

**Square One Drive Extension Municipal Class Environmental Assessment
Environmental Study Report**

Appendix P Air Quality Impact Assessment

Appendix P AIR QUALITY IMPACT ASSESSMENT

**Air Quality Impact Assessment
for Square One Drive
Extension**

Class Environmental Assessment
and Preliminary Design for the
Square One Drive Extension
(Rathburn Road West to
Confederation Parkway),
Mississauga, Ontario



Prepared for:
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File 165011005

September 14, 2017

Sign-off Sheet

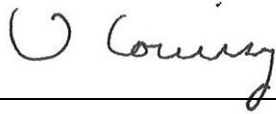
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Table of Contents

EXECUTIVE SUMMARY	I
ABBREVIATIONS	IV
1.0 INTRODUCTION	1.1
1.1 PROJECT DESCRIPTION.....	1.1
1.2 STUDY OBJECTIVES AND METHODOLOGY OVERVIEW	1.2
1.2.1 Air Quality	1.2
1.2.2 Greenhouse Gases.....	1.3
2.0 STUDY AREA.....	2.1
2.1 AIR QUALITY	2.1
2.2 GREENHOUSE GASES	2.1
3.0 CONTAMINANTS OF CONCERN AND ASSESSMENT CRITERIA.....	3.1
3.1 AIR QUALITY	3.1
3.2 GREENHOUSE GASES	3.3
4.0 AIR QUALITY RECEPTORS	4.1
5.0 EXISTING CONDITIONS	5.1
5.1 BACKGROUND AIR CONCENTRATIONS	5.1
5.2 EXISTING GHG EMISSIONS	5.3
6.0 CURRENT AND FUTURE AIR AND GHG EMISSIONS	6.1
6.1 AIR CONTAMINANT EMISSIONS	6.1
6.2 GHG EMISSIONS	6.2
7.0 AIR DISPERSION MODELLING ASSESSMENT.....	7.1
7.1 AIR DISPERSION MODELLING METHODS.....	7.1
7.2 AIR DISPERSION MODELLING RESULTS.....	7.2
8.0 CUMULATIVE EFFECTS ASSESSMENT.....	8.1
8.1 AIR QUALITY	8.1
8.2 GREENHOUSE GASES	8.4
9.0 MITIGATION.....	9.1
10.0 CONSTRUCTION	10.1
11.0 CONCLUSION.....	11.1
12.0 REFERENCES.....	12.1

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

LIST OF TABLES

Table 3-1	Summary of Air Quality Criteria Used in the Study	3.2
Table 5-1	Monitoring Locations Assessed in the Study	5.1
Table 5-2	Summary of Background Air Quality Levels.....	5.2
Table 5-3	National and Provincial GHG Emissions (kt CO ₂ e) – 2005 – 2015.....	5.3
Table 6-1	Summary of Key MOVES Inputs	6.1
Table 6-2	Summary of GHG Emissions.....	6.2
Table 7-1	Key CAL3QHCR Model Input Parameters	7.1
Table 7-2	Summary of Predicted Maximum Ground Level Concentrations at Representative Receptors – Project Alone	7.3
Table 8-1	Summary of Predicted Maximum Ground Level Concentrations at Representative Receptors – Cumulative Effects.....	8.2

LIST OF FIGURES

Figure 2-1	Study Area	2.2
Figure 4-1	Receptor Locations.....	4.2

LIST OF APPENDICES

APPENDIX A	SITE PLAN, LOCATION, AND ZONING MAP
APPENDIX B	DESIGN DRAWINGS
APPENDIX C	RECEPTORS
APPENDIX D	CONTAMINANT EMISSION CALCULATIONS
APPENDIX E	GREENHOUSE GAS EMISSIONS
APPENDIX F	SAMPLE MODEL FILES

Executive Summary

Stantec Consulting Ltd. (Stantec) was retained by the City of Mississauga (the City) to conduct an air quality impact and greenhouse gas (GHG) assessment for the extension of Square One Drive (Procurement: FA. 49. 464-15), herein referred to as "the Project", located in Mississauga, Ontario. The study is based on the preliminary design drawings completed to date for Square One Drive from Rathburn Road West to Confederation Parkway. The Project is being carried out in accordance with the "Municipal Class Environmental Assessment" documented by the Municipal Engineers Association (October 2000, as amended in 2007 and 2011).

The objective of this study is to characterize current air pollutant emissions (2017) and predict air quality effects within the Study Area after implementation of the Project in the future (2041) using background air quality and traffic data. Effects on greenhouse gas (GHG) emissions are also evaluated in this study. Predicted future emissions and effects with Project implementation are also compared to predicted future emissions and effects without implementation of the Project.

The City is proposing an extension to Square One Drive (the Project) in its 10-year capital plan. The existing portion of Square One Drive to the east of Confederation Parkway currently has two travelled lanes. The extension from Rathburn Road West to Confederation Parkway is also proposed to have two travel lanes, with street parking and a sidewalk on the south side, and a multi-use trail on the north side. The proposed intersection at Rathburn Road West and Square One Drive will be in the form of a two-lane roundabout with an approximate diameter of 46 m, while the intersection of Confederation Parkway and Square One Drive would be a signal-controlled intersection. For the purposes of the Air Quality Impact Assessment only, it is assumed that the Project is to be constructed in two phases: phase 1, from Confederation Parkway to approximately 120 m west of Confederation Parkway, would be constructed in 2019; and, phase 2, which includes the remainder of the Project, would be constructed by 2027.

The Study Area is predominantly residential land use with existing dwellings adjacent to Rathburn Road West and Confederation Parkway. The Study Area for this report encompasses the area where there is a potential for significant changes in air quality due to emissions from future changes to traffic, including Project related traffic. Assessment of potential air contaminant emissions includes the immediate proximity of the Project to a distance of approximately 500 m. Receptors outside of the Study Area are not likely to experience a change in air quality levels due to the Project. While the Study Area for GHG emissions estimations is the same as described for Air Quality, the GHG assessment area includes all of Ontario and Canada. This is to recognize that GHG emissions act cumulatively in the atmosphere globally.

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

The following conclusions were made from the air quality impact assessment:

- The highest predicted Ground Level Concentrations (GLCs) of the Project alone if the Project were to proceed were all below the relevant criteria for all COPCs except for Benzo(a)pyrene in all 3 scenarios.
- The concentrations of Benzo(a)pyrene are expected to decrease in the future. This is true for both with and without the Project proceeding. The scenario with the Project proceeding shows a benefit of greater decrease in emissions of Benzo(a)pyrene than the scenario with the Project not proceeding.
- The highest predicted GLCs of the Project alone for all contaminants, except particulate emissions, are either lower or approximately the same when compared to the current 2017 condition or the Project not proceeding scenario.
- For Project alone particulate emissions, both PM and PM10 show a predicted increase in maximum concentrations between the current 2017 condition and the future predicted scenario with the Project proceeding. For PM2.5, the predicted concentrations of the proposed Project show a decrease in concentrations from the current conditions, and a slight increase or no change in concentrations when compared to the Project not proceeding. In all cases, despite some predicted potential emissions increases, the concentrations are predicted to remain below the applicable air quality criteria.
- The maximum predicted cumulative concentrations of all COPCs if the Project were to proceed are below their respective criteria for all modeled receptors except for three contaminants: PM2.5, benzene and Benzo(a)pyrene.
- The highest cumulative annual GLC of PM2.5 if the Project were to proceed is predicted to be higher than the relevant criteria. The conservative evaluation and high background concentration are the contributing factors.
- The annual average cumulative benzene concentration is predicted to be above its criteria if the Project were to proceed, although the concentrations from the future condition with the Project are predicted to be either lower or approximately the same as both the current condition or the future condition without the Project proceeding. The background concentration of benzene in Ontario is currently measured to be above the relevant criteria. Overall, predicted annual average cumulative benzene concentrations are approximately the same between the future condition with and without the Project proceeding.
- The background concentration of Benzo(a)pyrene in Ontario is higher than the relevant criteria contributing to the predicted cumulative concentrations of this contaminant to exceed the relevant criteria.
- Greenhouse gas emissions are predicted to be higher in both future conditions compared to existing conditions due to increases in traffic volumes. The total incremental GHG emissions estimated to occur as a result of the Project is approximately 2%, however, this may be due to conservatism in the model and the increased emissions in the Study Area may be offset by decreases in local roads not covered in the Study Area.

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

- Increasingly stringent new vehicle emissions standards have been a focus of both federal and provincial initiatives and have shown consistent reduction in vehicle combustion emissions which would help to lower contaminant ground level concentrations.
- Contaminant emissions during construction have been assessed qualitatively as construction plans have not yet been finalized. Construction related air emissions are anticipated to take place over a shorter time period (weeks to months) than the ultimate Project operational lifetime (years) and are therefore expected to be several orders of magnitude less significant than the operational emissions associated with the Project.
- Overall air emissions with the Project proceeding are shown to be of benefit in most considerations when compared to the scenario without the Project proceeding. While greenhouse gas emissions are seen to increase marginally (approximately 2%), this limited impact may be offset by decreases in local roads not covered in the Study Area and can also be a result of conservatism in the study modelling carried out.

Abbreviations

AADT	Annual Average Daily Traffic
AAQC	Ontario Ambient Air Quality Criteria
AQHI	Air Quality Health Index
CAAQS	Canadian Ambient Air Quality Standards
CACs	Criteria Air Contaminants
CAIT	Climate Analysis Indicators Tool
CAS	Chemical Abstracts Service
COPCs	Chemicals of Potential Concern
ECCC	Environment and Climate Change Canada
GHG	Greenhouse Gas
GLC	Ground Level Concentration
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MOECC	Ministry of Environment and Climate Change
MOVES	Motor Vehicle Emission Simulator
MTO	Ministry of Transportation
NAAQO	National Ambient Air Quality Objectives
NAPS	National Air Pollution Surveillance Program
UTM	Universal Transverse Mercator
US EPA	United States Environmental Protection Agency
WRI	World Resource Institute
B(a)P	Benzo(a)pyrene
CH ₄	Methane
CO	Carbon monoxide
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
HFC	Hydrofluorocarbons
NF ₃	Nitrogen Trifluoride
NH ₃	Ammonia
N ₂ O	Nitrous Oxide

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

NO	Nitric Oxide
NO _x	Nitrogen oxide
NO ₂	Nitrogen Dioxide
O ₃	Ozone
PAHs	Polycyclic aromatic hydrocarbons
PFCs	Perfluorocarbons
PM	Particulate Matter
PM ₁₀	Particulate matter up to 10 micrometers in diameter
PM _{2.5}	Fine particulates up to 2.5 micrometers in diameter
SF ₆	Sulphur hexafluoride
SO ₂	Sulfur oxide
THC	Total Hydrocarbons
TSP	Total suspended particulate
US EPA	United States Environmental Protection Agency
VOCs	Volatile organic compounds
kt	kilotonnes

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Introduction

September 14, 2017

1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by the City of Mississauga (the City) to conduct an air quality impact and greenhouse gas (GHG) assessment for the extension of Square One Drive (Procurement: FA. 49. 464-15), herein referred to as "the Project", located in Mississauga, Ontario. The study is based on the preliminary design drawings completed to date for Square One Drive from Rathburn Road West to Confederation Parkway (provided in Appendix B). The Project is being carried out in accordance with the "Municipal Class Environmental Assessment" documented by the Municipal Engineers Association (October 2000, as amended in 2007 and 2011).

