,6% RPM=1589



Appendix D

Noise Calculation and Measurement Details

wood.

Conversion of Sound Pressure Levels to Sound Power Levels

Project: G.E. Booth WWTP
Location: Mississauga, ON

A-WEIGHTING (dB) - Applied to total PWL								
-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1

1/4 WAVELENGTH CRITERION (m)								
2.722	1.361	0.686	0.343	0.172	0.086	0.043	0.021	0.011

Measurement Reference [1,2]	Source ID	Source Description	Calc Type [3] (A, C, or S)	SPL Ref Distance [4] (S or C) (m)	Length [5] (C only) (m)	Area (A only) (m^2)	Partition Coefficient (S or C) (%)	Net Surface Area [5] (m^2)	Spectral Weighting (A or Flat)	Octave Band Sound Pressure Level Data (dB or dBA) [6] 32	63	125	250	500	1000	2000	4000	8000	Total (dBA)	Octave Band Sound Power Level Data (dB or dBA) [6] 31.5	63	125	250	500	1000	2000	4000	8000	Total (dBA)
LD831.004	BE	HVAC & Fluidized Air Blower Exhaust	A			12.0		12.0	Flat	69.7	70.6	77.9	87.5	89.4	85.6	80.6	72.0	63.3	90	80.5	81.4	88.7	98.2	100.2	96.3	91.4	82.8	74.1	101
LD831.005	TOX_In	TOX Inlets	A			20.0		20.0	Flat	69.0	69.3	69.8	69.6	69.1	68.5	70.5	64.1	59.4	75	82.0	82.3	82.8	82.7	82.1	81.5	83.5	77.1	72.4	88
LD831.006	TOX3_OD	TOX3 Overhead Door	A			20.0		20.0	Flat	75.3	71.7	70.1	69.2	68.5	66.0	62.9	56.1	49.0	71	88.3	84.7	83.1	82.2	81.5	79.1	75.9	69.1	62.0	84
LD831.007	TOX3_L1	HVAC Intake Louvre 1 (TOX3)	A			42.0		42.0	Flat	82.6	86.9	86.9	84.0	84.1	79.5	73.5	68.1	63.5	85	98.9	103.1	103.1	100.2	100.3	95.7	89.7	84.3	79.7	101
LD831.008	TOX3_L2	HVAC Intake Louvre 2 (TOX3)	A			24.0		24.0	Flat	83.9	84.7	83.0	78.3	77.0	74.3	69.3	64.2	58.9	79	97.7	98.5	96.8	92.1	90.8	88.1	83.1	78.0	72.8	93
LD831.009	TOX3_EF1	TOX3 Exhaust Fan1	S	5.0			50%	157.0	Flat	78.1	85.8	83.5	83.5	79.9	77.2	72.5	66.7	57.9	82	100.1	107.7	105.4	105.5	101.9	99.2	94.5	88.7	79.8	104
LD831.010	TOX3_EF2	TOX3 Exhaust Fan2	S	1.0			50%	6.3	Flat	81.0	81.0	85.1	81.8	75.9	73.0	67.9	64.0	55.2	79	89.0	88.9	93.1	89.8	83.9	81.0	75.9	72.0	63.2	87
LD831.011	TOX3_EF3_5	TOX3 Exhaust Fans 3, 4 & 5	S	1.5			50%	14.1	Flat	89.7	87.3	84.1	78.0	74.1	70.6	66.7	72.8	59.0	78	101.2	98.8	95.6	89.5	85.6	82.1	78.2	84.3	70.5	90
LD831.012	TOX4_EF1_3	TOX4 Exhaust Fans 1, 2 & 3	S	5.0			50%	157.0	Flat	77.0	83.0	80.9	81.4	76.6	72.7	74.5	68.6	59.4	80	99.0	105.0	102.8	103.3	98.6	94.7	96.4	90.5	81.4	102
LD831.013	TOX4_L	HVAC Intake Louvre (TOX4)	S	3.0			50%	56.5	Flat	75.7	80.0	72.2	78.8	71.4	68.3	73.9	63.6	52.4	78	93.3	97.5	89.7	96.3	88.9	85.8	91.5	81.1	69.9	95
LD831.014	TOX1_2EF1_9	TOX1&2 Exhaust Fans 1 through 9	S	1.5			50%	14.1	Flat	76.9	83.6	83.0	83.6	79.2	74.8	70.2	63.9	57.4	81	88.4	95.1	94.5	95.1	90.7	86.3	81.7	75.4	68.9	92
LD831.015	TOX1_2_OD	TOX1&2 Overhead Door	S	2.5			50%	39.3	Flat	73.7	72.2	72.1	70.5	69.2	71.9	70.2	62.8	53.2	76	89.6	88.1	88.1	86.5	85.1	87.8	86.1	78.7	69.1	92
LD831.016	SH_OD	Solids Handling Overhead Doors	S	5.0			50%	157.0	Flat	86.9	87.7	75.7	77.1	74.3	71.0	69.6	64.6	54.9	77	108.9	109.7	97.7	99.0	96.2	93.0	91.6	86.5	76.8	99
LD831.017	TOX4_OD	TOX3 Overhead Door	S	2.5			50%	39.3	Flat	73.2	69.4	68.0	66.4	66.1	67.1	67.6	64.7	64.6	73	89.2	85.4	83.9	82.3	82.0	83.0	83.5	80.7	80.5	89
LD831.018	CB_MAU	Makeup Air Unit 1 - Centrifuge Bldg	S	2.0			50%	25.1	Flat	79.7	76.5	73.8	71.3	68.5	67.9	70.3	67.9	54.9	75	93.7	90.5	87.8	85.3	82.5	81.9	84.3	81.9	68.9	89
LD831.019	CB_CU1	Condenser 1 - Centrifuge Bldg	S	1.5			50%	14.1	Flat	83.0	79.4	74.6	71.5	69.8	67.5	64.3	60.1	50.8	73	94.5	90.9	86.1	83.0	81.3	79.0	75.8	71.6	62.3	84
LD831.020	SH_EF	Solids Handling Exhaust fans	S	2.5			50%	39.3	Flat	76.3	75.7	71.6	68.1	64.1	58.8	54.6	52.3	50.0	66	92.2	91.6	87.5	84.1	80.1	74.7	70.5	68.2	65.9	82
LD831.021	BB_OD	Blower Building Overhead Door	A			12.0		12.0	Flat	78.4	79.2	77.7	71.3	74.2	69.7	67.1	65.0	53.7	76	89.2	90.0	88.5	82.1	85.0	80.5	77.9	75.8	64.5	86
LD831.022	BB_AI	Blower Building Air Intake1	S	2.0			25%	12.6	Flat	72.5	73.2	71.4	70.9	67.7	68.3	63.0	55.6	47.9	72	83.5	84.2	82.4	81.9	78.7	79.3	74.0	66.5	58.9	83
LD831.023	BB_AI	Blower Building Air Intake1	S	2.0			25%	12.6	Flat	82.4	91.2	83.7	74.0	71.6	68.6	66.6	62.3	53.8	75	93.4	102.2	94.7	85.0	82.6	79.6	77.6	73.3	64.8	86
LD831.024	SR_OD	Solids Receiving Overhead Door	S	2.5			50%	39.3	Flat	68.0	65.5	70.8	72.3	70.3	68.3	67.9	54.7	46.1	74	83.9	81.4	86.7	88.3	86.3	84.2	83.8	70.6	62.1	90
LD831.025	HW_EF1_2	Headworks Exhaust Fans 1&2	S	1.5			50%	14.1	Flat	78.2	77.7	82.7	86.1	81.8	79.3	71.8	65.3	56.9	84	89.7	89.2	94.2	97.6	93.3	90.8	83.3	76.8	68.4	95
LD831.026	TCF_GenStackExh	Thermal Conditioning Facility Generator Exhaust Stack	S	2.5			50%	39.3	Flat	77.1	75.9	72.6	73.5	68.0	63.9	60.3	54.0	46.4	70	93.0	91.8	88.5	89.4	83.9	79.9	76.2	69.9	62.3	86
LD831.027	TCF_GenRadExh	Thermal Conditioning Facility Generator Radiator Exhaust	S	2.5			50%	39.3	Flat	88.1	91.4	96.0	91.9	92.4	91.5	88.8	80.9	71.0	96	104.1	107.3	112.0	107.8	108.3	107.5	104.8	96.8	87.0	112
LD831.028	TCF_GenIntake	Thermal Conditioning Facility Generator Room Intake	S	2.5			50%	39.3	Flat	81.9	85.0	86.7	84.0	83.0	84.6	82.8	77.7	71.3	89	97.8	100.9	102.7	100.0	98.9	100.6	98.8	93.7	87.2	105
LD831.029	HW_GenRadExh	Headworks Generator Radiator Exhaust	S	2.5			50%	39.3	Flat	64.4	73.4	81.4	75.8	75.5	72.2	68.1	62.7	57.2	77	80.4	89.4	97.3	91.8	91.4	88.1	84.1	78.6	73.1	93
LD831.030	HW_GenIntake	Headworks Generator Room Intake	S	2.5			50%	39.3	Flat	73.1	75.4	75.9	72.6	76.9	69.9	67.8	62.9	59.9	77	89.0	91.4	91.8	88.6	92.9	85.8	83.7	78.8	75.8	93
LD831.031	HW_GenStackExh	Headworks Generator Exhaust Stack	S	2.5			50%	39.3	Flat	69.7	79.5	77.9	70.2	69.8	67.2	62.5	53.7	47.6	72	85.6	95.5	93.8	86.2	85.8	83.2	78.4	69.6	63.5	88
LD831.032	HW_EF3_4	Headworks Exhaust Fans 3&4	S	1.8			50%	20.3	Flat	71.6	90.2	88.8	80.1	78.1	74.5	68.2	62.1	57.1	80	84.7	103.2	101.8	93.2	91.2	87.6	81.3	75.2	70.2	93
LD831.033	HW_EF5	Headworks Exhaust Fan 5	S	3.0			50%	56.5	Flat	68.7	82.7	84.3	80.4	77.4	73.6	69.8	64.9	59.2	79	86.3	100.2	101.8	97.9	94.9	91.1	87.3	82.4	76.8	97
LD831.034	HW_CUS	Headworks Carbon Unit Stacks	S	2.5			50%	39.3	Flat	66.5	83.3	82.0	72.8	69.5	65.6	60.0	55.7	49.8	72	82.4	99.2	97.9	88.7	85.5	81.6	75.9	71.6	65.7	88
831_Data.007	SH_TEI	Sodium Hypochlorite Truck Engine Idling	S	4.0			50%	100.5	Flat	83.8	71.8	75.4	76.6	77.9	76.1	72.6	66.9	59.9	80	103.8	91.8	95.4	96.6	97.9	96.1	92.6	86.9	79.9	100
831_Data.009	SH_TB	Sodium Hypochlorite Truck Blower Left	S	3.5			50%	76.9	Flat	78.7	73.6	70.8	74.9	85.4	75.3	72.4	71.5	67.2	84	97.6	92.5	89.6	93.8	104.3	94.2	91.3	90.4	86.0	103
831_Data.019	FCB_OD	Ferrous Chloride Building Open Door	A			1.8		1.8	Flat	69.9	73.7	74.9	71.9	80.4	69.6	66.4	62.6	57.8	79	72.4	76.2	77.4	74.5	82.9	72.2	68.9	65.1	60.3	81
831_Data.033	TTP	Tanker Truck Passby	C	10.0	40.0		50%	1256.0	Flat	72.9	73.4	72.6	65.7	65.5	67.6	64.0	59.1	53.6	71	103.9	104.4	103.6	96.6	96.5	98.6	95.0	90.0	84.5	102
831_Data.034	FC_TEI	Ferrous Chloride Truck Engine Idling	S	3.9			50%	93.6	Flat	80.2	85.9	85.1	87.3	88.6	84.4	80.9	77.5	74.4	90	99.9	105.6	104.9	107.0	108.3	104.1	100.6	97.2	94.1	110
831_Data.035	FC_TB	Ferrous Chloride Truck Blower	S	3.0			25%	28.3	Flat	76.4	81.3	80.6	82.1	81.2	78.2	76.1	80.2	78.2	86	90.9	95.8	95.1	96.6	95.7	92.7	90.6	94.7	92.7	100
831_Data.036	PO_TEI	Polymer Truck Engine Idling	S	4.0			50%	99.0	Flat	75.4	70.9	72.9	70.1	73.3	70.5	69.3	67.9	62.7	76	95.3	90.9	92.9	90.0	93.3	90.4	89.3	87.9	82.6	96
831_Data.037	PO_TB	Polymer Truck Blower	S	2.9			25%	26.0	Flat	79.4	70.8	70.7	86.3	83.6	78.6	78.0	79.3	75.6	87	93.6	85.0	84.9	100.4	97.7	92.8	92.2	93.5	89.8	101
831_Data.042	BF_L1	Biofilter Building Louvre 1	S	2.2			50%	31.2	Flat	65.9	65.7	68.2	64.9	60.1	59.8	54.8	46.8	40.4	64	80.8	80.7	83.1	79.9	75.1	74.7	69.8	61.7	55.3	79
831_Data.043	BF_L2	Biofilter Building Louvre 2	S	2.1			50%	27.7	Flat	65.8	62.4	62.4	61.7	56.2	56.5	51.7	43.9	32.7	61	80.2	76.8	76.8	76.1	70.6	71.0	66.2	58.3	47.1	75
Prediction/Spec	GEB_POU	GEB Solids Exportation Portable Odour Unit							Flat											99.0	92.0	92.0	93.0	86.0	81.0	75.0	71.0	66.0	88
Manufacturer	MUA_150_03_IN	Proposed MUA-150-03 Outdoor Air Intake Elbow							Flat											86.0	86.0	85.0	81.0	79.0	78.0	76.0	74.0	73.0	84
Manufacturer/Spec	MUA_150_152_01_02_IN	Proposed MUA-150-152-01-02 Outdoor Air Intake (Plant 1 and 2)							Flat											76.0	76.0	81.0	87.0	83.0	78.0	77.0	67.0	57.0	85
Manufacturer/Spec	EF_150_152_01_02	Proposed EF-150-152-01-02 (Plant 1 and 2)							Flat											79.0	79.0	85.0	86.0	84.0	78.0	74.0	69.0	63.0	85
Manufacturer	MUA_922_01_IN	Proposed MUA-922-01 Outdoor Air Intake (Plant 2 OCF)							Flat											82.0	82.0	80.0	90.0	86.0	82.0	79.0	73.0	66.0	88
Manufacturer	MUA_921_01_IN	Proposed MUA-921-01 Outdoor Air Intake (Plant 1 OCF)							Flat											85.0	85.0	83.0	91.0	88.0	84.0	81.0	76.0	68.0	90
Prediction/Spec	EF_922_02_03	Proposed EF-922-02-03 (Plant 2 OCF)							Flat											76.0	76.0	88.0	84.0	80.0	75.0	70.0	66.0	62.0	82
Prediction/Spec	EF_921_02_03	Proposed EF-921-02-03 (Plant 1 OCF)							Flat											77.0	77.0	86.0	79.0	77.0	73.0	67.0	61.0	53.0	79
Prediction/Spec	P2OCF_ES	Proposed Exhuast Stack (Plant 2 OCF)							Flat											86.0	86.0	86.0	76.0	71.0	69.0	64.0	59.0	54.0	75
Prediction/Spec	P1OCF_ES	Proposed Exhuast Stack (Plant 1 OCF)							Flat											86.0	86.0	86.0	76.0	71.0	69.0	64.0	59.0	54.0	75
Prediction/Spec	IWOCF_ES	Proposed Exhuast Stack (Inlet Works OCF Upgrade)							Flat											86.0	86.0	86.0	76.0	71.0	69.0	64.0	59.0	54.0	75
Manufacturer	EF_921_01	Proposed Wall EF-921-01 (Plant 1 OCF)							Flat											90.0	90.0	92.0	86.0	83.0	77.0	71.0	65.0	61.0	84
Manufacturer	EF_250_01	Proposed Exhuast Fan (Plant 1 Aeration Access Stair)							Flat											89.0	89.0	87.0	83.0	78.0	74.0	70.0	77.0	65.0	82
Manufacturer	MUA_300_03_IN	Proposed MUA-300-03 Outdoor Air Intake (Blower Building 1)							Flat											88.0	88.0	89.0	85.0	83.0	82.0	80.0	78.0	76.0	87
Manufacturer	MUA_300_01_02_IN	Proposed MUA-300-01-02 Outdoor Air Intake (Blower Buildilng 1)							Flat											83.0	83.0	83.0	79.0	78.0	77.0	75.0	73.0	71.0	82
831_Data.001	LFH_EF	Lab Fume Hood Exhaust Fan	S	1.2			50%	9.0	Flat	72.8	72.1	79.4	80.9	75.4	68.4	68.0	64.2	59.6	77	82.3	81.7	88.9	90.4	85.0	78.0	77.5	73.7	69.2	87
831_Data.002	LFH_ES	Lab Fume Hood Exhaust Stack	S	1.0			100%	12.6	Flat	89.5	80.5	77.0	81.1	76.0	70.2	68.2	62.3	57.1	78	100.5	91.5	88.0	92.1	87.0	81.2	79.2	73.3	68.1	89

Notes:
1. All measurements conducted on July 21-22, 2016, April 23, 2019, May 8, 2019 and March 22, 2022 using a Larson Davis 831 sound level meter.
2. All measurements were consistent with the applicable portions of the MECP Publication NPC-103.
3. Calc Type of C, A, or S refers to the source geometry, and represent cylindrical, area, or spherical sources, respectively.
4. SPL Ref Distance refers to the radial distance from the microphone to the acoustic centre of a spherical source or the symmetrical axis of a cylindrical source.
5. Net surface area refers to surface area corrected for partition coefficient. Partition coefficient applies only to spherical and cylindrical geometries. Sound power level is estimated using an area correction 10 log A.
6. Refer to "Spectral Weighting" column for dB or dBA application information.

wood.

GE Booth Measured Sound Pressure Levels

	1/1 Octave Frequency Range									1/3 Octave Frequency Band																												
File Name	31.5	63	125	250	500	1000	2000	4000	8000	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500
LD831.004	69.7	70.6	77.9	87.5	89.4	85.6	80.6	72.0	63.3	59.8	59.0	68.9	59.4	63.4	68.2	64.7	62.4	68.5	77.3	69.5	86.8	78.5	85.0	84.6	84.5	82.0	81.0	78.6	77.6	75.7	72.7	69.8	66.1	63.7	61.5	57.1	53.7	51.0
LD831.005	69.0	69.3	69.8	69.6	69.1	68.5	70.5	64.1	59.4	60.7	62.7	67.1	60.5	61.8	67.2	62.6	61.6	65.1	66.9	63.9	66.6	63.0	66.3	63.5	62.3	62.9	63.4	64.8	64.8	67.4	64.5	59.6	59.5	58.9	56.1	54.8	51.9	47.9
LD831.006	75.3	71.7	70.1	69.2	68.5	66.0	62.9	56.1	49.0	64.3	61.5	74.8	62.3	66.0	69.5	63.3	64.9	65.2	65.6	62.6	67.2	60.9	65.6	62.6	62.3	62.0	61.2	60.4	59.4	58.5	55.9	53.3	50.8	48.6	45.8	44.3	41.6	39.9
LD831.007	82.6	86.9	86.9	84.0	84.1	79.5	73.5	68.1	63.5	74.8	78.1	78.4	76.9	80.1	85.1	78.3	77.4	83.8	82.8	79.6	79.0	79.4	81.5	77.9	77.2	75.6	75.5	72.4	70.1	68.6	66.6	65.1	62.8	61.0	59.8	58.8	57.2	55.7
LD831.008	83.9	84.7	83.0	78.3	77.0	74.3	69.3	64.2	58.9	74.4	77.1	81.9	76.0	80.1	81.9	76.1	78.5	80.2	74.1	72.2	75.0	72.7	72.0	72.9	71.7	69.3	69.2	70.0	66.0	63.9	62.2	60.3	59.1	58.7	55.6	54.1	52.2	49.5
LD831.009	78.1	85.8	83.5	83.5	79.9	77.2	72.5	66.7	57.9	74.4	71.3	76.3	69.4	71.5	84.8	78.8	78.5	80.2	77.9	79.1	79.6	77.8	75.4	75.7	73.4	74.1	71.7	70.6	69.2	67.3	66.4	64.1	61.5	58.7	55.6	52.4	48.4	45.1
LD831.010	81.0	81.0	85.1	81.8	75.9	73.0	67.9	64.0	55.2	72.4	70.3	80.4	68.3	72.4	77.7	76.5	82.1	80.2	78.8	79.9	75.7	74.2	72.0	71.3	69.9	69.6	68.3	66.1	64.4	63.2	61.1	62.0	57.7	55.3	53.0	49.7	45.7	43.0
LD831.011	89.7	87.3	84.1	78.0	74.1	70.6	66.7	72.8	59.0	68.9	69.7	89.6	72.5	78.6	85.6	80.0	80.0	78.9	79.2	74.0	73.2	71.6	70.0	69.8	67.7	66.9	65.7	64.3	62.6	61.8	61.0	72.6	59.2	55.4	58.2	50.0	45.6	42.2
LD831.012	77.0	83.0	80.9	81.4	76.6	72.7	74.5	68.6	59.4	68.7	67.0	75.7	69.7	74.7	81.1	75.9	73.1	76.0	77.9	78.7	74.9	75.2	74.2	70.4	69.6	69.0	68.3	66.5	66.2	65.2	73.1	65.4	63.0	61.3	57.1	54.2	49.6	47.3
LD831.013	75.7	80.0	72.2	78.8	71.4	68.3	73.9	63.6	52.4	72.1	66.9	74.0	69.0	70.9	77.9	74.0	66.8	67.5	67.7	70.6	77.6	68.6	68.2	64.4	67.1	64.7	63.1	62.1	62.3	60.0	73.4	58.6	59.2	54.2	49.7	47.5	43.4	42.3
LD831.014	76.9	83.6	83.0	83.6	79.2	74.8	70.2	63.9	57.4	65.3	64.7	75.1	71.3	77.5	79.5	79.3	79.6	78.0	77.0	81.2	77.5	76.4	75.2	75.0	72.7	71.2	70.3	68.0	66.5	66.0	62.8	60.8	59.3	56.1	52.7	54.5	48.9	44.7
LD831.015	73.7	72.2	72.1	70.5	69.2	71.9	70.2	62.8	53.2	65.8	65.6	71.3	68.6	64.7	69.7	66.4	62.6	69.2	67.9	67.2	64.8	64.2	64.8	64.5	64.1	62.5	69.1	67.5	64.0	67.2	64.3	60.1	57.2	54.9	50.7	47.9	44.0	41.6
LD831.016	86.9	87.7	75.7	77.1	74.3	71.0	69.6	64.6	54.9	72.0	71.1	85.0	82.9	71.1	87.0	74.6	68.5	69.7	72.5	71.8	74.4	69.1	67.6	71.8	67.7	66.2	66.3	66.4	65.9	65.6	62.0	60.8	60.6	56.9	52.1	49.5	46.3	42.6
LD831.017	73.2	69.4	68.0	66.4	66.1	67.1	67.6	64.7	64.6	66.2	65.5	69.6	69.1	65.2	63.3	64.1	62.4	63.0	64.2	61.5	60.3	62.6	61.4	61.0	61.5	60.1	61.1	64.5	62.2	63.0	63.3	60.7	60.1	58.9	60.8	60.7	57.1	52.0
LD831.018	79.7	76.5	73.8	71.3	68.5	67.9	70.3	67.9	54.9	73.3	71.6	74.4	77.1	69.5	70.5	72.7	67.1	70.3	67.7	67.1	67.0	65.0	63.8	62.7	64.8	63.6	62.5	63.3	62.7	65.3	67.4	66.8	60.2	55.6	52.4	49.5	46.6	44.3
LD831.019	83.0	79.4	74.6	71.5	69.8	67.5	64.3	60.1	50.8	78.7	77.3	76.7	80.2	73.8	73.1	74.5	67.9	71.9	68.5	67.2	66.3	66.5	63.8	64.0	66.6	63.9	62.8	60.8	59.9	59.7	59.0	57.8	54.7	50.7	48.7	44.8	41.9	40.0
LD831.020	76.3	75.7	71.6	68.1	64.1	58.8	54.6	52.3	50.0	69.5	67.3	73.3	71.7	70.5	71.9	70.4	68.0	66.7	64.4	65.4	62.6	60.5	59.5	60.7	57.3	54.3	55.1	51.8	51.0	47.5	50.5	48.2	47.2	46.4	47.3	46.1	38.4	38.7
LD831.021	78.4	79.2	77.7	71.3	74.2	69.7	67.1	65.0	53.7	60.4	59.8	66.9	78.0	68.1	78.7	64.3	66.9	77.0	66.6	64.7	67.1	67.4	72.7	66.1	66.1	64.5	65.8	64.5	63.3	62.0	61.5	63.5	58.7	53.2	51.3	47.8	45.7	41.8
LD831.022	72.5	73.2	71.4	70.9	67.7	68.3	63.0	55.6	47.9	67.0	64.8	69.8	67.3	69.0	69.8	65.2	62.7	68.6	66.9	62.4	67.4	67.2	63.6	62.4	62.6	61.2	66.7	59.3	61.3	57.3	52.9	52.9	50.6	47.2	44.8	42.8	40.9	39.6
LD831.023	82.4	91.2	83.7	74.0	71.6	68.6	66.6	62.3	53.8	70.5	70.6	75.2	81.1	86.2	88.4	83.8	80.4	78.5	77.2	70.7	66.6	67.7	67.4	67.0	65.7	65.0	64.3	61.7	60.6	63.5	60.7	59.5	57.2	54.7	51.7	47.9	44.9	42.6
LD831.024	68.0	65.5	70.8	72.3	70.3	68.3	67.9	54.7	46.1	70.5	63.4	63.8	61.4	60.9	60.2	60.8	65.9	68.3	60.2	62.9	69.4	68.1	62.2	69.0	60.8	65.4	60.6	63.5	66.4	60.8	53.7	52.7	48.3	45.8	43.2	41.1	38.7	38.3
LD831.025	78.2	77.7	82.7	86.1	81.8	79.3	71.8	65.3	56.9	77.1	74.7	73.1	70.1	68.5	67.8	76.6	80.8	75.2	76.5	82.7	81.4	79.7	76.4	78.2	76.4	75.8	75.2	71.8	69.3	66.3	63.7	62.1	60.6	57.8	54.3	51.6	48.9	46.2
LD831.026	77.1	75.9	72.6	73.5	68.0	63.9	60.3	54.0	46.4	65.5	64.4	76.5	66.0	67.7	73.8	69.0	67.3	67.8	68.4	68.9	71.1	62.1	65.3	62.7	60.7	60.4	58.2	58.7	57.3	55.5	52.5	51.3	48.9	45.9	43.3	41.0	39.7	39.1
LD831.027	88.1	91.4	96.0	91.9	92.4	91.5	88.8	80.9	71.0	80.4	81.8	84.4	83.6	86.2	86.6	86.9	89.8	94.4	85.7	85.2	88.5	87.2	88.6	87.1	87.2	86.8	86.6	86.8	85.7	84.0	81.7	78.1	76.1	71.9	68.6	65.7	62.3	60.9
LD831.028	81.9	85.0	86.7	84.0	83.0	84.6	82.8	77.7	71.3	69.8	74.1	80.4	73.2	76.7	82.9	78.9	78.8	85.0	78.5	81.8	79.1	75.7	77.1	78.0	79.2	78.9	78.6	81.5	79.1	78.2	76.0	74.5	72.8	70.8	68.3	65.8	64.7	61.6
LD831.029	64.4	73.4	81.4	75.8	75.5	72.2	68.1	62.7	57.2	65.5	57.7	55.5	62.1	65.0	68.6	71.0	77.4	73.6	77.8	72.3	67.5	72.1	71.6	71.2	68.9	67.4	67.7	67.1	64.5	63.8	60.6	59.6	56.9	56.9	54.5	51.5	49.1	45.5
LD831.030	73.1	75.4	75.9	72.6	76.9	69.9	67.8	62.9	59.9	71.9	67.3	67.5	69.6	69.6	71.2	71.1	74.1	67.5	68.9	67.8	65.7	69.2	73.4	73.6	66.4	64.8	65.8	64.6	62.0	63.6	63.1	59.9	57.4	56.2	56.3	55.2	53.4	51.2
LD831.031	69.7	79.5	77.9	70.2	69.8	67.2	62.5	53.7	47.6	64.4	63.1	67.3	62.5	61.8	63.5	79.7	76.5	62.3	67.6	66.9	65.0	62.8	67.0	64.8	62.3	65.8	58.7	58.9	58.6	59.3	53.1	51.1	48.1	46.1	44.2	42.7	41.0	40.2
LD831.032	71.6	90.2	88.8	80.1	78.1	74.5	68.2	62.1	57.1	69.9	67.1	66.6	66.2	67.3	69.4	90.6	87.8	70.9	75.4	78.1	74.5	70.0	73.6	72.9	73.8	70.2	69.8	68.6	65.3	63.0	60.1	58.7	57.1	55.8	53.7	52.1	50.6	51.4
LD831.033	68.7	82.7	84.3	80.4	77.4	73.6	69.8	64.9	59.2	68.8	65.6	62.8	62.9	60.0	60.2	83.2	79.4	67.6	82.4	77.3	71.9	71.4	72.9	73.6	71.0	69.8	68.5	67.8	66.9	63.6	63.6	62.0	59.9	57.0	56.0	54.6	52.0	49.9
LD831.034	66.5	83.3	82.0	72.8	69.5	65.6	60.0	55.7	49.8	64.0	61.0	62.7	60.6	63.7	61.7	83.6	81.0	62.6	70.4	68.3	68.7	65.9	66.0	64.3	63.9	61.5	61.9	58.8	56.9	54.7	53.7	53.0	50.4	47.8	46.4	45.0	42.9	41.1
831_Data.007	83.8	71.8	75.4	76.6	77.9	76.1	72.6	66.9	59.9	63.0	59.8	69.9	83.6	63.9	64.8	68.8	72.3	67.4	71.1	69.9	69.3	74.5	75.3	70.7	71.8	70.1	69.6	73.5	69.2	65.9	65.7	63.8	61.3	60.4	57.1	54.4	52.3	52.2
831_Data.009	78.7	73.6	70.8	74.9	85.4	75.3	72.4	71.5	67.2	64.2	65.1	63.3	78.4	72.5	65.6	64.7	65.5	68.7	60.2	61.7	66.7	69.0	84.9	79.4	72.2	70.2	71.4	70.0	67.2	68.9	66.3	69.0	66.5	62.8	63.5	61.9	61.5	59.3
831_Data.019	69.9	73.7	74.9	71.9	80.4	69.6	66.4	62.6	57.8	60.7	61.0	66.8	65.7	68.6	64.9	71.5	70.0	70.9	69.1	66.8	67.9	66.6	67.5	80.0	65.9	63.8	67.0	62.7	62.3	61.4	61.1	59.8	57.1	55.1	55.2	53.0	48.5	44.8
831_Data.033	72.9	73.4	72.6	65.7	65.5	67.6	64.0	59.1	53.6	59.5	58.9	64.3	72.0	68.9	63.1	71.0	72.0	61.8	62.0	61.0	62.2	58.8	61.3	59.5	61.2	62.5	63.6	62.3	59.6	60.5	56.0	55.8	54.8	51.0	50.6	48.8	45.6	39.3
831_Data.035	76.4	81.3	80.6	82.1	81.2	78.2	76.1	80.2	78.2	67.7	66.3	66.2	74.7	81.0	69.1	73.4	74.7	74.6	77.5	74.7	79.5	76.1	76.2	76.5	76.8	74.2	72.4	72.7	69.7	69.9	73.2	74.8	77.6	72.0	73.2	73.8	73.3	68.3
831_Data.036	75.4	70.9	72.9	70.1	73.3	70.5	69.3	67.9	62.7	65.2	62.0	62.5	74.9	68.2	63.3	65.6	69.5	68.8	65.3	62.6	59.4	68.7	69.5	68.4	67.6	67.0	65.8	63.4	63.9	65.2	64.4	65.0	62.1	61.7	60.2	57.5	53.2	52.0
831_Data.037	79.4	70.8	70.7	86.3	83.6	78.6	78.0	79.3	75.6	62.0	60.0	60.7	79.3	68.5	61.4	65.4	66.7	62.8	67.4	70.4	71.3	86.2	74.2	74.7	80.5	73.2	72.9	72.8	72.7	72.0	74.6	75.7	74.9	71.9	73.2	70.6	66.0	65.1
831_Data.042	65.9	65.7	68.2	64.9	60.1	59.8	54.8	46.8	40.4	62.1	59.1	62.4	60.7	59.3	60.7	62.5	61.2	64.7	63.7	63.6	55.7	56.6	54.1	54.9	56.5	55.8	55.8	52.3	50.8	50.5	48.6	44.1	41.6	39.0	36.2	36.2	34.1	28.8
831_Data.043	65.8	62.4	62.4	61.7	56.2	56.5	51.7	43.9	32.7	62.4	60.6	62.1	59.9	58.4	57.6	57.1	55.1	56.6	59.9	58.2	56.3	55.9	51.6	51.4	51.2	52.1	51.4	51.9	48.3	46.7	45.1	41.8	38.2	34.5	30.3	27.6	22.5	20.4
831_Data.001	72.8	72.1	79.4	80.9	75.4	68.4	68.0	64.2	59.6	62.1	63.1	69.9	68.6	66.1	64.5	69.6	71.9	75.3	76.0	76.4	75.8	76.5	72.4	70.7	66.2	63.8	63.6	63.5	63.3	64.0	62.0	61.0	57.0	59.5	58.4	52.6	47.7	45.2
831_Data.002	89.5	80.5	77.0	81.1	76.0	70.2	68.2	62.3	57.1	88.6	86.4	84.4	81.9	78.1	74.8	72.3	70.4	69.1	75.1	76.4	77.1	75.2	71.7	72.0	69.8	66.3	65.9	63.3	64.1	63.8	62.2	59.5	56.5	55.4	55.2	51.3	47.6	48.9

Sound Level Measurement Instrumentation

Equipment sound level measurements at the GE Booth facility were conducted by Wood on July 21-22, 2016, April 23, 2019, May 8, 2019 and March 22, 2022 using a Larson Davis 831 sound level meter. The Larson Davis 831 is a Type I sound level meter, and was equipped with a windscreen. A Larson Davis Model PRM831 preamplifier and a PCB Model 377B02 precision air-condenser microphone was used. The preamp and microphone have been factory calibrated with the SLM unit. The SLM meets IEC 61672-1 Type 1 requirements. The sound level meter was field calibrated with a Larson-Davis Model CA200 precision acoustic calibrator before and after the measurements.

All measurements were conducted in accordance with MOECC NPC-103 measurement protocols. Meters used for short-term measurements were programmed to record 1-second L_{eq} and L_{max}.

Station Name	TORONTO INTL A
Province	ONTARIO
Latitude	43.68
Longitude	-79.63
Elevation	173.4
Climate Identifier	6158731
WMO Identifier	71624
TC Identifier	YYZ

All times are specified in Local Standard Time (LST).

Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Legend

E	Estimated
M	Missing
NA	Not Available
‡	Partner data that is not subject to review by the National Climate Archives

Date/Time	Data Quality	Temp (°C)	Rel Hum (%)	Wind Spd (km/h)	Weather
21/07/2016 0:00	‡	21.4	58	8	NA
21/07/2016 1:00	‡	20.2	63	17	Mainly Clear
21/07/2016 2:00	‡	19.6	65	10	NA
21/07/2016 3:00	‡	19.5	67	7	NA
21/07/2016 4:00	‡	19.3	67	5	Mainly Clear
21/07/2016 5:00	‡	19.5	68	8	NA
21/07/2016 6:00	‡	20.5	65	9	NA
21/07/2016 7:00	‡	22.2	59	9	Clear
21/07/2016 8:00	‡	25.4	47	20	NA
21/07/2016 9:00	‡	27.6	43	19	NA
21/07/2016 10:00	‡	28.9	43	14	Mostly Cloudy
21/07/2016 11:00	‡	30.5	43	15	NA
21/07/2016 12:00	‡	31.5	42	21	NA
21/07/2016 13:00	‡	33	39	21	Cloudy
21/07/2016 14:00	‡	32.3	40	28	NA
21/07/2016 15:00	‡	32.6	39	31	NA
21/07/2016 16:00	‡	32.4	42	23	Cloudy
21/07/2016 17:00	‡	31.4	49	30	NA
21/07/2016 18:00	‡	30.2	54	29	NA
21/07/2016 19:00	‡	29.5	58	18	Mostly Cloudy
21/07/2016 20:00	‡	28.8	62	19	NA
21/07/2016 21:00	‡	28	65	19	NA
21/07/2016 22:00	‡	27.4	67	18	Mainly Clear
21/07/2016 23:00	‡	26.9	67	24	NA
22/07/2016 0:00	‡	25.8	68	18	NA
22/07/2016 1:00	‡	25.1	66	10	Mainly Clear
22/07/2016 2:00	‡	23.8	71	10	NA
22/07/2016 3:00	‡	24	68	15	NA
22/07/2016 4:00	‡	23.3	71	13	Mostly Cloudy
22/07/2016 5:00	‡	23	75	14	NA

Date/Time	Data Quality	Temp (°C)	Rel Hum (%)	Wind Spd (km/h)	Weather
22/07/2016 6:00	‡	23.7	77	17	NA
22/07/2016 7:00	‡	25.1	74	20	Mainly Clear
22/07/2016 8:00	‡	27.1	68	27	NA
22/07/2016 9:00	‡	29.2	61	22	NA
22/07/2016 10:00	‡	30.8	53	18	Clear
22/07/2016 11:00	‡	32.4	41	27	NA
22/07/2016 12:00	‡	31.7	39	28	NA
22/07/2016 13:00	‡	33.7	31	25	Clear
22/07/2016 14:00	‡	35.1	27	28	NA
22/07/2016 15:00	‡	33.4	31	31	NA
22/07/2016 16:00	‡	34.1	28	28	Clear
22/07/2016 17:00	‡	33.7	27	35	NA
22/07/2016 18:00	‡	32.1	33	37	NA
22/07/2016 19:00	‡	31	33	34	Clear
22/07/2016 20:00	‡	29.5	35	23	NA
22/07/2016 21:00	‡	28	43	20	NA
22/07/2016 22:00	‡	26.8	45	22	Mainly Clear
22/07/2016 23:00	‡	25.6	48	17	NA

Hourly Data Report for April 23, 2019

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

TORONTO INTL A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	43°40'36.000" N
Longitude:	79°37'50.000" W
Elevation:	173.40 m
Climate ID:	6158731
WMO ID:	71624
TC ID:	YYZ

TIME	Temp °C	Dew Point Temp °C	Rel Hum %	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
00:00	8.8	5.2	78	24	3	24.1	99.80			NA
01:00	9.1	5.7	79	20	5	24.1	99.73			Mainly Clear
02:00	8.7	5.4	80	13	7	24.1	99.61			NA
03:00	9.0	6.0	81	11	5	24.1	99.48			NA
04:00	8.9	6.0	82	36	2	24.1	99.49			Mostly Cloudy
05:00	8.9	6.0	82	7	3	24.1	99.45			NA
06:00	8.8	5.9	81	10	10	24.1	99.32			NA
07:00	10.4	7.1	80	12	10	24.1	99.23			Mainly Clear
08:00	11.7	7.7	76	14	12	24.1	99.15			NA
09:00	12.1	7.5	74	15	12	24.1	99.04			NA
10:00	11.6	7.3	75	14	11	24.1	98.95			Rain
11:00	12.9	8.4	74	13	18	24.1	98.76			Rain Showers
12:00	12.6	8.1	74	14	14	24.1	98.56			Rain Showers

	Temp °C	Dew Point Temp °C	Rel Hum %	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
13:00	10.7	7.2	79	36	3	9.7	98.58			Thunderstorms,Rain Showers
14:00	11.3	8.7	84	14	9	17.7	98.42			Rain
15:00	11.4	9.0	85	20	8	24.1	98.38			NA
16:00	14.6	11.8	83	28	45	24.1	98.44			Cloudy
17:00	9.5	6.3	80	29	46	24.1	98.63			NA
18:00	8.0	4.4	78	29	43	24.1	98.68			NA
19:00	6.9	3.0	76	29	39	24.1	98.74			Mostly Cloudy
20:00	6.6	2.5	75	29	38	24.1	98.83			NA
21:00	6.5	2.2	74	31	31	24.1	98.88			NA
22:00	6.3	1.8	73	30	34	24.1	98.92			Cloudy
23:00	6.2	1.6	72	29	27	24.1	98.94			NA

Legend

- E = Estimated
- M = Missing

- NA = Not Available

Date modified:
2019-03-21

Government of Canada | Gouvernement du Canada

Hourly Data Report for May 08, 2019

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

TORONTO INTL A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	43°40'36.000" N
Longitude:	79°37'50.000" W
Elevation:	173.40 m
Climate ID:	6158731
WMO ID:	71624
TC ID:	YYZ

TIME	Temp °C	Dew Point Temp °C	Rel Hum %	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
00:00	5.8	-2.0	57	35	23	24.1	100.47			NA
01:00	4.7	-1.5	64	35	22	24.1	100.49			Mainly Clear
02:00	4.0	-1.4	68	35	15	24.1	100.51			NA
03:00	3.6	-1.2	70	34	13	24.1	100.55			NA
04:00	3.1	-1.0	74	1	10	24.1	100.58			Mainly Clear
05:00	3.0	-0.8	76	36	8	24.1	100.65			NA
06:00	4.9	0.4	73	2	4	24.1	100.73			NA
07:00	7.9	0.4	59	10	16	24.1	100.84			Mainly Clear
08:00	8.8	-1.0	50	11	25	24.1	100.87			NA
09:00	9.7	-2.1	43	11	26	24.1	100.87			NA
10:00	10.0	-3.1	40	12	36	24.1	100.85			Mostly Cloudy
11:00	10.3	-1.0	45	12	21	24.1	100.77			NA
12:00	9.3	-2.1	45	13	37	24.1	100.77			NA

	Temp °C	Dew Point Temp °C	Rel Hum %	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
13:00	9.5	-1.9	45	14	37	24.1	100.73			Mostly Cloudy
14:00	10.6	-2.5	40	13	31	24.1	100.67			NA
15:00	11.2	-0.7	44	14	35	24.1	100.62			NA
16:00	11.1	-3.3	36	11	32	24.1	100.54			Mainly Clear
17:00	10.8	-4.7	33	11	28	24.1	100.50			NA
18:00	10.0	-4.9	35	12	22	24.1	100.50			NA
19:00	9.1	-5.3	36	11	22	24.1	100.44			Mostly Cloudy
20:00	8.8	-4.4	39	11	19	24.1	100.43			NA
21:00	8.8	-4.2	39	11	20	24.1	100.41			NA
22:00	9.4	-4.6	37	12	26	24.1	100.34			Cloudy
23:00	9.5	-4.4	37	12	26	24.1	100.34			NA

Legend

- E = Estimated
- M = Missing

- NA = Not Available

Date modified:

2019-03-21

Government of Canada | Gouvernement du Canada

Hourly Data Report for March 22, 2022

If selected Local Standard Time (LST), add 1 hour to adjust for Daylight Saving Time where and when it is observed.

TORONTO INTL A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	43°40'36.000" N	**Longitude:**	79°37'50.000" W
Elevation:	173.40 m	**Climate ID:**	6158731
WMO ID:	71624	**TC ID:**	YYZ

TIME LST	Temp °C	Dew Point °C	Rel Hum %	Precip. Amount mm	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
00:00	1.6	-8.7	46		35	15	24.1	100.30			NA
01:00	0.9	-8.3	51		36	16	24.1	100.31			Mainly Clear
02:00	-0.2	-7.6	58		33	10	24.1	100.37		-4	NA
03:00	-1.7	-7.2	66		33	9	24.1	100.40		-5	NA
04:00	-2.0	-7.7	65		34	13	24.1	100.42		-6	Mainly Clear
05:00	-1.7	-7.2	66		36	13	24.1	100.45		-6	NA
06:00	-2.2	-8.0	65		36	12	24.1	100.47		-6	NA
07:00	-1.0	-7.8	60		36	8	24.1	100.55		-4	Mainly Clear
08:00	0.7	-8.4	51		36	7	24.1	100.62			NA
09:00	2.1	-10.6	39		3	5	24.1	100.67			NA
10:00	3.4	-11.4	33		1	8	24.1	100.63			Mostly Cloudy
11:00	4.7	-13.3	26		2	9	24.1	100.59			NA
12:00	5.4	-11.5	29		36	2	24.1	100.56			NA
13:00	4.2	-11.9	30		17	15	24.1	100.55			Cloudy
14:00	4.0	-9.8	36		14	13	24.1	100.45			NA
15:00	4.3	-10.4	34		15	8	24.1	100.37			NA
16:00	4.1	-12.3	29		15	12	24.1	100.39			Cloudy
17:00	3.8	-13.2	28		14	11	24.1	100.36			NA
18:00	3.3	-15.2	24		10	12	24.1	100.27			NA
19:00	2.8	-12.9	31		9	7	24.1	100.33			Cloudy
20:00	3.2	-11.7	33		8	9	24.1	100.31			NA
21:00	3.3	-11.8	32		8	11	24.1	100.33			NA
22:00	3.0	-10.5	37		7	12	24.1	100.31			Cloudy
23:00	3.0	-11.3	34		10	9	24.1	100.25			NA

Legend

- E = Estimated
- M = Missing
- NA = Not Available*
- [empty] = Indicates an unobserved value

Date modified:

2022-03-02

CONVERSION OF SOUND PRESSURE LEVELS TO SOUND POWER LEVELS

Project Name: GE Booth 2022 Annual Update
Project Number:
Location: Mississauga, ON

Measurement Reference [1,2]	Source Description	Calc Type [3] (A, C, or S)	SPL Ref Distance [4] (S or C) (m)	Length [5] (C only) (m)	Area (A only) (m^2)	Partition Coefficient (S or C) (%)	Net Surface Area [5] (m^2)	Nearfield Correction (dB)	Spectral Weighting (A or Flat)	Octave Band Sound Pressure Level Data (dB or dBA) [6] 31.5	63	125	250	500	1000	2000	4000	8000	Total (dBA)
831_Data.001.s	New generator (south, level with louver)	S	1.6			50%	15.5		Flat	86.4	91.1	93.3	89.9	81.7	83.0	80.5	77.0	70.5	88
831_Data.002.s	New generator (east, level with louver)	S	1.6			50%	15.5		Flat	82.5	90.3	92.3	84.6	82.0	76.3	71.9	69.9	64.5	84
831_Data.003.s	New generator (north, level with louver)	S	1.6			50%	15.5		Flat	83.0	91.2	93.5	89.9	83.2	82.8	80.5	76.3	71.2	88
831_Data.004.s	New generator (north, far field)	S	4.1			50%	107.9		Flat	80.0	87.7	90.1	81.5	78.4	74.9	73.0	69.6	61.4	82
831_Data.005.s	New generator exhaust (at exit plane)	S	1.4			50%	12.3		Flat	81.7	95.5	98.0	89.1	84.4	80.6	75.7	72.1	64.9	88
831_Data.006.s	New generator (west)	S	1.6			50%	15.5		Flat	78.2	89.0	90.6	86.6	79.7	77.1	72.1	69.5	61.5	84
831_Data.007.s	New generator (far field)	S	7.1			50%	316.6		Flat	78.0	81.4	80.9	80.8	72.7	69.0	66.3	63.1	54.7	77
831_Data.008.s	New generator exhaust (at exit plane, far field)	S	4.5			50%	127.7		Flat	83.0	88.7	91.1	80.2	77.4	74.8	72.5	69.7	66.2	82
831_Data.009.s	New generator (north, level with louvers, far field)	S	4.5			50%	127.7		Flat	86.0	82.6	84.8	84.1	74.9	73.6	71.5	67.7	61.1	80
831_Data.010.s	New generator (south, level with louvers, far field)	S	4.7			50%	138.7		Flat	80.0	87.3	90.0	83.2	74.9	73.6	71.4	67.8	61.5	81
831_Data.011.s	Storage complex RTU-1 (east intake, fan off)	S	1.9			50%	22.0		Flat	63.9	67.2	70.8	58.4	57.2	52.6	51.4	46.8	41.5	60
831_Data.012.s	Storage complex RTU-1 (east intake, fan off, touch scan)	S				50%	0.0		Flat	67.5	68.0	73.9	63.2	64.6	60.0	60.1	54.6	43.7	67
831_Data.013.s	Storage complex RTU-1 (north intake, fan off, touch scan)	S				50%	0.0		Flat	69.6	69.8	82.9	65.0	65.0	61.2	58.8	54.4	47.0	70
831_Data.014.s	Storage complex RTU-1 (north intake, fan off)	S	1.8			50%	20.3		Flat	66.2	66.6	75.7	58.4	55.6	53.0	50.8	46.8	43.0	62
831_Data.015.s	Storage complex RTU-2 (north intake, fan off)	S	1.8			50%	20.3		Flat	72.2	69.0	76.0	61.9	59.3	56.7	53.9	50.9	47.5	64
831_Data.016.s	Storage complex RTU-2 (east intake, fan off)	S	1.8			50%	20.3		Flat	69.4	67.2	63.8	59.0	58.3	54.4	51.7	47.8	43.0	60
831_Data.017.s	Storage complex RTU-2 (east intake, fan off, touch scan)	S				50%	0.0		Flat	74.4	71.4	76.5	62.6	66.2	62.8	59.6	54.3	46.3	68
831_Data.018.s	Storage complex RTU-2 (north intake, fan off, touch scan)	S				50%	0.0		Flat	76.3	70.9	81.8	63.8	65.5	62.6	59.3	54.1	45.9	70
831_Data.019.s	Storage complex RTU-1 (east intake, fan on)	S	3.0			50%	55.8		Flat	71.8	74.4	71.1	66.9	64.8	61.4	58.4	54.4	49.9	67
831_Data.020.s	Storage complex RTU-1 (north intake, fan on)	S	2.9			50%	53.9		Flat	80.3	73.9	69.8	67.5	65.8	60.8	58.7	55.4	51.7	67
831_Data.021.s	Storage complex RTU-1 (top of fans, fan on)	S	1.0			50%	6.3		Flat	91.9	85.7	83.2	81.5	78.2	74.1	71.2	68.3	63.4	80
831_Data.022.s	discard	S				50%	0.0		Flat	74.6	75.0	70.4	63.5	65.8	64.7	66.3	66.0	64.4	73
831_Data.023.s	Storage complex wall pipe exhaust	S	2.0			50%	23.9		Flat	70.9	65.2	66.3	64.1	66.6	63.9	66.0	57.1	50.3	70
831_Data.024.s	EWPS EF far field	S	2.9			50%	52.1		Flat	68.1	74.3	68.8	65.1	62.8	58.0	52.4	45.4	41.8	64
831_Data.025.s	EWPS EF near field	S	1.0			50%	6.3		Flat	87.4	81.2	78.4	72.1	71.4	67.9	63.5	56.7	47.9	73

1. All measurements conducted on March 22, 2023 using Larson Davis 831 SLM.
2. All measurements were consistent with the applicable portions of the MOECC Publication NPC-103.
3. Calc Type of C, A, or S refer to the source geometry, and represent Cylindrical, Area, or Spherical sources, respectively.
4. SPL Ref Distance refers to the radial distance from the microphone to the acoustic centre of a spherical source or the symmetrical axis of a cylindrical source.
5. Net surface area refers to surface area corrected for partition coefficient. Partition coefficient applies only to spherical and cylindrical geometries. Sound power level is estimated using an area correction 10 log A.
6. Refer to "Spectral Weighting" column for dB or dBA application information.

Sound Power Level Calculation - Exit Noise

Openings/Discharge Points - Generator Casing

	A-weighted [dBA]								
Sound Power Level [Lw]	98.67								
	31.5	63	125	250	500	1000	2000	4000	8000
Octave Band Lw	96.7	101.5	103.6	100.2	92.0	93.3	90.9	87.3	80.9

Parameters	Units	Value							
L_p	dB	88	sound pressure level at distance d						
	31.5	63	125	250	500	1000	2000	4000	8000
Octave Band L_p	86.4	91.1	93.3	89.9	81.7	83.0	80.5	77.0	70.5
a	meters	1.61	radius of opening						
d	meters	1.6	distance from opening						
Θ		0.8							
E_1	dB	1	near-field correction						

Calculation Notes

Reference

EEMUA Publication 140 **Noise Procedure Specification**

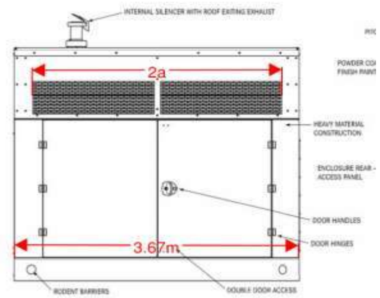
Section 3.2.7

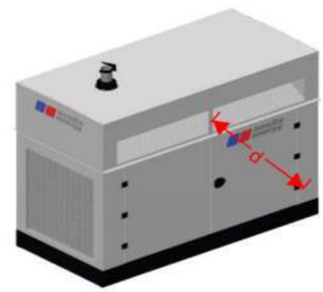
Sound Power Level

$$L_w = (L_p - E_1) + 10\log\pi(a^2 + d^2) - 10\log\left(2\left(\frac{1-\cos\theta}{sin^2\theta}\right)\right)$$

Near-field Correction

a/d	E_1
a/d<0.8	0 dB
0.8<a/d<2.3	1 dB
2.3<a/d<8.2	2 dB
8.2<a/d	3 dB





Level 1 Enclosure (pictured)*

A-WEIGHTING (dB) - Applied to total PWL	31.5	63	125	250	500	1000	2000	4000	8000
	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1

Sound Power Level Calculation - Hemispherical

Generator Combustion Exhaust

	A-weighted [dBA]
Sound Power Level [Lw]	99.05

	31.5	63	125	250	500	1000	2000	4000	8000
Octave Band Lw	93.04	106.83	109.28	100.44	95.72	91.88	87.07	83.47	76.18

Parameters	Units	Value	
L_p	dB	88	sound pressure level at distance d

	31.5	63	125	250	500	1000	2000	4000	8000
Octave Band L_p	81.7	95.5	98.0	89.1	84.4	80.6	75.7	72.1	64.9

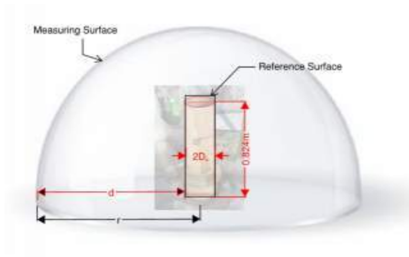
r	meters	1.47	
l	meters	0.8128	length of source
d	meters	1.4	measuring distance from the axis of source
D0	meters	0.06985	

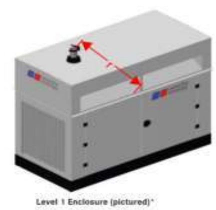
Calculation Notes

Reference

EEMUA Publication 140 — **Noise Procedure Specification**
Section 3.2.1

Sound Power Level $L_w = L_p + 10\log 2\pi r^2$





A-WEIGHTING (dB) - Applied to total Lw	31.5	63	125	250	500	1000	2000	4000	8000
	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1

Sound Power Level Calculation - Hemispherical Opening

Wall Pipe Exhaust

	A-weighted [dBA]								
Sound Power Level [Lw]	84.45								
	31.5	63	125	250	500	1000	2000	4000	8000
Octave Band Lw	84.95	79.20	80.29	78.11	80.63	77.94	79.97	71.09	64.33

Parameters	Units	Value	
L_p	dB	81	sound pressure level at distance d

	31.5	63	125	250	500	1000	2000	4000	8000
Octave Band L_p	70.9	65.2	66.3	64.1	66.6	63.9	66.0	57.1	50.3

r	meters	2.00	
l	meters		length of source
d	meters	2	measuring distance from the axis of source
D0	meters	0	

Calculation Notes

Reference

EEMUA Publication 140 — **Noise Procedure Specification**

Section 3.2.1

Sound Power Level $L_w = L_p + 10\log 2\pi r^2$

A-WEIGHTING (dB) - Applied to total Lw	31.5	63	125	250	500	1000	2000	4000	8000
	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1

Sound Power Level Calculation - Hemispherical

Rooftop Unit 1

	A-weighted [dBA]								
Sound Power Level [Lw]	87.76								
	31.5	63	125	250	500	1000	2000	4000	8000
Octave Band Lw	92.42	94.97	91.68	87.51	85.37	82.00	78.98	74.94	70.51

Parameters	Units	Value	
L_p	dB	81	sound pressure level at distance d

	31.5	63	125	250	500	1000	2000	4000	8000
Octave Band L_p	71.8	74.4	71.1	66.9	64.8	61.4	58.4	54.4	49.9

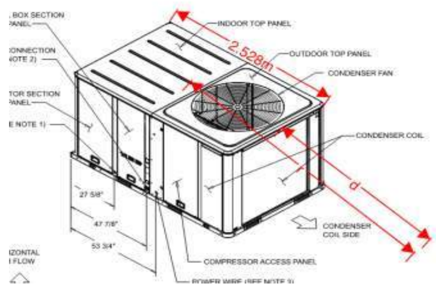
r	meters	4.26	
l	meters	1.33	length of source
d	meters	3	measuring distance from the axis of source
D0	meters	1.264	

Calculation Notes

Reference

EEMUA Publication 140 — **Noise Procedure Specification**
Section 3.2.1

Sound Power Level $L_w = L_p + 10\log 2\pi r^2$



A-WEIGHTING (dB) - Applied to total Lw	31.5	63	125	250	500	1000	2000	4000	8000
	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1

Sound Power Level Calculation - Hemispherical

EWPS Roof Exhaust Fan (EF-701)

	A-weighted [dBA]								
Sound Power Level [Lw]	82.63								
	31.5	63	125	250	500	1000	2000	4000	8000
Octave Band Lw	86.72	92.92	87.38	83.67	81.39	76.63	71.03	63.98	60.42

Parameters	Units	Value							
L_p	dB	81	sound pressure level at distance d						
	31.5	63	125	250	500	1000	2000	4000	8000
Octave Band L_p	68.1	74.3	68.8	65.1	62.8	58.0	52.4	45.4	41.8
r	meters	3.40							
l	meters		length of source						
d	meters	2.9	measuring distance from the axis of source						
D0	meters	0.5							

Calculation Notes

Reference

EEMUA Publication 140 **Noise Procedure Specification**
Section 3.2.1

Sound Power Level $L_w = L_p + 10\log 2\pi r^2$

A-WEIGHTING (dB) - Applied to total Lw	31.5	63	125	250	500	1000	2000	4000	8000
	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1

Government of Canada Gouvernement du Canada

Hourly Data Report for March 22, 2023

If selected Local Standard Time (LST), add 1 hour to adjust for Daylight Saving Time where and when it is observed.

TORONTO INTL A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	43°40'36.000" N
Longitude:	79°37'50.000" W
Elevation:	173.40 m
Climate ID:	6158731
WMO ID:	71624
TC ID:	YYZ

TIME LST	Temp °C	Dew Point °C	Rel Hum %	Precip. Amount mm	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
00:00	3.5	-2.8	64		8	8	24.1	100.56			NA
01:00	3.5	-3.1	62		8	9	24.1	100.50			Mostly Cloudy
02:00	3.4	-2.9	64		8	12	24.1	100.47			NA
03:00	2.6	-2.7	68		9	9	24.1	100.44			NA
04:00	2.1	0.5	89		7	13	24.1	100.42			Mostly Cloudy
05:00	1.3	0.1	91		9	10	24.1	100.39			NA
06:00	1.0	-0.6	89		8	15	24.1	100.40			NA
07:00	1.4	-0.6	86		9	10	24.1	100.38			Mostly Cloudy
08:00	1.9	-0.4	84		9	12	24.1	100.35			NA
09:00	2.2	-0.6	81		8	12	24.1	100.29			NA
10:00	3.6	0.3	79		9	10	24.1	100.26			Cloudy
11:00	4.6	-0.2	71		13	8	24.1	100.19			NA
12:00	5.1	0.5	72		15	9	24.1	100.12			NA
13:00	5.5	-0.3	66		12	12	24.1	100.01			Cloudy
14:00	5.9	-0.1	65		14	13	24.1	99.91			NA
15:00	5.1	0.0	70		12	12	24.1	99.81			NA
16:00	4.9	1.2	77		9	10	19.3	99.75			Cloudy
17:00	5.2	1.3	76		12	9	24.1	99.70			NA
18:00	5.2	1.3	76		14	9	24.1	99.69			NA

TIME LST	Temp °C	Dew Point °C	Rel Hum %	Precip. Amount mm	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
19:00	5.4	1.9	78		14	8	24.1	99.63			**Cloudy**
20:00	5.5	2.2	79		13	8	24.1	99.60			**NA**
21:00	5.8	2.7	80		13	6	24.1	99.54			**NA**
22:00	5.8	3.1	83		15	9	24.1	99.48			**Cloudy**
23:00	5.2	3.9	92		15	9	24.1	99.43			**NA**

Legend

- E = Estimated
- M = Missing
- NA = Not Available*
- [empty] = Indicates an unobserved value

Date modified:

2023-01-31

GE Booth Measured Sound Pressure Levels

	1/1 Octave Frequency Range									1/3 Octave Frequency Band																												
File Name	31.5	63	125	250	500	1000	2000	4000	8000	20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500
LD831.004	69.7	70.6	77.9	87.5	89.4	85.6	80.6	72.0	63.3	59.8	59.0	68.9	59.4	63.4	68.2	64.7	62.4	68.5	77.3	69.5	86.8	78.5	85.0	84.6	84.5	82.0	81.0	78.6	77.6	75.7	72.7	69.8	66.1	63.7	61.5	57.1	53.7	51.0
LD831.005	69.0	69.3	69.8	69.6	69.1	68.5	70.5	64.1	59.4	60.7	62.7	67.1	60.5	61.8	67.2	62.6	61.6	65.1	66.9	63.9	66.6	63.0	66.3	63.5	62.3	62.9	63.4	64.8	64.8	67.4	64.5	59.6	59.5	58.9	56.1	54.8	51.9	47.9
LD831.006	75.3	71.7	70.1	69.2	68.5	66.0	62.9	56.1	49.0	64.3	61.5	74.8	62.3	66.0	69.5	63.3	64.9	65.2	65.6	62.6	67.2	60.9	65.6	62.6	62.3	62.0	61.2	60.4	59.4	58.5	55.9	53.3	50.8	48.6	45.8	44.3	41.6	39.9
LD831.007	82.6	86.9	86.9	84.0	84.1	79.5	73.5	68.1	63.5	74.8	78.1	78.4	76.9	80.1	85.1	78.3	77.4	83.8	82.8	79.6	79.0	79.4	81.5	77.9	77.2	75.6	75.5	72.4	70.1	68.6	66.6	65.1	62.8	61.0	59.8	58.8	57.2	55.7
LD831.008	83.9	84.7	83.0	78.3	77.0	74.3	69.3	64.2	58.9	74.4	77.1	81.9	76.0	80.1	81.9	76.1	78.5	80.2	74.1	72.2	75.0	72.7	72.0	72.9	71.7	69.3	69.2	70.0	66.0	63.9	62.2	60.3	59.1	58.7	55.6	54.1	52.2	49.5
LD831.009	78.1	85.8	83.5	83.5	79.9	77.2	72.5	66.7	57.9	74.4	71.3	76.3	69.4	71.5	84.8	78.8	78.5	80.2	77.9	79.1	79.6	77.8	75.4	75.7	73.4	74.1	71.7	70.6	69.2	67.3	66.4	64.1	61.5	58.7	55.6	52.4	48.4	45.1
LD831.010	81.0	81.0	85.1	81.8	75.9	73.0	67.9	64.0	55.2	72.4	70.3	80.4	68.3	72.4	77.7	76.5	82.1	80.2	78.8	79.9	75.7	74.2	72.0	71.3	69.9	69.6	68.3	66.1	64.4	63.2	61.1	62.0	57.7	55.3	53.0	49.7	45.7	43.0
LD831.011	89.7	87.3	84.1	78.0	74.1	70.6	66.7	72.8	59.0	68.9	69.7	89.6	72.5	78.6	85.6	80.0	80.0	78.9	79.2	74.0	73.2	71.6	70.0	69.8	67.7	66.9	65.7	64.3	62.6	61.8	61.0	72.6	59.2	55.4	58.2	50.0	45.6	42.2
LD831.012	77.0	83.0	80.9	81.4	76.6	72.7	74.5	68.6	59.4	68.7	67.0	75.7	69.7	74.7	81.1	75.9	73.1	76.0	77.9	78.7	74.9	75.2	74.2	70.4	69.6	69.0	68.3	66.5	66.2	65.2	73.1	65.4	63.0	61.3	57.1	54.2	49.6	47.3
LD831.013	75.7	80.0	72.2	78.8	71.4	68.3	73.9	63.6	52.4	72.1	66.9	74.0	69.0	70.9	77.9	74.0	66.8	67.5	67.7	70.6	77.6	68.6	68.2	64.4	67.1	64.7	63.1	62.1	62.3	60.0	73.4	58.6	59.2	54.2	49.7	47.5	43.4	42.3
LD831.014	76.9	83.6	83.0	83.6	79.2	74.8	70.2	63.9	57.4	65.3	64.7	75.1	71.3	77.5	79.5	79.3	79.6	78.0	77.0	81.2	77.5	76.4	75.2	75.0	72.7	71.2	70.3	68.0	66.5	66.0	62.8	60.8	59.3	56.1	52.7	54.5	48.9	44.7
LD831.015	73.7	72.2	72.1	70.5	69.2	71.9	70.2	62.8	53.2	65.8	65.6	71.3	68.6	64.7	69.7	66.4	62.6	69.2	67.9	67.2	64.8	64.2	64.8	64.5	64.1	62.5	69.1	67.5	64.0	67.2	64.3	60.1	57.2	54.9	50.7	47.9	44.0	41.6
LD831.016	86.9	87.7	75.7	77.1	74.3	71.0	69.6	64.6	54.9	72.0	71.1	85.0	82.9	71.1	87.0	74.6	68.5	69.7	72.5	71.8	74.4	69.1	67.6	71.8	67.7	66.2	66.3	66.4	65.9	65.6	62.0	60.8	60.6	56.9	52.1	49.5	46.3	42.6
LD831.017	73.2	69.4	68.0	66.4	66.1	67.1	67.6	64.7	64.6	66.2	65.5	69.6	69.1	65.2	63.3	64.1	62.4	63.0	64.2	61.5	60.3	62.6	61.4	61.0	61.5	60.1	61.1	64.5	62.2	63.0	63.3	60.7	60.1	58.9	60.8	60.7	57.1	52.0
LD831.018	79.7	76.5	73.8	71.3	68.5	67.9	70.3	67.9	54.9	73.3	71.6	74.4	77.1	69.5	70.5	72.7	67.1	70.3	67.7	67.1	67.0	65.0	63.8	62.7	64.8	63.6	62.5	63.3	62.7	65.3	67.4	66.8	60.2	55.6	52.4	49.5	46.6	44.3
LD831.019	83.0	79.4	74.6	71.5	69.8	67.5	64.3	60.1	50.8	78.7	77.3	76.7	80.2	73.8	73.1	74.5	67.9	71.9	68.5	67.2	66.3	66.5	63.8	64.0	66.6	63.9	62.8	60.8	59.9	59.7	59.0	57.8	54.7	50.7	48.7	44.8	41.9	40.0
LD831.020	76.3	75.7	71.6	68.1	64.1	58.8	54.6	52.3	50.0	69.5	67.3	73.3	71.7	70.5	71.9	70.4	68.0	66.7	64.4	65.4	62.6	60.5	59.5	60.7	57.3	54.3	55.1	51.8	51.0	47.5	50.5	48.2	47.2	46.4	47.3	46.1	38.4	38.7
LD831.021	78.4	79.2	77.7	71.3	74.2	69.7	67.1	65.0	53.7	60.4	59.8	66.9	78.0	68.1	78.7	64.3	66.9	77.0	66.6	64.7	67.1	67.4	72.7	66.1	66.1	64.5	65.8	64.5	63.3	62.0	61.5	63.5	58.7	53.2	51.3	47.8	45.7	41.8
LD831.022	72.5	73.2	71.4	70.9	67.7	68.3	63.0	55.6	47.9	67.0	64.8	69.8	67.3	69.0	69.8	65.2	62.7	68.6	66.9	62.4	67.4	67.2	63.6	62.4	62.6	61.2	66.7	59.3	61.3	57.3	52.9	52.9	50.6	47.2	44.8	42.8	40.9	39.6
LD831.023	82.4	91.2	83.7	74.0	71.6	68.6	66.6	62.3	53.8	70.5	70.6	75.2	81.1	86.2	88.4	83.8	80.4	78.5	77.2	70.7	66.6	67.7	67.4	67.0	65.7	65.0	64.3	61.7	60.6	63.5	60.7	59.5	57.2	54.7	51.7	47.9	44.9	42.6
LD831.024	68.0	65.5	70.8	72.3	70.3	68.3	67.9	54.7	46.1	70.5	63.4	63.8	61.4	60.9	60.2	60.8	65.9	68.3	60.2	62.9	69.4	68.1	62.2	69.0	60.8	65.4	60.6	63.5	66.4	60.8	53.7	52.7	48.3	45.8	43.2	41.1	38.7	38.3
LD831.025	78.2	77.7	82.7	86.1	81.8	79.3	71.8	65.3	56.9	77.1	74.7	73.1	70.1	68.5	67.8	76.6	80.8	75.2	76.5	82.7	81.4	79.7	76.4	78.2	76.4	75.8	75.2	71.8	69.3	66.3	63.7	62.1	60.6	57.8	54.3	51.6	48.9	46.2
LD831.026	77.1	75.9	72.6	73.5	68.0	63.9	60.3	54.0	46.4	65.5	64.4	76.5	66.0	67.7	73.8	69.0	67.3	67.8	68.4	68.9	71.1	62.1	65.3	62.7	60.7	60.4	58.2	58.7	57.3	55.5	52.5	51.3	48.9	45.9	43.3	41.0	39.7	39.1
LD831.027	88.1	91.4	96.0	91.9	92.4	91.5	88.8	80.9	71.0	80.4	81.8	84.4	83.6	86.2	86.6	86.9	89.8	94.4	85.7	85.2	88.5	87.2	88.6	87.1	87.2	86.8	86.6	86.8	85.7	84.0	81.7	78.1	76.1	71.9	68.6	65.7	62.3	60.9
LD831.028	81.9	85.0	86.7	84.0	83.0	84.6	82.8	77.7	71.3	69.8	74.1	80.4	73.2	76.7	82.9	78.9	78.8	85.0	78.5	81.8	79.1	75.7	77.1	78.0	79.2	78.9	78.6	81.5	79.1	78.2	76.0	74.5	72.8	70.8	68.3	65.8	64.7	61.6
LD831.029	64.4	73.4	81.4	75.8	75.5	72.2	68.1	62.7	57.2	65.5	57.7	55.5	62.1	65.0	68.6	71.0	77.4	73.6	77.8	72.3	67.5	72.1	71.6	71.2	68.9	67.4	67.7	67.1	64.5	63.8	60.6	59.6	56.9	56.9	54.5	51.5	49.1	45.5
LD831.030	73.1	75.4	75.9	72.6	76.9	69.9	67.8	62.9	59.9	71.9	67.3	67.5	69.6	69.6	71.2	71.1	74.1	67.5	68.9	67.8	65.7	69.2	73.4	73.6	66.4	64.8	65.8	64.6	62.0	63.6	63.1	59.9	57.4	56.2	56.3	55.2	53.4	51.2
LD831.031	69.7	79.5	77.9	70.2	69.8	67.2	62.5	53.7	47.6	64.4	63.1	67.3	62.5	61.8	63.5	79.7	76.5	62.3	67.6	66.9	65.0	62.8	67.0	64.8	62.3	65.8	58.7	58.9	58.6	59.3	53.1	51.1	48.1	46.1	44.2	42.7	41.0	40.2
LD831.032	71.6	90.2	88.8	80.1	78.1	74.5	68.2	62.1	57.1	69.9	67.1	66.6	66.2	67.3	69.4	90.6	87.8	70.9	75.4	78.1	74.5	70.0	73.6	72.9	73.8	70.2	69.8	68.6	65.3	63.0	60.1	58.7	57.1	55.8	53.7	52.1	50.6	51.4
LD831.033	68.7	82.7	84.3	80.4	77.4	73.6	69.8	64.9	59.2	68.8	65.6	62.8	62.9	60.0	60.2	83.2	79.4	67.6	82.4	77.3	71.9	71.4	72.9	73.6	71.0	69.8	68.5	67.8	66.9	63.6	63.6	62.0	59.9	57.0	56.0	54.6	52.0	49.9
LD831.034	66.5	83.3	82.0	72.8	69.5	65.6	60.0	55.7	49.8	64.0	61.0	62.7	60.6	63.7	61.7	83.6	81.0	62.6	70.4	68.3	68.7	65.9	66.0	64.3	63.9	61.5	61.9	58.8	56.9	54.7	53.7	53.0	50.4	47.8	46.4	45.0	42.9	41.1
831_Data.007	83.8	71.8	75.4	76.6	77.9	76.1	72.6	66.9	59.9	63.0	59.8	69.9	83.6	63.9	64.8	68.8	72.3	67.4	71.1	69.9	69.3	74.5	75.3	70.7	71.8	70.1	69.6	73.5	69.2	65.9	65.7	63.8	61.3	60.4	57.1	54.4	52.3	52.2
831_Data.009	78.7	73.6	70.8	74.9	85.4	75.3	72.4	71.5	67.2	64.2	65.1	63.3	78.4	72.5	65.6	64.7	65.5	68.7	60.2	61.7	66.7	69.0	84.9	79.4	72.2	70.2	71.4	70.0	67.2	68.9	66.3	69.0	66.5	62.8	63.5	61.9	61.5	59.3
831_Data.019	69.9	73.7	74.9	71.9	80.4	69.6	66.4	62.6	57.8	60.7	61.0	66.8	65.7	68.6	64.9	71.5	70.0	70.9	69.1	66.8	67.9	66.6	67.5	80.0	65.9	63.8	67.0	62.7	62.3	61.4	61.1	59.8	57.1	55.1	55.2	53.0	48.5	44.8
831_Data.033	72.9	73.4	72.6	65.7	65.5	67.6	64.0	59.1	53.6	59.5	58.9	64.3	72.0	68.9	63.1	71.0	72.0	61.8	62.0	61.0	62.2	58.8	61.3	59.5	61.2	62.5	63.6	62.3	59.6	60.5	56.0	55.8	54.8	51.0	50.6	48.8	45.6	39.3
831_Data.035	76.4	81.3	80.6	82.1	81.2	78.2	76.1	80.2	78.2	67.7	66.3	66.2	74.7	81.0	69.1	73.4	74.7	74.6	77.5	74.7	79.5	76.1	76.2	76.5	76.8	74.2	72.4	72.7	69.7	69.9	73.2	74.8	77.6	72.0	73.2	73.8	73.3	68.3
831_Data.036	75.4	70.9	72.9	70.1	73.3	70.5	69.3	67.9	62.7	65.2	62.0	62.5	74.9	68.2	63.3	65.6	69.5	68.8	65.3	62.6	59.4	68.7	69.5	68.4	67.6	67.0	65.8	63.4	63.9	65.2	64.4	65.0	62.1	61.7	60.2	57.5	53.2	52.0
831_Data.037	79.4	70.8	70.7	86.3	83.6	78.6	78.0	79.3	75.6	62.0	60.0	60.7	79.3	68.5	61.4	65.4	66.7	62.8	67.4	70.4	71.3	86.2	74.2	74.7	80.5	73.2	72.9	72.8	72.7	72.0	74.6	75.7	74.9	71.9	73.2	70.6	66.0	65.1
831_Data.042	65.9	65.7	68.2	64.9	60.1	59.8	54.8	46.8	40.4	62.1	59.1	62.4	60.7	59.3	60.7	62.5	61.2	64.7	63.7	63.6	55.7	56.6	54.1	54.9	56.5	55.8	55.8	52.3	50.8	50.5	48.6	44.1	41.6	39.0	36.2	36.2	34.1	28.8
831_Data.043	65.8	62.4	62.4	61.7	56.2	56.5	51.7	43.9	32.7	62.4	60.6	62.1	59.9	58.4	57.6	57.1	55.1	56.6	59.9	58.2	56.3	55.9	51.6	51.4	51.2	52.1	51.4	51.9	48.3	46.7	45.1	41.8	38.2	34.5	30.3	27.6	22.5	20.4
831_Data.044	75.5	71.4	84.8	82.7	82.8	80.7	78.1	64.5	55.9	65.1	73.8	69.8	64.1	63.9	69.5	64.0	71.9	83.8	76.4	75.6	79.9	77.0	80.7	74.0	77.9	77.0	72.0	76.9	74.8	74.7	66.4	62.7	57.7	55.0	53.1	50.7	48.0	45.5
831_Data.001	72.8	72.1	79.4	80.9	75.4	68.4	68.0	64.2	59.6	62.1	63.1	69.9	68.6	66.1	64.5	69.6	71.9	75.3	76.0	76.4	75.8	76.5	72.4	70.7	66.2	63.8	63.6	63.5	63.3	64.0	62.0	61.0	57.0	59.5	58.4	52.6	47.7	45.2
831_Data.002	89.5	80.5	77.0	81.1	76.0	70.2	68.2	62.3	57.1	88.6	86.4	84.4	81.9	78.1	74.8	72.3	70.4	69.1	75.1	76.4	77.1	75.2	71.7	72.0	69.8	66.3	65.9	63.3	64.1	63.8	62.2	59.5	56.5	55.4	55.2	51.3	47.6	48.9
831_Data.004	71.6	75.2	77.7	74.0	77.3	70.6	65.5	64.1	63.1	63.2	67.0	66.8	66.5	67.3	71.4	71.2	67.8	73.7	74.9	70.1	67.1	67.1	72.9	73.7	70.1	68.0	64.2	64.3	61.4	60.7	59.9	60.6	59.8	57.0	56.4	57.6	60.2	63.0
831_Data.005	66.7	66.5	70.0	65.1	65.4	61.3	59.0	55.6	52.5	58.0	56.8	59.8	65.1	61.4	63.9	58.7	61.9	67.8	64.4	59.6	59.2	60.9	61.4	60.9	59.1	56.8	56.3	56.6	55.4	54.1	53.0	52.0	50.8	49.4	48.5	47.0	47.7	48.0

Sound Level Measurement Instrumentation

Equipment sound level measurements at the GE Booth facility were conducted by Wood on July 21-22, 2016, April 23, 2019, May 8, 2019 and March 22, 2022 using a Larson Davis 831 sound level meter. The Larson Davis 831 is a Type I sound level meter, and was equipped with a windscreen. A Larson Davis Model PRM831 preamplifier and a PCB Model 377B02 precision air-condenser microphone was used. The preamp and microphone have been factory calibrated with the SLM unit. The SLM meets IEC 61672-1 Type 1 requirements. The sound level meter was field calibrated with a Larson-Davis Model CA200 precision acoustic calibrator before and after the measurements.

All measurements were conducted in accordance with MOECC NPC-103 measurement protocols. Meters used for short-term measurements were programmed to record 1-second L_{eq} and L_{max}.

Conversion of Sound Pressure Levels to Sound Power Levels

Project: G.E. Booth WWTP
Location: Mississauga, ON

A-WEIGHTING (dB) - Applied to total PWL								
-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1

1/4 WAVELENGTH CRITERION (m)								
2.722	1.361	0.686	0.343	0.172	0.086	0.043	0.021	0.011

Measurement Reference [1,2]	Source ID	Source Description	Calc Type [3] (A, C, or S)	SPL Ref Distance [4] (S or C) (m)	Length [5] (C only) (m)	Area (A only) (m^2)	Partition Coefficient (S or C) (%)	Net Surface Area [5] (m^2)	Spectral Weighting (A or Flat)
LD831.004	BE	HVAC & Fluidized Air Blower Exhaust	A			12.0		12.0	Flat
LD831.005	TOX_In	TOX Inlets	A			20.0		20.0	Flat
LD831.006	TOX3_OD	TOX3 Overhead Door	A			20.0		20.0	Flat
LD831.007	TOX3_L1	HVAC Intake Louvre 1 (TOX3)	A			42.0		42.0	Flat
LD831.008	TOX3_L2	HVAC Intake Louvre 2 (TOX3)	A			24.0		24.0	Flat
LD831.009	TOX3_EF1	TOX3 Exhaust Fan1	S	5.0			50%	157.0	Flat
LD831.010	TOX3_EF2	TOX3 Exhaust Fan2	S	1.0			50%	6.3	Flat
LD831.011	TOX3_EF3_5	TOX3 Exhaust Fans 3, 4 & 5	S	1.5			50%	14.1	Flat
LD831.012	TOX4_EF1_3	TOX4 Exhaust Fans 1, 2 & 3	S	5.0			50%	157.0	Flat
LD831.013	TOX4_L	HVAC Intake Louvre (TOX4)	S	3.0			50%	56.5	Flat
LD831.014	TOX1_2EF1_9	TOX1&2 Exhaust Fans 1 through 9	S	1.5			50%	14.1	Flat
LD831.015	TOX1_2_OD	TOX1&2 Overhead Door	S	2.5			50%	39.3	Flat
LD831.016	SH_OD	Solids Handling Overhead Doors	S	5.0			50%	157.0	Flat
LD831.017	TOX4_OD	TOX3 Overhead Door	S	2.5			50%	39.3	Flat
LD831.018	CB_MAU	Makeup Air Unit 1 - Centrifuge Bldg	S	2.0			50%	25.1	Flat
LD831.019	CB_CU1	Condenser 1 - Centrifuge Bldg	S	1.5			50%	14.1	Flat
LD831.020	SH_EF	Solids Handling Exhaust fans	S	2.5			50%	39.3	Flat
LD831.021	BB_OD	Blower Building Overhead Door	A			12.0		12.0	Flat
LD831.022	BB_AI	Blower Building Air Intake1	S	2.0			25%	12.6	Flat
LD831.023	BB_AI	Blower Building Air Intake1	S	2.0			25%	12.6	Flat
LD831.024	SR_OD	Solids Receiving Overhead Door	S	2.5			50%	39.3	Flat
LD831.025	HW_EF1_2	Headworks Exhaust Fans 1&2	S	1.5			50%	14.1	Flat
LD831.026	TCF_GenStackExh	Thermal Conditioning Facility Generator Exhaust Stack	S	2.5			50%	39.3	Flat
LD831.027	TCF_GenRadExh	Thermal Conditioning Facility Generator Radiator Exhaust	S	2.5			50%	39.3	Flat
LD831.028	TCF_GenIntake	Thermal Conditioning Facility Generator Room Intake	S	2.5			50%	39.3	Flat
LD831.029	HW_GenRadExh	Headworks Generator Radiator Exhaust	S	2.5			50%	39.3	Flat
LD831.030	HW_GenIntake	Headworks Generator Room Intake	S	2.5			50%	39.3	Flat
LD831.031	HW_GenStackExh	Headworks Generator Exhaust Stack	S	2.5			50%	39.3	Flat
LD831.032	HW_EF3_4	Headworks Exhaust Fans 3&4	S	1.8			50%	20.3	Flat
LD831.033	HW_EF5	Headworks Exhaust Fan 5	S	3.0			50%	56.5	Flat
LD831.034	HW_CUS	Headworks Carbon Unit Stacks	S	2.5			50%	39.3	Flat
831_Data.007	SH_TEI	Sodium Hypochlorite Truck Engine Idling	S	4.0			50%	100.5	Flat
831_Data.009	SH_TB	Sodium Hypochlorite Truck Blower Left	S	3.5			50%	76.9	Flat
831_Data.019	FCB_OD	Ferrous Chloride Building Open Door	A			1.8		1.8	Flat
831_Data.033	TTP	Tanker Truck Passby	C	10.0	40.0		50%	1256.0	Flat
831_Data.034	FC_TEI	Ferrous Chloride Truck Engine Idling	S	3.9			50%	93.6	Flat
831_Data.035	FC_TB	Ferrous Chloride Truck Blower	S	3.0			25%	28.3	Flat
831_Data.036	PO_TEI	Polymer Truck Engine Idling	S	4.0			50%	99.0	Flat
831_Data.037	PO_TB	Polymer Truck Blower	S	2.9			25%	26.0	Flat
831_Data.042	BF_L1	Biofilter Building Louvre 1	S	2.2			50%	31.2	Flat
831_Data.043	BF_L2	Biofilter Building Louvre 2	S	2.1			50%	27.7	Flat
831_Data.044	WGAC	West GAC Odour Control Unit Exhaust	S	3.5			50%	76.9	Flat
Prediction/Spec	GEB_POU	GEB Solids Exportation Portable Odour Unit							Flat
831_Data.001	LFH_EF	Lab Fume Hood Exhaust Fan	S	1.2			50%	9.0	Flat
831_Data.002	LFH_ES	Lab Fume Hood Exhaust Stack	S	1.0			100%	12.6	Flat
831_Data.004	P1_GAC_IN	Plant 1 GAC Filter Vessel Air Intake	S	2.0			50%	25.1	Flat
831_Data.005	P1_GAC_ES	Plant 1 GAC Filter Vessel Exhaust Stack	S	1.6			100%	32.2	Flat

Measurement Reference [1,2]	Octave Band Sound Pressure Level Data (dB or dBA) [6]									Total
	32	63	125	250	500	1000	2000	4000	8000	(dBA)
LD831.004	69.7	70.6	77.9	87.5	89.4	85.6	80.6	72.0	63.3	90
LD831.005	69.0	69.3	69.8	69.6	69.1	68.5	70.5	64.1	59.4	75
LD831.006	75.3	71.7	70.1	69.2	68.5	66.0	62.9	56.1	49.0	71
LD831.007	82.6	86.9	86.9	84.0	84.1	79.5	73.5	68.1	63.5	85
LD831.008	83.9	84.7	83.0	78.3	77.0	74.3	69.3	64.2	58.9	79
LD831.009	78.1	85.8	83.5	83.5	79.9	77.2	72.5	66.7	57.9	82
LD831.010	81.0	81.0	85.1	81.8	75.9	73.0	67.9	64.0	55.2	79
LD831.011	89.7	87.3	84.1	78.0	74.1	70.6	66.7	72.8	59.0	78
LD831.012	77.0	83.0	80.9	81.4	76.6	72.7	74.5	68.6	59.4	80
LD831.013	75.7	80.0	72.2	78.8	71.4	68.3	73.9	63.6	52.4	78
LD831.014	76.9	83.6	83.0	83.6	79.2	74.8	70.2	63.9	57.4	81
LD831.015	73.7	72.2	72.1	70.5	69.2	71.9	70.2	62.8	53.2	76
LD831.016	86.9	87.7	75.7	77.1	74.3	71.0	69.6	64.6	54.9	77
LD831.017	73.2	69.4	68.0	66.4	66.1	67.1	67.6	64.7	64.6	73
LD831.018	79.7	76.5	73.8	71.3	68.5	67.9	70.3	67.9	54.9	75
LD831.019	83.0	79.4	74.6	71.5	69.8	67.5	64.3	60.1	50.8	73
LD831.020	76.3	75.7	71.6	68.1	64.1	58.8	54.6	52.3	50.0	66
LD831.021	78.4	79.2	77.7	71.3	74.2	69.7	67.1	65.0	53.7	76
LD831.022	72.5	73.2	71.4	70.9	67.7	68.3	63.0	55.6	47.9	72
LD831.023	82.4	91.2	83.7	74.0	71.6	68.6	66.6	62.3	53.8	75
LD831.024	68.0	65.5	70.8	72.3	70.3	68.3	67.9	54.7	46.1	74
LD831.025	78.2	77.7	82.7	86.1	81.8	79.3	71.8	65.3	56.9	84
LD831.026	77.1	75.9	72.6	73.5	68.0	63.9	60.3	54.0	46.4	70
LD831.027	88.1	91.4	96.0	91.9	92.4	91.5	88.8	80.9	71.0	96
LD831.028	81.9	85.0	86.7	84.0	83.0	84.6	82.8	77.7	71.3	89
LD831.029	64.4	73.4	81.4	75.8	75.5	72.2	68.1	62.7	57.2	77
LD831.030	73.1	75.4	75.9	72.6	76.9	69.9	67.8	62.9	59.9	77
LD831.031	69.7	79.5	77.9	70.2	69.8	67.2	62.5	53.7	47.6	72
LD831.032	71.6	90.2	88.8	80.1	78.1	74.5	68.2	62.1	57.1	80
LD831.033	68.7	82.7	84.3	80.4	77.4	73.6	69.8	64.9	59.2	79
LD831.034	66.5	83.3	82.0	72.8	69.5	65.6	60.0	55.7	49.8	72
831_Data.007	83.8	71.8	75.4	76.6	77.9	76.1	72.6	66.9	59.9	80
831_Data.009	78.7	73.6	70.8	74.9	85.4	75.3	72.4	71.5	67.2	84
831_Data.019	69.9	73.7	74.9	71.9	80.4	69.6	66.4	62.6	57.8	79
831_Data.033	72.9	73.4	72.6	65.7	65.5	67.6	64.0	59.1	53.6	71
831_Data.034	80.2	85.9	85.1	87.3	88.6	84.4	80.9	77.5	74.4	90
831_Data.035	76.4	81.3	80.6	82.1	81.2	78.2	76.1	80.2	78.2	86
831_Data.036	75.4	70.9	72.9	70.1	73.3	70.5	69.3	67.9	62.7	76
831_Data.037	79.4	70.8	70.7	86.3	83.6	78.6	78.0	79.3	75.6	87
831_Data.042	65.9	65.7	68.2	64.9	60.1	59.8	54.8	46.8	40.4	64
831_Data.043	65.8	62.4	62.4	61.7	56.2	56.5	51.7	43.9	32.7	61
831_Data.044	75.5	71.4	84.8	82.7	82.8	80.7	78.1	64.5	55.9	85
Prediction/Spec										
831_Data.001	72.8	72.1	79.4	80.9	75.4	68.4	68.0	64.2	59.6	77
831_Data.002	89.5	80.5	77.0	81.1	76.0	70.2	68.2	62.3	57.1	78
831_Data.004	71.6	75.2	77.7	74.0	77.3	70.6	65.5	64.1	63.1	77
831_Data.005	66.7	66.5	70.0	65.1	65.4	61.3	59.0	55.6	52.5	67

Measurement Reference [1,2]	Octave Band Sound Power Level Data (dB or dBA) [6]									Total
	31.5	63	125	250	500	1000	2000	4000	8000	(dBA)
LD831.004	80.5	81.4	88.7	98.2	100.2	96.3	91.4	82.8	74.1	101
LD831.005	82.0	82.3	82.8	82.7	82.1	81.5	83.5	77.1	72.4	88
LD831.006	88.3	84.7	83.1	82.2	81.5	79.1	75.9	69.1	62.0	84
LD831.007	98.9	103.1	103.1	100.2	100.3	95.7	89.7	84.3	79.7	101
LD831.008	97.7	98.5	96.8	92.1	90.8	88.1	83.1	78.0	72.8	93
LD831.009	100.1	107.7	105.4	105.5	101.9	99.2	94.5	88.7	79.8	104
LD831.010	89.0	88.9	93.1	89.8	83.9	81.0	75.9	72.0	63.2	87
LD831.011	101.2	98.8	95.6	89.5	85.6	82.1	78.2	84.3	70.5	90
LD831.012	99.0	105.0	102.8	103.3	98.6	94.7	96.4	90.5	81.4	102
LD831.013	93.3	97.5	89.7	96.3	88.9	85.8	91.5	81.1	69.9	95
LD831.014	88.4	95.1	94.5	95.1	90.7	86.3	81.7	75.4	68.9	92
LD831.015	89.6	88.1	88.1	86.5	85.1	87.8	86.1	78.7	69.1	92
LD831.016	108.9	109.7	97.7	99.0	96.2	93.0	91.6	86.5	76.8	99
LD831.017	89.2	85.4	83.9	82.3	82.0	83.0	83.5	80.7	80.5	89
LD831.018	93.7	90.5	87.8	85.3	82.5	81.9	84.3	81.9	68.9	89
LD831.019	94.5	90.9	86.1	83.0	81.3	79.0	75.8	71.6	62.3	84
LD831.020	92.2	91.6	87.5	84.1	80.1	74.7	70.5	68.2	65.9	82
LD831.021	89.2	90.0	88.5	82.1	85.0	80.5	77.9	75.8	64.5	86
LD831.022	83.5	84.2	82.4	81.9	78.7	79.3	74.0	66.5	58.9	83
LD831.023	93.4	102.2	94.7	85.0	82.6	79.6	77.6	73.3	64.8	86
LD831.024	83.9	81.4	86.7	88.3	86.3	84.2	83.8	70.6	62.1	90
LD831.025	89.7	89.2	94.2	97.6	93.3	90.8	83.3	76.8	68.4	95
LD831.026	93.0	91.8	88.5	89.4	83.9	79.9	76.2	69.9	62.3	86
LD831.027	104.1	107.3	112.0	107.8	108.3	107.5	104.8	96.8	87.0	112
LD831.028	97.8	100.9	102.7	100.0	98.9	100.6	98.8	93.7	87.2	105
LD831.029	80.4	89.4	97.3	91.8	91.4	88.1	84.1	78.6	73.1	93
LD831.030	89.0	91.4	91.8	88.6	92.9	85.8	83.7	78.8	75.8	93
LD831.031	85.6	95.5	93.8	86.2	85.8	83.2	78.4	69.6	63.5	88
LD831.032	84.7	103.2	101.8	93.2	91.2	87.6	81.3	75.2	70.2	93
LD831.033	86.3	100.2	101.8	97.9	94.9	91.1	87.3	82.4	76.8	97
LD831.034	82.4	99.2	97.9	88.7	85.5	81.6	75.9	71.6	65.7	88
831_Data.007	103.8	91.8	95.4	96.6	97.9	96.1	92.6	86.9	79.9	100
831_Data.009	97.6	92.5	89.6	93.8	104.3	94.2	91.3	90.4	86.0	103
831_Data.019	72.4	76.2	77.4	74.5	82.9	72.2	68.9	65.1	60.3	81
831_Data.033	103.9	104.4	103.6	96.6	96.5	98.6	95.0	90.0	84.5	102
831_Data.034	99.9	105.6	104.9	107.0	108.3	104.1	100.6	97.2	94.1	110
831_Data.035	90.9	95.8	95.1	96.6	95.7	92.7	90.6	94.7	92.7	100
831_Data.036	95.3	90.9	92.9	90.0	93.3	90.4	89.3	87.9	82.6	96
831_Data.037	93.6	85.0	84.9	100.4	97.7	92.8	92.2	93.5	89.8	101
831_Data.042	80.8	80.7	83.1	79.9	75.1	74.7	69.8	61.7	55.3	79
831_Data.043	80.2	76.8	76.8	76.1	70.6	71.0	66.2	58.3	47.1	75
831_Data.044	94.3	90.3	103.7	101.6	101.7	99.6	97.0	83.4	74.8	104
Prediction/Spec	99.0	92.0	92.0	93.0	86.0	81.0	75.0	71.0	66.0	88
831_Data.001	82.3	81.7	88.9	90.4	85.0	78.0	77.5	73.7	69.2	87
831_Data.002	100.5	91.5	88.0	92.1	87.0	81.2	79.2	73.3	68.1	89
831_Data.004	85.6	89.2	91.7	88.0	91.3	84.6	79.5	78.1	77.1	91
831_Data.005	81.8	81.6	85.1	80.2	80.5	76.4	74.1	70.7	67.6	82

Notes:
1. All measurements conducted on July 21-22, 2016, April 23, 2019, May 8, 2019 and March 22, 2022 using a Larson Davis 831 sound level meter.
2. All measurements were consistent with the applicable portions of the MECP Publication NPC-103.
3. Calc Type of C, A, or S refers to the source geometry, and represent cylindrical, area, or spherical sources, respectively.
4. SPL Ref Distance refers to the radial distance from the microphone to the acoustic centre of a spherical source or the symmetrical axis of a cylindrical source.
5. Net surface area refers to surface area corrected for partition coefficient. Partition coefficient applies only to spherical and cylindrical geometries. Sound power level is estimated using an area correction 10 log A.
6. Refer to "Spectral Weighting" column for dB or dBA application information.

Station Name TORONTO INTL A
Province ONTARIO
Latitude 43.68
Longitude -79.63
Elevation 173.4
Climate Identifier 6158731
WMO Identifier 71624
TC Identifier YYZ
All times are specified in Local Standard Time (LST).
Add 1 hour to adjust for Daylight Saving Time where and when it is observed.
Legend
E Estimated
M Missing
NA Not Available
‡ Partner data that is not subject to review by the National Climate Archives

Date/Time	Data Quality	Temp (°C)	Rel Hum (%)	Wind Spd (km/h)	Weather
21/07/2016 0:00	‡	21.4	58	8	NA
21/07/2016 1:00	‡	20.2	63	17	Mainly Clear
21/07/2016 2:00	‡	19.6	65	10	NA
21/07/2016 3:00	‡	19.5	67	7	NA
21/07/2016 4:00	‡	19.3	67	5	Mainly Clear
21/07/2016 5:00	‡	19.5	68	8	NA
21/07/2016 6:00	‡	20.5	65	9	NA
21/07/2016 7:00	‡	22.2	59	9	Clear
21/07/2016 8:00	‡	25.4	47	20	NA
21/07/2016 9:00	‡	27.6	43	19	NA
21/07/2016 10:00	‡	28.9	43	14	Mostly Cloudy
21/07/2016 11:00	‡	30.5	43	15	NA
21/07/2016 12:00	‡	31.5	42	21	NA
21/07/2016 13:00	‡	33	39	21	Cloudy
21/07/2016 14:00	‡	32.3	40	28	NA
21/07/2016 15:00	‡	32.6	39	31	NA
21/07/2016 16:00	‡	32.4	42	23	Cloudy
21/07/2016 17:00	‡	31.4	49	30	NA
21/07/2016 18:00	‡	30.2	54	29	NA
21/07/2016 19:00	‡	29.5	58	18	Mostly Cloudy
21/07/2016 20:00	‡	28.8	62	19	NA
21/07/2016 21:00	‡	28	65	19	NA
21/07/2016 22:00	‡	27.4	67	18	Mainly Clear
21/07/2016 23:00	‡	26.9	67	24	NA
22/07/2016 0:00	‡	25.8	68	18	NA
22/07/2016 1:00	‡	25.1	66	10	Mainly Clear
22/07/2016 2:00	‡	23.8	71	10	NA
22/07/2016 3:00	‡	24	68	15	NA
22/07/2016 4:00	‡	23.3	71	13	Mostly Cloudy
22/07/2016 5:00	‡	23	75	14	NA

Date/Time	Data Quality	Temp (°C)	Rel Hum (%)	Wind Spd (km/h)	Weather
22/07/2016 6:00	‡	23.7	77	17	NA
22/07/2016 7:00	‡	25.1	74	20	Mainly Clear
22/07/2016 8:00	‡	27.1	68	27	NA
22/07/2016 9:00	‡	29.2	61	22	NA
22/07/2016 10:00	‡	30.8	53	18	Clear
22/07/2016 11:00	‡	32.4	41	27	NA
22/07/2016 12:00	‡	31.7	39	28	NA
22/07/2016 13:00	‡	33.7	31	25	Clear
22/07/2016 14:00	‡	35.1	27	28	NA
22/07/2016 15:00	‡	33.4	31	31	NA
22/07/2016 16:00	‡	34.1	28	28	Clear
22/07/2016 17:00	‡	33.7	27	35	NA
22/07/2016 18:00	‡	32.1	33	37	NA
22/07/2016 19:00	‡	31	33	34	Clear
22/07/2016 20:00	‡	29.5	35	23	NA
22/07/2016 21:00	‡	28	43	20	NA
22/07/2016 22:00	‡	26.8	45	22	Mainly Clear
22/07/2016 23:00	‡	25.6	48	17	NA

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Hourly Data Report for April 23, 2019

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

TORONTO INTL A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	43°40'36.000" N
Longitude:	79°37'50.000" W
Elevation:	173.40 m
Climate ID:	6158731
WMO ID:	71624
TC ID:	YYZ

TIME	Temp °C	Dew Point Temp °C	Rel Hum %	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
00:00	8.8	5.2	78	24	3	24.1	99.80			NA
01:00	9.1	5.7	79	20	5	24.1	99.73			Mainly Clear
02:00	8.7	5.4	80	13	7	24.1	99.61			NA
03:00	9.0	6.0	81	11	5	24.1	99.48			NA
04:00	8.9	6.0	82	36	2	24.1	99.49			Mostly Cloudy
05:00	8.9	6.0	82	7	3	24.1	99.45			NA
06:00	8.8	5.9	81	10	10	24.1	99.32			NA
07:00	10.4	7.1	80	12	10	24.1	99.23			Mainly Clear
08:00	11.7	7.7	76	14	12	24.1	99.15			NA
09:00	12.1	7.5	74	15	12	24.1	99.04			NA
10:00	11.6	7.3	75	14	11	24.1	98.95			Rain
11:00	12.9	8.4	74	13	18	24.1	98.76			Rain Showers
12:00	12.6	8.1	74	14	14	24.1	98.56			Rain Showers

	Temp °C	Dew Point Temp °C	Rel Hum %	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
13:00	10.7	7.2	79	36	3	9.7	98.58			Thunderstorms,Rain Showers
14:00	11.3	8.7	84	14	9	17.7	98.42			Rain
15:00	11.4	9.0	85	20	8	24.1	98.38			NA
16:00	14.6	11.8	83	28	45	24.1	98.44			Cloudy
17:00	9.5	6.3	80	29	46	24.1	98.63			NA
18:00	8.0	4.4	78	29	43	24.1	98.68			NA
19:00	6.9	3.0	76	29	39	24.1	98.74			Mostly Cloudy
20:00	6.6	2.5	75	29	38	24.1	98.83			NA
21:00	6.5	2.2	74	31	31	24.1	98.88			NA
22:00	6.3	1.8	73	30	34	24.1	98.92			Cloudy
23:00	6.2	1.6	72	29	27	24.1	98.94			NA

Legend

- E = Estimated
- M = Missing

- NA = Not Available

Date modified:

2019-03-21

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Hourly Data Report for May 08, 2019

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

TORONTO INTL A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	43°40'36.000" N
Longitude:	79°37'50.000" W
Elevation:	173.40 m
Climate ID:	6158731
WMO ID:	71624
TC ID:	YYZ

TIME	Temp °C	Dew Point Temp °C	Rel Hum %	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
00:00	5.8	-2.0	57	35	23	24.1	100.47			NA
01:00	4.7	-1.5	64	35	22	24.1	100.49			Mainly Clear
02:00	4.0	-1.4	68	35	15	24.1	100.51			NA
03:00	3.6	-1.2	70	34	13	24.1	100.55			NA
04:00	3.1	-1.0	74	1	10	24.1	100.58			Mainly Clear
05:00	3.0	-0.8	76	36	8	24.1	100.65			NA
06:00	4.9	0.4	73	2	4	24.1	100.73			NA
07:00	7.9	0.4	59	10	16	24.1	100.84			Mainly Clear
08:00	8.8	-1.0	50	11	25	24.1	100.87			NA
09:00	9.7	-2.1	43	11	26	24.1	100.87			NA
10:00	10.0	-3.1	40	12	36	24.1	100.85			Mostly Cloudy
11:00	10.3	-1.0	45	12	21	24.1	100.77			NA
12:00	9.3	-2.1	45	13	37	24.1	100.77			NA

	Temp °C	Dew Point Temp °C	Rel Hum %	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
13:00	9.5	-1.9	45	14	37	24.1	100.73			Mostly Cloudy
14:00	10.6	-2.5	40	13	31	24.1	100.67			NA
15:00	11.2	-0.7	44	14	35	24.1	100.62			NA
16:00	11.1	-3.3	36	11	32	24.1	100.54			Mainly Clear
17:00	10.8	-4.7	33	11	28	24.1	100.50			NA
18:00	10.0	-4.9	35	12	22	24.1	100.50			NA
19:00	9.1	-5.3	36	11	22	24.1	100.44			Mostly Cloudy
20:00	8.8	-4.4	39	11	19	24.1	100.43			NA
21:00	8.8	-4.2	39	11	20	24.1	100.41			NA
22:00	9.4	-4.6	37	12	26	24.1	100.34			Cloudy
23:00	9.5	-4.4	37	12	26	24.1	100.34			NA

Legend

- E = Estimated
- M = Missing

- NA = Not Available

Date modified:

2019-03-21

Hourly Data Report for March 22, 2022

If selected Local Standard Time (LST), add 1 hour to adjust for Daylight Saving Time where and when it is observed.

TORONTO INTL A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	43°40'36.000" N	**Longitude:**	79°37'50.000" W
Elevation:	173.40 m	**Climate ID:**	6158731
WMO ID:	71624	**TC ID:**	YYZ

TIME LST	Temp °C	Dew Point °C	Rel Hum %	Precip. Amount mm	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
00:00	1.6	-8.7	46		35	15	24.1	100.30			NA
01:00	0.9	-8.3	51		36	16	24.1	100.31			Mainly Clear
02:00	-0.2	-7.6	58		33	10	24.1	100.37		-4	NA
03:00	-1.7	-7.2	66		33	9	24.1	100.40		-5	NA
04:00	-2.0	-7.7	65		34	13	24.1	100.42		-6	Mainly Clear
05:00	-1.7	-7.2	66		36	13	24.1	100.45		-6	NA
06:00	-2.2	-8.0	65		36	12	24.1	100.47		-6	NA
07:00	-1.0	-7.8	60		36	8	24.1	100.55		-4	Mainly Clear
08:00	0.7	-8.4	51		36	7	24.1	100.62			NA
09:00	2.1	-10.6	39		3	5	24.1	100.67			NA
10:00	3.4	-11.4	33		1	8	24.1	100.63			Mostly Cloudy
11:00	4.7	-13.3	26		2	9	24.1	100.59			NA
12:00	5.4	-11.5	29		36	2	24.1	100.56			NA
13:00	4.2	-11.9	30		17	15	24.1	100.55			Cloudy
14:00	4.0	-9.8	36		14	13	24.1	100.45			NA
15:00	4.3	-10.4	34		15	8	24.1	100.37			NA
16:00	4.1	-12.3	29		15	12	24.1	100.39			Cloudy
17:00	3.8	-13.2	28		14	11	24.1	100.36			NA
18:00	3.3	-15.2	24		10	12	24.1	100.27			NA
19:00	2.8	-12.9	31		9	7	24.1	100.33			Cloudy
20:00	3.2	-11.7	33		8	9	24.1	100.31			NA
21:00	3.3	-11.8	32		8	11	24.1	100.33			NA
22:00	3.0	-10.5	37		7	12	24.1	100.31			Cloudy
23:00	3.0	-11.3	34		10	9	24.1	100.25			NA

Legend

- E = Estimated
- M = Missing
- NA = Not Available*
- [empty] = Indicates an unobserved value

Date modified:

2022-03-02

Appendix E

Insignificant Noise Sources

List of Insignificant Noise Sources

Project: G.E. Booth WRRF
Location: Mississauga, ON

Source Description	Location and Reason/Rational
Heaters	Located indoors
Other General Exhausts	Not audible over facility noise
Other HVAC Units	Not audible over facility noise
Tanks	Not a source of significant noise emissions
Incinerators	Not audible over facility noise
Water Channels	Associated with clarifiers and aeration tanks. Assumed to be a source of odour source and audible over facility noise
HVAC Unit LAB-RTU-01	Insignificant outdoor noise level as per manufacturer data sheet (79 dBA).
Contract 3 - New Plant 1 Combustion Intake/Exhaust Vents for HVAC units	Expected not to be a significant source of noise
Contract 3 - New Plant 1 Outdoor Air Conditioning Units CDU-300-01/02, CDU-921-01, CDU-922-01, CDU-150-01	Low noise ratings from manufacturer (see Appendix D)

Appendix F

Key Parameters included in the Model and Sample Calculations

Key Parameters Included in the Noise Model

Project: G.E. Booth WRRF
Location: Mississauga, ON

Parameter	Value	Rationale
Ground Absorption	0 - 0.5	A value of 0.0 was used for Lake Ontario, a value of 0 was used for the Facility ground and an overall value of 0.5 was used for the remaining areas between the Facility and PORs to account for a mix of soft ground (e.g., grass) and hard ground (e.g., pavement) surfaces.
Temperature	10°C	Ontario standard conditions
Relative Humidity	0.7	Ontario standard conditions
Max. Order of Reflection	1	Accounts building reflections

Receiver
Name: Proposed Residential (Vacant Lot) 8th Floor
ID: POR07
X: 617081.37 m
Y: 4825754.60 m
Z: 22.50 m

Point Source, ISO 9613, Name: "HVAC Intake Louvre 1 (TOX4)", ID: "!01!TOX4_L"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
15	617416.30	4825919.05	19.00	0	DEN	32	58.9	0.0	0.0	3.0	0.0	62.4	0.0	-3.0	0.0	0.0	5.4	0.0	0.0	-3.0
15	617416.30	4825919.05	19.00	0	DEN	63	76.3	0.0	0.0	3.0	0.0	62.4	0.0	-3.0	0.0	0.0	8.1	0.0	0.0	11.8
15	617416.30	4825919.05	19.00	0	DEN	125	78.6	0.0	0.0	3.0	0.0	62.4	0.2	-2.5	0.0	0.0	11.5	0.0	0.0	9.9
15	617416.30	4825919.05	19.00	0	DEN	250	92.7	0.0	0.0	3.0	0.0	62.4	0.4	-2.5	0.0	0.0	15.2	0.0	0.0	20.2
15	617416.30	4825919.05	19.00	0	DEN	500	90.7	0.0	0.0	3.0	0.0	62.4	0.7	-2.5	0.0	0.0	18.2	0.0	0.0	14.8
15	617416.30	4825919.05	19.00	0	DEN	1000	90.8	0.0	0.0	3.0	0.0	62.4	1.4	-2.5	0.0	0.0	20.4	0.0	0.0	12.1
15	617416.30	4825919.05	19.00	0	DEN	2000	97.7	0.0	0.0	3.0	0.0	62.4	3.6	-2.5	0.0	0.0	22.1	0.0	0.0	15.0
15	617416.30	4825919.05	19.00	0	DEN	4000	87.1	0.0	0.0	3.0	0.0	62.4	12.2	-2.5	0.0	0.0	23.3	0.0	0.0	-5.4
15	617416.30	4825919.05	19.00	0	DEN	8000	73.8	0.0	0.0	3.0	0.0	62.4	43.6	-2.5	0.0	0.0	24.1	0.0	0.0	-50.9
25	617416.30	4825919.05	19.00	1	DEN	250	92.7	0.0	0.0	3.0	0.0	63.7	0.4	-2.5	0.0	0.0	20.9	0.0	1.0	12.2
25	617416.30	4825919.05	19.00	1	DEN	500	90.7	0.0	0.0	3.0	0.0	63.7	0.8	-2.5	0.0	0.0	25.0	0.0	1.0	5.7
25	617416.30	4825919.05	19.00	1	DEN	1000	90.8	0.0	0.0	3.0	0.0	63.7	1.6	-2.5	0.0	0.0	25.0	0.0	1.0	5.1
25	617416.30	4825919.05	19.00	1	DEN	2000	97.7	0.0	0.0	3.0	0.0	63.7	4.2	-2.5	0.0	0.0	25.0	0.0	1.0	9.4
25	617416.30	4825919.05	19.00	1	DEN	4000	87.1	0.0	0.0	3.0	0.0	63.7	14.1	-2.5	0.0	0.0	25.0	0.0	1.0	-11.1
25	617416.30	4825919.05	19.00	1	DEN	8000	73.8	0.0	0.0	3.0	0.0	63.7	50.3	-2.5	0.0	0.0	25.0	0.0	1.0	-60.6

Point Source, ISO 9613, Name: "Ferrous Chloride Truck Engine Idling", ID: "!01!FC_TEI"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
45	617115.43	4826209.97	1.00	0	D	32	60.5	0.0	0.0	0.0	0.0	64.2	0.0	-3.0	0.0	0.0	8.2	0.0	0.0	-8.9
45	617115.43	4826209.97	1.00	0	D	63	79.4	0.0	0.0	0.0	0.0	64.2	0.1	-3.0	0.0	0.0	10.1	0.0	0.0	8.0
45	617115.43	4826209.97	1.00	0	D	125	88.8	0.0	0.0	0.0	0.0	64.2	0.2	-2.8	0.0	0.0	12.5	0.0	0.0	14.7
45	617115.43	4826209.97	1.00	0	D	250	98.4	0.0	0.0	0.0	0.0	64.2	0.5	-2.8	0.0	0.0	15.1	0.0	0.0	21.4
45	617115.43	4826209.97	1.00	0	D	500	105.1	0.0	0.0	0.0	0.0	64.2	0.9	-2.8	0.0	0.0	17.9	0.0	0.0	24.9
45	617115.43	4826209.97	1.00	0	D	1000	104.1	0.0	0.0	0.0	0.0	64.2	1.7	-2.8	0.0	0.0	20.8	0.0	0.0	20.2
45	617115.43	4826209.97	1.00	0	D	2000	101.8	0.0	0.0	0.0	0.0	64.2	4.4	-2.8	0.0	0.0	23.8	0.0	0.0	12.2
45	617115.43	4826209.97	1.00	0	D	4000	98.2	0.0	0.0	0.0	0.0	64.2	15.0	-2.8	0.0	0.0	25.0	0.0	0.0	-3.2
45	617115.43	4826209.97	1.00	0	D	8000	93.0	0.0	0.0	0.0	0.0	64.2	53.4	-2.8	0.0	0.0	25.0	0.0	0.0	-46.8
45	617115.43	4826209.97	1.00	0	N	32	60.5	0.0	-188.0	0.0	0.0	64.2	0.0	-3.0	0.0	0.0	8.2	0.0	0.0	-196.9
45	617115.43	4826209.97	1.00	0	N	63	79.4	0.0	-188.0	0.0	0.0	64.2	0.1	-3.0	0.0	0.0	10.1	0.0	0.0	-180.0
45	617115.43	4826209.97	1.00	0	N	125	88.8	0.0	-188.0	0.0	0.0	64.2	0.2	-2.8	0.0	0.0	12.5	0.0	0.0	-173.3
45	617115.43	4826209.97	1.00	0	N	250	98.4	0.0	-188.0	0.0	0.0	64.2	0.5	-2.8	0.0	0.0	15.1	0.0	0.0	-166.6
45	617115.43	4826209.97	1.00	0	N	500	105.1	0.0	-188.0	0.0	0.0	64.2	0.9	-2.8	0.0	0.0	17.9	0.0	0.0	-163.1
45	617115.43	4826209.97	1.00	0	N	1000	104.1	0.0	-188.0	0.0	0.0	64.2	1.7	-2.8	0.0	0.0	20.8	0.0	0.0	-167.8
45	617115.43	4826209.97	1.00	0	N	2000	101.8	0.0	-188.0	0.0	0.0	64.2	4.4	-2.8	0.0	0.0	23.8	0.0	0.0	-175.8
45	617115.43	4826209.97	1.00	0	N	4000	98.2	0.0	-188.0	0.0	0.0	64.2	15.0	-2.8	0.0	0.0	25.0	0.0	0.0	-191.2
45	617115.43	4826209.97	1.00	0	N	8000	93.0	0.0	-188.0	0.0	0.0	64.2	53.4	-2.8	0.0	0.0	25.0	0.0	0.0	-234.8
45	617115.43	4826209.97	1.00	0	E	32	60.5	0.0	-188.0	0.0	0.0	64.2	0.0	-3.0	0.0	0.0	8.2	0.0	0.0	-196.9
45	617115.43	4826209.97	1.00	0	E	63	79.4	0.0	-188.0	0.0	0.0	64.2	0.1	-3.0	0.0	0.0	10.1	0.0	0.0	-180.0
45	617115.43	4826209.97	1.00	0	E	125	88.8	0.0	-188.0	0.0	0.0	64.2	0.2	-2.8	0.0	0.0	12.5	0.0	0.0	-173.3
45	617115.43	4826209.97	1.00	0	E	250	98.4	0.0	-188.0	0.0	0.0	64.2	0.5	-2.8	0.0	0.0	15.1	0.0	0.0	-166.6
45	617115.43	4826209.97	1.00	0	E	500	105.1	0.0	-188.0	0.0	0.0	64.2	0.9	-2.8	0.0	0.0	17.9	0.0	0.0	-163.1
45	617115.43	4826209.97	1.00	0	E	1000	104.1	0.0	-188.0	0.0	0.0	64.2	1.7	-2.8	0.0	0.0	20.8	0.0	0.0	-167.8
45	617115.43	4826209.97	1.00	0	E	2000	101.8	0.0	-188.0	0.0	0.0	64.2	4.4	-2.8	0.0	0.0	23.8	0.0	0.0	-175.8
45	617115.43	4826209.97	1.00	0	E	4000	98.2	0.0	-188.0	0.0	0.0	64.2	15.0	-2.8	0.0	0.0	25.0	0.0	0.0	-191.2
45	617115.43	4826209.97	1.00	0	E	8000	93.0	0.0	-188.0	0.0	0.0	64.2	53.4	-2.8	0.0	0.0	25.0	0.0	0.0	-234.8
46	617115.43	4826209.97	1.00	1	D	250	98.4	0.0	0.0	0.0	0.0	64.2	0.5	-2.8	0.0	0.0	13.7	0.0	1.0	21.8
46	617115.43	4826209.97	1.00	1	D	500	105.1	0.0	0.0	0.0	0.0	64.2	0.9	-2.8	0.0	0.0	16.4	0.0	1.0	25.4
46	617115.43	4826209.97	1.00	1	D	1000	104.1	0.0	0.0	0.0	0.0	64.2	1.7	-2.8	0.0	0.0	19.3	0.0	1.0	20.7
46	617115.43	4826209.97	1.00	1	D	2000	101.8	0.0	0.0	0.0	0.0	64.2	4.4	-2.8	0.0	0.0	22.2	0.0	1.0	12.7
46	617115.43	4826209.97	1.00	1	D	4000	98.2	0.0	0.0	0.0	0.0	64.2	15.0	-2.8	0.0	0.0	25.0	0.0	1.0	-4.3
46	617115.43	4826209.97	1.00	1	D	8000	93.0	0.0	0.0	0.0	0.0	64.2	53.7	-2.8	0.0	0.0	25.0	0.0	1.0	-48.1

Point Source, ISO 9613, Name: "Ferrous Chloride Truck Engine Idling", ID: "!01!FC_TEI"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
46	617115.43	4826209.97	1.00	1	N	250	98.4	0.0	-188.0	0.0	0.0	64.2	0.5	-2.8	0.0	0.0	13.7	0.0	1.0	-166.2
46	617115.43	4826209.97	1.00	1	N	500	105.1	0.0	-188.0	0.0	0.0	64.2	0.9	-2.8	0.0	0.0	16.4	0.0	1.0	-162.6
46	617115.43	4826209.97	1.00	1	N	1000	104.1	0.0	-188.0	0.0	0.0	64.2	1.7	-2.8	0.0	0.0	19.3	0.0	1.0	-167.3
46	617115.43	4826209.97	1.00	1	N	2000	101.8	0.0	-188.0	0.0	0.0	64.2	4.4	-2.8	0.0	0.0	22.2	0.0	1.0	-175.3
46	617115.43	4826209.97	1.00	1	N	4000	98.2	0.0	-188.0	0.0	0.0	64.2	15.0	-2.8	0.0	0.0	25.0	0.0	1.0	-192.3
46	617115.43	4826209.97	1.00	1	N	8000	93.0	0.0	-188.0	0.0	0.0	64.2	53.7	-2.8	0.0	0.0	25.0	0.0	1.0	-236.1
46	617115.43	4826209.97	1.00	1	E	250	98.4	0.0	-188.0	0.0	0.0	64.2	0.5	-2.8	0.0	0.0	13.7	0.0	1.0	-166.2
46	617115.43	4826209.97	1.00	1	E	500	105.1	0.0	-188.0	0.0	0.0	64.2	0.9	-2.8	0.0	0.0	16.4	0.0	1.0	-162.6
46	617115.43	4826209.97	1.00	1	E	1000	104.1	0.0	-188.0	0.0	0.0	64.2	1.7	-2.8	0.0	0.0	19.3	0.0	1.0	-167.3
46	617115.43	4826209.97	1.00	1	E	2000	101.8	0.0	-188.0	0.0	0.0	64.2	4.4	-2.8	0.0	0.0	22.2	0.0	1.0	-175.3
46	617115.43	4826209.97	1.00	1	E	4000	98.2	0.0	-188.0	0.0	0.0	64.2	15.0	-2.8	0.0	0.0	25.0	0.0	1.0	-192.3
46	617115.43	4826209.97	1.00	1	E	8000	93.0	0.0	-188.0	0.0	0.0	64.2	53.7	-2.8	0.0	0.0	25.0	0.0	1.0	-236.1

Point Source, ISO 9613, Name: "Solids Handling Overhead Door 1", ID: "!01!SH_OD1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
49	617435.77	4825982.11	3.00	0	DEN	32	69.5	0.0	0.0	3.0	0.0	63.5	0.0	-3.0	0.0	0.0	13.8	0.0	0.0	-1.8
49	617435.77	4825982.11	3.00	0	DEN	63	83.5	0.0	0.0	3.0	0.0	63.5	0.1	-3.0	0.0	0.0	17.0	0.0	0.0	8.9
49	617435.77	4825982.11	3.00	0	DEN	125	81.6	0.0	0.0	3.0	0.0	63.5	0.2	-2.7	0.0	0.0	20.3	0.0	0.0	3.4
49	617435.77	4825982.11	3.00	0	DEN	250	90.4	0.0	0.0	3.0	0.0	63.5	0.4	-2.7	0.0	0.0	23.8	0.0	0.0	8.4
49	617435.77	4825982.11	3.00	0	DEN	500	93.0	0.0	0.0	3.0	0.0	63.5	0.8	-2.7	0.0	0.0	24.4	0.0	0.0	10.1
49	617435.77	4825982.11	3.00	0	DEN	1000	93.0	0.0	0.0	3.0	0.0	63.5	1.5	-2.7	0.0	0.0	24.7	0.0	0.0	9.0
49	617435.77	4825982.11	3.00	0	DEN	2000	92.8	0.0	0.0	3.0	0.0	63.5	4.1	-2.7	0.0	0.0	24.8	0.0	0.0	6.1
49	617435.77	4825982.11	3.00	0	DEN	4000	87.5	0.0	0.0	3.0	0.0	63.5	13.8	-2.7	0.0	0.0	24.9	0.0	0.0	-9.0
49	617435.77	4825982.11	3.00	0	DEN	8000	75.7	0.0	0.0	3.0	0.0	63.5	49.3	-2.7	0.0	0.0	25.0	0.0	0.0	-56.3

Point Source, ISO 9613, Name: "Solids Handling Overhead Door 2", ID: "!01!SH_OD2"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
53	617425.04	4826011.40	3.00	0	DEN	32	69.5	0.0	0.0	3.0	0.0	63.7	0.0	-3.0	0.0	0.0	17.1	0.0	0.0	-5.2
53	617425.04	4826011.40	3.00	0	DEN	63	83.5	0.0	0.0	3.0	0.0	63.7	0.1	-3.0	0.0	0.0	21.0	0.0	0.0	4.7
53	617425.04	4826011.40	3.00	0	DEN	125	81.6	0.0	0.0	3.0	0.0	63.7	0.2	-2.8	0.0	0.0	23.4	0.0	0.0	0.1
53	617425.04	4826011.40	3.00	0	DEN	250	90.4	0.0	0.0	3.0	0.0	63.7	0.4	-2.8	0.0	0.0	24.1	0.0	0.0	7.9
53	617425.04	4826011.40	3.00	0	DEN	500	93.0	0.0	0.0	3.0	0.0	63.7	0.8	-2.8	0.0	0.0	24.5	0.0	0.0	9.7
53	617425.04	4826011.40	3.00	0	DEN	1000	93.0	0.0	0.0	3.0	0.0	63.7	1.6	-2.8	0.0	0.0	24.8	0.0	0.0	8.8
53	617425.04	4826011.40	3.00	0	DEN	2000	92.8	0.0	0.0	3.0	0.0	63.7	4.2	-2.8	0.0	0.0	24.9	0.0	0.0	5.9
53	617425.04	4826011.40	3.00	0	DEN	4000	87.5	0.0	0.0	3.0	0.0	63.7	14.1	-2.8	0.0	0.0	24.9	0.0	0.0	-9.4
53	617425.04	4826011.40	3.00	0	DEN	8000	75.7	0.0	0.0	3.0	0.0	63.7	50.2	-2.8	0.0	0.0	25.0	0.0	0.0	-57.4

Point Source, ISO 9613, Name: "Proposed Exansion Dewatering Building Odour Control Fan 1", ID: "!06!OCF_1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
69	617413.46	4825769.34	0.50	0	DEN	32	42.8	0.0	0.0	0.0	0.0	61.5	0.0	-3.0	0.0	0.0	9.6	0.0	0.0	-25.3
69	617413.46	4825769.34	0.50	0	DEN	63	59.0	0.0	0.0	0.0	0.0	61.5	0.0	-3.0	0.0	0.0	12.5	0.0	0.0	-12.0
69	617413.46	4825769.34	0.50	0	DEN	125	72.2	0.0	0.0	0.0	0.0	61.5	0.1	-2.7	0.0	0.0	15.3	0.0	0.0	-2.0
69	617413.46	4825769.34	0.50	0	DEN	250	79.9	0.0	0.0	0.0	0.0	61.5	0.3	-2.7	0.0	0.0	17.6	0.0	0.0	3.2
69	617413.46	4825769.34	0.50	0	DEN	500	85.8	0.0	0.0	0.0	0.0	61.5	0.6	-2.7	0.0	0.0	18.6	0.0	0.0	7.8
69	617413.46	4825769.34	0.50	0	DEN	1000	93.7	0.0	0.0	0.0	0.0	61.5	1.2	-2.7	0.0	0.0	19.3	0.0	0.0	14.5
69	617413.46	4825769.34	0.50	0	DEN	2000	96.2	0.0	0.0	0.0	0.0	61.5	3.2	-2.7	0.0	0.0	19.6	0.0	0.0	14.6
69	617413.46	4825769.34	0.50	0	DEN	4000	92.3	0.0	0.0	0.0	0.0	61.5	10.9	-2.7	0.0	0.0	19.8	0.0	0.0	2.8
69	617413.46	4825769.34	0.50	0	DEN	8000	89.1	0.0	0.0	0.0	0.0	61.5	38.9	-2.7	0.0	0.0	19.9	0.0	0.0	-28.5

Point Source, ISO 9613, Name: "Proposed Exansion Dewatering Building Odour Control Fan 2", ID: "!06!OCF_2"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
80	617417.00	4825761.57	0.50	0	DEN	32	42.8	0.0	0.0	0.0	0.0	61.5	0.0	-3.0	0.0	0.0	11.0	0.0	0.0	-26.7
80	617417.00	4825761.57	0.50	0	DEN	63	59.0	0.0	0.0	0.0	0.0	61.5	0.0	-3.0	0.0	0.0	13.8	0.0	0.0	-13.4
80	617417.00	4825761.57	0.50	0	DEN	125	72.2	0.0	0.0	0.0	0.0	61.5	0.1	-2.7	0.0	0.0	16.7	0.0	0.0	-3.5
80	617417.00	4825761.57	0.50	0	DEN	250	79.9	0.0	0.0	0.0	0.0	61.5	0.4	-2.7	0.0	0.0	18.8	0.0	0.0	1.9
80	617417.00	4825761.57	0.50	0	DEN	500	85.8	0.0	0.0	0.0	0.0	61.5	0.6	-2.7	0.0	0.0	19.4	0.0	0.0	6.9
80	617417.00	4825761.57	0.50	0	DEN	1000	93.7	0.0	0.0	0.0	0.0	61.5	1.2	-2.7	0.0	0.0	19.7	0.0	0.0	14.0
80	617417.00	4825761.57	0.50	0	DEN	2000	96.2	0.0	0.0	0.0	0.0	61.5	3.3	-2.7	0.0	0.0	19.8	0.0	0.0	14.3
80	617417.00	4825761.57	0.50	0	DEN	4000	92.3	0.0	0.0	0.0	0.0	61.5	11.0	-2.7	0.0	0.0	19.9	0.0	0.0	2.5

Point Source, ISO 9613, Name: "Proposed Exansion Dewatering Building Odour Control Fan 2", ID: "!06!OCF_2"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
80	617417.00	4825761.57	0.50	0	DEN	8000	89.1	0.0	0.0	0.0	0.0	61.5	39.3	-2.7	0.0	0.0	20.0	0.0	0.0	-29.0

Point Source, ISO 9613, Name: "Proposed Ground MUA-922-01 OA Intake (Plant 2 OCF)", ID: "!04!MUA-922-01_IN"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
96	617236.29	4825829.46	0.70	0	DEN	32	42.6	0.0	0.0	3.0	0.0	55.8	0.0	-3.0	0.0	0.0	5.6	0.0	0.0	-12.8
96	617236.29	4825829.46	0.70	0	DEN	63	55.8	0.0	0.0	3.0	0.0	55.8	0.0	-3.0	0.0	0.0	8.0	0.0	0.0	-2.0
96	617236.29	4825829.46	0.70	0	DEN	125	63.9	0.0	0.0	3.0	0.0	55.8	0.1	-2.4	0.0	0.0	10.6	0.0	0.0	2.8
96	617236.29	4825829.46	0.70	0	DEN	250	81.4	0.0	0.0	3.0	0.0	55.8	0.2	-2.4	0.0	0.0	13.6	0.0	0.0	17.2
96	617236.29	4825829.46	0.70	0	DEN	500	82.8	0.0	0.0	3.0	0.0	55.8	0.3	-2.4	0.0	0.0	16.4	0.0	0.0	15.7
96	617236.29	4825829.46	0.70	0	DEN	1000	82.0	0.0	0.0	3.0	0.0	55.8	0.6	-2.4	0.0	0.0	17.9	0.0	0.0	13.1
96	617236.29	4825829.46	0.70	0	DEN	2000	80.2	0.0	0.0	3.0	0.0	55.8	1.7	-2.4	0.0	0.0	18.8	0.0	0.0	9.3
96	617236.29	4825829.46	0.70	0	DEN	4000	74.0	0.0	0.0	3.0	0.0	55.8	5.7	-2.4	0.0	0.0	19.4	0.0	0.0	-1.4
96	617236.29	4825829.46	0.70	0	DEN	8000	64.9	0.0	0.0	3.0	0.0	55.8	20.3	-2.4	0.0	0.0	19.7	0.0	0.0	-25.4

Point Source, ISO 9613, Name: "New Storage Complex Indirect Fired Make-up Air Unit", ID: "!01!SC_AHU_1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
123	617193.30	4826296.14	11.62	0	DEN	32	65.0	0.0	0.0	0.0	0.0	65.9	0.0	-3.0	0.0	0.0	4.5	0.0	0.0	-2.5
123	617193.30	4826296.14	11.62	0	DEN	63	75.0	0.0	0.0	0.0	0.0	65.9	0.1	-3.0	0.0	0.0	4.8	0.0	0.0	7.3
123	617193.30	4826296.14	11.62	0	DEN	125	82.4	0.0	0.0	0.0	0.0	65.9	0.2	-2.8	0.0	0.0	4.9	0.0	0.0	14.2
123	617193.30	4826296.14	11.62	0	DEN	250	87.4	0.0	0.0	0.0	0.0	65.9	0.6	-2.8	0.0	0.0	5.1	0.0	0.0	18.6
123	617193.30	4826296.14	11.62	0	DEN	500	90.0	0.0	0.0	0.0	0.0	65.9	1.1	-2.8	0.0	0.0	5.6	0.0	0.0	20.3
123	617193.30	4826296.14	11.62	0	DEN	1000	92.6	0.0	0.0	0.0	0.0	65.9	2.0	-2.8	0.0	0.0	6.7	0.0	0.0	20.8
123	617193.30	4826296.14	11.62	0	DEN	2000	96.2	0.0	0.0	0.0	0.0	65.9	5.3	-2.8	0.0	0.0	8.9	0.0	0.0	18.9
123	617193.30	4826296.14	11.62	0	DEN	4000	93.6	0.0	0.0	0.0	0.0	65.9	18.1	-2.8	0.0	0.0	11.7	0.0	0.0	0.7
123	617193.30	4826296.14	11.62	0	DEN	8000	78.5	0.0	0.0	0.0	0.0	65.9	64.6	-2.8	0.0	0.0	14.5	0.0	0.0	-63.7

Point Source, ISO 9613, Name: "Solids Receiving Overhead Door", ID: "!01!SR_OD"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
126	617478.73	4825961.13	2.50	0	DEN	32	49.5	0.0	0.0	3.0	0.0	64.0	0.0	-3.0	0.0	0.0	10.0	0.0	0.0	-18.5
126	617478.73	4825961.13	2.50	0	DEN	63	60.2	0.0	0.0	3.0	0.0	64.0	0.1	-3.0	0.0	0.0	13.8	0.0	0.0	-11.7
126	617478.73	4825961.13	2.50	0	DEN	125	75.6	0.0	0.0	3.0	0.0	64.0	0.2	-2.8	0.0	0.0	17.3	0.0	0.0	-0.2
126	617478.73	4825961.13	2.50	0	DEN	250	84.7	0.0	0.0	3.0	0.0	64.0	0.5	-2.8	0.0	0.0	20.5	0.0	0.0	5.5
126	617478.73	4825961.13	2.50	0	DEN	500	88.1	0.0	0.0	3.0	0.0	64.0	0.9	-2.8	0.0	0.0	23.5	0.0	0.0	5.4
126	617478.73	4825961.13	2.50	0	DEN	1000	89.2	0.0	0.0	3.0	0.0	64.0	1.6	-2.8	0.0	0.0	24.2	0.0	0.0	5.1
126	617478.73	4825961.13	2.50	0	DEN	2000	90.0	0.0	0.0	3.0	0.0	64.0	4.3	-2.8	0.0	0.0	24.6	0.0	0.0	2.8
126	617478.73	4825961.13	2.50	0	DEN	4000	76.6	0.0	0.0	3.0	0.0	64.0	14.7	-2.8	0.0	0.0	24.8	0.0	0.0	-21.1
126	617478.73	4825961.13	2.50	0	DEN	8000	66.0	0.0	0.0	3.0	0.0	64.0	52.4	-2.8	0.0	0.0	24.9	0.0	0.0	-69.6
148	617478.73	4825961.13	2.50	1	DEN	250	84.7	0.0	0.0	3.0	0.0	64.3	0.5	-2.8	0.0	0.0	21.9	0.0	1.0	2.8
148	617478.73	4825961.13	2.50	1	DEN	500	88.1	0.0	0.0	3.0	0.0	64.3	0.9	-2.8	0.0	0.0	24.9	0.0	1.0	2.7
148	617478.73	4825961.13	2.50	1	DEN	1000	89.2	0.0	0.0	3.0	0.0	64.3	1.7	-2.8	0.0	0.0	25.0	0.0	1.0	2.9
148	617478.73	4825961.13	2.50	1	DEN	2000	90.0	0.0	0.0	3.0	0.0	64.3	4.5	-2.8	0.0	0.0	25.0	0.0	1.0	1.0
148	617478.73	4825961.13	2.50	1	DEN	4000	76.6	0.0	0.0	3.0	0.0	64.3	15.2	-2.8	0.0	0.0	25.0	0.0	1.0	-23.2
148	617478.73	4825961.13	2.50	1	DEN	8000	66.0	0.0	0.0	3.0	0.0	64.3	54.2	-2.8	0.0	0.0	25.0	0.0	1.0	-72.7

Point Source, ISO 9613, Name: "Idling Transport Truck", ID: "!01!ITT"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
160	617460.62	4825938.54	1.00	0	DEN	32	58.0	0.0	0.0	0.0	0.0	63.5	0.0	-3.0	0.0	0.0	10.4	0.0	0.0	-12.9
160	617460.62	4825938.54	1.00	0	DEN	63	75.7	0.0	0.0	0.0	0.0	63.5	0.1	-3.0	0.0	0.0	14.5	0.0	0.0	0.6
160	617460.62	4825938.54	1.00	0	DEN	125	80.0	0.0	0.0	0.0	0.0	63.5	0.2	-2.8	0.0	0.0	18.4	0.0	0.0	0.7
160	617460.62	4825938.54	1.00	0	DEN	250	84.2	0.0	0.0	0.0	0.0	63.5	0.4	-2.8	0.0	0.0	21.7	0.0	0.0	1.3
160	617460.62	4825938.54	1.00	0	DEN	500	89.1	0.0	0.0	0.0	0.0	63.5	0.8	-2.8	0.0	0.0	23.2	0.0	0.0	4.4
160	617460.62	4825938.54	1.00	0	DEN	1000	92.7	0.0	0.0	0.0	0.0	63.5	1.5	-2.8	0.0	0.0	24.0	0.0	0.0	6.4
160	617460.62	4825938.54	1.00	0	DEN	2000	91.3	0.0	0.0	0.0	0.0	63.5	4.1	-2.8	0.0	0.0	24.5	0.0	0.0	2.0
160	617460.62	4825938.54	1.00	0	DEN	4000	85.7	0.0	0.0	0.0	0.0	63.5	13.8	-2.8	0.0	0.0	24.7	0.0	0.0	-13.6
160	617460.62	4825938.54	1.00	0	DEN	8000	75.8	0.0	0.0	0.0	0.0	63.5	49.3	-2.8	0.0	0.0	24.9	0.0	0.0	-59.1
162	617460.62	4825938.54	1.00	1	DEN	250	84.2	0.0	0.0	0.0	0.0	64.6	0.5	-2.8	0.0	0.0	24.1	0.0	1.0	-3.3
162	617460.62	4825938.54	1.00	1	DEN	500	89.1	0.0	0.0	0.0	0.0	64.6	0.9	-2.8	0.0	0.0	25.0	0.0	1.0	0.4
162	617460.62	4825938.54	1.00	1	DEN	1000	92.7	0.0	0.0	0.0	0.0	64.6	1.7	-2.8	0.0	0.0	25.0	0.0	1.0	3.1
162	617460.62	4825938.54	1.00	1	DEN	2000	91.3	0.0	0.0	0.0	0.0	64.6	4.6	-2.8	0.0	0.0	25.0	0.0	1.0	-1.1

Point Source, ISO 9613, Name: "Idling Transport Truck", ID: "!01!ITT"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
162	617460.62	4825938.54	1.00	1	DEN	4000	85.7	0.0	0.0	0.0	0.0	64.6	15.7	-2.8	0.0	0.0	25.0	0.0	1.0	-17.8
162	617460.62	4825938.54	1.00	1	DEN	8000	75.8	0.0	0.0	0.0	0.0	64.6	55.8	-2.8	0.0	0.0	25.0	0.0	1.0	-67.8

Point Source, ISO 9613, Name: "Sodium Hypochlorite Truck Blower", ID: "!01!SH_TB"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
165	617472.04	4825943.86	0.50	0	D	32	58.2	0.0	0.0	0.0	0.0	63.8	0.0	-3.0	0.0	0.0	8.6	0.0	0.0	-11.2
165	617472.04	4825943.86	0.50	0	D	63	66.3	0.0	0.0	0.0	0.0	63.8	0.1	-3.0	0.0	0.0	12.6	0.0	0.0	-7.1
165	617472.04	4825943.86	0.50	0	D	125	73.5	0.0	0.0	0.0	0.0	63.8	0.2	-2.8	0.0	0.0	16.3	0.0	0.0	-4.0
165	617472.04	4825943.86	0.50	0	D	250	85.2	0.0	0.0	0.0	0.0	63.8	0.5	-2.8	0.0	0.0	19.6	0.0	0.0	4.1
165	617472.04	4825943.86	0.50	0	D	500	101.1	0.0	0.0	0.0	0.0	63.8	0.8	-2.8	0.0	0.0	22.5	0.0	0.0	16.8
165	617472.04	4825943.86	0.50	0	D	1000	94.2	0.0	0.0	0.0	0.0	63.8	1.6	-2.8	0.0	0.0	23.5	0.0	0.0	8.1
165	617472.04	4825943.86	0.50	0	D	2000	92.5	0.0	0.0	0.0	0.0	63.8	4.2	-2.8	0.0	0.0	24.2	0.0	0.0	3.1
165	617472.04	4825943.86	0.50	0	D	4000	91.4	0.0	0.0	0.0	0.0	63.8	14.2	-2.8	0.0	0.0	24.6	0.0	0.0	-8.4
165	617472.04	4825943.86	0.50	0	D	8000	84.9	0.0	0.0	0.0	0.0	63.8	50.8	-2.8	0.0	0.0	24.8	0.0	0.0	-51.7
165	617472.04	4825943.86	0.50	0	N	32	58.2	0.0	-188.0	0.0	0.0	63.8	0.0	-3.0	0.0	0.0	8.6	0.0	0.0	-199.2
165	617472.04	4825943.86	0.50	0	N	63	66.3	0.0	-188.0	0.0	0.0	63.8	0.1	-3.0	0.0	0.0	12.6	0.0	0.0	-195.1
165	617472.04	4825943.86	0.50	0	N	125	73.5	0.0	-188.0	0.0	0.0	63.8	0.2	-2.8	0.0	0.0	16.3	0.0	0.0	-192.0
165	617472.04	4825943.86	0.50	0	N	250	85.2	0.0	-188.0	0.0	0.0	63.8	0.5	-2.8	0.0	0.0	19.6	0.0	0.0	-183.9
165	617472.04	4825943.86	0.50	0	N	500	101.1	0.0	-188.0	0.0	0.0	63.8	0.8	-2.8	0.0	0.0	22.5	0.0	0.0	-171.2
165	617472.04	4825943.86	0.50	0	N	1000	94.2	0.0	-188.0	0.0	0.0	63.8	1.6	-2.8	0.0	0.0	23.5	0.0	0.0	-179.9
165	617472.04	4825943.86	0.50	0	N	2000	92.5	0.0	-188.0	0.0	0.0	63.8	4.2	-2.8	0.0	0.0	24.2	0.0	0.0	-184.9
165	617472.04	4825943.86	0.50	0	N	4000	91.4	0.0	-188.0	0.0	0.0	63.8	14.2	-2.8	0.0	0.0	24.6	0.0	0.0	-196.4
165	617472.04	4825943.86	0.50	0	N	8000	84.9	0.0	-188.0	0.0	0.0	63.8	50.8	-2.8	0.0	0.0	24.8	0.0	0.0	-239.7
165	617472.04	4825943.86	0.50	0	E	32	58.2	0.0	-188.0	0.0	0.0	63.8	0.0	-3.0	0.0	0.0	8.6	0.0	0.0	-199.2
165	617472.04	4825943.86	0.50	0	E	63	66.3	0.0	-188.0	0.0	0.0	63.8	0.1	-3.0	0.0	0.0	12.6	0.0	0.0	-195.1
165	617472.04	4825943.86	0.50	0	E	125	73.5	0.0	-188.0	0.0	0.0	63.8	0.2	-2.8	0.0	0.0	16.3	0.0	0.0	-192.0
165	617472.04	4825943.86	0.50	0	E	250	85.2	0.0	-188.0	0.0	0.0	63.8	0.5	-2.8	0.0	0.0	19.6	0.0	0.0	-183.9
165	617472.04	4825943.86	0.50	0	E	500	101.1	0.0	-188.0	0.0	0.0	63.8	0.8	-2.8	0.0	0.0	22.5	0.0	0.0	-171.2
165	617472.04	4825943.86	0.50	0	E	1000	94.2	0.0	-188.0	0.0	0.0	63.8	1.6	-2.8	0.0	0.0	23.5	0.0	0.0	-179.9
165	617472.04	4825943.86	0.50	0	E	2000	92.5	0.0	-188.0	0.0	0.0	63.8	4.2	-2.8	0.0	0.0	24.2	0.0	0.0	-184.9
165	617472.04	4825943.86	0.50	0	E	4000	91.4	0.0	-188.0	0.0	0.0	63.8	14.2	-2.8	0.0	0.0	24.6	0.0	0.0	-196.4
165	617472.04	4825943.86	0.50	0	E	8000	84.9	0.0	-188.0	0.0	0.0	63.8	50.8	-2.8	0.0	0.0	24.8	0.0	0.0	-239.7
167	617472.04	4825943.86	0.50	1	D	250	85.2	0.0	0.0	0.0	0.0	64.8	0.5	-2.8	0.0	0.0	21.0	0.0	1.0	0.6
167	617472.04	4825943.86	0.50	1	D	500	101.1	0.0	0.0	0.0	0.0	64.8	0.9	-2.8	0.0	0.0	24.0	0.0	1.0	13.2
167	617472.04	4825943.86	0.50	1	D	1000	94.2	0.0	0.0	0.0	0.0	64.8	1.8	-2.8	0.0	0.0	25.0	0.0	1.0	4.4
167	617472.04	4825943.86	0.50	1	D	2000	92.5	0.0	0.0	0.0	0.0	64.8	4.7	-2.8	0.0	0.0	25.0	0.0	1.0	-0.3
167	617472.04	4825943.86	0.50	1	D	4000	91.4	0.0	0.0	0.0	0.0	64.8	16.1	-2.8	0.0	0.0	25.0	0.0	1.0	-12.7
167	617472.04	4825943.86	0.50	1	D	8000	84.9	0.0	0.0	0.0	0.0	64.8	57.3	-2.8	0.0	0.0	25.0	0.0	1.0	-60.4
167	617472.04	4825943.86	0.50	1	N	250	85.2	0.0	-188.0	0.0	0.0	64.8	0.5	-2.8	0.0	0.0	21.0	0.0	1.0	-187.4
167	617472.04	4825943.86	0.50	1	N	500	101.1	0.0	-188.0	0.0	0.0	64.8	0.9	-2.8	0.0	0.0	24.0	0.0	1.0	-174.8
167	617472.04	4825943.86	0.50	1	N	1000	94.2	0.0	-188.0	0.0	0.0	64.8	1.8	-2.8	0.0	0.0	25.0	0.0	1.0	-183.6
167	617472.04	4825943.86	0.50	1	N	2000	92.5	0.0	-188.0	0.0	0.0	64.8	4.7	-2.8	0.0	0.0	25.0	0.0	1.0	-188.3
167	617472.04	4825943.86	0.50	1	N	4000	91.4	0.0	-188.0	0.0	0.0	64.8	16.1	-2.8	0.0	0.0	25.0	0.0	1.0	-200.7
167	617472.04	4825943.86	0.50	1	N	8000	84.9	0.0	-188.0	0.0	0.0	64.8	57.3	-2.8	0.0	0.0	25.0	0.0	1.0	-248.4
167	617472.04	4825943.86	0.50	1	E	250	85.2	0.0	-188.0	0.0	0.0	64.8	0.5	-2.8	0.0	0.0	21.0	0.0	1.0	-187.4
167	617472.04	4825943.86	0.50	1	E	500	101.1	0.0	-188.0	0.0	0.0	64.8	0.9	-2.8	0.0	0.0	24.0	0.0	1.0	-174.8
167	617472.04	4825943.86	0.50	1	E	1000	94.2	0.0	-188.0	0.0	0.0	64.8	1.8	-2.8	0.0	0.0	25.0	0.0	1.0	-183.6
167	617472.04	4825943.86	0.50	1	E	2000	92.5	0.0	-188.0	0.0	0.0	64.8	4.7	-2.8	0.0	0.0	25.0	0.0	1.0	-188.3
167	617472.04	4825943.86	0.50	1	E	4000	91.4	0.0	-188.0	0.0	0.0	64.8	16.1	-2.8	0.0	0.0	25.0	0.0	1.0	-200.7
167	617472.04	4825943.86	0.50	1	E	8000	84.9	0.0	-188.0	0.0	0.0	64.8	57.3	-2.8	0.0	0.0	25.0	0.0	1.0	-248.4

Point Source, ISO 9613, Name: "Proposed Rooftop MUA-152-01 OA Intake (Plant 2)", ID: "!04!MUA-152-01_IN"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
169	617205.00	4825859.33	6.55	0	DEN	32	36.8	0.0	0.0	3.0	0.0	55.2	0.0	-3.0	0.0	0.0	2.2	0.0	0.0	-14.7
169	617205.00	4825859.33	6.55	0	DEN	63	50.0	0.0	0.0	3.0	0.0	55.2	0.0	-3.0	0.0	0.0	2.9	0.0	0.0	-2.2
169	617205.00	4825859.33	6.55	0	DEN	125	65.1	0.0	0.0	3.0	0.0	55.2	0.1	-0.8	0.0	0.0	3.7	0.0	0.0	9.8
169	617205.00	4825859.33	6.55	0	DEN	250	78.6	0.0	0.0	3.0	0.0	55.2	0.2	-1.6	0.0	0.0	4.7	0.0	0.0	23.1
169	617205.00	4825859.33	6.55	0	DEN	500	80.0	0.0	0.0	3.0	0.0	55.2	0.3	-1.7	0.0	0.0	5.8	0.0	0.0	23.3
169	617205.00	4825859.33	6.55	0	DEN	1000	78.2	0.0	0.0	3.0	0.0	55.2	0.6	-1.7	0.0	0.0	7.3	0.0	0.0	19.7
169	617205.00	4825859.33	6.55	0	DEN	2000	78.4	0.0	0.0	3.0	0.0	55.2	1.6	-1.7	0.0	0.0	9.2	0.0	0.0	17.1
169	617205.00	4825859.33	6.55	0	DEN	4000	68.2	0.0	0.0	3.0	0.0	55.2	5.3	-1.7	0.0	0.0	11.2	0.0	0.0	1.1

Point Source, ISO 9613, Name: "Proposed Rooftop MUA-152-01 OA Intake (Plant 2)", ID: "!04!MUA-152-01_IN"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
169	617205.00	4825859.33	6.55	0	DEN	8000	56.1	0.0	0.0	3.0	0.0	55.2	19.0	-1.7	0.0	0.0	13.3	0.0	0.0	-26.8
203	617205.00	4825859.33	6.55	1	DEN	250	78.6	0.0	0.0	3.0	0.0	57.9	0.2	-1.9	0.0	0.0	12.0	0.0	1.0	12.4
203	617205.00	4825859.33	6.55	1	DEN	500	80.0	0.0	0.0	3.0	0.0	57.9	0.4	-2.0	0.0	0.0	14.6	0.0	1.0	11.0
203	617205.00	4825859.33	6.55	1	DEN	1000	78.2	0.0	0.0	3.0	0.0	57.9	0.8	-2.0	0.0	0.0	17.3	0.0	1.0	6.1
203	617205.00	4825859.33	6.55	1	DEN	2000	78.4	0.0	0.0	3.0	0.0	57.9	2.1	-2.0	0.0	0.0	20.0	0.0	1.0	2.3
203	617205.00	4825859.33	6.55	1	DEN	4000	68.2	0.0	0.0	3.0	0.0	57.9	7.2	-2.0	0.0	0.0	20.0	0.0	1.0	-13.0
203	617205.00	4825859.33	6.55	1	DEN	8000	56.1	0.0	0.0	3.0	0.0	57.9	25.8	-2.0	0.0	0.0	20.0	0.0	1.0	-43.7
205	617205.00	4825859.33	6.55	1	DEN	125	65.1	0.0	0.0	3.0	0.0	57.6	0.1	-1.3	0.0	0.0	5.3	0.0	1.0	5.4
205	617205.00	4825859.33	6.55	1	DEN	250	78.6	0.0	0.0	3.0	0.0	57.6	0.2	-1.9	0.0	0.0	5.8	0.0	1.0	18.9
205	617205.00	4825859.33	6.55	1	DEN	500	80.0	0.0	0.0	3.0	0.0	57.6	0.4	-2.0	0.0	0.0	6.6	0.0	1.0	19.4
205	617205.00	4825859.33	6.55	1	DEN	1000	78.2	0.0	0.0	3.0	0.0	57.6	0.8	-2.0	0.0	0.0	7.8	0.0	1.0	16.0
205	617205.00	4825859.33	6.55	1	DEN	2000	78.4	0.0	0.0	3.0	0.0	57.6	2.1	-2.0	0.0	0.0	9.6	0.0	1.0	13.1
205	617205.00	4825859.33	6.55	1	DEN	4000	68.2	0.0	0.0	3.0	0.0	57.6	7.0	-2.0	0.0	0.0	11.9	0.0	1.0	-4.3
205	617205.00	4825859.33	6.55	1	DEN	8000	56.1	0.0	0.0	3.0	0.0	57.6	24.9	-2.0	0.0	0.0	14.4	0.0	1.0	-36.9

Point Source, ISO 9613, Name: "Polymer Truck Blower", ID: "!01!PO_TB"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
208	617480.77	4825966.09	0.75	0	D	32	59.2	0.0	-3.0	0.0	0.0	64.1	0.0	-3.0	0.0	0.0	10.2	0.0	0.0	-15.2
208	617480.77	4825966.09	0.75	0	D	63	63.8	0.0	-3.0	0.0	0.0	64.1	0.1	-3.0	0.0	0.0	14.1	0.0	0.0	-14.5
208	617480.77	4825966.09	0.75	0	D	125	73.8	0.0	-3.0	0.0	0.0	64.1	0.2	-2.8	0.0	0.0	17.6	0.0	0.0	-8.4
208	617480.77	4825966.09	0.75	0	D	250	96.8	0.0	-3.0	0.0	0.0	64.1	0.5	-2.8	0.0	0.0	20.8	0.0	0.0	11.1
208	617480.77	4825966.09	0.75	0	D	500	99.5	0.0	-3.0	0.0	0.0	64.1	0.9	-2.8	0.0	0.0	23.7	0.0	0.0	10.6
208	617480.77	4825966.09	0.75	0	D	1000	97.8	0.0	-3.0	0.0	0.0	64.1	1.7	-2.8	0.0	0.0	24.3	0.0	0.0	7.5
208	617480.77	4825966.09	0.75	0	D	2000	98.4	0.0	-3.0	0.0	0.0	64.1	4.4	-2.8	0.0	0.0	24.6	0.0	0.0	5.0
208	617480.77	4825966.09	0.75	0	D	4000	99.5	0.0	-3.0	0.0	0.0	64.1	14.8	-2.8	0.0	0.0	24.8	0.0	0.0	-4.5
208	617480.77	4825966.09	0.75	0	D	8000	93.7	0.0	-3.0	0.0	0.0	64.1	52.9	-2.8	0.0	0.0	24.9	0.0	0.0	-48.4
208	617480.77	4825966.09	0.75	0	N	32	59.2	0.0	-188.0	0.0	0.0	64.1	0.0	-3.0	0.0	0.0	10.2	0.0	0.0	-200.2
208	617480.77	4825966.09	0.75	0	N	63	63.8	0.0	-188.0	0.0	0.0	64.1	0.1	-3.0	0.0	0.0	14.1	0.0	0.0	-199.5
208	617480.77	4825966.09	0.75	0	N	125	73.8	0.0	-188.0	0.0	0.0	64.1	0.2	-2.8	0.0	0.0	17.6	0.0	0.0	-193.4
208	617480.77	4825966.09	0.75	0	N	250	96.8	0.0	-188.0	0.0	0.0	64.1	0.5	-2.8	0.0	0.0	20.8	0.0	0.0	-173.8
208	617480.77	4825966.09	0.75	0	N	500	99.5	0.0	-188.0	0.0	0.0	64.1	0.9	-2.8	0.0	0.0	23.7	0.0	0.0	-174.4
208	617480.77	4825966.09	0.75	0	N	1000	97.8	0.0	-188.0	0.0	0.0	64.1	1.7	-2.8	0.0	0.0	24.3	0.0	0.0	-177.5
208	617480.77	4825966.09	0.75	0	N	2000	98.4	0.0	-188.0	0.0	0.0	64.1	4.4	-2.8	0.0	0.0	24.6	0.0	0.0	-180.0
208	617480.77	4825966.09	0.75	0	N	4000	99.5	0.0	-188.0	0.0	0.0	64.1	14.8	-2.8	0.0	0.0	24.8	0.0	0.0	-189.5
208	617480.77	4825966.09	0.75	0	N	8000	93.7	0.0	-188.0	0.0	0.0	64.1	52.9	-2.8	0.0	0.0	24.9	0.0	0.0	-233.4
208	617480.77	4825966.09	0.75	0	E	32	59.2	0.0	-188.0	0.0	0.0	64.1	0.0	-3.0	0.0	0.0	10.2	0.0	0.0	-200.2
208	617480.77	4825966.09	0.75	0	E	63	63.8	0.0	-188.0	0.0	0.0	64.1	0.1	-3.0	0.0	0.0	14.1	0.0	0.0	-199.5
208	617480.77	4825966.09	0.75	0	E	125	73.8	0.0	-188.0	0.0	0.0	64.1	0.2	-2.8	0.0	0.0	17.6	0.0	0.0	-193.4
208	617480.77	4825966.09	0.75	0	E	250	96.8	0.0	-188.0	0.0	0.0	64.1	0.5	-2.8	0.0	0.0	20.8	0.0	0.0	-173.8
208	617480.77	4825966.09	0.75	0	E	500	99.5	0.0	-188.0	0.0	0.0	64.1	0.9	-2.8	0.0	0.0	23.7	0.0	0.0	-174.4
208	617480.77	4825966.09	0.75	0	E	1000	97.8	0.0	-188.0	0.0	0.0	64.1	1.7	-2.8	0.0	0.0	24.3	0.0	0.0	-177.5
208	617480.77	4825966.09	0.75	0	E	2000	98.4	0.0	-188.0	0.0	0.0	64.1	4.4	-2.8	0.0	0.0	24.6	0.0	0.0	-180.0
208	617480.77	4825966.09	0.75	0	E	4000	99.5	0.0	-188.0	0.0	0.0	64.1	14.8	-2.8	0.0	0.0	24.8	0.0	0.0	-189.5
208	617480.77	4825966.09	0.75	0	E	8000	93.7	0.0	-188.0	0.0	0.0	64.1	52.9	-2.8	0.0	0.0	24.9	0.0	0.0	-233.4
222	617480.77	4825966.09	0.75	1	D	63	63.8	0.0	-3.0	0.0	0.0	64.6	0.1	-3.0	0.0	0.0	10.0	0.0	1.0	-11.9
222	617480.77	4825966.09	0.75	1	D	125	73.8	0.0	-3.0	0.0	0.0	64.6	0.2	-2.8	0.0	0.0	13.5	0.0	1.0	-5.7
222	617480.77	4825966.09	0.75	1	D	250	96.8	0.0	-3.0	0.0	0.0	64.6	0.5	-2.8	0.0	0.0	16.8	0.0	1.0	13.6
222	617480.77	4825966.09	0.75	1	D	500	99.5	0.0	-3.0	0.0	0.0	64.6	0.9	-2.8	0.0	0.0	19.9	0.0	1.0	12.8
222	617480.77	4825966.09	0.75	1	D	1000	97.8	0.0	-3.0	0.0	0.0	64.6	1.8	-2.8	0.0	0.0	22.9	0.0	1.0	7.3
222	617480.77	4825966.09	0.75	1	D	2000	98.4	0.0	-3.0	0.0	0.0	64.6	4.6	-2.8	0.0	0.0	25.0	0.0	1.0	2.9
222	617480.77	4825966.09	0.75	1	D	4000	99.5	0.0	-3.0	0.0	0.0	64.6	15.7	-2.8	0.0	0.0	25.0	0.0	1.0	-7.1
222	617480.77	4825966.09	0.75	1	D	8000	93.7	0.0	-3.0	0.0	0.0	64.6	56.1	-2.8	0.0	0.0	25.0	0.0	1.0	-53.3
222	617480.77	4825966.09	0.75	1	N	63	63.8	0.0	-188.0	0.0	0.0	64.6	0.1	-3.0	0.0	0.0	10.0	0.0	1.0	-196.9
222	617480.77	4825966.09	0.75	1	N	125	73.8	0.0	-188.0	0.0	0.0	64.6	0.2	-2.8	0.0	0.0	13.5	0.0	1.0	-190.7
222	617480.77	4825966.09	0.75	1	N	250	96.8	0.0	-188.0	0.0	0.0	64.6	0.5	-2.8	0.0	0.0	16.8	0.0	1.0	-171.4
222	617480.77	4825966.09	0.75	1	N	500	99.5	0.0	-188.0	0.0	0.0	64.6	0.9	-2.8	0.0	0.0	19.9	0.0	1.0	-172.1
222	617480.77	4825966.09	0.75	1	N	1000	97.8	0.0	-188.0	0.0	0.0	64.6	1.8	-2.8	0.0	0.0	22.9	0.0	1.0	-177.7
222	617480.77	4825966.09	0.75	1	N	2000	98.4	0.0	-188.0	0.0	0.0	64.6	4.6	-2.8	0.0	0.0	25.0	0.0	1.0	-182.1
222	617480.77	4825966.09	0.75	1	N	4000	99.5	0.0	-188.0	0.0	0.0	64.6	15.7	-2.8	0.0	0.0	25.0	0.0	1.0	-192.1
222	617480.77	4825966.09	0.75	1	N	8000	93.7	0.0	-188.0	0.0	0.0	64.6	56.1	-2.8	0.0	0.0	25.0	0.0	1.0	-238.3
222	617480.77	4825966.09	0.75	1	E	63	63.8	0.0	-188.0	0.0	0.0	64.6	0.1	-3.0	0.0	0.0	10.0	0.0	1.0	-196.9
222	617480.77	4825966.09	0.75	1	E	125	73.8	0.0	-188.0	0.0	0.0	64.6	0.2	-2.8	0.0	0.0	13.5	0.0	1.0	-190.7