The objective of this study is to characterize current air pollutant emissions (2017) and predict air quality effects within the Study Area after implementation of the Project in the future (2041) using background air quality and traffic data. Effects on greenhouse gas (GHG) emissions are also evaluated in this study. Predicted future emissions and effects with Project implementation are also compared to predicted future emissions and effects without implementation of the Project. This study has been completed with guidance from "Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects" (MTO, 2012), the United States Environmental Protection Agency (US EPA) "Transportation Conformity Guidance for Quantitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas" (US EPA, 2015) and "Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners" (Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment, 2003).

1.1 PROJECT DESCRIPTION

The City is proposing an extension to Square One Drive (the Project) in its 10 -year capital plan. The existing portion of Square One Drive to the east of Confederation Parkway currently has two travelled lanes. The extension from Rathburn Road West to Confederation Parkway is also proposed to have two travel lanes, with street parking and a sidewalk on the south side, and a multi-use trail on the north side. The proposed intersection at Rathburn Road West and Square One Drive will be in the form of a two-lane roundabout with an approximate diameter of 46 m, while the intersection of Confederation Parkway and Square One Drive would be a signal-controlled intersection. For the purposes of the Air Quality Impact Assessment only, it is assumed that the Project is to be constructed in 2 phases: phase 1, from Confederation Parkway to approximately 120 m west of Confederation Parkway, would be constructed in 2019; and, phase 2, which includes the remainder of the Project, would be constructed by 2027.

The Project location is provided in Appendix A and site plan of the Project is provided in Appendix B.



1.2 STUDY OBJECTIVES AND METHODOLOGY OVERVIEW

This study documents the environmental analysis of the potential effects from air and GHG emissions from the Project on current local air quality and GHG emissions, and anticipated air quality and GHG emissions in the year 2041. The objective of the study is to assess the local air quality effect from the Project-related activities (including Project associated traffic changes), considering the existing background air quality levels in the Study Area. GHG emissions from the Project are assessed against existing provincial (Ontario) and national GHG emissions.

1.2.1 Air Quality

The Project has the potential to interact with other sources of emissions, causing cumulative air quality effects. Background concentrations (as measured at nearby monitoring stations) are used in combination with air dispersion modelling to represent the cumulative effect of other existing emissions sources in addition to the sources being included in the dispersion modelling. Typically, sources of air emissions in a Study Area may include:

- residential
- commercial
- industrial
- agricultural
- transportation (e.g. traffic on local roads, railways, aircraft)
- naturally occurring (e.g. wind erosion of open surfaces, forests, fires)

Existing ambient air quality measured data in the area would include the contribution due to these sources and can therefore be used with a dispersion modeling assessment of a proposed development or transportation facility to quantify the incremental change in local air quality with respect to the emissions source(s) being studied.

A comparison of predicted cumulative air contaminant concentrations in the local Study Area to applicable Federal or provincial air quality criteria is performed to evaluate the Project's effect on local air quality. The predicted cumulative concentrations of contaminants of concern at the nearby receptors include the total traffic contributions and background concentration levels in the local Study Area.

The assessment of air quality effect related to the current conditions and the Project activities in year 2041 consisted of the following elements and methodologies:

- Evaluation of current baseline ambient air quality levels based published data.
- Emissions estimation of contaminants of concern from vehicles travelling on roads within the Study Area for current conditions and year 2041 accounting for forecasted future total traffic levels from growth in the City, using the US EPA MOVES2014a vehicle emissions estimation software.
- Selection of receptors in proximity of the Study Area, existing and proposed local roads.

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Introduction

September 14, 2017

- Traffic dispersion modelling (using CAL3QHCR with emission estimations from MOVES2014a) for existing conditions and for year 2041 and the effects with and without completion of the Project to predict air quality levels at the selected receptors.
- Prediction of cumulative air quality concentrations by combining ambient background air quality concentrations with the Study Area related local traffic dispersion modelling predictions.
- Comparison of the cumulative air quality predictions to regulatory standards and ambient air quality criteria.

1.2.2 Greenhouse Gases

GHG emissions associated with the Project were evaluated and documented in this study. The assessment of GHG effects related to the Project consisted of the following elements:

- Assessment of baseline provincial (Ontario) and national GHG emissions from existing published sources of GHG data.
- Emissions estimation of common GHGs from vehicles travelling on roads within the Study Area for current conditions and year 2041, accounting for forecasted future total traffic levels from growth in the City, using the US EPA MOVES2014a vehicle emissions estimation software. Emissions both with and without implementation of the Project are considered.
- Comparison of emissions from the Study Area to provincial (Ontario) and national GHG emissions. GHG effects on climate change from a single project cannot be measured or evaluated, it is the cumulative effect of global GHGs that has been shown to contribute to warming of the atmosphere (Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment 2003).

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Study Area
September 14, 2017

2.0 STUDY AREA

Square One Drive is a collector road under the jurisdiction of the City of Mississauga. Square One Drive extends approximately 300 m from Rathburn Road West to Confederation Parkway.

The Study Area is predominantly residential land use with existing dwellings adjacent to Rathburn Road West and Confederation Parkway (a Zoning map is included in Appendix A). The Study Area for this report encompasses the area where there is a potential for significant changes in air quality due to emissions from future changes to traffic, including Project related traffic. Appendix A shows the general area where the extension is proposed.

2.1 AIR QUALITY

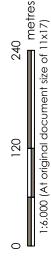
The Study Area used for assessing potential air contaminant emissions includes the immediate proximity of the Project and the local roads leading into and out of the Project roads, as shown in Figure 2-1. The Study Area was selected to extend a distance of approximately 500 m, such that receptors outside of the Study Area are not likely to experience a change in air quality levels due to Project. The lands in the Study Area are zoned as residential, open space and city centre zones with a combination of townhouses, semi-detached homes, condominiums, commercial buildings and Sheridan College.

2.2 GREENHOUSE GASES

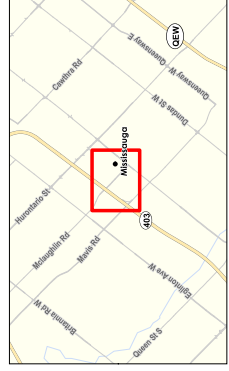
While the Study Area for GHG emissions estimations is the same as described for Air Quality, the GHG assessment area includes all of Ontario and Canada. This is to recognize that GHG emissions act cumulatively in the atmosphere globally.



Legend
Site Location
Study Area



Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry
3. Orthomosaic © first State Solutions, 2014; Imagery © Google, 2014.



Project Location
City of
Mississauga
Client/Project
CITY OF MISSISSAUGA
SQUARE ONE DRIVE EXTENSION CLASS EA
ROAD TRAFFIC - AIR QUALITY REPORT

Figure No.
2-1
Title
Study Area



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3.0 CONTAMINANTS OF CONCERN AND ASSESSMENT CRITERIA

The air contaminant emission sources expected from the Project are mobile sources that emit combustion gases from burning fossil fuels (e.g., gasoline and diesel) and fugitive dust. Combustion emissions depend on the combustion device type (engine type), the fuel composition, the fuel consumption rate and operating time. Fugitive dust emissions are generated by road traffic during the movement of mobile sources (e.g., cars and trucks).

3.1 AIR QUALITY

The expected Chemicals of Potential Concern (COPCs) that would likely be emitted during the Project operation are primarily Criteria Air Contaminants (CACs), volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). CACs include nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), total suspended particulate matter (TSP), particulate matter less than 10 μm in diameter (PM_{10}) and particulate matter less than 2.5 μm in diameter ($\text{PM}_{2.5}$).

NO_x are produced in most combustion processes, consisting of nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colourless gas with no direct effects on health or vegetation at ambient levels and with no regulatory criteria. NO_2 is the regulated form of NO_x . TSP generally means particles with an aerodynamic diameter of less than 44 μm . Particulate effects on human health are primarily considered using PM_{10} and $\text{PM}_{2.5}$ as these particles of these sizes can become trapped by the upper airways or in the case of $\text{PM}_{2.5}$, can make their way deep into the lungs and become lodged.

Total hydrocarbons (THC) and volatile organic compounds (VOCs) constitute two other groupings of COPCs for the Project. Key toxic VOCs from fuel combustion processes which are included in the study include benzene, 1,3-butadiene, formaldehyde, acetaldehyde, and acrolein. The compliance status of these speciated VOCs can be used as representatives for determination of compliance of other VOCs.

Polycyclic aromatic hydrocarbons (PAHs) is a subset of total hydrocarbons, of which the key representative substance is benzo(a)pyrene (B(a)P). Based on the Ontario Ministry of the Environment and Climate Change (MOECC) document "Air Contaminants Benchmark List: Standards, Guidelines and Screening Levels for Assessing Point of Impingement Concentrations of Air Contaminants" (MOECC, 2016) which is used in conjunction with Ontario Regulation 419/05 (O. Reg 419/05), B(a)P can be considered as a surrogate of total PAHs. Therefore, B(a)P is included in the assessment.

Air contaminant emission standards and guidelines are based on human health, environmental effects or nuisance effects. The provincial air quality objectives and standards were used and

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Contaminants of Concern and Assessment Criteria
September 14, 2017

relevant federal standards were referenced to provide guidance when no provincial standards were available.