Point Source, ISO 9613, Name: "Polymer Truck Blower", ID: "!01!PO_TB"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
222	617480.77	4825966.09	0.75	1	E	250	96.8	0.0	-188.0	0.0	0.0	64.6	0.5	-2.8	0.0	0.0	16.8	0.0	1.0	-171.4
222	617480.77	4825966.09	0.75	1	E	500	99.5	0.0	-188.0	0.0	0.0	64.6	0.9	-2.8	0.0	0.0	19.9	0.0	1.0	-172.1
222	617480.77	4825966.09	0.75	1	E	1000	97.8	0.0	-188.0	0.0	0.0	64.6	1.8	-2.8	0.0	0.0	22.9	0.0	1.0	-177.7
222	617480.77	4825966.09	0.75	1	E	2000	98.4	0.0	-188.0	0.0	0.0	64.6	4.6	-2.8	0.0	0.0	25.0	0.0	1.0	-182.1
222	617480.77	4825966.09	0.75	1	E	4000	99.5	0.0	-188.0	0.0	0.0	64.6	15.7	-2.8	0.0	0.0	25.0	0.0	1.0	-192.1
222	617480.77	4825966.09	0.75	1	E	8000	93.7	0.0	-188.0	0.0	0.0	64.6	56.1	-2.8	0.0	0.0	25.0	0.0	1.0	-238.3

Point Source, ISO 9613, Name: "Proposed Rooftop MUA-152-02 OA Intake (Plant 2)", ID: "!04!MUA-152-02_IN"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
231	617213.19	4825862.29	6.55	0	DEN	32	36.8	0.0	0.0	3.0	0.0	55.7	0.0	-3.0	0.0	0.0	2.8	0.0	0.0	-15.7
231	617213.19	4825862.29	6.55	0	DEN	63	50.0	0.0	0.0	3.0	0.0	55.7	0.0	-3.0	0.0	0.0	4.0	0.0	0.0	-3.7
231	617213.19	4825862.29	6.55	0	DEN	125	65.1	0.0	0.0	3.0	0.0	55.7	0.1	-0.9	0.0	0.0	5.7	0.0	0.0	7.5
231	617213.19	4825862.29	6.55	0	DEN	250	78.6	0.0	0.0	3.0	0.0	55.7	0.2	-1.7	0.0	0.0	7.9	0.0	0.0	19.5
231	617213.19	4825862.29	6.55	0	DEN	500	80.0	0.0	0.0	3.0	0.0	55.7	0.3	-1.8	0.0	0.0	10.4	0.0	0.0	18.4
231	617213.19	4825862.29	6.55	0	DEN	1000	78.2	0.0	0.0	3.0	0.0	55.7	0.6	-1.8	0.0	0.0	13.1	0.0	0.0	13.5
231	617213.19	4825862.29	6.55	0	DEN	2000	78.4	0.0	0.0	3.0	0.0	55.7	1.7	-1.8	0.0	0.0	16.0	0.0	0.0	9.9
231	617213.19	4825862.29	6.55	0	DEN	4000	68.2	0.0	0.0	3.0	0.0	55.7	5.6	-1.8	0.0	0.0	17.6	0.0	0.0	-5.9
231	617213.19	4825862.29	6.55	0	DEN	8000	56.1	0.0	0.0	3.0	0.0	55.7	20.0	-1.8	0.0	0.0	18.6	0.0	0.0	-33.4
233	617213.19	4825862.29	6.55	1	DEN	125	65.1	0.0	0.0	3.0	0.0	57.9	0.1	-1.4	0.0	0.0	5.2	0.0	1.0	5.2
233	617213.19	4825862.29	6.55	1	DEN	250	78.6	0.0	0.0	3.0	0.0	57.9	0.2	-2.0	0.0	0.0	5.6	0.0	1.0	18.8
233	617213.19	4825862.29	6.55	1	DEN	500	80.0	0.0	0.0	3.0	0.0	57.9	0.4	-2.0	0.0	0.0	6.3	0.0	1.0	19.3
233	617213.19	4825862.29	6.55	1	DEN	1000	78.2	0.0	0.0	3.0	0.0	57.9	0.8	-2.0	0.0	0.0	7.5	0.0	1.0	16.0
233	617213.19	4825862.29	6.55	1	DEN	2000	78.4	0.0	0.0	3.0	0.0	57.9	2.1	-2.0	0.0	0.0	9.1	0.0	1.0	13.2
233	617213.19	4825862.29	6.55	1	DEN	4000	68.2	0.0	0.0	3.0	0.0	57.9	7.3	-2.0	0.0	0.0	11.3	0.0	1.0	-4.2
233	617213.19	4825862.29	6.55	1	DEN	8000	56.1	0.0	0.0	3.0	0.0	57.9	25.9	-2.0	0.0	0.0	13.8	0.0	1.0	-37.5

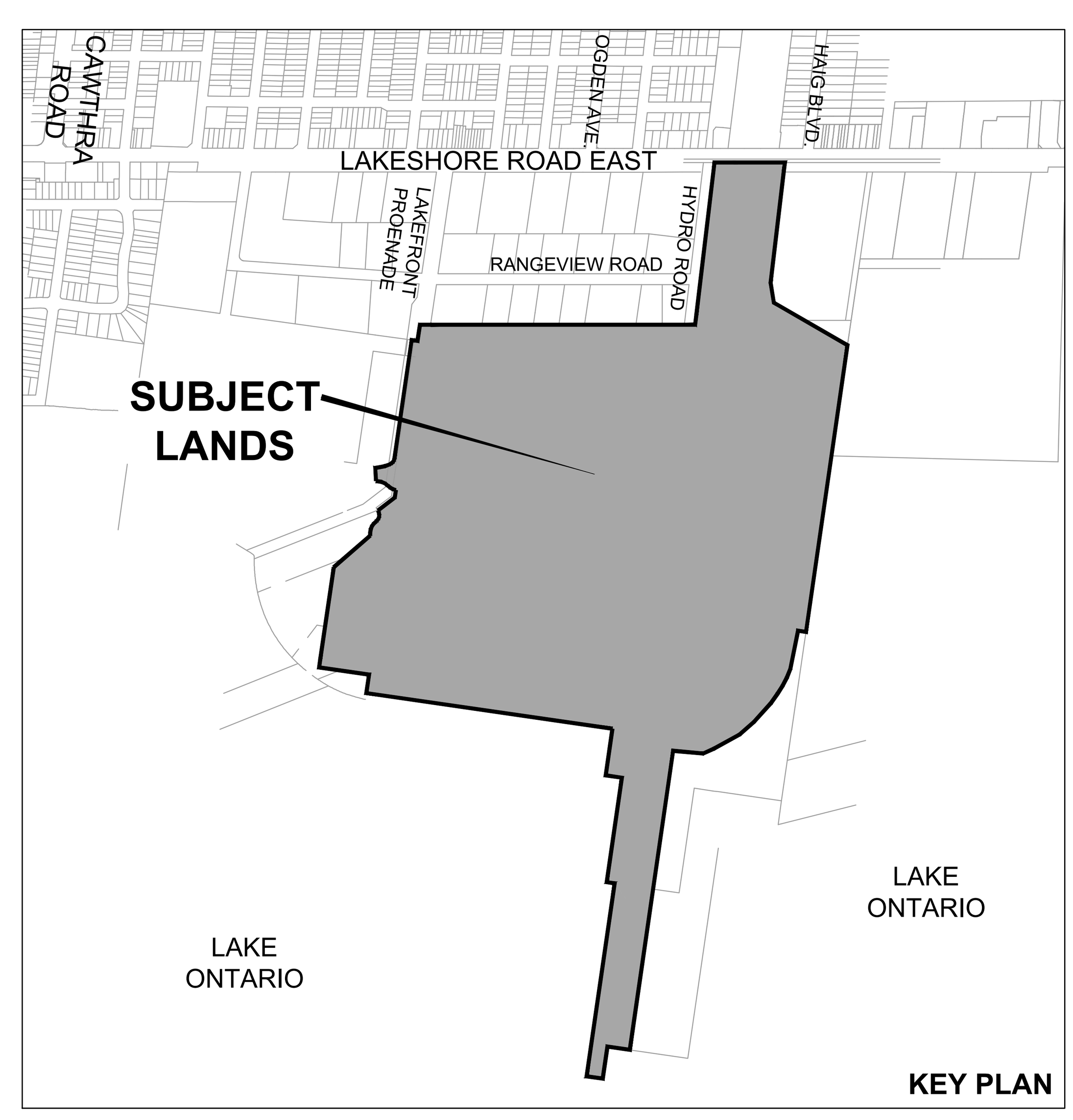
Point Source, ISO 9613, Name: "Headworks Exhaust Fan 5", ID: "!01!HW_EF5"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
253	617154.53	4826231.31	12.80	0	DEN	32	46.9	0.0	0.0	0.0	0.0	64.7	0.0	-3.0	0.0	0.0	7.4	0.0	0.0	-22.1
253	617154.53	4826231.31	12.80	0	DEN	63	74.0	0.0	0.0	0.0	0.0	64.7	0.1	-3.0	0.0	0.0	9.0	0.0	0.0	3.2
253	617154.53	4826231.31	12.80	0	DEN	125	85.7	0.0	0.0	0.0	0.0	64.7	0.2	-2.7	0.0	0.0	11.2	0.0	0.0	12.4
253	617154.53	4826231.31	12.80	0	DEN	250	89.3	0.0	0.0	0.0	0.0	64.7	0.5	-2.7	0.0	0.0	13.6	0.0	0.0	13.2
253	617154.53	4826231.31	12.80	0	DEN	500	91.7	0.0	0.0	0.0	0.0	64.7	0.9	-2.7	0.0	0.0	16.4	0.0	0.0	12.4
253	617154.53	4826231.31	12.80	0	DEN	1000	91.1	0.0	0.0	0.0	0.0	64.7	1.8	-2.7	0.0	0.0	19.2	0.0	0.0	8.1
253	617154.53	4826231.31	12.80	0	DEN	2000	88.5	0.0	0.0	0.0	0.0	64.7	4.7	-2.7	0.0	0.0	22.2	0.0	0.0	-0.3
253	617154.53	4826231.31	12.80	0	DEN	4000	83.4	0.0	0.0	0.0	0.0	64.7	15.8	-2.7	0.0	0.0	25.0	0.0	0.0	-19.4
253	617154.53	4826231.31	12.80	0	DEN	8000	75.7	0.0	0.0	0.0	0.0	64.7	56.4	-2.7	0.0	0.0	25.0	0.0	0.0	-67.7
262	617154.53	4826231.31	12.80	1	DEN	1000	91.1	0.0	0.0	0.0	0.0	64.8	1.8	-2.7	0.0	0.0	17.3	0.0	2.0	7.9
262	617154.53	4826231.31	12.80	1	DEN	2000	88.5	0.0	0.0	0.0	0.0	64.8	4.7	-2.7	0.0	0.0	20.2	0.0	2.0	-0.5
262	617154.53	4826231.31	12.80	1	DEN	4000	83.4	0.0	0.0	0.0	0.0	64.8	16.0	-2.7	0.0	0.0	23.1	0.0	2.0	-19.8
262	617154.53	4826231.31	12.80	1	DEN	8000	75.7	0.0	0.0	0.0	0.0	64.8	57.1	-2.7	0.0	0.0	25.0	0.0	2.0	-70.5

Point Source, ISO 9613, Name: "TOX1&2 Overhead Door", ID: "!01!TOX1_2_OD"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
265	617417.34	4825960.56	2.50	0	DEN	32	50.2	0.0	0.0	3.0	0.0	62.9	0.0	-3.0	0.0	0.0	13.1	0.0	0.0	-19.9
265	617417.34	4825960.56	2.50	0	DEN	63	61.9	0.0	0.0	3.0	0.0	62.9	0.0	-3.0	0.0	0.0	16.5	0.0	0.0	-11.6
265	617417.34	4825960.56	2.50	0	DEN	125	72.0	0.0	0.0	3.0	0.0	62.9	0.2	-2.7	0.0	0.0	20.4	0.0	0.0	-5.7
265	617417.34	4825960.56	2.50	0	DEN	250	77.9	0.0	0.0	3.0	0.0	62.9	0.4	-2.7	0.0	0.0	24.0	0.0	0.0	-3.7
265	617417.34	4825960.56	2.50	0	DEN	500	81.9	0.0	0.0	3.0	0.0	62.9	0.8	-2.7	0.0	0.0	24.5	0.0	0.0	-0.6
265	617417.34	4825960.56	2.50	0	DEN	1000	87.8	0.0	0.0	3.0	0.0	62.9	1.4	-2.7	0.0	0.0	24.7	0.0	0.0	4.4
265	617417.34	4825960.56	2.50	0	DEN	2000	87.3	0.0	0.0	3.0	0.0	62.9	3.8	-2.7	0.0	0.0	24.9	0.0	0.0	1.4
265	617417.34	4825960.56	2.50	0	DEN	4000	79.7	0.0	0.0	3.0	0.0	62.9	12.9	-2.7	0.0	0.0	24.9	0.0	0.0	-15.4
265	617417.34	4825960.56	2.50	0	DEN	8000	68.0	0.0	0.0	3.0	0.0	62.9	46.1	-2.7	0.0	0.0	25.0	0.0	0.0	-60.3
275	617417.34	4825960.56	2.50	1	DEN	125	72.0	0.0	0.0	3.0	0.0	63.1	0.2	-2.7	0.0	0.0	19.6	0.0	1.0	-6.2
275	617417.34	4825960.56	2.50	1	DEN	250	77.9	0.0	0.0	3.0	0.0	63.1	0.4	-2.7	0.0	0.0	20.0	0.0	1.0	-0.9
275	617417.34	4825960.56	2.50	1	DEN	500	81.9	0.0	0.0	3.0	0.0	63.1	0.8	-2.7	0.0	0.0	20.0	0.0	1.0	2.8
275	617417.34	4825960.56	2.50	1	DEN	1000	87.8	0.0	0.0	3.0	0.0	63.1	1.5	-2.7	0.0	0.0	20.0	0.0	1.0	8.0
275	617417.34	4825960.56	2.50	1	DEN	2000	87.3	0.0	0.0	3.0	0.0	63.1	3.9	-2.7	0.0	0.0	20.0	0.0	1.0	5.0
275	617417.34	4825960.56	2.50	1	DEN	4000	79.7	0.0	0.0	3.0	0.0	63.1	13.2	-2.7	0.0	0.0	20.0	0.0	1.0	-11.8
275	617417.34	4825960.56	2.50	1	DEN	8000	68.0	0.0	0.0	3.0	0.0	63.1	47.0	-2.7	0.0	0.0	20.0	0.0	1.0	-57.4

Appendix G

Proposed Lakeview Waterfront Development

P:\792-013 (Lakeview, Mississauga)\7. Drawings\7.1 GSAI\2021 09 September\DP Sept 27 21.dwg



LAND USE SCHEDULE

LAND USE	BLOCKS	AREA (ha)	AREA (ac)	UNITS	DENSITY (UPNHA)
RESIDENTIAL MEDIUM DENSITY	1-13	20.89	51.62	8050	319.8
MIXED USE	14-18	4.28	10.58		
MIXED USE CULTURAL HUB	19-21	1.65	4.08		
EMPLOYMENT	22,23	5.36	13.24		
PARK	24-39	14.73	36.40		
ROAD WIDENING	40,41	0.40	0.99		
0.3m RESERVE	42-45	0.01	0.02		
NATURAL HERITAGE SYSTEM (NHS)	46,47	11.77	29.08		
CULTURAL PIER	48	0.56	1.38		
FUTURE LAKEFRONT PROMENADE R.O.W.	49	0.41	1.01		
18.05m R.O.W. (226m LENGTH)		0.41	1.01		
19.05m R.O.W. (1,232m LENGTH)		2.35	5.81		
20.55m R.O.W. (482m LENGTH)		0.99	2.45		
22.25m R.O.W. (602m LENGTH)		1.34	3.31		
23.05m R.O.W. (817m LENGTH)		1.89	4.67		
23.15m R.O.W. (836m LENGTH)		1.94	4.79		
25.40m R.O.W. (341m LENGTH)		0.87	2.15		
26.00m R.O.W. (280m LENGTH)		0.46	1.14		
26.05m R.O.W. (523m LENGTH)		1.37	3.39		
TOTAL	**49**	**71.68**	**177.13**	**8050**	**319.8**

DRAFT PLAN OF SUBDIVISION
LAKEVIEW COMMUNITY PARTNERS LIMITED

FILE # 21T-M 19001 W1

PART OF LOTS 7, 8 AND 9, CONCESSION 3
SOUTH OF DUNDAS STREET &
PART OF WATER LOT IN FRONT OF LOT 7
CONCESSION 3, SOUTH OF DUNDAS STREET &
PART OF WATER LOT IN FRONT OF LOT 9
CONCESSION 3, SOUTH OF DUNDAS STREET &
PART OF WATER LOT LOCATION HY28
IN FRONT OF LOTS 7 AND 8, CONCESSION 3
SOUTH OF DUNDAS STREET &
PART OF WATER LOT LOCATION HY77
IN FRONT OF LOT 7, CONCESSION 3
SOUTH OF DUNDAS STREET
(GEOGRAPHIC TOWNSHIP OF TORONTO, COUNTY OF PEEL),
CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEEL

OWNERS CERTIFICATE

I HEREBY AUTHORIZE GLEN SCHNARR & ASSOCIATES INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE CITY OF MISSISSAUGA FOR APPROVAL.

SIGNED ____________ DATE: DEC. 3, 2019

FABIO MAZZOCCO, PRESIDENT
LAKEVIEW COMMUNITY PARTNERS LIMITED

SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE CORRECTLY AND ACCURATELY SHOWN.

SIGNED ____________ DATE: SEPT. 3, 2021

RON QUERUBIN
ONTARIO LAND SURVEYOR

ADDITIONAL INFORMATION

(UNDER SECTION 51(17) OF THE PLANNING ACT) INFORMATION REQUIRED BY CLAUSES A,B,C,D,E,F,G,J & L ARE SHOWN ON THE DRAFT AND KEY PLANS.

H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
I) SILTY CLAY, SANDY SILT, CLAYEY SILT, SILT, SILTY SAND, ETC.
K) SANITARY AND STORM SEWERS TO BE PROVIDED

NOTES

- PAVEMENT & WATERFRONT TRAIL ILLUSTRATIONS ARE DIAGRAMMATIC
- HYDRO ROAD & LAKESHORE ROAD E. DAYLIGHT TRIANGLE DIMENSIONS = 10m x 10m
- DAYLIGHT ROUNDINGS ARE 5m RADII, UNLESS OTHERWISE NOTED

Glen Broll
REGISTERED PROFESSIONAL PLANNER
R.P.P.

SCALE 1:2500
(24 x 36)
SEPTEMBER 27, 2021

GSAI
Glen Schnarr & Associates Inc.

A by-law to amend By-law Number 0225-2007, as amended.

WHEREAS pursuant to section 34 of the *Planning Act*, R.S.O. 1990, c.P.13, as amended, the council of a local municipality may pass a zoning by-law;

NOW THEREFORE the Council of The Corporation of the City of Mississauga ENACTS as follows:

1. By-law Number 0225-2007, as amended, being a City of Mississauga Zoning By-law, is amended by adding the following Exception Table:

9.2.3.XX	Exception: OS2-XX1	Map # 1	By-law:
In an OS2-XX1 zone the permitted **uses** and applicable regulations shall be as specified for an OS2 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Use			
9.2.3.XX.1	(1) **Restaurant** (2) **Take-out Restaurant** (3) **Parking Lot** (4) Outdoor markets (5) Commercial uses (6) Outdoor stage and seating area (7) Creative industry incubator space (8) Cultural infrastructure facilities (9) Outdoor patio accessory to a **restaurant** or **take-out restaurant** (10) **Temporary tent and/or stage** (11) **Temporary structures**		
Regulations			
9.2.3.XX.2	The provisions contained in Line 1.0, and 3.0 of Table 2.1.2.1.1, subsection 2.1.9.7, Line 4.0, 5.0 and 7.0 of Table 9.2.1, and Table 2.1.14.1 of this By-law shall not apply		
9.2.3.XX.3	Maximum **gross floor area - non-residential** for all **take-out restaurants** and **restaurants**		500 m^2
9.2.3.XX.4	Maximum **gross floor area – non-residential** used for all commercial uses in freestanding buildings or structures		5,000 m^2
9.2.3.XX.5	"Commercial uses" means a **retail store**, **personal service establishment,** information kiosk, and an event ticket office		
9.2.3.XX.6	For the purposes of this By-law, temporary structures shall include but are not limited to shipping containers, sea cans, wooden and seasonal structures		
9.2.3.XX.7	An interim free-standing district energy facility providing heating and cooling for the surrounding lands shall be located within a **building** or **structure**		
9.2.3.XX.8	A **structure** required for permitting physical services and utilities under subsection 2.1.1.2 of this By-law shall not be subject to the zone regulations		
9.2.3.XX.9	Parking shall not be required for any use permitted in the OS2-XX1 zone		
9.2.3.XX.10	Notwithstanding clause (3) of sentence 9.2.3.xx.1 of this Exception, only the following **parking lots** shall be permitted: (a) One **parking lot** adjacent to a marina located in a G1-XX zone (b) One **parking lot** containing only accessible, and car-share parking		

9.2.3.XX	Exception: OS2-XX1	Map # 1	By-law:
In an OS2-XX1 zone the permitted **uses** and applicable regulations shall be as specified for an OS2 zone except that the following **uses**/regulations shall apply:			
9.2.3.XX.11	Minimum number of bicycle parking spaces for all permanent **structures** and **buildings**		
	Retail store, **personal service establishment, restaurant**		
	Employee		0.085 spaces per 100 m2 GFA – non – residential
	Visitor		0.25 spaces per 100 m2 GFA – non – residential
	All other non-residential uses Employee		4% of required parking
	Visitor		4% of required parking
9.2.3.XX.12	A bicycle parking space must comply with the following:		
	(1) The minimum dimension of a bicycle parking space is:		
	(1.1) minimum length		1.8 m
	(1.2) minimum width		0.6 m
	(1.3) minimum vertical clearance from the ground		1.9 m
	(2) The minimum dimension of a bicycle parking space if placed in a vertical position on a wall, structure or mechanical device is:		
	(2.1) minimum length or vertical clearance		1.9 m
	(2.2) minimum width		0.6 m
	(2.3) minimum horizontal clearance from the wall		1.2 m
	(3) The minimum vertical clearance for each bicycle parking space if a stacked bicycle parking space is provided		1.2 m
	(4) An area used to provide bicycle parking spaces must have a minimum vertical clearance of:		
	(4.1) for a stacked bicycle parking space		2.4 m
	(4.2) all other cases		1.9 m
	(5) A bicycle parking space must have a minimum aisle clearance of:		
	(5.1) when facing a wall or other obstacle		0.9 m
	(5.2) when facing a bicycle parking space		1.5 m
9.2.3.XX.13	One change facility per gender containing a change room and shower stalls shall be provided accessory to each **building** in accordance with the following:		
	Minimum number of shower stalls per gender in a change facility for all permanent **structures** and **buildings**		
	Required number of employee bicycle parking spaces		Required Number of Shower stalls Per gender
	0-4		0
	5-29		1
	30-59		2
	60-89		3
	90-119		4
	120-149		5
	150-179		6
	Over 179		7 plus 1 for each additional 30 bicycle spaces
9.2.3.XX.14	A maximum of one **building** containing a **retail store, restaurant**, or **take-out restaurant** uses, or combination thereof shall be permitted along the frontage of Hydro Road abutting lands zoned C4-XX2		

2. By-law Number 0225-2007, as amended, being a City of Mississauga Zoning By-law, is amended by adding the following Exception Table:

<table>
<tr><th>10.2.2.XX</th><th>Exception: G1-XX</th><th>Map # 1</th><th>By-law:</th></tr>
<tr><td colspan="4">In a G1-XX zone the permitted uses and applicable regulations shall be as specified for a G1 zone except that the following uses/regulations shall apply:</td></tr>
<tr><td colspan="4">Additional Permitted Use</td></tr>
<tr><td>10.2.2.XX.1</td><td colspan="3">(1) Uses permitted under “OS2-XX1”
(2) Buildings and structures and conveyor belt legally existing on the date of passing of this By-law formerly used for infrastructure in support of power generation
(3) Alterations and additions to existing buildings and structures formerly used for infrastructure in support of power generation
(4) Shade structure</td></tr>
<tr><td colspan="4">Uses Not Permitted</td></tr>
<tr><td>10.2.2.XX.2</td><td colspan="3">(1) Outdoor stage and seating area
(2) Parking Lot
(3) Outdoor markets
(4) Creative industry incubator space
(5) Cultural infrastructure facilities</td></tr>
<tr><td colspan="4">Regulations</td></tr>
<tr><td>10.2.2.XX.3</td><td colspan="3">The provisions contained in Line 1.0, and 3.0 of Table 2.1.2.1.1, and Table 2.1.14.1 of this By-law shall not apply</td></tr>
<tr><td>10.2.2.XX.4</td><td colspan="3">Parking shall not be required for any use permitted in the G1-XX zone</td></tr>
</table>

3. By-law Number 0225-2007, as amended, being a City of Mississauga Zoning By-law, is amended by adding the following Exception Table:

<table>
<tr><th>12.2.3.XX</th><th>Exception: I-XX</th><th>Map # 1</th><th>By-law:</th></tr>
<tr><td colspan="4">In a zone the permitted uses and applicable regulations shall be as specified for a I zone except that the following uses/regulations shall apply:</td></tr>
<tr><td colspan="4">Additional Permitted Uses</td></tr>
<tr><td>12.2.3.XX.1</td><td colspan="3">(1) Science and technology facility
(2) Office
(3) Marine related uses for boats and personal watercraft where boats and/or boat accessories may be sold, stored indoors/outdoors, serviced, or repaired
(4) Cultural facilities
(5) Commercial school is permitted accessory to a University/College use
(6) Parking lot
(7) Parking for lands zoned OS2-XX1, and C4-XX3
(8) Outdoor patio accessory to a restaurant or take-out restaurant within a University/College
(9) Renewable energy facility
(10) Cogeneration facility based on renewable energy
(11) Outdoor storage accessory to a cogeneration facility based on renewable energy
(12) Waste Transfer Station associated with a vacuum waste collection system
(13) Composting Facility associated with a vacuum waste collection system
(14) Outdoor storage accessory to a waste transfer station associated with a vacuum waste collection system
(15) Public information centre accessory to either a Renewable energy facility or Cogeneration facility based on renewable energy
(16) Uses permitted under article 2.1.1.2 of this By-law in a building
(17) Co-working office</td></tr>
<tr><td colspan="4">Uses Not Permitted</td></tr>
<tr><td>12.2.3.XX.2</td><td colspan="3">(1) Hospital
(2) Staff/Student Residence
(3) Day care</td></tr>
</table>

12.2.3.XX	Exception: I-XX	Map # 1	By-law:
In a zone the permitted **uses** and applicable regulations shall be as specified for a I zone except that the following **uses**/regulations shall apply:			
Regulations			
12.2.3.XX.3	The provisions contained in Line 1.0, and 3.0 of Table 2.1.2.1.1, subsections 2.1.14 and 2.1.17, and Line, 3.0, 4.0, 5.0, 6.0 and 7.0 of Table 12.2.2 of this By-law shall not apply		
12.2.3.XX.4	A **Waste Transfer Station** associated with a vacuum waste collection system and **Composting Facility** associated with a vacuum waste collection system shall be restricted to that waste collected for those abutting lands containing a vacuum waste collection system		
12.2.3.XX.5	A **medical office** shall only be permitted in **buildings** when adjacent lands zoned OS1		
12.2.3.XX.6	Notwithstanding clause (14) of section 12.2.3.xx.1 of this Exception, outdoor storage shall be limited to large household goods, shall only be located in a side or rear yard and shall be screened facing the front and side lot lines		
12.2.3.XX.7	"Co-working office" means an area predominantly used as an office rented out to transient users		
12.2.3.XX.8	A **structure** required for permitting physical services and utilities under subsection 2.1.1.2 of this By-law shall not be subject to the zone regulations		
12.2.3.XX.9	An interim free-standing district energy facility providing heating and cooling for the surrounding lands shall be located within a **building** or **structure**		
12.2.3.XX.10	Minimum setback to lands zoned G1		7.5 m
12.2.3.XX.11	Maximum height of all **buildings** and **structures** exclusive of mechanical/penthouse facilities		15 Storeys
12.2.3.XX.12	Maximum total **gross floor area - non-residential** that may be used for accessory uses to a University/College		20%
12.2.3.XX.13	Accessory uses to a University/College **shall** not be permitted above the third storey		
12.2.3.XX.14	Minimum **front yard**		1.5 m
12.2.3.XX.15	Minimum **interior side yard**		2.5 m
12.2.3.XX.16	Minimum **exterior side yard**		3.0 m
12.2.3.XX.17	Minimum **rear yard**		7.5 m
12.2.3.XX.18	Minimum depth of a **landscaped buffer** along a property line abutting lands zoned: OS2-XX1 G1 E2-XX		 0.0 m 6.0 m 1.5 m
12.2.3.XX.19	Minimum setback for accessory **structures** to lands zoned OS2– XX		1.5 m
12.2.3.XX.20	Minimum **lot frontage** for all **building** and **structures** associated with a use permitted under 2.1.1.2 of this By- law, and uses permitted under clauses (9), (10), (11), (12), (13), (14), (15), and (16) of sentence 12.2.3.XX.1 of this Exception, **Waste Transfer Station** associated with an alternative waste collection system, **Composting Facility** associated with an alternative waste collection system, **Renewable energy** facility or **Cogeneration facility** based on **renewable energy**		13.0 m
12.2.3.XX.21	**Driveways**, **aisles**, and visitor parking may be shared with abutting lands zoned C4-XX3		
12.2.3.XX.22	Minimum number of **parking spaces** per 100 m^2 **gross floor area - non-residential** for a co-working office		2.7

12.2.3.XX	Exception: I-XX	Map # 1	By-law:
In a zone the permitted **uses** and applicable regulations shall be as specified for a I zone except that the following **uses**/regulations shall apply:			
12.2.3.XX.23	Minimum number of bicycle parking spaces **Office** Employee Visitor **All other non-residential uses** Employee Visitor		 0.17 spaces per 100 m^2 GFA – non-residential 0.03 spaces per 100 m^2 GFA – non-residential 4% of required parking 4% of required parking
12.2.3.XX.24	A bicycle parking space must comply with the following: (1) The minimum dimension of a bicycle parking space is: (1.1) minimum length (1.2) minimum width (1.3) minimum vertical clearance from the ground (2) the minimum dimension of a bicycle parking space if placed in a vertical position on a wall, structure or mechanical device is: (2.1) minimum length or vertical clearance (2.2) minimum width (2.3) minimum horizontal clearance from the wall (3) the minimum vertical clearance for each bicycle parking space if a stacked bicycle parking space is provided (4) An area used to provide bicycle parking spaces must have a minimum vertical clearance of: (4.1) for a stacked bicycle parking space (4.2) all other cases (5) A bicycle parking space must have a minimum aisle clearance of: (5.1) when facing a wall or other obstacle (5.2) when facing a bicycle parking space		 1.8 m 0.6 m 1.9 m 1.9 m 0.6 m 1.2 m 1.2 m 2.4 m 1.9 m 0.9 m 1.5 m
12.2.3.XX.25	One change facility per gender containing a change room and shower stalls shall be provided accessory to each **building** in accordance with the following: Minimum number of shower stalls per gender in a change facility for all permanent **structures** and **buildings** Required number of employee bicycle parking spaces 0-4 5-29 30-59 60-89 90-119 120-149 150-179 Over 179		Required Number of Shower Stalls Per Gender 0 1 2 3 4 5 6 7 plus 1 for each additional 30 bicycle spaces
12.2.3.XX.26	A multi-use trail may be permitted in the **rear yard** and **landscape buffer** adjacent a **rear lot line**		

4. By-law Number 0225-2007, as amended, being a City of Mississauga Zoning By-law, is amended by adding the following Exception Table:

<table>
<tr><td>8.2.3.XX</td><td>Exception: E2-XX</td><td>Map # 1</td><td>By-law:</td></tr>
<tr><td colspan="4">In an E2-XX zone the permitted uses and applicable regulations shall be as specified for a E2 zone except that the following uses/regulations shall apply:</td></tr>
<tr><td colspan="4">Additional Permitted Uses</td></tr>
<tr><td>8.2.3.XX.1</td><td colspan="3">(1) Marine related uses for boats and personal watercraft where boats and/or boat accessories may be sold, stored indoors/outdoors, serviced, repaired or constructed and marine fuels are sold as an accessory use
(2) Renewable energy facility
(3) Cogeneration facility based on renewable energy
(4) Outdoor storage accessory to a cogeneration facility based on renewable energy
(5) Incubator space
(6) Waste Transfer Station associated with a vacuum waste collection system
(7) Composting Facility associated with a vacuum waste collection system
(8) Outdoor storage accessory to a waste transfer station associated with a vacuum waste collection system
(9) Parking for lands zoned I-XX, RA5-XX, and C4 - XX3
(10) Transportation Facility
(11) Co-working office
(12) Public information centre accessory to either a Renewable energy facility or Cogeneration facility based on renewable energy
(13) Uses permitted under 2.1.1.2 of this By-law in a building
(14) A Municipal Contractor Service Shop
(15) A Municipal Contractor's Yard</td></tr>
<tr><td colspan="4">Uses Not Permitted</td></tr>
<tr><td>8.2.3.XX.2</td><td colspan="3">(1) Truck Terminal
(2) Waste Processing Station
(3) Contractor Service Shop
(4) Contractor's Yard
(5) Vehicle Pound Facility
(6) Motor Vehicle Body Repair Facility
(7) Motor Vehicle Body Repair Facility - Commercial Motor Vehicle
(8) Motor Vehicle Repair Facility
(9) Motor Vehicle Repair Facility - Commercial Motor Vehicle
(10) Motor Vehicle Repair Facility – Restricted
(11) Motor Vehicle Wash Facility – Commercial Motor Vehicle
(12) Motor Vehicle Wash Facility – Restricted
(13) Gas Bar
(14) Motor Vehicle Service Station
(15) Motor Vehicle Sales, Leasing and/or Rental Facility - Commercial Motor Vehicles
(16) Adult Video Store
(17) Adult Entertainment Establishment
(18) Body-Rub Establishment
(19) Truck Fuel Dispensing Facility
(20) Accessory retail store</td></tr>
<tr><td colspan="4">Regulations</td></tr>
<tr><td>8.2.3.XX.3</td><td colspan="3">The provisions contained in Lines 1.0, 3.0, 10.0 and 12.0 in Table 2.1.2.1.1, subsections 2.1.14 and 2.1.17, and 8.1.4, sentences 8.1.5.1.1 and 8.1.5.1.4, subsection 8.1.6, Lines 5.1, 9.3, 10.1, 12.1, and 12.5 of Table 8.2.1, and article 2.1.19.2 of this By- law shall not apply</td></tr>
<tr><td>8.2.3.XX.4</td><td colspan="2">Maximum floor space index - non-residential</td><td>4.0</td></tr>
<tr><td>8.2.3.XX.5</td><td colspan="2">Minimum setback of all building and structures to all lands zoned G1</td><td>7.5 m</td></tr>
<tr><td>8.2.3.XX.6</td><td colspan="3">A Waste Transfer Station and Composting Facility shall be restricted to that waste collected for those abutting lands containing a vacuum waste collection system</td></tr>
</table>

8.2.3.XX	Exception: E2-XX	Map # 1	By-law:
In an E2-XX zone the permitted **uses** and applicable regulations shall be as specified for a E2 zone except that the following **uses**/regulations shall apply:			
8.2.3.XX.7	An interim free-standing district energy facility providing heating and cooling for the surrounding lands shall be located within a **building** or **structure**		
8.2.3.XX.8	A **structure** required for permitting physical services and utilities under subsection 2.1.1.2 of this By-law shall not be subject to the zone regulations		
8.2.3.XX.9	A multi-use trail may be permitted in the **rear yard** and l**andscape buffer** adjacent a **rear lot line**		
8.2.3.XX.10	Minimum **lot frontage** for all **building** and **structures** associated with a use permitted under 2.1.1.2 of this By- law, **Waste Transfer Station** associated with a vacuum waste collection system, **Composting Facility** associated with a vacuum waste collection system, **Renewable energy** facility or **Cogeneration facility** based on **renewable energy**		13.0 m
8.2.3.XX.11	Notwithstanding clause (8) of section 8.2.3.XX.1 of this Exception, outdoor storage shall be limited to large household goods, shall only be located in a side or rear yard and shall be screened facing the front and side lot lines		
8.2.3.XX.12	A **Waste Transfer Station** associated with a vacuum waste collection system or **Composting Facility** associated with a vacuum waste collection system or **Renewable energy** facility or **Cogeneration facility** based on renewable energy shall not be included in the maximum **floor space index - non-residential** calculation		
8.2.3.XX.13	A Transportation Facility shall be restricted to the storage of a maximum of 50 **motor vehicles** used exclusively for the use of personal car-sharing or ride-sharing purposes		
8.2.3.XX.14	The provisions of 8.1.2 of this By-law shall not be restricted to an office building or medical office building		
8.2.3.XX.15	"Co-working office" means an area predominantly used as an office rented out to transient users		
8.2.3.XX.16	Minimum number of **parking spaces** per 100 m^2 **gross floor area - non-residential** for a co-working office		2.7
8.2.3.XX.17	Minimum number of bicycle parking spaces		
	Office		
	Employee		0.17 spaces per 100 m^2 GFA – non – residential
	Visitor		0.03 spaces per 100 m^2 GFA – non – residential
	All other non-residential uses		
	Employee		4% of required parking
	Visitor		4% of required parking

<table>
<tr><th>8.2.3.XX</th><th>Exception: E2-XX</th><th>Map # 1</th><th>By-law:</th></tr>
<tr><td colspan="4">In an E2-XX zone the permitted uses and applicable regulations shall be as specified for a E2 zone except that the following uses/regulations shall apply:</td></tr>
<tr><td>8.2.3.XX.18</td><td colspan="2">A bicycle parking space must comply with the following:

(1) The minimum dimension of a bicycle parking space is:
(1.1) minimum length
(1.2) minimum width
(1.3) minimum vertical clearance from the ground
(2) The minimum dimension of a bicycle parking space if placed in a vertical position on a wall, structure or mechanical device is:
(2.1) minimum length or vertical clearance
(2.2) minimum width
(2.3) minimum horizontal clearance from the wall
(3) The minimum vertical clearance for each bicycle parking space if a stacked bicycle parking space is provided
(4) An area used to provide bicycle parking spaces must have a minimum vertical clearance of:
(4.1) for a stacked bicycle parking space
(4.2) all other cases
(5) A bicycle parking space must have a minimum aisle clearance of:
(5.1) when facing a wall or other obstacle
(5.2) when facing a bicycle parking space</td><td>

1.8 m
0.6 m
1.9 m

1.9 m
0.6 m

1.2 m

2.4 m
1.9 m

0.9 m
1.5 m</td></tr>
<tr><td>8.2.3.XX.19</td><td colspan="2">One change facility per gender containing a change room and shower stalls shall be provided accessory to each building in accordance with the following:

Minimum number of shower stalls per gender in a change facility for all permanent structures and buildings

Required number of employee bicycle parking spaces

0-4
5-29
30-59
60-89
90-119
120-149
150-179
Over 179</td><td>Required Number of Shower stalls Per gender

0
1
2
3
4
5
6
7 plus 1 for each additional 30 bicycle spaces</td></tr>
<tr><td>8.2.3.XX.20</td><td colspan="2">Minimum setback of parking areas, driveways, loading spaces, other paved areas and an area used for accessory outdoor storage to all lands zoned G1</td><td>7.5 m</td></tr>
<tr><td>8.2.3.XX.21</td><td colspan="2">Minimum depth of a landscaped buffer along a property line abutting lands zoned:
G1
I-XX
E2-21</td><td>

6.0 m
1.5 m
4.5 m</td></tr>
<tr><td>8.2.3.XX.22</td><td colspan="2">A multi-use trail may be located within a landscape buffer</td><td></td></tr>
<tr><td>8.2.3.XX.23</td><td colspan="2">Maximum height of all buildings and structures exclusive of mechanical/penthouse facilities</td><td>15 storeys</td></tr>
<tr><td>8.2.3.XX.24</td><td colspan="2">Minimum landscaped area</td><td>10% of the lot</td></tr>
</table>

5. By-law Number 0225-2007, as amended, being a City of Mississauga Zoning By-law, is amended by adding the following Exception Table:

6.2.5.XX1	Exception: C4-XX1	Map # 1	By-law:
In a C4-XX1 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Uses			
6.2.5.XX1.1	(1) **Retirement Building** (2) **Long-Term Care Building** (3) Parking for lands zoned RA5-XX (4) Outdoor patio accessory to a **restaurant** or **take-out restaurant** (5) Co-working office (6) **Parking structure** (7) Temporary Sales or Community Engagement Office		
Uses Not Permitted			
6.2.5.XX1.2	(1) **Funeral Establishment** (2) **Overnight accommodation** (3) University/College		
Regulations			
6.2.5.XX1.3	The provisions contained in Lines 1.0, and 3.0 of Table 2.1.2.1.1, subsection 2.1.2, article 2.1.25.4, subsection 2.1.30, and Lines 11.1, 12.3, 12.4, 14.0 and 16.0 contained in Table 6.2.1 of this By-law shall not apply		
6.2.5.XX1.4	Maximum number of **dwelling units** on all lands zoned RA5-XX, C4-XX1, C4-XX2, and C4-XX3		8,050
6.2.5.XX1.5	For the purposes of this By-law, all lands zoned C4- XX1 shall be considered one **lot**		
6.2.5.XX1.6	The **first** storey of a building within 25 m of Lakeshore Road East and Hydro Road frontages shall only contain non-residential **uses**		
6.2.5.XX1.7	Notwithstanding the provisions of section 6.2.5.XX1.6 of this Exception: (1) a lobby for a residential **building** may be located on the **first storey** (2) An outdoor play area accessory to a **day care** may be at grade or on the roof of the first four **storeys**		
6.2.5.XX1.8	Maximum **height** Residential **buildings** which may include ancillary non-residential **uses** Non-residential **buildings** **Parking Structure**		15 storeys 15 storeys 4 storeys
6.2.5.XX1.9	Maximum **height** for all residential **buildings** within 20 m of Lakeshore Road East		8 storeys
6.2.5.XX1.10	A **lot line** abutting Lakeshore Road East shall be deemed to be the **front lot line**		
6.2.5.XX1.11	Minimum setback of all **buildings** and **structures** to all lands zoned G1		7.5 m
6.2.5.XX1.12	Minimum depth of a l**andscaped buffer** along a property line abutting lands zoned: G1 RA5-XX		 3.0 m 1.5 m
6.2.5.XX1.13	Minimum resident **parking spaces** per **apartment dwelling unit**		1.0
6.2.5.XX1.14	Minimum number of **parking spaces** per **retirement dwelling unit**		0.4
6.2.5.XX1.15	Minimum visitor **parking spaces** per **dwelling unit**		0.15
6.2.5.XX1.16	Maximum percentage of required resident **parking spaces** that may be tandem, provided that each pair of **tandem parking spaces** is allocated to one **dwelling unit**		25%
6.2.5.XX1.17	For the resident visitor component, a shared parking arrangement may be used for the calculation of required visitor/non-residential parking in accordance with the following: the greater of 0.15 visitor spaces per unit or Parking required for a **retail store**, **restaurant**, **take-out restaurant**, **personal service establishment**, **commercial school**, **financial institution**, **medical office**, **office**, and **day care**		

6.2.5.XX1	Exception: C4-XX1	Map # 1	By-law:

In a C4-XX1 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:

6.2.5.XX1.18 Notwithstanding section 3.1.2.3 of this By-law, a shared parking formula may be used as indicated below.
All required parking spaces must be accessible to all users participating in the shared parking arrangement and may not be reserved for specific users.
The initial step in determining required parking for a mixed use development is to calculate the parking requirement for each **use** in the development as if these **uses** were free-standing **buildings**. The parking requirement for each **use** is then multiplied by the percent of the peak period for each time period (i.e. noon), contained below. Each column is totalled for weekday and weekend. The highest figure obtained from all time periods shall become the required parking for the mixed use development.

Mixed Use Development Shared Parking Formula

Type of Use	*Weekday Shared Parking Time Factors*			
	Morning	*Noon*	*Afternoon*	*Evening*
Office/Medical Office	*100%*	*90%*	*95%*	*10%*
Real Estate Office	*90%*	*80%*	*100%*	*50%*
Financial Institution	*70%*	*75%*	*100%*	*80%*
Various commercial*	*50%*	*50%*	*70%*	*75%*
Restaurant/Take-out Rest.	*25%*	*65%*	*25%*	*100%*
***Overnight Accom.-** Rooms*	*50%*	*25%*	*25%*	*65%*
***Overnight Accom.-** Other*	*95%*	*100%*	*90%*	*95%*
Residential	*90%*	*65%*	*90%*	*100%*
Residential Visitors	*20%*	*20%*	*50%*	*100%*
	Weekend Shared Parking Time Factors			
	Morning	*Noon*	*Afternoon*	*Evening*
Office	*10%*	*10%*	*10%*	*10%*
Real Estate Office	*50%*	*50%*	50%	*20%*
Financial Institution	*90%*	*90%*	90%	*20%*
Various commercial*	*50%*	*75%*	*100%*	*10%*
Restaurant/Take-out Rest.	*20%*	*90%*	*50%*	*100%*
***Overnight Accom.-** Rooms*	*70%*	*25%*	*25%*	*50%*
***Overnight Accom.-** Other*	*95%*	*95%*	*90%*	*95%*
Residential	*90%*	*65%*	*90%*	*100%*
Residential Visitors	*20%*	*20%*	*60%*	*100%*

*Various Commercial includes **Retail Store**, **Personal Service Establishment**, and **Repair Establishments**

6.2.5.XX1.19	No parking shall be required for an outdoor patio associated with a **restaurant** or **take-out restaurant**	
6.2.5.XX1.20	Minimum number of **parking spaces** per 100 m² **gross floor area - non-residential** for a **retail store, personal service establishment**, or **office**	3.0
6.2.5.XX1.21	Minimum number of **parking spaces** per 100 m² **gross floor area - non-residential** for a **financial institution, real estate office**, or **medical office**	4.85
6.2.5.XX1.22	Minimum number of **parking spaces** per 100 m^2 **gross floor area - non-residential** for a co-working office	2.7
6.2.5.XX1.23	A car-share **parking space** shall be a **parking space** dedicated to a short-term vehicle rental for residents	
6.2.5.XX1.24	Bicycle-share parking spaces shall be dedicated to short- term bicycle rental for residents and shall be required to meet size requirements as specified in Illustrations on Schedule 3	
6.2.5.XX1.25	Total resident **parking spaces** per residential **dwelling unit** may be reduced at a rate of four **parking spaces** for every car-share **parking space** provided on the site up to a maximum of 1 car-share **parking space** per 60 **dwelling units**	
6.2.5.XX1.26	Total resident **parking spaces** per residential **dwelling unit** may be reduced at a rate of 3 **parking spaces** for every 10 bicycle-share parking spaces and an additional 1 **parking space** for 2 bicycle-share parking spaces to a maximum of 25% of total required **parking spaces** per residential **dwelling unit**	

6.2.5.XX1	Exception: C4-XX1	Map # 1	By-law:
In a C4-XX1 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:			

6.2.5.XX1.27	Minimum number of bicycle parking spaces	
	Apartments, retirement building	
	Resident	0.6 spaces per unit
	Visitor	0.14 spaces per unit
	Office	
	Employee	0.17 spaces per 100 m^2 GFA – non – residential
	Visitor	0.03 spaces per 100 m^2 GFA – non – residential
	Retail store, personal services establishment, restaurant	
	Employee	0.085 spaces per 100 m^2 GFA – non – residential
	Visitor	0.25 spaces per 100 m^2 GFA – non – residential
	Employee	4% of required spaces
	Visitor	4% of required spaces
6.2.5.XX1.28	A bicycle parking space must comply with the following:	
	(1) The minimum dimension of a bicycle parking space is	
	(1.1) minimum length	1.8 m
	(1.2) minimum width	0.6 m
	(1.3) minimum vertical clearance from the ground	1.9 m
	(2) the minimum dimension of a bicycle parking space if placed in a vertical position on a wall, structure or mechanical device is:	
	(2.1) minimum length or vertical clearance	1.9 m
	(2.2) minimum width	0.6 m
	(2.3) minimum horizontal clearance from the wall	1.2 m
	(3) the minimum vertical clearance for each bicycle parking space if a stacked bicycle parking space is provided	1.2 m
	(4) An area used to provide bicycle parking spaces must have a minimum vertical clearance of:	
	(4.1) for a stacked bicycle parking space	2.4 m
	(4.2) all other cases	1.9 m
	(5) A bicycle parking space must have a minimum aisle clearance of:	
	(5.1) when facing a wall or other obstacle	0.9 m
	(5.2) when facing a bicycle parking space	1.5 m

6.2.5.XX1	Exception: C4-XX1	Map # 1	By-law:
In a C4-XX1 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:			
6.2.5.XX1.29	One change facility per gender containing a change room and shower stalls shall be provided accessory to each **building** in accordance with the following: Minimum number of shower stalls per gender in a change facility for all permanent **structures** and **buildings**		
	Required number of employee bicycle parking spaces		Required Number of Shower stalls Per gender
	0-4		0
	5-29		1
	30-59		2
	60-89		3
	90-119		4
	120-149		5
	150-179		6
	Over 179		7 plus 1 For each Additional 30 bicycle spaces
6.2.5.XX1.30	Minimum setback from an above or below grade **parking structure** inclusive of external above grade access stairwells, to a **lot line**		1.0 m
6.2.5.XX1.31	Stairs, walkways, planters and ventilation shafts are permitted to encroach into a required **landscaped area**		
6.2.5.XX1.32	**Driveways**, **aisles**, and visitor parking may be shared with abutting lands zoned RA5 - XX		
6.2.5.XX1.33	A multi-use trail may be permitted in an **interior side yard** or any **landscape buffer** adjacent an **interior side lot line**		

6. By-law Number 0225-2007, as amended, being a City of Mississauga Zoning By-law, is amended by adding the following Exception Table:

6.2.5.XX2	Exception: C4 – XX2	Map # 1	By-law:
In a C4 – XX2 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:			
Additional Permitted Use			
6.2.5.XX2.1	(1) **Retirement Building** (2) Parking for lands zoned RA5-XX (3) Outdoor patio accessory to a **restaurant** or **take-out restaurant** (4) One craft beer brewery with accessory **restaurant** (5) Public information centre		
Uses Not Permitted			
6.2.5.XX2.2	(1) **Funeral Establishment** (2) **Retail store** greater than 600 m^2 **GFA – non-residential** (3) University/College		
Regulations			
6.2.5.XX2.3	The provisions contained in Lines 1.0, and 3.0 of Table 2.1.2.1.1, subsection 2.1.2, Lines 4.0, 5.0, 6.0, 7.0, 8.0, 9.0 and 11.0 in Table 2.1.9.1, article 2.1.25.4, subsection 2.1.30, Lines 2.6.1, 2.6.2, 2.6.3, 2.6.4, 11.1, 12.3, 12.4, 14.0 and 16.0 contained in Table 6.2.1 of this By-law shall not apply		
6.2.5.XX2.4	For the purposes of this By-law, all lands zoned C4-XX2 shall be considered one **lot** for each parcel separated by public rights-of-way		
6.2.5.XX2.5	Maximum number of **dwelling units** on all lands zoned RA5-XX, C4-XX1, C4-XX2, and C4-XX3		8,050
6.2.5.XX2.6	For the purposes of this By-law, **overnight accommodation** may include an accessory **restaurant**, **take-out restaurant** and an outdoor patio accessory to a **restaurant** or **take-out restaurant**		
6.2.5.XX2.7	A unit on the **first** storey of all **buildings** facing a public **street** shall only contain non-residential **uses**		
6.2.5.XX2.8	Notwithstanding the provisions of section 6.2.5.XX1.7 of this Exception: (1) a lobby for a residential **building** may be located in the **first storey** (2) an outdoor play area accessory to a **day care** may be at grade or may be located in the **first storey**		
6.2.5.XX2.9	Below grade **parking structures** under **private roads** or public boulevard areas shall be permitted		
6.2.5.XX2.10	Maximum **height** of all **buildings**		12 storeys
6.2.5.XX2.11	Notwithstanding the provisions of sentence 6.2.5.XX2.10 of this Exception, one building may have a maximum **height** of 22 storeys		
6.2.5.XX2.12	Minimum setback from a **parking structure** completely below or above finished grade inclusive of external above grade access stairwells, to a **lot line**		1.0 m
6.2.5.XX2.13	Minimum resident **parking spaces** per **apartment dwelling unit**		1.0
6.2.5.XX2.14	Minimum number of **parking spaces** per **retirement dwelling unit**		0.4
6.2.5.XX2.15	Minimum visitor **parking spaces** per **dwelling unit**		0.15
6.2.5.XX2.16	Maximum percentage of required resident **parking spaces** that may be tandem, provided that each pair of **tandem parking spaces** is allocated to one **dwelling unit**		25%
6.2.5.XX2.17	Minimum number of **parking spaces** per 100 m^2 **gross floor area - non-residential** for a **restaurant**		9.0
6.2.5.XX2.18	Minimum number of **parking spaces** per 100 m^2 **gross floor area - non-residential** for an **office**, **medical office**, **financial institution**, **personal service establishment**, **repair establishment**, **take-out restaurant** or **retail store**		1.0
6.2.5.XX2.19	An **enclosed pedestrian mall**, a **food court**, and any corridor not open to the public and used by more than one tenant of the **building** may be deducted from the total **gross floor area - non-residential**		

6.2.5.XX2	Exception: C4 – XX2	Map # 1	By-law:

In a C4 – XX2 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:

6.2.5.XX2.20	Minimum number of **parking spaces** per 100 m² **gross floor area - non-residential** for a craft beer brewery with accessory **restaurant**	
	Craft beer brewery	1.6
	Accessory **Restaurant**	9.0
6.2.5.XX2.21	For the resident visitor component, a shared parking arrangement may be used for the calculation of required visitor/non-residential parking in accordance with the following: the greater of 0.15 visitor spaces per unit or Parking required for a **retail store**, **restaurant**, **take-out restaurant**, **personal service establishment**, **commercial school**, **financial institution**, **medical office**, **office**, and **day care**	

6.2.5.XX2.22 Notwithstanding section 3.1.2.3 of this By-law, a shared parking formula may be used as indicated below.

All required parking spaces must be accessible to all users participating in the shared parking arrangement and may not be reserved for specific users.

The initial step in determining required parking for a mixed use development is to calculate the parking requirement for each **use** in the development as if these **uses** were free-standing **buildings**. The parking requirement for each **use** is then multiplied by the percent of the peak period for each time period (i.e. noon), contained below. Each column is totalled for weekday and weekend. The highest figure obtained from all time periods shall become the required parking for the mixed use development.

Mixed Use Development Shared Parking Formula

Type of Use	*Weekday Shared Parking Time Factors*			
	Morning	*Noon*	*Afternoon*	*Evening*
Office/Medical Office	100%	90%	95%	10%
Real Estate Office	90%	80%	100%	50%
Financial Institution	70%	75%	100%	80%
Various commercial*	50%	50%	70%	75%
Restaurant/Take-out Rest.	25%	65%	25%	100%
Overnight Accom.- *Rooms*	50%	25%	25%	65%
Overnight Accom.- *Other*	95%	100%	90%	95%
Residential	90%	65%	90%	100%
Residential Visitors	20%	20%	50%	100%
	Weekend Shared Parking Time Factors			
	Morning	*Noon*	*Afternoon*	*Evening*
Office	10%	10%	10%	10%
Real Estate Office	50%	50%	50%	20%
Financial Institution	90%	90%	90%	20%
Various commercial*	50%	75%	100%	10%
Restaurant/Take-out Rest.	20%	90%	50%	100%
Overnight Accom.- *Rooms*	70%	25%	25%	50%
Overnight Accom.- *Other*	95%	95%	90%	95%
Residential	90%	65%	90%	100%
Residential Visitors	20%	20%	60%	100%

*Various Commercial includes **Retail Store**, **Personal Service Establishment**, and **Repair Establishments**

6.2.5.XX2	Exception: C4 – XX2	Map # 1	By-law:
In a C4 – XX2 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:			
6.2.5.XX2.23	A car-share **parking space** shall be a **parking space** dedicated to a short-term vehicle rental for residents		
6.2.5.XX2.24	Bicycle-share parking spaces shall be dedicated to short- term bicycle rental for residents and shall be required to meet size requirements as specified on Illustrations on Schedule 3		
6.2.5.XX2.25	Total resident **parking spaces** per residential **dwelling unit** may be reduced at a rate of four **parking spaces** for every car-share **parking space** provided on the site up to a maximum of 1 car-share **parking space** per 60 **dwelling units**		
6.2.5.XX2.26	Total resident **parking spaces** per residential **dwelling unit** may be reduced at a rate of 3 **parking spaces** for every 10 bicycle-share parking spaces and an additional 1 **parking space** for 2 bicycle-share parking spaces to a maximum of 25% of total required **parking spaces** per residential **dwelling unit**		
6.2.5.XX2.27	Minimum number of bicycle parking spaces		
	Apartments, retirement building		
	Resident		0.6 spaces per unit
	Visitor		0.15 spaces per unit
	Office		
	Employee		0.17 spaces per 100 m^2 GFA – non – residential
	Visitor		0.03 spaces per 100 m^2 GFA – non – residential
	Retail store, personal service establishment, restaurant		
	Employee		0.085 spaces per 100 m^2 GFA – non – residential
	Visitor		0.25 spaces per 100 m^2 GFA – non – residential
	All other non-residential uses		
	Employee		4% of required parking
	Visitor		4% of required parking
6.2.5.XX2.28	A bicycle parking space must comply with the following:		
	(1) The minimum dimension of a bicycle parking space is:		
	(1.1) minimum length		1.8 m
	(1.2) minimum width		0.6 m
	(1.3) minimum vertical clearance from the ground		1.9 m
	(2) the minimum dimension of a bicycle parking space if placed in a vertical position on a wall, structure or mechanical device is:		
	(2.1) minimum length or vertical clearance		1.9 m
	(2.2) minimum width		0.6 m
	(2.3) minimum horizontal clearance from the wall		1.2 m
	(3) the minimum vertical clearance for each bicycle parking space if a stacked bicycle parking space is provided		1.2 m
	(4) An area used to provide bicycle parking spaces must have a minimum vertical clearance of:		
	(4.1) for a stacked bicycle parking space		2.4 m
	(4.2) all other cases		1.9 m
	(5) A bicycle parking space must have a minimum aisle clearance of:		
	(5.1) when facing a wall or other obstacle		0.9 m
	(5.2) when facing a bicycle parking space		1.5 m

6.2.5.XX2	Exception: C4 – XX2	Map # 1	By-law:
In a C4 – XX2 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:			
6.2.5.XX2.29	One change facility per gender containing a change room and shower stalls shall be provided accessory to each **building** in accordance with the following: Minimum number of shower stalls per gender in a change facility for all permanent **structures** and **buildings** Minimum number of shower stalls per gender in a change facility 0-4 5-29 30-59 60-89 90-119 120-149 150-179 Over 179		Required Number of Shower stalls Per gender 0 1 2 3 4 5 6 7 plus 1 for each additional 30 bicycle spaces
6.2.5.XX2.30	**Driveways**, **aisles**, and visitor parking may be shared with abutting lands zoned RA5 – XX and/or C4-XX3		
6.2.5.XX2.31	Minimum number of **loading spaces**		0

7. By-law Number 0225-2007, as amended, being a City of Mississauga ZoningBy-law, is amended by adding the following Exception Table:

6.2.5.XX3	Exception: C4-XX3	Map # 1	By-law:
In a C4-XX3 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:			
Permitted Uses			
6.2.5.XX3.1	Lands zoned C4-XX3 shall only be used for the following: (1) **Retail store** less than or equal to 250 m^2 **GFA – non-residential** (2) **Restaurant** (3) **Take-out restaurant** (4) Outdoor patio accessory to a **restaurant** or **take-out restaurant** (5) **Personal service establishment** (6) **Commercial School** (7) **Repair establishment** (8) **Office** (9) **Apartment** (10) **Dwelling unit** located above the **first storey** of a commercial **building** (11) Live/work unit (12) Creative industry incubator space (13) Cultural infrastructure facilities (14) **Staff/Student Residence** for lands zoned I-XX (15) **Public school** (16) **Passive Recreational Use** (17) **Active Recreational Use** (18) **Parking lot**		
Regulations			
6.2.5.XX3.2	The provisions contained in Lines 1.0, and 3.0 of Table 2.1.2.1.1, subsection 2.1.2, Lines 4.0, 5.0, 6.0, 7.0, 8.0, 9.0 and 11.0 in Table 2.1.9.1, article 2.1.25.4, subsection 2.1.30, Lines 2.6.1, 2.6.2, 2.6.3, 2.6.4, 11.1, 12.3, 12.4, 14.0 and 16.0 contained in Table 6.2.1 of this By-law shall not apply		
6.2.5.XX3.3	For the purposes of this By-law, all lands zoned C4-XX3 shall be considered one **lot** for each parcel separated by public rights-of-way		

6.2.5.XX3	Exception: C4-XX3	Map # 1	By-law:
In a C4-XX3 zone the permitted **uses** and applicable regulations shall be as specified for a C4 zone except that the following **uses**/regulations shall apply:			
6.2.5.XX3.4	Maximum number of **dwelling units** on all lands zoned RA5-XX, C4-XX1, C4-XX2, and C4-XX3		8,050
6.2.5.XX3.5	An **office**, **personal service establishment**, **repair establishment**, **restaurant**, **take-out restaurant** or **retail store** located in an **apartment building** shall only be located within the **first storey** of the apartment **building**		
6.2.5.XX3.6	The ground floor of a **parking structure** facing a public **street** or mews shall only be used for cultural infrastructure facilities**, office, retail store, personal service establishments**, **restaurant**, and **take-out restaurant** uses		
6.2.5.XX3.7	The area of the ground floor of a **parking structure** used for cultural infrastructure facilities**, office, retail store, personal service establishments**, **restaurant**, and **take-out restaurant** uses shall be limited to the first 20m facing a public **street** or mews		
6.2.5.XX3.8	Maximum **height** for all **buildings**		12 Storeys
6.2.5.XX3.9	Minimum resident **parking spaces** per **apartment dwelling unit**		1.0
6.2.5.XX3.10	Minimum visitor **parking spaces** per **dwelling unit**		0.15
6.2.5.XX3.11	Maximum percentage of required resident **parking spaces** that may be tandem, provided that each pair of **tandem parking spaces** is allocated to one **dwelling unit**		25%
6.2.5.XX3.12	Minimum number of **parking spaces** per 100 m² **gross floor area - non-residential** for a **restaurant**		9.0
6.2.5.XX3.13	Minimum number of **parking spaces** per 100 m² **gross floor area - non-residential** for a **retail store, personal service** establishment, or **office**		3.0
6.2.5.XX3.14	Minimum number of **parking spaces** per 100 m² **gross floor area - non-residential** for a **financial institution, real estate office**, or **medical office**		4.85
6.2.5.XX3.15	**Driveways**, **aisles**, and visitor parking may be shared with abutting lands zoned C4-XX2 and I-XX		
6.2.5.XX3.16	Minimum number of **parking spaces** per 100 m² **gross floor area - non-residential** for a cultural infrastructure use		3.0
6.2.5.XX3.17	A car-share **parking space** shall be a **parking space** dedicated to a short-term vehicle rental for residents		
6.2.5.XX3.18	Bicycle-share parking spaces shall be dedicated to short-term bicycle rental for residents and shall be required to meet size requirements as specified on Illustrations on Schedule 3		
6.2.5.XX3.19	Total resident **parking spaces** per residential **dwelling unit** may be reduced at a rate of four **parking spaces** for every car-share **parking space** provided on the site up to a maximum of 1 car-share **parking space** per 60 **dwelling units**		
6.2.5.XX3.20	Total resident **parking spaces** per residential **dwelling unit** may be reduced at a rate of 3 **parking spaces** for every 10 bicycle-share parking spaces and an additional 1 **parking space** for 2 bicycle-share parking spaces to a maximum of 25% of total required **parking spaces** per residential **dwelling unit**		
6.2.5.XX3.21	Minimum number of **loading spaces**		0
6.2.5.XX3.22	Minimum setback from an above or below grade **parking structure** inclusive of external above grade access stairwells, to a **lot line**		1.0 m
6.2.5.XX3.23	Required parking may be provided on lands zoned I-XX		

8. By-law Number 0225-2007, as amended, being a City of Mississauga Zoning By-law, is amended by adding the following Exception Table:

<table>
<tr><td>4.15.6.XX</td><td>Exception: RA5-XX</td><td>Map # 1</td><td>By-law:</td></tr>
<tr><td colspan="4">In an RA5-XX zone the permitted uses and applicable regulations shall be as specified for a RA5 zone except that the following uses/regulations shall apply:</td></tr>
<tr><td colspan="4">Additional Permitted Use</td></tr>
<tr><td>4.15.6.XX.1</td><td colspan="3">(1) Townhouse
(2) Townhouse on a CEC road
(3) Back to Back townhouse
(4) Back to Back townhouse on a CEC road
(5) Stacked townhouse
(6) Stacked townhouse on a CEC road
(7) Parking lot
(8) Restaurant
(9) Take-out restaurant
(10) Outdoor patio accessory to a restaurant or take-out restaurant
(11) Personal Service Establishment
(12) Medical office - restricted
(13) Day Care
(14) Retail store
(15) Animal care establishment
(16) Financial Institution
(17) Model Home in a townhouse, back-to-back townhouse, or stacked townhouse constructed for the purpose of display and sale of dwelling units to be constructed on lots within a registered plan of subdivision or condominium</td></tr>
<tr><td colspan="4">Regulations</td></tr>
<tr><td>4.15.6.XX.2</td><td colspan="3">The provisions contained in Lines 1.0 and 3.0 in Table 2.1.2.1.1, subsection 2.1.14, article 2.1.16.2, subsection 2.1.30, Lines 6.0, 7.0, 9.0 and 11.0 in Table 2.1.9.1, Lines 4.0, 5.0, 6.0, 8.1, 8.2, 8.3, 8.4, 9.1, 9.2, 9.3, 9.4, 10.1, 10.2, 10.3, 10.4, 11.1, 11.2, 11.3, 12.3, 12.4, 13.4, 13.5, 15.1, 15.2, 15.3, 15.4, 15.5, 15.6, and 16.0 in Table 4.15.1 of this By-law shall not apply</td></tr>
<tr><td>4.15.6.XX.3</td><td colspan="3">Maximum heights of all apartments, long-term care buildings, and retirement buildings, on Parcel Areas 1 to 15 as identified on Schedule RA5- XX of this Exception shall conform to the following schedule:

<table><tr><th>Parcel Area</th><th>Maximum Building Height</th></tr><tr><td>1</td><td>15 Storeys</td></tr><tr><td>2</td><td>15 Storeys</td></tr><tr><td>3A</td><td>15 Storeys</td></tr><tr><td>3B</td><td>25 Storeys</td></tr><tr><td>4A</td><td>25 Storeys</td></tr><tr><td>4B</td><td>21 Storeys</td></tr><tr><td>5A</td><td>18 Storeys</td></tr><tr><td>5B</td><td>15 Storeys</td></tr><tr><td>6A</td><td>28 Storeys</td></tr><tr><td>6B</td><td>15 Storeys</td></tr><tr><td>7</td><td>15 Storeys</td></tr><tr><td>8</td><td>15 Storeys</td></tr><tr><td>9</td><td>15 Storeys</td></tr><tr><td>10</td><td>29 Storeys</td></tr><tr><td>11</td><td>24 Storeys</td></tr><tr><td>12A</td><td>40 Storeys</td></tr><tr><td>12B</td><td>15 Storeys</td></tr><tr><td>13</td><td>12 Storeys</td></tr><tr><td>14</td><td>17 Storeys</td></tr><tr><td>15</td><td>12 Storeys</td></tr></table></td></tr>
<tr><td>4.15.6.XX.4</td><td colspan="2">Maximum number of dwelling units on all lands zoned RA5 XX, C4-XX1, C4-XX2, and C4-XX3</td><td>8,050</td></tr>
<tr><td>4.15.6.XX.5</td><td colspan="3">For the purposes of this By-law, Parcel Blocks as pairs 3A to 3B, 4A to 4B, 5A to 5B, 6A to 6B, and 12A to 12B inclusive identified on Schedule 1 of this Exception shall be considered one property</td></tr>
</table>

4.15.6.XX	Exception: RA5-XX	Map # 1	By-law:
In an RA5-XX zone the permitted **uses** and applicable regulations shall be as specified for a RA5 zone except that the following **uses**/regulations shall apply:			
4.15.6.XX.6	A surface **parking lot** shall only be permitted Parcel Areas 3A, 3B, 6B, 8, 9, 10, 11, 12B, 13, 14, and 15 as indicated on Schedule 1 of this By-law		
4.15.6.XX.7	The surface **parking lot** shall not be permitted after a Parcel Area as identified on Schedule 1 has been developed to 50% of the Parcel Area **lot area**		
4.15.6.XX.8	All non-residential **uses** shall not be permitted on Parcel Areas 5B and 7		
4.15.6.XX.9	All non-residential **uses** shall only be permitted within a **building**, **structure** or part thereof, used for an **apartment**, **long-term care building**, **retirement building**, or any combination thereof		
4.15.6.XX.10	A **day care** may be located within a **retirement building** and/or **apartment** and the accessory outdoor play area may be at grade or on the roof of the **building** or **structure**		
4.15.6.XX.11	An interim free-standing district energy facility providing heating and cooling for the surrounding lands shall be located within a **building** or **structure**		
4.15.6.XX.12	A **structure** required for permitting physical services and utilities under subsection 2.1.1.2 of this By-law shall not be subject to the zone regulations		
4.15.6.XX.13	**Motor vehicle** parking may be provided off site on lands zoned RA5-XX, C4-XX1, and C4-XX2		
4.15.6.XX.14	Below grade **parking structures** under **private roads** shall be permitted		
4.15.6.XX.15	Minimum resident **parking spaces** per **apartment dwelling unit**	1.0	
4.15.6.XX.16	Minimum resident **parking spaces** per **townhouse, townhouse** on a **CEC road, back to back townhouse, back to back townhouse** on a **CEC road, stacked townhouse,** and **stacked townhouse** on a **CEC road**	1.4	
4.15.6.XX.17	Minimum visitor **parking spaces** per **dwelling unit**	0.15	
4.15.6.XX.18	Minimum number of **parking spaces** per **retirement dwelling unit**	0.4	
4.15.6.XX.19	No **townhouse, townhouse** on a **CEC road, back to back townhouse, back to back townhouse** on a **CEC road, stacked townhouse,** and **stacked townhouse** on a **CEC road** shall have a private driveway with direct access to, or a **front garage facing** a public street		
4.15.6.XX.20	Minimum number of **parking spaces** per 100 m^2 **gross floor area - non-residential** for a **restaurant**	9.0	
4.15.6.XX.21	No parking shall be required for an outdoor patio associated with a **restaurant** or **take-out restaurant**		
4.15.6.XX.22	Minimum number of **parking spaces** per 100 m^2 **gross floor area - non-residential** for a **retail store, personal service establishment**, **animal care establishment**, **medical office – restricted**, or **take- out restaurant**	0.0	
4.15.6.XX.23	Minimum number of **parking spaces** per 100 m^2 **gross floor area - non-residential** for a **financial institution**	4.85	
4.15.6.XX.24	Minimum number of **parking spaces** per 100 m^2 **gross floor area - non-residential** for an **office**	3.0	
4.15.6.XX.25	A car-share **parking space** shall be a **parking space** dedicated to a short-term vehicle rental for residents		
4.15.6.XX.26	Bicycle-share parking spaces shall be dedicated to short- term bicycle rental for residents and shall be required to meet size requirements as specified on Illustrations on Schedule 3		
4.15.6.XX.27	**Pervious material** is permitted on any surface driveways, aisleways, or parking		
4.15.6.XX.28	Total resident **parking spaces** per residential **dwelling unit** may be reduced at a rate of four **parking spaces** for every car-share **parking space** provided on the site up to a maximum of 1 car-share **parking space** per 60 **dwelling units**		
4.15.6.XX.29	Total resident **parking spaces** per residential **dwelling unit** may be reduced at a rate of 3 **parking spaces** for every 10 bicycle-share parking spaces and an additional 1 **parking space** for 2 bicycle-share parking spaces to a maximum of 25% of total required **parking spaces** per residential **dwelling unit**		

<table>
<tr><td>4.15.6.XX</td><td>Exception: RA5-XX</td><td>Map # 1</td><td>By-law:</td></tr>
<tr><td colspan="4">In an RA5-XX zone the permitted uses and applicable regulations shall be as specified for a RA5 zone except that the following uses/regulations shall apply:</td></tr>
<tr><td>4.15.6.XX.30</td><td colspan="2">Minimum number of bicycle parking spaces

Apartment, townhouse, townhouse on a CEC road, back to back townhouse, back to back townhouse on a CEC road, stacked townhouse, and stacked townhouse on a CEC road which do not have an exclusive use garage and driveway
Resident

Visitor</td><td>

0.6 spaces per unit
0.15 spaces per unit</td></tr>
<tr><td>4.15.6.XX.31</td><td colspan="2">A bicycle parking space must comply with the following:

(1) The minimum dimension of a bicycle parking space is:
(1.1) minimum length
(1.2) minimum width
(1.3) minimum vertical clearance from the ground
(2) the minimum dimension of a bicycle parking space if placed in a vertical position on a wall, structure or mechanical device is:
(2.1) minimum length or vertical clearance
(2.2) minimum width
(2.3) minimum horizontal clearance from the wall
(3) the minimum vertical clearance for each bicycle parking space if a stacked bicycle parking space is provided
(4) An area used to provide bicycle parking spaces must have a minimum vertical clearance of:
(4.1) for a stacked bicycle parking space
(4.2) all other cases
(5) A bicycle parking space must have a minimum aisle clearance of:
(5.1) when facing a wall or other obstacle
(5.2) when facing a bicycle parking space</td><td>

1.8 m
0.6 m
1.9 m

1.9 m
0.6 m
1.2 m

1.2 m

2.4 m
1.9 m

0.9 m
1.5 m</td></tr>
<tr><td>4.15.6.XX.32</td><td colspan="2">Total resident parking spaces per residential dwelling unit may be reduced at a rate of 1 vehicle parking space for every 5 bicycle parking space provided in excess of the minimum number of bicycle parking spaces, if the reduction of the vehicle parking space is not greater than 20% of the total minimum vehicle parking spaces required</td><td></td></tr>
<tr><td>4.15.6.XX.33</td><td colspan="2">For the visitor component, a shared parking arrangement may be used for the calculation of required visitor/non- residential parking in accordance with the following:
the greater of 0.15 visitor spaces per unit or
Parking required for a restaurant, take-out restaurant, personal service establishment, day care, and retail store</td><td></td></tr>
</table>

4.15.6.XX	Exception: RA5-XX	Map # 1	By-law:

In an RA5-XX zone the permitted **uses** and applicable regulations shall be as specified for a RA5 zone except that the following **uses**/regulations shall apply:

4.15.6.XX.34 Notwithstanding section 3.1.2.3 of this By-law, a shared parking formula may be used as indicated below.

All required parking spaces must be accessible to all users participating in the shared parking arrangement and may not be reserved for specific users.

The initial step in determining required parking for a mixed use development is to calculate the parking requirement for each **use** in the development as if these **uses** were free-standing **buildings**. The parking requirement for each **use** is then multiplied by the percent of the peak period for each time period (i.e. noon), contained below. Each column is totalled for weekday and weekend. The highest figure obtained from all time periods shall become the required parking for the mixed use development.