A summary of the relevant Ontario Ambient Air Quality Criteria (AAQC), National Ambient Air Quality Objectives (NAAQOs), Canadian Ambient Air Quality Standards (CAAQS), and are presented in Table 3-1 below.

Table 3-1 Summary of Air Quality Criteria Used in the Study

Contaminant	CAS	Averaging Period (hours)	Air Quality Objectives / Criteria ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Regulation
NO ₂	10102-44-0	1	400	Health	CAAQS/ NAAQO ^A
		24	200		
		Annual	100		
CO	630-08-0	1	35,000	Health	AAQC
		8	15,000		
SO ₂	7446-09-5	1	900	Health/ Vegetation	AAQC
		24	300		
		Annual	60		
PM	N/A (pm)	24	120	Visibility	AAQC
		Annual	70		
PM ₁₀	N/A (PM ₁₀)	24	50	Health	AAQC
PM _{2.5}	N/A (PM _{2.5})	24	27	Health	CAAQS ^B
		Annual	8.8	Health	CAAQS ^C
Benzene	71-43-2	24	2.3	Health	AAQC
		Annual	0.45		AAQC
1,3-Butadiene	106-99-0	24	10	Health	AAQC
		Annual	2		AAQC
Acrolein	107-02-8	1	4.5	Health	AAQC
		24	0.4		AAQC
Acetaldehyde	75-07-0	0.5	500	Health	AAQC
		24	500		AAQC
Formaldehyde	50-00-0	24	65	Health	AAQC
Benzo(a)pyrene	50-32-8	24	0.00005	Health	AAQC
		Annual	0.00001		AAQC

Notes:

A National Ambient Air Quality Objectives (NAAQO) maximum acceptable levels are used.

B Canadian Ambient Air Quality Standards (CAAQS) for Respirable Particulate Matter and Ozone, effective by 2015 (CCME, 2012). The Respirable Particulate Matter Objective is referenced to the 98th percentile daily average concentration averaged over 3 consecutive years.



AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Contaminants of Concern and Assessment Criteria
September 14, 2017

Contaminant	CAS	Averaging Period (hours)	Air Quality Objectives / Criteria ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Regulation
-------------	-----	--------------------------	--	-----------------	------------

C Annual Canadian Ambient Air Quality Standard for Respirable Particulate Matter, effective by 2015. The Respirable Particulate Matter Objective is referenced to the 3-year average of the annual average concentrations.

AAQC – Ontario Ambient Air Quality Criteria

3.2 GREENHOUSE GASES

A GHG is any gas that contributes to potential climate change by trapping heat in the atmosphere. GHGs are known to contribute to warming of the climate, leading to many other changes around the world: in the atmosphere; on land; and in the oceans.

Common GHGs include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Other GHGs include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). HFCs and PFCs are used mainly as refrigerants, SF_6 is commonly found in electrical equipment, and NF_3 is used in the plasma etching of silicon wafers. The Project is expected to emit CO_2 , CH_4 , and N_2O from the combustion of fuels in vehicles and all three of these GHGs are assessed in this study. Other GHGs, such as HFCs, PFCs, SF_6 and NF_3 , are not expected to occur in notable quantities related to the Project, therefore these gases are not included in the analysis.

GHGs absorb heat radiated by the earth and subsequently warm the atmosphere, leading to what is commonly known as the greenhouse effect. The relative measure of how much heat a GHG absorbs in the atmosphere is characterized as the global warming potential (GWP), relative to CO_2 . For this assessment, the GWPs of CO_2 , CH_4 and N_2O are 1, 25, and 298, respectively, based on Canada's National Inventory Report 1990-2015 (Environment and Climate Change Canada (ECCC, 2017)). Because different GHGs contribute to different extents to the greenhouse effect, the unit of kilotonnes of carbon dioxide equivalent (kt CO_2e) is used to express the total quantity of GHGs. This unit is calculated by multiplying the tonnage emission of each GHG by its global warming potential, then summing the contributions from all relevant GHGs.

As identified in guidance provided on assessing climate change in environmental assessments, "the contribution of an individual project to climate change cannot be measured" (Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment 2003). Therefore, evaluation of Project effects will focus on estimation of GHG releases, mitigation and evaluation of Project GHG releases in relation to provincial (Ontario) and national GHG totals.

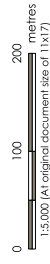
4.0 AIR QUALITY RECEPTORS

The assessment of air quality is based on the predicted concentrations of COPCs at receptors located in the Study Area. Selected receptors include those found in "Road Traffic Noise and Vibration Impact Assessment for Square One Drive Extension" (Stantec, 2017a) and other potentially sensitive receptors.

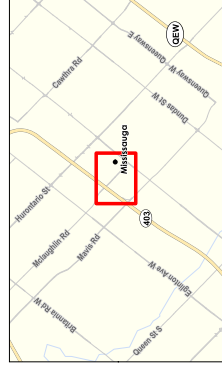
With the implementation of the Project, it is expected that traffic volumes and average speeds on nearby local roads will be affected, thus having an effect on identified receptors. The local roads where traffic may be affected were determined from the Stantec document "DRAFT Transportation and Traffic Analysis Report" (Stantec 2017b). Air quality levels from local traffic were predicted at 15 receptors along the local roads in the Study Area. The receptors included residential homes, condominiums, educational facilities and commercial buildings. The UTM coordinates are included in Appendix C and the location of these receptors is provided in Figure 2.



- Legend
- Site Location
 - Point of Reception



- Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry
 3. Orthomosaic © first State Solutions, 2014; Imagery Data, 2014.



Project Location
City of
Mississauga

14501 T005 REV A
Prepared by BCC on 2017-09-05
Technical Review by SPE on 2017-09-05
Independent Review by ABC on 2017-09-05

Client/Project
CITY OF MISSISSAUGA
SQUARE ONE DRIVE EXTENSION CLASS EA
ROAD TRAFFIC - AIR QUALITY REPORT

Figure No.

4-1

Receptor Locations



Disclaimer: Client assumes no responsibility for data specified in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or omission of the data.

Existing Conditions
September 14, 2017

5.0 EXISTING CONDITIONS

Background COPC concentrations and provincial and national GHG emissions were assessed to characterize the existing air quality and GHG emissions.

5.1 BACKGROUND AIR CONCENTRATIONS

Ambient air quality monitoring has been conducted by the National Air Pollution Surveillance Program (NAPS) operated by Environment Canada in populated regions of Canada. NAPS was established in 1969 and the goal of the program is to provide accurate and long-term air quality data of a uniform standard across Canada. The NAPS program continuously measures SO₂, NO₂, CO, O₃, and PM_{2.5} at various stations across Canada. The NAPS network data for the most recent five years of data currently available (2011 to 2015) at the nearest monitoring stations to the Study Area were reviewed. Locations of Ontario's Air Quality Health Index (AQHI) Monitoring Network were also used.

Available ambient monitoring data from the Mississauga monitoring was reviewed for this study. However, PM₁₀, CO, B(a)P, 1,3-Butadiene and Benzene were not monitored at this station. Monitoring data from five other nearby, representative NAPS and one AQHI monitoring stations were reviewed to determine background concentrations for these contaminants. Other Ontario Ambient Air Monitoring Stations near the Study Area were also checked and data from these locations are consistent with the NAPS stations used in the assessment near the Study Area. A summary of the NAPS and AQHI stations used is shown in **Table 5-1** and their locations are shown in **Appendix A**

Table 5-1 Monitoring Locations Assessed in the Study

ID	Address	City	Latitude	Longitude	Monitored Contaminant Assessed in the Study ¹
NAPS ID 60434	3359 Mississauga Road North	Mississauga	43.546970	-79.65869	NO ₂ , SO ₂ , PM _{2.5}
NAPS ID 60413	Elmcrest Road	Toronto	43.64852	-79.59138	VOCs
NAPS ID 60512	Elgin And Kelly	Hamilton	43.257780	-79.86167	CO, PM ₁₀ , VOCs, PAHs
NAPS ID 60428	525 Main Street North	Brampton	43.69875	-79.78092	VOCs
NAPS ID 60435	461 Kipling Avenue	Toronto (Etobicoke South)	43.610761	-79.52194	PM ₁₀ , VOCs, PAHs
NAPS ID 60427	223 College Street	Toronto	43.658222	-79.397183	PAHs

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Existing Conditions
September 14, 2017

ID	Address	City	Latitude	Longitude	Monitored Contaminant Assessed in the Study ¹
AQHI ID 35125	125 Resources Rd.	Toronto West	43.709444	-79.5435	CO

NOTE:

1. Some of the contaminants monitored at these stations may not be presented in this report. Only COPCs for the Project are presented.

The MOECC normally requires that 90th percentile ambient monitoring data be added to the dispersion model predictions to conservatively account for existing ambient concentrations. The background levels used in this study were therefore the 90th percentile values for short-term averages (1-hr and 24-hr). For annual averages, an annual average value was used as the background level.

The 90th percentile concentrations for applicable time periods are in **Table 5-2**.

Table 5-2 Summary of Background Air Quality Levels

Contaminant	CAS	Averaging Period (hour)	Background Concentration (µg/m³)
NO ₂	10102-44-0	1	40.2
		24	33.4
		Annual	21.7
CO	630-08-0	1	474.7
		8	461.3
SO ₂	7446-09-5	1	6.9
		24	5.8
		Annual	3.8
PM ₁₀	N/A (PM ₁₀)	24	30.6
PM _{2.5}	N/A (PM _{2.5})	24	13.8
		Annual	8.7
Benzene	71-43-2	24	1.1
		Annual	1.03
1,3-Butadiene	106-99-0	24	0.08
		Annual	0.05
Benzo(a)pyrene	50-32-8	24	0.00048
		Annual	0.00055

Existing Conditions
September 14, 2017

5.2 EXISTING GHG EMISSIONS

An understanding of the existing provincial and national GHG emissions may be used to put GHG emissions in the Study Area into context. Existing provincial and national GHG emission totals were obtained from Canada's National Inventory Reports released between 2012 and 2017 (covering up to 2015 calendar year). These emissions are provided in **Table 5-3**.