Mixed Use Development Shared Parking Formula

Type of Use	*Weekday Shared Parking Time Factors*			
	Morning	*Noon*	*Afternoon*	*Evening*
Office/Medical Office	100%	90%	95%	10%
Real Estate Office	90%	80%	100%	50%
Financial Institution	70%	75%	100%	80%
Various commercial*	50%	50%	70%	75%
Restaurant/Take-out Rest.	25%	65%	25%	100%
Overnight Accom.- *Rooms*	50%	25%	25%	65%
Overnight Accom.- *Other*	95%	100%	90%	95%
Residential	90%	65%	90%	100%
Residential Visitors	20%	20%	50%	100%
	Weekend Shared Parking Time Factors			
	Morning	*Noon*	*Afternoon*	*Evening*
Office	10%	10%	10%	10%
Real Estate Office	50%	50%	50%	20%
Financial Institution	90%	90%	90%	20%
Various commercial*	50%	75%	100%	10%
Restaurant/Take-out Rest.	20%	90%	50%	100%
Overnight Accom.- *Rooms*	70%	25%	25%	50%
Overnight Accom.- *Other*	95%	95%	90%	95%
Residential	90%	65%	90%	100%
Residential Visitors	20%	20%	60%	100%

*Various Commercial includes **Retail Store**, **Personal Service Establishment**, **Animal Care Establishment**, and **Repair Establishments**

4.15.6.XX.35	Maximum percentage of required resident **parking spaces** that may be tandem, provided that each pair of **tandem parking spaces** is allocated to one **dwelling unit**	25%
4.15.6.XX.36	**Driveways**, **aisles**, and visitor parking may be shared with abutting lands zoned C4-XX1, and C4-XX2	
4.15.6.XX.37	A **structure** required for permitting physical services and utilities under subsection 2.1.1.2 of this By-law shall not be subject to the zone regulations	
4.15.6.XX.38	Minimum **landscaped area**	25% of **lot area**
4.15.6.XX.39	Minimum **landscaped area** for Parcel Blocks 12A, 12B, and 15	10% of **lot area**
4.15.6.XX.40	Minimum setback of a rooftop from all exterior edges	0.0 m
4.15.6.XX.41	**Accessory Buildings and Structures** A maximum of one **accessory building** or **structure**, other than a detached **garage**, and/or two gazebos and/or two pergolas per lot shall be permitted for every **apartment**, **long-term care building**, or **retirement building**	
	Accessory building maximum height	5.0 m
	Gazebo maximum height	6.0 m
	Accessory building maximum **Floor Area**	30 m^2
	Gazebo maximum **Floor Area**	30 m^2

4.15.6.XX	Exception: RA5-XX	Map # 1	By-law:
In an RA5-XX zone the permitted **uses** and applicable regulations shall be as specified for a RA5 zone except that the following **uses**/regulations shall apply:			
4.15.6.XX.42	Maximum projection of a **balcony** for the first five **storeys** measured from the outermost face or faces of the **building** from which the **balcony** projects		3.5 m
4.15.6.XX.43	Maximum projection of a **balcony** for the sixth **storey** or higher measured from the outermost face or faces of the **building** from which the **balcony** projects		2.6 m
4.15.6.XX.44	Notwithstanding section 2.1.16.2 of this By-law, a **model home** may be permitted on lands zoned to permit **townhouse, townhouse** on a **CEC road, back to back townhouse, back to back townhouse** on a **CEC road, stacked townhouse, stacked townhouse** on a **CEC road,** and/or **apartments**		
4.15.6.XX.45	The number of **model homes** for any draft approved plan of subdivision shall not exceed 50% of the total number of blocks		
4.15.6.XX.46	**Back to back townhouse, back to back townhouse** on a **CEC road, stacked townhouse,** and **stacked townhouse** on a **CEC road** is subject to the regulations in the table below and the applicable footnotes from Table 4.14.1 of this By-law:		

Regulations table for **Back to back townhouse, back to back townhouse** on a **CEC road, stacked townhouse,** and **stacked townhouse** on a **CEC road**		
Column	**A**	**B**
ZONES	**Back-to-Back townhouse**	**Stacked townhouse**
PERMITTED USES		
RESIDENTIAL		
Stacked Townhouse, Stacked Townhouse on a **CEC**	✓	
Back to back Townhouse on a **CEC, Back to Back Townhouse**		✓
ZONES	**Back-to-Back townhouse**	**Stacked townhouse**
ZONE REGULATIONS		
MINIMUM **LOT FRONTAGE**	21.6 m	16.0 m
MINIMUM **DWELLING UNIT WIDTH**	4.5 m	4.5 m
MAXIMUM DWELLING **HEIGHT**		
Sloped roof	17.0 m (1) and 4 **storeys**	17.0 m (1) and 4 **storeys**
Flat roof	13.0 m and 4 **storeys** (9)	11.0 m and 3 **storeys** (9)
MINIMUM **FRONT YARD**	3.0 m (2)	3.0 m (2)
MINIMUM **EXTERIOR SIDE YARD**	2.4 m (2)	2.4 m (2)
MINIMUM **INTERIOR SIDE YARD**	1.2 m (2)	1.2 m (2)
Where any portion of the **interior side lot line** abuts a zone permitting **detached dwellings** and/or **semi-detached**	1.2 m (2)	1.2 m (2)
Where the **interior side lot line** abuts a RM4, RM5, RM6, RM7, RM8, RM9, RM10, RM11, or RM12 zone and the rear wall of the **building** abuts the **interior side lot line**	1.2 m (2)(3)	
Where the **front wall** of a **building** abuts the **interior side lot line**	1.2 m (2)	1.2 m (2)
MINIMUM **REAR YARD**	7.5 m (2)	6.0 m (2)
Where any portion of the **rear lot line** abuts a zone permitting **detached dwellings** and/or **semi-detached**	9.0 m (2)	6.0 m (2)
Where the **front wall** of the **building** abuts the **rear lot line**	9.0 m (2)	6.0 m (2)
PROJECTIONS		
Maximum projection of a **balcony**, awning or **deck**, exclusive of stairs, from the outermost face or faces of the **building**	2.4 m	2.4 m

Maximum projection of any part of a **building**, including architectural features but exclusive of stairs, above a below grade patio	50% of the depth of the patio	n/a
Column **A**	**B**	**C**
ZONES	**Back-to-Back townhouse**	**Stacked townhouse**
MINIMUM INTERNAL SETBACKS		
From a **garage face** to a **condominium road** or sidewalk	6.0 m	6.0 m
MINIMUM INTERNAL SETBACKS		
From a **garage face** to a **condominium road** or sidewalk	6.0 m	6.0 m
From a **garage face** to a **condominium road** or sidewalk, where the **garage** and **driveway** are accessed at the rear of the **dwelling unit**	1.0 m	1.0 m
From the **front wall** of a **building** to a **condominium road**, sidewalk, walkway or **parking space** not located on a **driveway**	3.0 m	3.0 m
From a **porch**, exclusive of stairs, located at and accessible from the **first storey** or below the **first storey**, to a **condominium road**, sidewalk, walkway or **parking space**	1.5 m	1.5 m
From a rear wall of a **building** to a side wall of another **building** on the same **lot**	7.2 m	7.2 m
From a rear wall of a **building** to a rear wall of another **building** on the same **lot**	12.0 m	12.0 m
From a side wall of a **building** to a side wall of another **building** on the same **lot**	2.4 m	2.4 m
From a side wall of any **building** to a **walkway**	1.2 m	1.2 m
From a side wall of a **building** to a **condominium road**, sidewalk, or **parking space**	2.4 m	2.4 m
From a **front wall** of a **building** to a **front wall** of another **building** on the same **lot**, where the **building** is less than or equal to three **storeys**	12.0 m (4)	12.0 m
From a **front wall** of a **building** to a front **wall** of another **building** on the same **lot**, where the **building** is less than or equal to three **storeys** and contains a **dwelling unit** in the **basement**	15.0 m	15.0 m
From a **front wall** of a **building** to a **front wall** of another **building** on the same **lot**, where the **building** is four **storeys**	12.0 m (4)	12.0 m
From a **front wall** of a **building** to a side wall of another **building** on the same **lot**	7.2 m (4)	7.2 m
The area created by the minimum separation distance between **buildings** may include the required **amenity area**		
ATTACHED **GARAGE**, PARKING AND **DRIVEWAY**		
Attached **garage**	Permitted (5)	Permitted (5)
Minimum **parking spaces**	✓(6) (7)	✓(6) (7)
Minimum visitor **parking spaces**	✓(6)	✓(6)
Maximum **driveway** width	3.0 m (7)	3.0 m (7)
PARKING AREAS AND **PARKING STRUCTURE** SETBACKS		
Minimum setback between a **parking space** and an **interior side lot line** and/or **rear lot line**	0.9 m	0.9 m
Minimum setback of a **parking structure** constructed above or partially above finished grade to any **lot line**	1.0 m	1.0 m
Minimum setback of a **parking structure** constructed completely below finished grade to any **lot line**	1.0 m	1.0 m
CONDOMINIUM ROADS, **SIDEWALKS** AND **WALKWAYS**		
Minimum width of a **condominium road**	6.0 m	6.0 m
Condominium roads are permitted to be shared with abutting lands zoned to permit **back to back townhouse**, **stacked townhouse**, or **apartment**, or any combination thereof	✓	✓

Minimum width of a **sidewalk** traversed by a **driveway**	1.5 m	1.5 m
Minimum width of a **sidewalk** not traversed by a **driveway**	1.5 m	1.5 m
MINIMUM **AMENITY AREA** AND **LANDSCAPED AREA**		
Minimum **landscaped area**	6 % of **lot area**	40% of **lot area**
Minimum required **landscaped soft area**	50% of **landscaped area**	50% of **landscaped area**
Minimum **landscaped buffer** abutting any side and **rear lot line**	3.0 m	3.0 m
Minimum **landscaped buffer** abutting any side and **rear lot line**	3.0 m	3.0 m
A setback from an **amenity area** shall be unencumbered except for a perpendicular **walkway** and shall consist of only soft landscaped material	✓	✓
Minimum contiguous private outdoor space per unit	n/a	6.0 m^2
Minimum contiguous private outdoor space per unit when located on a balcony	4.5 m^2	4.5 m^2
Minimum setback of a rooftop amenity space from all exterior edges of a **building** adjacent to low density residential development	0.0 m	0.0 m

4.15.6.XX	Exception: RA5-XX	Map # 1	By-law:
In an RA5-XX zone the permitted **uses** and applicable regulations shall be as specified for a RA5 zone except that the following **uses**/regulations shall apply:			
4.15.6.XX.47	Minimum **amenity area**		The greater of 2.3 m^2 per **dwelling unit** or 5% of the site area
4.15.6.XX.48	Maximum area of rooftop access/stairwell to be used for washroom and/or kitchen, such area not to be included in **gross floor area** calculation or in **height** calculation		50%
4.15.6.XX.49	Notwithstanding Table 4.10.1 of this By-law, a **townhouse** shall be subject to the following zone regulations: (1) MINIMUM **LOT AREA** PER **DWELLING UNIT** (2) MINIMUM **LOT FRONTAGE**		 100 m^2 18.0 m
4.15.6.XX.50	Notwithstanding Table 4.10.1 of this By-law, a **townhouse** shall be subject to the following minimum **lot line** setbacks: (1) From the side wall of a **townhouse** to a **lot line** that is not a **street line** (1) From the rear wall of a **townhouse** to a **lot line** that is not a **street line** (2) From a **wing wall** attached to a **townhouse** to a **lot line** (2) From heating and/or air conditioning equipment to a **lot line**		 1.2 m 6.0 m 1.2 m 0.6 m

4.15.6.XX	Exception: RA5-XX	Map # 1	By-law:
In an RA5-XX zone the permitted **uses** and applicable regulations shall be as specified for a RA5 zone except that the following **uses**/regulations shall apply:			
4.15.6.XX.51	Notwithstanding Table 4.10.1 of this By-law, a **townhouse** shall be subject to the following minimum internal setbacks:		
	(1) From a front and/or side wall of a **townhouse** to a **condominium road**, sidewalk or visitor **parking space**		2.4 m
	(2) From a **garage face** to a **condominium road** or sidewalk, where the **garage** and **driveway** are accessed at the rear of the **dwelling unit**		1.0 m
	(3) From a **garage face** to a **condominium road** or sidewalk		5.75 m
	(4) From a side wall of a **townhouse** to a side wall of another dwelling		2.4 m
	(5) From a side wall of a **townhouse** to an internal walkway		1.2 m
	(6) From a rear wall of a **townhouse** to a side wall of another dwelling		7.2 m
	(7) From a rear wall of a **townhouse** to a rear wall of another dwelling		12.0 m
	(8) From a rear wall of a **townhouse** to a **condominium road**, sidewalk, or internal walkway		6.0 m
	(9) From a rear wall of a **townhouse** to a **condominium road**, sidewalk, or internal walkway where the **garage** and **driveway** are accessed at the rear of the **dwelling unit**		2.4 m
4.15.6.XX.52	Notwithstanding Table 4.10.1 of this By-law, a **townhouse** shall be subject to the following maximum projections:		
	(1) An awning attached to the front and/or side wall of a **townhouse**		1.0 m
	(2) **Balcony** attached to front, side, and or rear wall of a **Townhouse**		1.5 m
4.15.6.XX.53	Notwithstanding Table 4.10.1 of this By-law, a **townhouse** shall be subject to the following maximum **height**:		
	(1) **Sloped roof**		17 m and 4 **storeys**
	(2) **Flat roof**		13 m and 4 **storeys**
	(3) A rooftop access/stairwell, which may include a washroom and/or kitchen, shall not be included in the calculation of **height**		
Section 37 Public Benefits Contribution			
4.15.6.XX.42	Pursuant to section 37 of the Planning Act, R.S.O 1990, c.P.13, as amended, the height and density of development provided by this Exception shall be permitted subject to the owner of the lands zoned "RA5-XX", "C4-XX1", "C4-XX2", "C4-XX3", "OS1", "OS2", "OS2-XX", "I-XX", "G1", "G1-XX", and "E2-XX"entering into an agreement with The Corporation of the City of Mississauga (the City) for the provision of certain facilities, services or matters in return for the increase in height and density of development granted by this Exception as provided by section 37(3) of the Planning Act, R.S.O. 1990, c.P.13, as amended. This agreement shall be registered on title to the lands zoned "RA5-XX", "C4- XX1", "C4-XX2", "C4-XX3", "OS1", "OS2", "OS2-XX", "I-XX", "G1", "G1-XX", and "E2-XX"and shall require the owner to: (1) make payment to the City the sum of $XXX to be used by the City toward upgrades to XX Park, and/or affordable housing initiatives and/or a contribution towards the XX cultural building, and/or construction of a parking structure, and/or streetscape upgrades which may include street related art.		

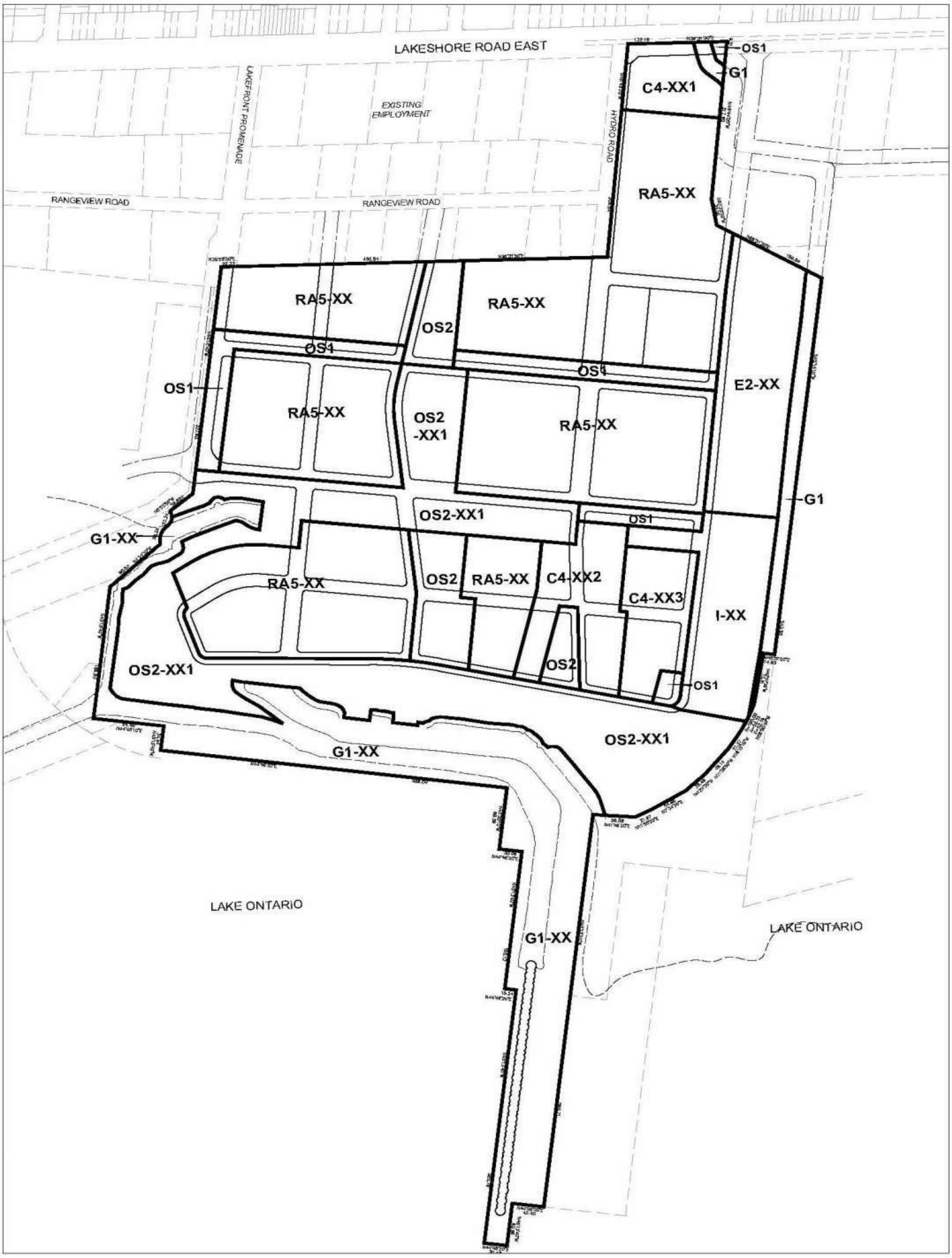
9. Map Number 1 of Schedule "B" to By-law Number 0225-2007, as amended, being a City of Mississauga Zoning By-law, is amended by changing thereon from "U-1" and “G1” to "RA5-XX”, “C4-XX1”, “C4-XX2”, “C4-XX3”, “OS1”, “OS2”, “OS2-XX”, “I-XX”, “G1”, “G1-XX”, and “E2-XX”, the zoning of Part of Lots 7, 8 and 9, Concession 3, South of Dundas Street, part of Water Lot in front of Lot 7, Concession 3, South of Dundas Street, part of Water Lot location HY28 in front of Lot 7, Concession 3, South of Dundas Street, Water Lot location HY77 in front of Lot 7, Concession 3, South of Dundas Street, part of Water Lot location HY116 in front of Lot 7 Concession 3, South of Dundas Street (Geographic Township of Toronto, County of Peel), in the City of Mississauga, PROVIDED HOWEVER THAT the "RA5-XX”, “C4-XX1”, “C4-XX2”, “C4-XX3”, “OS1”, “OS2”, “OS2-XX”, “I- XX”, “G1”, “G1-XX”, and “E2-XX” zoning shall only apply to the lands which are shown on the attached Schedule "A", which is deemed to be an integral part of this By-law, outlined in the heaviest broken line with the "RA5-XX”, “C4- XX1”, “C4-XX2”, “C4-XX3”, “OS1”, “OS2”, “OS2-XX”, “I-XX”, “G1”, “G1-XX”, and “E2-XX” zoning indicated thereon.

ENACTED and PASSED this __________ day of ____________________ 2020.

MAYOR

CLERK

Schedule "A"



PART OF LOTS 8, 7 AND 9, CONCESSION 3, SOUTH OF DUNDAS STREET
PART OF WATER LOT IN FRONT OF LOT 7, CONCESSION 3, SOUTH OF
DUNDAS STREET PART OF WATER LOT LOCATION HY28 IN FRONT OF LOT 7,
CONCESSION 3, SOUTH OF DUNDAS STREET WATER LOT LOCATION HY 77IN
FRONT OF LOT 7,CONCESSION 3, SOUTH OF DUNDAS STREET
PART OF WATER LOT LOCATION HY 116IN
RONT OF LOT 7, CONCESSION 3, SOUTH OF DUNDAS STREET
(GEOGRAPHIC TOWNSHIP OF TORONTO, COUNTY OF PEEL),
CITY OF MISSISSAUGA

THIS IS SCHEDULE "A" TO

BY-LAW _______________

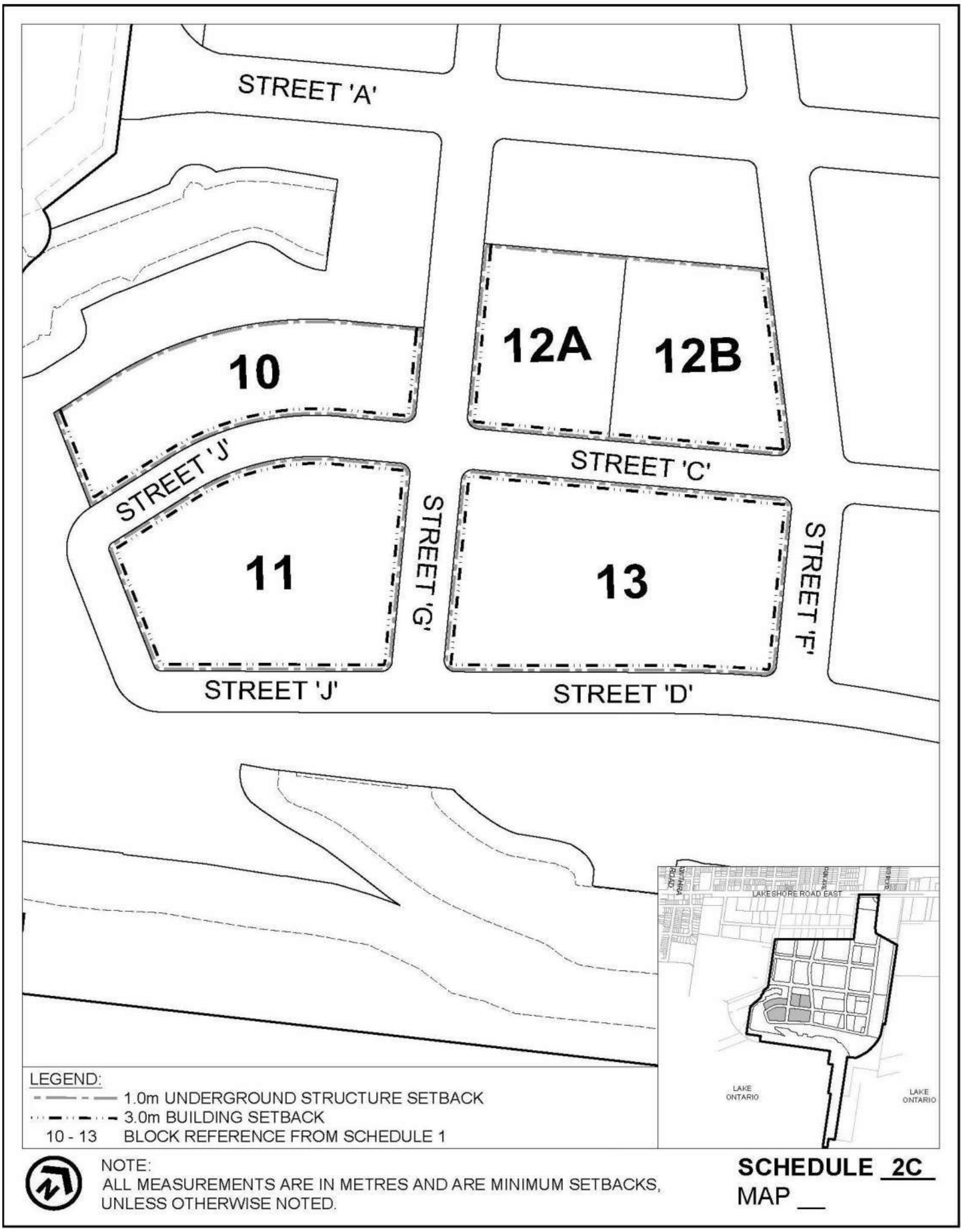
PASSED BY COUNCIL

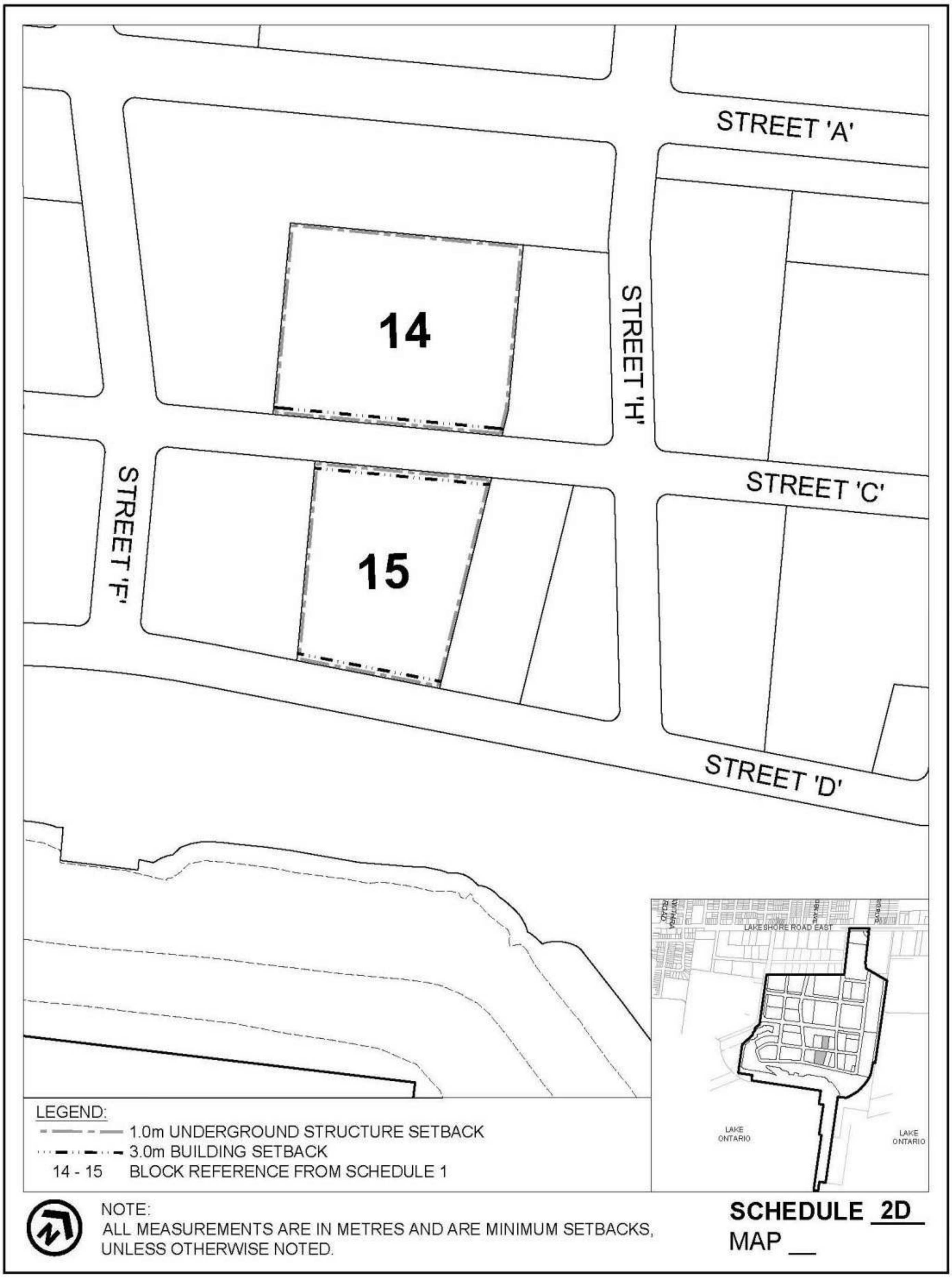
____

Schedule "1" (Parcel Areas)

Schedules "2A-2D" (Setbacks)


HYDRO ROAD
RANGEVIEW ROAD
7
STREET 'E'
5A
5B
8
STREET 'H' (HYDRO ROAD)
STREET 'I'
STREET 'B'
STREET 'B'
6A
6B
9
STREET 'A'
LAKESHORE ROAD EAST
LAKE ONTARIO
LAKE ONTARIO
LEGEND:
1.0m UNDERGROUND STRUCTURE SETBACK
3.0m BUILDING SETBACK
5A - 9 BLOCK REFERENCE FROM SCHEDULE 1
NOTE:
ALL MEASUREMENTS ARE IN METRES AND ARE MINIMUM SETBACKS, UNLESS OTHERWISE NOTED.
SCHEDULE 2B
MAP __


STREET 'A'
10
12A
12B
STREET 'J'
STREET 'C'
11
STREET 'G'
13
STREET 'F'
STREET 'J'
STREET 'D'
LAKESHORE ROAD EAST
LAKE ONTARIO
LAKE ONTARIO
LEGEND:
1.0m UNDERGROUND STRUCTURE SETBACK
3.0m BUILDING SETBACK
10 - 13 BLOCK REFERENCE FROM SCHEDULE 1
NOTE:
ALL MEASUREMENTS ARE IN METRES AND ARE MINIMUM SETBACKS, UNLESS OTHERWISE NOTED.
SCHEDULE 2C
MAP __


STREET 'A'
STREET 'H'
STREET 'C'
STREET 'F'
STREET 'D'
14
15
LAKESHORE ROAD EAST
LAKE ONTARIO
LAKE ONTARIO
LEGEND:
1.0m UNDERGROUND STRUCTURE SETBACK
3.0m BUILDING SETBACK
14 - 15 BLOCK REFERENCE FROM SCHEDULE 1
NOTE:
ALL MEASUREMENTS ARE IN METRES AND ARE MINIMUM SETBACKS, UNLESS OTHERWISE NOTED.
SCHEDULE 2D
MAP

Schedule "3" (Bicycle Parking Illustrations)

Illustration: Bicycle Parking

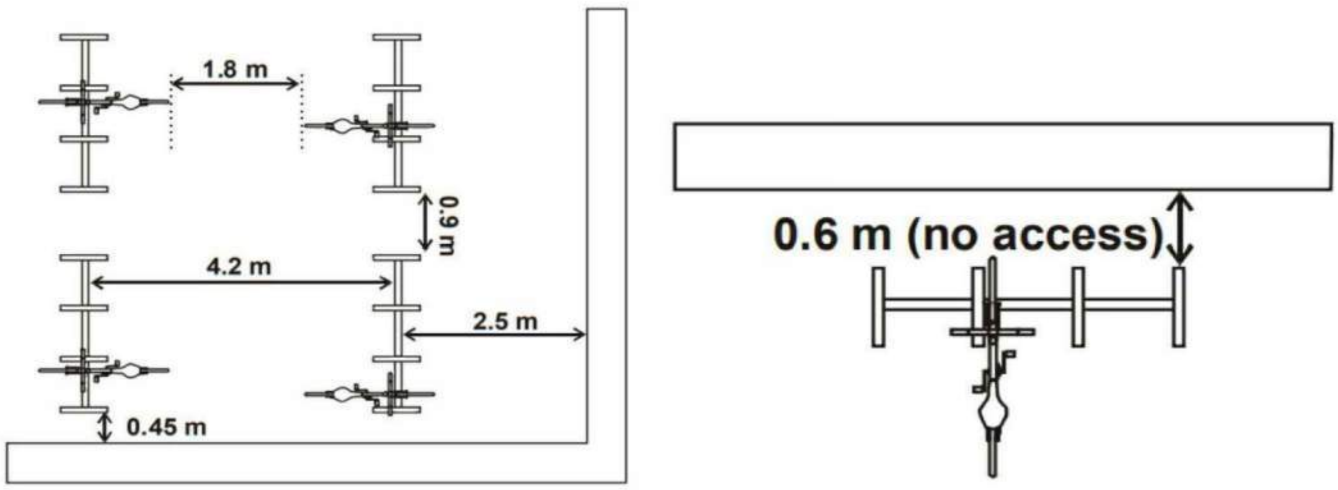


Illustration No.: 1

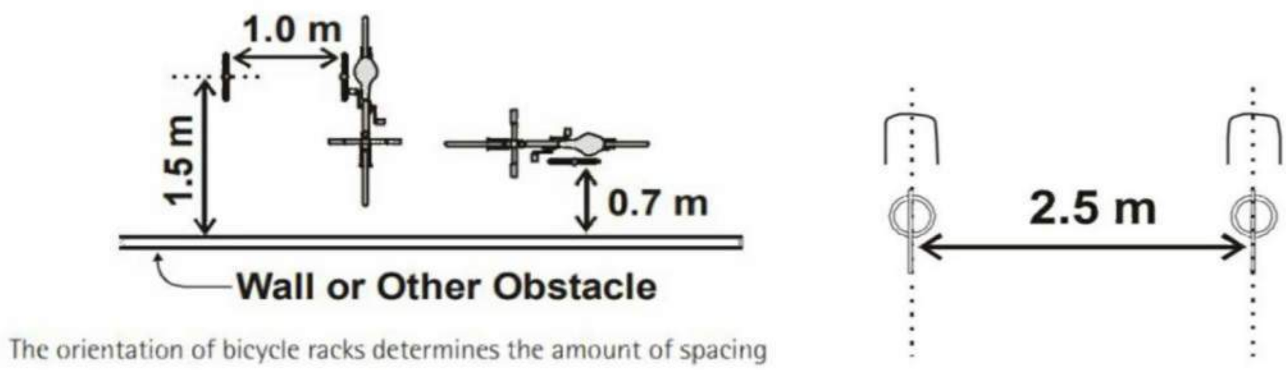


Illustration No.: 2

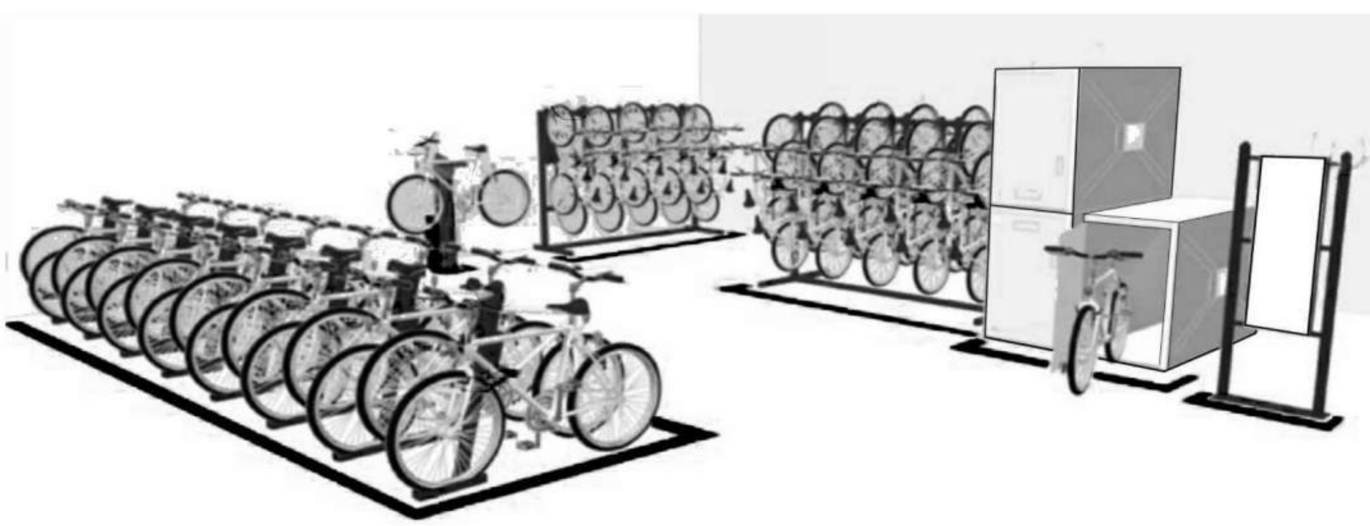


Illustration No.: 3

Note:
The above illustrations are for clarification and convenience only and do not form part of this By-law. The Definitions and General Provisions parts of this By-law must be referenced.

PART OF LOTS 8 ,7 AND 9, CONCESSION 3 ,SOUTH OF DUNDAS STREET PART OF WATER LOT IN FRONT OF LOT 7, CONCESSION 3, SOUTH OF DUNDAS STREET PART OF WATER LOT LOCATION HY28 IN FRONT OF LOT 7, CONCESSION 3 ,SOUTH OF DUNDAS STREET WATER LOT LOCATION HY 77IN FRONT OF LOT 7,CONCESSION 3, SOUTH OF DUNDAS STREET PART OF WATER LOT LOCATION HY 116 IN FRONT OF LOT 7, CONCESSION 3, SOUTH OF DUNDAS STREET (GEOGRAPHIC TOWNSHIP OF TORONTO ,COUNTY OF PEEL ,)CITY OF MISSISSAUGA

THIS IS SCHEDULE "3" (BICYCLE PARKING ILLUSTRATIONS) TO

BY-LAW ______________

PASSED BY COUNCIL

____

APPENDIX "A" TO BY-LAW NUMBER

<u>Explanation of the Purpose and Effect of the By-law</u>

The purpose of this By-law is to permit a mixed-use development consisting of residential uses in various built form types including townhouses and apartments, employment, commercial and institutional uses, and open space uses including active, passive and naturalized parkland.

This By-law amends the zoning of the property outlined on the attached Schedule "A" from "U-1" (Utility) and “G1” (Greenlands) to "RA5-XX” (Residential Apartment - Exception), “C4-XX1” (Mainstreet Commercial – Exception), “C4-XX2” (Mainstreet Commercial – Exception), “C4-XX3” (Mainstreet Commercial – Exception), “OS1” (Neighbourhood Open Space), “OS2” (City Open Space), “OS2-XX1” (Open Space - Exception), “I-XX” (Institutional - Exception), “G1” (Greenlands), “G1-XX” (Greenlands – Exception) and “E2-XX” (Employment – Exception).

"U-1" permits power generation buildings and structures with ancillary uses.
“G1” permits greenlands for natural hazard protection purposes.

"RA5-XX” (Residential Apartment - Exception) permits various forms of townhouse and apartment dwellings, with varying heights in accordance with the appended schedule.

“C4-XX1” (Mainstreet Commercial – Exception) permits mixed-use development consisting of at-grade commercial focussed primarily on neighbourhood commercial and local convenience uses with residential and some limited non-residential uses sharing the site or in shared buildings.

“C4-XX2” (Mainstreet Commercial – Exception) permits mixed-use development consisting of at-grade commercial focussed primarily on urban village and local convenience uses catering to destination visitors as well as local residents. The zone shall also include residential uses above in shared buildings and these buildings may also include other non-residential uses including offices, and hotel uses.

“C4-XX3” (Mainstreet Commercial – Exception) permits mixed-use development consisting of at-grade commercial with residential uses shared on site or in the same building. These lands shall also provide locations for cultural, educational and ancillary institutional uses.

“OS1” (Neighbourhood Open Space) permits parkland for community park purposes and includes active and passive uses.

“OS2” (City Open Space) permits parkland for city-wide park purposes and includes active and passive uses.

“OS2-XX1” (Open Space - Exception) permits predominantly parkland for city-wide park purposes which includes active and passive uses, but may also include limited commercial, cultural, and other uses.

“I-XX” (Institutional - Exception) permits institutional uses such as a post-secondary school, research facilities, offices, and shall also permit various infrastructure uses (i.e. district energy, alternative waste collection system, and sanitary sewer requirements).

“G1” (Greenlands) permits greenlands for natural hazard protection purposes.

“G1-XX” (Greenlands – Exception) permits predominantly greenlands for natural hazard protection purposes, but also includes “OS2-XX1” open space and commercial uses.

“E2-XX” (Employment – Exception) permits various uses including office, limited commercial, infrastructure uses, and other employment uses.

Location of Lands Affected

Southeast corner of Lakeshore Road East and Hydro Road, and lands at the end of Hydro Road, and including east side of Lakefront Promenade, south of Rangeview Road, in the City of Mississauga, as shown on the attached Map designated as Schedule "A".

Further information regarding this By-law may be obtained from David Breveglieri of the City Planning and Building Department at 905-615-3200 ext. 5551.

City of Mississauga
Agenda

MISSISSAUGA

Planning and Development Committee

Date:	November 8, 2021
Time:	6:00 PM
Location:	Council Chambers, Civic Centre, 2nd Floor
	300 City Centre Drive, Mississauga, Ontario, L5B 3C1
	And Online Video Conference

Members

Mayor Bonnie Crombie	
Councillor Stephen Dasko	Ward 1
Councillor Karen Ras	Ward 2
Councillor Chris Fonseca	Ward 3
Councillor John Kovac	Ward 4
Councillor Ron Starr	Ward 6 (Vice-Chair)
Councillor Dipika Damerla	Ward 7
Councillor Matt Mahoney	Ward 8
Councillor Sue McFadden	Ward 10
Councillor George Carlson	Ward 11 (Chair)
Councillor Carolyn Parrish	Ward 5 (ex-officio)
Councillor Pat Saito	Ward 9 (ex-officio)

Participate Virtually or In Person

Advance registration is required to participate in person and/or make comment in the virtual public meeting. Please email deputations.presentations@mississauga.ca no later than Friday, November 5, 2021 at 4:00 p.m. Any materials you wish to show the Committee during your presentation must be provided as an attachment to the email. Links to cloud services will not be accepted. You will be provided with directions on how to participate from Clerks' staff.

Participate Via Telephone

Residents without access to the internet, via computer, smartphone or tablet, can participate and/or make comment in the meeting via telephone. To register, please call Megan Piercey at 905-615-3200 ext. 4915 no later than Friday, November 5, 2021 at 4:00 p.m. You must provide your name, phone number, and application number if you wish to speak to the Committee. You will be provided with directions on how to participate from Clerks' staff.

Contact
Megan Piercey, Legislative Coordinator, Legislative Services
905-615-3200 ext. 4915
megan.piercey@mississauga.ca

PUBLIC MEETING STATEMENT: In accordance with the *Ontario Planning Act*, if you do not make a verbal submission to the Committee or Council, or make a written submission prior to City Council making a decisi on on the proposal, you will not be entitled to appeal the decision of the City of Mississauga to the Ontario Land Tribunal (OLT), and may not be added as a party to the hearing of an appeal before the OLT.

Send written submissions or request notification of future meetings to:
Mississauga City Council Att: Development Assistant
c/o Planning and Building Department – 6th Floor
300 City Centre Drive, Mississauga, ON, L5B 3C1
Or Email: application.info@mississauga.ca

1. **CALL TO ORDER**

2. **DECLARATION OF CONFLICT OF INTEREST**

3. **MINUTES OF PREVIOUS MEETING**

3.1. Planning and Development Committee Meeting Draft Minutes - October 25, 2021

4. **MATTERS TO BE CONSIDERED**

4.1. PUBLIC MEETING RECOMMENDATION REPORT (WARD 1)

Draft Plan of Subdivision, Official Plan Amendment and Rezoning applications to permit a mixed use waterfront community with employment, commercial, institutional, cultural, park uses and 8,050 residential units, south side of Lakeshore Road East, east of Lakefront Promenade.
Address: 1082 Lakeshore Road East and 800 Hydro Road
Applicant: Lakeview Community Partners Limited
File: OZ 19/003 W1, OZ 19/021 W1 and T-M19001 W1

5. **ADJOURNMENT**

City of Mississauga

Corporate Report

MISSISSAUGA

Date: October 15, 2021 To: Chair and Members of Planning and Development Committee From: Andrew Whittemore, M.U.R.P., Commissioner of Planning & Building	Originator's files: OZ 19/003 W1, OZ 19/021 W1, and T-M19001 W1 Meeting date: November 8, 2021

Subject

PUBLIC MEETING RECOMMENDATION REPORT (WARD 1)
Draft Plan of Subdivision, Official Plan Amendment and Rezoning applications to permit a mixed use waterfront community with employment, commercial, institutional, cultural, park uses and 8,050 residential units
1082 Lakeshore Road East and 800 Hydro Road, south side of Lakeshore Road East, east of Lakefront Promenade
Owner: Lakeview Community Partners Limited
Files: OZ 19/003 W1, OZ 19/021 W1 and T-M19001 W1

Recommendation

1. That the applications under Files OZ 19/003 W1, OZ 19/021 W1, T-M19001 W1, Lakeview Community Partners Limited, 1082 Lakeshore Road East and 800 Hydro Road, to amend Mississauga Official Plan to **Residential High Density** and **Business Employment**; to change the zoning to **RA5-Exception** (Apartments – Exception)**, RM9-Exception** (Back to Back and Stacked Townhouses – Exception), **E1-Exceptions** (Employment in Nodes – Exceptions), **C4-Exceptions** (Mainstreet Commercial – Exceptions)**, OS2- Exceptions** (Open Space - City Park – Exceptions), **G1-Exception** (Greenlands – Natural Hazards – Exception) and **G2-Exception** (Greenlands – Natural Features – Exception) to permit a mixed use community which will include apartments, townhomes, employment, commercial, cultural, and park uses in conformity with the provisions outlined in the staff report dated October 15, 2021 from the Commissioner of Planning and Building; and that the draft plan of subdivision under File T-M19001 W1, be approved subject to the conditions referenced in the staff report dated October 15, 2021 from the Commissioner of Planning and Building.

2. That the applicant agree to satisfy all the requirements of the City and any other external agency concerned with the development.

3. That the decision of Council for approval of the rezoning application be considered null and void, and a new development application be required unless a zoning by-law is passed within 36 months of the Council decision.

4. That the "H" holding symbol is to be removed from the **RM9-Exception** (Back to Back and Stacked Townhouses – Exception), **RA5-Exception** (Apartments- Exception), **C4-Exception** (Mainstreet Commercial – Exception) and **E1-Exceptions** (Employment in Nodes- Exceptions) zoning applicable to the subject lands, by further amendment upon confirmation from applicable agencies and City Departments that matters as outlined in the report dated October 15, 2021, from the Commissioner of Planning and Building have been satisfactorily addressed.

5. That notwithstanding subsection 45.1.3 of the *Planning Act*, subsequent to Council approval of the development application, the applicant and/or the City of Mississauga can apply for a minor variance application.

6. That Council classify the lands delineated in Appendix 11 as Class 4 Area in accordance with the Environmental Noise Guidelines – Stationary and Transportation Sources – Approval and Planning (NPC – 300).

7. That notwithstanding Corporate Policy 07-02-01 (Pre-Servicing of Subdivisions), that Council permit the pre-servicing of the subject site in accordance with the conditions of draft plan approval, and subject to a process that is satisfactory to the Commissioner of Transportation and Works.

8. That City Council endorse the Lakeview Village Development Master Plan Design Guidelines as contained in Appendix 13.

Executive Summary

- The applications amend the policies of the official plan, change the zoning by-law and permit a plan of subdivision to allow a mixed use waterfront community containing commercial, employment, parks, open space, cultural and 8,050 residential dwellings within buildings of varying heights
- The applicant has conducted extensive technical analysis and made several revisions to the proposal to address issues raised at the Public Meeting, by City staff and outside agencies, including enlarging the school block, redistributing approximately 250 residential units, adding 0.4 ha (1 ac.) of land to facilitate the extension of Lakefront Promenade, adjusting right-of-ways and block dimensions, and further refining Official Plan policies and zoning by-law provisions
- Approval should be subject to an "H" holding symbol to address outstanding

requirements relating to noise, odour and traffic capacity

- That the northern blocks of the site be classified as a Class 4 Area under the NPC-300 Environmental Noise Guidelines in recognition of the abutting industrial properties
- It has been concluded that the proposed development is supportable from a planning perspective
- Staff are satisfied with the changes to the proposal and find them to be acceptable from a planning standpoint, and recommend that the applications be approved

Background

Prior to the submission of the development applications, Lakeview Community Partners Limited together with the City, the Region, relevant external agencies and the community undertook a year-long process of creating the Lakeview Waterfront Development Master Plan which culminated with Council's endorsement of the Plan on November 6, 2019.

The draft plan of subdivision, rezoning and official plan amendment applications were submitted between February 2019 and December 2019.

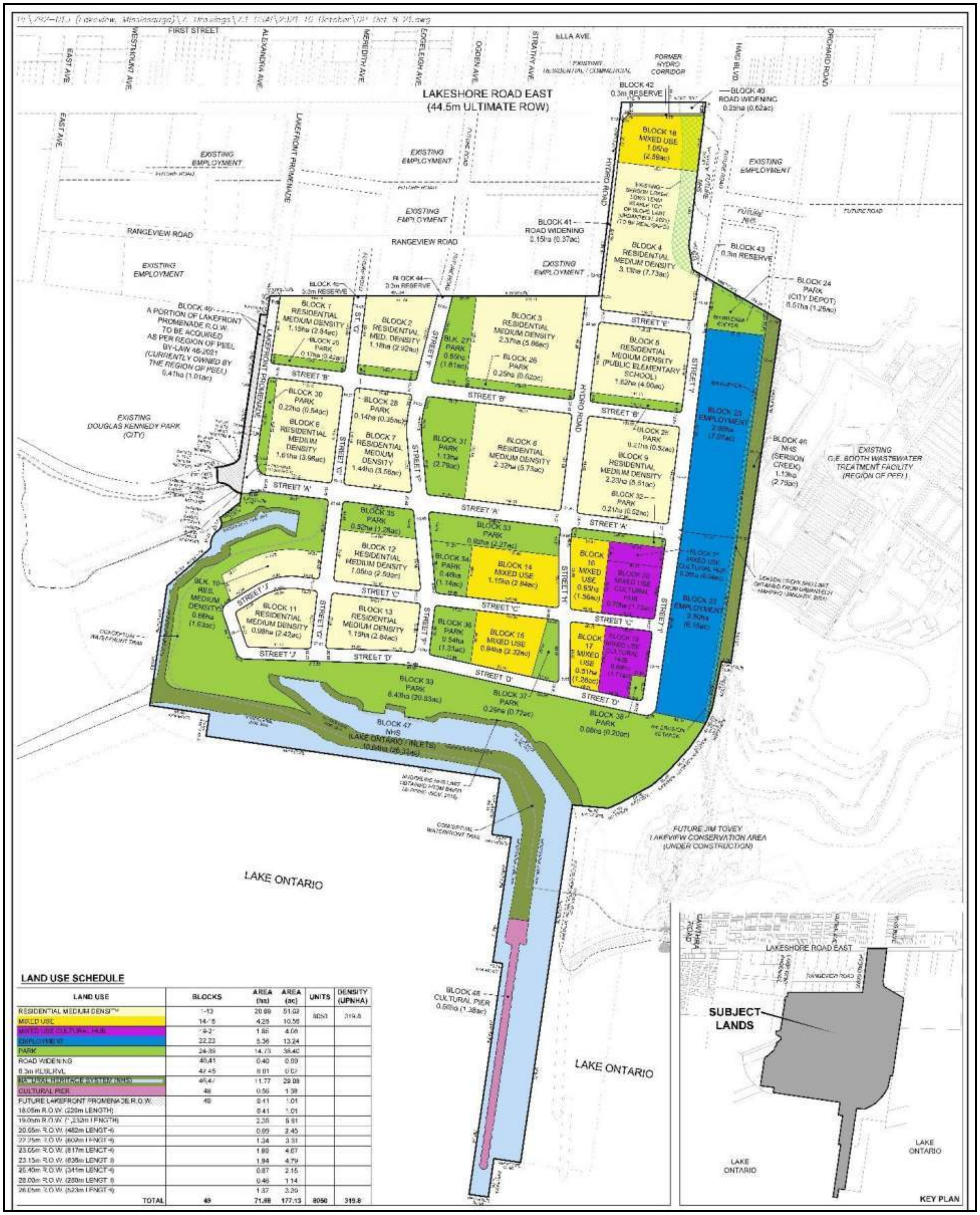
A public meeting was held by the Planning and Development Committee on September 21, 2020, at which time an Information Report https://www7.mississauga.ca/documents/committees/pdc/2020/2020_09_21_PDC_Agenda.pdf was received for information. Recommendation PDC-0032-2020 was then adopted by Council on September 30, 2020.

> That the report dated August 28, 2020, from the Commissioner of Planning and Building regarding the applications by Lakeview Community Partners Limited to permit a mixed-use waterfront community, under Files OZ 19/003 W1, OZ 19/021 W1 and T-M19001 W1, 1082 Lakeshore Road East and 800 Hydro Road, be received for information.

There were various additional technical documents that were required to be submitted and reviewed and multiple outstanding matters that needed to be resolved before the Planning and Building Department could make a recommendation on the applications. Pursuant to the provisions of subsection 34(17) of the *Planning Act,* given the amount of time since the public meeting, and given the inclusion of additional lands to the draft plan of subdivision, full notification of this report was provided.

[UNUSED PAGES REMOVED]

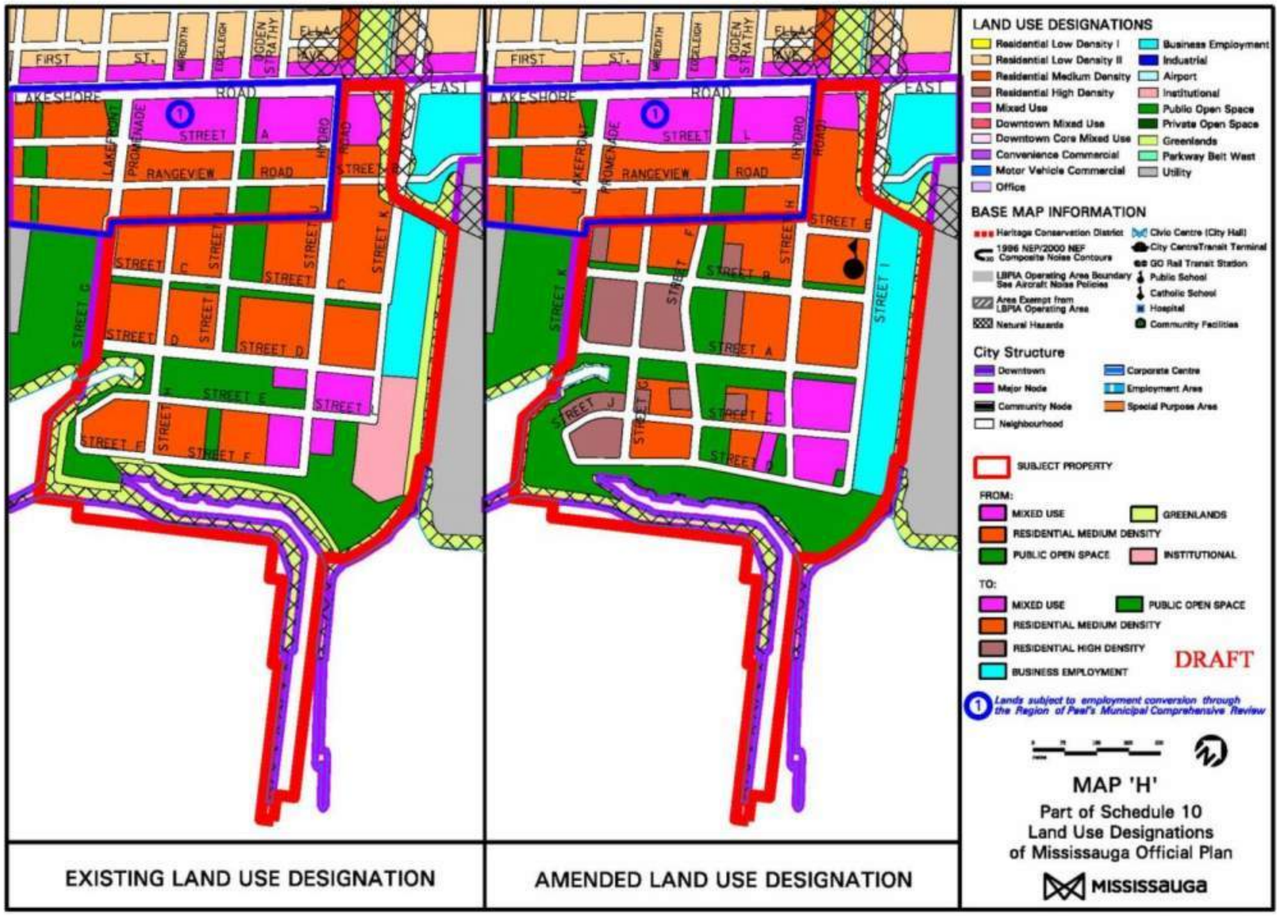
Appendix 3 – Draft Plan of Subdivision



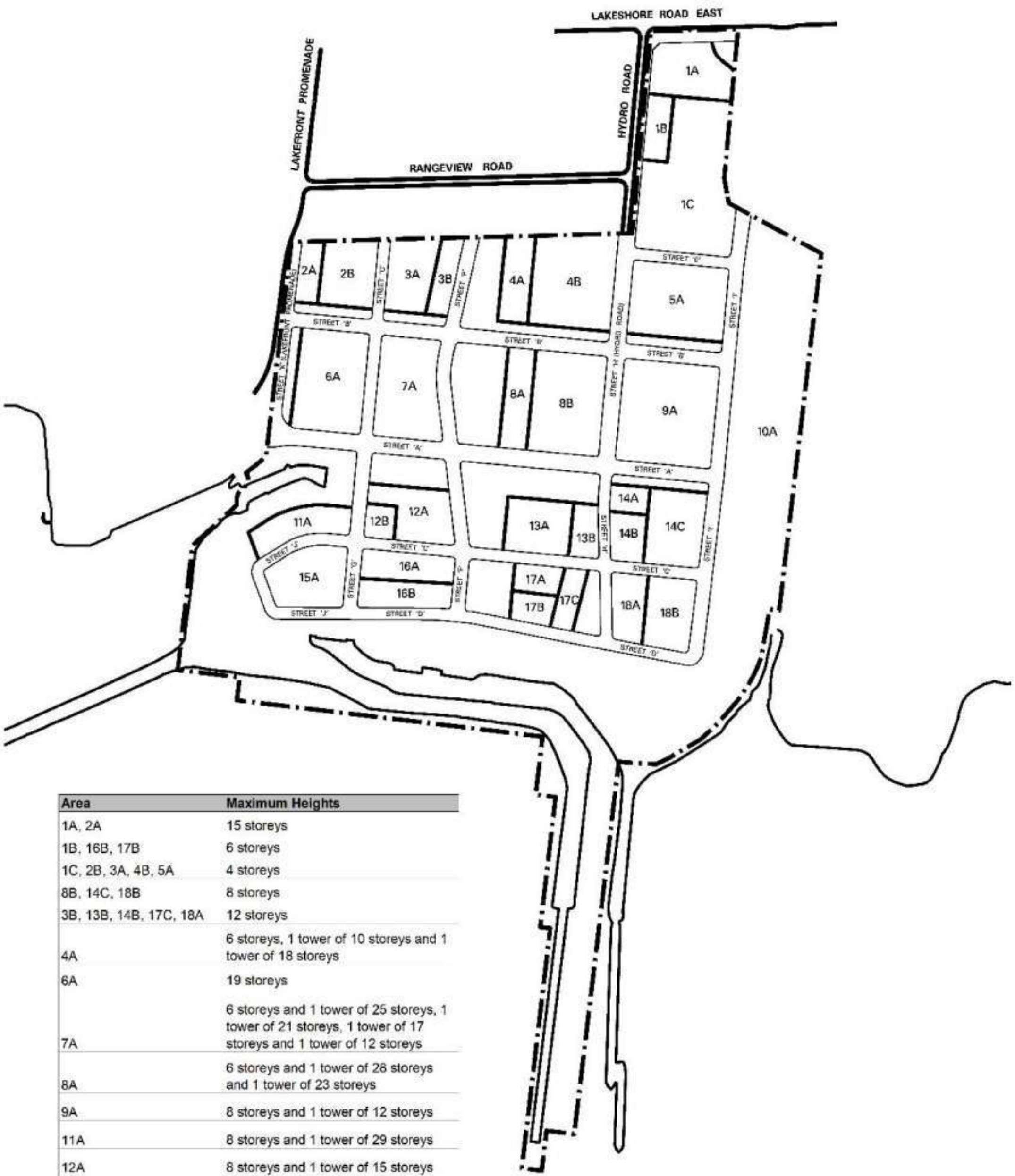
LAND USE SCHEDULE

LAND USE	BLOCKS	AREA (ha)	AREA (ac)	UNITS	DENSITY (UPNHA)
RESIDENTIAL MEDIUM DENSITY	1-13	20.89	51.62	8050	319.8
MIXED USE	14-18	4.28	10.56		
MIXED USE CULTURAL HUB	19-21	1.85	4.06		
EMPLOYMENT	22,23	5.36	13.24		
PARK	24-39	14.73	36.40		
ROAD WIDENING	40,41	0.40	0.99		
0.3m RESERVE	42-45	0.01	0.02		
NATURAL HERITAGE SYSTEM (NHS)	46,47	11.77	29.08		
CULTURAL PIER	48	0.56	1.38		
FUTURE LAKEFRONT PROMENADE R.O.W.	49	0.41	1.01		
18.05m R.O.W. (220m LENGTH)		0.41	1.01		
19.05m R.O.W. (1,232m LENGTH)		2.35	5.81		
20.05m R.O.W. (482m LENGTH)		0.99	2.45		
22.25m R.O.W. (609m LENGTH)		1.34	3.31		
23.05m R.O.W. (817m LENGTH)		1.89	4.67		
23.15m R.O.W. (836m LENGTH)		1.94	4.79		
25.40m R.O.W. (341m LENGTH)		0.87	2.15		
28.00m R.O.W. (280m LENGTH)		0.46	1.14		
26.05m R.O.W. (523m LENGTH)		1.37	3.39		
TOTAL	49	71.88	177.13	8050	319.8

Appendix 4 – Proposed OPA Map

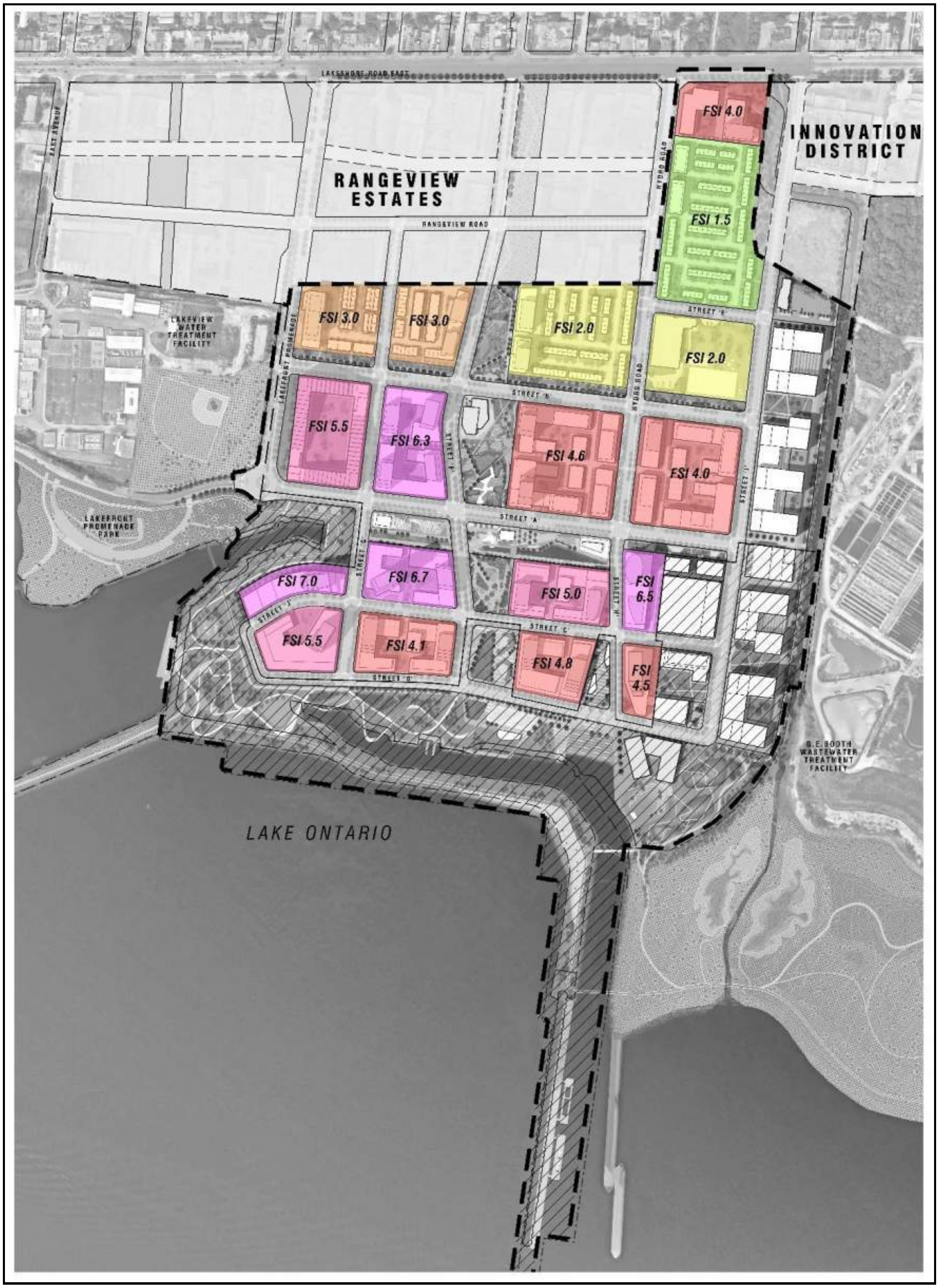


Appendix 7 - Zoning Height Schedule



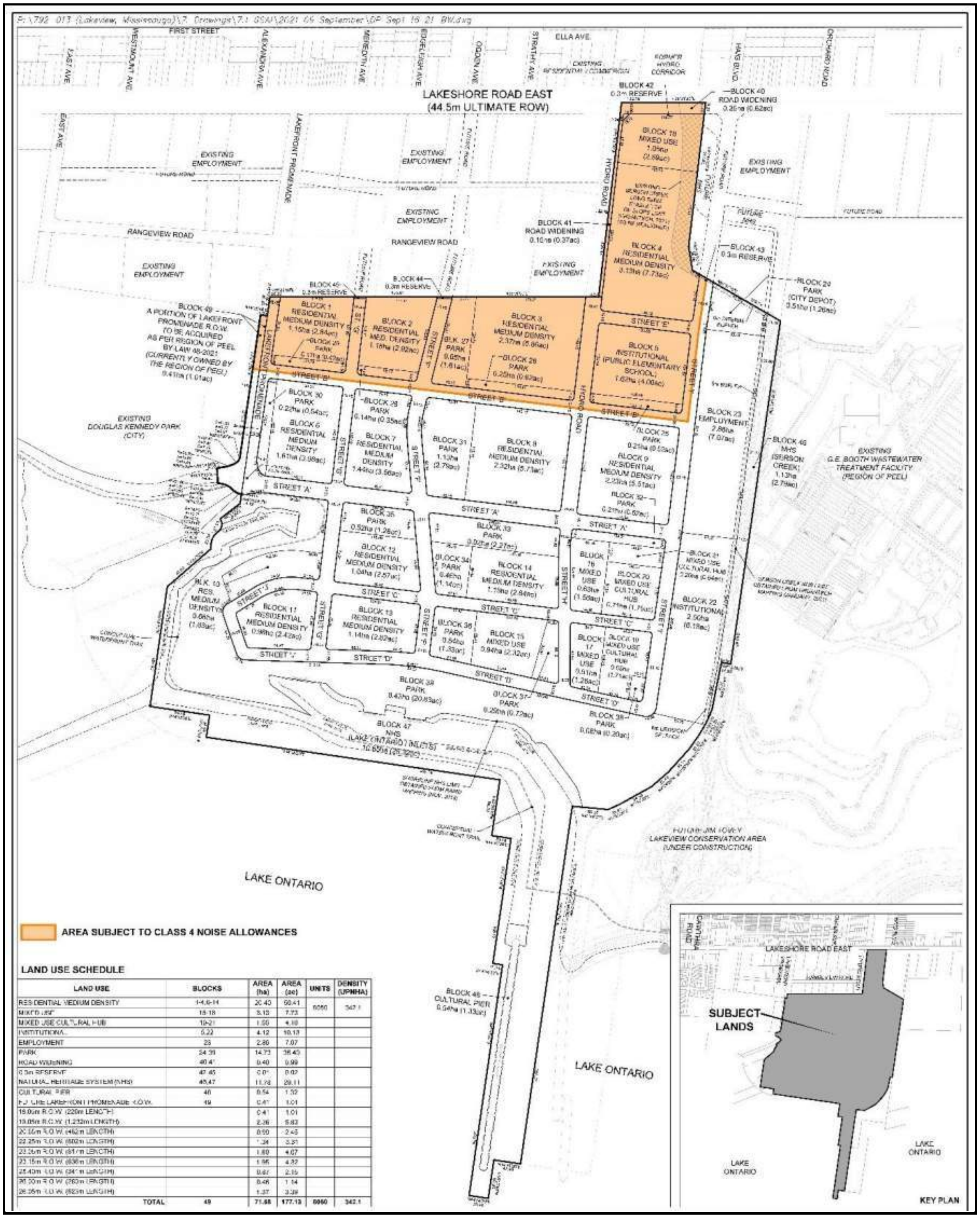
Area	Maximum Heights
1A, 2A	15 storeys
1B, 16B, 17B	6 storeys
1C, 2B, 3A, 4B, 5A	4 storeys
8B, 14C, 18B	8 storeys
3B, 13B, 14B, 17C, 18A	12 storeys
4A	6 storeys, 1 tower of 10 storeys and 1 tower of 18 storeys
6A	19 storeys
7A	6 storeys and 1 tower of 25 storeys, 1 tower of 21 storeys, 1 tower of 17 storeys and 1 tower of 12 storeys
8A	6 storeys and 1 tower of 28 storeys and 1 tower of 23 storeys
9A	8 storeys and 1 tower of 12 storeys
11A	8 storeys and 1 tower of 29 storeys
12A	8 storeys and 1 tower of 15 storeys
12B	1 tower of 40 storeys
13A	8 storeys and 1 tower of 17 storeys
14A	22 storeys
15A	6 storeys and 1 tower of 24 storeys
16A	6 storeys, 1 tower of 9 storeys, 1 tower of 10 storeys and 1 tower of 12 storeys
17A	6 storeys and 1 tower of 11 storeys
Area	**Minimum Heights**
10A	3 storeys

Appendix 8 - Zoning Maximum FSI Schedule



Appendix 9 - Concept Plan with Heights

Appendix 11 - Class 4 Area Noise Classification Delineation



LAND USE SCHEDULE

LAND USE	BLOCKS	AREA (ha)	AREA (ac)	UNITS	DENSITY (UPNHA)
RESIDENTIAL MEDIUM DENSITY	1-4,6-14	20.40	50.41	6060	342.1
MIXED USE	15-18	3.13	7.73		
MIXED USE CULTURAL HUB	19-21	1.66	4.10		
INSTITUTIONAL	5,22	4.12	10.13		
EMPLOYMENT	23	2.86	7.07		
PARK	24-39	14.73	36.40		
ROAD WIDENING	40-41	0.40	0.99		
0.3m RESERVE	42-45	0.01	0.02		
NATURAL HERITAGE SYSTEM (NHS)	46,47	11.78	29.11		
CULTURAL PIER	48	0.54	1.32		
FUTURE LAKEFRONT PROMENADE R.O.W.	49	0.41	1.01		
18.0m R.O.W. (220m LENGTH)		0.41	1.01		
19.05m R.O.W. (1,232m LENGTH)		2.36	5.83		
20.16m R.O.W. (462m LENGTH)		0.99	2.45		
22.25m R.O.W. (602m LENGTH)		1.34	3.31		
23.26m R.O.W. (617m LENGTH)		1.65	4.07		
23.15m R.O.W. (836m LENGTH)		1.95	4.82		
25.40m R.O.W. (341m LENGTH)		0.87	2.15		
26.30m R.O.W. (260m LENGTH)		0.46	1.14		
26.35m R.O.W. (523m LENGTH)		1.37	3.38		
TOTAL	49	71.88	177.13	6060	342.1

Limitations

Limitations

3. The work performed in the preparation of this report and the conclusions presented herein are subject to the following:
    a. The contract between Wood and the Client, including any subsequent written amendment or Change Order dully signed by the parties (hereinafter together referred as the "Contract");
    b. Any and all time, budgetary, access and/or site disturbance, risk management preferences, constraints or restrictions as described in the contract, in this report, or in any subsequent communication sent by Wood to the Client in connection to the Contract; and
    c. The limitations stated herein.
4. **Standard of care:** Wood has prepared this report in a manner consistent with the level of skill and care ordinarily exercised by reputable members of Wood's profession, practicing in the same or similar locality at the time of performance, and subject to the time limits and physical constraints applicable to the scope of work, and terms and conditions for this assignment. No other warranty, guaranty, or representation, expressed or implied, is made or intended in this report, or in any other communication (oral or written) related to this project. The same are specifically disclaimed, including the implied warranties of merchantability and fitness for a particular purpose.
5. **Limited locations:** The information contained in this report is restricted to the site and structures evaluated by Wood and to the topics specifically discussed in it, and is not applicable to any other aspects, areas or locations.
6. **Information utilized:** The information, conclusions and estimates contained in this report are based exclusively on: i) information available at the time of preparation, ii) the accuracy and completeness of data supplied by the Client or by third parties as instructed by the Client, and iii) the assumptions, conditions and qualifications/limitations set forth in this report.
7. **Accuracy of information:** No attempt has been made to verify the accuracy of any information provided by the Client or third parties, except as specifically stated in this report (hereinafter "Supplied Data"). Wood cannot be held responsible for any loss or damage, of either contractual or extra-contractual nature, resulting from conclusions that are based upon Wood's use of the Supplied Data.
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Appendix E:

Stage 1 and Marine Archaeological Assessment Reports

Appendix E:

Stage 1 and Marine Archaeological Assessment Reports

E1: Stage 1 Archaeological Assessment for the Clarkson WRRF and G.E. Booth WRRF

ARCHEOWORKS INC.

Stage 1 Archaeological Assessment:
Class Environmental Assessments and Conceptual Designs for
Proposed Capacity Expansions of the
South Peel Wastewater Treatment Plants
Within Lots 5-7 and 31-32, Concession 3 South of Dundas Street
Geographic Township of Toronto
Former County of Peel
Now the City of Mississauga
Regional Municipality of Peel
Ontario

Project #: 047-MI2726-20
Licensee (#): Kassandra Aldridge (P439)
PIF#: P439-0095-2020

Original Report

March 29, 2021

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EXECUTIVE SUMMARY

Archeoworks Inc. was retained by *GM BluePlan Engineering Limited* on behalf of the *Regional Municipality of Peel* to conduct a Stage 1 Archaeological Assessment (AA) in support of proposed capacity expansions to the Clarkson and G.E. Booth Wastewater Treatment Plants, both located in the City of Mississauga, Regional Municipality of Peel, Ontario. The two facilities (collectively referred to as the "study area") encompass Lots 5-7 (G.E. Booth WWTP) and 31-32 (Clarkson WWTP), Concession 3 South of Dundas Street, Geographic Township of Toronto, Former County of Peel.

Stage 1 AA background research established potential for the recovery of archaeologically significant materials within the study area due to the presence of water sources and historical Euro-Canadian settlement. However, a review of aerial imagery, supplemented by on-site inspection, determined that much of the study area had been subjected to extensive disturbance; only small pockets of land retaining archaeological potential will therefore require a Stage 2 AA.

Based on the findings of the Stage 1 AA study, the following recommendations are presented:

1. In accordance with findings from the relevant previous archaeological assessments, areas within the G.E. Booth WWTP study area determined to no longer retain archaeological potential and/or warrant no further work, are recommended to be exempted from further assessment.

2. The low-lying and permanently wet area along the east margin of Clarkson WWTP is considered to be low archaeological potential and may be exempted from further assessment. No further work is recommended for this area.

3. Areas demonstrated in historical aerial imagery, indicated in the site plans, and confirmed visually on-site to have been previously disturbed extensively, no longer retain archaeological potential and may be exempted from further assessment. No further work is recommended for these areas, with the exception of the area below:
    i. Per MCFN request, a portion of the southwest corner of the Clarkson WWTP must be subjected to judgmental test pit survey in accordance with the standards set within *Section 2.1.8* of the *2011 S&G*.

4. A Stage 2 AA test pit survey at five-metre intervals must be undertaken in all other portions of the study area which retain archaeological potential, in accordance with the standards set within *Section 2.1.2* of the *2011 S&G*. These specifically include:
    i. At Clarkson WWTP: grassed and/or treed areas in the northwest, northeast and southeast corners, and a grassed area along the west margin.
    ii. At G.E. Booth WWTP: wooded area in the northwest corner, flanking both sides of the extant access road.

No construction activities shall take place within the study area prior to the *MHSTCI* (Archaeology Program Unit) confirming in writing that all archaeological licensing and technical review requirements have been satisfied.

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LIST OF TABLES

PROJECT PERSONNEL

Project Director..Kassandra Aldridge – MHSTCI licence P439

Field Director and Archaeologist .... Lee Templeton – MHSTCI licence R454

Report Preparation .... Jay Allen Villapando

Background Research .... Lee Templeton
Jay Allen Villapando

Graphics .... Lee Templeton
Jay Allen Villapando

Report Reviewer .... Kim Slocki – MHSTCI licence P029

1.0 PROJECT CONTEXT

1.1 Objective

The objectives of a Stage 1 Archaeological Assessment (AA), as outlined by the 2011 *Standards and Guidelines for Consultant Archaeologists* (*'2011 S&G'*) published by the *Ministry of Heritage, Sport, Tourism and Culture Industries* (*MHSTCI*) (2011), are as follows:

- To provide information about the property's geography, history, previous archaeological fieldwork and current land condition;
- To evaluate in detail the property's archaeological potential, which will support recommendations for Stage 2 survey for all or parts of the property; and
- To recommend appropriate strategies for Stage 2 survey.

1.2 Development Context

In order to address forecasted increases in population and wastewater flow as identified in the 2013 Water and Wastewater Master Plan and recent ongoing updates, the *Regional Municipality of Peel* is proposing to make upgrades at its two southern wastewater treatment plant (WWTP) facilities:

1.) G.E. Booth (Lakeview) WWTP, which receives wastewater from Peel Region's east trunk sewer system, located at municipal address 1300 Lakeshore Road East, City of Mississauga; and

2.) Clarkson WWTP, which receives wastewater from Peel Region's west trunk sewer system, located at municipal address 2307 Lakeshore Road West, City of Mississauga.

Archeoworks Inc. was retained by *GM BluePlan Engineering Limited* on behalf of the *Region of Peel* to conduct a Stage 1 AA in support of the Schedule "C" Municipal Class Environmental Assessments (EAs) and conceptual designs for the proposed capacity expansions in the two aforementioned South Peel WWTPs (***see Appendix A – Map 1***). The subject facilities – henceforth referred to as the "study area" – lie within historical Lots 5 through 7 (Clarkson) and Lots 31 through 32 (G.E. Booth), Concession 3 South of Dundas Street (SDS), Geographic Township of Toronto, Former County of Peel.

This study was triggered by the *Ontario Environmental Assessment Act* in support of the *Municipal Class Environmental Assessment* regulatory process. This Stage 1 AA was conducted pre-submission under the project direction of Ms. Kassandra Aldridge under the archaeological consultant licence number P439, in accordance with the *Ontario Heritage Act* (2009). Permission to investigate the study area was granted by *GM BluePlan Engineering Limited* on May 4, 2020.

1.3 Historical Context

To establish the historical context and archaeological potential of the study area, *Archeoworks Inc.* conducted a review of Aboriginal and Euro-Canadian settlement history, and a review of available historical mapping and aerial imagery. The results of this background research are documented below and summarized in **Appendix B – Summary of Background Research**.

1.3.1 Pre-Contact Period

The Pre-Contact Period of Southern Ontario covers the earliest period of human habitation in the region. It is broadly divided into the Paleo-Indian, Archaic and Woodland Periods. A summary is provided in **Table 1**.

Table 1: Pre-Contact Period

Period	Date	Overview and Attributes
PALEO-INDIAN		
Early	ca. 11000 to 8500 BC	Small groups of nomadic hunter-gathers use seasonal and naturally available resources; sites are rare; hunted in small family groups who periodically gathered into larger groups/bands during favourable periods in the hunting cycle; campsites used during travel episodes and found in well-drained soils in elevated locations; sites found primarily along glacial strandlines per current understanding of regional geological history; artifacts include fluted and lanceolate stone points, scrapers, dart heads. - Gainey, Barnes, Crowfield Fluted Points (Early Paleo-Indian) - Holcombe, Hi-Lo, Lanceolates (Late Paleo-Indian) (Ellis and Deller, 1990, pp.37-64; Wright, 1994, p.25).
Late	ca. 8500 to 7500 BC	
ARCHAIC		
Early	ca. 7800 to 6000 BC	Descendants of Paleo-Indians; lithic scatters are the most commonly encountered site type; trade networks appear; artifacts include reformed fluted and lanceolate stone points with notched bases to attach to wooden shafts; ground-stone tools shaped by grinding and polishing; stone axes, adzes and bow and arrow; introduction of copper tools by Shield Archaic culture in Northern Ontario. - Side-notched, corner-notched, bifurcate projectile points (Early Archaic) - Stemmed, Otter Creek/Other Side-notched, Brewerton side and corner-notched projectile points (Middle Archaic) - Narrow Point, Broad Point, Small Point projectile points (Late Archaic) (Dawson, 1983, pp.8-14; Ellis et al., 1990, pp.65-124; Ellis, 2013, pp.41-46; Wright, 1994, pp.26-28).
Middle	ca. 6000 to 2000 BC	
Late	ca. 2500 to 500 BC	
WOODLAND		
Early	ca. 800 BC to 0	Evolved out of Late Archaic Period; introduction of pottery (ceramic), earliest of which were coil-formed, under-fired and likely utilitarian; two primary cultural complexes: Meadowood (broad extent of occupation in southern Ontario) and Middlesex (restricted to Eastern Ontario); poorly understood settlement-subsistence patterns; artifacts include cache blades, and side-notched points that were often recycled into other tool forms; primarily Onondaga chert; commonly associated with Saugeen and Point Peninsula complexes. - Meadowood side-notched projectile points (Spence et al., 1990, pp.125-142; Wright, 1994, pp.29-30; Ferris and Spence, 1995, pp.89-97; Williamson, 2013, pp.48-61).

Period	Date	Overview and Attributes
Middle	ca. 200 BC to AD 700	Three primary cultural complexes: Point Peninsula (generally south-central and eastern Ontario), Saugeen (generally southwestern Ontario), and Couture (southwestern-most part of Ontario); introduction of large "house" structures; settlements have dense debris cover indicating increased degree of sedentism; incipient horticulture; burial mounds present; shared preference for stamped, scallop-edged or tooth-like decoration, but each cultural complex had distinct pottery forms; Laurel Culture (ca. 500 BC to AD 1000) established in the boreal forests of Northern Ontario. - Saugeen Point projectile points (Saugeen) - Vanport Point projectile points (Couture) - Snyder Point projectile points - Laurel stemmed and corner-notched projectile points (Dawson, 1983, pp.15-19; Ferris and Spence, 1995, pp.97-102; Gagné, 2012; Hessel, 1993, p.9; Spence et al., 1990, pp.142-170; Williamson, 2013, pp.48-61; Wright, 1994, pp.28-33; Wright, 1999, pp.629-649).
Late (Transitional)	ca. AD 600 to 1000	Algonquian-speaking Anishinaabe peoples such as the Odawa and *Michi Saagig* (Mississauga) inhabit southern Ontario and used territories northward for hunting and trapping during winter months; Mississauga oral traditions speak of Iroquoian people coming into their territory around AD 500-1000, establishing settlements and growing maize; treaties were made and the newcomers were allowed to stay in their traditional territories. Earliest Iroquoian development in Ontario: Princess Point culture, which exhibits few continuities from earlier developments with no apparent predecessors, and hypothesized to have migrated into Ontario; settlement data is limited, but oval houses are present; artifacts include 'Princess Point Ware' vessels that are cord-roughened, with horizontal lines and exterior punctation; smoking pipes and ground stone tools are rare; introduction of maize/corn horticulture; continuity between Princess Point and Late Woodland cultural groups. - Triangular projectile points (Fox, 1990, pp.171-188; Ferris and Spence, 1995, pp.102-106; Gitiga Migizi and Kapyrka, 2015, p.1).
Early Late	ca. AD 900 to 1300	Two primary Iroquoian cultures: Glen Meyer (primarily southwestern Ontario from Long Point on Lake Erie to southwestern shore of Lake Huron) and Pickering (north of Lake Ontario to Georgian Bay and Lake Nipissing); well-made and thin-walled clay vessels with stamping, incising and punctation; multi-family longhouses and some small, semi-permanent palisade villages; increase in corn-yielding sites; crudely made smoking pipes, and worked bone/antler present; evolution of ossuary burials - Triangular-shaped, basally concave projectile points with downward projecting corners or spurs (Williamson, 1990, pp.291-320; Ferris and Spence, 1995, pp.106-109).
Middle Late	ca. AD 1300 to 1400	Two primary Iroquoian cultures: Uren and Middleport; decorated clay vessels decrease; well-developed clay pipe complex that includes effigy pipes; increase in village sizes (0.5 to 1.7 ha) and campsites (0.1 to 0.6 ha) appear with some palisades; classic longhouse takes form; increasing reliance on maize and other cultigens such as beans and squash; intensive exploitation of local land and water resources; from Middleport emerged the Huron-Wendat, Petun, Neutral and Erie. - Triangular and (side of corner or corner removed) notched projectile points - Middleport Triangular and Middleport Notched projectile points (Dodd el al., 1990, pp.321-360; Ferris and Spence, 1995, pp.109-115).

Period	Date	Overview and Attributes
Late Late	ca. AD 1400 to 1600	Algonquian-speaking groups (e.g., Mississauga, Odawa) maintain stable relations with Iroquoian-speaking groups (e.g., Huron-Wendat, Petun, Neutral), who continued to establish settlements in southern Ontario. Two Iroquoian groups: the Neutral to the west of the Niagara Escarpment, and Huron-Wendat to the east. Huron-Wendat sites occur in the valleys and basins of the Humber, Rouge and Duffin Creek, upper and lower Trent, Lake Scugog and Simcoe County; longhouses; villages enlarged to 100 longhouses clustered together as horticulture (maize, squash, and beans) gained importance in subsistence patterns; villages chosen for proximity to water, arable soils, available fire wood and defendable position; diet supplemented with fish; ossuaries; tribe/band formation; relocation of some Iroquois groups to north of Lake Simcoe; Neutral sites found around the western end of Lake Ontario and eastward across the Niagara Peninsula; Neutrals (called Attiewandaron by the Huron-Wendat) distributed west of the Niagara Escarpment as far as Milton; their settlements range from villages up to five acres in size to isolated fishing cabins; villages tend to be located along smaller creeks, headwaters and marshlands; diet dependent on hunting, gathering, fishing and farming; longhouses present. - Huron-Wendat projectile points are limited but change from predominantly side-notched to unnotched triangular - Neutral projectile points are typically small but long and narrow, frequently side-notched (Ferris and Spence, 1995, pp.115-122; Heidenreich, 1978, pp.368-388; Lennox and Fitzgerald, 1990, pp.405-456; Gitiga Migizi and Kapyrka, 2015, p.1; Ramsden, 1990, pp.361-384; Warrick, 2000, pp.446-454; Warrick, 2008, p.15).

1.3.2 Contact Period

The Contact Period of Southern Ontario encompasses the two centuries following the arrival of the first Europeans to the region. **Table 2** provides a summary of some of the main developments that occurred during this time.

Table 2: Contact Period

Period	Date Range	Overview and Attributes
European Contact	ca. AD 1600s	Algonquian-speaking groups such as the Anishinaabe (Mississauga, Chippewa, Ojibwe, Odawa, Nippissing, etc.) continue to inhabit Ontario, alongside Iroquoian-speaking groups such as the Huron-Wendat north of Lake Simcoe and the Neutral (Attiewandaron) in the Niagara Peninsula; inter-marriage; French arrival into Ontario; trade relationship between the Huron-Wendat and the French established; trade goods begin to replace traditional tools/items; Jesuit and Recollect missionaries; epidemics; Mississauga oral tradition speaks of Anishinaabe "paddling away" to their northern hunting territories to escape disease and warfare in southern Ontario at this time (Fox and Garrad, 2004, p.124; Jury, 1974, pp.3-4; McMillan and Yellowhorn, 2004, pp.110-111; Lennox and Fitzgerald, 1990, pp.405-456; Gitiga Migizi and Kapyrka, 2015, p.1; Trigger, 1994, pp.47-55; White, 1978, pp.407-411).

Period	Date Range	Overview and Attributes
Haudenosaunee Arrival	ca. AD 1650s	The Five (later Six) Nations of Iroquois ("Haudenosaunee"), originally located south of the Great Lakes, engaged in warfare with other Iroquois groups in southern Ontario, as their territory no longer yielded enough furs; numerous Huron-Wendat, Petun and Neutral villages attacked and destroyed in 1649-50s; small groups that remained became widely dispersed throughout Great Lakes region, with some resettling in what are now Quebec, southwestern Ontario and the United States; Haudenosaunee, particularly the Seneca, established settlements along the Lake Ontario shoreline at strategic locations along canoe-and-portage routes — including Ganatsekwyagon at the mouth of the Rouge River, Teiaiagon at a bend near the mouth of the Humber River, and the length of the Niagara River — and used territory extensively for fur trade; European trade and exploration continues (Gitiga Migizi and Kapyrka, 2015, p.1; Robinson, 1965, pp.15-16; Schmalz, 1991, pp.12-34; Trigger, 1994, p.53-59; Williamson, 2013, p.60).
Anishinaabe Return	ca. AD 1650s to 1700	Anishinaabe groups return to southern Ontario in the 1690s; battles fought throughout, resulting in the Haudenosaunee being driven out and returning to homelands south of the Great Lakes; '*Mississauga*' term applied to Anishinaabe bands living on the north shore of Lake Ontario; they were focused on hunting/fishing/gathering with little emphasis on agriculture; temporary and moveable houses (wigwam) left little archaeological material behind; Credit River became a favoured location of trade between Mississauga and European traders; Mississauga settlement near Port Credit (Gibson, 2006, pp.35-41; Hathaway, 1930, p.433; Johnston, 2004, pp.9-10; Skeoch, 2000, pp.20-21; Smith, 2013, pp.16-20; Williamson, 2013, p.60).
Trade, Peace and Conflict	ca. AD 1700 to 1770s	Great Peace of 1701 in Montreal established peace among First Nations groups around the Great Lakes, and secured their neutrality in case of conflict between France and Britain; European commerce and exploration resumed; Anishinaabe continued to trade with both the English and the French; genesis of the Métis; skirmishes between France and Britain as well as their respective First Nations allies erupt in 1754 ("French and Indian Wars") and form part of the larger Seven Years' War; French defeat transferred the territory of New France to British control; Treaty of Paris signed in 1763; Royal Proclamation of 1763 established framework for negotiation of treaties with First Nations and administration of North American territories ceded by France to Britain; uprising by several First Nations groups against British ("Pontiac's War"); fur trade continued until Euro-Canadian settlement (Hall, 2015; Jaenen, 2013; Johnston, 2004, pp.13-14; Schmalz, 1991, pp.35-62, 81; Surtees, 1994, pp.92-97).
Early British Administration	ca. AD 1770s to 1800s	American Revolutionary War (1775-1783) drove large numbers of United Empire Loyalists, military claimants, and groups who faced persecution in the United States to re-settle in southern Ontario; Treaty of Paris signed in 1783/1784 and formally recognized the independence of the United States; Province of Quebec divided in 1791 into sparsely populated Upper Canada (now southern Ontario) and culturally French Lower Canada (now southern Quebec); Jay's Treaty of 1795 establishes American—Canadian border along the Great Lakes; large parts of Upper Canada opened to settlement from the British Isles and continental Europe after land cession treaties were negotiated by the British Crown with various First Nations groups (Department of Indian Affairs, 1891; Government of Ontario, 2020; Hall, 2019; Jaenen, 2014; Sprague, 2015; Surtees, 1994, p.110; Sutherland, 2014).

1.3.3 Euro-Canadian Settlement Period (1800s to present)

1.3.3.1 Toronto Township

In 1805 a tract of land 26 miles long, between Etobicoke Creek and Burlington Bay, stretching back from the Lake Ontario shoreline for about five to six miles (roughly corresponding to present-day Eglinton Avenue) was agreed to be ceded by the certain Mississauga groups in what is known as the "First Purchase" or Treaty 13A. One mile on either side of the Credit River and the 'flat lands' bordering the Etobicoke Creek were to remain property of the Mississauga, and they were to obtain £1000 worth of goods and the right to retain their fishery sites at the mouths of the Credit River, Sixteen Mile Creek, and Twelve Mile Creek as part of the treaty (Fix, 1967, p.13; Heritage Mississauga, 2018d; Weaver, 1913, p.65).

In September 1806, representatives of the Crown and certain Mississauga groups signed Treaty 14, or the "Head of the Lake Purchase," confirming the cession of lands along the north shore of Lake Ontario that had been agreed upon the previous year. These lands were surveyed and constituted into townships – the preferred unit of land division by British administrators (Loverseed, 1987, p.23). The survey of the portion of Toronto Township lying south of what is now Eglinton Avenue ("Old Survey" lands), where the study area lies, was completed in 1806 by Samuel Wilmot, Deputy Surveyor (Walker and Miles, 1877, p.86). Dundas Street, a military road established by orders of Lieutenant-Governor John Graves Simcoe and constructed by the Queen's Rangers following a trail used by First Nations, was the only road at this time. It consequently became the main east-west roadway through the newly-established Province of Upper Canada. The road penetrated the dense forest in Toronto Township, and until settlers arrived, it remained a wagon-width trail (Clarkson, 1977, p.8; Riendeau, 2002, p.123). Initial settlement in the Township of Toronto was along Dundas Street, and these first settlers were experienced farmers, many of which were United Empire Loyalists and Late Loyalists (Riendeau, 2002, pp.123-124).

Even though the lands within Toronto Township had become available for settlement, Napoleonic Wars in Europe slowed immigration from the British Isles; only 175 individuals are listed in the 1809 Census Record (Riendeau, 2002, p.125). After the War of 1812, there was mounting pressure for new land to accommodate the "increasing amount of new settlers from the British Isles, to meet the demands of the demobilized military personnel for their promised land grants, and to provide the necessary land for children of the United Empire Loyalists who had settled in eastern Ontario and on the Niagara Frontier a generation earlier" (McKinney, 1967, p.244). To accommodate this influx of settlers, the remainder of the Mississauga Tract, within what is now Peel Region, was negotiated by William Claus in 1818. The area belonged to the Credit River Mississauga who found themselves victim to encroachment on their lands and fisheries by Euro-Canadian settlers (Surtees, 1994, p.116). Under the leadership of Chief Ajetance, the Mississauga settled for goods in the value of £522.10 annually per person in exchange for 648,000 acres of land, including some land along the Credit River. This Second Purchase, known as the Ajetance Purchase or Treaty 19, ceded the lands north of Eglinton Avenue and form the 'New Survey' of the Township of Toronto (Department of Indian Affairs, 1891, p.lv; Surtees, 1994, p.117; Riendeau, 2002, pp.123,127).

In 1826, the Mississauga village at the mouth of the Credit River was relocated to the Credit Mission, located on the site of what is now the Mississauga Golf and Country Club on Mississauga Road (Heritage Mississauga, 2018b; Riendeau, 2002, p.125). By 1837, the Mississauga population was decimated by contagious diseases, such as smallpox, tuberculosis and measles, killing nearly two-thirds of the Mississaugas at the western end of Lake Ontario (Smith, 2002, p.110; Riendeau, 2002, p.125). Further constricted by the pressures of the Euro-Canadian settler, the Mississaugas of the Credit River were relocated again to the Grand River Reserve (Riendeau, 2002, p.125).

By 1842, the population of the Township of Toronto included 5,377 individuals, and 28,468 of 59,260 acres taken up were under cultivation. There were four grist mills and 21 saw mills in the township. European settlement in the Township of Toronto continued along the Credit River, as well as the Etobicoke River; numerous mills were constructed along their entirety (Smith, 1846, pp. 192-193; Martin, 1967, p.273).

1.3.3.2 History of Clarkson

The Clarkson WWTP facility takes its name from the historic community of Clarkson, centred along Lakeshore Road, west of Southdown Road. Clarkson is the considered one of the oldest settled villages in Peel Region, having been first settled in 1808 by Thomas Marigold and Benjamin Monger and their families. In 1811, an inn was opened on Middle Road (present-day Queen Elizabeth Way), and in 1819, Warren Clarkson purchased 200 acres around the community. By 1835, Clarkson Road, which originally followed a trail leading into the hamlet, had been constructed. An inn, store and a burying ground were established along this road. In 1853, the Great Western Railway, purchased land from Warren Clarkson to construct the railway. Originally, the hamlet was called 'Marigold's Point,' it was changed to 'Clarkson's Corners' and then 'Clarkson' when the train station on the Great Western Railway was completed in 1855. In 1875, the Clarkson post office was opened. By the end of the nineteenth century, fruit growing, packing, storing and shipping became an important industry in the community (Smith, 1846, pp.192-193; Martin, 1967, p.273; Heritage Mississauga, 2018a).

1.3.3.3 History of Lakeview

The vicinity of the G.E. Booth WWTP facility is located within an area called Lakeview. Though not officially named so until 1922, Lakeview was among the earliest settled parts of Toronto Township. The first recorded European settler is Thomas Ingersoll, who moved to the area in 1805, followed in the next years by Philip Cody (1806) and Daniel Harris (1807) (Hicks, 2005, p. XII). The area remained rural for most of the 19th century, with settlers engaging in mixed agriculture (TRCA, 2013a, pp. 12-13). Beginning in the 1890s, much of the land south of Lakeshore Road came under the possession of the Ontario Militia Department, who among other things established a rifle range. The federal government also built Canada's first aerodrome and flying school in the Lakeview area in 1915. During the Second World War the Department of National Defence took over the rifle range property for military training, while also establishing the Canada Arms School, Small Arms Militia Training Centre, and factories for ammunition and small arms. Lakeview thus became a military-oriented community. After the war the federal government sold off the parcels for public (power generation, parks, water and sewerage works) and private (commercial and industrial) use (Hicks, 2005, pp. 46-49; Heritage Mississauga, 2018c).

1.3.4 Past Land Use

To further assess the study area's potential for the recovery of Euro-Canadian remains, local histories, historical maps and aerial photographs were consulted to gain an understanding of the land use history.

1.3.4.1 Clarkson WWTP

The Clarkson WWTP facility is situated on the south parts of Lots 31 and 32, Concession 3 SDS. The 1859 *Tremaine's Map of the County of Peel* and the 1877 *Illustrated Historical Atlas of the County of Peel* (***see Maps 2-3***) depict at least two locations within the facility which hosted the farmsteads of Captain C.H. Scholefield ca. 1859, and, later, Rev. George Evans ca. 1877.

In 1893 the land on which the Clarkson WWTP sits was acquired by Toronto businessman George Horace Gooderham of the Gooderham family, whose name appears in Gooderham & Worts, the world's second-largest whisky distillery in the early 1900s. At one point described as one of the finest farms in Ontario, the Gooderham Estate produced large quantities of fruits and vegetables, and contained, at its height four barns, four houses and a dedicated rail spur. The houses that stood on the farm included: a family residence ("Manor House"), a house for the farm manager (the first of which was Harold Scholefield), and two boarding houses for workers. Some of these structures can be seen in the early 20th century military topographic maps of the area (***see Map 4***). The estate was sold off in parcels beginning in the 1940s for business and residential uses. One of the buildings was converted into Greyscher House, a nursing home for seniors, in 1947. After the Township of Toronto purchased the property in 1955, the Greyscher House and one of the dwelling houses respectively became the new administration buildings for the township's parks department and the Clarkson Sewage Disposal Plant, the forerunner of today's Clarkson WWTP facility (Hicks, 2003, pp. 87-89; City of Mississauga, 2011).

Aerial photographs show that, while new features (buildings, graded areas, sewer and utility lines, etc.) kept being added, much of the land within the current Clarkson WWTP facility limits remained undeveloped or in agricultural use until the early 1970s (***see Maps 5-6***). Massive expansion upgrades in the mid-1970s resulted in much of the facility being subjected to soil disturbance, including the valley lands associated with the Lakeside Creek in the property's southwest corner, which was piped underground ca. 1973 (***see Map 6***). Review of available post-1975 aerial photographs at the City of Mississauga's mapping service[1] provide further evidence of large-scale soil grading and construction within the Clarkson WWTP grounds, especially in the period 2004 to 2019, therefore leaving only few pockets of land undisturbed.

1.3.4.2 G.E. Booth (Lakeview) WWTP

The G.E. Booth WWTP facility sits on parts of Lots 5 to 7, Concession 3 SDS. A review of the facility's land use history is detailed in the TRCA Stage 1 AA report that was conducted in support of Lakeview Waterfront Connection Project (TRCA, 2013a). The report found that Lot 5 was

[1] Due to copyright conditions, orthorectified aerial imagery from Mississauga Maps cannot be provided within this report. Historical aerial imagery of the vicinity of the G.E. Booth WWTP can be accessed via the following link: ***http://www6.mississauga.ca/missmaps/maps.aspx#map=15/-8863100.07/5387809.82/0.9075712110370514***

originally a Crown Reserve which was first reserved for Valentine Harding in 1810 but later granted to Col. Samuel Smith, a United Empire Loyalist, in 1817. Lots 6 and 7 were granted to Thomas Lucas who by 1809 had cleared five acres and built a house on the property. Lot 6 was then later sold to Samuel Smith in 1818. In the 1859 *Tremaine's Map of the County of Peel* the Lot 5 is still identified as being property of the Smith Estate, while Lots 6 and 7 were owned by R.J. Polley and Michael Barnes (***see Map 7***). By 1877, Lots 5 and 6 had been united under the ownership of James Hamilton, while the widow of Michael Barnes retained Lot 7 (***see Map 8***). Neither historical map, however, depict any structure within the G.E. Booth study area limits.

Information about the occupants of Lots 5 to 7 indicate that the area of the current WWTP facility was actively being used for mixed farming until the 1890s, when a rifle range was established (TRCA, 2013a). The property was purchased by the federal government in 1935 and used by the Department of National Defence for military purposes until 1955, when Toronto Township purchased 35 acres on Lot 6 to build the Lakeview Sewage Disposal Plant (the forerunner of G.E. Booth WWTP) which was opened in 1957. Major expansions to the facility took place in the 1970s (which enlarged the facility footprint to include Lot 5) and the 2000s[2] (Hicks, 2005, pp. 46-49; pp. 266-267). Note that a review of the Lakeview area's 20th century aerial imagery and land use history has already been presented in a previous Stage 1 AA report by the Toronto and Region Conservation Authority (TRCA, 2013a).

1.3.4.3 Lakeshore Road

Both WWTP facilities lie along Lakeshore Road, a historic thoroughfare opened in 1804 which roughly followed the path of an older First Nations trail. It was improved as a corduroyed road in the 1820s and became Canada's first road to be designated a cemented highway in 1914 (Hicks, 2005, pp. XVII-XVIII).

1.3.4.4 Summary

In Ontario, the *2011 S&G* considers areas of early Euro-Canadian settlements (e.g., pioneer homesteads, isolated cabins, farmstead complexes, early wharf or dock complexes, pioneer churches, and early cemeteries), early historic transportation routes (e.g., trails, passes, roads, railways, portage routes), and properties that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations are considered features or characteristics that indicate archaeological potential (per *Section 1.3.1* of the *2011 S&G*). Therefore, based on the presence of early Euro-Canadian settlements, and the proximity of early historic transportation routes, this feature contributes in establishing the archaeological potential of the study area.

1.3.5 Present Land Use

Under the City of Mississauga's Official Plan, the land use for the entire Clarkson WWTP facility is categorized as Utility. The G.E. Booth study area is also mostly categorized as Utility, except for

[2] Due to copyright conditions, orthorectified aerial imagery from Mississauga Maps cannot be provided within this report. Historical aerial imagery of the vicinity of the G.E. Booth WWTP can be accessed via the following link: ***http://www6.mississauga.ca/missmaps/maps.aspx#map=15/-8855066.23/5400062.43/0.9075712110370514***

the Lake Ontario shoreline, and the immediate vicinities of the Serson and Applewood Creeks which are Greenlands. These latter areas, and a wooded portion in the northwest, are also considered to be areas of Natural Hazard (City of Mississauga, 2019).

1.4 Archaeological Context

To establish the archaeological context and further establish the archaeological potential of the study area, *Archeoworks Inc*. conducted a comprehensive review of designated and listed heritage properties, commemorative markers and pioneer churches and early cemeteries in relation to the study area. Furthermore, an examination of registered archaeological sites and previous AAs in proximity to the study area limits, and a review of the physiography of the study area were performed. The results of this background research are documented below and summarized in **Appendix B – Summary of Background Research**.

1.4.1 Designated and Listed Cultural Heritage Resources

Per *Section 1.3.1* of the *2011 S&G*, properties listed on a municipal register or designated under the *Ontario Heritage Act*, or that is a federal, provincial, or municipal historic landmark or site, are considered features or characteristics that indicate archaeological potential. Several heritage resources are located within 300 metres of the G.E. Booth WWTP study area (***see Table 3***). No properties of cultural heritage value or interest lie within 300 metres of the Clarkson WWTP.

Table 3: Cultural Heritage Properties Located within 300 metres of the Study Area

Address	Date	Description	Status
1300 Lakeshore Road East	1940	Long Branch Indoor Rifle Range: single-storey, partially subterranean rectangular structure used for World War II militia training; still in active civilian use (City of Mississauga, 2020c). *Note:* Partially encompassed within the study area.	Designated under By-Law 170-2012
	1910	Long Branch Outdoor Rifle Range: sixteen wooden baffles and one concrete backstop dating to 1910, but area has been used for militia training since 1891 (City of Mississauga, 2020d; Ontario Heritage Trust, 2020a)	Designated under By-Law 0144-2017
1352 + 1400 + 1440 Lakeshore Road East	1941	Small Arms Limited Building: low-lying H-shaped facility, part of a larger complex dedicated to government firearms manufacture during World War II (City of Mississauga, 2020e)	Designated under By-Law 258-2009
	-	Arsenal Lands Water Tower: last visible remnant of former munitions plant that stood on the site (City of Mississauga, 2020f)	
811 Lakefront Promenade / 800 + 985 Hydro Road	-	Lakeview Generating Station: one of five hydro generation plants along north shore of Lake Ontario with strong architectural massing and distinct visual impact (City of Mississauga, 2020b)	Previously listed; Now demolished/ unlisted

However, it must be noted that due to the late timeframe of construction (i.e., post-1900) of the aforementioned properties of cultural heritage value or interest, these properties do not directly contribute to elevated potential to encounter historic (i.e., pre-1900) archaeological resources.

1.4.2 Heritage Conservation Districts

Per *Section 1.3.1* of the *2011 S&G*, heritage resources listed on a municipal register or designated under the *Ontario Heritage Act* are considered features or characteristics that indicate archaeological potential. The study area is not located in or within 300 metres of a Heritage Conservation District (City of Mississauga, 2020a). Therefore, this feature does not contribute in establishing the archaeological potential of the study area.

1.4.3 Commemorative Plaques or Monuments

Per *Section 1.3.1* of the *2011 S&G,* commemorative markers of Aboriginal and Euro-Canadian settlements and history which may include local, provincial, or federal monuments, cairns or plaques, or heritage parks are considered features or characteristics that indicate archaeological potential. The study area is not located in or within 300 metres of a commemorative plaque or monument (Ontario Historic Plaques, 2019; Ontario Heritage Trust, 2020b). Therefore, this feature does not contribute in establishing the archaeological potential of the study area.

1.4.4 Pioneer/Historic Cemeteries

Per *Section 1.3.1* of the *2011 S&G,* pioneer churches and early cemeteries are considered features or characteristics that indicate archaeological potential. The study area is not located in or within 300 metres of a pioneer/historic cemetery or church (Ontario Genealogical Society, 2019). Therefore, this feature does not contribute in establishing the archaeological potential of the study area.

1.4.5 Registered Archaeological Sites

Per *Section 1.1, Standard 1* and *Section 7.5.8, Standard 1* of the *2011* S&G, the *Ontario Archaeological Sites Database* (OASD) maintained by the *MHSTCI* was consulted in order to provide a summary of registered or known archaeological sites within a minimum one-kilometre distance of the study area limits. According to the OASD, there are no registered archaeological sites within a one-kilometre radius of the study area (MHSTCI, 2020). This feature therefore does not contribute to establishing archaeological potential of the study area.

1.4.6 Previous Archaeological Assessments

Per *Section 1.1, Standard 1* and *Section 7.5.8, Standards 4-5* of the *2011* S&G, to further establish the archaeological context of the study area, a review of previous AAs carried out within the limits of, or immediately adjacent (i.e., within 50 metres) to the study area — as documented by all available reports — was undertaken. Eight reports were identified (***see Table 4***).

Table 4: Previous Archaeological Assessments

Company	Stage of Work	Relation to Study Area	Details and Recommendation
Previous Archaeological Assessments Tied to Current Development Project:			
Scarlett Janusas Archaeology Inc., 2020	Marine AA	G.E. Booth WWTP offshore	220 hectares of Lake Ontario shore fronting WWTP facility considered to exhibit low archaeological potential. No further AA recommended.

Company	Stage of Work	Relation to Study Area	Details and Recommendation
Previous Archaeological Assessments Tied to Other Development Projects:			
Timmins Martelle Heritage Consultants Inc., 2007	Stage 1-2 AA	Immediately north of Clarkson WWTP	Assessment in support of development of 551 Avonhead Road. Stage 2 visual and test pit survey found no archaeological resources. No further AA recommended.
Scarlett Janusas Archaeological and Heritage Consulting and Education, 2012	Marine AA	G.E. Booth WWTP offshore	Marine AA for Lake Ontario shore between Lakeview Generating Station and Etobicoke Creek, including shore off G.E. Booth WWTP, in support of Lakeview Waterfront Connection (LWC) revitalization project. No cultural materials located for portion fronting WWTP.
Toronto and Region Conservation Authority, 2013a	Stage 1 AA	Encompasses entire G.E. Booth WWTP	Land-based AA in support of LWC Project, covering lands south of Lakeshore Road, west of Etobicoke Creek and east of Serson Creek; includes G.E. Booth WWTP. Background research determined much of WWTP facility to be extensively disturbed. No further AA recommended for disturbed areas. Some areas within WWTP facility found to retain archaeological potential and recommended to be subjected to Stage 2 test pit survey.
Toronto and Region Conservation Authority, 2013b	Stage 2 AA	Encompasses part of G.E. Booth WWTP	Assessment of four areas within larger Lakeview Waterfront Connection Project, one of which ("Area A") is situated in the northwest woodlot of the WWTP facility. Combination of visual inspection and test pit survey found no archaeological resources. No further AA recommended.
Toronto and Region Conservation Authority, 2016	Stage 1-2 AA	Encompasses part of G.E. Booth WWTP	Assessment of proposed construction access road spanning G.E. Booth WWTP and Ontario Power Generation lands, as part of the larger Lakeview Waterfront Connection Project. Combination of visual inspection and test pit survey found no archaeological resources. No further AA recommended.
Archaeological Research Associates Ltd., 2017	Stage 1-2 AA	Immediately east of G.E. Booth WWTP	Much of former Lakeview Generating Station property (Ontario Power Generation lands) found to be extensively disturbed; undisturbed lands subjected to Stage 2 test pit survey. No archaeological resources found; no further AA recommended.
Archeoworks Inc., 2019	Stage 1 AA	Encompasses entire Clarkson WWTP	Assessment in support of Southdown District Stormwater Servicing and Environmental Management Plan, covering a large part of the City of Mississauga, including Clarkson WWTP. Stage 2 test pit survey specifically recommended for lands within WWTP facility.

1.4.7 Physical Features

1.4.7.1 Physiographic Region

Both WWTP facilities are situated within the Iroquois Plain physiographic region of Southern Ontario. This physiographic region consists of undulating till plains above the old shorelines of Lake Iroquois, the extensive lake that covered the Lake Ontario region when the last glacier was receding. The old shoreline is "well-marked by bluffs or gravel bars;" immediately below is a strip of "boulder pavement and sandy offshore deposits" that are "not very productive" for agriculture. Until 1940, the Iroquois Plain was a general farming area, with a tendency for horticulture and growth of canning crops. However, since the Second World War, the remaining farms have become larger while much of the land has been put to urban uses (Chapman and Putnam, 1984, pp.190-196).

1.4.7.2 Soil Types and Topography

Prior to developmental activities in the 20th and 21st centuries, the native soil within the G.E. Booth WWTP was Chinguacousy clay loam, while Berrien sandy loam and Cooksville clay loam could be found in the Clarkson WWTP (Ontario Agricultural College, 1953). A summary of their characteristics is presented in **Table 5**.

Table 5: Study Area Soil Types

Series, Soil Type	Great Soil Group	Soil Materials	Drainage	Topography	Surface Stoniness
G.E. Booth WWTP					
Chinguacousy, clay loam	Grey-Brown Podzolic	Heavy textured till. Shale and limestone	Imperfect	Smooth gently sloping	Few stones
Clarkson WWTP					
Berrien, sandy loam	Grey-Brown Podzolic	Sandy outwash over heavy till	Imperfect	Smooth, very gently sloping	Stonefree
Cooksville, clay loam	Grey-Brown Podzolic	Shallow soil over bedrock. Over grey shale	Imperfect	Smooth gently sloping	Few stones

1.4.7.3 Hydrological Features

Hydrological features such as primary water sources (i.e. lakes, rivers, creeks, streams) and secondary water sources (i.e. intermittent streams and creeks, springs, marshes, swamps) would have helped supply plant and food resources to the surrounding area and are indicators of archaeological potential (per *Section 1.3.1* of the *2011 S&G*). The G.E. Booth WWTP is flanked by Applewood Creek to the east, Lake Ontario to the south and Serson Creek to the west, while Lakeside Creek flows through Clarkson WWTP. Given the presence of these water sources, archaeological potential can be established within the study area. However, it must be noted that post-1950 developments have artificially altered the areas surrounding the aforementioned creeks, as well as the Lake Ontario shoreline.

1.4.8 Current Land Conditions

Both the Clarkson WWTP and G.E. Booth WWTP facilities are mostly dominated by buildings, installations and structures; many open surfaces have been either graded and/or paved over. The natural topography has been greatly altered at both facilities. Wooded and areas of overgrown vegetation exist in the valley lands associated with Applewood and Serson Creeks at G.E. Booth WWTP. Shrubbed and overgrown areas also exist along the margins of the Clarkson WWTP; some cover soil heaps from previous site expansion/improvement works. Reclamation work along the Lake Ontario shore is also taking place south of G.E. Booth WWTP.

1.4.9 Date of Property Inspection

A field review (“property inspection”) was carried out on June 29, 2020. The purpose of the property inspection is to: identify and describe areas of high potential requiring additional archaeological research; identify and describe areas of no/low potential not warranting further archaeological concern; and to help gather information in order to formulate appropriate Stage 2 AA strategies. Details of the property inspection are presented in **Section 2.0**.

1.5 Confirmation of Archaeological Potential

Based on the information gathered from the background research documented in the preceding sections, there is elevated archaeological potential within the study area limits. Features that contribute to archaeological potential are summarized in **Appendix B**.

However, it must be noted that post-1900 developments can negate the possibility of encountering intact archaeological deposits due to deep and extensive soil disturbance. Succeeding **Sections 2.0** and **3.0** will provide further details regarding which areas will no longer require further work due to previous disturbance, and which undisturbed areas will require further Stage 2 AA.

2.0 PROPERTY INSPECTION

This property inspection was conducted in compliance with the standards set forth in *Section 1.2* of the *2011 S&G*, published by the *MHSTCI*. The weather condition at the time of inspection was sunny, with a daily high temperature of 25°C, permitting good visibility of all features within the study area.

Inspection was carried out by taking photographs of the general surroundings within the study area, with the exception of lands previously determined as no longer warranting further archaeological concern (***see Section 3.1***). Attention was paid to documenting a range of land alterations and features affecting the assessment of archaeological potential. Areas believed to have been untouched by previous development was were also inspected to determine suitability for further archaeological testing.

Photographic images of the study area are presented within **Appendix C**. Location and orientation information associated with all photographs taken in the field is provided within **Maps 9-10.** An inventory of the documentary record generated in the field can be found within **Appendix D***.*

2.1 Identification & Documentation of Physiographic Features Affecting Assessment Strategies

A review of historical and recent aerial imagery has revealed that the courses and/or banks of the Lakeside Creek at Clarkson WWTP, and Applewood and Serson Creeks at G.E. Booth WWTP, were heavily altered in the second half of the 20th century as part of the development of both facilities (***see Section 1.3.4***). None of the physiographic features encountered within the study area (e.g., slopes, watercourses) were confirmed to be natural; rather they are considered disturbed (***see Section 2.2 below***). At the Clarkson WWTP, however, it was observed that the graded landscape drains the rainwater into the property's east margin (***see Images 1-2***), resulting in low-lying waterlogged locations.

2.2 Identification & Documentation of Structures and Built Features Affecting Assessment Strategies

Most of the lands within the study area appear to have been subject to extensive and deep (i.e, to below subsoil) post-1950 alterations. These include: extant (and former) footprints of built structures and installations, gravel and paved surfaces, graded landscapes, and artificial berms/soil piles (***see Images 3-31***). The site plan of each facility also indicates that an extensive network of buried utility and servicing lines exists throughout, including the pipes conveying Lakeside Creek underground at Clarkson WWTP.

2.3 Identification & Documentation of Additional Features Contributing to Archaeological Potential

During the Stage 1 property inspection no additional features contributing to archaeological potential were identified.

2.4 Confirmation of Previously Identified Features of Archaeological Potential

Only small portions of the study area retain archaeological potential as no extensive soil disturbance was observed in these areas, both in reviewed post-1950 aerial imagery and during the on-site property inspection (***see Images 32-34***).

2.5 Indigenous Engagement

In response to an initiative set forth by the MHSTCI, wherein active project information is released to Indigenous communities who request this data, the *Mississaugas of the Credit First Nation* (MCFN) have requested participation and project information for all archaeological assessment work occurring within their treaty territory; this project falling within such lands. Communication details with the MCFN regarding their participation in this project have been documented within the **Indigenous Engagement Document** as per *Section 7.6.2* of the *2011 S&G*.

3.0 ANALYSIS AND CONCLUSIONS

In combination with data gathered from the background research (***see Sections 1.3 and 1.4***) and reviews of a series of maps and aerial imagery, an evaluation of the established archaeological potential was performed. The resulting Stage 1 AA map is presented as **Maps 9-10**. A selection of photographs taken in the field is presented in **Appendix C** as **Images 1-34**, and their locations are accordingly marked in the maps.

3.1 Previously Assessed Areas

Two Marine AAs (SJAHCE, 2012; SJAI, 2020), and four Stage 1 and/or 2 AAs (TRCA, 2013a, 2013b, 2016; ARA Ltd., 2017), have already sufficiently assessed the archaeological concerns in the majority of the G.E. Booth WWTP study area (***see Section 1.4.6***). These portions can be exempted from further Stage 2 archaeological testing.

3.2 Physiographic Features of No or Low Archaeological Potential

The study area was also evaluated for physical features of no or low archaeological potential. These usually include but are not limited to: permanently wet areas, exposed bedrock, and steep slopes (greater than 20°) except in locations likely to contain pictographs or petroglyphs, as per *Section 2.1, Standard 2.a.* of the 2011 *S&G.*

The low-lying and permanently wet area along the east margin of the Clarkson WWTP facility is considered to be of low archaeological potential (***see Section 2.1***). It is therefore recommended to be exempt from further archaeological investigation.

3.3 Identified Deep and Extensive Disturbances

The study area was evaluated for extensive disturbances that have removed archaeological potential. Disturbances may include but are not limited to: quarrying, major landscaping involving grading below topsoil, building footprints, or sewage and infrastructure development. *Section 1.3.2* of the *2011 S&G* considers infrastructure development among those "features indicating that archaeological potential has been removed."

Heavy post-1950 land alterations were noted throughout much of the two WWTP facilities. As documented in historical aerial imagery (***see Section 1.3.4***) and current site plans, and also confirmed during property inspection (***see Section 2.2***), these deep and extensive disturbances would have resulted in severe damage to the integrity of any archaeological resources which may have been present within their footprints. These areas may be exempted from further archaeological investigation.

3.3.1 MCFN Engagement

The Department of Consultation and Accommodation (DOCA) of the Mississaugas of the Credit First Nation (MCFN) has requested that the wooded area and manicured lawn at the southwest corner of the Clarkson WWTP be subjected to judgmental test pitting (***see Indigenous Engagement Document***).

3.4 Identified Areas of Archaeological Potential

Desktop review of historical aerial imagery, combined with on-site property inspection, indicate that pockets of land within the two WWTP facilities neither exhibit extensively disturbed conditions nor contain physical features of low to no archaeological potential. Specifically, these include (***see Maps 9-10***):

1) Wooded portions in the northwest angle of the G.E. Booth WWTP study area, flanking the access road; and
2) Four grassed/treed/overgrown portions of the Clarkson WWTP study area, namely: along the west margin, and at the northwest, northeast and southeast corners.

These lands are considered to retain archaeological potential and are in suitable condition for Stage 2 test pit survey at standard five-metre intervals.

4.0 RECOMMENDATIONS

Considering the findings detailed in preceding sections, the following recommendations are presented (***see Maps 9-10***):

1. In accordance with findings from the relevant previous archaeological assessments, areas within the G.E. Booth WWTP study area determined to no longer retain archaeological potential and/or warrant no further work, are recommended to be exempted from further assessment.

2. The low-lying and permanently wet area along the east margin of Clarkson WWTP is considered to be low archaeological potential and may be exempted from further assessment. No further work is recommended for this area.

3. Areas demonstrated in historical aerial imagery, indicated in the site plans, and confirmed visually on-site to have been previously disturbed extensively, no longer retain archaeological potential and may be exempted from further assessment. No further work is recommended for these areas, with the exception of the area below:
   i. Per MCFN request, a portion of the southwest corner of the Clarkson WWTP must be subjected to judgmental test pit survey in accordance with the standards set within *Section 2.1.8* of the *2011 S&G*.

4. A Stage 2 AA test pit survey at five-metre intervals must be undertaken in all other portions of the study area which retain archaeological potential, in accordance with the standards set within *Section 2.1.2* of the *2011 S&G*. These specifically include:
   i. At Clarkson WWTP: grassed and/or treed areas in the northwest, northeast and southeast corners, and a grassed area along the west margin.
   ii. At G.E. Booth WWTP: wooded area in the northwest corner, flanking both sides of the extant access road.

No construction activities shall take place within the study area prior to the *MHSTCI* (Archaeology Program Unit) confirming in writing that all archaeological licensing and technical review requirements have been satisfied.

5.0 ADVICE ON COMPLIANCE WITH LEGISLATION

1. This report is submitted to the *MHSTCI* as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the *MHSTCI*, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

2. It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

3. Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

4. The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the *Ministry of Consumer Services*.

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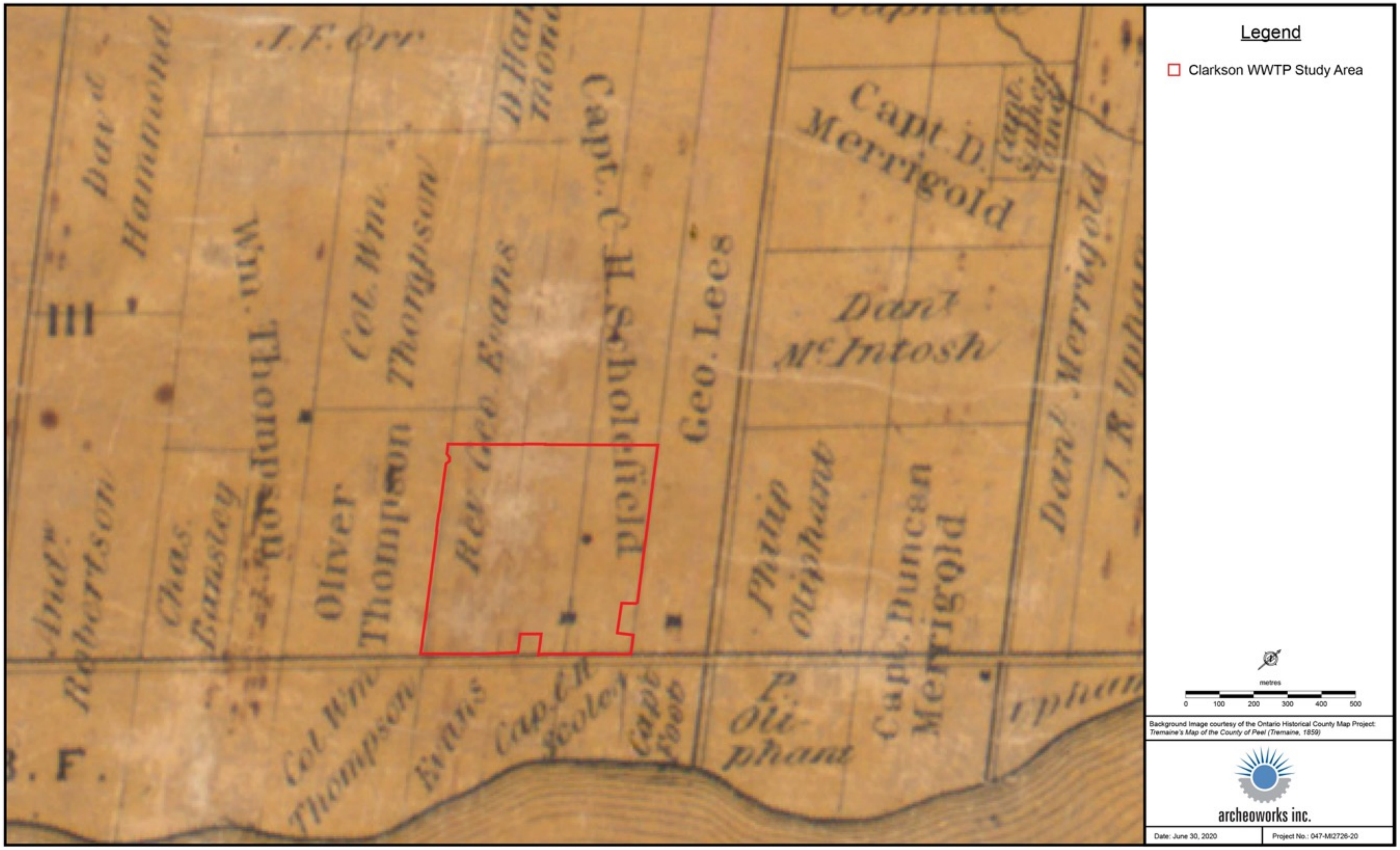
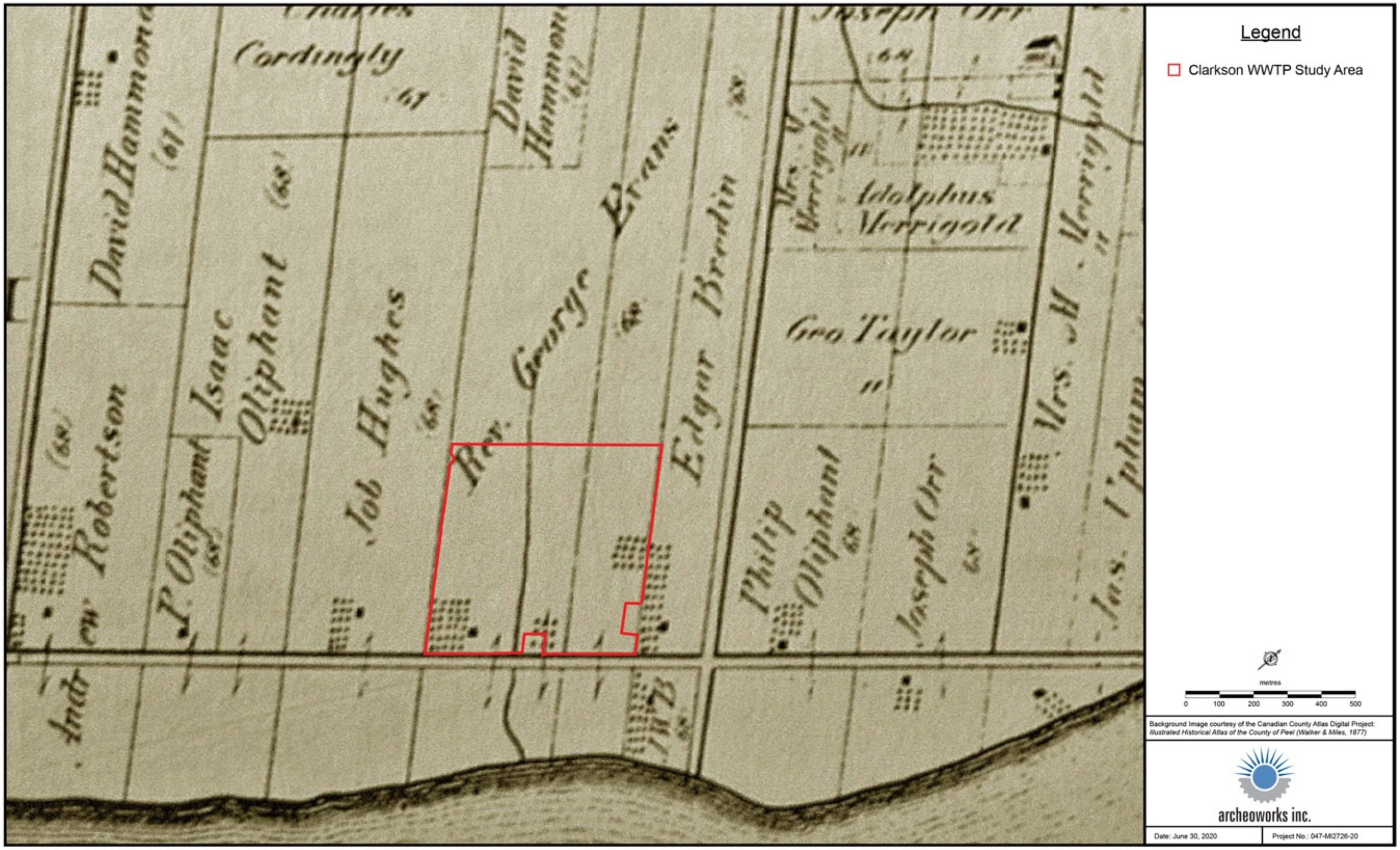
APPENDICES

APPENDIX A: MAPS

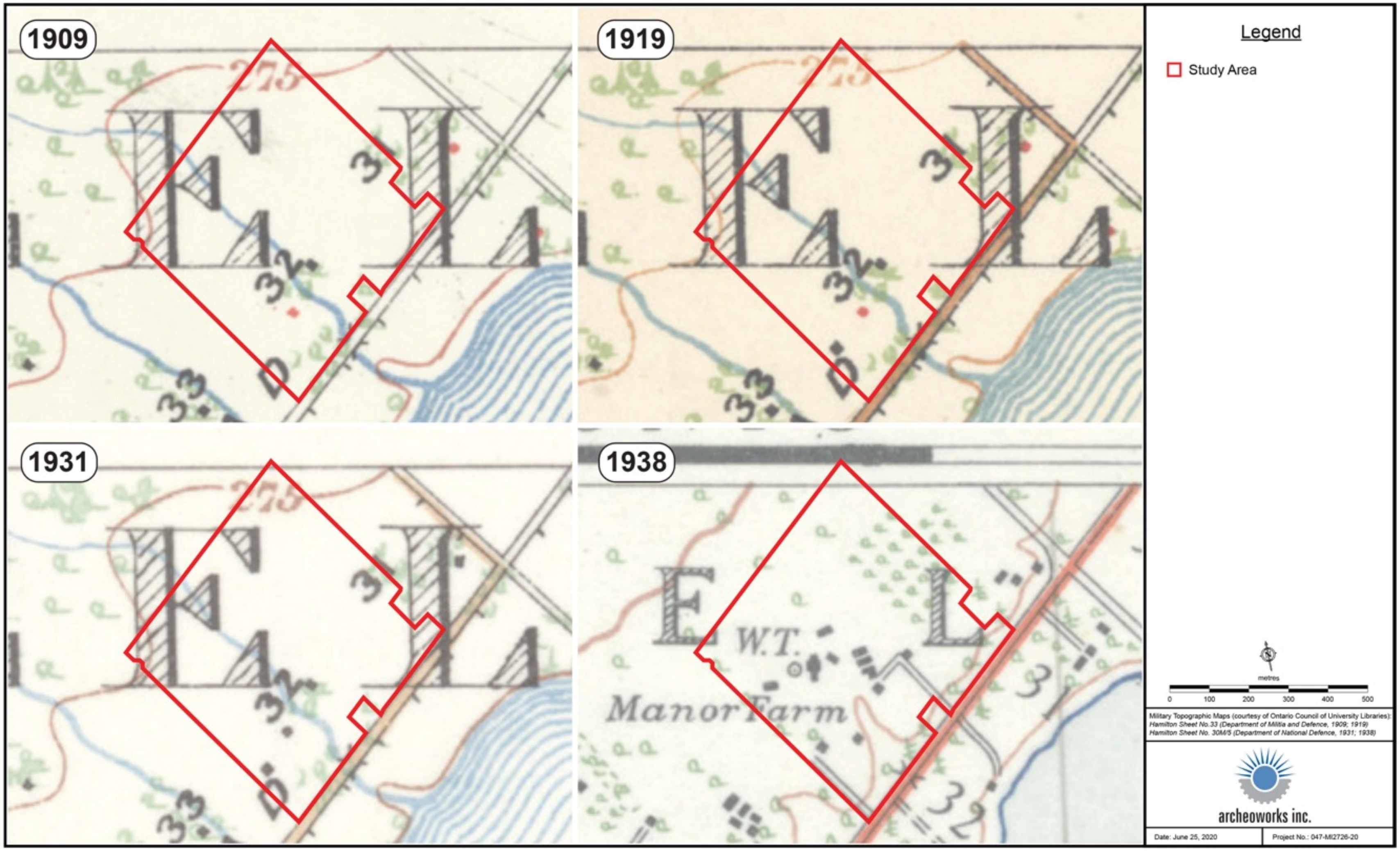
Map 1: Topographic map section identifying the Stage 1 AA study area limits.



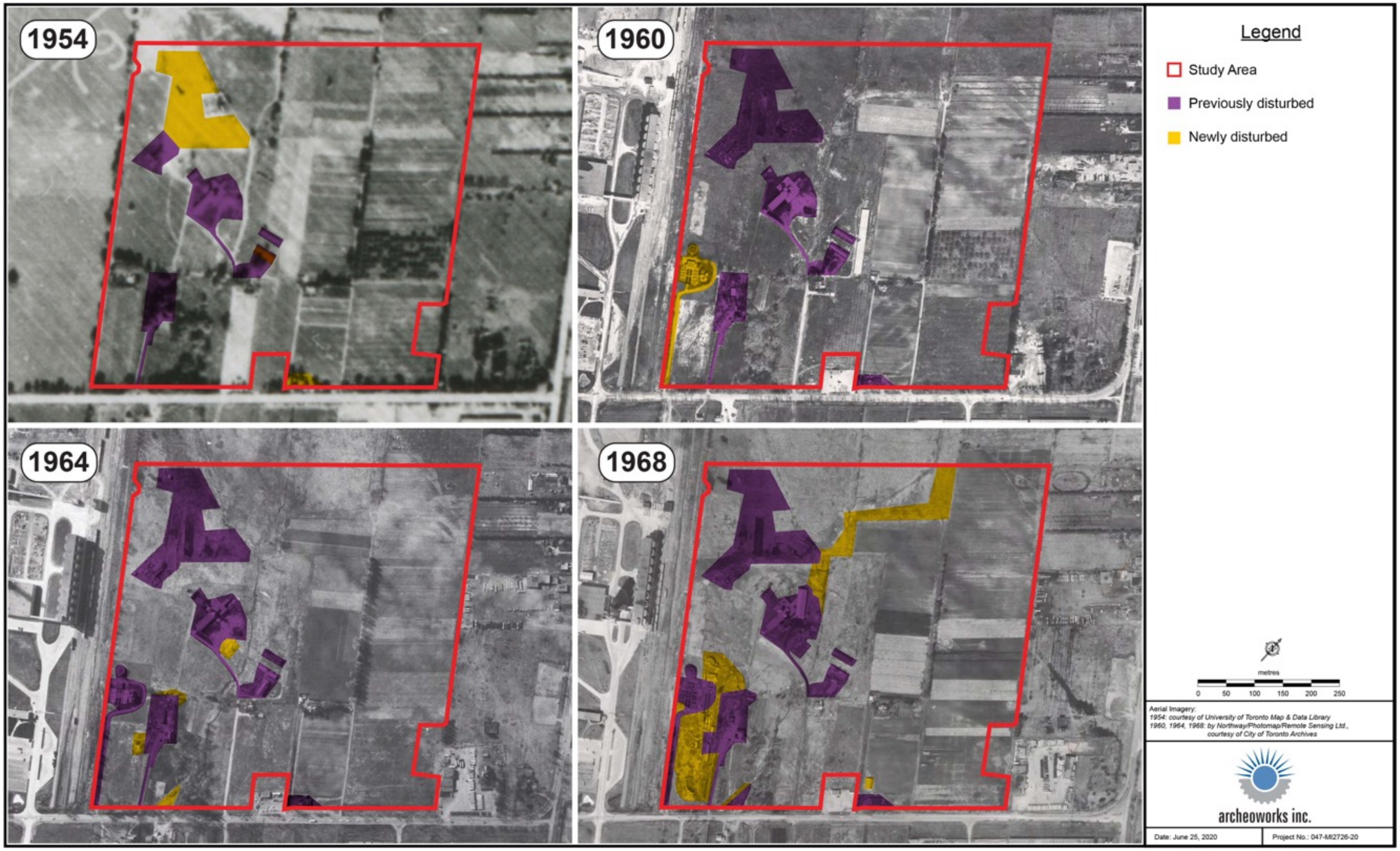
Map 2: Clarkson WWTP study area within the 1859 *Tremaine's Map of the County of Peel*.



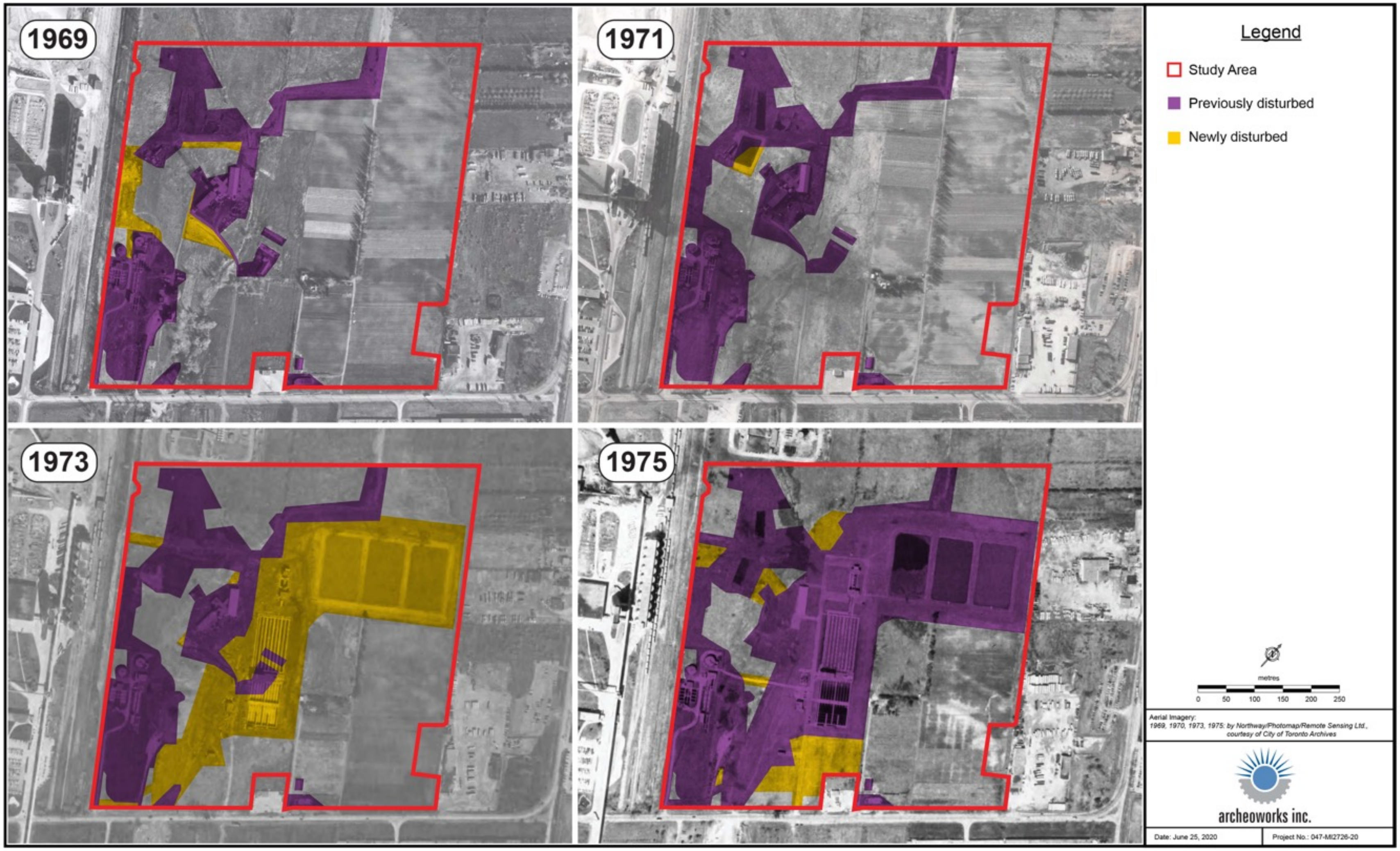
Map 3: Clarkson WWTP study area within the 1877 *Illustrated Historical Atlas of the County of Peel*.



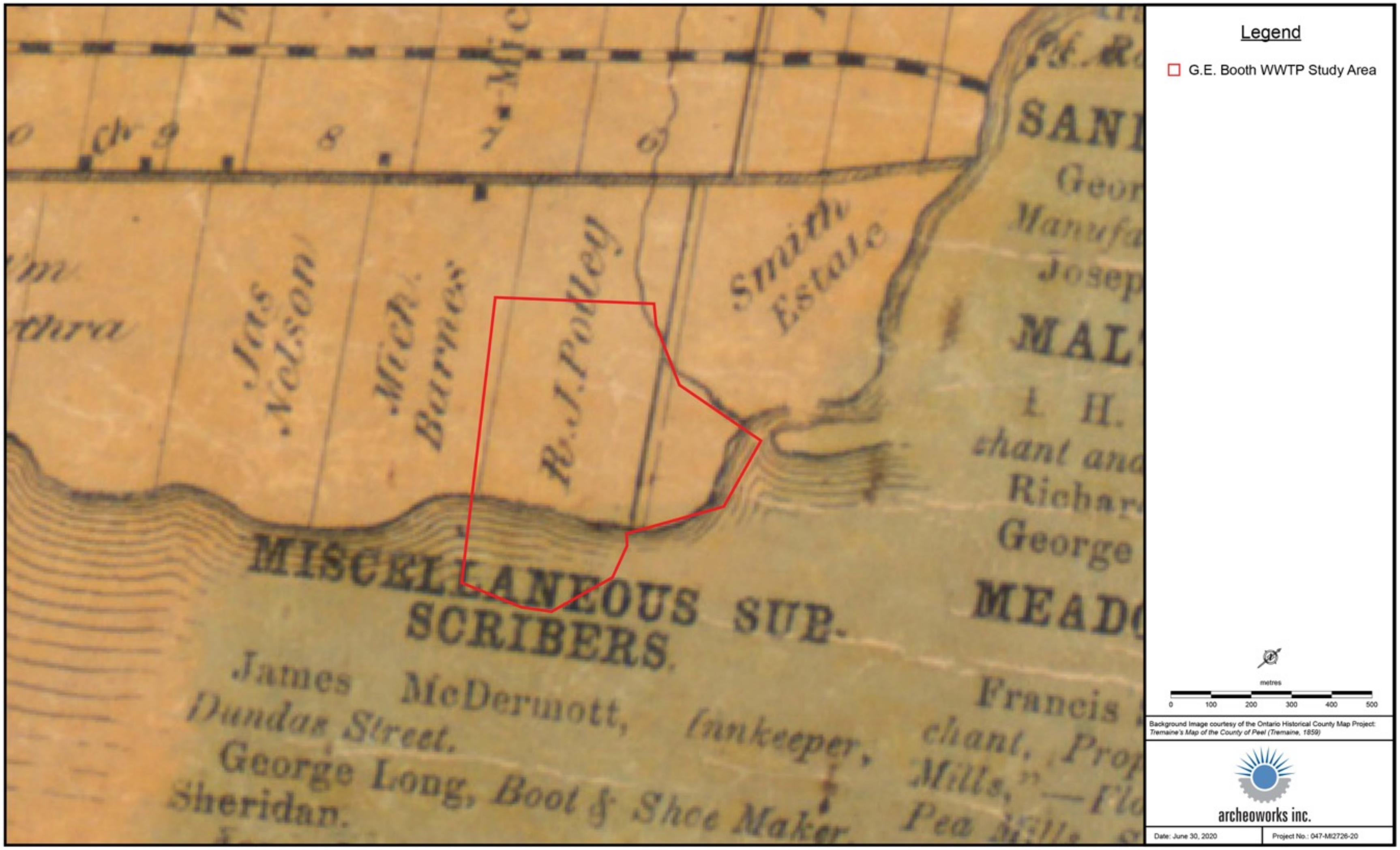
Map 4: Clarkson WWTP study area within early 20th century military topographic maps (1909-1938).



Map 5: Clarkson WWTP study area within a series of aerial photographs from 1954 to 1968, showing extent of disturbances over time.

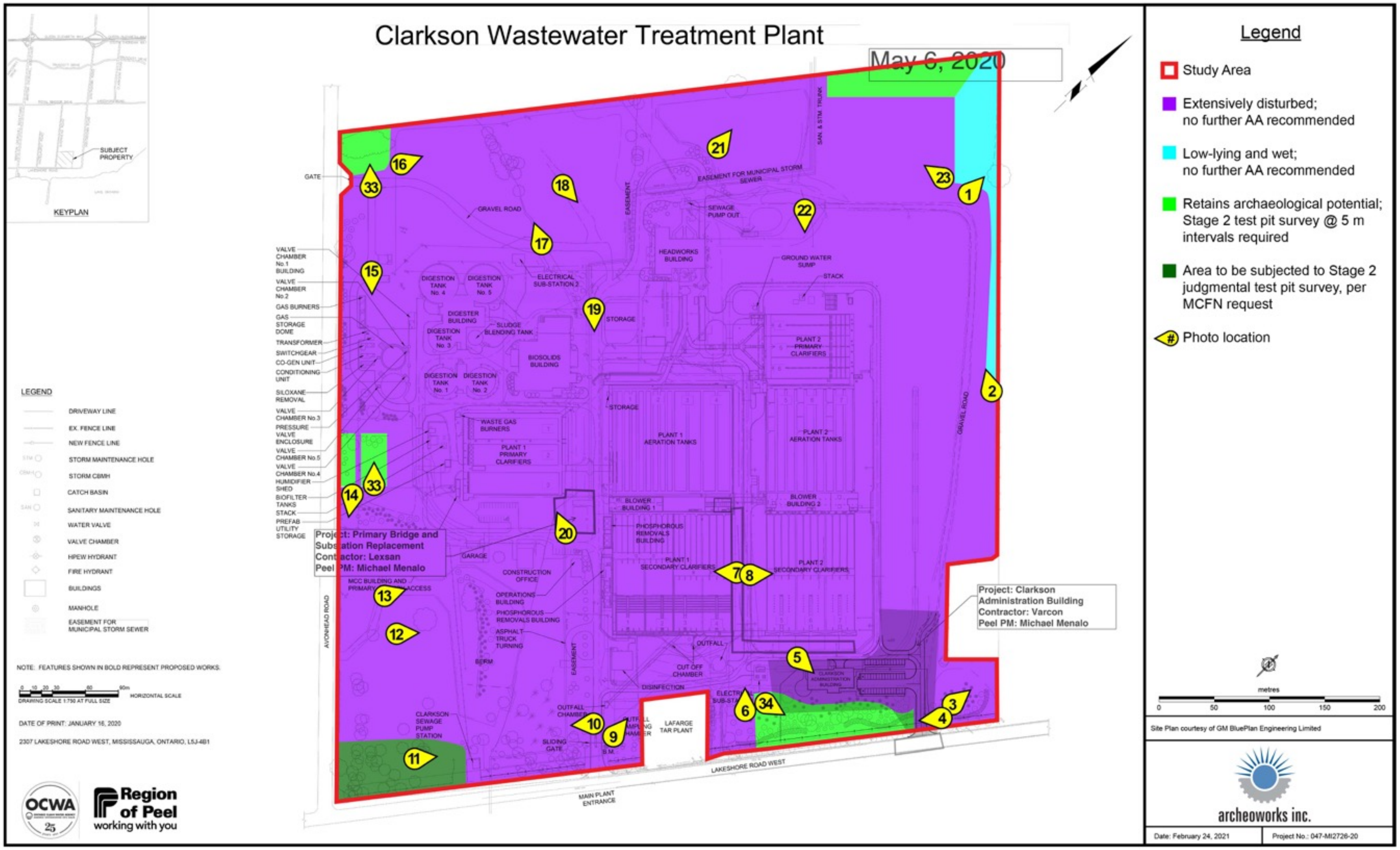


Map 6: Clarkson WWTP study area within a series of aerial photographs from 1969 to 1975, showing extent of disturbances over time.

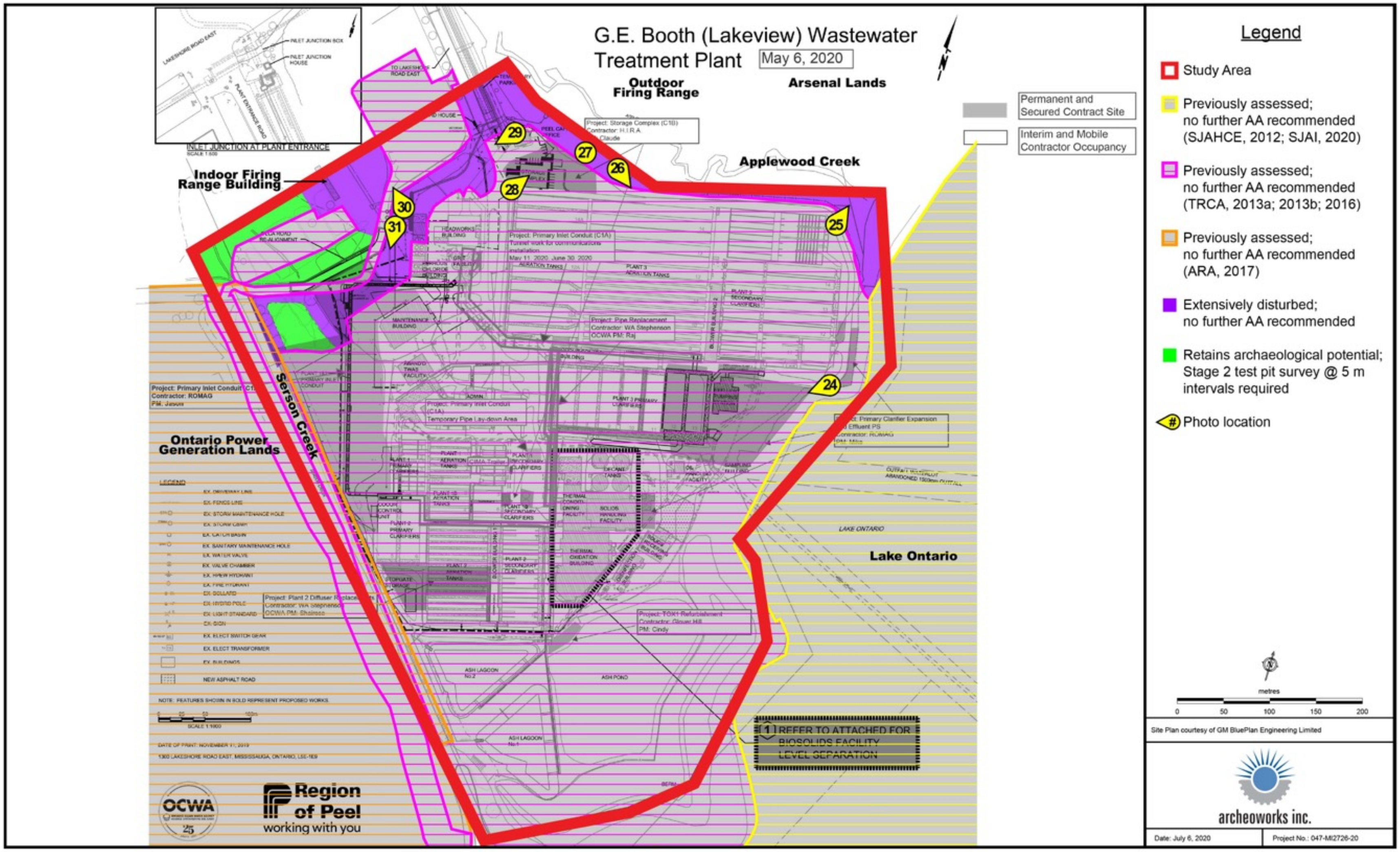


Map 7: G.E. Booth WWTP study area within the 1859 *Tremaine's Map of the County of Peel*.

Map 8: G.E. Booth WWTP study area within the 1877 *Illustrated Historical Atlas of the County of Peel*.



Map 9: Stage 1 AA results for Clarkson WWTP study area, with photo locations indicated.



Map 10: Stage 1 AA results for G.E. Booth WWTP study area, with photo locations indicated.

APPENDIX B: SUMMARY OF BACKGROUND RESEARCH

Feature of Archaeological Potential		Yes	No	Unknown	Comment
1	Known archaeological sites within 300 m?		X		If Yes, potential confirmed
Physical Features		**Yes**	**No**	**Unknown**	**Comment**
2	Is there water on or adjacent to the property?	X			If Yes, potential confirmed
2a	Presence of primary water source within 300 metres of the study area (lakes, rivers, streams, creeks)	X			If Yes, potential confirmed
2b	Presence of secondary water source within 300 metres of the study area (intermittent creeks and streams, springs, marshes, swamps)	X			If Yes, potential confirmed
2c	Features indicating past presence of water source within 300 metres (former shorelines, relic water channels, beach ridges)		X		If Yes, potential confirmed
2d	Accessible or inaccessible shoreline (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh)		X		If Yes, potential confirmed
3	Elevated topography (knolls, drumlins, eskers, plateaus, etc.)		X		If Yes to two or more of 3-5 or 7-10, potential confirmed
4	Pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground		X		If Yes to two or more of 3-5 or 7-10, potential confirmed
5	Distinctive land formations (mounds, caverns, waterfalls, peninsulas, etc.)		X		If Yes to two or more of 3-5 or 7-10, potential confirmed
Cultural Features		**Yes**	**No**	**Unknown**	**Comment**
6	Is there a known burial site or cemetery that is registered with the Cemeteries Regulation Unit on or directly adjacent to the property?		X		If Yes, potential confirmed
7	Associated with food or scarce resource harvest areas (traditional fishing locations, food extraction areas, raw material outcrops, etc.)		X		If Yes to two or more of 3-5 or 7-10, potential confirmed
8	Indications of early Euro-Canadian settlement (monuments, cemeteries, structures, etc.) within 300 metres	X			If Yes to two or more of 3-5 or 7-10, potential confirmed
9	Associated with historic transportation route (historic road, trail, portage, rail corridor, etc.) within 100 metres of the property	X			If Yes to two or more of 3-5 or 7-10, potential confirmed
Property-specific Information		**Yes**	**No**	**Unknown**	**Comment**
10	Contains property designated under the Ontario Heritage Act	X			If Yes, potential confirmed
11	Local knowledge (aboriginal communities, heritage organizations, municipal heritage committees, etc.)		X		If Yes, potential confirmed
12	Recent ground disturbance, not including agricultural cultivation (post-1960, extensive and deep land alterations)	X – in some parts			If Yes, low archaeological potential is determined

APPENDIX C: IMAGES


Image 1: View of low-lying wet area along east margin of Clarkson WWTP


Image 2: View of low-lying wet area along east margin of Clarkson WWTP.


Image 3: View of artificial berm in southeast corner of Clarkson WWTP.


Image 4: View of access road under construction and flagged utility line (bottom left) near southeast corner of Clarkson WWTP.


Image 5: View of recently constructed administration building.


Image 6: View of extant buildings, installations and utilities, and graded soil at Clarkson WWTP.


Image 7: View of extant structures and disturbed landscape at Clarkson WWTP.


Image 8: View of extant structures and disturbed landscape at Clarkson WWTP.

Image 9: View of graded landscape and extant building near entrance of Clarkson WWTP.

Image 10: View of graded rolling landscape and extant buildings around the southwest open area of Clarkson WWTP.

Image 11: View of extant pumping station building (right), markers (left) and solar panel installations (background, centre) within the landscaped area in the southwest portion of Clarkson WWTP

Image 12: View of former valley of Lakeside Creek, now piped underground (not visible). Note artificial berm/soil pile (centre) resulting from landscaping activities in surrounding areas.


Image 13: View of graded rolling landscape and extant buildings in western area of Clarkson WWTP.


Image 14: View of graded landscape sloping down to Avonhead Road, along west margin of Clarkson WWTP.


Image 15: View of extant buildings, installations, paved surfaces and graded landscapes in west of Clarkson WWTP.


Image 16: View of recently disturbed lands along the north of Clarkson WWTP.

Image 17: View of graded soils and artificial berms in former Lakeside Creek course (now piped underground) at Clarkson WWTP.

Image 18: View of graded area and buildings in north of Clarkson WWTP.

Image 19: View of extant paved surfaces and buildings near centre of Clarkson WWTP.

Image 20: View of graded landscape and existing structures near centre of Clarkson WWTP.

Image 21: View of tall artificial berm/soil pile resulting from landscaping activities along north margins of Clarkson WWTP.

Image 22: View of extant paved surfaces and structures in the east of Clarkson WWTP.

Image 23: View of low artificial berms/soil piles in northeast of Clarkson WWTP.

Image 24: View of extant paved road and artificial landscape at G.E. Booth WWTP, with ongoing Lake Ontario reclamation works visible.


Image 25: View of exposed graded soils forming artificial tableland just above mouth of Applewood Creek, within G.E. Booth WWTP.


Image 26: View of graded margins and extant structures at G.E. Booth WWTP.


Image 27: Closeup view of gravelly fill comprising the artificial tableland west of Applewood Creek, within G.E. Booth WWTP.


Image 28: View of storage complex under construction at G.E. Booth WWTP.

Image 29: View of heaving graded landscape, paved areas and extant buildings and installations around the entrance to G.E. Booth WWTP.

Image 30: View of artificial berms (background, left) and graded landscape (foreground) within G.E. Booth WWTP.

Image 31: View of graded landscape and extant buildings and installations in northwest of G.E. Booth WWTP.

Image 32: View of testable undisturbed area along west margin of Clarkson WWTP.

Image 33: View of testable undisturbed area at northwest corner of Clarkson WWTP.

Image 34: View of testable undisturbed area near southeast corner of Clarkson WWTP.

APPENDIX D: INVENTORY OF DOCUMENTARY AND MATERIAL RECORD

Project Information:				
Project Number:		047-MI2726-20		
Licensee:		Kassandra Aldridge (P439)		
MHSTCI PIF:		P439-0095-2020		
Document/ Material			**Location**	**Comments**
1	Research/ Analysis/ Reporting Material	Digital files stored in: /2020/047-MI2726-20 - South Peel WWTP - Mississauga/Stage 1	Archeoworks Inc., 16715-12 Yonge St., Suite 1029, Newmarket, ON, Canada L3X 1X4	Stored on Archeoworks network servers
2	Field Paperwork	Annotated maps and notes: 3 pages	Archeoworks Inc., 16715-12 Yonge St., Suite 1029, Newmarket, ON, Canada L3X 1X4	Scanned and stored on Archeoworks network servers
3	Fieldwork Photographs	Digital Images: 22 images	Archeoworks Inc., 16715-12 Yonge St., Suite 1029, Newmarket, ON, Canada L3X 1X4	Stored on Archeoworks network servers

Under the Section 14 of the Terms and Conditions for Archaeological Licences issued under the *Ontario Heritage Act*, "the licensee shall hold in safekeeping all artifacts and records of archaeological fieldwork carried out under this licence, except where those artifacts and records are transferred by the licensee to Her Majesty the Queen in right of Ontario or the licensee is directed to deposit them in a public institution in accordance with subsection 66(1) of the Act." The collections are being stored at Archeoworks Inc. on the licensee's behalf.

Appendix E:

Stage 1 and Marine Archaeological Assessment Reports

E2: Stage 1 Archaeological Assessment for the Administration Building for G.E. Booth WRRF

ARCHEOWORKS INC.

Stage 1 Archaeological Assessment for
Proposed Administrative Facility Building within the
G.E. Booth Wastewater Treatment Plant at
1300 Lakeshore Road East
Within Part of Lot 6, Concession 3 South of Dundas Street
In the Geographic Township of Toronto
Historic County of Peel
Now in the City of Mississauga
Regional Municipality of Peel
Ontario

Project #: 047-MI2726-20
Licensee (#): Kassandra Aldridge (P439)
PIF #: P439-0155-2022

Original Report

May 15, 2023

Presented to:
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L4K 4M3
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Prepared by:
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EXECUTIVE SUMMARY

In order to address forecasted increases in population and wastewater flow as identified in the 2013 Water and Wastewater Master Plan and recent ongoing updates, the *Regional Municipality of Peel* is proposing to make upgrades at the G.E. Booth (Lakeview) Wastewater Treatment Plant (WWTP), located at municipal address 1300 Lakeshore Road East in the City of Mississauga, which receives wastewater from Peel Region's east trunk sewer system.

In 2020/21, *Archeoworks Inc*. was previously retained by *GM BluePlan Engineering Limited* on behalf of the *Region of Peel* to conduct a Stage 1 Archaeological Assessment (AA) in support of the conceptual design for the proposed capacity expansions of the G.E. Booth WWTP. This subject facility is located within Lots 5 through 7, Concession 3 South of Dundas Street (SDS), Geographic Township of Toronto, historic County of Peel, now the City of Mississauga, Regional Municipality of Peel, Ontario (Archeoworks Inc., 2021). The Stage 1 AA report is currently awaiting review from the *MCM* and has yet to be entered into the *Ontario Public Register of Archaeological Reports*.