Table 5-3 National and Provincial GHG Emissions (kt CO₂e) – 2005 – 2015

Year	GHG Emissions (kt CO ₂ e)		Reference
	Canada	Ontario	
2005	738,000	204,000	ECCC 2017
2006	729,000	196,000	ECCC 2017, ECCC 2012
2007	750,000	200,000	ECCC 2017, ECCC 2013
2008	729,000	192,000	ECCC 2017, ECCC 2014
2009	689,000	171,000	ECCC 2017, ECCC 2015
2010	701,000	175,000	ECCC 2017
2011	707,000	175,000	ECCC 2017
2012	716,000	171,000	ECCC 2017
2013	729,000	171,000	ECCC 2017
2014	727,000	168,000	ECCC 2017
2015	722,000	166,000	ECCC 2017

NOTE:

Ontario's GHG emissions from 2006 to 2008 are based on GWPs from IPCC's 2nd Assessment Report (IPCC 1995). All other Ontario years and all Canada emissions are based on GWPs from IPCC's 4th Assessment Report (IPCC 2012).

An estimate of global emissions based on the Climate Analysis Indicators Tool (CAIT), developed by the World Resources Institute (WRI) shows that Canada's total emissions represents 1.6% of worldwide emissions (most recent estimate in 2012, WRI 2015). Based on the compiled ECCC data currently available, Ontario contributes approximately 23% of Canada's total emissions.

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Current and Future Air and GHG Emissions
September 14, 2017

6.0 CURRENT AND FUTURE AIR AND GHG EMISSIONS

The methods and results of the air and GHG emissions estimations are provided in this section, for both the current and future 2041 conditions.

6.1 AIR CONTAMINANT EMISSIONS

The US EPA Motor Vehicle Emission Simulator – MOVES 2014a (US EPA-420-B-15-095, November 2015) was used to estimate emissions from vehicle traffic on local roads. This model is capable of providing estimates of emissions from cars, trucks and non-highway mobile sources under a wide range of user-defined conditions. Data such as age distribution of the fleet, average vehicle speeds, vehicle distribution (*i.e.*, 5% heavy vehicles) and road type are incorporated in the model and were based on MOVES default parameters, other Stantec reports and review of the Study Area.

Air contaminant emissions from both the current 2017 and future 2041 scenarios were estimated. The future 2041 scenario accounted for future predicted efficiencies in engine technology provided in the MOVES model. In this model, vehicles operating in later years are predicted to have lower emissions per vehicle compared to earlier years (*i.e.*, 2041 vs existing conditions). Table 6-1 summarizes the key MOVES inputs used.

Table 6-1 Summary of Key MOVES Inputs

Parameter	Input	Basis
Model Year	2017 (Existing) and 2041 (Future)	Basis of study
Vehicle Distribution	4% and 5% Heavy Vehicles	Stantec Memo (Stantec 2017c)
Fuels	Gasoline and Diesel Fuels	Expected fuel usage in the area
Age Distribution	MOVES defaults based on modeling year	MOVES database
Pollutants	NO ₂ , CO, SO ₂ , PM ₁₀ , PM _{2.5} , Benzene, 1,3-Butadiene, Acrolein, Acetaldehyde, Formaldehyde, Benzo(a)pyrene PM cannot be modelled by MOVES directly. The majority of tailpipe particulate matter is PM ₁₀ or less. PM ₁₀ exhaust emission rate used for PM.	See section 3.1
Source Use Types	Combination Short-Haul Truck, Passenger Car	Stantec Memo (Stantec 2017c)
Road Type	Urban Unrestricted Access	Located in an urban area with arterials, connectors and local streets (<i>i.e.</i> not accessed by on-ramps)
Average Speed	5 to 60 km/hr (in 5 km/hr increments)	Based on expected speeds in the area (Stantec 2017d)



AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Current and Future Air and GHG Emissions
September 14, 2017

Emission factors in grams of pollutant emitted per vehicle mile travelled (g/VMT) for vehicle speeds ranging from 5 to 60 km/hr and 2 vehicle distributions (4% and 5% heavy vehicles) were obtained from MOVES and applied to appropriate links in the dispersion model (see section 7.0). Appendix D summarizes the emission factors obtained from MOVES.

While MOVES provides an estimate of COPC emissions from vehicle tailpipe, another source of emissions in the Study Area is particulate matter from paved roads due to moving traffic. These particulate emissions include PM, PM₁₀ and PM_{2.5} and are assessed in addition to the output from MOVES. Suspended particulate emissions from paved roads due to vehicles travelling on public roads in the Study Area are estimated using methodologies in the US EPA AP-42 Chapter 13.2.1 (Paved Roads, US EPA, update November 2006). Annual Average Daily Traffic (AADT) and vehicle distributions were obtained from the Stantec memo "City of Mississauga, Square One Drive Extension Class EA, AADT volumes – Existing Conditions and Future Scenarios" (Stantec, 2017c). Where AADT link data was not available an average ratio between all available AADT link data and their respective peak vehicle volumes was determined. This ratio was then used to determine AADT for links without this data. The calculation and emissions results are summarized in Appendix D.

6.2 GHG EMISSIONS

The estimation of GHG emissions followed the same methodology described for air contaminant emissions, using MOVES to predict CO₂e emission factors under the same model inputs, for both the current 2017 and future 2041 conditions. These emission factors were then used to calculate total emissions in 2017 and 2041 both with and without implementation of the Project. The total emissions for each case were based on each link's emission factor (g/VMT) and the predicted annual vehicle miles travelled (based on the length and AADT of each link). Where AADT link data was not available an average ratio between all available AADT link data and their respective peak vehicle volumes was determined. This ratio was then used to determine AADT for links without this data. The total estimated GHG emissions are provided in Appendix E and summarized in Table 6-2.

Table 6-2 Summary of GHG Emissions

Annual GHG Emissions (t CO ₂ e / year)		
2017 - Existing	2041 - No Extension	2041 - Extension
8,106	9,815	10,011

The 2041 scenario with the Project proceeding represents an increase in GHG emissions of approximately 24% over the existing scenario and 2% over the future scenario if the Project were not to proceed. Due to expected improvements in engine technology and cleaner fuels, overall CO₂e emissions per vehicle mile travelled are lower in the future but are offset by the expected corresponding increase in vehicle traffic. Therefore, the total incremental GHG emissions estimated to occur as a result of the Project is approximately 2%. This estimation is likely overly

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Current and Future Air and GHG Emissions
September 14, 2017

conservative as the Project is not expected to result in an increase in overall vehicle traffic in the City. The increased vehicle distances travelled on local roads within the Study Area may be offset by a decrease in travel on other roads not included in the Study Area.

7.0 AIR DISPERSION MODELLING ASSESSMENT

Dispersion modelling from traffic on local roads was performed on COPCs in air for the following assessment scenarios, using the results of the emissions assessment described in Section 6.0:

- 2017 – Existing conditions (no extension)
- 2041 – No extension
- 2041 – With extension

7.1 AIR DISPERSION MODELLING METHODS

The US EPA CAL3QHCR model was used to predict air quality levels from the traffic emissions scenarios at the receptors. This model can predict pollutant ground level concentrations (GLC) from motor vehicles near highways and arterial streets. CAL3QHCR requires inputs such as roadway geometries, receptor locations, meteorological conditions and vehicular emission factors.

A total of 78 links (road segments) were input into the model. These links were determined based on available existing (2017) and predicted future (2041) traffic volume data from the Stantec Traffic Report (Stantec, 2017a). The road link locations and other link data are shown in Appendix D. Emission factors from MOVES in g/VMT were assigned to each link depending on the link's predicted vehicle distribution and average speed.

The CAL3QHCR model requires local meteorological data. Five years of meteorological data (2012 – 2016) available from the nearest meteorological station were used in the modelling. Since CAL3QHCR can only process one year of meteorological data for each run, each of the five years' met data were processed individually and the highest predicted ambient concentrations over the 5-years were conservatively determined. Table 7-1 summarizes key CAL3QHCR inputs used in the model runs. Appendix F provides a sample input and output files.

Table 7-1 Key CAL3QHCR Model Input Parameters

Parameter	Input
Traffic Data	Peak hourly volumes determined from Stantec Traffic Report (Stantec, 2017a). See Appendix D. Average speeds (Stantec, 2017d). See Appendix D.
Deposition Velocity ¹	PM _{2.5} : 0.01 cm/s PM ₁₀ : 0.5 cm/s TSP: 0.15 cm/s NO ₂ : 0.1 cm/s CO: 0.03 cm/s VOCs: 0 cm/s

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Air Dispersion Modelling Assessment
September 14, 2017

Parameter	Input
Settling Velocity ¹	PM _{2.5} : 0.02 cm/s PM ₁₀ : 0.3 cm/s TSP: 1.8 cm/s CO, NO ₂ , and VOC's: 0 cm/s
Emission Factors	Emission Factors from MOVES2014a were applied to the appropriate depending on predicted average vehicle speed

NOTE:

- 1 Ministry of Transportation (MTO), (2012). Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects, June 2012.

7.2 AIR DISPERSION MODELLING RESULTS

Emissions of NO₂, SO₂, CO, PM, PM₁₀, PM_{2.5} and VOCs were assessed and concentration predictions were made over the receptors discussed in Section 4.0. The model predictions were compared to AAQCs, the federal NAAQOs or CAAQs where applicable. Table 7-2 summarizes the predicted ground level concentrations for the three modeled scenarios, and compares the results to applicable regulatory limits.