Upon the development of the design concept, the location of a New Administration Facility Building was established partially beyond what was previously subjected to archaeological assessment as part of the conceptual design for the proposed capacity expansions of the G.E. Booth WWTP. As such, *Archeoworks Inc.* was subsequently retained by *GM BluePlan Engineering Limited* to conduct a Stage 1 AA in support of the construction of the New Administration Facility within the G.E. Booth WWTP property. This parcel of land will herein be referred to as the "study area." The study area is located within Lot 6, Concession 3 South of Dundas Street (SDS), in the Geographic Township of Toronto (South), historic County of Peel, now in the City of Mississauga, Regional Municipality of Peel, Ontario.

Background research established archaeological potential within the study area due to the proximity of documented pre-1900 Euro-Canadian settlement (historic structures and a formerly opened roadway) and two watercourses (the Applewood Creek and Serson Creek). Additionally, the study area is located within a designated heritage property. This research also revealed several previous archaeological assessments encompassing a portion of the study area, which determined that portion of the study area has been cleared of further archaeological concern. The remaining balance of the study area was reviewed against current and historical air/aerial photographs, orthophotographs and satellite imagery which revealed deep and extensive land alterations from previous construction activities within the study area.

Considering the findings detailed in the succeeding sections, the following recommendations are presented:

1. Lands within the study area that were subjected to a previous archaeological assessment and deemed free of further archaeological concern, with the report accepted into the

MCM's Ontario Public Register of Archaeological Reports, are recommended to be exempt from further assessment.

2. With archaeological potential having been removed within portions of the study area due to previous deep and extensive land alterations, per *Section 1.3.2* of the *2011 S&G,* no further archaeological concerns exist. It may be considered free of further archaeological concern.

No construction activities shall take place within the study area prior to the *Ministry of Citizenship and Multiculturalism* (Archaeology Programs Unit) confirming in writing that all archaeological licensing and technical review requirements have been satisfied.

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PROJECT PERSONNEL

Project Director.. Kassandra Aldridge – MCM licence P439

Report Preparation and Research .... Lee Templeton – MCM licence R454

Graphics .... Lee Templeton

Report Review... Kim Slocki

1.0 PROJECT CONTEXT

1.1 Objectives

The objectives of a Stage 1 Archaeological Assessment (AA), as outlined by the 2011 *Standards and Guidelines for Consultant Archaeologists* (‘*2011 S&G*’) published by the *Ministry of Citizenship and Multiculturalism* (*MCM*) (2011), are as follows:

- To provide information about the property’s geography, history, previous archaeological fieldwork and current land condition;
- To evaluate in detail, the property’s archaeological potential, which will support recommendations for Stage 2 survey for all or parts of the property; and
- To recommend appropriate strategies for a Stage 2 survey.

1.2 Development Context

In order to address forecasted increases in population and wastewater flow as identified in the 2013 Water and Wastewater Master Plan and recent ongoing updates, the *Regional Municipality of Peel* is proposing to make upgrades at the G.E. Booth (Lakeview) Wastewater Treatment Plant (WWTP), located at municipal address 1300 Lakeshore Road East in the City of Mississauga, which receives wastewater from Peel Region’s east trunk sewer system.

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Upon the development of the design concept, the location of a New Administration Facility Building was established partially beyond what was previously subjected to archaeological assessment as part of the conceptual design for the proposed capacity expansions of the G.E. Booth WWTP. As such, *Archeoworks Inc.* was subsequently retained by *GM BluePlan Engineering Limited* to conduct a Stage 1 AA in support of the construction of the New Administration Facility within the G.E. Booth WWTP property. This parcel of land will herein be referred to as the “study area.” The study area is located within Lot 6, Concession 3 South of Dundas Street (SDS), in the Geographic Township of Toronto (South), historic County of Peel, now in the City of Mississauga, Regional Municipality of Peel, Ontario (***see Appendix A – Map 1***).

This study is being conducted in compliance with the planning and design process for Schedule ‘C’ projects as outlined in the *Municipal Class Environmental Assessment*, which is approved under the *Ontario Environmental Assessment Act*. This Stage 1 AA was conducted under the project direction of Ms. Kassandra Aldridge, under the archaeological consultant licence number P439, in accordance with the *Ontario Heritage Act* (1990; amended 2022) and the *2011 S&G*. Permission to investigate the study area was granted by *GM BluePlan Engineering Limited* on April 28th, 2023.

1.3 Historical Context

To establish the historical context and archaeological potential of the study area, *Archeoworks Inc.* conducted a comprehensive review of Indigenous and Euro-Canadian settlement history, and a review of available historical mapping, topographic mapping, air/aerial photographs, orthophotographs and satellite imagery. The results of this background research are documented below and summarized in **Appendix B – Summary of Background Research**.

1.3.1 Pre-Contact Period

The pre-contact period of Southern Ontario includes numerous Indigenous groups that continually progressed and developed within the environment they inhabited (Ferris, 2013, p.13). **Table 1** includes a brief overview and summary of the pre-contact Indigenous history of Southern Ontario.

Table 1: Pre-Contact Period

<table>
<tr><th>Periods</th><th>Date Range</th><th>Overview and Attributes</th></tr>
<tr><td colspan="3">PALEO-INDIAN (Early)</td></tr>
<tr><td>Early</td><td>ca. 11000 to 8500 BC</td><td rowspan="2">Small groups of nomadic hunter-gatherers who utilized seasonal and naturally available resources; sites are rare; hunted in small family groups who periodically gathered into larger groups/bands during favourable periods in the hunting cycle; campsites used during travel episodes and found in well-drained soils in elevated situations; sites also found along glacial features (e.g., glacial lake shorelines/strandlines) due to current understanding of regional geological history; artifacts include fluted and lanceolate stone points, scrapers and dart heads.
- Gainey, Barnes, Crowfield Fluted Points (Early Paleo-Indian)
- Holcombe, Hi-Lo, Lanceolates (Late Paleo-Indian)
(Ellis and Deller, 1990, pp.37-64; Ellis, 2013, p.37; Wright, 1994, p.25).</td></tr>
<tr><td>Late</td><td>ca. 8500 to 7500 BC</td></tr>
<tr><td colspan="3">ARCHAIC (Middle)</td></tr>
<tr><td>Early</td><td>ca. 7800 to 6000 BC</td><td>Descendants of Paleo-Indian ancestors; lithic scatters are the most commonly encountered site type; trade networks appear; artifacts include reformed fluted and lanceolate stone points with notched bases to attach to wooden shaft; ground-stone tools shaped by grinding and polishing; stone axes, adzes and bow and arrow; Shield Archaic in Northern Ontario introduced copper tools.
- Side-notched, corner-notched, bifurcate projectile points (Early Archaic)</td></tr>
</table>

<table>
<tr><th>Periods</th><th>Date Range</th><th>Overview and Attributes</th></tr>
<tr><td>Middle</td><td>ca. 6000 to 2000 BC</td><td rowspan="2">- Stemmed, Otter Creek/Other Side-notched, Brewerton side and corner-notched projectile points (Middle Archaic)
- Narrow Point, Broad Point, Small Point projectile points (Late Archaic)
(Dawson, 1983, pp.8-14; Ellis et al., 1990, pp.65-124; Ellis, 2013, pp.41-46; Wright, 1994, pp.26-28).

Oral Traditions
Oral traditions of the Algonquian-speaking Michi Saagiig (Mississauga Anishinaabeg) assert that they, “are the descendants of the ancient peoples who lived in Ontario during the Archaic and Paleo-Indian periods” (Gitiga Migizi and Kapyrka, 2015, p.1).</td></tr>
<tr><td>Late</td><td>ca. 2500 to 500 BC</td></tr>
<tr><td colspan="3">WOODLAND (Late)</td></tr>
<tr><td>Early</td><td>ca. 800 to AD 1</td><td>Evolved out of the Late Archaic Period; introduction of pottery (ceramic) where the earliest were coil-formed, under fired and likely utility usage; two primary cultural complexes: Meadowood (broad extent of occupation in southern Ontario) and Middlesex (restricted to Eastern Ontario); poorly understood settlement-subsistence patterns; artifacts include cache blades, and side-notched points that were often recycled into other tool forms; primarily Onondaga chert; intensive exploitation of quarries in southeastern Ontario; commonly associated with Saugeen and Point Peninsula complexes.
- Meadowood side-notched projectile points
(Dawson, 1983, pp.15-19; Ferris and Spence, 1995, pp.89-97; Gagné, 2015; Spence et al., 1990, pp.125-142; Williamson, 2013, pp.48-61; Wright, 1994, pp.29-30).</td></tr>
<tr><td>Middle</td><td>ca. 200 BC to AD 700</td><td>Three primary cultural complexes in Southern Ontario: Point Peninsula (generally located throughout south-central and eastern Southern Ontario), Saugeen (generally located southwestern Southern Ontario), and Couture (generally located in southwestern-most part of Ontario); “given the dynamics of hunter-gatherer societies, with high levels of interaction and intermarriage among neighbouring groups, one would not expect the existence of discrete cultures” and the “homogeneity of these complexes have been challenged” (Ferris and Spence, 1995, p.98); introduction of large “house” structures and substantial middens; settlements have dense debris cover indicating increased degree of sedentism; incipient horticulture; burial mounds present; shared preference for stamped, scallop-edged or tooth-like decoration, but each cultural complex had distinct pottery forms; Laurel Culture (ca. 500 BC to AD 1000) established in boreal forests of Northern Ontario.
- Saugeen Point projectile points (Saugeen)
- Vanport Point projectile points (Couture)
- Snyder Point projectile points
- Laurel stemmed and corner-notched projectile points
(Dawson, 1983, pp.15-19; Ferris and Spence, 1995, pp.97-102; Gagné, 2015; Hessel, 1993, pp.8-9; Spence et al., 1990, pp.142-170; Williamson, 2013, pp.48-61; Wright, 1994, pp.28-33; Wright, 1999, pp.629-649).</td></tr>
<tr><td colspan="3">Late Woodland</td></tr>
</table>

Periods	Date Range	Overview and Attributes
Late (Transitional)	ca. AD 600 to 1000	Earliest Iroquoian development in Southern Ontario is Princess Point which exhibits few continuities from earlier developments with no apparent predecessors; hypothesized to have migrated into Ontario, but more recent research of ceramic data from the Rice Lake-Trent River region determined early Iroquoian development to be an *in situ* cultural development (Curtis, 2014, p.190); the settlement data is limited, but oval houses are present; introduction of maize/corn horticulture; artifacts include 'Princess Point Ware' vessels that are cord roughened, with horizontal lines and exterior punctation; smoking pipes and ground stone tools are rare; continuity of Princess Point and Late Woodland Iroquoian groups. - Triangular projectile points (Ferris and Spence, 1995, pp.102-106; Fox, 1990, pp.171-188; Gitiga Migizi and Kapyrka, 2015, pp.1-3). *Oral Traditions* According to their oral traditions, the north shore of Lake Ontario in Southern Ontario was occupied throughout the entire Late Woodland Period by the *Michi Saagiig* (Mississauga Anishinaabeg); their traditional territory extended north where they would hunt and trap during the winter months, followed by a return to Lake Ontario in the spring and summer; "the traditional territories of the Michi Saagiig span from Gananoque in the east, all along the north shore of Lake Ontario, west to the north shore of Lake Erie at Long Point. The territory spreads as far north as the tributaries that flow into these lakes, from Bancroft and north of the Haliburton highlands" (Gitiga Migizi and Kapyrka, 2015, p.1); oral traditions speak of people (the Iroquois) coming into their territory between AD 500-1000 who wished to establish villages and grow corn; treaties were made allowing the Iroquois to stay in their traditional territories (Gitiga Migizi and Kapyrka, 2015, pp.1-3). This oral tradition is contrary to other First Nation communities based on both archaeological evidence and their oral traditions (***see Appendix C***).
Early	ca. AD 900 to 1300	Two Iroquoian cultures in Southern Ontario: Glen Meyer (located primarily in southwestern Ontario from Long Point on Lake Erie to southwestern shore of Lake Huron) and Pickering (encompassed north of Lake Ontario to Georgian Bay and Lake Nipissing); the abandonment of these two phases "were expressed early on, with the recognition that local site sequences were more or less continuous through what has been classified as distinct phases" (Birch, 2015, p.271); early houses were small and elliptical; developed into multi-family longhouses and some small, semi-permanent palisade villages; adoption of greater variety of harvest goods; increase in corn-yielding sites; well-made and thin-walled clay vessels with stamping, incising and punctation; crudely made smoking pipes, and worked bone/antler present; evolution of ossuary burials; grave goods are rare and not usually associated with a specific individual. - Triangular-shaped, basally concave projectile points with downward projecting corners or spurs (Ferris and Spence, 1995, pp.106-109; Williamson, 1990, pp.291-320).
Middle	ca. AD 1300 to 1400	Two Iroquoian cultures in Southern Ontario: Uren and Middleport; increase in village sizes (0.5 to 1.7 hectares) and campsites (0.1 to 0.6 hectares) appear; some with palisades; classic longhouse takes form; increasing reliance on maize and other cultigens such as beans and squash; intensive exploitation of locally available land and water resources; decorated clay vessels decrease; well-

Periods	Date Range	Overview and Attributes
		developed clay pipe complex that includes effigy pipes; from Middleport emerged the Huron-Wendat, Petun, Neutral Natives and the Erie. - Triangular and (side of corner or corner removed) notched projectile points - Middleport Triangular and Middleport Notched projectile points (Dodd et al., 1990, pp.321-360; Ferris and Spence, 1995, pp.109-115).
Late	ca. AD 1400 to 1600	Two major Iroquoian groups: the Neutral Natives to the west of the Niagara Escarpment and the Huron-Wendat to the east; the Petun were located in the Blue Mountain region; traditionally, the Huron-Wendat territory stretched "from the Gaspé Peninsula in the Gulf of Saint Lawrence and up along the Saint Lawrence Valley on both sides of the Saint Lawrence River all the way up to the Great Lakes. Huronia, included in Wendake South, represents a part of the ancestral territory of the Huron-Wendat Nation in Ontario. It extends from Lake Nipissing in the North to Lake Ontario in the south and Île Perrot in the East and Owend [sic] Sound in the West" and they "formed alliances and traded goods with other First Nations among the networks that stretched across the continent" (per.comm. R.Gaudreau-Couture, 21 June 2022); within this large area, Huron-Wendat "concentrations of sites occur in the areas of the Humber River valley, the Rouge and Duffin Creek valleys, the lower Trent valley, Lake Scugog, the upper Trent River and Simcoe County" (Ramsden, 1990, p.363); longhouses; villages enlarged to 100 longhouses clustered together as horticulture (maize, squash and beans) gained importance in subsistence patterns; villages chosen for proximity to water, arable soils, available fire wood and defendable position; diet supplemented with fish; ossuaries; tribe/band formation; gradual relocation to north of Lake Simcoe. Neutral (called *Attiewandaron* by the Huron-Wendat) Natives distributed west of the Niagara Escarpment, around the western end of Lake Ontario and eastward across the Niagara Peninsula to Lake Erie; sites also found in the Grand River area and as far as Milton in the east; varying settlements include villages up to five acres in size to isolated fishing cabins; villages tend to be located along smaller creeks, headwaters and marshlands; diet dependent on hunting, gathering, fishing and farming; longhouses present; ossuaries; tribe/band formation; theorized that Credit River (southwest of the study area) may have functioned as a boundary marker between the ancestral Neutral Natives and Huron-Wendat peoples. (Ferris and Spence, 1995, pp.115-122; Heidenreich, 1978, pp.368-388; Lennox and Fitzgerald, 1990, pp.405-456; Ramsden, 1990, pp.361-384; Warrick, 2000, p.446; Warrick, 2008, p.15). *Oral Traditions* During this time, the Algonquian-speaking groups of the Anishinaabeg (e.g., Ojibway/Chippewa, Odawa, Mississaugas, Algonquin, and others) maintained stable relations with Iroquoian-speaking groups (e.g., Huron-Wendat, Neutral, Petun) who continued to establish settlements in Southern Ontario, according to *Michi Saagig* oral tradition (Gitiga Migizi and Kapyrka, 2015, p.1).

1.3.2 Contact Period

The contact period of Southern Ontario is defined by European arrival, interaction and influence with the established Indigenous communities of Southern Ontario. **Table 2** includes an overview of some of the main developments that occurred during the contact period of Southern Ontario.

Table 2: Contact Period

Periods	Date Range	Overview and Attributes
European Contact	ca. AD 1600s	The Anishinaabeg (e.g., Mississauga, Ojibway, Chippewa, Odawa, Algonquin, and others) continued to inhabit Ontario, alongside Iroquoian-speaking groups such as the Huron-Wendat north of Lake Simcoe and the Neutral (*Attiewandaron*) in the Niagara Peninsula; inter-marriage between Algonquian- and Iroquoian-speaking groups; French arrival into Ontario; numerous Huron-Wendat villages north of Lake Simcoe in and around the City of Barrie ("Huronia"); extensive trade relationship with Huron-Wendat and French established; Neutral Natives clustered in the Niagara Peninsula; Neutral Natives referred to as *la Nation neutre* by Samuel de Champlain but limited European contact with Neutrals; trade goods begin to replace traditional tools/items; Jesuit and Récollets missionaries; epidemics (Fox and Garrad, 2004, p.124; Gitiga Migizi and Kapyrka, 2015, pp.1-3; Heidenreich, 1978, pp.368-388; Jury, 1974, pp.3-4; Lennox and Fitzgerald, 1990, pp.405-456; Trigger, 1994, pp.47-55; Warrick, 2008, pp.12, 245; White, 1978, pp.407-411). *Oral Traditions* Mississauga Anishinaabeg oral traditions tell of Algonquian-speaking groups wintering with Iroquoian neighbours, resulting in a complex archaeological record; oral traditions also speak of Anishinaabeg "paddling away" to their northern hunting territories to escape disease and warfare in southern Ontario at this time (Gitiga Migizi and Kapyrka, 2015, pp.1-3).
Five Nations of Iroquois (Haudenosaunee)	ca. AD 1650s	The Five (later Six) Nations (Mohawk, Seneca, Oneida, Onondaga and Cayuga; later included the Tuscarora) of Iroquois (or Haudenosaunee), originally located south of the Great Lakes, engaged in warfare with Huron-Wendat neighbours as their territory no longer yielded enough furs; the Five Nations, armed with Dutch firearms, attacked and destroyed numerous Huron-Wendat villages in 1649-50; the groups that remained became widely dispersed throughout the Great Lakes region but remained an independent Nation; the Huron-Wendat ultimately resettled near Quebec City (forming the oldest First Nations community in Canada), in southwestern Ontario and in America; the Five Nations attacked Neutrals ca.1650s and caused their dispersal; the Five Nations established settlements along the northern shoreline of Lake Ontario at strategic locations along canoe-and-portage routes and used territory for extensive fur trade; European fur trade and exploration continues (Abler and Tooker, 1978, p.506; Gitiga Migizi and Kapyrka, 2015, p.2; Robinson, 1965, pp.15-16; Schmalz, 1991, pp.12-34; Trigger, 1994, pp.53-59; Warrick, 2008, p.208; Williamson, 2013, p.60).
Anishinaabeg Return (and Arrival)	ca. AD 1650s to 1700s	Some narratives tell of Anishinaabeg groups either returning (Gitiga Migizi and Kapyrka, 2015, p.2) or moving by military conquest (MCFN, 2017) to southern Ontario in the 1690s; battles fought throughout, ultimately resulting in most of the Five Nations being driven out of Southern Ontario and returning to their lands south of the Great Lakes (and some remained in parts of Southern Ontario); the English referred to those Algonquian-speaking groups that settled in the area bounded by Lakes Ontario, Erie, and Huron as Chippewas or Ojibwas (Smith, 2002, p.107); '*Mississauga*' term applied to Anishinaabeg bands living on the north shore of Lake Ontario; they were focused on hunting/fishing/gathering with little emphasis on agriculture; temporary and moveable houses (wigwam) left little archaeological material behind; multiple settlements throughout Southern Ontario; the study area is within the traditional territory of the Mississaugas of the Credit First Nation (MCFN) who state they, "were the original owners of the

Periods	Date Range	Overview and Attributes
		territory embraced in the following description, namely commencing at Long Point on Lake Erie thence eastward along the shore of the Lake to the Niagara River. Then down the River to Lake Ontario, then northward along the shore of the Lake to the River Rouge east of Toronto then up that river to the dividing ridge to the head waters of the River Thames then southward to Long Point the place of the beginning" (MCFN, 2017); the Etobicoke Creek and the flats adjacent to the creek are located northeast of the study area; the word 'Etobicoke' is a derivation of a Mississauga word for "place where the alders grow" and the flats of the Etobicoke Creek would have been used to plant crops, gather food and acted as a resting place for traveling parties; the Credit River became a favoured location of trade between Mississauga and European traders; Mississauga settlement near Port Credit (Gibson, 2006, pp.35-41; Hathaway, 1930, p.433; Johnston, 2004, pp.9-10; Loverseed, 1987, pp.11, 17; McMillan and Yellowhorn, 2004, pp.110-111; Skeoch, 2000, pp.20-21; Smith, 2013, pp.16-20; TRCA, 1998, p.18; Trigger, 1994, pp.57-59; Williamson, 2013, p.60).
Trade, Peace and Conflict	ca. AD 1700 to 1770s	Great Peace negotiations of 1701 in Montreal established peace around the Great Lakes; collectively referred to the Anishinaabeg and Five Nations of Iroquois as the First Nations; European commerce and exploration resumed; the Anishinaabeg continued to trade with both the English and the French; beginnings of the Métis and their communities; skirmishes between France and Britain as well as their respective First Nations allies erupt in 1754 ("French and Indian Wars") and forms part of the larger Seven Years' War; French defeat transferred the territory of New France to British control; Treaty of Paris (1763); Royal Proclamation of 1763 "states explicitly that Indigenous people reserved all land not ceded by or purchased from them" (Hall, 2019a); the Proclamation established framework for how treaties were negotiated (by only the King or an assigned representative of the King, and only at a public meeting called for this specific purpose) and established the "constitutional basis for the future negotiations of Indigenous treaties in British North America" (Hall, 2019a); the Proclamation established the British administration of North American territories ceded by France to Britain; uprising by several First Nations groups against British ("Pontiac's War"); fur trade continued until Euro-Canadian settlement (Abler and Tooker, 1978, pp.505-517; Hall, 2019a; Jaenen, 2013; Johnston, 2004, pp.13-14; Schmalz, 1991, pp.35-62, 81; Surtees, 1994, pp.92-97; Tooker, 1978, pp.418-441).
Early British Administration and Euro-Canadian Settlement	ca. AD 1770s to 1790s	American Revolutionary War (1775-1783) drove large numbers of United Empire Loyalists (those who were loyal to the British Crown), military petitioners, and groups who faced persecution in the United States to re-settle in Upper Canada; Treaty of Paris (1783) formally recognized the independence of the United States; Province of Quebec divided in 1791 into sparsely populated Upper Canada (now southern Ontario) and culturally French Lower Canada (now southern Quebec); Jay's Treaty of 1795 establishes American/Canadian border along the Great Lakes; large parts of Upper Canada opened to settlement from the British Isles and continental Europe after land cession treaties were negotiated by the British Crown with various First Nations groups (Government of Ontario, 2021; Hall, 2019b; Jaenen, 2014; Surtees, 1994, p.110; Sutherland, 2014).

1.3.3 Euro-Canadian Settlement Period (AD 1800s to present)

1.3.3.1 First Nation Land Treaties and Township of Toronto

In 1805, a tract of land approximately 42 kilometres long, between Etobicoke Creek and Burlington Bay, stretching back from the Lake Ontario shoreline for about eight to nine kilometres (roughly corresponding to present-day Eglinton Avenue) was agreed to be ceded by the certain Mississauga groups in what is known as the "First Purchase" or Treaty 13A. One mile (or 1.6 kilometres) on either side of the Credit River and the 'flat lands' bordering the Etobicoke Creek were to remain property of the Mississauga, and they were to obtain £1000 worth of goods and the right to retain their fishery sites at the mouths of the Credit River, Sixteen Mile Creek, and Twelve Mile Creek as part of the treaty (Department of Indian Affairs, 1891, pp.35-40; Fix, 1967, p.13; Heritage Mississauga, 2018a; MCFN, 2020; Weaver, 1913, p.65).

In September 1806, representatives of the Crown and certain Mississauga groups signed Treaty 14, or the "Head of the Lake Purchase," confirming the cession of lands along the north shore of Lake Ontario that had been agreed upon the previous year (Government of Ontario, 2021). These lands were surveyed and formed into townships – the preferred unit of land division by British administrators (Loverseed, 1987, p.23). The survey of the portion of Toronto Township lying south of what is now Eglinton Avenue ("Old Survey" lands), where the study area lies, was completed in 1806 by Samuel Wilmot, Deputy Surveyor (Pope, 1877, p.86). Dundas Street, a military road established by orders of Lieutenant-Governor John Graves Simcoe and constructed by the Queen's Rangers following a trail used by First Nations, was the only road at this time. It consequently became the main east-west roadway through the newly established Province of Upper Canada. The road penetrated the dense forest in Toronto Township, and until settlers arrived, it remained a wagon-width trail (Clarkson, 1977, p.8; Riendeau, 2002, p.123). Initial settlement in the Township of Toronto was along Dundas Street, and these first settlers were experienced farmers, many of which were United Empire Loyalists and Late Loyalists (Riendeau, 2002, pp.123-124). Additionally, Lakeshore Road was opened in 1804 and roughly followed the path of an older First Nation trail. It was improved as a corduroyed road in the 1820s and became Canada's first road to be designated a cemented highway in 1914 (Hicks, 2005, pp.XVII-XVIII).

Even though the lands within Toronto Township had become available for settlement, Napoleonic Wars in Europe slowed immigration from the British Isles; only 175 individuals are listed in the 1809 Census Record (Riendeau, 2002, p.125). After the War of 1812, there was mounting pressure for new land to accommodate the "increasing amount of new settlers from the British Isles, to meet the demands of the demobilized military personnel for their promised land grants, and to provide the necessary land for children of the United Empire Loyalists who had settled in eastern Ontario and on the Niagara Frontier a generation earlier" (McKinney, 1967, p.244). To accommodate this influx of settlers, the remainder of the Mississauga Tract, within what is now Peel Region, was negotiated by William Claus in 1818. The area belonged to the Credit River Mississauga who found themselves victim to encroachment on their lands and fisheries by Euro-Canadian settlers (Surtees, 1994, p.116). Under the leadership of Chief Ajetance, the Mississauga settled for goods in the value of £522.10 annually per person in exchange for 648,000 acres of land, including some land along the Credit River. This Second Purchase, known as the Ajetance Purchase or Treaty 19, ceded the lands north of Eglinton Avenue and form the 'New Survey' of the Township of Toronto (Department of Indian Affairs, 1891, p.lv; Surtees, 1994, p.117; Riendeau, 2002, pp.123,127).

In 1826, the Mississauga village at the mouth of the Credit River was relocated to the Credit Mission, located on the site of what is now the Mississauga Golf and Country Club on Mississauga Road (Heritage Mississauga, 2018b; Riendeau, 2002, p.125). By 1837, the Mississauga population was decimated by contagious diseases, such as smallpox, tuberculosis and measles (Smith, 2002, p.110; Riendeau, 2002, p.125). Further constricted by the pressures of the Euro-Canadian settler, the Mississaugas of the Credit River were relocated again to the Grand River Reserve (Riendeau, 2002, p.125).

By 1842, the population of the Township of Toronto included 5,377 individuals, and 28,468 of 59,260 acres taken up were under cultivation. There were four grist mills and 21 sawmills in the township. European settlement in the Township of Toronto continued along the Credit River, as well as the Etobicoke River; numerous mills were constructed along their entirety (Smith, 1846, pp. 192-193; Martin, 1967, p.273).

1.3.3.2 Community of Lakeview

The study area is located in the vicinity of an area called Lakeview. Though not officially named so until 1922, Lakeview was among the earliest settled parts of Toronto Township. The first recorded European settler is Thomas Ingersoll, who moved to the area in 1805, followed in the next years by Philip Cody (1806) and Daniel Harris (1807) (Hicks, 2005, p.XII). The area remained rural for most of the 19th century, with settlers engaging in mixed agriculture (TRCA, 2013a, pp.12-13). Beginning in the 1890s, much of the land south of Lakeshore Road came under the possession of the Ontario Militia Department, who among other things established a rifle range. The federal government also built Canada's first aerodrome and flying school in the Lakeview area in 1915. During the Second World War, the Department of National Defence took over the rifle range property for military training, while also establishing the Canada Arms School, Small Arms Militia Training Centre, and factories for ammunition and small arms. Lakeview thus became a military-oriented community. After the war, the federal government sold off the parcels for public (power generation, parks, water and sewerage works) and private (commercial and industrial) use (Hicks, 2005, pp.46-49; Heritage Mississauga, 2018c).

1.3.3.3 G.E. Booth (Lakeview) WWTP

The study area is located within the G.E. Booth WWTP facility which sits on parts of Lots 5 to 7, Concession 3 SDS. A review of the facility's land use history is detailed in the TRCA Stage 1 AA report that was conducted in support of Lakeview Waterfront Connection Project (TRCA, 2013a, pp.12-13). The report found that Lot 6 was granted to Thomas Lucas who, by 1809, had cleared five acres and built a house on the property. Lot 6 was then later sold to Samuel Smith in 1818.

Information about the occupants of Lot 6 indicate that the study area within the current WWTP facility was actively being used for mixed farming until the 1890s, when the Long Branch Rifle

Range was established (TRCA, 2013a, pp.12-13). The property, consisting of Lots 4 to 9 and part of Lot 10, was purchased by the federal government in 1935 and used by the Department of National Defence for military purposes until 1955, when Toronto Township purchased 35 acres on Lot 6 to build the Lakeview Sewage Disposal Plant (the forerunner of G.E. Booth WWTP) which was opened in 1957. Major expansions to the facility took place in the 1970s (which enlarged the facility footprint to include Lot 5) and the 2000s (Hicks, 2005, pp.46-49, 266-267).

1.3.4 Study area Land Use History (AD 1800s to present)

1.3.4.1 Pre-1900 Land Use

Several documents were reviewed to gain an understanding of the land use history and of the study area's potential for the recovery of historic pre-1900 remains, namely G.R. Tremaine's 1859 *Map of the County of Peel* and J.H. Pope's 1877 *Illustrated Historical Atlas of the County of Peel* (***see Maps 2-3; Table 3***).

Table 3: Summary of Structures and Property Owners/Occupants documented in the 1859 *Tremaine's Map* and the 1877 *Illustrated Historical Atlas* in the Study Area

Con.	Lot	Part	Owner/Occupant		Structure(s) in the Study Area	
			1859	1877	1859	1877
3 SDS*	6	All	R. J. Polley	James Hamilton	-	-
				TOTALS	*0*	*0*

* South of Dundas Street

The study area primarily encompassed farmland of two property owners: R.J. Polley and James Hamilton. On the 1859 *Tremaine's Map*, no structures (i.e., homesteads) are depicted in the study area while one homestead is depicted falling within 300 metres. By 1877, no structures were depicted in the study area while four homesteads are depicted within 300 metres of the study area.

The study area is located within 100 metres of an early historic transportation route established during the survey of the Township of Toronto: a previously opened, now closed, road allowance between Lots 5 and 6. In Ontario, the *2011 S&G* considers areas of early Euro-Canadian settlements (e.g., pioneer homesteads, isolated cabins, farmstead complexes, early wharf or dock complexes, pioneer churches, and early cemeteries), early historic transportation routes (e.g., trails, passes, roads, railways, portage routes), and properties that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations, as features or characteristics that indicate archaeological potential (per *Section 1.3.1*). Therefore, based on the proximity of early Euro-Canadian settlements and an early historic transportation route, these features contribute to establishing the archaeological potential of the study area.

1.3.4.2 Post-1900 Land Use

To facilitate further evaluation of the established archaeological potential within the study area, a detailed review of 1909, 1922, 1933 and 1942 topographic maps (***see Map 4***), air/aerial photographs from 1954, 1968, 1970, 1975, 1981, 1985, 1991 and 1992 (***see Maps 5-6***), orthophotographs from 2002, 2007, 2008, 2009, 2010, 2012, 2016, 2017, 2018, 2019, 2020 and 2021 (***see Maps 7-9***), satellite imagery from 2005 (Google Earth, 2023) and aerial photographs from 1966, 1989, 1997, 2000, 2004, 2005 and 2006 (City of Mississauga, 2023a) was undertaken.

The earliest 20th century topographic maps identify the study area within land that had been cleared of overgrown vegetation and was likely brought into agricultural productivity. From 1909 to 1933, no structures are present within the study area, while several houses fronting on Lakeview Road were depicted. Additionally, Applewood Creek and the formerly opened road allowance between Lots 5 and 6 were depicted near the study area, and a bridge was constructed over the creek. This roadway was an unmetalled (or dirt) roadway. By 1942, several structures (of varying sizes) of the Long Branch Rifle Range are depicted within the study area.

A detailed review of air/aerial photographs from 1954, 1966, 1968, 1970, 1975, 1981, 1985, 1989, 1991, 1992, 1997, 2000, 2004, 2005 and 2006, and orthophotographs from 2002, 2007, 2008, 2009, 2010, 2012, 2016, 2017, 2018, 2019, 2020 and 2021 can be found in **Section 2.1.1.**

1.3.5 Present Land Use

The present land use of the study area in the City of Mississauga's Official Plan is categorized as Utility (City of Mississauga, 2023b).

1.4 Archaeological Context

To establish the archaeological context and further establish the archaeological potential of the study area, *Archeoworks Inc*. conducted a comprehensive review of the municipal archaeological management plan, designated and listed cultural heritage resources, heritage conservation districts, commemorative markers, and pioneer churches and early cemeteries in relation to the study area. Furthermore, an examination of registered archaeological sites and previous AAs within proximity to the study area limits, and a review of the physiography of the study area were performed. The results of this background research are documented below and summarized in **Appendix B – Summary of Background Research**.

1.4.1 Archaeological Management Plan

Per *Section 1.1, Standard 1* of the *2011 S&G*, when available, an archaeological management plan (AMP) or other archaeological potential mapping must be reviewed. Currently, the City of Mississauga and the Regional Municipality do not have a publicly available AMP.

1.4.2 Designated and Listed Cultural Heritage Resources

Per *Section 1.3.1* of the *2011 S&G*, properties listed on a municipal register or designated under the *Ontario Heritage Act*, or that is a federal, provincial, or municipal historic landmark or site are considered features or characteristics that indicate archaeological potential. The study area is located within a designated heritage resource and within 300 metres of several additional heritage resources (City of Mississauga, 2023c; ***see Tables 4-5***). Therefore, this feature contributes to establishing the archaeological potential of the study area.

Table 4: Cultural Heritage Resources within the Study Area

Municipal Address	Description	Heritage Status
1300 Lakeshore Road East	The Long Branch Indoor Rifle Range	Designated (170-2012)

Table 5: Cultural Heritage Resources within 300 metres of the Study Area

Municipal Address	Description	Heritage Status
1239 Lakeshore Road East	Lakeview Park School	Listed
1400 Lakeshore Road East	The Small Arms Limited Building & Water Tower	Designated (258-2009)
1440 Lakeshore Road East	The Small Arms Limited Building & Water Tower	Designated (258-2009)

1.4.3 Heritage Conservation Districts

Per *Section 1.3.1* of the *2011 S&G*, heritage resources listed on a municipal register or designated under the *Ontario Heritage Act*, are considered features or characteristics that indicate archaeological potential. The study area is not located in or within 300 metres of a Heritage Conservation District (City of Mississauga, 2014; City of Mississauga, 2018). Therefore, this feature does not contribute to establishing the archaeological potential of the study area.

1.4.4 Cultural Heritage Landscape

In 2005, the City of Mississauga had identified several cultural heritage landscapes and cultural features throughout Mississauga. In 2022, these cultural heritage landscapes and cultural features were re-evaluated to determine whether these landscapes are Significant Cultural Heritage Landscapes and to propose priority strategies for protection, including interpretation and commemoration strategies. The study area is not located in or within 300 metres of a cultural heritage landscape (City of Mississauga, 2022a; City of Mississauga, 2022b; City of Mississauga, 2022c). Therefore, this feature does not contribute to establishing the archaeological potential of the study area.

1.4.5 Commemorative Plaques or Monuments

Per *Section 1.3.1* of the *2011 S&G,* commemorative markers of Indigenous and Euro-Canadian settlements and history, which may include local, provincial, or federal monuments, cairns or plaques, or heritage parks, are considered features or characteristics that indicate archaeological potential. The study area is not located in or within 300 metres of a commemorative plaque or monument (Read the Plaque, 2023). Therefore, this feature does not contribute to establishing the archaeological potential of the study area.

1.4.6 Pioneer/Historic Cemeteries

Per *Section 1.3.1* of the *2011 S&G,* pioneer churches and early cemeteries are considered features or characteristics that indicate archaeological potential. The study area is not located in or within 300 metres of a pioneer church and/or early cemetery (OGS, 2023; City of Mississauga, 2023d). Therefore, this feature does not contribute to establishing the archaeological potential of the study area.

1.4.7 Registered Archaeological Sites

Per *Section 1.1, Standard 1* and *Section 7.5.8, Standard 1* of the *2011 S&G*, the *Ontario Archaeological Sites Database* (OASD) maintained by the *MCM* was consulted in order to provide a summary of registered or known archaeological sites within a minimum one-kilometre distance of the study area limits. According to the OASD, one (1) registered archaeological site is located within a one-kilometre radius of the study area (MCM, 2023; ***see Table 6***).

Table 6: Registered Archaeological Sites within One Kilometre of the Study Area

Borden #	Name	Cultural Affiliation	Type
AjGv-7	Robinson	-	-

"-" denotes details not provided in OASD.

Per *Section 1.3.1* of the *2011 S&G*, previously registered archaeological sites in close proximity to the study area are considered to be features or characteristics that indicate archaeological potential. Therefore, given that no registered archaeological sites are located within 300 metres of the study area, this feature does not contribute to establishing the archaeological potential of the study area.

1.4.8 Previous Archaeological Assessments

Per *Section 1.1, Standard 1* and *Section 7.5.8, Standards 4-5* of the *2011 S&G*, to further establish the archaeological context of the study area, a review of previous AAs carried out within the limits of, or immediately adjacent (i.e., within 50 metres) to the study area (as documented by all available reports) was undertaken. Five (5) reports were identified (***see Table 7***).

Table 7: Previous Archaeological Assessments

Company, Year	Stage of Work	Relation to Study Area	Details & Recommendations
Previous Assessments tied to the Current Proposed Development			
Archeoworks Inc., 2021	1 AA	Encompasses part of the study area	Encompassing the Clarkson WWTP at 2307 Lakeshore Road West and the G.E. Booth WWTP at 1300 Lakeview Road East. A property inspection was conducted, and large portions of the G.E. Booth's WWTP was previously assessed. It was recommended that those parts of the G.E. Booth's subject area that were previously assessed and no longer retain archaeological potential are exempt from further AA; further AA was recommended in the wooded area at the extreme northwest corner of the subject area.
Previous Assessments tied to Other Developments			
TRCA, 2013a	1 AA	Encompasses the study area	Land-based AA in support of LWC Project, covering lands south of Lakeshore Road, west of Etobicoke Creek and east of Serson Creek; includes G.E. Booth WWTP. Background research determined much of WWTP facility to be extensively disturbed. No further AA recommended for disturbed areas. Some areas within WWTP facility found to retain archaeological potential and recommended to be subjected to Stage 2 test pit survey.

Company, Year	Stage of Work	Relation to Study Area	Details & Recommendations
TRCA, 2013b	2 AA	Within 50 metres of the study area	Assessment of four areas within larger Lakeview Waterfront Connection Project, one of which ("Area A") is situated in the northwest woodlot of the WWTP facility. Combination of visual inspection and test pit survey found no archaeological resources. No further AA recommended.
TRCA, 2016	1-2 AA	Encompasses part of the study area	Assessment of proposed construction access road spanning G.E. Booth WWTP and Ontario Power Generation lands, as part of the larger Lakeview Waterfront Connection Project. Combination of visual inspection and test pit survey found no archaeological resources. No further AA recommended.
Bluestone Research, 2019	1 AA	Within 50 metres of the study area	Located within 1300 Lakeshore Road East associated with the site plan control application of a rectangular-shaped parcel measuring 70 metres by 40 metres. Archaeological potential was determined to not be present due to extensive and deep land alterations that severely damaged the integrity of any archaeological resource. No further AA recommended.

1.4.9 Physical Features

An investigation of the study area's physical features was conducted to aid in the development of an argument for archaeological potential. Environmental factors such as close proximity to water, soil type, and nature of the terrain, for example, can be used as predictors to determine where human occupation may have occurred in the past.

1.4.9.1 Physiographic Region

The study area is located within the Iroquois Plains physiographic region of Southern Ontario. This region extends around the western part of Lake Ontario, from the Niagara River to the Trent River, its width varying from a few hundred yards to about eight miles. The lowland bordering Lake Ontario, when the last glacier was receding but still occupied the St. Lawrence Valley, was inundated by a body of water known as Lake Iroquois. The undulating till plains above the old shorelines of Lake Iroquois make up the Iroquois Plain. The plain, cut in previously deposited clay and till, is partly floored with sand deposits; from Scarborough to Trenton the plain widens until the old beach is six and one-half miles inland from the present shore of Lake Ontario. The old shoreline is well marked by bluffs or gravel bars while immediately below is a strip of boulder pavement and sandy off-shore deposits which vary in width. Poorly drained, this coarse sandy soil is not very productive. Prior to 1930, until 1940, the Iroquois Plain was a general farming area, with a tendency for horticulture and growth of canning crops. Since the Second World War, the remaining farms have become larger while much of the land has been put to urban uses (Chapman and Putnam, 1984, pp.190-196).

1.4.9.2 Soil Type and Topography

Prior to the developmental activities in the 20th and 21st centuries, the native soil type found within the study area was Chinguacousy clay loam. A description of its characteristics may be found in **Table 8** (Ontario Agricultural College, 1953).

Table 8: Study Area Soil Types

Soil Series and Type	Great Soil Group	Soil Materials	Drainage	Topography; Surface Stoniness
Chinguacousy clay loam	Grey-Brown Podzolic	Heavy textured till/shale and limestone	Imperfect	Smooth, gently sloping; few stones

The topography within the study area is higher than the land surrounding the study area, measuring between 86 and 89 metres above sea level, while the land surrounding it measures between 82 and 85 metres above sea level.

1.4.9.3 Water Sources

Hydrological features such as primary water sources (e.g., lakes, rivers, creeks, streams) and secondary water sources (e.g., intermittent streams and creeks, springs, marshes, swamps) would have helped supply plant and food resources to the surrounding area and are indicators of archaeological potential (per *Section 1.3.1* of the *2011 S&G*). The study area is located within 300 metres of Applewood Creek and Serson Creek. Therefore, this feature contributes to establishing the archaeological potential of the study area.

1.4.10 Current Land Conditions

The study area is situated within the G.E. Booth WWTP at 1300 Lakeshore Road East, in the City of Mississauga. The study area encompasses a large L-shaped berm, a paved parking area, paved access routes, a paved construction laydown area, and an area of overgrown vegetation.

1.4.11 Date of Desktop and Field Reviews

A desktop review of field conditions using past historical air/aerial photographs, past and current orthophotographs and satellite imagery was undertaken on May 12th, 2023.

Given that the City of Mississauga does not have a publicly available AMP, and that there is no AMP available for the Regional Municipality of Peel, a property inspection was not undertaken (per *Section 1.4.2* of the *2011 S&G*).

1.5 Confirmation of Archaeological Potential

Based on the information gathered from the background research documented in the preceding sections, elevated archaeological potential has been established within the study area limits. Features contributing to archaeological potential are summarized in **Appendix B**. However, it must be noted that post-1900 developments can negate the possibility of encountering intact archaeological deposits due to deep and extensive soil disturbances. Further assessment of conditions within the study area will be addressed in **Section 2.0**.

2.0 ANALYSIS AND CONCLUSIONS

In combination with data gathered from the background research (***see Sections 1.3 and 1.4***), a desktop review of air/aerial photographs, orthophotographs and satellite imagery, an evaluation of the established archaeological potential of the study area was performed. The results of this evaluation are presented in **Map 10**. An inventory of the documentary record generated can be found within **Appendix D**.

2.1 Analysis

2.1.1 Air/Aerial Photographs, Orthophotographs and Satellite Imagery Review

To facilitate a further evaluation of the archaeological potential within the study area, a detailed review of air/aerial photographs from 1954, 1968, 1970, 1975, 1981, 1985, 1991 and 1992 (***see Maps 5-6***) orthophotographs from 2002, 2007, 2008, 2009, 2010, 2012, 2016, 2017, 2018, 2019, 2020 and 2021 (***see Maps 7-9***) satellite imagery from 2005 (Google Earth, 2023) and aerial photographs from 1966, 1989, 1997, 2000, 2004, 2005 and 2006 (City of Mississauga, 2023a) was undertaken.

The 1954 air photograph depicts the study area encompassing several structures of the Long Branch Rifle Range, and the pathways and roadways connecting those buildings. By 1966, the former Long Branch Rifle Range structures had been demolished and much of the study area had been subjected to construction grading associated with the demolition of those buildings and construction of the nearby industrial complex at 1260 Lakeshore Road East. Within two years, patchy vegetation had returned to the study area and an access route leading to the G.E. Booth WWTP was installed along the eastern limits of the study area. Additionally, what appears to be a retaining wall was installed within the northern limits of the study area.

By 1970, a fence was installed along the access route, and extended westward from the access route beyond the study area limits. In 1975, the rear parking area of 1260 Lakeshore Road East was paved in asphalt, while the remaining balance of the study area was unchanged to 2004. It is noted that although the 1992 air photograph appears to show construction grading, it is likely snow-covered at the time the image was taken. For about thirty years, the study area encompassed patchy vegetation with two small areas of saturated soil conditions, and part of a paved parking lot. Minor dirt access routes extending from 1260 Lakeshore Road East into the study area were depicted in the northern limits of the study area in 2002.

Beginning in 2004, the entire fenced area within the study area (or the central part) was subjected to extensive construction grading. Those lands beyond the western fenced limits within the study area consisted of manicured yard. By 2005, the entire study area was subjected to extensive construction grading associated with improvements occurring with the G.E. Booth WWTP property. This disturbance consisted of the installation of a large L-shaped berm along the northern and western limits of the fenced portion of the study area, while the southern and eastern limits of the fenced portion of the study area consisted of a gravelled parking area and access route. Beyond the fenced limits, an access route was installed between the paved rear parking lot of the industrial complex of 1260 Lakeshore Road East, and the northern fenced limits. The area beyond the western fenced limits and within the study area was also subjected to construction grading and large debris piles were placed in this portion of the study area. By the following year, vegetation had returned to part of the western portion of the study area west of the fenced area.

By 2007, asphalt was installed south of the berm and along the access routes, and by 2012, a portion of this asphalt area was used as a construction debris laydown area. Beginning in 2016, the central part of the study area south of the berm and along the berm was re-graded and by 2018, a small outbuilding and access route leading to the southern limits of the G.E. Booth WWTP was installed through the study area. After this time, the study area remained unchanged.

It is clear from this review that the study area has witnessed significant land disturbances beginning in the mid-1950 to 1960s, and again in the mid-2000s and extending to the present.

2.1.2 Previous Archaeological Assessments

Lands encompassed within the study area which have already been subjected to an archaeological assessment (Stage 1 and/or Stage 2) and deemed free of further archaeological concern (***see Section 1.4.8, Table 7***), with the report accepted into the *MCM*'s *Ontario Public Register of Archaeological Reports*, are recommended to be exempt from further assessment (TRCA, 2016; Archeoworks Inc., 2021). No additional archaeological assessment is required in that portion of the study area.

2.1.3 Identified Deep and Extensive Disturbances

An evaluation of deep and extensive land alterations – commonly referred to as disturbances – that have severely impacted the integrity of any archaeological resources that may be present within the study area was conducted. Per *Section 1.3.2* of the *2011 S&G*, these include, but are not limited to: quarrying, major landscaping involving grading below topsoil, building footprints, or sewage and infrastructure development.

It is evident from a detailed review of past and current air/aerial photographs, orthophotographs and satellite imagery that the study area has been subjected to previous and recent land alterations associated with the demolition of the Long Branch Rifle Range buildings and the construction activities within the G.E. Booth WWTP property such as the installation of man-made berms, paved access routes, construction debris laydown areas and asphalt parking areas. Such activities would have resulted in severe damage to the integrity of any archaeological resources which may have been present within their footprints.

No areas retaining archaeological potential were identified within the study area. As such, the study area is considered free of archaeological concern and do not require further archaeological assessment.

2.2 Conclusions

In 2020/21, *Archeoworks Inc*. was previously retained by *GM BluePlan Engineering Limited* on behalf of the *Region of Peel* to conduct a Stage 1 AA in support of the conceptual design for the proposed capacity expansions of the G.E. Booth G.E. Booth (Lakeview) Wastewater Treatment Plant (WWTP) (Archeoworks Inc., 2021). The Stage 1 AA report is currently awaiting review from the *MCM* and has yet to be entered into the *Ontario Public Register of Archaeological Reports*.

Upon the development of the design concept, the location of a New Administration Facility Building was established partially beyond what was previously subjected to archaeological assessment as part of the conceptual design for the proposed capacity expansions of the G.E. Booth WWTP. As such, *Archeoworks Inc.* was subsequently retained by *GM BluePlan Engineering Limited* to conduct a Stage 1 AA in support of the construction of the New Administration Facility within the G.E. Booth WWTP property (the “study area”) at 1300 Lakeshore Road East.

Background research established archaeological potential within the study area due to the proximity of documented pre-1900 Euro-Canadian settlement (historic structures and a roadway), two watercourses (the Applewood Creek and Serson Creek), and is located within a designated heritage property. This research also revealed several previous archaeological assessments (TRCA, 2016; Archeoworks Inc., 2021) encompassing a portion of the study area, which determined that portion of the study area has been cleared of further archaeological concern.

For those lands where archaeological potential had been established and that had not been subjected to assessment, a further review of air/aerial photographs, orthophotographs and satellite imagery from the mid-20th to the 21st century was undertaken to confirm if the established archaeological potential identification was relevant. The review of these images and photographs revealed extensive land alterations associated with the demolition of the former Long Branch Rifle Range buildings (ca. mid-1950 to 1960s) and again in the mid-2000s to present-day associated with other construction activities within the G.E. Booth WWTP property. Owing to the confirmation of the removal of archaeological potential, the study area is considered free of archaeological concern and does not require further archaeological assessment.

3.0 RECOMMENDATIONS

Considering the findings outlined within this report, the following recommendations are presented:

1. Lands within the study area that were subjected to a previous archaeological assessment and deemed free of further archaeological concern, with the report accepted into the *MCM's Ontario Public Register of Archaeological Reports*, are recommended to be exempt from further assessment.

2. With archaeological potential having been removed within portions of the study area due to previous deep and extensive land alterations, per *Section 1.3.2* of the *2011 S&G,* no further archaeological concerns exist. It may be considered free of further archaeological concern.

No construction activities shall take place within the study area prior to the *MCM* (Archaeology Programs Unit) confirming in writing that all archaeological licensing and technical review requirements have been satisfied.

4.0 ADVICE ON COMPLIANCE WITH LEGISLATION

1. This report is submitted to the *MCM* as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c. 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the *MCM*, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

2. It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

3. Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

4. The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and the Registrar at the *Ministry of Government and Consumer Services*.

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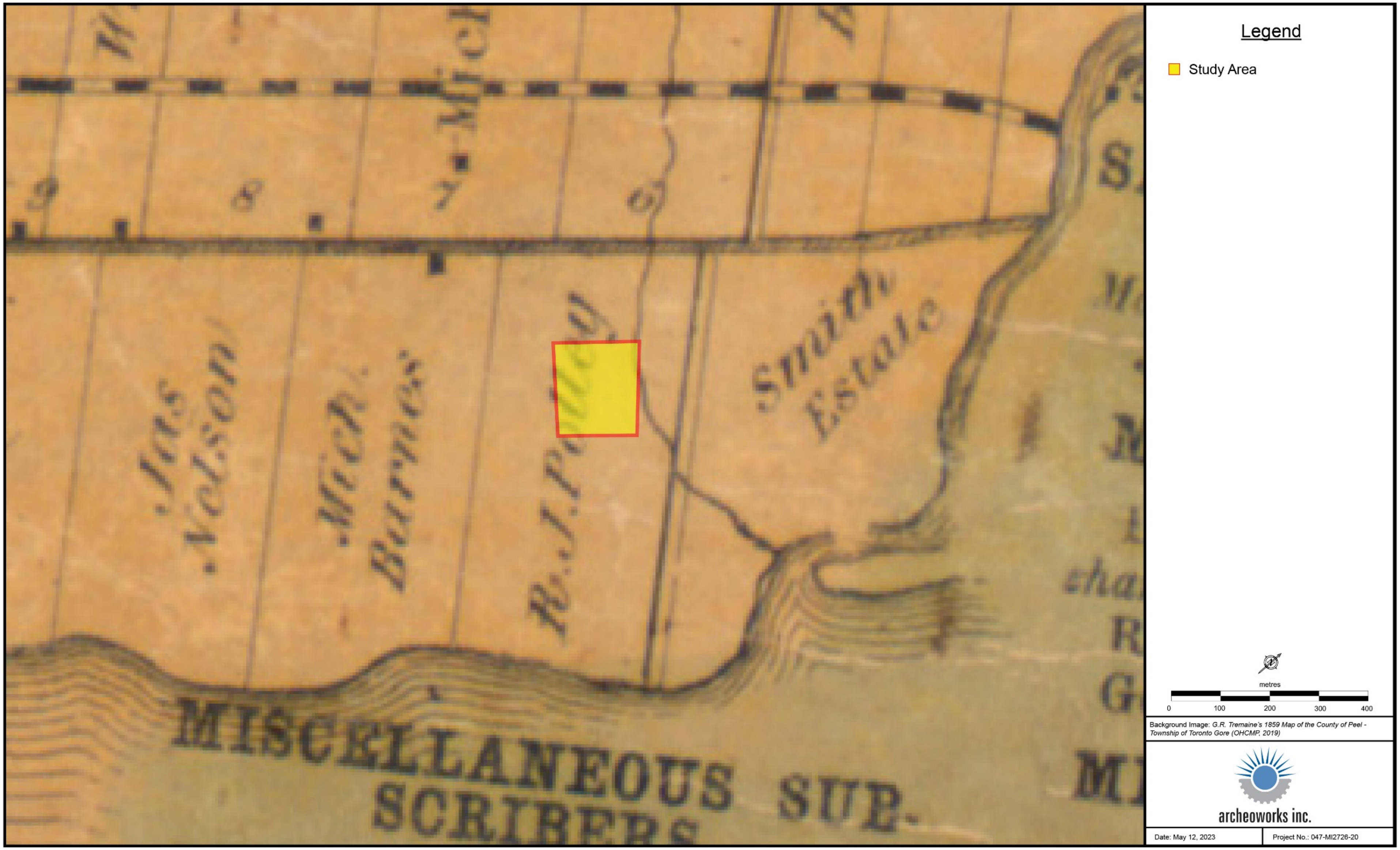
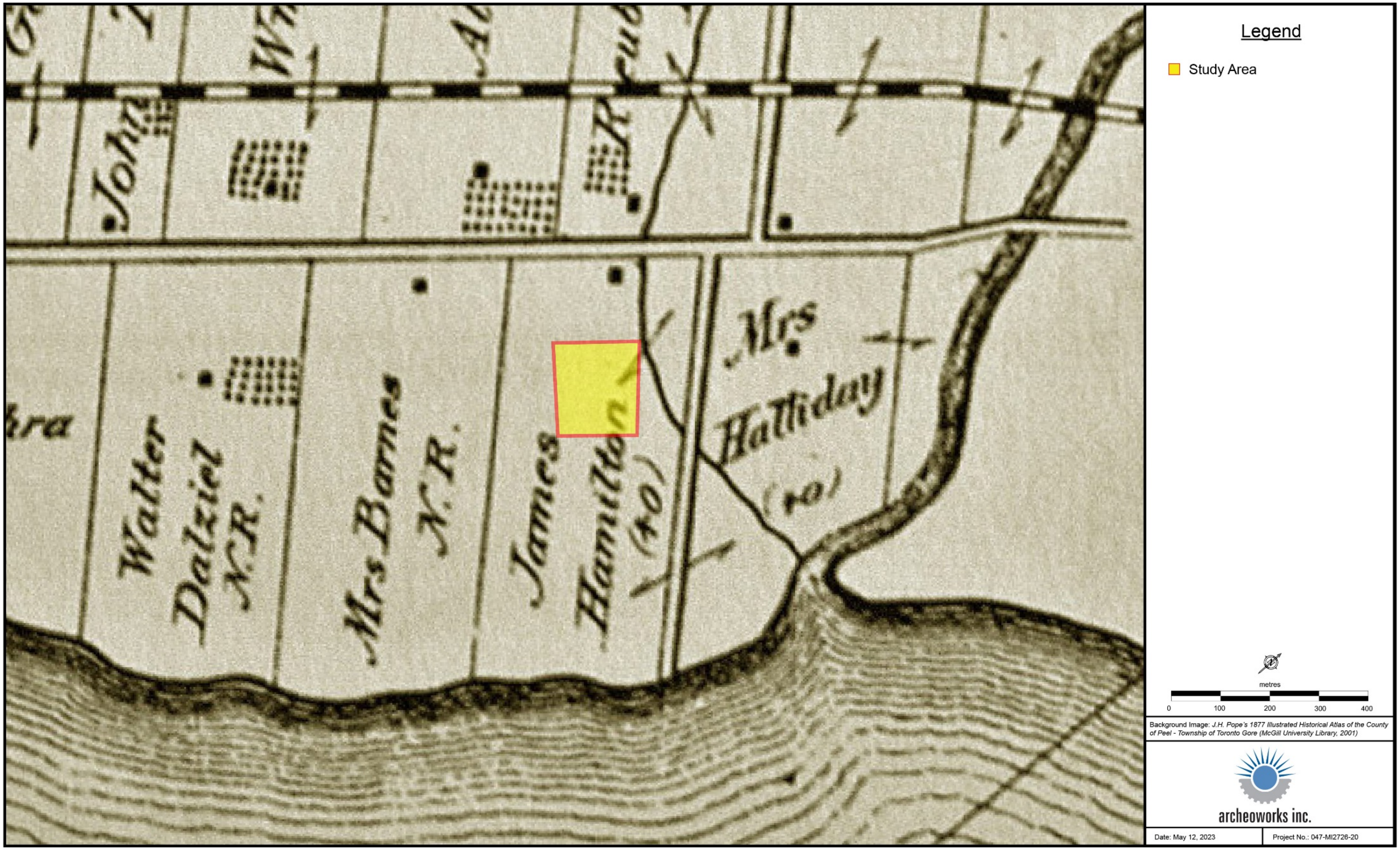
APPENDICES

APPENDIX A: MAPS

Map 1: National Topographic Map identifying the Stage 1 AA study area.

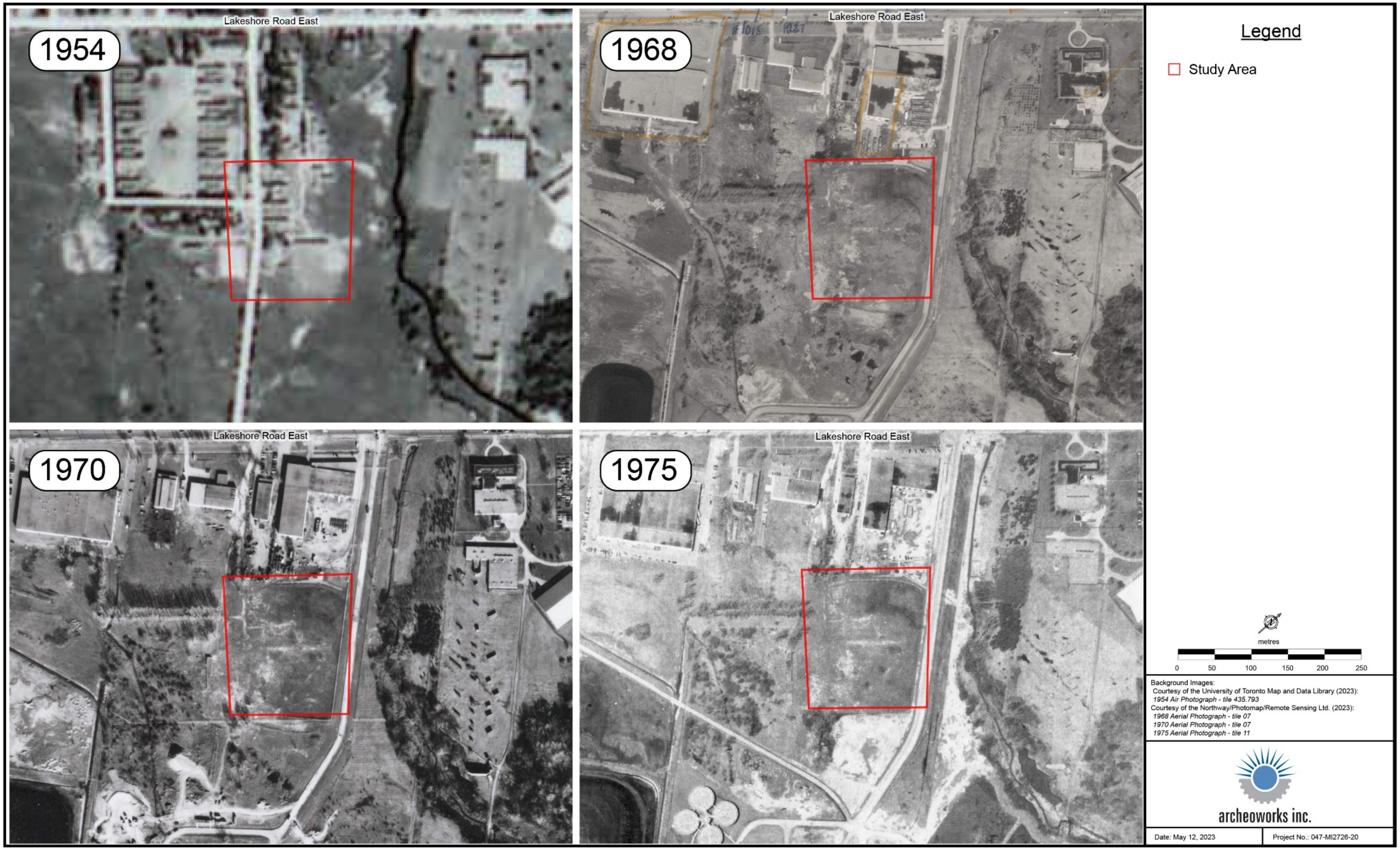


Map 2: Stage 1 AA study area within the 1859 Tremaine's Map of the County of Peel.

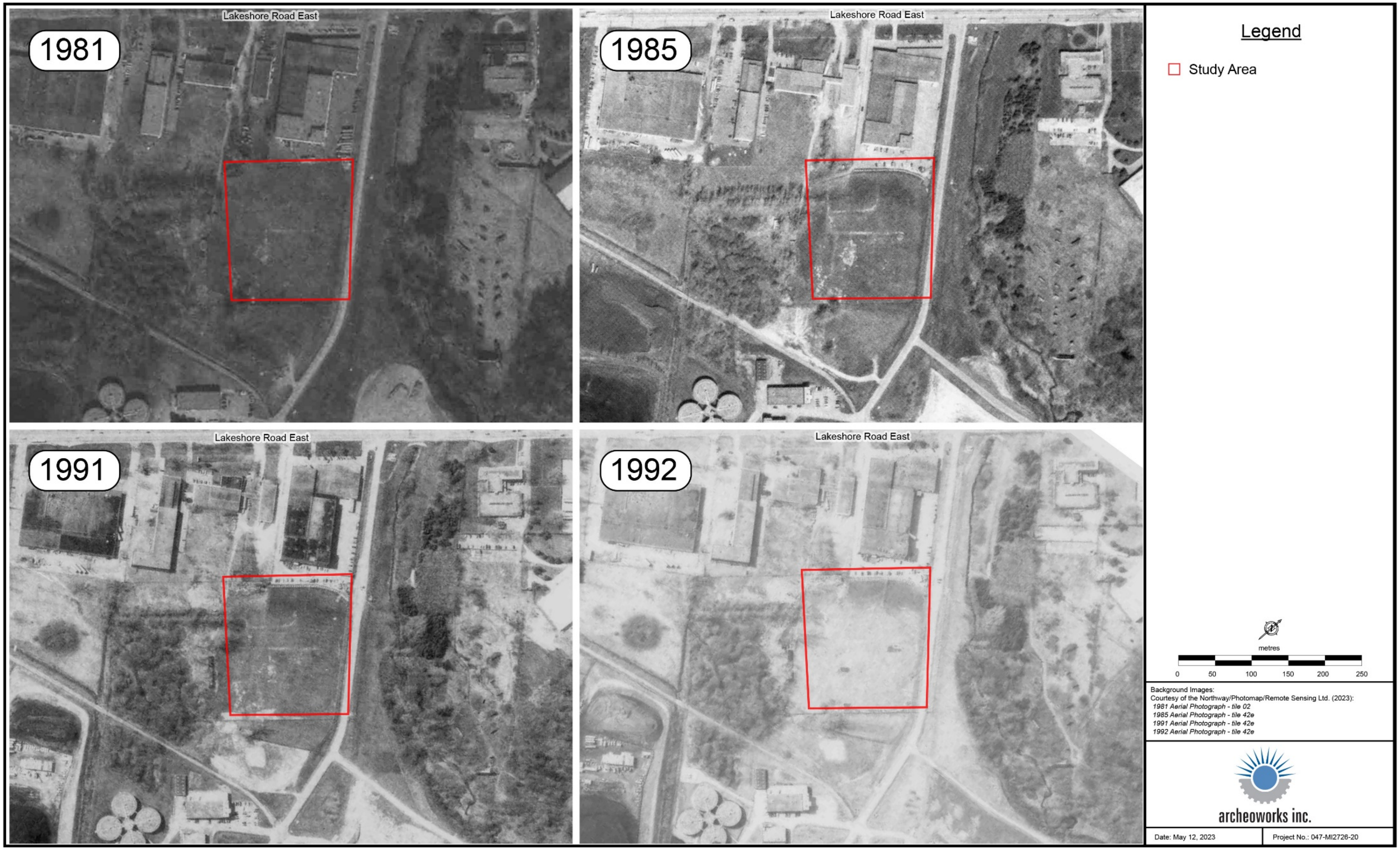


Map 3: Stage 1 AA study area within the 1877 Illustrated Historical Atlas of the County of Peel.

Map 4: Stage 1 AA study area within 1909, 1922, 1933 and 1942 topographic maps.



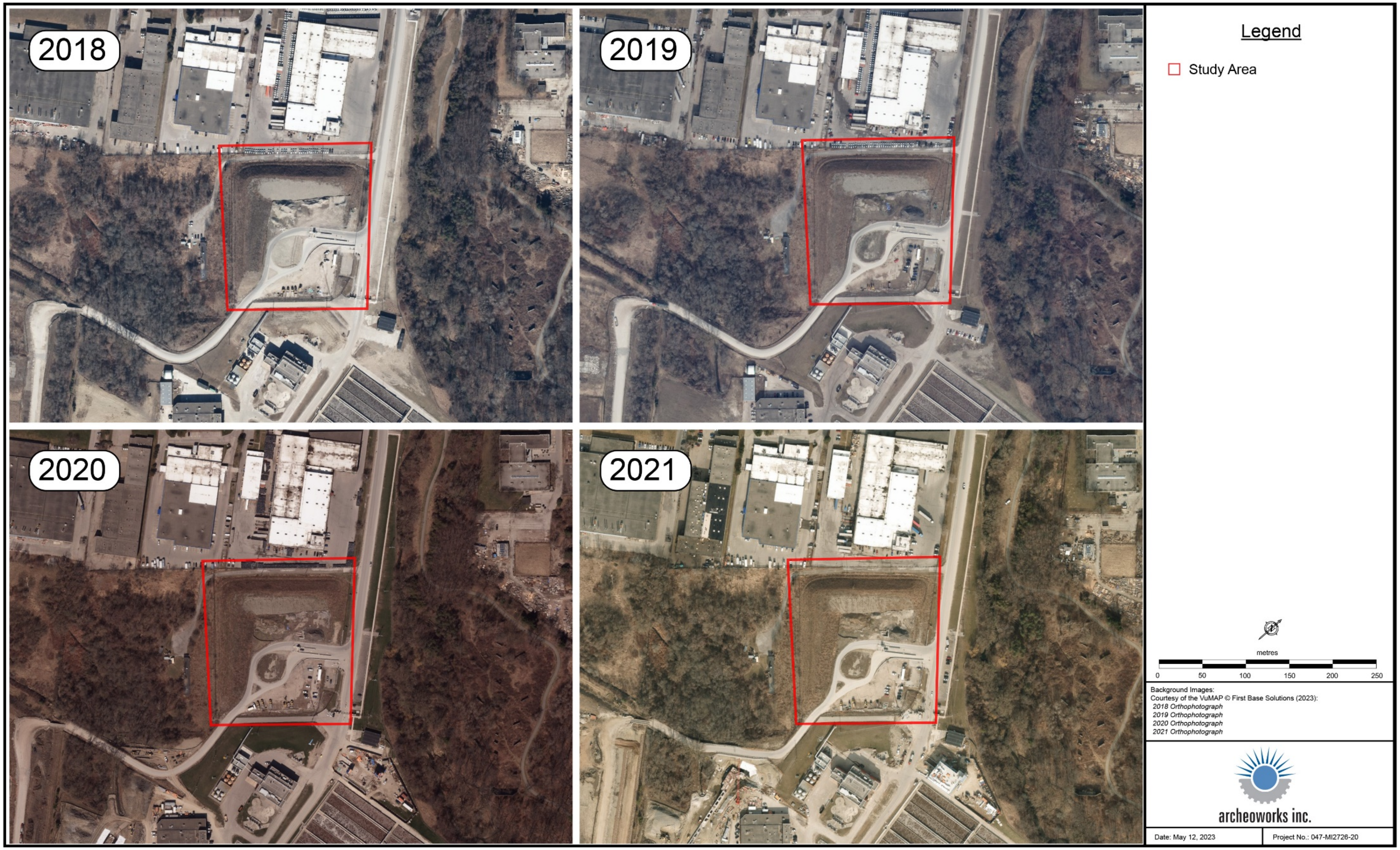
Map 5: Stage 1 AA study area within a 1954, 1968, 1970 and 1975 air/aerial photographs.



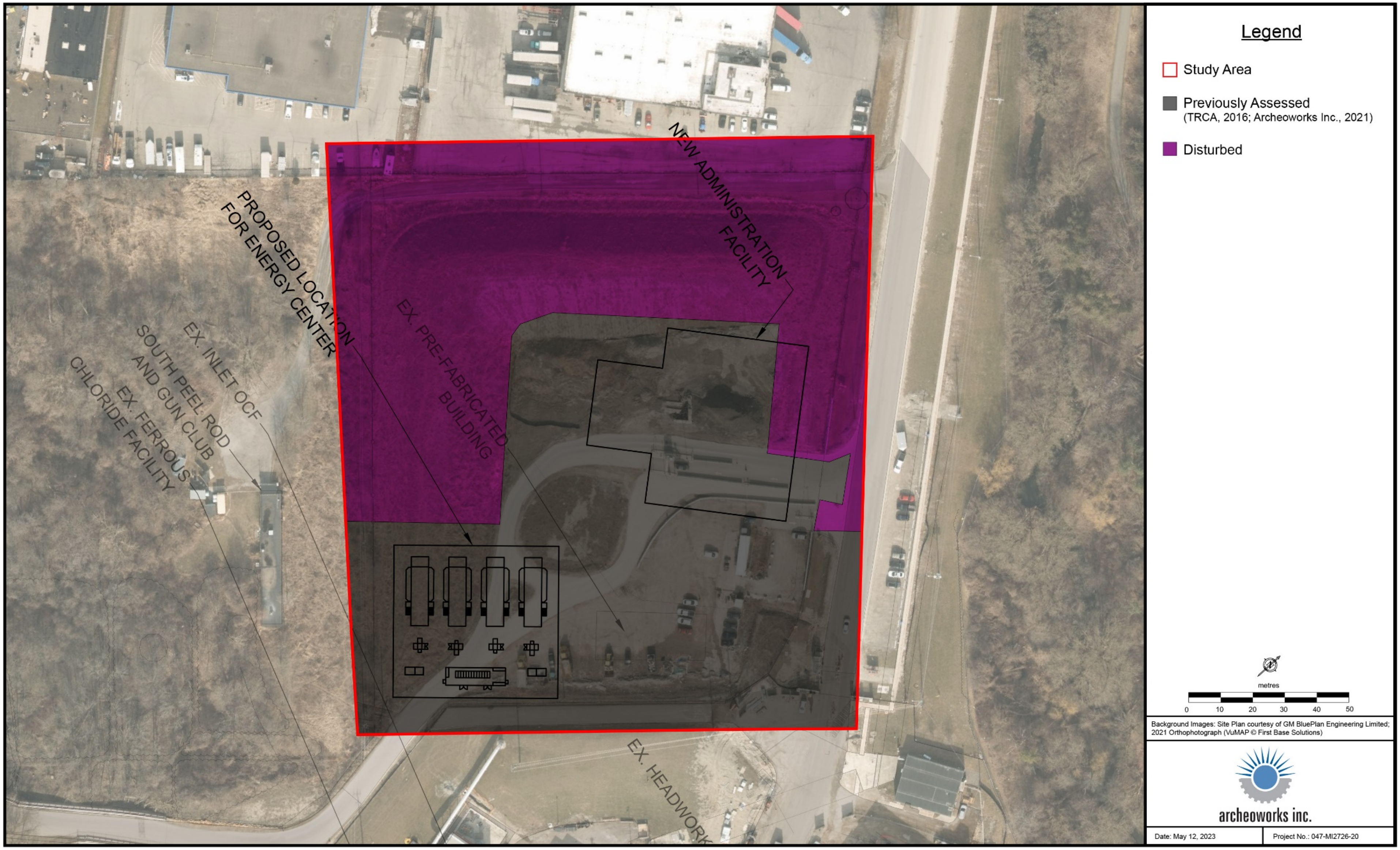
Map 6: Stage 1 AA study area within a 1981, 1985, 1991 and 1992 aerial photographs.

Map 7: Stage 1 AA study area within a 2002, 2007, 2008 and 2009 orthophotographs.

Map 8: Stage 1 AA study area within a 2010, 2012, 2016 and 2017 orthophotographs.



Map 9: Stage 1 AA study area within a 2018, 2019, 2020 and 2021 orthophotographs.



Map 10: Stage 1 AA results of the study area.

APPENDIX B: SUMMARY OF BACKGROUND RESEARCH

Feature of Archaeological Potential		Results		
Physical Features		**Yes**	**No**	**Comment**
1	Water on or adjacent to the study area	X		If Yes, potential confirmed
1a	Presence of primary water source within 300 metres of the study area (lakes, rivers, streams, creeks)	X	X	If Yes, potential confirmed
1b	Presence of secondary water source within 300 metres (intermittent creeks and streams, springs, marshes, swamps)		X	If Yes, potential confirmed
1c	Features indicating past presence of water source within 300 metres (former shorelines, relic water channels, beach ridges, etc.)		X	If Yes, potential confirmed
1d	Accessible or inaccessible shoreline within 300 metres (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh, etc.)		X	If Yes, potential confirmed
2	Elevated topography (eskers, drumlins, knolls, plateaus, etc.)		X	If Yes to two or more of 2-4 or 7-10, potential confirmed
3	Pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground		X	If Yes to two or more of 2-4 or 7-10, potential confirmed
4	Distinctive land formations (mounds, caverns, waterfalls, peninsulas, etc.)		X	If Yes to two or more of 2-4 or 7-10, potential confirmed
Cultural Features		**Yes**	**No**	**Comment**
5	Previously identified archaeological site(s) within 300 metres		X	If Yes, potential confirmed
6	Known burial site or cemetery on or directly adjacent to the property		X	If Yes, potential confirmed
7	Associated with resource areas related to food or medicinal plants, scarce raw materials, early Euro-Canadian industry		X	If Yes to two or more of 2-4 or 7-10, potential confirmed
8	Indications of early Euro-Canadian settlement (monuments, cemeteries, structures, etc.) within 300 metres	X		If Yes to two or more of 2-4 or 7-10, potential confirmed
9	Historic transportation route (historic road, trail, portage, rail area, etc.) within 100 metres	X		If Yes to two or more of 2-4 or 7-10, potential confirmed
10	Property listed on a municipal register or designated under the *Ontario Heritage Act* or that is a federal, provincial or municipal historic landmark or site within 300 metres	X		If Yes to two or more of 2-4 or 7-10, potential confirmed
Property-specific Information		**Yes**	**No**	**Comment**
11	Contains property listed or designated (under the *Ontario Heritage Act*) by the municipality		X	If Yes, potential confirmed
12	Local knowledge (Indigenous communities, heritage organizations, municipal heritage committees, etc.)		X	If Yes, potential confirmed
13	Archaeological Management Plan (AMP) illustrating archaeological potential for all or parts of the study area		X	If Yes, potential confirmed
14	Recent ground disturbance, not including agricultural cultivation (post-1960, extensive and deep land alterations)	X - all		If Yes, low archaeological potential is determined

APPENDIX C: HISTORY OF THE HURON-WENDAT NATION

ANNEX
History of the Nation Huronne-Wendat

As an ancient people, traditionally, the Huron-Wendat, a great Iroquoian civilization of farmers and fishermen-hunter-gatherers and also the masters of trade and diplomacy, represented several thousand individuals. They lived in a territory stretching from the Gaspé Peninsula in the Gulf of Saint Lawrence and up along the Saint Lawrence Valley on both sides of the Saint Lawrence River all the way to the Great Lakes. Huronia, included in Wendake South, represents a part of the ancestral territory of the Huron-Wendat Nation in Ontario. It extends from Lake Nipissing in the North to Lake Ontario in the South and Île Perrot in the East to around Owend Sound in the West. This territory is today marked by several hundred archaeological sites, listed to date, testifying to this strong occupation of the territory by the Nation. It is an invaluable heritage for the Huron-Wendat Nation and the largest archaeological heritage related to a First Nation in Canada.

According to our own traditions and customs, the Huron-Wendat are intimately linked to the Saint Lawrence River and its estuary, which is the main route of its activities and way of life. The Huron-Wendat formed alliances and traded goods with other First Nations among the networks that stretched across the continent.

Today, the population of the Huron-Wendat Nation is composed of more than 4000 members distributed on-reserve and off-reserve.

The Huron-Wendat Nation band council (CNHW) is headquartered in Wendake, the oldest First Nations community in Canada, located on the outskirts of Quebec City (20 km north of the city) on the banks of the Saint Charles River. There is only one Huron-Wendat community, whose ancestral territory is called the Nionwentsïo, which translates to "our beautiful land" in the Wendat language.

The Huron-Wendat Nation is also the only authority that have the authority and rights to protect and take care of her ancestral sites in Wendake South.

APPENDIX D: INVENTORY OF DOCUMENTARY AND MATERIAL RECORD

Project Information:				
Project Number:		047-MI2726-20		
Licensee:		Kassandra Aldridge (P439)		
MCM PIF:		P439-0155-2023		
Document/ Material		**Details**	**Location**	
1.	Research/ Analysis/ Reporting Material	Digital files stored in: /2020/047-MI2726-20 - South Peel WWTP - Mississauga/ Added Stage 1 - 2023	Archeoworks Inc., 16715-12 Yonge Street, Suite 1029, Newmarket, ON, Canada, L3X 1X4	Stored on Archeoworks network servers

Under Section 14 of the Terms and Conditions for Archaeological Licences issued under the *Ontario Heritage Act*, “the licensee shall hold in safekeeping all artifacts and records of archaeological fieldwork carried out under this licence, except where those artifacts and records are transferred by the licensee to His Majesty the King in right of Ontario or the licensee is directed to deposit them in a public institution in accordance with subsection 66(1) of the Act." The collections are being stored at *Archeoworks Inc.* on the licensee's behalf.