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Air Dispersion Modelling Assessment
September 14, 2017

Table 7-2 Summary of Predicted Maximum Ground Level Concentrations at Representative Receptors – Project Alone

Contaminant	CAS	Maximum Receptor Concentration - Project Alone (µg/m³)			Averaging Period (hours)	Air Quality Objectives /Criteria (µg/m³)	Limiting Effect	Regulation	Percentage of Reference Criteria (%)		
		Existing 2017	2041 - No Extension	2041 - Extension					Existing 2017	2041 - No Extension	2041 - Extension
NO ₂	10102-44-0	19.2	14.1	13.7	1	400	Health	AAQC	5%	4%	3%
		5.2	4.0	4.0	24	200			3%	2%	2%
		1.6	1.3	1.3	Annual	100			2%	1%	1%
CO	630-08-0	886.4	224.1	217.6	1	36,200	Health	AAQC	2%	<1%	<1%
		458.2	114.6	114.6	8	15,700			3%	<1%	<1%
SO ₂	7446-09-5	1.1	1.0	1.0	1	690	Health/ Vegetation	AAQC	<1%	<1%	<1%
		0.3	0.3	0.3	24	275			<1%	<1%	<1%
		0.09	0.09	0.09	Annual	11.4			<1%	<1%	<1%
PM	N/A (pm)	27.3	37.9	41.1	24	120	Visibility	AAQC	23%	32%	34%
		9.0	12.5	13.6	Annual	60			15%	21%	23%
PM ₁₀	N/A (PM ₁₀)	12.5	15.9	16.3	24	50	Health	AAQC	25%	32%	33%
PM _{2.5}	N/A (PM _{2.5})	4.9	3.0	3.1	24	27 ^A	Health	CAAQS	18%	11%	12%
		1.5	1.0	1.0	Annual	8.8 ^B	Health		18%	11%	12%
Benzene	71-43-2	0.2	0.02	0.02	24	2.3	Health	AAQC	10%	<1%	<1%
		0.07	0.007	0.007	Annual	0.45			16%	2%	2%
1,3-Butadiene	106-99-0	0.04	0.0005	0.0005	24	10	Health	AAQC	<1%	<1%	<1%
		0.01	0.0001	0.0001	Annual	2			<1%	<1%	<1%

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Air Dispersion Modelling Assessment
September 14, 2017

Contaminant	CAS	Maximum Receptor Concentration - Project Alone (µg/m ³)		Averaging Period (hours)	Air Quality Objectives /Criteria (µg/m ³)	Limiting Effect	Regulation	Percentage of Reference Criteria (%)		
		Existing 2017	2041 - No Extension					Existing 2017	2041 - No Extension	2041 - Extension
Acrolein	107-02-8	0.1	0.02	1	4.5	Health	AAQC	2%	<1%	<1%
		0.03	0.006	24	0.4			7%	1%	1%
Acetaldehyde	75-07-0	0.9	0.2	0.5	500	Health	AAQC	<1%	<1%	<1%
		0.2	0.04	24	500			<1%	<1%	<1%
Formaldehyde	50-00-0	0.4	0.1	24	65	Health	AAQC	<1%	<1%	<1%
Benzo(a)pyrene	50-32-8	0.0006	0.0001	24	0.00005	Health	AAQC	1,191%	215%	206%
		0.0002	0.00003	Annual	0.00001			1,837%	336%	323%

NOTE:

- A Requires the maximum 98th percentile values averaged over 3-years in order to directly compare to the 24-hour average PM_{2.5} CAAQS
- B Requires a maximum 3-year average to directly compare to the annual PM_{2.5} CAAQS
- C Maximum concentration over 15 receptors are shown here. Predicted ground level concentrations within the same scenario but different contaminant/ averaging period are not necessarily from the same receptor. Similarly, contaminant/ averaging period between different scenarios are not necessarily comparing the same receptor.

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Air Dispersion Modelling Assessment
September 14, 2017

The highest predicted GLCs for all contaminants were all below the relevant criteria except for Benzo(a)pyrene in all 3 scenarios.

Although the predicted concentrations of Benzo(a)pyrene are higher than the relevant criteria (approximately 12 to 18 times higher), based on the model predictions, the concentrations of this contaminant are expected to decrease in both future scenarios, with and without the Project proceeding. In fact, the scenario with the Project proceeding shows a greater decrease in emissions from Benzo(a)pyrene than the scenario with the Project not proceeding. This is because even though traffic volumes are expected to increase by 2041, the predicted advances in cleaner fuels and advanced emissions control technology are anticipated to lower all vehicle contaminant tailpipe emissions including Benzo(a)pyrene.

The highest predicted GLCs for all contaminants are either lower or approximately the same in the case of the Project proceeding than it is for either the current 2017 condition or the Project not proceeding scenario, except for particulate emissions. This is due to the predicted advances in cleaner fuels, higher average speeds in the extension leading to greater vehicle efficiency, and orientation of the proposed extension in relation to the subject receptors.

For particulate emissions, both PM and PM₁₀, show a predicted increase in maximum concentrations between the current 2017 condition and the future predicted scenario with the Project proceeding. An increase in emissions is also predicted if the Project were to proceed when compared to the future scenario were the Project not to proceed. For PM_{2.5}, the predicted concentrations of the proposed Project show a decrease in concentrations from the current conditions, and a slight increase or no change in concentrations when compared to the Project not proceeding. In all cases, the concentrations are predicted to be below the applicable criteria. The predicted general increase in all future particulate emissions may be attributed to the future increased volume of vehicles on the road (due to traffic growth) causing higher rates of loose material on the road surface that can become suspended, offsetting advances in clean fuel and engine technology.

8.0 CUMULATIVE EFFECTS ASSESSMENT

This section discusses the assessment of background air quality and GHG emissions in order to evaluate the Project's emissions cumulatively and in relation to other existing sources of emissions in the Study Area.

8.1 AIR QUALITY

The maximum predicted GLCs obtained in the air quality dispersion model were added to the background concentrations discussed in Section 5.0 in order to assess the cumulative effects of the Project along with the existing sources of air emissions in the Study Area. The maximum predicted cumulative concentrations for each of the COPCs for the existing and future conditions with and without the Project are summarized in Table 8-1. The values presented in this table are the maximum predicted values over all the 15 receptors. Where no data is available to characterize background levels, the background concentration is noted as N/A.

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Cumulative Effects Assessment
September 14, 2017

Table 8-1 Summary of Predicted Maximum Ground Level Concentrations at Representative Receptors – Cumulative Effects

Contaminant	CAS	Background Concentrations (µg/m³)	Maximum Receptor Concentration - Cumulative (µg/m³)			Averaging Period (hours)	Air Quality Objectives / Criteria (µg/m³)	Limiting Effect	Regulation	Percentage of Reference Criteria (%)		
			Existing 2017	2041 - No Extension	2041 - Extension					Existing 2017	2041 - No Extension	2041 - Extension
NO ₂	10102-44-0	40.2	59.4	54.3	53.9	1	400	Health	AAQC	15%	14%	13%
		33.4	38.6	37.4	37.4	24	200			19%	19%	19%
		21.7	23.3	23.0	22.9	Annual	100		NAAQO	23%	23%	23%
CO	630-08-0	475	1361	699	692	1	36,200	Health	AAQC	4%	2%	2%
		461	920	576	576	8	15,700			6%	4%	4%
SO ₂	7446-09-5	6.9	7.9	7.9	7.8	1	690	Health/ Vegetation	AAQC	1%	1%	1%
		5.8	6.1	6.1	6.1	24	275			2%	2%	2%
		3.8	3.9	3.9	3.9	Annual	11.4			34%	34%	34%
PM	N/A (pm)	N/A	27.3	37.9	41.1	24	120	Visibility	AAQC	23%	32%	34%
		N/A	9.0	12.5	13.6	Annual	60			15%	21%	23%
PM ₁₀	N/A (PM ₁₀)	30.6	43.1	46.4	46.8	24	50	Health	AAQC	86%	93%	94%
PM _{2.5}	N/A (PM _{2.5})	13.8	18.7	16.8	16.9	24	27 ^A	Health	CAAQS	69%	62%	63%
		8.7	10.2	9.6	9.7	Annual	8.8 ^B	Health		116%	109%	110%
Benzene	71-43-2	1.1	1.4	1.2	1.2	24	2.3	Health	AAQC	60%	51%	51%
		1.0	1.1	1.0	1.0	Annual	0.45			244%	230%	230%
1,3-Butadiene	106-99-0	0.08	0.1	0.08	0.08	24	10	Health	AAQC	1%	<1%	<1%
		0.05	0.06	0.05	0.05	Annual	2			3%	2%	2%
Acrolein	107-02-8	N/A	0.1	0.02	0.02	1	4.5	Health	AAQC	2%	<1%	<1%



AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Cumulative Effects Assessment
September 14, 2017

Contaminant	CAS	Background Concentrations (µg/m³)	Maximum Receptor Concentration - Cumulative (µg/m³)			Averaging Period (hours)	Air Quality Objectives / Criteria (µg/m³)	Limiting Effect	Regulation	Percentage of Reference Criteria (%)		
			Existing 2017	2041 - No Extension	2041 - Extension					Existing 2017	2041 - No Extension	2041 - Extension
Acetaldehyde	75-07-0	N/A	0.03	0.006	0.006	24	0.4			7%	1%	1%
		N/A	0.9	0.2	0.2	0.5	500			<1%	<1%	<1%
		N/A	0.2	0.04	0.04	24	500	Health	AAQC	<1%	<1%	<1%
Formaldehyde	50-00-0	N/A	0.4	0.1	0.1	24	65	Health	AAQC	<1%	<1%	<1%
Benzo(a)pyrene	50-32-8	0.0005	0.001	0.0006	0.0006	24	0.00005			2159%	1183%	1175%
		0.0006	0.0007	0.0006	0.0006	Annual	0.00001	Health	AAQC	7311%	5810%	5797%

NOTE:

- A Requires the maximum 98th percentile values averaged over 3-years in order to directly compare to the 24-hour average PM_{2.5} CAAQS
- B Requires a maximum 3-year average to directly compare to the annual PM_{2.5} CAAQS
- C Maximum concentration over 15 receptors are shown here. Predicted ground level concentrations within the same scenario but different contaminant/ averaging period are not necessarily from the same receptor. Similarly, contaminant/ averaging period between different scenarios are not necessarily comparing the same receptor.

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Cumulative Effects Assessment
September 14, 2017

The maximum predicted cumulative concentrations of all COPCs in all scenarios are below their respective criteria for all modeled receptors except for three contaminants: PM_{2.5}, benzene and Benzo(a)pyrene.

The highest cumulative annual GLC of PM_{2.5} if the Project were to proceed is predicted to be higher than the relevant criteria. The PM_{2.5} CAAQS is a 98th percentile 3-year average criteria. In order to make an applicable direct comparison, a similar 98th percentile value should be used. However, the CAL3QHCR model does not provide enough data to predict a 98th percentile value, therefore in order to be conservative, the PM_{2.5} value used in comparison to the criteria was a maximum 24-hour average value over the course of 5 years. This conservative method over-estimates the concentration of PM_{2.5} from the Project, and contributes to the predicted exceedance of the annual PM_{2.5} annual criteria. A key contributing factor to the predicted exceedance of the cumulative annual concentration of PM_{2.5} is the fact that the background annual PM_{2.5} concentration is currently 98% of the annual criteria without inclusion of model predictions.