Appendix E:

Stage 1 and Marine Archaeological Assessment Reports

E3: Marine Archaeological Assessment for New Outfall for G.E. Booth WRRF

BACKGROUND RESEARCH
MARINE ARCHAEOLOGICAL ASSESSMENT
SCHEDULE C CLASS EA FOR CAPACITY EXPANSION OF G.E. BOOTH WWTP
ORIGINAL REPORT

Prepared for:

GM Blueplan Engineering

and

Ministry of Heritage, Sport, Tourism and Culture Industries

SCARLETT JANUSAS ARCHAEOLOGY INC.
Main: 269 Cameron Lake Road, Tobermory, Ontario N0H 2R0
Branch: 1166 2nd Ave. W., Unit 1, Owen Sound, Ontario N4K 2N2
Main Office: 519-596-8243 / Cell: 519-374-1119
jscarlett@amtelecom.net
www.actionarchaeology.ca

Marine Licence #: 2020-08
July 9, 2020

Executive Summary

GM BluePlan Engineering, on behalf of the Region of Peel (proponent) retained the services of Scarlett Janusas Archaeology Inc. (SJAI) to conduct background research for the marine portion of the project of the Schedule C Class EA for Capacity Expansion of G.E. Booth WWTP in Mississauga, Ontario. For the purposes of this report the property undergoing archaeological assessment will hereafter be referred to as the "Study Area".

The study area consists of the shoreline in front of the existing G.E. Booth waste water treatment plant and extends in a cone shaped configuration approximately two to 2.5 kilometres into Lake Ontario on an approximate southeast orientation. The area encompasses approximately 220 hectares. The development includes the consideration for a new outfall tunnel that could extend approximately two kilometres from the plant into Lake Ontario. At this time, the exact location of the outfall will not be known until later in the project.

A land archaeological assessment has been conducted at the plant site itself under project information number P338-055-2013. A portion of the study area has already undergone both marine background research and an in-water archaeological marine survey under licence numbers 2010-003 and 2012-003, conducted by Scarlett Janusas Archaeological and Heritage Consulting and Education (now Scarlett Janusas Archaeology Inc.). There were no in-water archaeological resources located during the survey conducted in 2010 and the in-water work conducted in 2012 concentrated on the area in front of Marie Curtis Park, but found only modern materials.

The study area is considered to exhibit low archaeological potential based on the detailed historic background research for marine related infrastructure. Previous assessment in approximately one quarter of the Study Area, including the nearshore, did not locate any significant cultural materials. It is less likely that further from shore, that any marine related infrastructure would be located. There always remains the possibility of wrecks of unregistered (therefore, unreported) shipwrecks in the area, however, this is a low probability.

Based upon the marine heritage background research of past and present conditions, the following is recommended:

- No further archaeological assessment is required for the Study Area; however,
- Compliance regulations must be adhered to in the event that archaeological resources are located during the project.

Table of Contents

Project Personnel

Project Manager Principal Archaeologist	Scarlett Janusas
Report Preparation	Scarlett Janusas
Historic Research	Patrick Folkes Scarlett Janusas
Graphics	Scarlett Janusas

BACKGROUND RESEARCH
MARINE ARCHAEOLOGICAL ASSESSMENT
G.E. BOOTH WASTEWATER TREATMENT PLANT
ORIGINAL REPORT

1.0 PROJECT CONTEXT

1.1 Development Context

GM BluePlan Engineering, on behalf of the Region of Peel (proponent) retained the services of Scarlett Janusas Archaeology Inc. (SJAI) to conduct background research for the marine portion of the project of the Schedule C Class EA for Capacity Expansion of G.E. Booth WWTP in Mississauga, Ontario. For the purposes of this report the property undergoing archaeological assessment will hereafter be referred to as the "Study Area".

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1.2 Historical Context

1.2.1 Current Environment

The Study Area encompasses an area of approximately 220 hectares in Lake Ontario fronting the existing G.E. Booth WWTP. The existing shoreline has undergone major infrastructure changes over time, and is not representative of the original shoreline.

1.2.2 Prehistory of Study Area

Prior to any human occupation, glaciers covered much of Southern Ontario. As these glaciers retreated, they left behind large meltwater lakes and streams and a landscape of barren tundra interspersed with open forests. This environment supported large mammals such as moose, elk and large herds of caribou and left the waters teeming with fish. The first human inhabitants probably moved into this region of Ontario approximately 11,000 years ago following the retreat of the Laurentide Ice Sheet. Nomadic Paleo-Indian hunters usually maintained a band level society while living in small camps, moving often as they followed the various herds across the area. Their population was small and they did not stay in the same place for long, making evidence of their existence somewhat scarce. However, some Paleo-Indian campsites have been found along the shorelines of glacial waters where a number of their stone tools and weapons have been found. Paleo shorelines occur but are distant (inland) from the study area.

Figure 1: The Study Area

People of the early and middle Archaic periods (7,000 – 2,500 BC) lived similar lives to those of the Paleo-Indians. They remained in small nomadic groups, often moving further inland during the winters as they followed the caribou herds. However, their stone tools and weapons became more advanced as the level of their skill and craftsmanship progressed, often adding ornamentation and intricate carved details to their items. By the late Archaic period (2,500 – 1,000 BC) they were involved in trade networks for sought after raw materials such as tobacco and also engaged in burial ceremonies.

Although daily life probably remained relatively the same, there were at least two changes earmarking the subsequent early Woodland period (1,000 – 400 BC). During this period, ceramics appear to have come into use and very elaborate burial practices made an appearance that included the burial of precious and ornate objects with the dead. The Middle Woodland period saw an increase in the trading of these objects and limited agricultural practices coupled with longer site occupations made an appearance during the transitional Woodland period (900 - 600AD).

During the Late Woodland or Iroquoian period (900 – 1650 AD), there was a major shift to agriculture as well as the establishment of more permanent camps and villages. The social structure of communities also changed with the development of political systems based on families and the need for alliances with other groups of people. The early villages were small with a series of longhouses surrounded by wooden palisades. Later villages housed as many as two thousand people and had very entrenched political structure. Prehistoric lake activities include the use of dugout canoes, and later birch bark canoes. The organic nature of these types of watercraft more often than not do not survive time unless buried in anaerobic environments (Janusas 2000:5).

1.2.3 Indigenous Historic Period

The Credit River is first noted by the name “R. au Credit” on Labroquire’s chart of 1757. The designation appears to derive from the interchange between the French and the Mississauga people who frequented the river to trade and to fish, occasions during which the granting of credit was essential to the economic relationship. The name was probably well established by the summer of 1749 when Chaussegros de Lery stopped at the Credit River and encountered what was later described as a village of Mississaugas (Robinson 1933: 91).

On June 16th, 1796, Lieutenant Governor John Graves Simcoe and party entered the Credit by canoe. In her diary, Mrs. Simcoe noted that “numbers of Indians reside here at this season to fish for salmon (Robertson 1911: 328). The Simcoes explored several miles upstream before returning to Lake Ontario and continuing their eastward journey to York.

In 1799, an anonymous writer published a similar observation of the “Credai River”, that it is a “a great resort for these [the Mississaugas] and other Indian tribes, and abounds in fish (no author 1799:66).”

The year of Herriot's account, on August 2nd, 1805, the Mississauga provisionally ceded to the Crown a large tract of the Credit and Etobicoke watersheds, though reserving fishing rights and land a mile (1.609 km) deep on each side of the Credit (Treaty No. 13A). This was confirmed the following year, September 6th, 1806 (Treaties 22 and 23), in the wake of which an agricultural settlement was established for them in 1826 on the Credit about a mile (1.609 km) upstream from Lake Ontario (no author 1834a: 42; The Aboriginal Protection Society 1839: 6-7).

1.2.4 Previously Known Archaeological Resources and Assessments

The Ministry of Heritage, Sport, Tourism and Culture Industries indicates that the Robinson site, AjGv-7, a campsite of undetermined cultural affiliation, lies close to the Study Area. The Toronto Region and Conservation Authority conducted a Stage 1 and 2 archaeological assessment close to the Study Area under PIF #P303-123-2011 (TRCA 2012). No cultural materials were located during the assessment. In 2013, a Stage 1 archaeological assessment of the G.E. Booth property was undertaken under PIF #338-055-2013 also by the TRCA. Recommendations included that areas with archaeological potential were required to undergo Stage 2 archaeological assessment. A combined Stage 1 and 2 archaeological assessment on lands adjacent to the G.E. Booth plant were conducted by P. Racher under PIF # P007-0750-2016. A Stage 2 archaeological assessment was undertaken by Archaeological Research Associates in 2018 on the property adjacent to the G.E. Booth property, and extended along the breakwaters. This was conducted under the licence of Paul Racher, PIF # P007-0971-2018. No cultural materials were located in any of the above surveys, and there were no recommendations for additional archaeological investigation.

A marine archaeological survey was conducted under licence 2012-003 by Scarlett Janusas Archaeological and Heritage Consulting and Education on an area within the Study Area and northeast of the Study Area. This marine assessment (Figure 2) covers off approximately one quarter of the current study area. Assessment consisted of sidescan survey, magnetometer survey and ground truthing of some targets (Figures 3 - 6). Targets with unique characteristics that stood out form their surroundings and appeared to be manmade were selected for further investigation. These characteristics included straight lines (intersecting or parallel), targets that were higher than their surroundings, circles, and areas where magnetic anomalies lined up with features detected with the side scan sonar. There were two pipelines extending out into Lake Ontario that also presented on the magnetometer survey. These are associated with the Booth Wastewater Treatment Plant, and are visible as relatively straight lines on Figure 6. Targets included both geophysical and cultural (sometimes difficult to discern difference based on sidescan sonar alone). There were cultural materials located during the previous assessment but all lie outside the current Study Area. Some targets were located only with magnetometer, and were buried, therefore, rendering these targets impossible to identify. There were cultural materials identified by Marie Curtis Park and these were the subject of an additional marine archaeological assessment, conducted by SJAHCE, under licence 2012-010. These materials were determined to be recent (within the last 50 years). START

Figure 2: Previously Assessed Area

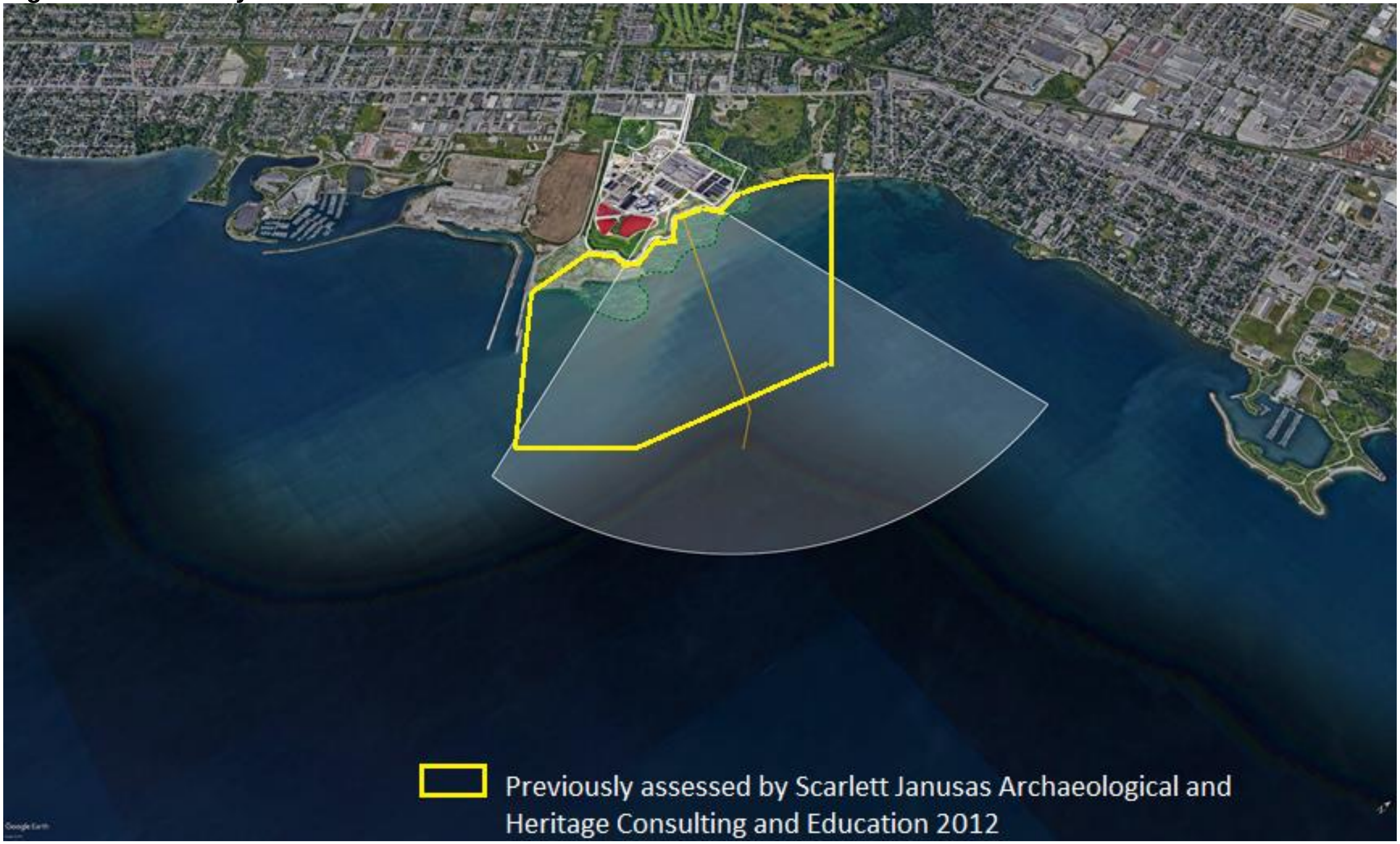


Figure 3: Side Scan Survey Mosaic from 2012 (SJAHCE 2012)

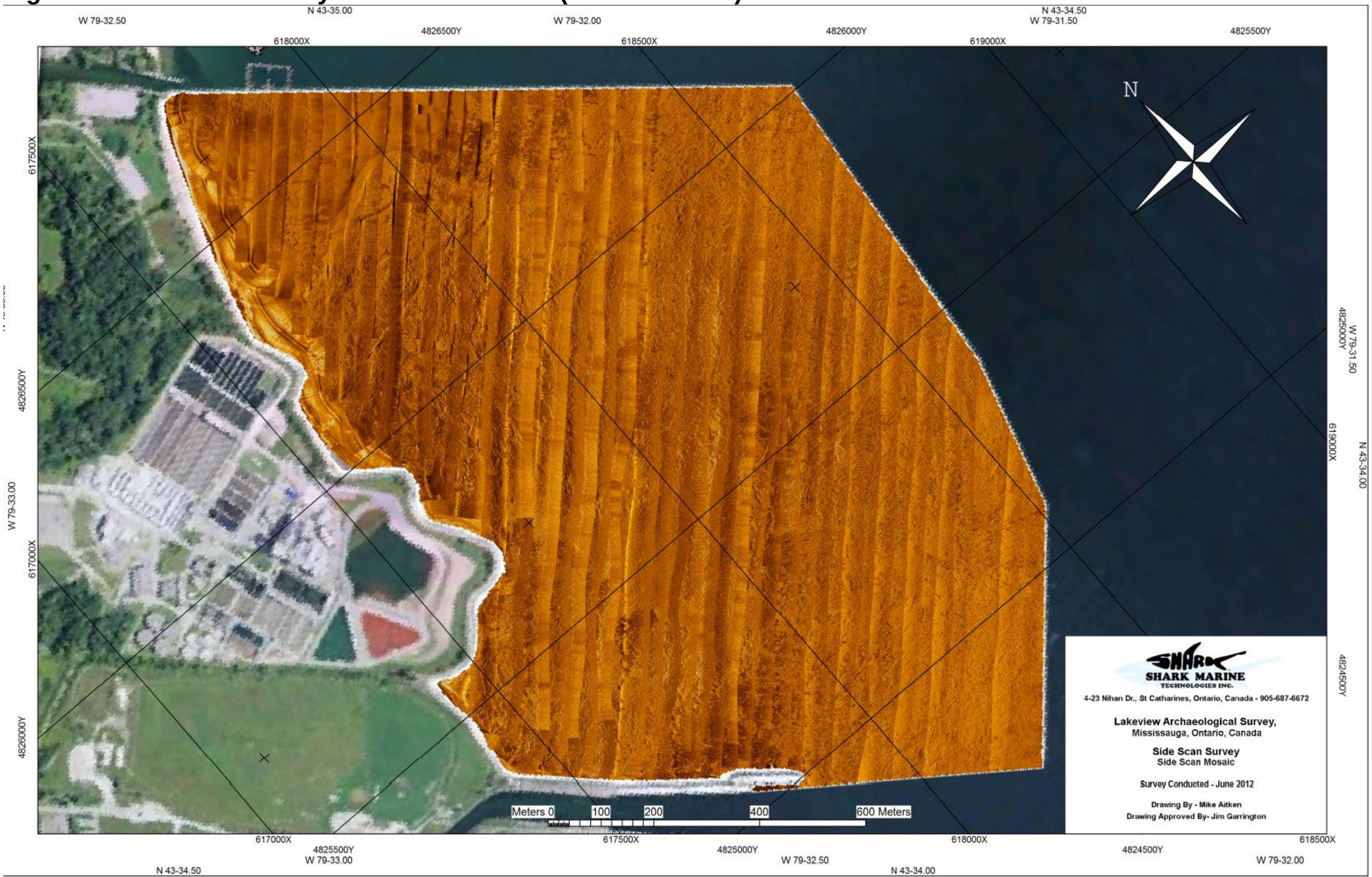


Figure 4: Magnetometer Survey, Gamma Values from 2012 (SJAHCE 2012)

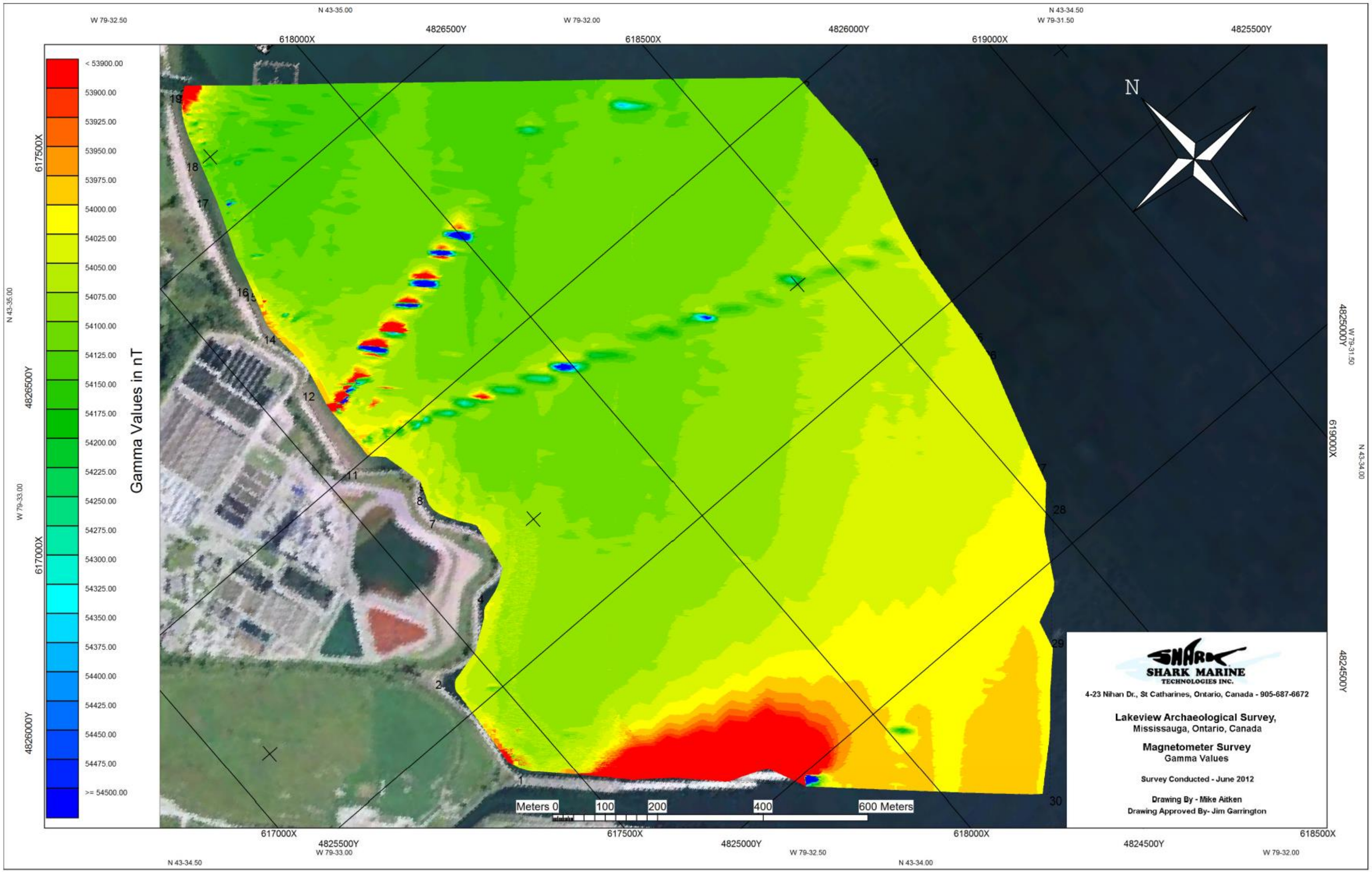


Figure 5: Magnetometer Survey, Magnetic Gradient from 2012 (SJAHCE 2012)

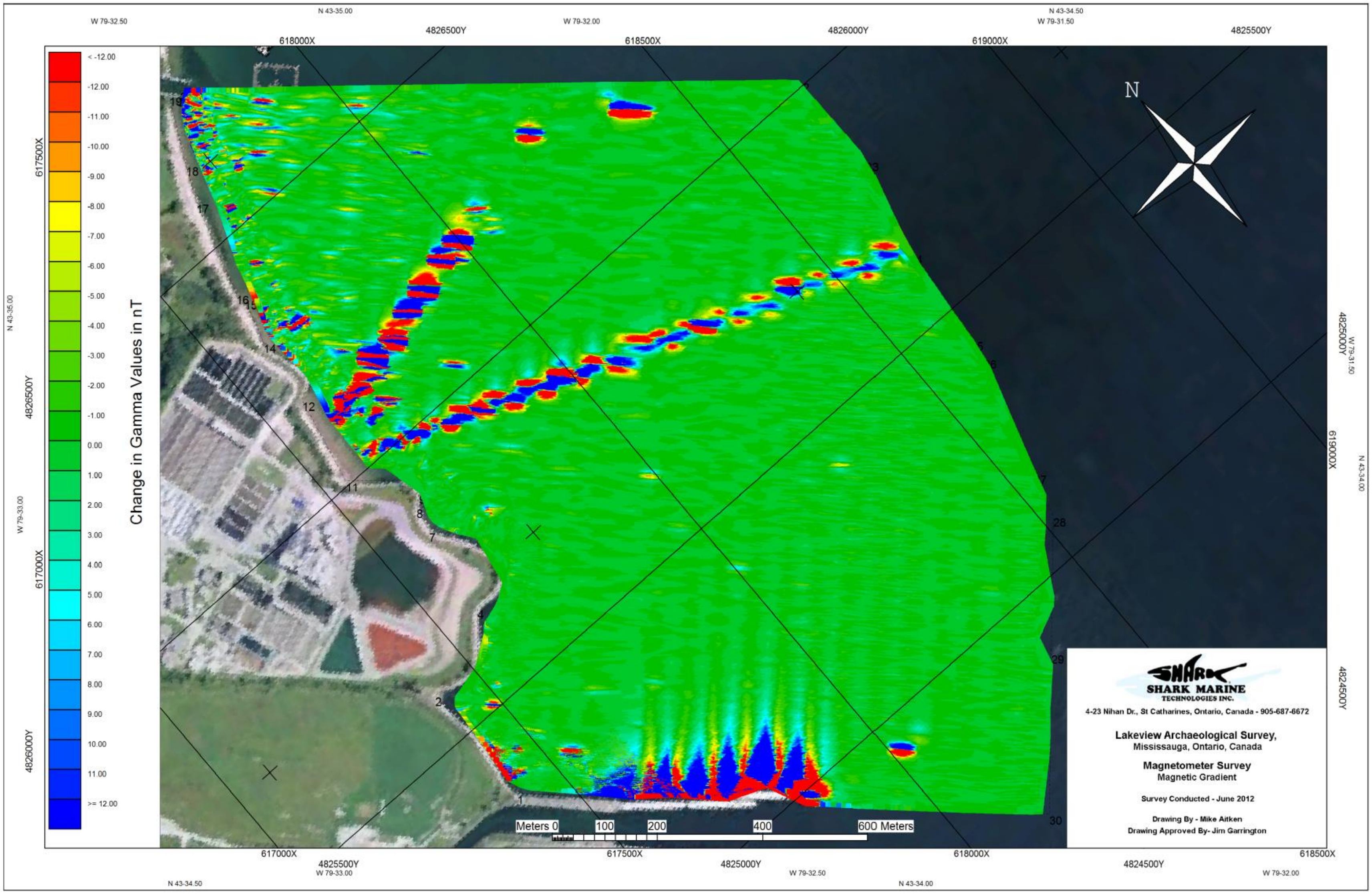
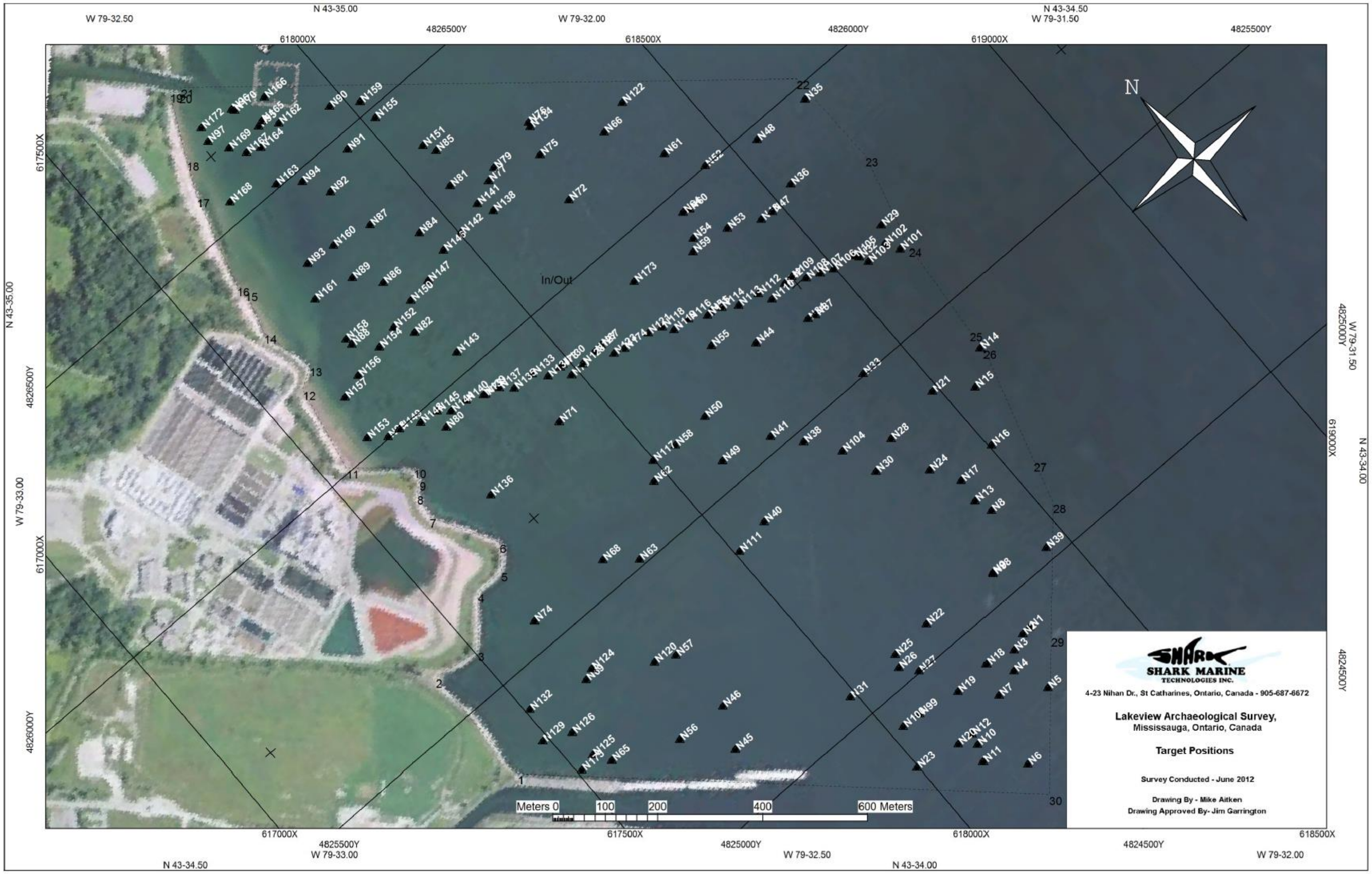


Figure 6: Targets found in 2012 (SJAHCE 2012)



1.2.5 Booth Wastewater Treatment Plant: Historic Impact on the Near Shore Lake Bottom

The historic record of human activity impacting the near shore bottom of Lake Ontario can be identified in three phases.

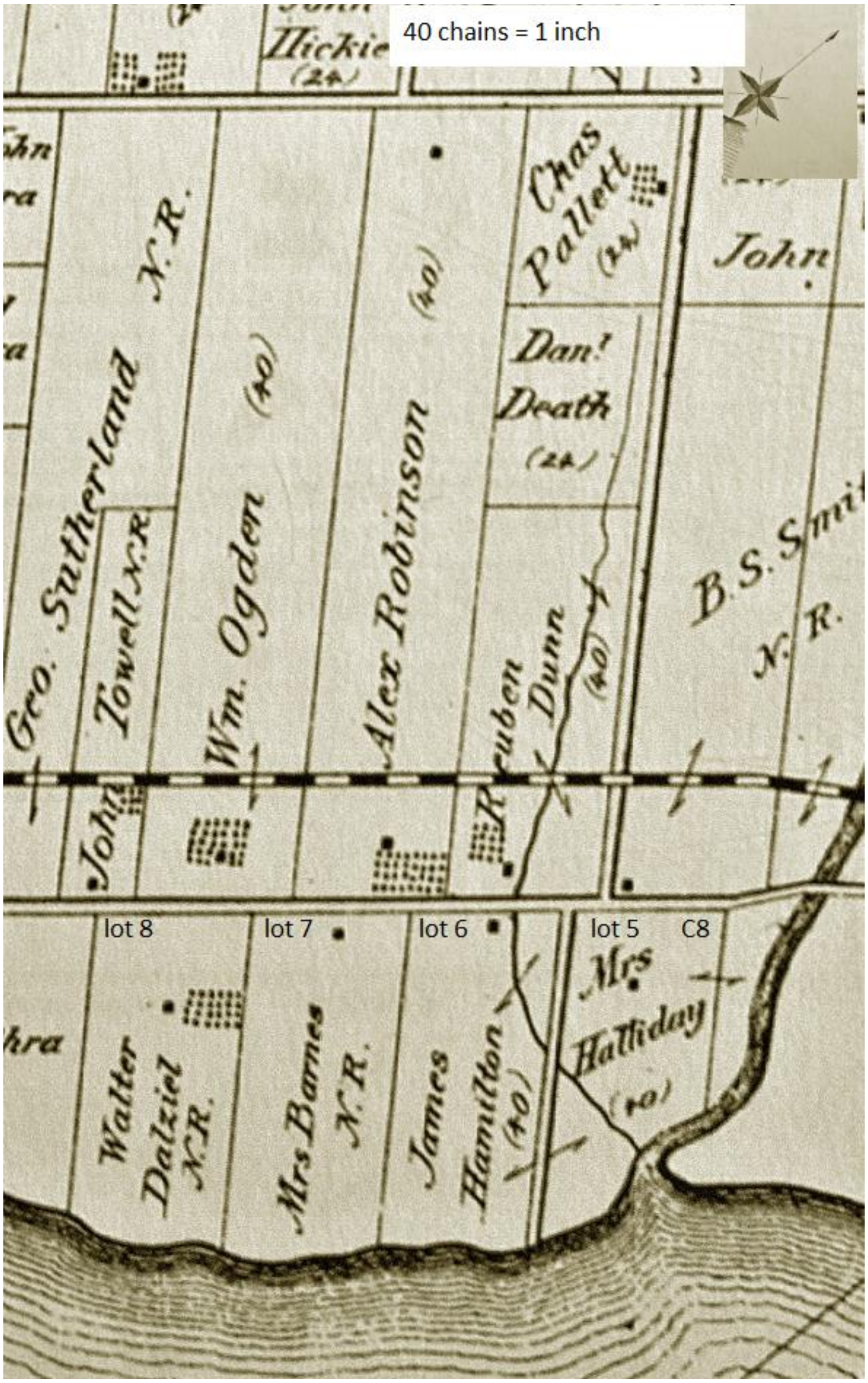
Until the midpoint of the nineteenth century the coast of Toronto Township, in particular that of Lots 5 through 8, Concession III, in S.D.S., remained unchanged (Figure 7). These lots occupy the waterfront west from Etobicoke Creek, and are all, or in part, occupied now by the Booth Wastewater Treatment plant. The purchasers and occupiers of theses ostensibly farm lots made no alteration or undertook no exploitation of the waterfront. This situation changed in the early 1850s. To meet the demands of a maturing Toronto for aggregates used in a variety of road and construction projects, the exploitation of the bottom deposits in the inshore shallows became widespread. A fleet of small schooner-rigged vessels, with their attendant scows, based notably at Port Credit, provided the means. The ubiquitous “stone hookers”, as the schooners were popularly known, plied their trade into the early twentieth century. Although there is no certain reference to their activities off the future Booth site, their presence is certainly implied. The coming and going of the “stone Hookers|” is commonly described in Toronto newspapers of the period as they arrived from or cleared for “the lake shores”. A term applying to the coast from Humber Bay to Port Credit.

To illustrate the extent and longevity of the business, a few examples may suffice. On a single day, April 30, 1872, seven stone hookers arrived in Toronto harbour (Mail 1872). On May 21, 1885, the stone-laden **Kate, Maple Leaf**, and **Jessie Stuart** arrived from “the lake shore” (Toronto World 1885). Similarly, the **White Oak, Mary Ellis**, and **Swallow** in July, 1886 (Toronto World 1886); the **M.E. Ferguson, Coral,** and **Reindeer** on April 30, 1891 (Toronto World 1891); the **Maple Leaf**, and **White Wings** on April 22, 1896 (Toronto World 1896); the **Lillian, Newsboy, Olympia, Maple Leaf,** and **Northwest** on June 10, 1898 (Toronto World 1898), all carrying aggregates from the lake shore.

Wherever the location, the schooners, being of shoal draught, would anchor close to the beach and await the loading of a scow (by hand) and its arrival alongside for the transfer aboard of gravel and stone. The scowman used a rake-like device to pull stone from the bottom or alternatively to shovel beach gravel directly into their small craft (Snider 1933). As early as the mid-1850s the latter provoked complaints from adjacent land owners, and in 1856 legislation was tabled by the Province of Canada to prevent the erosion causing activity. It was enacted the following year as “An Act for the Protection of Persons Owning Lands on the Shore of Lake Ontario in the Counties of York, Peel and Halton’. The Act (Section I) states that “No person shall remove or raise and stone from the bed of Lake Ontario at a less distance than four rods beyond the low water mark, at any place between the River Humber and Burlington Beach.”

Although offending vessel captains were liable to a fine, to what extent the Act deterred the taking of aggregate at the boundary of the lake and beach is unknown. Certainly the

Figure 7: 1877 Historic Mapping of Lots 5 – 8, South Toronto Township



business flourished as the removal of stone was simply carried on in deeper water. A shallow bank, no more than three fathoms deep, and commonly much less, extended one half mile offshore southwest of the mouth of Etobicoke Creek. There was here a supply sufficient to sustain the stone hookers into the twentieth century.

Commencing in 1891 the stone hookers anchoring off Lots 5 through 7 had to contend with the occasional hazard of the Long Branch Rifle Range established on the former farm lots west of the Etobicoke Creek. In 1910, the Department of Militia and Defence took over the property. Subsequent training and exercises, especially during World War One, effected Lake Ontario in that it was a down range backdrop for the use of small arms. No heavy weapons, such as artillery, were apparently used and so residue deposited on the lake bottom would consist of only small calibre rounds.

In the mid-1930s the property was taken over by the Department of National Defence and on August 7, 1940, Small Arms Ltd., a Crown Corporation, established there a facility for the manufacture of light military firearms (Sten machine guns and Lee Enfield rifles). Although the testing of these weapons was secured by safety features, such as backstops, mariners were warned of sailing through nearby waters. Although Small Arms closed at the end of World War Two, the use of the range continued until officially closed in 1957. Yet, curiously, the offshore danger zone still appeared on hydrographic charts. The 1958 edition of the ‘Great Lakes Pilot’ defined it as an area “beginning at a point 3 miles (4.8 km) southwest of Mimico, the boundary extends 18,600 feet (5,669 m) (southeast), thence 13,400 feet (4,084 m)(southwest), thence 18,000 feet (5,486 m) (northwest) to a point on the shore” (Canadian Hydrographic Service 1958). The outer limits were marked by orange spar buoys. The caution of a “surface firing area” still appeared in the 1967 edition of the ‘Pilot’ (Canadian Hydrographic Service 1967). Reference to the “rifle range” was not deleted until the Supplement to the ‘Pilot’ issued by the Canadian Hydrographic Service in 1971.

If the small arms activity of World Wars One and Two made little impact on the lake bottom, the subsequent exploitation of the former, so-called Arsenal Lands in the second half of the twentieth century profoundly altered the shoreline. The construction of the Lakeview Generating Station (1958 and following years) on historic Lots 7 and 8, and the G.E. Booth Wastewater Treatment Plant, the first phase of which opened in November, 1961, on Lots 5 and 6, occasioned major changes to the inshore bottomscape. For the present Study Area this was reflected in the “water lot” granted by the Province in respect of Lot 6 (Archives of Ontario). This “water lot” consisted of 19.40 acres (7.85 ha) extending across the entire front of Lot 6. An additional “water lot” was granted for a 48-inch (122 cm) diameter outlet pipe running from the southwest corner of Lot 5 into the lake (it is now shown as “abandoned” on the current plan). The subsequent expansion of the plant involved the dredging and infilling of the original bottom to create the existing berms, ash ponds, and ash lagoons.

While the existing development of the shore and alteration of the adjacent historic lake bottom are the most visible of human impacts, the removal of aggregates during the decades of stone hooking implies that no part of the scoured “lake shore” bottom survives in a pristine state.

1.2.6 Shipwrecks and Marine Casualties

Excluding the planned scuttling of the **Ridgetown, Bryn Mawr, John Fritz** and **John R. Roebling** (make up the breakwater to the southwest of the Study Area) in the twentieth century, an inventory of ships sunk or wrecked in the vicinity in principally drawn from events in the nineteenth century. Most shipwrecks occurred at the height of the sailing ship era, and of the vessels lost a number were form the ranks of the stonehookers. A detailed list of sources consulted is part of the references cited section of this report. Ship dimensions, where available, were drawn from various official port registers (e.g. Toronto and Hamilton) and from lists of Canadian vessels published irregularly by the Department of Marine and Fisheries post confederation.

The schooner **Fanny** left Kingston for some point up the lake on September 25th, 1838. It was subsequently reported to have been wrecked "at or near Port Credit", though without loss of life (the Chronicle & Gazette, 1839, February 20th). The **Fanny** was built at Niagara-on-the-Lake and launched in 1834 (Hallowell Free Press, 1834, July 14th).

In August, 1844, the schooner **Rover** foundered "about 3 miles [4,827 km] out from Port Credit, "drowning four, including the wife and child of the captain, who was the only survivor {British Whig 1844, August 16th). The **Rover**, laden with salt, was bound from Toronto to Port Dalhousie.

On September 13, 1878, a freshet in the Credit River swept through the harbour and caused major damage to vessels lying within. The steam tug **Flora L. Baines** was carried out into the lake and sunk (no author 1878 b). The **Baines**, built at Penetanguishene in 1875 by Edward Baines ,was 5.7 tons and measured 31.3' [9.54024 m] in length, had a breadth of beam of 7.5' [2.286 m], and a depth of hold of 3.4' [1.03632 m]. It was employed in Toronto harbour in 1875, and the following year was shipped by rail to Lake Simcoe. It carried passengers on Lake Couchiching that summer. In 1877, the **Baines** was back on Toronto harbour where it ferried passengers to and from the Toronto Islands and the Humber River (no author 1875 – 1878).

Under the requirement of the Steamboat Inspection Act, the **Baines** was inspected at Toronto on July 29th 1878, and licenced to carry passengers in the local trade. The circumstances of her presence at Port Credit are unknown.

There were numerous other shipwrecks and foundering's but all were cited as being located close to the harbour of Port Credit, west of the Study Area.

There may be other shipwrecks in the area, but they were not located during this research. Unregistered shipwrecks would not generally appear in the records, nor is there an accounting for possible small boats, accidents on ice roads (when the lakes were frozen); or Indigenous watercraft.

2.0 DETERMINATION OF ARCHAEOLOGICAL POTENTIAL

The study area is considered to exhibit low archaeological potential based on the detailed historic background research for marine related infrastructure. Previous assessment in approximately one quarter of the Study Area, including the nearshore, did not locate any significant cultural materials. It is less likely that further from shore, that any marine related infrastructure would be located. There always remains the possibility of wrecks of unregistered (therefore, unreported) shipwrecks in the area, however, this is a low probability.

3.0 ADVICE ON COMPLIANCE WITH LEGISLATION

According to the 2011 Standards and Guidelines (Section 7.5.9) the following must be stated within this report:

This report is submitted to the Minister of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Heritage, Sport, Tourism and Culture Industry's, a letter will be issued by the Ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be an archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of *the Ontario Heritage Act*.

The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

4.0 RECOMMENDATIONS

Based on the background research, the following is recommended:

- No further archaeological assessment is required for the Study Area; however,
- Compliance regulations must be adhered to in the event that archaeological resources are located during the project.

5.0 BIBLIOGRAPHY AND SOURCES

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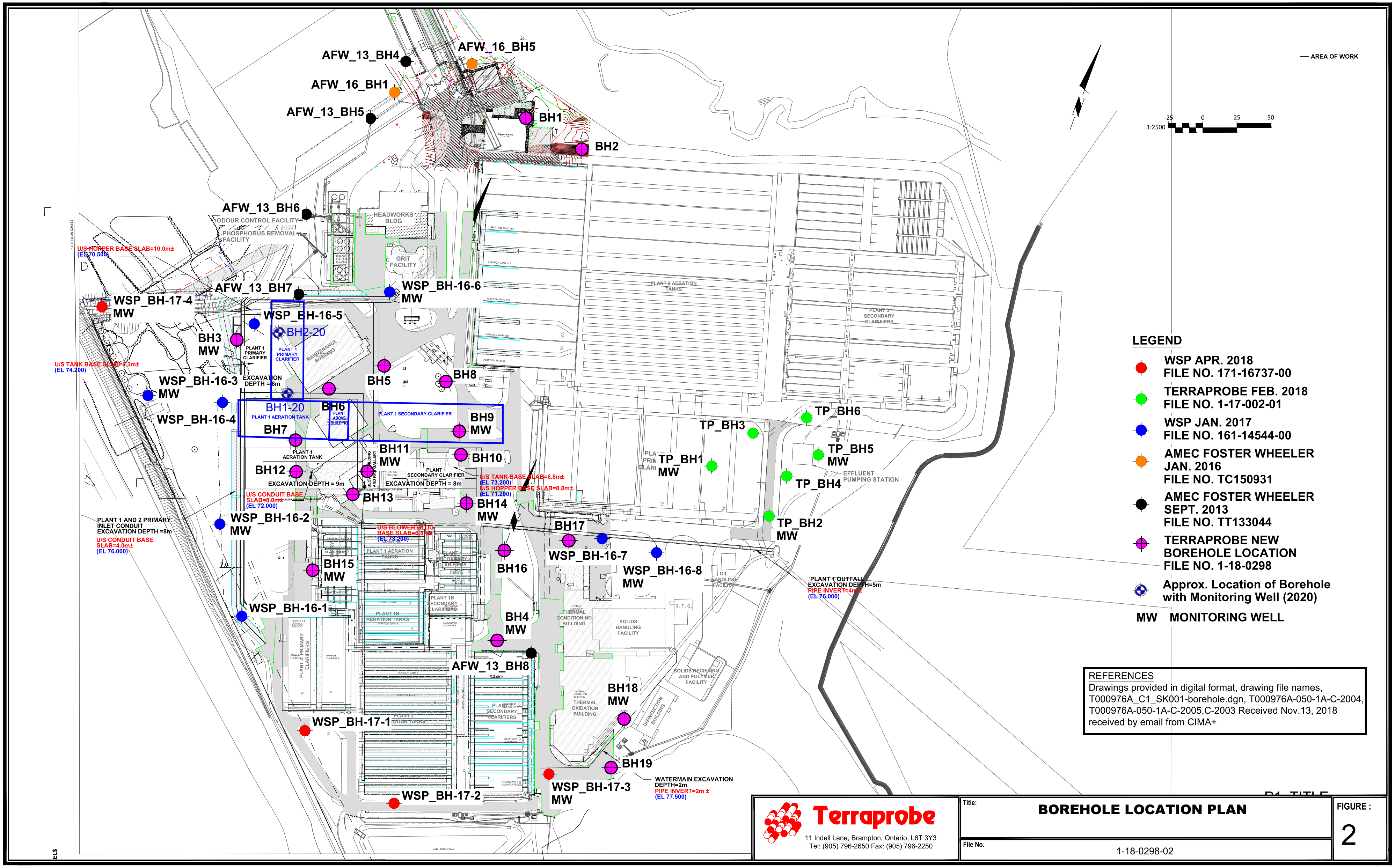
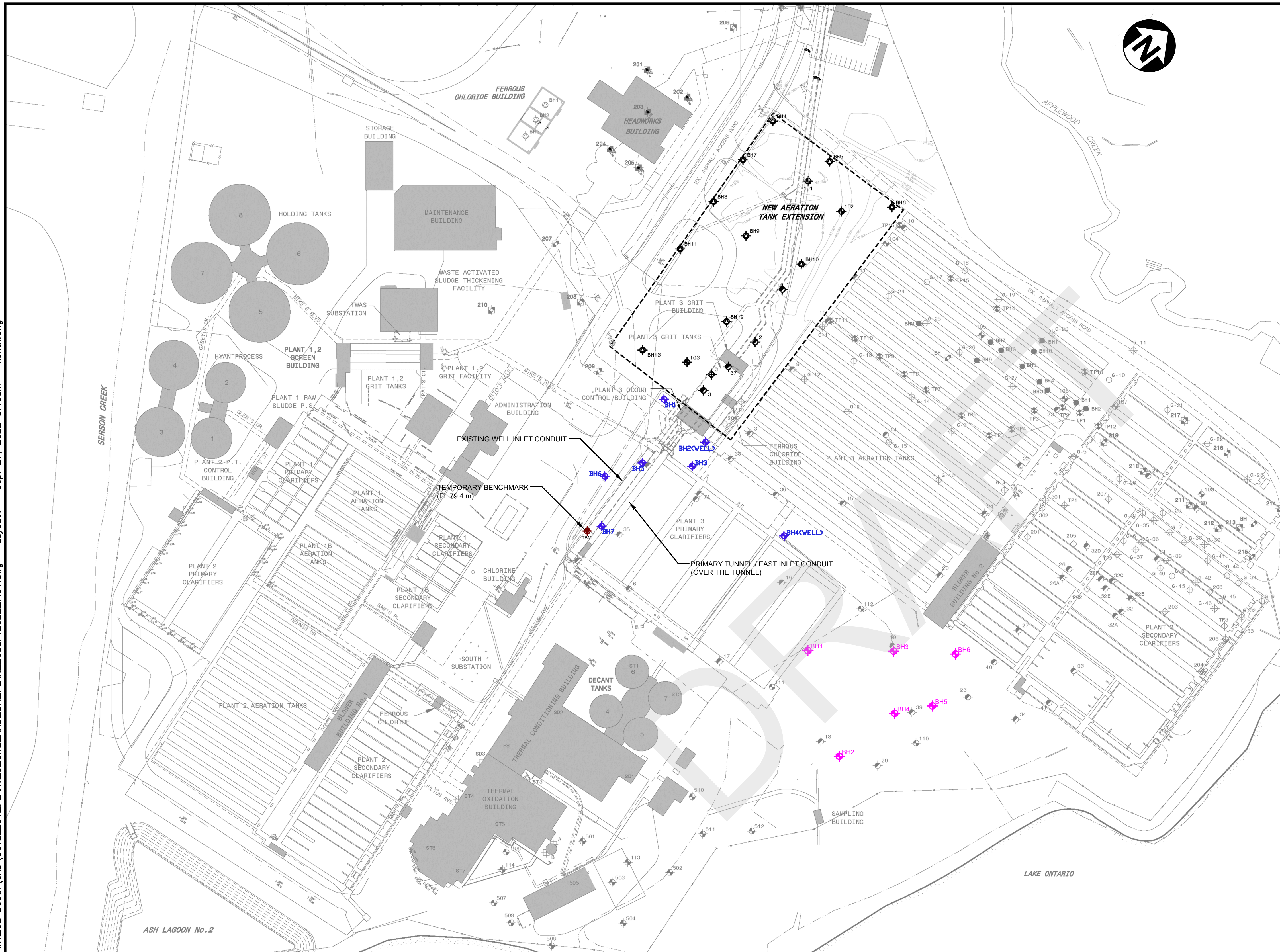
Appendix F:

Hydrogeological and Geotechnical Background Information


AFW_13_BH4
AFW_16_BH5
AFW_16_BH1
AFW_13_BH5
BH1
BH2
AFW_13_BH6
ODOUR CONTROL FACILITY
PHOSPHORUS REMOVAL FACILITY
HEADWORKS BLDG
GRIT FACILITY
U/S HOPPER BASE SLAB=10.0m±
(EL 70.500)
AFW_13_BH7
WSP_BH-16-6 MW
WSP_BH-17-4 MW
WSP_BH-16-5
BH2-20
BH3 MW
PLANT 1 PRIMARY CLARIFIER
MAINTENANCE BUILDING
U/S TANK BASE SLAB=7.3m±
(EL 74.200)
WSP_BH-16-3 MW
EXCAVATION DEPTH =8m
BH5
BH8
PLANT 3 AERATION TANKS
PLANT 3 SECONDARY CLARIFIERS
BH1-20
BH6
PLANT 1 AERATION TANK
PLANT ABOVE BUILDING
PLANT 1 SECONDARY CLARIFIER
BH9 MW
WSP_BH-16-4
BH7
TP_BH6
TP_BH3
TP_BH1 MW
TP_BH5 MW
TP_BH4
EFFLUENT PUMPING STATION
BH11 MW
BH10
PLANT 1 AERATION TANK
BH12
EXCAVATION DEPTH = 9m
PLANT 1 SECONDARY CLARIFIER
EXCAVATION DEPTH = 8m
U/S TANK BASE SLAB=6.8m±
(EL 73.200)
U/S HOPPER BASE SLAB=8.8m±
(EL 71.200)
U/S CONDUIT BASE SLAB=8.0m±
(EL 72.000)
BH13
BH14 MW
TP_BH2 MW
PLANT 1 AND 2 PRIMARY INLET CONDUIT EXCAVATION DEPTH =8m
U/S CONDUIT BASE SLAB=4.0m±
(EL 76.000)
WSP_BH-16-2 MW
U/S BLOWER BLDG BASE SLAB=6.8m±
(EL 73.200)
BH17
WSP_BH-16-7
BH16
WSP_BH-16-8 MW
OIL HANDLING FACILITY
PLANT 1 OUTFALL EXCAVATION DEPTH=5m
PIPE INVERT=4m±
(EL 76.000)
BH15 MW
PLANT 1B SECONDARY CLARIFIERS
PLANT 1B AERATION TANKS
THERMAL CONDITIONING BUILDING
SOLIDS HANDLING FACILITY
R.T.O.
WSP_BH-16-1
BH4 MW
PLANT 2 PRIMARY CLARIFIERS
AFW_13_BH8
SOLIDS RECEIVING AND POLYMER FACILITY
BH18 MW
THERMAL OXIDATION BUILDING
DISINFECTION BUILDING
WSP_BH-17-1
PLANT 2 AERATION TANKS
PLANT 2 SECONDARY CLARIFIERS
BH19
WATERMAIN EXCAVATION DEPTH=2m
PIPE INVERT=2m ±
(EL 77.500)
WSP_BH-17-3 MW
WSP_BH-17-2
AREA OF WORK
1:2500
-25 0 25 50
LEGEND
WSP APR. 2018 FILE NO. 171-16737-00
TERRAPROBE FEB. 2018 FILE NO. 1-17-002-01
WSP JAN. 2017 FILE NO. 161-14544-00
AMEC FOSTER WHEELER JAN. 2016 FILE NO. TC150931
AMEC FOSTER WHEELER SEPT. 2013 FILE NO. TT133044
TERRAPROBE NEW BOREHOLE LOCATION FILE NO. 1-18-0298
Approx. Location of Borehole with Monitoring Well (2020)
MW MONITORING WELL
REFERENCES
Drawings provided in digital format, drawing file names, T000976A_C1_SK001-borehole.dgn, T000976A-050-1A-C-2004, T000976A-050-1A-C-2005,C-2003 Received Nov.13, 2018 received by email from CIMA+
Terraprobe
11 Indell Lane, Brampton, Ontario, L6T 3Y3
Tel: (905) 796-2650 Fax: (905) 796-2250
Title:
BOREHOLE LOCATION PLAN
File No.
1-18-0298-02
FIGURE :
2



LEGEND

BH1	BOREHOLE LOCATION (WOOD, 2022)
(WELL)	MONITORING WELL LOCATION (WOOD, 2022)
BH1	BOREHOLE LOCATION (TERRAPROBE, 2018)
BH1	PROPOSED BOREHOLE LOCATION (2008)
201	BOREHOLE LOCATION (AMEC, DEC. 2003)
TP1	TEST PIT LOCATION (AMEC, JUNE 2003)
BH1	BOREHOLE LOCATION (AMEC, JUNE 2003)
101	BOREHOLE LOCATION (AMEC, SEPT. 2002)
501	BOREHOLE LOCATION (GEO-CANADA, AUG. 2001)
G-1	BOREHOLE LOCATION (GEO-CANADA, JUNE 1989)
204	BOREHOLE LOCATION (PETO, JUNE 1988)
ST,A,B	BOREHOLE LOCATION (PETO, JAN. 1981)
SD,F	BOREHOLE LOCATION (PETO, SEPT. 1972)
29	BOREHOLE LOCATION (PETO, 1970)
TBM	TEMPORARY BENCHMARK (EL 79.4 m)

NOTES

1. BASE DRAWING, EXTRACTED FROM REPORT "PLANT 3 AT EXPANSION.PDF (PAGE 12)", PROVIDED BY CIMA+, DATED: JUNE 8, 2022.

0 20 40 60 80m
APPROXIMATE SCALE

CLIENT LOGO

CIMA+

CLIENT

CIMA+

wsp
WSP E&I Canada Limited
50 Vogell Road, Units 3&4, Richmond Hill, Ontario, L4B 3K6

DWN BY:	KW
CHK'D BY:	SM
DATUM:	-
PROJECTION:	-
SCALE:	AS SHOWN

TITLE
SITE AND BOREHOLE LOCATION PLAN

PROJECT
GEOTECHNICAL INVESTIGATION REPORT
PLANT 3 PRIMARY CLARIFIER ODOUR MANAGEMENT
G.E. BOOTH WASTEWATER TREATMENT PLANT (WWTP)
MISSISSAUGA, REGIONAL MUNICIPALITY OF PEEL

REV. NO.:	-
DATE:	SEPTEMBER 2022
PROJECT NO:	OGTE2201
CONTRACT NO:	-
FIGURE No.	1

F:\2022\OGTE2201 – CIMA – Geo Inv_GE Booth\CAD\OGTE2201_PLANT_3_SITE_AND_BH_PLAN_26SEPT2022_FIG1.dwg – Layout1 – Sep. 27, 2022 8:46am – kent.wong

Appendix G:

Phase 1 Environmental Site Assessment (ESA) Report

Prepared By:

GM BluePlan ENGINEERING

The Regional Municipality of Peel

Phase One Environmental Site Assessment G.E. Booth Wastewater Treatment Plant

GMBP File: 719051
November 2020

Region of Peel working with you

GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
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PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

G.E. BOOTH WASTEWATER TREATMENT PLANT, CITY OF MISSISSAUGA

NOVEMBER 2020

GMBP FILE: 719051

1. INTRODUCTION AND BACKGROUND INFORMATION

GM BluePlan Engineering Limited (GMBP) was retained by the Regional Municipality of Peel (hereafter referred to as the "Client") to undertake a Phase One Environmental Site Assessment (ESA) for the property located at the civic address 1300 Lakeshore Road East, City of Mississauga, Ontario (hereafter referred to as the "Site").

The Site is approximately 38.6 hectares (95.5 acres) in size and is located at the southeast corner of the City of Mississauga, along the shoreline of Lake Ontario, as seen on Figures 1 and 2. The Site is utilized for the operation of the GE Booth Wastewater Treatment Plant (formerly known as the Lakeview Sewage Treatment Plant). The Site is currently owned by the Region of Peel and is operated by the Ontario Clean Water Agency (OCWA). The Site operates as a Class IV Wastewater Treatment facility under Ontario Regulation 129/04, and under the Environmental Compliance Approval #5461-AWWQUL.

The Phase One ESA was undertaken to identify the potential and/or actual environmental concerns or risks associated with the Site resulting from current and/or historical land uses on the Site and the neighbouring properties. This Phase One ESA is being conducted to support the Schedule C Class Environmental Assessment (EA) and therefore is not required to support a Record of Site Condition (RSC) under the Ontario Regulation (O.Reg) 153/04 (as amended).

2. METHODOLOGY

The Phase One ESA was conducted in general accordance with the guidelines of the Canadian Standards Association (CSA) as presented in Report No. Z768-01, Phase One Environmental Site Assessment (November 2001). The purpose of a Phase One ESA is to identify actual and potential environmental concerns or risks associated with the Site. These environmental concerns may be the result of current or historical uses of the Site or surrounding properties. The Phase One ESA process involves the review of documents, maps, interview(s) with persons with knowledge of the property and other recorded information in conjunction with the observations of a reconnaissance visit to the Site by the Assessor. Based on the information gathered, an assessment of the potential environmental concerns can be made and, if warranted, recommendations offered for further investigation. The available records were reviewed and the reconnaissance visit follows.

Background physiographic, geological, hydrogeological and topographical information for the Site and the surrounding area was assembled from several sources including the City of Mississauga Interactive Online Mapping Tool, the Technical Standards and Safety Authority (TSSA), the Ministry of Environment, Conservation and Parks (MECP), publications from the Ontario Geological Survey and others.

Aerial photographs of the Site and surroundings were obtained from the Environmental Risk Information System (ERIS) for the years 1931, 1946, 1950, 1960, 1978, 1980, 1999, and 2015. Aerial photographs were assessed for indication of historical land uses and identification of relevant land features. Copies of reviewed aerial photographs are provided in Appendix A.

Fire insurance plans (FIPs) were also requested from ERIS. The subject property and the surrounding areas were outside of the available coverage provided by FIPs at the time of their publication (1960).

A search of the City Directory records for the City of Mississauga in the vicinity of the Site was requested from ERIS to ascertain occupancy for the Site and surrounding properties. A summary of the reviewed City Directory records as provided by ERIS is enclosed in Appendix B. However, it shall be noted that, due to the on-going pandemic (i.e. COVID-19) at the time of this investigation, libraries containing City Directories were closed limiting the coverage of City records provided by ERIS.

An environmental risk report was requested from ERIS (ERIS report) to review available historical and environmental databases and provide information on reported spills, registered waste generators and fuel storage tanks. The ERIS report covered a search area extending at a 250 m radius from the property. The ERIS Report is provided in Appendix C.

The Ministry of the Environment, Conservation and Parks (MECP) Waste Disposal Site Inventory (MOE, 1991) was reviewed to identify closed and active waste disposal sites in the vicinity of the Site. A summary of the landfill inventory database is included in Appendix D. The MECP Freedom of Information (FOI) request was filed to obtain records of environmental nature pertaining to the subject property. A response from the FOI office of MECP was not received at the time this report was issued. Once it is received, if the response indicates records of environmental significance, these will be provided under a separate cover.

The Fuels Safety Division of the Technical Standards and Safety Authority (TSSA) was contacted for review of their records on underground and aboveground fuel storage tanks on the Site and on select neighbouring properties. The TSSA response is included in Appendix E.

The City of Mississauga Schedule B Zoning Bylaw 0225-2007 was reviewed to gather information about current land uses at the Site and the neighbouring properties. Applicable zoning map and information is provided in Appendix F.

The MECP Record of Site Condition (RSC) Registry was reviewed to determine whether a Record of Site Condition has been submitted for the Site or its neighbouring properties. A Record of Site Condition is required to be completed as part of the process of transitioning a property of former industrial/commercial land use into one of residential, parkland, agricultural or other land use for which a more stringent environmental quality standard is applicable. As such, presence of a Record of Site Condition and associated environmental investigations for a particular property may provide information on potential for environmental impacts or risks to adjacent properties.

Reconnaissance of the subject property was completed on September 23, 2020 by Abdirahman Faarah, B. Sc. of GMBP and Cory Young B.Sc. of GMBP. GMBP was also accompanied by Cindy Kambeitz from the Regional Municipality of Peel (RMOP) during the Site visit, who provided information on the activities occurring on-Site (both current and historic). Photographs of the subject property and surrounding properties were taken during the reconnaissance and select photographs are included in Appendix G.

3. PHASE ONE ESA FINDINGS

The findings from the records search, additional studies and the site reconnaissance were compiled and are presented herein. For the purposes of clarity in discussion:

- The direction north (”project north”) shall be taken to be in the direction along Hydro Road toward the Lakeshore Road East right-of-way.
- The term “Study Area” shall refer to the Site and those lands located within 250 m of the Site boundary.

3.1 Site Location and Description

The subject Site is located at the civic address 1300 Lakeshore Road East, Mississauga and is situated along the coast of Lake Ontario (refer to Figure 1 and 2). The Site is situated within an industrial land use setting.

Industrial properties line the north side of the Site. Residential properties are also observed further north of the Site, on the opposite side of the Lakeshore Road East right-of-way. Bordering the Site to the west is an area of open space (i.e. no buildings). The Site is bordered to the south by Lake Ontario and to the east is undeveloped greenspace used as a community trail way.

The Site is further described as:

- Part of Lot 5, Concession 3, South of Dundas Street, Geographic Township of Toronto

The subject property is comprised of numerous structures associated with the workings of the wastewater treatment plant (WWTP). Those structures include several treatment tanks known as clarifiers, aeration tanks, waste activated sludge tanks (WAS), anaerobic digesters, boilers, and a large smokestack associated with the on-Site incinerator. The Site also consists of lagoon areas to the south of the site used to settle and store the ash slurry generated from the incinerators. The effluent (treated wastewater) produced on-Site is discharged to Lake Ontario via a 1.6-kilometre outfall pipe.

3.2 Site Physiography, Geology and Hydrogeology

Geologically, the Site is located in the physiographic region known as the “Iroquois Plain”, which is located within the footprint of the former Lake Iroquois. This region is characterized by fine-grained lacustrine deposits (i.e. deep-water deposits) as well as sandier beach deposits located along the shoreline of the ancestral lake (Chapman and Putnam, 1984).

Overburden stratigraphy in the general vicinity of the Site is reported to consist of interbedded diamicton, gravel, sand and silty clay known as the Halton Till (Karrow, 1967). Based on the physiographic and quaternary mapping (Figures 3 and 4), the Site appears to be located on a bevelled till plain landform and the surficial soils in the general vicinity of the Site are reported to consist of Halton Till as well as course-grained glaciolacustrine deposits (Chapman and Putnam, 1984).

From the review of available MECP well records in the vicinity of the Site, the shallow soils are reported to consist of sand and gravel from surface to a depth of approximately 15.2 metres below ground surface at the deepest on-site monitoring well. However, in contrast, the well records located at the neighbouring adjacent properties describe the surficial soils as silt and clay. It is possible that the sand and gravel soil identified by the on-site well records is attributed to A-Gravel and B-Gravel used for the backfilling of the various subsurface infrastructure associated with the WWTP, as this prevalence of and sand and gravel is not observed beyond the Site.

The bedrock in the south Mississauga area is the Ordovician age shale of the Georgian Bay Formation (Jagger Hims, 1998; MECP, 2019c).

Hydrologically, the Site is bordered to the east by Applewood Creek and to the west by Serson Creek. Both of these creeks run parallel to the Site boundaries and both discharge into Lake Ontario. Serson Creek also intersects with an on-Site stormwater management pond located at the southwest of the Site.

Shallow groundwater flow often correlates to topographical features and groundwater typically flows towards nearby lakes, streams, and wetland areas, except where modified by utility and service trenches. Based on the close proximity of Lake Ontario to the Site, the shallow groundwater flow direction in the overburden is inferred to be south in the direction of Lake Ontario.

While the groundwater flow direction is inferred for the Site, an accurate assessment of groundwater flow direction can only be completed through the installation of an appropriate number of groundwater monitoring wells and regular water level measurements to establish local groundwater flow patterns with more certainty.

3.3 Water Well Records

There are 22 MECP well records identified on the Site: nine (9) records are reported to be used for dewatering purposes, five (5) for monitoring wells, six (6) records are for decommissioned/abandoned wells, and two (2) records are not specified/unknown.

3.4 Historical Uses of the Site and Surroundings

Information about the historical land use of the Site was gathered from several sources including aerial photographs (Appendix A), City Directory listings (Appendix B), as well as other available historical records and information reported from other sources, as discussed herein. The findings from these sources are presented to illustrate the historical land use of the Site and its surroundings to aid in the identification of areas of potential environmental concern.

3.4.1 Aerial Photographs

A review of aerial photographs from the years 1931, 1946, 1950, 1960, 1978, 1999, and 2015 was completed to assess historical land use of the subject Site and surrounding areas. Copies of aerial photographs are enclosed in Appendix A.

In the 1931 aerial photograph, the Site is undeveloped and appears to be used for agricultural purposes. There are no visible building structures on the Site. The southern portion of the Site remains inundated by Lake Ontario at this time (i.e. "made ground" has not been built up). In the vicinity of the Site, there appears to be a few residential dwellings along Lakeshore Road West and agricultural properties to the east and west.

In the 1946 aerial photograph, the only observable change is a single residential dwelling can now be seen on the subject site, to the southeast. New industrial developments are observed to the north and east; the west of the Site remains undeveloped.

In the 1950 aerial photograph, no further changes are observed at the site. Increased residential and industrial developments are observed to the north of the Site, along Lakeshore Road East.

In the 1960 aerial photograph, no changes are observed to the Site itself, however the property neighbouring to the west is now developed into an industrial property inferred to be the Ontario Power Generation (OPG) Coal Powered Lakeview Generating Station.

In the 1978 aerial photograph, the Site has now been developed into the WWTP. Numerous structures associated with the workings of the WWTP are observed, as well as two smaller lagoon areas to the east and a large lagoon to the south. Some "made ground" has been built up, extending the lakeshore southward in the southwestern part of the Site, indicating placement of fill in that area. To the west of the Site, the Lakeview Generation Station can now be observed with more clarity- the land on this property, directly adjacent to the Site appears to be used to stockpile a vast amount of coal intended to be burned to create energy. A large building and numerous smokestacks can also be observed as well.

No significant changes are observed in the 1980 aerial photograph.

In the 1999 aerial, the operations at the WWTP appear to have expanded - an increase in structures is observed. The lagoon areas to the east of the Site have now been replaced with treatment tanks, while the lagoon to the south still remains.

In the 2015 aerial photograph, the large lagoon to the south has now been separated into three smaller lagoons. No further changes to the Site are observed. The structures associated with the Lakeside Generating Station have been demolished. The area adjacent to the Site (i.e. the area previously used to stockpile coal) is now vacant and revegetated. To the south of the Site, additional fill has been placed to expand the "made ground" area for the construction of what appears to be a new lagoon off-Site.

3.4.2 City Directory

The City Directory records for the Site and the neighbouring properties (available through ERIS) dating back to 1962 were reviewed in approximate 5 to 10-year increments (Appendix B). Based on review of the available records, the first registered listing for the Site appears to be in 1962 and is listed as the Ontario Lakeview Sewage Treatment Centre. In 1973, the Site is listed under Gore and Storrie Limited, an engineering consultant who worked on the design of the Lakeview Sewage Treatment Centre. In 1985, a few sub-contractor companies are also listed under the Site address.

In addition, the available City Directory coverage provided records for the addresses along Lakeshore Road East (1180-1310). The records indicate numerous commercial and industrial occupants on these properties throughout the years, starting from 1962 and so on.

Further details of the City Directory listings for neighbouring properties are presented in the City Directory summary enclosed in Appendix B.

3.5 ERIS Report

The Environmental Risk Information System (ERIS) report compiles information from over 50 private and public databases relevant to environmental risk. The databases store information such as, but not limited to, reported spills, waste generators registered under Ontario Regulation 347, fuel storage tanks (private, retail, historical, and others), MECP orders, compliance and convictions. The available environmental database search was requested for the Site and surrounding properties within a 250 m radius of the Site. Numerous records were identified for the Site and are summarized in the Table 1. Select records from the ERIS report that can be considered potentially contaminating activities (PCAs) are summarized below:

The ERIS Report provided records of 68 spills that have occurred on-Site registered with the MECP. 55 out of 68 of these reported spills are associated with the release of wastewater/effluent to the environment, either by accidental release at the outfall to Lake Ontario or from the overflow of tanks or leaking pipes on Site. The accidental releases occurring into Lake Ontario are outside of the purview of this Phase One ESA as they do not directly affect the environmental integrity of the Site. The spills of wastewater to land that have occurred on-Site are understood to have been addressed through the WWTP's spill response protocols. However, any remaining impacts to land are expected to further biodegrade in the subsurface.

As noted in Table 1, the ERIS Report also provided information on a spill that involved the release of approximately 1000 L of petroleum fuel to the asphalt surface, when a fuel truck driver overfilled an underground fuel storage tank. This reported spill is discussed in more detail in Sections 3.6.3 and 4.2 of this report.

Two minor spills of ferrous chloride to the surface were also reported during the refilling of storage tanks on-Site. These spills were reportedly a relatively small quantity and the iron and chlorine that constitute the ferrous chloride are not expected to cause significant impacts to the soil and groundwater on-Site.

The other reported spills pertain to the accidental release of natural gas to the atmosphere – which is not anticipated to impact the soil or groundwater on-Site

The ERIS report provided records from the O.Reg. 347 Waste Generators Summary indicating that the Site generates various types of wastes. In addition, the Site is also listed in the National PCB Inventory for PCB storage on-Site. The Site was visually assessed for any potential wastes generated or stored on-Site and these topics are discussed more fully in Section 3.7 and Section 4 of this report.

The ERIS report also identified numerous records for the neighbouring properties within 250 m of the Site. A more detailed discussion of the records attributed to off-site or neighbouring properties is provided in Section 3.8.2 of this report. The ERIS report with further details on the identified records is enclosed in Appendix C.

3.6 Other Records Review

3.6.1 Ministry of Environment, Conservation and Parks

A request to the MECP was filed to acquire available records under the Freedom of Information (FOI) and Protection of Privacy Act. A response from the MECP FOI office was not received at the time of writing this report. If the FOI reveals details of environmental significance, it will be submitted under separate cover. A search of the 1991 Waste Disposal Site Inventory (Appendix D) revealed no records of active or closed disposal sites within a 5-kilometre radius of the Site, prior to the year 1991.

The MECP Record of Site Condition (RSC) Registry was reviewed on August 18, 2020 for RSC sites on the following streets:

- Lakeshore Road East, Mississauga
- Hydro Road

One record for the property 1260 Lakeshore Road East was identified for filing an RSC in 2008 (RSC ID: 45431). The property usage was proposed to be changed from commercial and to become residential. The RSC record indicates that a Phase One ESA and a separate Underground Storage Tank Investigation were completed as part of this filing. The soil on the property was sampled for volatile organic compounds (VOCs) and petroleum hydrocarbons (PHCs) and all parameters were reported to be below laboratory detection limits. No remedial actions were undertaken as part of the RSC submission.

A review of the Environment Canada's National Pollutant Release Inventory (NPRI) database revealed one record attributed to the Site and is registered under the Ontario Clean Water Agency for the operation of the G.E. Booth WWTP which reportedly releases various pollutants to the air and the following pollutants to water: 86 tonnes of Ammonia (total), 2,226 Tonnes of Nitrate, 73 tonnes of Phosphorous, and 250 kilograms of Selenium. This reported release to water is presumably the release of these pollutants to Lake Ontario, which is the final discharge location of treated wastewater from the Clarkson Plant.

3.6.2 TSSA Fuel Safety Division Database

A request for information was submitted via e-mail to the Technical Standards and Safety Authority (TSSA) to search the Site and select nearby properties to identify records of fuel storage. The e-mail query and response from TSSA are included in Appendix E.

The response from the TSSA revealed one (1) record of an active fuel oil tank existing on the subject Site. The records search did not provide any other records within the study area of this Phase One ESA.

3.6.3 Reports of On-Site Fuel Spill

In 2015, a spill occurred on the Site when a truck operator overfilled an underground fuel storage tank when refuelling, causing diesel fuel to spill onto the asphalt surface and drain into a nearby stormwater catch basin. This spill is mentioned in the ERIS report which further describes the spill as 1000 L of diesel fuel. The RMOP representative who accompanied GMBP during the site reconnaissance confirmed that the UST involved in this spill is located at the west exterior wall of the Thermal Oxidation Building and has since been abandoned and is no longer in use for fuel storage; however, the tank still remains underground. The diesel fuel drained into a nearby stormwater catch basin which discharged the captured diesel fuel to a stormwater drainage outfall located at the southwest corner of the WWTP, where a stormwater management pond exists. The Ministry of Ontario Spill Action Centre and the Region of Peel's Environmental Control were notified of this incident. Green for Life (GFL) was also contracted for clean-up and remediation of the diesel fuel spill and began work immediately. The asphalt surface and catch basin were vacuum-trucked and power washed, and the storm sewer was then flushed. The diesel fuel in the pond was boomed to restrict further movement through the pond and was skimmed. Finally, the immediate outfall area was also cleaned and rebuilt, and the affected asphalt area was also replaced with new asphalt.

In 2017, additional remediation was conducted when soil impacts, presumably caused by the 2015 diesel fuel spill were identified at the drainage outfall area where the storm service discharges. The identified contaminants were PHCs (F1-F4 fractions), toluene and xylene. Subsequently, a focussed excavation in the drainage channel was completed to remove impacted soil and surface water attributable to the diesel fuel spill. Based on the field work and confirmatory sampling, it was concluded that the soil and surface water had been appropriately remediated. However, it should be noted that other impacts of heavier PHC fractions (i.e. F3 and F4) were identified that were not attributable to the diesel fuel spill. These impacted soils were not remediated and were left in the stormwater management pond.

Please refer to Appendix H for the incident reporting at the time of spill and the additional remediation work completed at the stormwater discharge location.

3.7 Site Zoning and Permits

The zoning maps from the City of Mississauga were reviewed to obtain information about the current land uses of the Site and adjacent lands. Applicable zoning maps are provided in Appendix F.

The Site itself is zoned as a Utility, Institutional, Development, Buffer and Airport Zone (U-zone, U-1). The operation of a sewage treatment facility is a land use activity that is consistent with this zoning designation. The neighbouring property to the west is also zoned as U-1 and the property neighbouring the Site to the northeast is zoned as a Greenland Zone (G1). The adjacent properties to the north of the Site are predominately zoned Exception Zones (E) which enable the use of the properties for various industrial activities.

3.8 Site Reconnaissance

Site reconnaissance was conducted by Mr. Abdirahman Faarah B. Sc., G.I.T. and Cory Young B.Sc., C.Tech, of GMBP on September 23, 2020. The weather conditions were recorded as clear skies with temperature near 21°C. Select photographs from the site reconnaissance are provided in Appendix G.

3.8.1 Site Description

The Site is accessed directly from via a gated entrance on Lakeshore Road East. There are paved roadways that provide access to the different locations throughout the Site. The Site mainly comprises of three plants, each of which consists of primary clarifiers, aeration tanks, and secondary clarifiers. The Site also consists of the following buildings that are in association with the wastewater treatment process: Headworks Building, Administration Building, Grit Facility, Emergency Generator Building, Ferrous Chloride Building, Maintenance Building, TWAS Facility, Thermal Conditioning Facility, Solids Receiving Building, Solids Handling Facility, Thermal Oxidation Building and Incinerator, Disinfection Building, and Oil Handling Facility. Please refer to Appendix I for a Site plan showing the building layouts on Site.

At the south portion of the Site, two smaller ash lagoons and one larger ash pond were observed which are used as a capture and disposal method for the ash generated on-Site from the incinerator. The larger particulates in the ash settle out of the water and when the lagoon is full, the settled ash is removed and hauled to a landfill site for final disposal. During the Site visit, Ash Lagoon Number 2 located to the southeast was not being utilized at the time. Red soil was observed along the base and walls of the lagoon: this is reportedly caused by the iron from the ferrous chloride added to the wastewater during the treatment process. Further south of the lagoons, a large berm was observed spanning along the southern property boundary with some minor vegetation growing from it. Crushed brick and slag appeared to be the primary materials that were used to create this berm.

To the west of the Site, adjacent to Plant One’s primary clarifier tanks and the Raw Sludge Pumping Station #2 building, a waste oil AST was observed placed outside. The tank appeared weathered and aged as rust was observed around it. The tank was equipped with a vacuum pressure gauge that, at the time of site visit, exhibited positive pressure within the tank. The tank was also placed within a metal secondary spill containment unit, creating separation from the ground surface. No evidence of stains or leaks were observed on the tank or within the secondary containment unit.

Adjacent to this waste oil AST, a groundwater monitoring wells was observed, finished with a flushmount casing. A total of 6 other groundwater monitoring wells were observed on-Site:

- one located at the northeast corner of the Site, adjacent to Plant 3;
- one located within the visitors parking lot at the centre of the Site,
- one downgradient and adjacent to the administration building,
- one downgradient and adjacent to the maintenance building,
- one downgradient and adjacent to the thermal oxidation building,
- and one at the southern property boundary on the opposite side of the berm.

These groundwater wells are reportedly utilized to monitor groundwater level for construction dewatering purposes on-Site – analytical data was not available for assessment in this report.

<u>Headworks Building & Grit Facility</u>

The Headworks Building is where the beginning of the wastewater treatment cycle begins. When wastewater enters the WWTP, it goes through preliminary treatment here, which includes different mechanical screens to remove larger objects as well as small grit particles. Materials caught by these screens are cleaned, dewatered, and then trucked away to an appropriate landfill.

The Headworks Building and Grit Facility could not be accessed due to on-going construction occurring at this area of the Site, during the Site visit.

Administration Building

The Administration Building was observed to be used as an office space for the WWTP staff. It also previously served as a miniature chemical laboratory in the past. During the Site visit, the laboratory space was observed to be small-scale, confined to a single room, and appeared to be no longer in use. No chemicals or laboratory equipment were observed here.

Emergency Generator Building

The Emergency Generator Building was historically used to house two emergency generators. These generators have since been decommissioned and are no longer present. The building has been abandoned and is entirely vacant. The two generators were placed on individual concrete platforms, creating separation from the tile finished floor (overlying concrete). Exhaust fans were observed on the ceiling of the building that were presumably connected to the generators. The floors in the building appeared to be in good condition with no major cracks observed. Observations did not indicate evidence of historic fuel tanks or staining on the floors and walls.

Ferrous Chloride Building

The Ferrous Chloride Building is where wastewater effluent is treated with ferrous chloride to reduce the phosphorous load in the wastewater. This reaction causes iron and phosphate to precipitate: ultimately these precipitates are disposed of alongside the processed solid waste via the incinerator.