The annual average cumulative benzene concentration is predicted to be above its criteria for all 3 scenarios, although the concentrations from the future condition with the Project are predicted to be either lower or approximately the same as both the current condition or the future condition without the Project proceeding. Levels above the annual criteria in all three cases are caused by the background concentration which is already above its threshold (1.03 µg/m³ vs. 0.45 µg/m³ criteria, or 228% of the limit) without any contribution from the model predictions. Reviews of the 14 NAPS stations in Ontario which monitored benzene between 2009 and 2013 shows that 9 of these stations measured benzene concentrations higher than the relevant annual criteria.

For Benzo(a)pyrene, the predicted maximum GLCs of the Project alone is predicted to be less than the GLC of the current 2017 condition. Also, as can be seen in Table 8-1, the background concentration of this contaminant is currently higher than the relevant criteria, even without implementation of the Project. This trend is common across Ontario at all NAPS stations where Benzo(a)pyrene was monitored since 2010.

8.2 GREENHOUSE GASES

In order to evaluate the potential cumulative effects of GHG emissions due to the Project, the relative emissions with and without implementation of the Project were compared to the current baseline emissions in Ontario and in Canada.

The estimated GHG emissions from the future scenario if the Project were to proceed represents 0.006% of Ontario's total emissions, and 0.001% of Canada's total emissions.

The incremental increase in GHG emissions due to the Project proceeding, in relation to the Project not proceeding is 196 t CO₂e per year. This is an incremental increase in the GHG emissions in Ontario of 0.0001%, and in Canada of 0.00003%.



AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Cumulative Effects Assessment
September 14, 2017

These potential changes are considered inconsequential in relation to provincial and national GHG totals.

Mitigation
September 14, 2017

9.0 MITIGATION

Vehicle emission reduction strategies have been a focus of primarily federal but also provincial initiatives over the past 20 to 30 years. Increasingly stringent new vehicle emissions standards have been adopted, and augmented with programs such as vehicle maintenance related to emissions generation, and requirements for emissions for other engine types. These increasingly stringent policies focused on vehicle emissions reduction have shown consistent reduction in combustion emissions components in air quality data reported by federal and provincial monitoring.

Construction
September 14, 2017

10.0 CONSTRUCTION

At this stage of the Project, construction plans have not been finalized. The project has been identified in a 10-year capital plan. It is currently anticipated for the purposes of the Air Quality Impact Assessment only that the construction strategy involves two phases (Stantec, 2017e)

- Phase 1 would potentially be implemented in 2019. This is between Confederation Parkway and the AMACON access (including signalization/improvements to the Square One Drive & Confederation Parkway intersection).
- Phase 2 would potentially be implemented by 2027. This is between the AMACON access and Rathburn Road West (including construction of the roundabout the Square One Drive & Rathburn Road West, and the realignment of Rathburn Road West).

Based on the limited construction plan information, some qualitative comments on construction related air emissions impacts and potential mitigation measures are provided.

The sources of construction related emissions expected will be primarily from heavy equipment engines and related hydrocarbon combustion. Fugitive dust from vehicle traffic over temporary unpaved surfaces will also result.

Total construction related air emissions would be anticipated over several weeks to potentially months, and not years as for the ultimate Project operational lifetime. As such, the construction emissions are expected to be several orders of magnitude less significant than the operational emissions associated with the Project. Project construction emissions can be mitigated by ensuring that well-tuned and maintained engines are provided with construction equipment, and that proper project planning and management ensures a short duration for potential unpaved vehicle traffic surfaces.

Conclusion
September 14, 2017

11.0 CONCLUSION

The following conclusions were made from the air quality impact assessment.

- The highest predicted GLCs of the Project alone if the Project were to proceed were all below the relevant criteria for all COPCs except for Benzo(a)pyrene in all 3 scenarios.
- The concentrations of Benzo(a)pyrene are expected to decrease in the future. This is true for both with and without the Project proceeding. The scenario with the Project proceeding shows a benefit of greater decrease in emissions from Benzo(a)pyrene than the scenario with the Project not proceeding.
- The highest predicted GLCs of the Project alone for all contaminants, except particulate emissions, are either lower or approximately the same when compared to the current 2017 condition or the Project not proceeding scenario.
- For Project alone particulate emissions, both PM and PM10, show a predicted increase in maximum concentrations between the current 2017 condition and the future predicted scenario with the Project proceeding. For PM2.5, the predicted concentrations of the proposed Project show a decrease in concentrations from the current conditions, and a slight increase or no change in concentrations when compared to the Project not proceeding. In all cases, despite some predicted potential emissions increases, the concentrations are predicted to be below the applicable criteria.
- The maximum predicted cumulative concentrations of all COPCs if the Project were to proceed are below their respective criteria for all modeled receptors except for three contaminants: PM2.5, benzene and Benzo(a)pyrene.
- The highest cumulative annual GLC of PM2.5 if the Project were to proceed is predicted to be higher than the relevant criteria. The conservative evaluation and high background concentration are the contributing factors.
- The annual average cumulative benzene concentration is predicted to be above its criteria if the Project were to proceed, although the concentrations from the future condition with the Project are predicted to be either lower or approximately the same as both the current condition or the future condition without the Project proceeding. The background concentration of benzene in Ontario is currently measured to be above the relevant criteria. Overall, predicted annual average cumulative benzene concentrations are approximately the same between the future condition with and without the Project proceeding.
- The background concentration of Benzo(a)pyrene in Ontario is higher than the relevant criteria contributing to the predicted cumulative concentrations of this contaminant to exceed the relevant criteria.
- Greenhouse gas emissions are predicted to be higher in both future conditions compared to existing conditions due to increases in traffic volumes. The total incremental GHG emissions estimated to occur as a result of the Project is approximately 2%, however, this may be due to conservatism in the model and the increased emissions in the Study Area may be offset by decreases in local roads not covered in the Study Area.

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

Conclusion
September 14, 2017

- Increasingly stringent new vehicle emissions standards have been a focus of both federal and provincial initiatives and have shown consistent reduction in vehicle combustion emissions which would help to lower contaminant ground level concentrations.
- Contaminant emissions during construction have been assessed qualitatively as construction plans have not yet been finalized. Construction related air emissions are anticipated to take place over a shorter time period (weeks to months) than the ultimate Project operational lifetime (years) and are therefore expected to be several orders of magnitude less significant than the operational emissions associated with the Project.
- Overall air emissions with the Project proceeding are shown to be of benefit in most considerations when compared to the scenario without the Project proceeding. While greenhouse gas emissions are seen to increase marginally (approximately 2%), this limited impact may be offset by decreases in local roads not covered in the Study Area and can also be a result of conservatism in the study modelling carried out.

AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

References

September 14, 2017

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AIR QUALITY IMPACT ASSESSMENT FOR SQUARE ONE DRIVE EXTENSION

References

September 14, 2017

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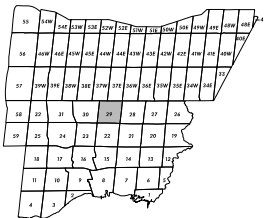
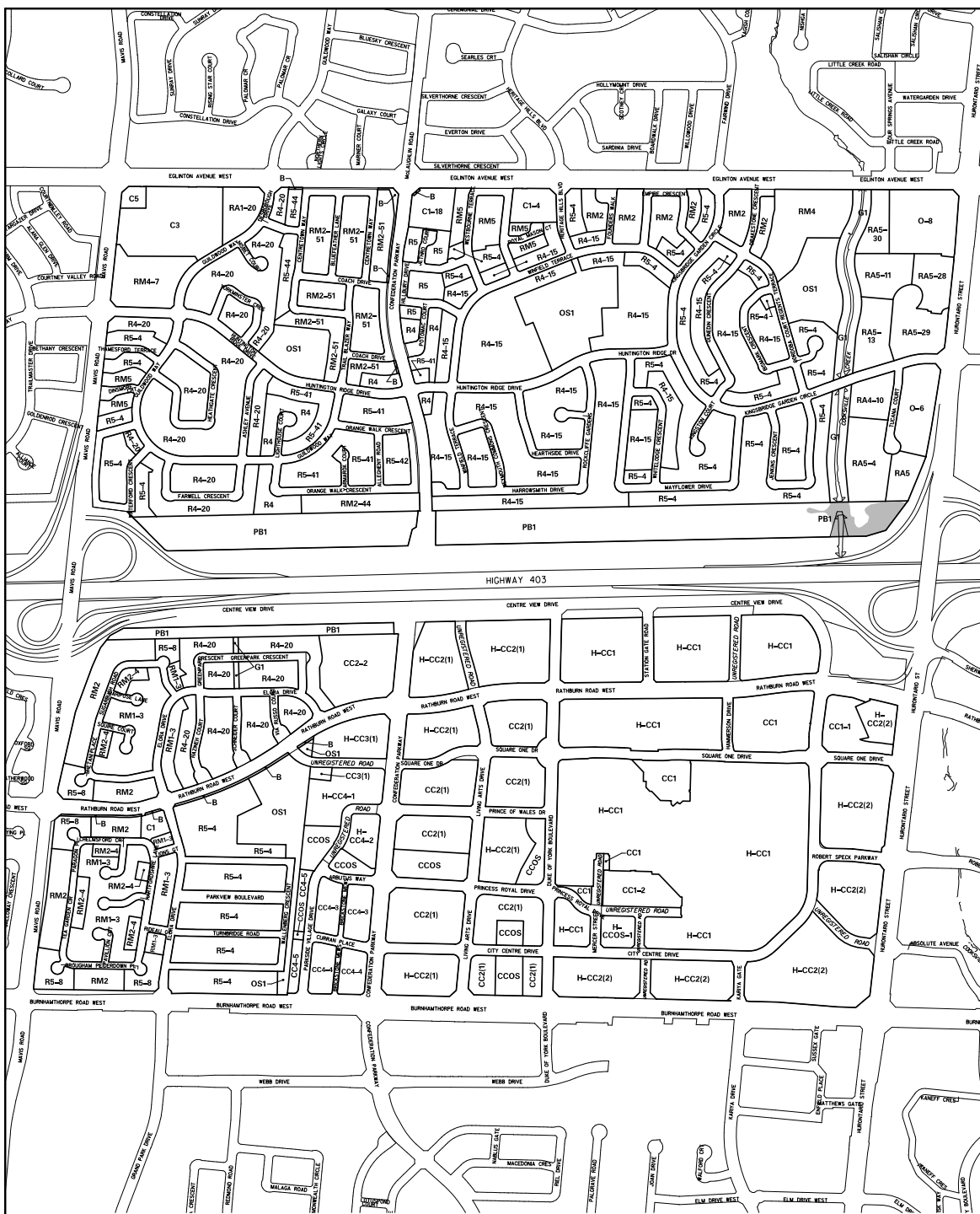
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Appendix A SITE PLAN, LOCATION, AND ZONING MAP