Ferrous Chloride is delivered to the Site by trucks and is stored in 8 separate tanks just outside of the Ferrous Chloride Building. Each of these tanks are placed within concrete secondary containment barriers, providing separation from the ground and containing any spilled substances. No evidence of stains was observed in the tanks or in the secondary containment barriers. The inside of the ferrous buildings consists of a network of pipes that distribute the ferrous chloride to other locations on the Site.

Maintenance Building

The Maintenance building was observed to be used as an equipment and material storage area as well as a repair and maintenance shop. A storage locker was observed within the building that contained neatly organized shelves of commercial cleaning products and spill response materials. The locker also contained tools and general equipment used by the maintenance workers (i.e. fall harnesses, step ladders, tools).

The shop area of the building contained multiple industrial machinery (e.g. welding equipment, mechanical saws and compressors) used for the repair and maintenance of the WWTP equipment (e.g. valves, pipes, gear boxes). Various pails of lubricant and hydraulic oils used for the upkeep of the mechanical equipment was observed in the shop area. The shop contained concrete floors with no visible major cracks, however multiple floor drains were observed in the work area. The floor also exhibited dark stains in the work area, typical of machining and repair facilities. Outside of the building, two manhole chambers were observed, one labelled as a sanitary service and. The other manhole which comes before it, is assumed to be an oil and grit separator. A monitoring well was also observed adjacent to the sanitary service manhole, and downgradient of the building.

Abandoned TWAS Building

The TWAS building is where sludge produced from the clarifiers was further processed in the past. Flocculant polymer and ferrous chloride are added to the sludge here in order to thicken the sludge so It can be handled easier when transferring solid waste to the incinerator.

At the time of Site visit, the TWAS building was decommissioned and abandoned and the building is scheduled for demolition. Access to the building was not available because it is located in an active construction zone. Therefore, site reconnaissance was not completed on the interior of this building.

Thermal Conditioning Facility

The Thermal Conditioning Facility was observed to be used to house a 1000 kVA diesel powered indoor generator. The Generator was observed to be placed on top of a concrete platform, providing separation from the ground surface. Adjacent to the generator was an associated fireproof, double-walled, above ground fuel storage tank. The storage tank was also placed on top of a concrete platform but was located in a narrow space between the wall of the building and the generator: This created a confined space condition and thus limited access to the tank. However, no evidence of spills or stains were observed in the general vicinity of this AST. Overall, the building floors were also finished with concrete with no major cracks or stains observed. Outside of the north exterior wall of the building, a second diesel fuel, fireproof, double-walled AST was observed, with piping leading into the Thermal Conditioning Facility. This AST contains a maximum volume of 6000 L of diesel fuel. The tank was placed on top of a concrete platform that exhibited some dark staining on it. However, this staining was limited in extent and likely is the result of some minor spill during refuelling of the tank.

Solids Handling Facility

The Solids Handling Facility is where the solid materials separated by the clarifiers is further processed by thickening and dewatering, to reduce the liquid content of the sludge. This is completed to increase treatment capacity and prepare the material for incineration. Polymers are also added to the solids here to increase thickening and dewatering efficiency.

Four large decant tanks were observed here from the outside of the building. These tanks allow for further flocculation and coagulation of the solids prior to dewatering. The inside of the building consisted of a series of centrifuges and a network of pipes transporting solids through the thickening and dewatering process. Numerous drums and pails of hydraulic and lubricant oils were observed here, inferred to be used for the upkeep of the machinery observed within the building. The floors in the building were finished with concrete with no major cracks and only minor stains observed in the vicinity of the oil drums. Floor drains were observed in the building, but it could not be determined where they drain to.

Thermal Oxidation Facility

After thickening and dewatering of the solids has occurred, the solids are sent to the Thermal Conditioning Facility for incineration. Due to the nature of the work completed here, the inside of the building was not accessed.

However, on the outside of the building to the east, an underground fuel storage tank was identified. The RMOP representative who accompanied GMBP during the Site visit stated that this UST has been abandoned and is no longer in use, but the tank still remains underground. The RMOP representative also stated that a spill of fuel oil occurred here when a truck operator refueling the tank overfilled the tank causing a spill to the ground surface. The Ministry of Ontario Spills Action Centre was notified, and some form of remediation was completed. The RMOP representative stated that the potentially impacted soil where the fuel spread was disposed of off-Site and the asphalt surface was replaced. Any reporting or documentation concerning the remediation was requested by GMBP and is discussed in this report in later Sections.

Oil Handling Facility

The Oil Handling Facility was observed to be used as a storage space for various hydraulic and lubricant oils used on-Site for the operation of the WWTP. Numerous drums and pails were observed placed on top of skids. The floor of the building was finished with concrete with no major cracks or stains observed on the ground. Floor drains were observed in the building as well. At the exterior of the building, a sanitary service manhole was observed alongside an oil and grit separator system connected to the floor drains in the building. A large waste oil AST described as a double-walled, vacuum monitored tank that contains a maximum volume of 12,000 L was also observed outside of the Oil Handling Facility. The AST was placed on top of a concrete platform, with no visible stains on the tank itself or on the floor in the vicinity of the tank. Adjacent to the AST, four totes on skids were observed labelled as waste oil and were placed on top of a spill containment trench, raised up off the ground. No stains were observed in the vicinity of the skids.

Disinfection Building

The disinfection building is where sodium hypochlorite and sodium bisulphite are stored on-Site. The sodium hypochlorite is used to chlorinate the effluent to reduce to bacteria content to acceptable levels. Near the end of the outfall, sodium bisulphite is then added to remove residual chlorine prior to the final release to Lake Ontario.

Both chemicals are stored in tanks within the building and are placed on top of fibreglass platforms creating separation from the ground. Spill response materials were also observed stored within the building. A sampling location where treated effluent is tested was also observed within the building.

3.8.2 Adjacent and Nearby Properties

Adjacent and nearby properties were observed from the Site and from public rights-of-way during the site reconnaissance. Adjacent neighbouring properties are shown on Figure 2. Further details of activities at the neighbouring properties are contained in the City Directory (Appendix B), ERIS report (Appendix C), with selected pertinent details discussed below. Selected photographs are presented in Appendix G.

North

1260 Lakeshore Road East

Neighbouring the Site to the north is the property 1260 Lakeshore Road East. This property is currently occupied by Mckenna Logistics Centre, who reportedly utilizes the property as a warehouse for its logistics and distribution business.

This property appears in the ERIS Report for records from the O.Reg. 347 Waste Generators Summary for the following substances: alkaline wastes, aliphatic solvents, halogenated solvents, and organic acids; all associated with the use of the property as a warehouse. The ERIS report also identified a Record of Site Condition (RSC) that was filed for this property in August 2008 – the property was proposed to be converted from a commercial property use to a residential property use.

1230 Lakeshore Road East

Also neighbouring the Site to the north is the property 1230 Lakeshore Road East that is currently occupied by Bluebird Self Storage.

The ERIS Report indicates that this property was previously utilized for manufacturing purposes. Multiple records from the O.Reg. 347 Waste Generators Summary were identified at this property for the following substances: aromatic solvents, petroleum distillates, halogenated solvents, emulsified oils, organic/inorganic laboratory chemicals, heavy metals, and paint/pigment/coating residues. This property was also previously registered with the NPRI as having released of some of the substances listed above as pollutants.

1200 Lakeshore Road East

The property 1200 Lakeshore Road East neighbors the Site to the north and is currently occupied by Cintube Limited – a metal fabricator.

The ERIS Report indicates that this property was historically utilized for manufacturing and has records from the O.Reg. 347 Waste Generators Summary for substances such as: waste oils and lubricants, emulsified oils, and amines. The property was also previously registered with the NPRI for release of manganese to all media and nitrogen oxides to the air. The ERIS report also identified an RSC that was filed for this property in November 2018. The RSC was conducted to facilitate a land use change from industrial to commercial.

1180 Lakeshore Road East

The property 1180 Lakeshore Road East neighbors the Site to the north and is currently occupied by Plasterform Inc. – a plastic and glass manufacturer. The property was formerly occupied by Mark IV Industries, an automotive parts manufacturer, and by Purolator Products Limited who reportedly used the property to store that fleet of vehicles over night.

The ERIS report provided records from the O.Reg. 347 Waste Generators Summary for substances such as: paint pigments/coating residues, aliphatic solvents, petroleum distillates, polymeric resins, and halogenated solvents, waste oils and lubricants, light fuels, and latex wastes. The ERIS report also provided records that the property was registered with the NPRI for release of various pollutants.

These neighbouring properties to the north are considered upgradient of the subject Site.

East

Neighbouring the Site to the east is Region of Peel owned land that is currently an undeveloped greenspace utilized as a community trail-way. Further east of this greenspace is the property 1352 Lakeshore Road East.

1352/1440 Lakeshore Road East

The property 1352 Lakeshore Road East (also formerly 1440 Lakeshore Road East) is currently occupied by the Small Arms Inspection Building (SAIB); which has been designated as a "Heritage Building". The SAIB currently functions as a historic museum, as well as a multi-purpose building that offers a wide range of arts and cultural programs. The property was historically used (circa 1935-1974) during World War I and II by the government to manufacture firearms for Canada's war efforts. Starting circa 1975, OPG utilized the property as a training and development centre for its employees. In 1992, the property was acquired by the Toronto and Region and Conservation Authority (TRCA) who in 2008, applied to the City of Mississauga for a demolition permit for the property. The property was then subsequently designated a heritage building and is planned to be re-purposed as a park space. The Eris report revealed records from the O.Reg. 347 Waste Generators Summary for substances such as: petroleum distillates, halogenated solvents, waste oils and lubricants, and organic/inorganic laboratory chemicals. The ERIS report also provided a record of a spill that occurred on the property that involved the release of 45 L of hydraulic oil to surface water during a discharge or bypass to a watercourse (i.e. Etobicoke Creek or Lake Ontario).

Based on the inferred groundwater flow direction (i.e. flowing in the direction of Lake Ontario), this property is considered to be crossgradient of the subject Site.

South

Directly south of the site, the expansion of the lakefront via artificial land infilling is ongoing. This newly created land is intended to become a community greenspace when completed. Further south of this area is Lake Ontario.

West

1082 Lakeshore Road East/ 800 Hydro Road

The property 1082 Lakeshore Road East (also listed as 800 Hydro Road) is the location of the former OPG Lakeview Power Generating Station. The plant was constructed circa 1958-1962 and was operational through to 2005. The plant generated electricity through the burning of coal. The coal was historically stored on-Site on a 16.25-hectare laydown area located directly adjacent to the Site. The Lakeview Power Plant was demolished in 2006 through to 2007 and the site has since been remediated and is proposed to be developed into a mixed-use residential community with a parkland. The ERIS report did not reveal any pertinent records for this property related to potential environmental impact to the subject Site.

During the Site visit, this property was observed to be vacant with no building structures on the property and had considerable plant overgrowth. Overall, no evidence of residual coal remaining on the property was observed. However. the condition of the surface soils could not be assessed for evidence of coal or associated stains due to the plant overgrowth.

Based on the inferred groundwater flow direction (i.e. flowing in the direction of Lake Ontario), this property is considered to be crossgradient of the subject Site.

For further details on the identified records at the neighbouring properties, refer to the ERIS report in Appendix C.

4. ASSESSMENT FOR AREAS OF POTENTIAL ENVIRONMENTAL CONCERN (APECS)

The information gathered from the site reconnaissance and the records search was reviewed to identify Potentially Contaminating Activities (PCAs) within the search area. These PCAs were then assessed in the context of additional available information, such as site setting and geology associated with the Site, to determine whether these should be considered as Areas of Potential Environmental Concern (APECs) relevant to the Site. An APEC is an item that presents an environmental concern with respect to environmental risk where further investigation is recommended. Additional information obtained as part of the Hydrogeological Study at the Site was used in the assessment of APECs. Please refer to Figure 5 for the APECs identified on-Site.

4.1 Fill Material

Historically, fill materials imported to construction sites were not necessarily scrutinized for quality and as such, deleterious fill materials could be deposited and potentially become an environmental concern and liability to a property.

Currently, the Site appears to be generally at grade with the adjacent properties to the north, east and west. However, based on a review of historical imagery and mapping, it appears fill was bought to the Site to expand the lakefront circa 1975, specifically in the southeast area of the Site where the ash lagoons and ash pond exist presently. The fill that was used here is of an unknown quality and is considered to pose a risk for potential environmental impact to the subject Site. In addition, south of the ash lagoons and ash pond, a relatively large berm exists that appears to be constructed from crushed brick and slag material, as seen during the Site visit. This berm is comprised of fill of an unknown quality and is considered to pose a risk for potential environmental impact to the subject Site (APEC #1).

APEC 1: Made Ground at Ash Lagoons/Ponds and Adjacent Berm

- Activity: Imported Fill of Unknown Quality
- Potential Contaminants of Concern: Metals, PAHs
- Media Affected: Soil

4.2 Fuel Handling and Storage Tanks

Fuel storage tanks are a frequent cause of environmental impacts. Leaking tanks may produce a long-term, continuous source of hydrocarbon products that may impact soils and groundwater, especially in the case of aged underground fuel storage tanks which did not have a reliable means of leak detection. Underground fuel storage tanks are also often accompanied by underground piping, which may also be susceptible to leaking and release of hydrocarbons. Additionally, fuel impacts may be found some distance away from a tank (whether aboveground or underground) in the vicinity of the fuel tank fill point.

4.2.1 On-Site

A total of four (4) above ground storage tanks (ASTs) were observed on-Site during the Site visit, two (2) of which were used to store diesel fuel and two (2) of which were used to store waste oil. In addition to these ASTs there is also an underground storage tank (UST) on-Site, which is no longer in use but is still in situ.

Both of the diesel fuel ASTs were located at the Thermal Oxidation Facility and are described as fireproof and double-walled. One of the tanks was located inside of the building, and the other was located outside at the northern exterior wall of the building with feed pipes leading into the building. The AST on the inside of the building was placed on a concrete platform, above the ground which was also finished with concrete. Direct access to this tank was not possible due to its placement in a confined space, however no evidence of stains or leaks were observed in its vicinity or on the ground. This AST is considered to be low risk for environmental impact to the Site. The AST located outside was also placed on top of a concrete platform, however a dark stain was observed on this platform, indicative of a minor spill that may have occurred when refuelling. Due to the limited extent of this dark stain, and the separation from the ground surface provided by the concrete platform, the potential for environmental impact to the soil and groundwater is considered to be low.

The two (2) waste oil tanks were above ground storage tanks observed were used for the storage of waste oils produced on-Site. One of these waste oil ASTs was located adjacent to the Raw Sludge Pumping Station #2 building. This AST was placed within a metal-walled secondary containment unit intended to capture any leaks or spills. The AST was also equipped with a pressure gauge that exhibited positive pressure within the tank during the Site visit. No evidence of stains or spills were observed on the tank or within the secondary containment unit.

The other waste oil AST was located outside of the Oil Handling Facility. This AST is described as a double-walled, vacuum monitored tank that contains a maximum volume of 12,000 L. The AST was placed on top of a concrete platform, with no visible stains on the tank itself or on the floor in the vicinity of the tank. Adjacent to the AST, four totes on skids were observed labelled as waste oil and were placed on top of a spill containment trench raised up off the ground. No stains were observed in the vicinity of the skids as well.

The inside of the Oil Handling Facility was observed to be used as a storage space for hydraulic and lubricant oils. Numerous drums and pails were observed on skids/pallets, collectively containing a variety of petroleum-based products. The floor of the building was finished with concrete and two floor drains were also observed inside: no evidence of spills or any staining was observed on the floors inside of the building. Furthermore, the ERIS report did not provide any records of spill occurring at the Oil Handling Facility. An oil and grit separator adjacent to a sanitary service manhole was observed at the exterior of the building, presumably connected to the floor drains within. Overall, the storage of oil inside of the building are considered to be low risk due to the clean conditions within the building and the presence of spill containment measures (i.e. floor drains connected to oil and grit separators) as well as no reported spills. Moreover, the building appears to have been constructed circa 2014 as seen on available aerial photos on the City of Mississauga website, eliminating the risk for historical impacts.

However, the presence of the waste oil AST and the four waste oil totes outside of the Oil Handling Facility are considered to pose a risk for potential environmental impact (APEC 2).

The UST on-Site has been reportedly abandoned and is no longer in use for the storage of fuel but remains in-situ. However, it has been previously involved in a spill resulting in 1000 L of diesel fuel escaping onto the asphalt surface and flowing into a nearby stormwater sewer. Soil remediation was conducted adjacent to the tank and at the stormwater management pond where the storm sewer discharges. During the remediation, heavy PHC fraction (i.e. F3 an F4 PHCs) impacted soil was identified within the stormwater management pond but was not remediated as it was not believed to be impacted by the diesel fuel spill. Therefore, based on this analytical data, the potential for impacts to still exist at the stormwater management pond remains and is considered to pose a risk for potential environmental impact to the Site (APEC 2). Furthermore, the UST still remains in the subsurface and there is potential that the tank may have leaked its remaining contents or that impacts adjacent to tank were not effectively remediated at the time of the reported spill. Therefore, the UST and areas adjacent to it are considered to be an area of potential environmental concern (APEC 3)

In summary, the following APECs have been identified concerning the fuel handling and storage occurring on-Site:

APEC 2: Oil Handling Facility Waste Oil AST and Totes
- Activity: Waste Oil Products Storage in Fixed Tanks
- Potential Contaminants of Concern: PHC F2-F4
- Media Affected: Soil

APEC 3: Reported PHC Impacts at On-Site Stormwater Management Pond
- Activity: Identified Impacts of PHCs at Pond
- Potential Contaminants of Concern: PHC F2-F4

- Media Affected: Soil

APEC 4: Abandoned UST and Diesel Fuel Spill

- Activity: Spill of Diesel Fuel to Surface During Refuelling
- Potential Contaminants of Concern: PHC F1-F4 and BTEX
- Media Affected: Soil and Groundwater

4.2.2 Off-Site

Both the ERIS report and the TSSA tank record search did not reveal any records of tanks on the adjacent properties within the study area.

4.3 Asbestos Containing Materials, Urea Formaldehyde Foam Insulation, Ozone Depleting Substances, Leaded Paint

Asbestos was widely used in variety of construction materials in the past. The use of asbestos containing materials (ACMs) in building materials was discontinued around 1985. Ontario Regulation 278/05 under the Occupational Health and Safety Act, 1990, defines ACMs as materials that contain 0.5 per cent or more of asbestos by dry weight. Federal and Provincial Occupational Health and Safety Acts, and the Workplace Hazardous Materials Information System (WHMIS), identify asbestos as a carcinogenic health hazard that is regulated. Because of these regulations, the production of asbestos containing materials has been widely discontinued since the mid 1980's.

Urea Formaldehyde Foam Insulation (UFFI) was installed primarily in wall cavities during the 1970s as an alternative to the typical insulation materials at that time. Its appearance can vary from white to tan in colour and resembles Styrofoam. Over time, UFFI that is exposed to the air, becomes wet, or has been damaged, can potentially release formaldehyde vapours, which can cause various human health effects. Due to the documented health concerns, the use of UFFI insulation was discontinued in 1980.

The most common ozone depleting substances (ODS) of concern are chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and halons, which were commonly used in air conditioning, refrigeration, and in the manufacture of rigid foam. The initial control of these substances was implemented in 1987 and the complete phase-out of these substances was finalized between 1994 and 1995.

Lead was used as an additive in paints prior to 1960 to make paint wear well and dry quickly and evenly. Leaded paint is a potential source of environmental impact or risk primarily if it is in poor condition and flaking. Most indoor and outdoor paints produced before 1950 contained substantial amounts of lead. Since 1976, the amount of lead in interior paint has been limited by law. Although the lead content of exterior paint is not regulated, Canadian paint manufacturers have voluntarily ensured that no lead is intentionally added. Exterior paint with lead carries a warning label.

A designated substance survey was reportedly previously completed on the Site. The findings of the survey concluded that ACM was found in the following buildings: Administration Building, Blower Building No.1 and No.2, Thermal Conditioning Facility, and the Thermal Oxidation Building. These findings of asbestos should be taken into consideration if any demolitions is to occur at the above listed buildings – as to prevent the spread of asbestos into the soil and groundwater on-Site. ACM materials should be removed and remediated by the appropriate parties, followed by another designated substance survey involving sampling of surfaces to confirm remediation.

During the current Site visit, UFFI, ODSs or leaded paint were not specifically identified at the Site. However, it is noted that there is historical evidence of ACM on-Site.

4.4 Polychlorinated Biphenyls (PCBs)

Between 1920 and 1978, PCBs were used extensively as a dielectric fluid in electrical transformers, motor capacitors, and fluorescent light ballasts. Current legislation prohibits the manufacture and sale of new equipment containing PCBs (1980).

The ERIS report provided records from Environment Canada and the MECP, that the Site was previously registered as a PCB storage facility. However, in conversations with Peel staff there is no evidence that the site was ever used for PCB storage. In addition, during the Site visit, no evidence of PCB storage was observed throughout the Site. Therefore, the ERIS records for PCB storage are not considered to pose a risk for potential environmental impacts to the Site based on the provided information.

Fluorescent lighting was observed in the on-Site buildings. Based on the age of the original building, the ballasts may contain PCBs, and should be handled and disposed of properly especially when observed to be leaking fluid.

4.5 Other Industrial Activities

4.5.1 Repair and Maintenance of Equipment On-Site

The Maintenance Building is used as a repair shop for equipment used for the operation of the WWTP. Dark stains were observed on the concrete floor of this building as well as at some of the floor drains. Outside of the building, a service manhole inferred to be an oil and grit separator was observed.

Repair facilities of this nature are known to produce contaminants such as heavy metals and PHCs. Therefore, the activities occurring at the Maintenance Building are considered to form an APEC on the subject Site (APEC 6).

APEC 5: Maintenance Building

- Activity: Repair and Maintenance of Equipment
- Potential Contaminants of Concern: Metals, PHCs F1-F4 + BTEX
- Media Affected: Soil and Groundwater

4.5.2 Chemical Manufacturing, Processing and Bulk Storage

The property 1260 Lakeshore Road East is occupied by Mckenna Logistics Centre who utilizes the property as a warehouse and distribution centre. From available aerial photos on the City of Mississauga Interactive Maps Tool, the property also appears to be used as a temporary parking space for brand new vehicles to be sold at a dealership. The ERIS report also provided records that the bulk storage of chemical products historically occurred at this property.

A review of the RSC site registry indicated that this property had previously filed an RSC to change the property usage from commercial to residential. This RSC filing included sampling of the subsurface soils for VOCs and PHCs and the results indicated that all parameters tested were below laboratory detection limits.

This property is located upgradient of the subject Site. However, based on the analytical data provided by the RSC record, the potential for environmental impact to the subject Site is considered to be low and therefore not considered an APEC.

4.5.3 Metal Fabrication

The properties 1230 and 1200 Lakeshore Road East are utilized, or have been historically utilized, as manufacturing facilities for metal fabricated products such as car parts and metal valves. The ERIS report provided records on these properties for producing various types of waste.

These properties are located upgradient of the subject site; however, these properties are also a considerable distance away from the Site (>150 m) and are separated from the site by an undeveloped greenspace area. Furthermore, the intervening soils are described as till (fine-textured) which hinders the mobility of potential contaminants. Therefore, these two properties are considered to pose low risk for potential environmental impact to the subject Site.

4.5.4 Firearms Manufacturing

The property 1352 Lakeshore Road East (formerly 1440 Lakeshore Road East) was historically used (during World War I and II) by the government to manufacture firearms for Canada's war efforts. Starting circa 1975, OPG utilized the property as a training and development centre for its employees. This property is considered to be located cross-gradient of the subject Site and is located approximately 200 m away – separated by a greenspace used as a trail way.

Based on the inferred groundwater flow direction (i.e. flowing in the direction of Lake Ontario), the separation distance, and the reported fine-textured soils, this property is not considered to pose a risk for environmental impact to the Site.

4.5.5 Coal-Fired Power Plant

The property 1082 Lakeshore Road East, also known as 800 Hydro Road, was previously the location of the Lakeview Coal-Powered Generating Station. The power plant generated electricity through the burning of coal and was in operation for approximately 43 years. The property is considered to be cross-gradient of the subject Site and the intervening soils are described as clay and silt; however, the coal laydown area was historically located in very close proximity to the subject Site. This introduces potential for risk of environmental impact to the subject Site and forms an APEC on the Site.

APEC 6: Former Lakeview Power Generating Station Coal Stockpile

- Activity: Electricity Generation
- Potential Contaminants of Concern: Metals and PAHs
- Media Affected: Groundwater

4.5.6 Treatment of Sewage

According to Ontario Regulation 153/04 (Table 2), a facility that treats more than 10,000 L/d of sewage is considered to be a Potentially Contaminating Activity. Given that the Site is a wastewater treatment plant with a throughput exceeding that threshold (and therefore that this activity occurs on-Site), the sewage treatment activity is considered to be an APEC with respect to the Site.

The Site is also host to two ash lagoons and an ash pond. Ash lagoons and ponds are known to be a good source for heavy metals and if they are not designed adequately with the appropriate landfill liners or if there is a spill due to overflow of the pond, the concentrations of heavy metals can impact the local soil and groundwater. No information pertaining to the construction of the ash pond/lagoons was obtained and so the potential for contaminant infiltration into the subsurface remains.

In addition, from the review of available aerial photos, it appears that the Site historically had lagoons located at the east area of the Site, where Plant 3 exists currently.

These two locations are the most likely to have been impacted due to wastewater activities and are considered APECs.

APEC 7: Existing Ash Lagoons and Pond

- Activity: Treatment of Sewage
- Potential Contaminants of Concern: Metals and PAHs
- Media Affected: Soil

APEC 8: Historic Lagoons

- Activity: Treatment of Sewage
- Potential Contaminants of Concern: Metals
- Media Affected: Soil

4.6 Registered Waste Generators

As indicated in the ERIS report (Appendix C), several records of registered waste generation were identified in at the neighbouring properties, as previously discussed in Section 3.8.

The MECP through the Environmental Protection Act and Ontario Regulation 347 sets out strict provisions for storage, registration, transport and disposal of generated industrial/hazardous wastes. If handled, stored and disposed of properly, as per current regulations, these registered wastes pose a limited environmental risk and limited potential for impacts to the subject properties. However, it is outside the scope of the current assessment to thoroughly study the waste handling and overall operations of the neighbouring and surrounding properties.

5. SUMMARY OF FINDINGS AND ASSESSMENT

A Phase One Environmental Site Assessment has been completed for the G.E. Booth Wastewater Treatment Plant, located at 1300 Lakeshore Road East. The findings of this assessment are summarized as follows:

- The subject Site has an approximate area of 38.6 hectares in size. The legal description of the lot is described as Part of Lot 5, Concession 3, South of Dundas Street, Geographic Township of Toronto
- The Site is zoned as a Utility, Institutional, Development, Buffer and Airport Zone (U-zone) under the City of Mississauga Schedule B, By-law No. 0225-2007. The adjacent properties to the north are zoned as Exception Zones (E) which enable the use of the properties for various industrial activities. The property to the east is zoned as a Greenland Zone (G1) and is used as a community trail way.
- Lake Ontario is located approximately 150 m south of the Site and is separated by a property currently under construction to become a community greenspace.
- Based on the geology of the Site conditions, the direction of shallow groundwater flow on the Site is inferred to be generally south toward Lake Ontario.
- The subject Site is currently occupied by the G.E. Booth Wastewater Treatment Plant that operates as a Class IV Wastewater Treatment facility under Ontario Regulation 129/04, and under the Environmental Compliance Approval #5461-AWWQUL.
- Based on historical mapping, the subject Site and adjacent properties were used for residential and agricultural purposes, prior to their use as industrial.
- Two diesel fuel ASTs were observed on the subject Site – one inside the Thermal Conditioning Facility building, and the other located just outside, at the northern exterior wall of the building. Both ASTs were observed to be double-walled, fireproofed, and placed on top of concrete platforms, providing separation from the ground. Besides some minor dark stains observed on the concrete platform of the outside tank, the tanks appeared to be good condition with no evidence of leaks.
- A waste oil AST was observed outside of the Raw Sludge Pumping Station #2 building. This AST appeared to weathered and aged, with rust and deteriorating paint observed on the tank. However, this AST was equipped with a pressure gauge that exhibited positive pressure within the tank and was also placed within a secondary containment unit that had walls, intended to capture any spills and leaks. Both the tank and the secondary containment unit did not exhibit any evidence of stains from waste oil.
- The Oil Handling Facility was observed to be used as a storage space for various hydraulic and lubricant oils used throughout the Site. Numerous drums and pails were observed within the building placed on top of skids. The floors of the building were finished with concrete and also contained a couple floor drains. No evidence of spills or leaks were observed within the building.
- Outside of the Oil Handling Facility, a 12,000 L waste oil AST was observed placed on top of a concrete platform. This AST is described as a double-walled, vacuum monitored tank. No evidence of spills, leaks, or stains were observed in the vicinity of this AST. Furthermore, adjacent to this AST were four totes on skids labelled as waste oil. The totes were placed on top of a subsurface secondary containment chamber with a molded fibreglass grated inlet intended to capture any spill or leaks associated with these waste oil totes.
- At the southern area of the Site, two ash lagoons and an ash holding pond were observed to exist here. Ash lagoons and ponds are known to be a source of heavy metals impacts and if they are not designed

adequately with landfill liners or if there is a spill due to overflow of the pond, the concentrations of heavy metals can impact the local soil and groundwater.

- Based on available historical mapping of the Site, the southern portion of the Site (i.e. where the ash lagoons and the large berm are) appears to have been constructed with fill to expand the lakefront of the Site. During the Site visit, crushed concrete and slag material was observed all along the surface of this area. Therefore, this fill material is of an unknown quality.
- The ERIS report provided a record of a spill that occurred on-Site involving a fuel oil UST. The spill resulted in approximately 1000 L of diesel fuel being released to the asphalt surface and into a nearby stormwater catch basin. This stormwater service discharged the diesel fuel to an on-Site stormwater management pond located at the southwest corner of the Site. Remediation and confirmatory sampling were competed in the past to mitigate impact to the asphalt, the storm service and the stormwater management pond. Subsequent reporting indicated that the diesel fuel was successfully remediated from all impacted areas. However, the UST, though abandoned, remains in the ground. Moreover, elevated heavier PHC fractions were identified at the discharge outfall and stormwater management pond that were not attributable to the diesel fuel spill.
- The neighbouring properties to the north are reportedly utilized for industrial purposes. The ERIS report provided records for each of these properties from the O.Reg. 347 Waste Generators Summary for various types of waste. Based on the inferred groundwater flow direction, these northern properties are considered upgradient of the subject Site.

6. CONCLUSIONS AND RECOMMENDATIONS

This Phase One Environmental Site Assessment (ESA) was completed to identify potential and/or actual environmental concerns associated with the Site resulting from land use activities, whether current or historical and whether those occurred on-Site or on nearby lands. This Phase One ESA was conducted to support the G.E. Booth WWTP Schedule C Class Environmental Assessment; and therefore, not required to support a Record of Site Condition (RSC) under Ontario Regulation (O. Reg.) 153/04 (as amended).

Based on the findings of the Phase One ESA, the following areas of potential environmental concern (APECs) were identified:

APEC 1: Made Ground at Ash Lagoons and Ponds

- Activity: Imported Fill of Unknown Quality
- Potential Contaminants of Concern: Metals, PAHs
- Media Affected: Soil

APEC 2: Oil Handling Facility Waste Oil AST and Totes

- Activity: Waste Oil Products Storage in Fixed Tanks
- Potential Contaminants of Concern: PHCs F2-F4
- Media Affected: Soil

APEC 3: Reported PHC Impacts at On-Site Stormwater Management Pond

- Activity: Identified Impacts of PHCs at Pond
- Potential Contaminants of Concern: PHC F2-F4
- Media Affected: Soil

APEC 4: Abandoned UST and Diesel Fuel Spill

- Activity: Spill of Diesel Fuel to Surface During Refuelling
- Potential Contaminants of Concern: PHCs F1-F4 and BTEX
- Media Affected: Soil and Groundwater

APEC 5: Maintenance Building

- Activity: Repair and Maintenance of Equipment
- Potential Contaminants of Concern: Metals, PHCs F1-F4 + BTEX
- Media Affected: Soil and Groundwater

APEC 6: Former Lakeview Power Generating Station Coal Stockpile
- Activity: Electricity Generation
- Potential Contaminants of Concern: Metals and PAHs
- Media Affected: Groundwater

APEC 7: Existing Ash Lagoons and Pond
- Activity: Treatment of Sewage
- Potential Contaminants of Concern: Metals and PAHs
- Media Affected: Soil

APEC 8: Historic Lagoons
- Activity: Treatment of Sewage
- Potential Contaminants of Concern: Metals
- Media Affected: Soil

Based on the findings of the Phase One ESA and the identification of several APECs, additional investigation is recommended to be carried out where it is necessary to identify soil and groundwater quality with greater certainty, such as to support an excess soils management plan or a construction dewatering plan or to identify potential hazards in areas to be excavated. This additional investigation could be carried out in the context of a Phase Two ESA.

All of which is respectfully submitted.

GM BluePlan Engineering Limited
Per:

Abdirahman Faarah, G.I.T., B. Sc.

Cory Young, B.Sc.-Env.Sc, C.Tech

Matt Long, M. Eng., P. Eng.

7. REFERENCES

7.1 Contacts with Agencies

Fuels Safety Division
Technical Standards and Safety Authority
14th Floor, Centre Tower
3300 Bloor Street West
Toronto, ON M8X 2X4
Attn: Public Information Centre

Tel: 877-682-8772

National Air Photo Library
Natural Resources Canada
615 Booth Street, Room 180
Ottawa, ON K1A 0E9
Tel: 613-995-4560
Fax: 613-995-4568

Ministry of Environment, Conservation and Parks
Guelph District Office
1 Stone Road West
Guelph, ON N1G 4Y2
Tel: 519-826-4255
Fax: 519-826-4286

7.2 Contacts with Private Companies

Environmental Risk Information Service (ERIS) Limited
12 Concorde Place, Suite 800
Toronto, ON M3C 4J2
Tel: 416-510-5204 / 877-512-5204
Fax: 416-510-5133
E-mail: info@ecologeris.com

7.3 Reference Materials

Canadian Standards Association (CSA). 2001. Standard Z768-01, Phase I Environmental Site Assessment

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The Underwriters' Survey Bureau, Limited. 1987 (revised 1906), 1960. Fire Insurance Plans for City of Guelph.

8. STATEMENT OF LIMITATIONS

The information presented in this Phase One ESA report is intended for the sole use of the Regional Municipality of Peel. GM BluePlan Engineering Limited accepts no liability for use of this information by third parties. Any decisions made by third parties on the basis of information provided in this report are made at the sole risk of the third parties.

The scope of this Phase One ESA was limited to a review of the history of the Site; a review of available regional mapping and available background reports and information; surface/topographic features; contact with relevant regulatory agencies; review of available historical records and reports and a site reconnaissance completed on September 23, 2020. This Phase One ESA assumes that a Record of Site Condition (RSC) under O. Reg. 153/04 (as amended) is not required to be filed for this property.

GM BluePlan Engineering Limited cannot guarantee the accuracy or reliability of information provided by others or presented in records and reports available for the property. GM BluePlan Engineering Limited does not accept liability for unknown, unidentified, undisclosed or unforeseen surface or sub-surface contamination that may be later identified.

The scope of this Phase One ESA was limited to investigating the actual or potential sources of environmental impact or environmental risk and does not include full confirmation of actual environmental impact or environmental risk. While comments have been made regarding the inferred groundwater flow direction and the perceived risks of potential environmental concerns to soil and groundwater at the Site from on-site or off-site sources, full confirmatory assessment of soil and groundwater conditions (beyond those investigated as described herein) is beyond the scope of this assessment. While comments have been provided regarding ACM, PCB, leaded paint, ODS and UFFI, a thorough inspection and testing for these materials was not performed and is outside of the scope of this assessment. Further, while comments have been made regarding the perceived risks of potential environmental concerns, a complete risk assessment is beyond the scope of this report.

This report is believed to provide documentation of site conditions as of September 24, 2020.

9. QUALIFICATIONS OF ASSESSORS

Phase One ESA research and site reconnaissance were performed by Mr. Abdirahman Faarah, B. Sc, G.I.T., and Cory Young, B. Sc., C.Tech..

Mr. Abdirahman Faarah, B. Sc., G.I.T., is an Environmental Technologist with two and half years (2.5) years of experience in environmental and hydrogeological investigations. Mr. Faarah has been involved in conducting field activities, performing data analysis and report writing for Phase One and Two Environmental Site Assessments, site remediation, hydrogeologic studies, dewatering studies and various environmental investigations for residential, commercial and industrial properties.

Mr. Cory Young, BSc.-Env.Sc., C.Tech is a Senior Technical Specialist with GM BluePlan who has over 13 years experience in preparing Phase One and Phase Two Environmental Site Assessments completing site remediation and conducting various environmental and civil investigations across southern Ontario. Cory has been involved in various petroleum hydrocarbon evaluations, fuel storage tank decommissioning projects, and numerous investigations related to residential, commercial, and industrial properties.

Mr. Matthew Long, M.Eng., P.Eng., is a Geo-environmental Engineer with ten years of experience in environmental engineering, practicing in hydrogeological, geotechnical, and mine tailings engineering contexts. Mr. Long has prepared or overseen the preparation of numerous Phase One Environmental Site Assessments for residential, commercial, and industrial/institutional properties and has also completed several Phase Two Environmental Site Assessments during his tenure with GM BluePlan.

GM BluePlan Engineering Limited has completed numerous Phase One Environmental Site Assessments, which also include follow-up Phase Two Environmental Site Assessments. GM BluePlan Engineering Limited has also been involved with the remediation of numerous sites, and with the preparation of a Record of Site Condition for residential, commercial and industrial properties.

FIGURES

TABLES

Table 1: Overview of Information Obtained from ERIS Report.

Name of Database	Description	Findings
National Pollutant Release Inventory	Provides data for properties registered to produce over threshold values of listed contaminants.	23 records were identified on Site for the G.E. Booth Wastewater Treatment Plant (for air and municipal sewage and treatment).
Ontario Regulation 347 – Waste Generator's Summary	Provides data on registered waste generators as defined in Regulation 347 of the Ontario EPA.	25 records identified on Site associated with the operation of the G.E. Booth WWTP producing various types of waste.
Ontario Regulation 347 – Waste Receivers Summary	Provides data on registered waste receivers that operate under Certificates of Approval.	13 records were identified for the Site, listing the G.E. Booth WWTP as a receiver of various types of waste.
Certificate of Approvals	Provides data on approvals issued for the release of pollutants to the environment, or provides potable water supply, or transports/ disposes of waste.	41 records were identified on Site for the municipal private and sewage works and emissions to air and water.
Ontario Spills	Provides data on spills and incidents registered with the MECP.	68 records were identified on the Site including the release of raw sewage to environment and various other chemicals related to the works at the G.E. Booth WTTP.
National PCB Inventory	Provides data on registered PCB waste and storage sites.	3 records identified on Site where PCB-laden material was stored for disposal.
Inventory of PCB Storage Sites	Provides data on inactive PCB storage equipment and/or disposal sites registered with the MECP.	6 records were identified on Site for the use of equipment such as transformers and capacitors that utilize high level PCBs, and the storage of PCBs in drums on Site.
Non-Compliance Reports	Provides data on non-compliant discharges of contaminants to air and water that exceed limits identified in the CA or ECA	5 records of non-compliances were reported on Site related to the release of contaminants to the air and the exceedance of contaminant content in treated sewage material.
Environmental Compliance Approval	Provides data on approvals issued for the release of pollutants to the environment, or provides potable water supply, or transports/ disposes of waste	36 records were identified on Site for the municipal private and sewage works and emissions to air and water
Environmental Activity and Sector Registry	Provides data on activities registered with the MECP that would otherwise require formal approval.	1 record was identified on Site related to water taking: i.e. construction dewatering.

Name of Database	Description	Findings
Pipeline Incidents	Provides data on strikes, leaks, and spills associated with pipelines.	1 record was identified on Site related to striking a pipeline of natural gas.
Fuel Oil Spills and Leaks	Provides data on leaks of various petroleum hydrocarbons reported to the Spills Action centre (SAC).	1 record was identified on Site related to the spill of liquid petroleum when an underground storage tank was overfilled.
Commercial Fuel Oil Tanks	Provides data on locations of commercial underground fuel oil tanks.	1 record was identified on Site for an underground fuel oil tank that is listed as active and has a capacity of 20,000 L.
Greenhouse Gas Emissions (GHG) from Large Facilities	Provides data on large facilities who emit GHG into the atmosphere.	1 record was attributed to the Site and states that the Site contributes CO_2, CH_4, and N_2O to the atmosphere.
ERIS Historical Searches	Provides data on environmental risk reports conducted on the property	2 records were identified of historical ERIS reports conducted on the subject Site.

APPENDIX A:
Aerial Photographs

APPENDIX B:
City Directory

APPENDIX C:

Eris Report

APPENDIX D:
Ministry of Environment, Conservation and Parks

APPENDIX E:
Technical Standards and Safety Authority

APPENDIX F:
City of Mississauga Zoning Maps

APPENDIX G:

Site Reconnaissance Photos

APPENDIX H:
Supporting Documents

APPENDIX I:
Site Plan

Appendix H:

Source Water Study – WWTP Treatment Failure Scenario

G.E. Booth and Clarkson Waste Water Treatment Plant

Source Water Studies - WWTP Treatment Failure Scenario

July 21, 2023 | 13344.101.R3.Rev0

Baird.

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G.E. Booth and Clarkson Wastewater Treatment Plant

Source Water Studies - WWTP Treatment Failure Scenario

Prepared for:

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Revision	Date	Status	Comments	Prepared	Reviewed	Approved
Rev A	2023 03 31	Draft	For GMBP Review	HD	DMF	FJLD
Rev B	2023 07 05	Draft	For GMBP Review	HD	DMF	FJLD
Rev 0	2023 07 20	Final		HD	DMF	FJLD

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1. Introduction

1.1 Scope of Work

This report summarizes technical studies undertaken to assess source water threats to drinking water intakes, resulting from the proposed increased flow at the Clarkson WWTP and a proposed new outfall with increased flow at the G.E. Booth WWTP, in support of the Schedule C Class Environmental Assessment (EA). The scope of work is based on direction provided by the Credit Valley, Toronto and Region & Central Lake Ontario (CTC) Source Protection Region (Janet Ivey dated Nov. 22, 2021), attached as Appendix A, outlining CTC source water protection requirements for the WWTP expansions. The locations of the existing outfalls and proposed new outfall for G.E. Booth WWTP are shown in Figure 1.1, along with the locations of the nearby water treatment plant intakes and Intake Protetion Zone 1 (IPZ-1).

The scope of work included:

1. Review of event based modeling undertaken previously and presented in the CTC Assessment Report
2. Update the spill scenario for a disinfection failure at the Clarkson WWTP using the proposed increased flow, and evaluate E. coli concentrations at Lorne Park, A.P. Kenndy and R.L. Clark intakes using the MIKE3 model.
3. Update the spill scenario for a disinfection failure at the G.E. Booth WWTP using the proposed increased flow and new outfall/diffuser location, and evaluate E. coli concentrations at Lorne Park, A.P. Kenndy and R.L. Clark intakes.
4. Summarize the methodology and results.

1.2 Source Water Protection Background

Ontario's Clean Water Act (2006) provides a framework for the development and implementation of Source Protection Plans to protect sources of drinking water across Ontario. The Ministry of the Environment, Conservation and Parks issued updated Technical Rules (MECP, 2021) that must be followed in the development of Source Protection Plans.

The Clarkson and G.E. Booth WWTPs are located within the Credit Valley Source Protection Area (CVSPA), which is grouped within the larger Credit Valley, Toronto and Region & Central Lake Ontario (CTC) Source Protection Region (SPR). As mandated by the Clean Water Act, 2006, a Source Protection Plan must be prepared for each SPR. The CTC Source Protection Plan was approved on July 28, 2015 and came into effect on December 31, 2015.

The Technical Rules require the development of an Assessment Report to evaluate intake vulnerability and the risks to the water quality and water system threats. The Assessment Report is a technical document that provides the scientific information used to develop the Source Protection Plan. The Approved Updated Assessment Report: Credit Valley Source Protection Area came into effect on December 5, 2019.

Event based modeling may be used to identify significant threats to drinking water. This approach was used by the CVSPA in the development of their Assessment Report (CVSPA, 2019). The technical studies presented in this report, build on that work.

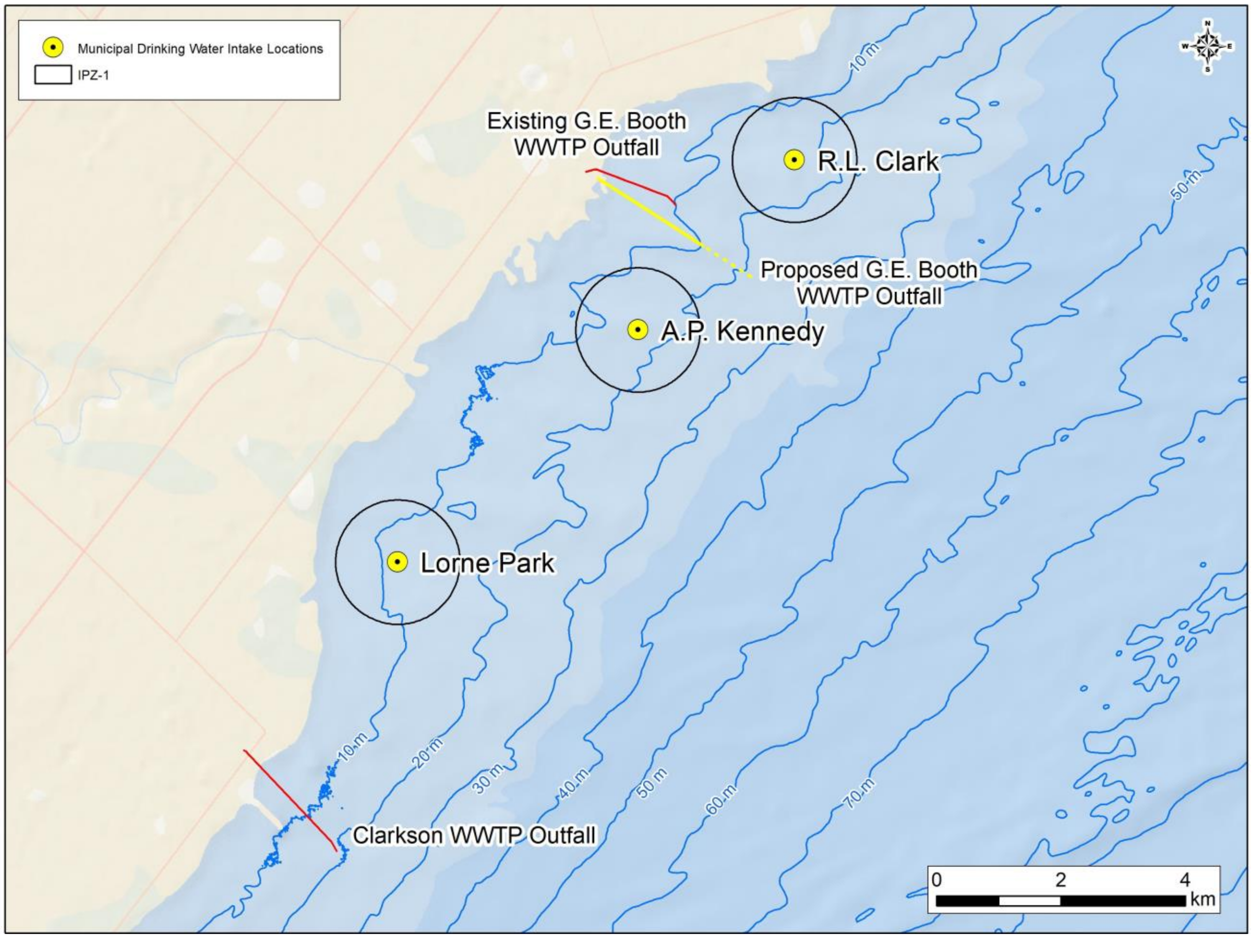

Figure 1.1: Location of wastewater treatment plant outfalls and water intakes in project area

2. Event Based Modeling for the CTC

2.1 Previous Modeling

An event-based approach was used by the CVSPA to identify significant threats to drinking water. Under this approach a number of spill scenarios were evaluated through numerical modelling, to determine whether they would result in a significant threat to drinking water intakes. The scenarios included a disinfection failure at each Lake Ontario WWTP, including Clarkson WWTP and G.E. Booth WWTP, to determine if disinfection failures would cause deterioration of the quality of raw water for drinking water purposes for the CVSPA WTPs. The modeled parameter of concern was E.coli and the recreational standard for E.coli of 100 CFU/100 ml was used as the threshold to assess deterioration of water quality. The model was run for the period between April 25 and August 31, 2008. Each WWTP was simulated at the Certificate of Approval flow rate and E.coli levels within the discharge were set to a contant 5,000,000 CFU/100 ml. The decay of E.coli was taken into consideration in the model. The MIKE3 model was used to determine the concentration of E.coli at the intakes.

The current rated capacity for the Clarkson WWTP is 350 MLD and the rated capacity for the G.E. Booth WWTP is 500 MLD. These flows were used for the previous modeling reported in the CVSPA Assessment Report (2019).

The disinfection failure at Clarkson WWTP was determined to be a significant threat to the Burlington, Burloak, Oakville, Lorne Park, Lakeview (now A.P. Kennedy) and R.L. Clark water systems in the CVSPA. The disinfection failure at G.E. Booth WWTP was determined to be a significant threat to the Burloak, Oakville, Lorne Park, Lakeview (now A.P. Kennedy), R.L. Clark and R.C. Harris drinking water systems. The predicted E.coli concentrations at the WTP intakes are summarized in Table 2.1. The arithmetic mean is presented in the table.

Table 2.1: Significant drinking water threats from disinfection failures at Clarkson and G.E. Booth WWTP (from CVSPA, 2019)

WWTP	WTP	Peak Concentration at WTP Intake (CFU/100 ml)	Mean Concentration at WTP Intake (CFU/100 ml)
Clarkson WWTP	Burlington	623	9
Clarkson WWTP	Burloak	889	50
Clarkson WWTP	Oakville	9,950	593
Clarkson WWTP	Lorne Park	5,600	529
Clarkson WWTP	A.P. Kennedy	1,426	59
Clarkson WWTP	R.L. Clark	1,400	42
G.E. Booth	Burloak	1,000	22
G.E. Booth	Oakville	3,070	70
G.E. Booth	Lorne Park	38,000	2400
G.E. Booth	A.P. Kennedy	83,800	1600
G.E. Booth	R.L. Clark	55,600	5500
G.E. Booth	R.C. Harris	110	6

3. Updated Numerical Modeling of Spill Scenarios

3.1 MIKE3 Model Setup

The MIKE3 hydrodynamic model was used to evaluate the fate and transport of the effluent plume within the model domain. Developed by the Danish Hydraulic Institute (DHI), MIKE3 is a comprehensive state-of-the-art software system designed to simulate 3D flows and environmental processes where stratification is of concern. The finite difference version of MIKE3 (MIKE3 FD) is appropriate for Lake Ontario, which is subject to 3D phenomena such as thermal stratification, thermal bars, up-welling and down-welling events.

This finite difference model uses a structured grid system to discretize the lakebed bathymetry and solve the governing partial differential equations. Higher resolution can be introduced into specific regions in the model domain using a nested grid approach. The MIKE3 model was developed using a series of nested grids with increased resolution along the Peel waterfront. Figure 3.1 shows the model domain's extent and the loation of the nested grids. All grids were rotated 25 degrees.

The coarse outer grid has a resolution of 2,430 m and covers the entire lake. The first level of nested grid has a resolution of 810 m, and the second level of nesting is 270 m. Both grids extend from Oakville to the east side of Toronto and encompass the Peel shoreline; a 90 m grid resolves the area surrounding the G.E. Booth and Clarkson WWTP. The model used 40 vertical layers with 2 m spacing to discretize the water column.

The primary driving mechanism in the model for hydrodynamics is wind. Spatial winds developed by NOAA on a 5 km grid spacing were used in the simulations; additional inputs such as air temperature, relative humidity, and cloud cover (clearness coefficient) were defined using recorded data from Pearson Airport.

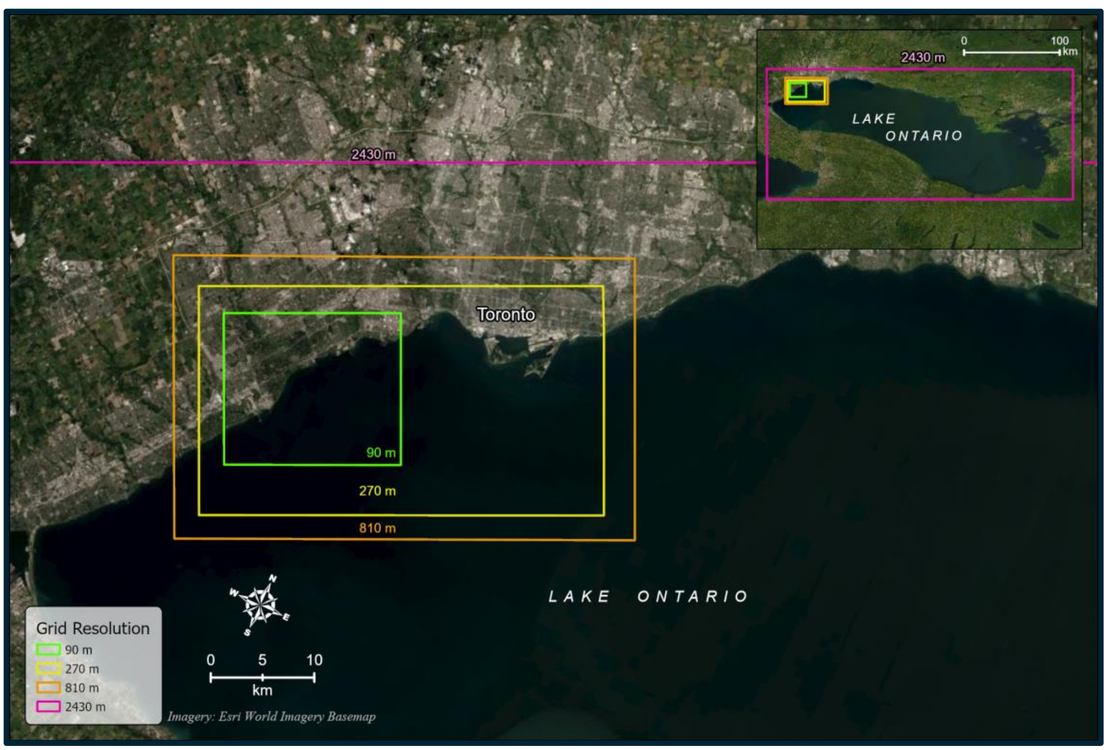

Figure 3.1: MIKE3 model domain and nested grids

3.2 Spill Scenarios

The MIKE3 model was used to similate the WWTP disinfection failure scenarios described in Section 2.1 for the proposed increased flow at Clarkson WWTP and for the new outfall and flow at G.E. Booth WWTP, to determine if the proposed changes at the WWTPs would cause deterioration of the quality of raw water for drinking water purposes at the CVSPA WTPs. Each WWTP was simulated at the Certificate of Approval flow rate and E.coli levels within the discharge were set to a contant 5,000,000 CFU/100 ml. The decay of E.coli was taken into consideration in the model

At the Clarkson WWTP, the flow was increased from the current rated capacity of 350 MLD to 500 MLD. At G.E. Booth, the flow was increased from the current capacity of 500 MLD to 550 MLD. The proposed new outfall at G.E. Booth WWTP extends approximately 2000 m from shore where it attaches to a 1000 m long multiport diffuser system. The average water depth over the length of the diffuser is 18.5 m below Chart Datum. There are 67 risers over the entire length of the diffuser with a port diameter of 0.5 m. The ports on the first 250 m of the diffuser will be capped for future use leaving 51 ports open on the remaining 750 m of diffuser. The exit velocity from the open ports is 0.64 m/s assuming a design flow of 550 MLD. Further details are provided in Baird (2022) and the proposed outfall and diffuser location is shown in Figure 1.1.

The model was used to predict the E. coli levels at the drinking water intakes closest to the Clarkson and G.E. Booth WWTP: A.P. Kennedy WTP; R.L. Clark WTP; and Lorne Park WTP. These intakes are all located in the grid developed for the Receiving Water Impact Assessments (Baird, 2022a,b). It is recommended that the more distant intakes are evaluated during final design, to determine if concentrations exceed the water quality threshold for the WWTP disinfection failure scenario.

The model was run for the period from April 25 to August 31, 2008. This is the same period that was used for the previous modeling for the Assessment Report (CVSPA, 2019). Starting the simulations in the spring allows the model to begin under constant isothermal temperature conditions in the lake and lets the water column's thermal structure develop over the summer and fall.

The spill scenarios were modelled for G.E. Booth and Clarkson disinfection failures separately. Two scenarios are evaluated for each plant disinfection failure:

- (Scenario 1) the spill occurs for two days in seven days between April 25th and August 31st, successively (Figure 3.2).
- (Scenario 2) the spill occurs continuously between April 25th and August 31st (Figure 3.3) .

While the former is probably more representative of an actual spill event, the latter provides a very conservative upper end threshold to envelope the results. This was done to ensure that the modeling activies carried out for this study encompassed the spill modeling that was completed as part of the previous source water project (there were some uncertainties regarding the spill duration and frequency).

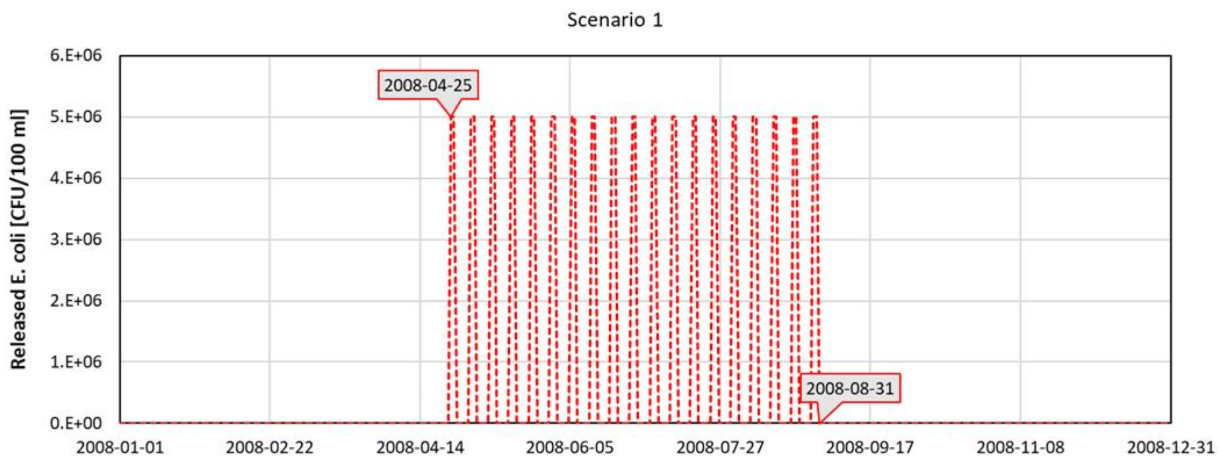

Figure 3.2: (Scenario 1) spill occurs for two days every seven days between April 25th and August 31st

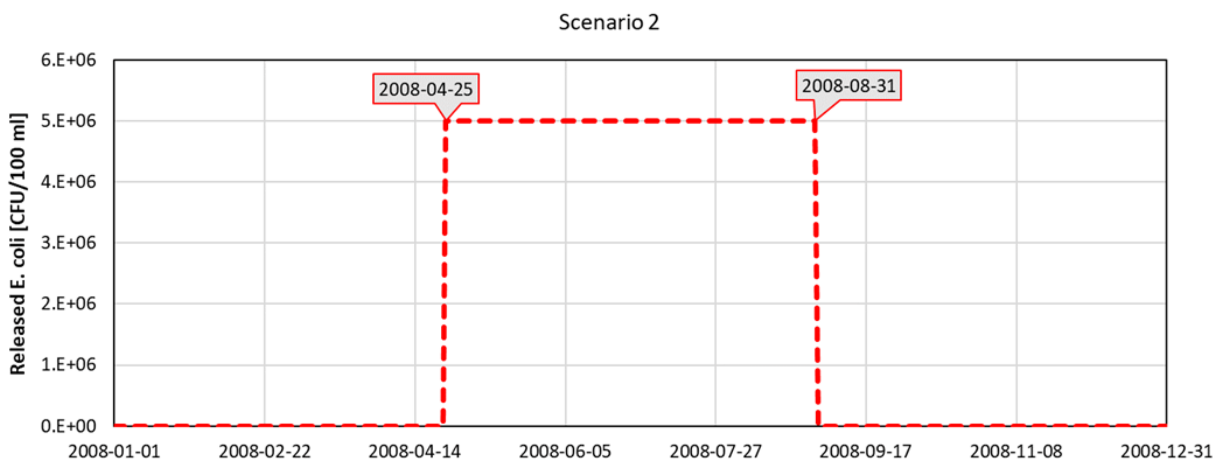

Figure 3.3: (Scenario 2) the spill occurs continuously between April 25th and August 31st

4. Predicted E.coli Concentrations at the Intakes

E. coli concentrations were assessed at the Lorne Park, A.P. Kennedy, and R.L. Clark WTP intakes. The tables and figures below summarize the maximum instantaneous, arithmetic and geometric mean; 90th percentile and 75th percentile E. coli levels at the intakes during the spill sceanio (April 25th and August 31st).

Table 4.1 and Figure 4.1 show the predicted E. coli levels at the WTP intakes for the disinfection failure at Clarkson WWTP (Scenario 1). Table 4.2 and Figure 4.2 show the results for the disinfection failure Clarkson WWTP (Scenario 2). Based on the predicted instantaneous maximum concentration, exceedances occurred at the three intakes assessed, for both Scenario 1 and Scenario 2. The predicted instantaneous maximums exceeded the peak values reported in CVSPA (2019) for the existing Clarkson outfall flow (see Table 2.1). While an increase is to be expected with the flow at Clarkson WWTP increasing from 350 MLD to 500 MLD, the predicted instantaneous means were two to six times higher than those presented in CVSPA (2019) for the existing flows. It is noted that the previous work was undertaken by others using a different model setup and the results would be expected to differ. The results for the arithmetic mean (Scenario 1) are closer to the results for the existing flow conditions presented in CVSPA (2019).

Table 4.1: Clarkson WWTP disinfection failure Scenario 1, predicted E. coli levels at WTP intakes

Clarkson WWTP (Scenario 1)	Arithmetic Mean (#/100 ml)	Inst. Max (#/100 ml)	90th Percentile (#/100 ml)	75th Percentile (#/100 ml)
Lorne Park WTP	509	20,350	637	50
A.P. Kennedy WTP	94	8,293	86	5
R.L. Clark WTP	64	3,473	26	1

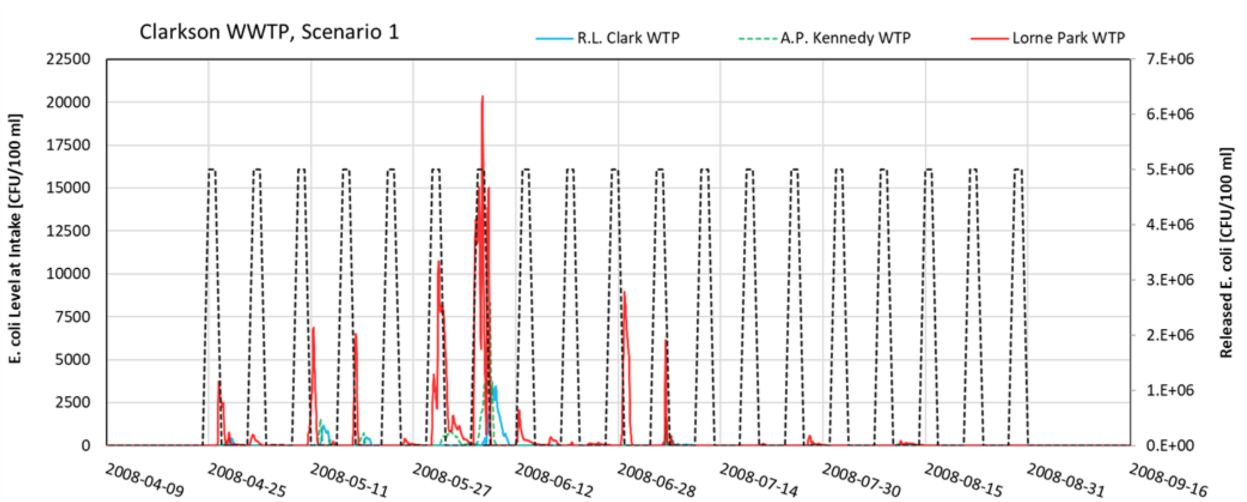

Figure 4.1: Clarkson WWTP disinfection failure Scenario 1, time series of E. coli level at WTP intakes

Table 4.2: Clarkson WWTP disinfection failure Scenario 2, predicted E. coli levels at WTP intakes

Clarkson WWTP (Scenario 2)	Arithmetic Mean (#/100 ml)	Inst. Max (#/100 ml)	90th Percentile (#/100 ml)	75th Percentile (#/100 ml)
Lorne Park WTP	2,259	32,213	7,836	2,533
A.P. Kennedy WTP	570	13,341	2,212	347
R.L. Clark WTP	329	10,635	1,008	70

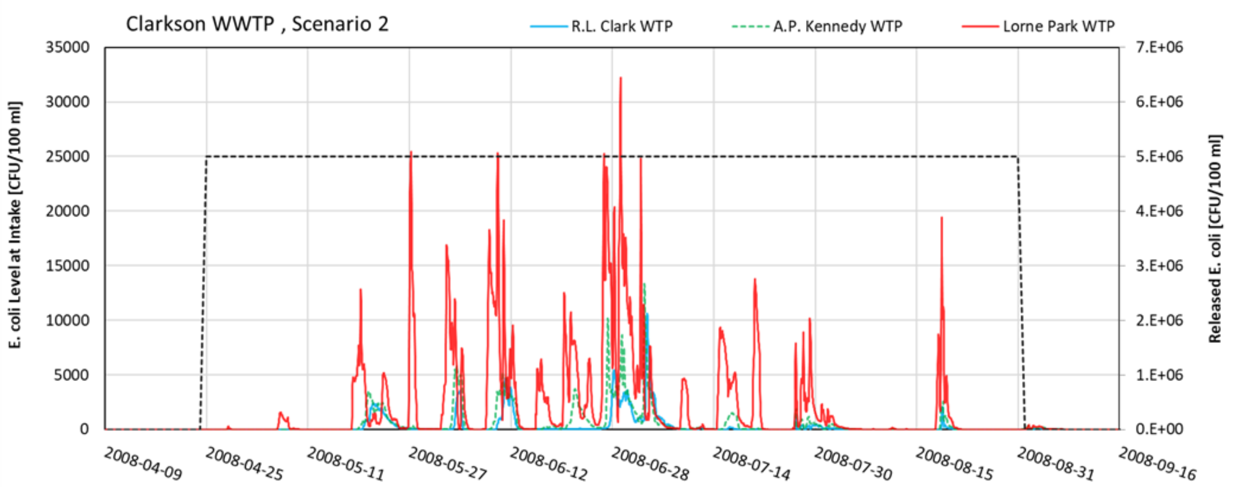

Figure 4.2: Clarkson WWTP disinfection failure Scenario 2, time series of E. coli level at WTP intakes

Table 4.1 and Figure 4.1 show the predicted E. coli levels at the WTP intakes for the disinfection failure at G.E. Booth WWTP (Scenario 1). Table 4.2 and Figure 4.2 show the results for the disinfection failure G.E. Booth WWTP (Scenario 2). Based on the predicted instantaneous maximum concentrations, exceedances occurred at the three intakes assessed, for both Scenario 1 and Scenario 2. The predicted instantaneous maximums are however significantly lower than the peak values reported in CVSPA (2019) for the existing G. E. Booth outfall and flow (see Table 2.1). The predicted E. coli arithmetic means (Scenarios 1 and 2) are significantly lower than the results for the existing outfall and flow presented in CVSPA (2019). This is a reflection of the improved mixing provided by the proposed new outfall diffuser which is located in deeper water and is longer than the existing diffuser.

Table 4.3: G.E. Booth disinfection failure Scenario 1, predicted E. coli level at WTP intakes

G.E. Booth (Scenario 1)	Arithmetic Mean (#/100 ml)	Inst. Max (#/100 ml)	90th Percentile (#/100 ml)	75th Percentile (#/100 ml)
Lorne Park WTP	60	2,580	145	18
A.P. Kennedy WTP	524	23,678	970	84
R.L. Clark WTP	521	22,535	1,465	140

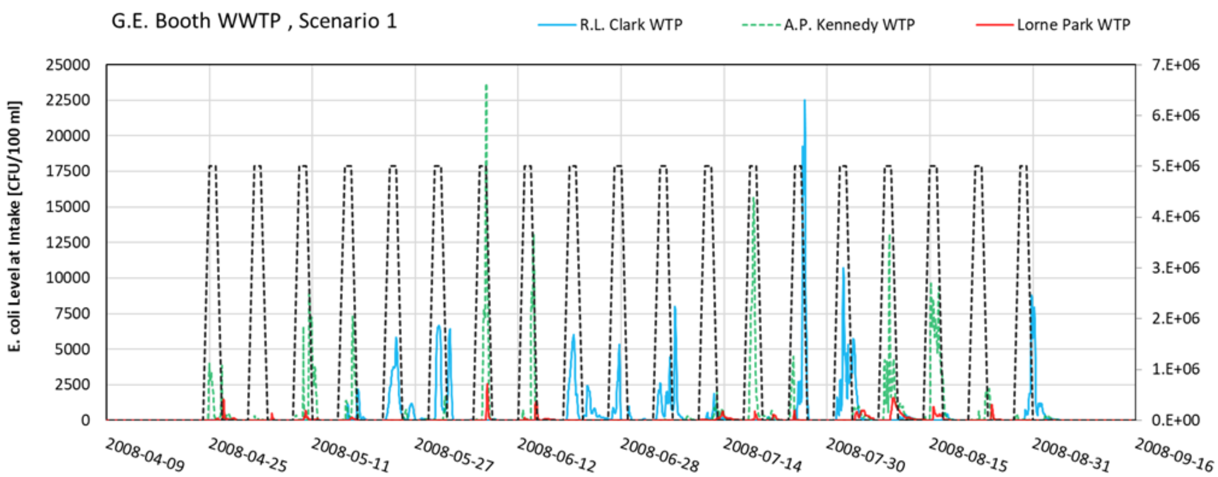

Figure 4.3: G.E. Booth disinfection failure Scenario 1, time series of E. coli level at WTP intakes

Table 4.4: G.E. Booth disinfection failure Scenario 2, predicted E. coli level at WTP intakes

G.E. Booth (Scenario 2)	Arithmetic Mean (#/100 ml)	Inst. Max (#/100 ml)	90th Percentile (#/100 ml)	75th Percentile (#/100 ml)
Lorne Park Intake	231	3,218	771	226
AP Kennedy	1,637	25,527	6,299	1,498
R.L. Clark Intake	1,687	26,690	5,092	2,295

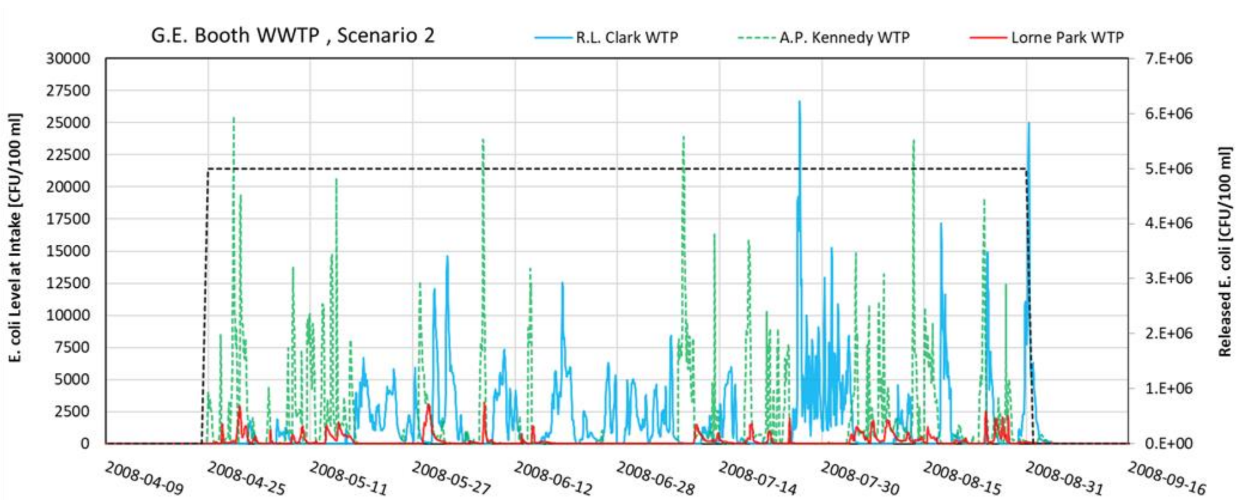

Figure 4.4: G.E. Booth disinfection failure Scenario 2, time series of E. coli level at WTP intakes

5. Conclusions and Recommendations

5.1 Conclusions

Source water threats to drinking water intakes, resulting from the proposed increased flow at the Clarkson WWTP and a proposed new outfall with increased flow at the G.E. Booth WWTP have been assessed, updating work presented in the CVSPA Assessment Report (2019). An event-based approach was used to identify significant threats to drinking water; similar to previous work undertaken by the CVSPA . Using this approach disinfection failures at the Clarkson WWTP and G.E. Booth WWTP were evaluated independently through numerical modelling, to determine whether they would result in a significant threat to drinking water intakes. The modeled parameter of concern was E.coli.

The disinfection failure scenario modeling has been updated for the proposed new conditions as follows:

- Clarkson WWTP flow increased from 350 MLD to 500 MLD.
- G.E. Booth outfall extended approximately 2000 m from shore where it attaches to a 1000 m long multiport diffuser system; flow increased from 500 MLD to 550 MLD.

The MIKE3 model was used to predict the E. coli levels at the drinking water intakes closest to the Clarkson and G.E. Booth WWTP: A.P. Kennedy WTP; R.L. Clark WTP; and Lorne Park WTP. These intakes are all located in the grid developed for the Receiving Water Impact Assessments completed in support of the Schedule C Class Environmental Assessment (Baird, 2022a,b). The model results demonstrated that disinfection failures at Clarkson and G.E. Booth WTPs will result in E. coli concentrations above the threshold level of 100 CFU/100 ml, indicating the scenarios modeled are a significant threat for the intakes assessed.

As expected, the model results showed higher E. coli levels for the spill scenario with the increased flow of 500 MLD at Clarkson WWTP, when compared to the existing flow of 350 MLD. It is noted that a different MIKE3 model setup was used from the previous work (CVSPA, 2019) and the model results cannot be compared directly.

The model predicted lower E. coli levels for the spill scenario with the increased flow of 550 MLD and new outfall diffuser at G.E. Booth WWTP, when compared to the existing flow of 500 MLD. This is a reflection of the improved mixing provided by the proposed new outfall diffuser which is located in deeper water and is longer than the existing diffuser.

5.2 Recommendations

1. An assessment of source water threats to drinking water intakes, resulting from the proposed increased flow at the Clarkson WWTP and a proposed new outfall with increased flow at the G.E. Booth WWTP, in support of the Schedule C Class Environmental Assessment (EA) has been completed. Additional analyses may be required during detailed design, based on further discussions with the CTCSPR. It is recommended that this report is shared with the CTCSPR.
2. Event based modeling could be updated if potential threats to drinking water intakes change. This may include a review and update to the spill scenarios associated with disinfection failures, modeling, updated IPZ-3 mapping, and threats assessment.
3. The results of any updated modeling and threats assessment could be incorporated into the assessment reports and the source protection plan by CTC source protection staff.
4. The threats to other WTP intakes including but not limited to Burlington, Burloak, Oakville and R.C. Harris WTPs were not assessed in this study. The Clarkson and G.E. Booth disinfection failures were identified as a significant threat to these intakes for the existing conditions in CVSPA (2019). While it is understood

that Peel Region intends to mitigate the risk of disinfection failures through proper design, adequate process redundancy, stand-by power and best management practices during operation and maintenance, it is recommended that Peel Region contact CTCSPR during detailed design to determine if additional analyses is required to assess whether Clarkson and G.E. Booth disinfection failures would be a significant threat to these WTP intakes.

5. Sanitary trunk sewer breaks were also assessed by CVSPA and determined to be significant drinking water threats for some water systems. While it is understood that Peel Region has implemented a sewer network monitoring program that evaluates the condition of the system and based on this, refurbishes, upgrades and expands sewers as required to reduce the risks of sanitary trunk sewer breaks, it is recommended that Peel Region contact CTCSPR during detailed design to determine if additional analyses is required for significant drinking water threats is required.

6. References

Baird, 2022a. Clarkson Wastewater Treatment Plant Receiving Water Impact Assessment. A report prepared for Peel Region, under sub-contract to GM BluePlan Engineering.

Baird, 2022b. G.E. Booth Wastewater Treatment Plant Receiving Water Impact Assessment. A report prepared for Peel Region, under sub-contract to GM BluePlan Engineering.

Credit Valley Source Protection Area (CVSPA), 2019. CVSCPA Approved Assessment Report, 2019.

Credit Valley, Toronto and Region & Central Lake Ontario (CTC) Source Protection, 2015. CTC Source Protection Plan.

Ministry of the Environment, Conservation and Parks, 2021. 2021 technical rules under the Clean Water Act

Appendix A

CTC Correspondence

From:	Ivey, Janet
To:	Fiona Duckett
Cc:	Therese Estephan; Bill Snodgrass; Jacques, Craig; Mulchansingh, Kerry; Gowda, Chitra; Don Ford; Oliveira, Elvis; Quarisa, Frank
Subject:	Peel Region - Booth/Clarkson WWTP outlets - CTC source water
Date:	Monday, November 22, 2021 4:33:01 PM
Attachments:	image001.jpg

Hi Fiona,

I'm following up on your Nov 16 2021 request for direction on source water assessments to support the Peel Region Class EAs for the Clarkson and GE Booth (formerly Lakeview) wastewater treatment plants. Per your clarification to Craig Jacques, I understand that a new outfall is planned for GE Booth (further offshore) and changes to Clarkson discharges may be considered.

The Credit Valley Assessment Report describes event-based modelling that identified significant threats to drinking water intakes for the Credit Valley and Toronto and Region source protection areas, as well as the neighbouring Halton-Hamilton Source Protection Region. From table 5.39:

- Disinfection failure at Clarkson WWTP was determined to be a significant threat to the Burlington, Burloak, Oakville, Lorne Park, Lakeview (now AP Kennedy) and RL Clark water systems.
- Disinfection failure at GE Booth (formerly Lakeview) was determined to be a significant threat to the Burloak, Oakville, Lorne Park, Lakeview (now AP Kennedy), RL Clark and RC Harris drinking water systems.
- Sanitary trunk sewer breaks were also determined to be significant drinking water threats for some water systems.

The event-based modelling completed to date should be reviewed and inform the Class EA process. Event-based modeling could be updated if potential threats to drinking water intakes change, as could result from changes to WWTP outfalls and discharges. This may include review and update of spill scenarios associated with WWTP disinfection failures, modelling, updated IPZ-3 mapping, and threats assessment. The need for and timing of updates to event-based modelling should be considered by the Lake Ontario Collaborative Group and affected municipalities, per policy LO-G-2 of the CTC Source Protection Plan.

The results of any updated event-based modelling and threats assessment would be incorporated into the assessment reports and the source protection plan by CTC source protection authority staff through an amendment under s. 34 or s. 36 of the Clean Water Act.

If an update to a WWTP environmental compliance approval is required, MECP may have additional requirements.

Best regards,

Jan

I'm working remotely. The best way to reach me is by email, mobile phone (437-247-8078) or Microsoft Teams.

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