30

28



 **MISSISSAUGA**



0 100 200
METRES

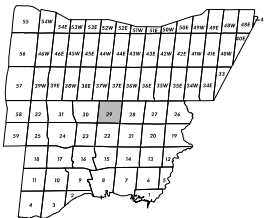
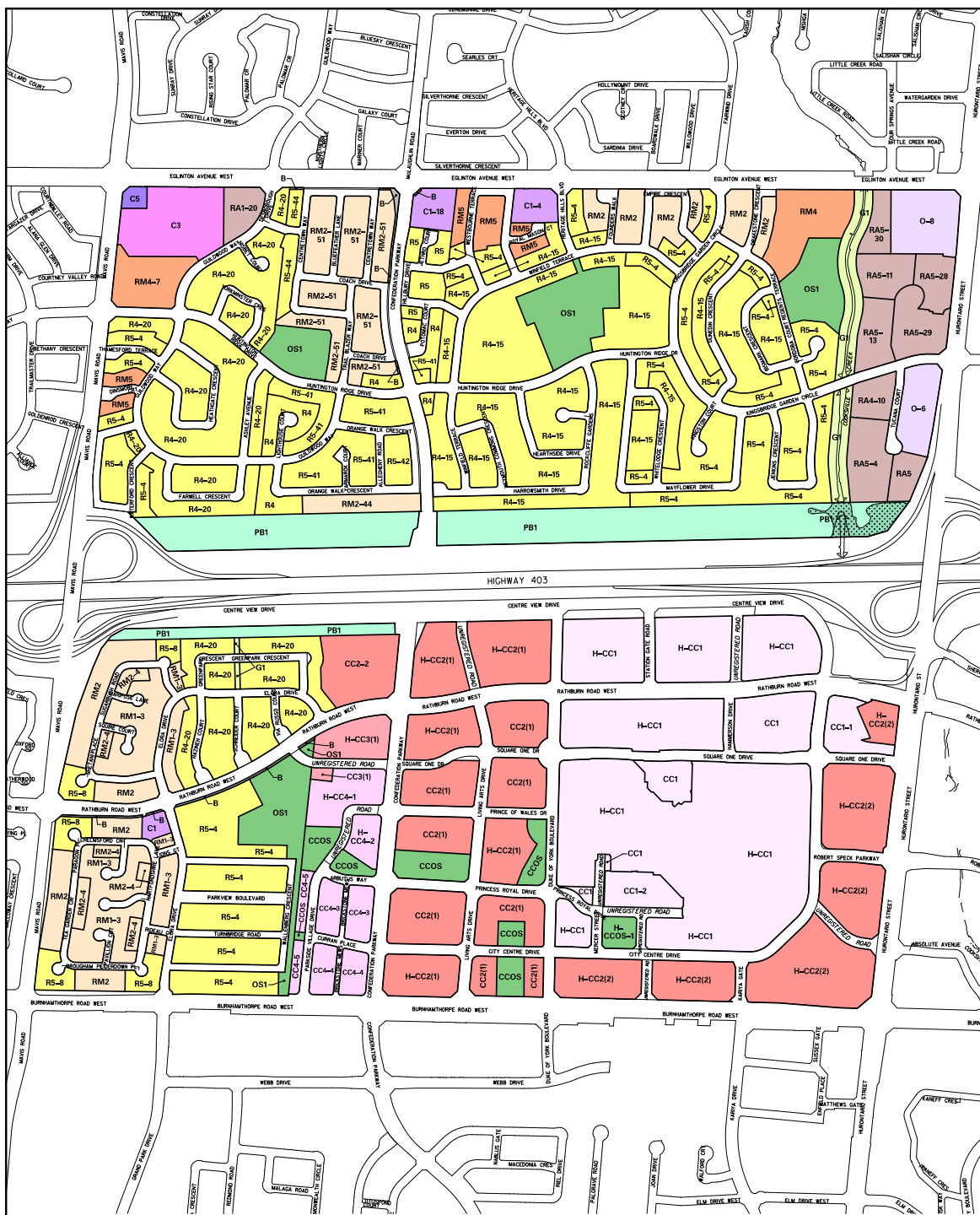
 Greenlands Overlay

Zoning Notation Example:
R4-12 = R4-Exception 12

Zoning Map 29

Schedule "B" To
By-law No. 0225-2007

Revised: 2016 December 31



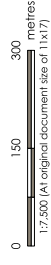
Zoning Map 29

Schedule "B" To
By-law No. 0225-2007

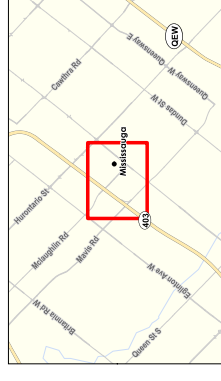
Revised: 2016 December 31



Legend
Site Location

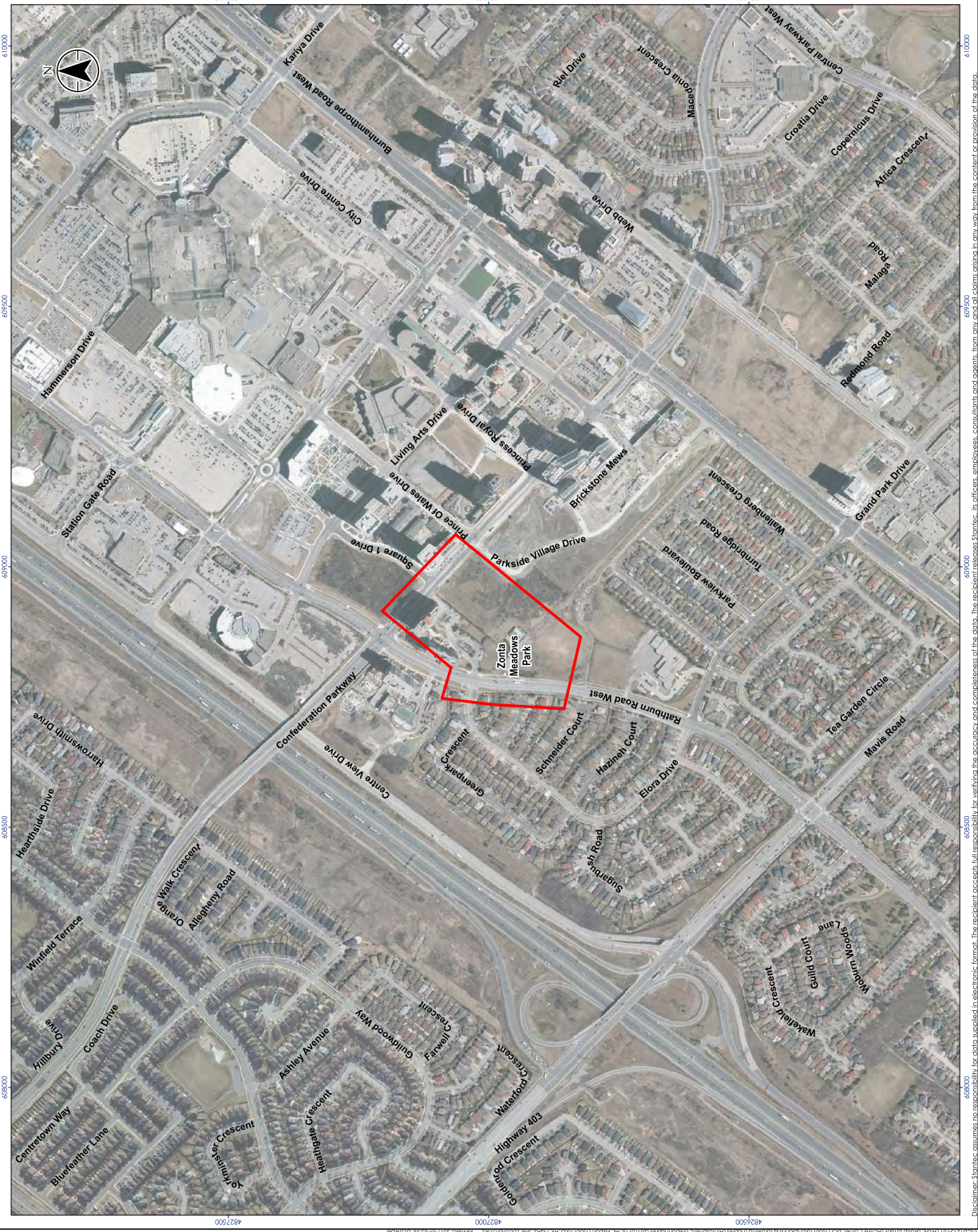


Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry
3. Orthomosaic © first base Solutions, 2014; Imagery © Google, 2014.



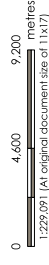
Project Location
City of Mississauga
Client/Project
CITY OF MISSISSAUGA
SQUARE ONE DRIVE EXTENSION CLASS EA
ROAD TRAFFIC - AIR QUALITY REPORT
Figure No.
A2

Site Location





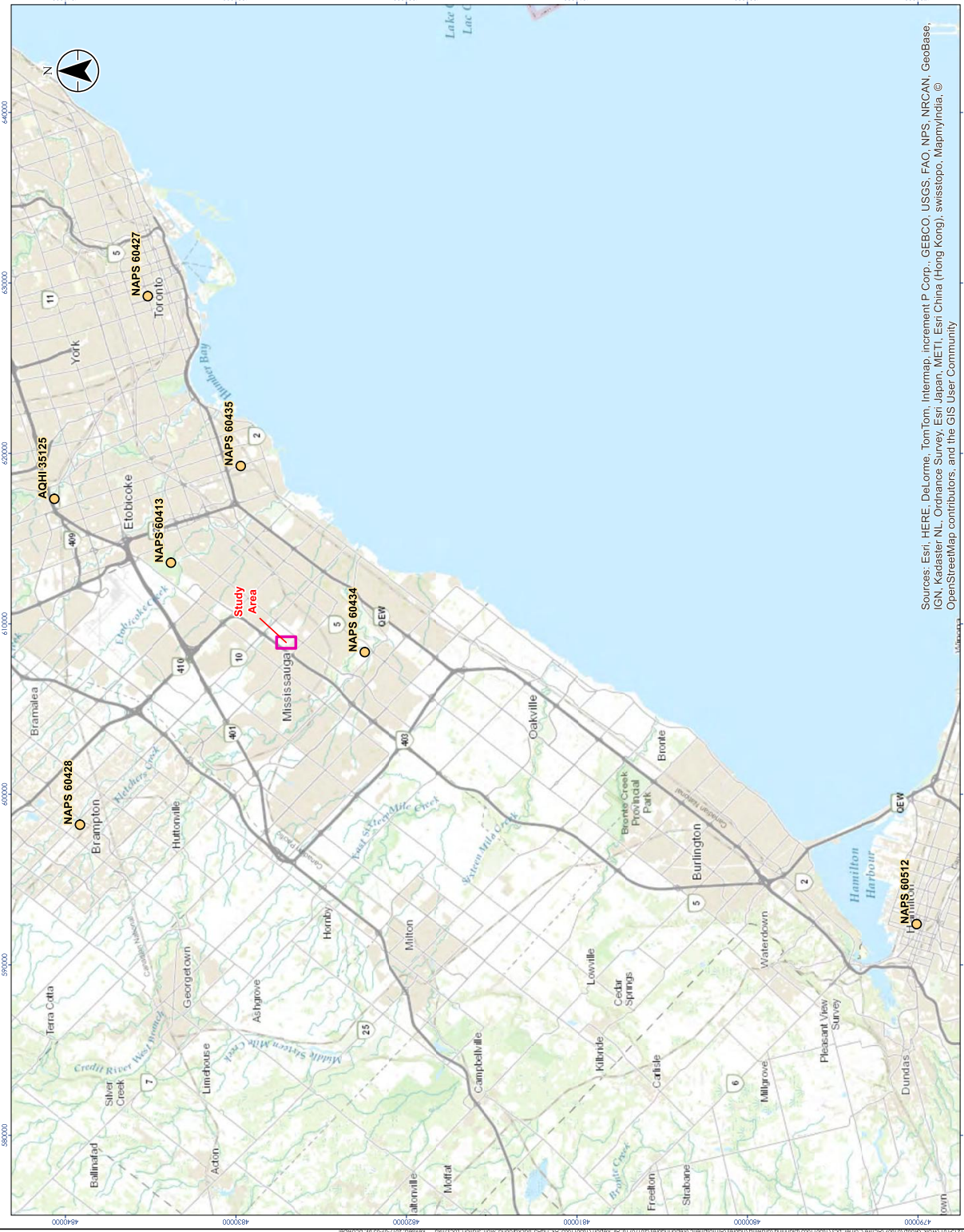
- Legend
- Study Area
 - Background Monitoring
 - Station Locations



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, 2017.

Project Location	14501 TDS REV A
City of	Prepared by BCC on 2017-09-05
Mississauga	Technical Review by SPE on 2017-mm-dd
Client/Project	Independent Review by ABC on 2017-mm-dd
CITY OF MISSISSAUGA	
SQUARE ONE DRIVE EXTENSION CLASS EA	
ROAD TRAFFIC - AIR QUALITY REPORT	
Figure No.	
A3	

Background Monitoring Station Locations



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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Appendix B DESIGN DRAWINGS

Appendix C RECEPTORS

Table B1 - Receptor UTM Coordinates

Receptor ID	Easting (m)	Northing (m)	Receptor Description
POR001	608747	4826963	Noise Receptor - Residential
POR002	608831	4827062	Noise Receptor - Residential
POR003	608922	4827095	Noise Receptor - Residential
POR004	609001	4827104	Noise Receptor - Residential
POR005	608742	4826980	Noise Receptor - Residential
POR006	609042	4827080	Noise Receptor - Residential
POR007	608713	4826582	Commercial
POR008	608773	4826661	School
POR009	608677	4826647	Residence
POR010	608789	4827163	Residence
POR011	608765	4827243	Residence
POR012	608862	4827478	Commercial
POR013	609065	4827589	Commercial
POR014	609072	4827261	Commercial
POR015	609171	4827369	College

-79.6529	43.5877
-79.6519	43.58858
-79.6507	43.58887
-79.6497	43.58893
-79.653	43.58786
-79.6492	43.58871
-79.6534	43.58428
-79.6527	43.58498
-79.6538	43.58487
-79.6524	43.5895
-79.6526	43.59022
-79.6514	43.59232
-79.6488	43.59329
-79.6488	43.59034
-79.6476	43.5913

Appendix D CONTAMINANT EMISSION CALCULATIONS

Summary of g/VMT emission factors by contaminant/ link - 2017 (Excluding paved road resuspension)													
Link ID	Description	Assigned Average Speed (5-60 km/hr in 5 km/hr)	Vehicle Distribution	Pollutant Name and ID									
				Carbon Monoxide	Oxides of Nitrogen (Nox)	Benzene	1,3-Butadiene	Formaldehyde	Acetaldehyde	Acrolein	Sulfur Dioxide	Nitrogen Dioxide (NO2)	Benz(a)pyrene
1	195% Car and 5% Truck - 60 km/hr	60	95% Car and 5% Truck	3.09E+00	1.07E+00	2.20E-03	3.15E-04	3.38E-03	1.74E-03	2.61E-04	3.37E-03	8.99E-02	6.77E-06
2	295% Car and 5% Truck - 55 km/hr	55	95% Car and 5% Truck	3.30E+00	1.10E+00	2.34E-03	3.34E-04	3.55E-03	1.83E-03	3.34E-04	3.47E-03	9.20E-02	7.11E-06
3	395% Car and 5% Truck - 50 km/hr	50	95% Car and 5% Truck	3.56E+00	1.21E+00	2.51E-03	3.58E-04	3.75E-03	1.93E-03	2.88E-04	3.67E-03	1.00E-01	7.41E-06
4	495% Car and 5% Truck - 45 km/hr	45	95% Car and 5% Truck	3.68E+00	1.23E+00	2.70E-03	3.88E-04	4.03E-03	2.08E-03	3.10E-04	3.86E-03	1.03E-01	7.85E-06
5	595% Car and 5% Truck - 40 km/hr	40	95% Car and 5% Truck	3.87E+00	1.27E+00	2.93E-03	4.25E-04	4.38E-03	2.27E-03	3.37E-04	4.10E-03	1.07E-01	8.49E-06
6	695% Car and 5% Truck - 35 km/hr	35	95% Car and 5% Truck	4.30E+00	1.32E+00	3.21E-03	4.66E-04	4.83E-03	2.49E-03	3.71E-04	4.36E-03	1.11E-01	9.89E-06
7	795% Car and 5% Truck - 30 km/hr	30	95% Car and 5% Truck	4.89E+00	1.39E+00	3.58E-03	5.23E-04	5.44E-03	2.81E-03	4.18E-04	4.71E-03	1.17E-01	1.17E-05
8	895% Car and 5% Truck - 25 km/hr	25	95% Car and 5% Truck	5.21E+00	1.48E+00	3.99E-03	5.93E-04	6.33E-03	3.25E-03	4.88E-04	5.17E-03	1.24E-01	1.26E-05
9	995% Car and 5% Truck - 20 km/hr	20	95% Car and 5% Truck	5.65E+00	1.55E+00	4.60E-03	6.97E-04	7.65E-03	3.90E-03	5.91E-04	5.74E-03	1.31E-01	1.41E-05
10	1095% Car and 5% Truck - 15 km/hr	15	95% Car and 5% Truck	6.40E+00	1.74E+00	5.60E-03	8.69E-04	9.80E-03	4.96E-03	7.59E-04	6.78E-03	1.46E-01	1.65E-05
11	1195% Car and 5% Truck - 10 km/hr	10	95% Car and 5% Truck	7.90E+00	2.21E+00	7.61E-03	1.21E-03	1.40E-02	7.06E-03	1.09E-03	8.93E-03	1.82E-01	2.14E-05
12	1295% Car and 5% Truck - 5 km/hr	5	95% Car and 5% Truck	1.23E+01	3.86E+00	1.35E-02	2.19E-03	2.54E-02	1.28E-02	1.98E-03	1.55E-02	3.09E-01	3.54E-05
13	1396% Car and 4% Truck - 60 km/hr	60	96% Car and 4% Truck	3.09E+00	9.20E-01	2.16E-03	2.98E-04	2.84E-03	1.50E-03	2.16E-04	3.26E-03	7.91E-02	6.48E-06
14	1496% Car and 4% Truck - 55 km/hr	55	96% Car and 4% Truck	3.29E+00	9.41E-01	2.30E-03	3.17E-04	2.98E-03	1.58E-03	2.26E-04	3.35E-03	8.09E-02	6.80E-06
15	1596% Car and 4% Truck - 50 km/hr	50	96% Car and 4% Truck	3.55E+00	1.03E+00	2.47E-03	3.40E-04	3.15E-03	1.67E-03	2.39E-04	3.53E-03	8.75E-02	7.08E-06
16	1696% Car and 4% Truck - 45 km/hr	45	96% Car and 4% Truck	3.67E+00	1.06E+00	2.66E-03	3.68E-04	3.38E-03	1.80E-03	2.57E-04	3.72E-03	9.02E-02	7.47E-06
17	1796% Car and 4% Truck - 40 km/hr	40	96% Car and 4% Truck	3.86E+00	1.09E+00	2.89E-03	4.03E-04	3.68E-03	1.96E-03	2.79E-04	3.95E-03	9.36E-02	8.06E-06
18	1896% Car and 4% Truck - 35 km/hr	35	96% Car and 4% Truck	4.30E+00	1.13E+00	3.16E-03	4.43E-04	4.05E-03	2.15E-03	3.07E-04	4.21E-03	9.72E-02	9.41E-06
19	1996% Car and 4% Truck - 30 km/hr	30	96% Car and 4% Truck	4.88E+00	1.19E+00	3.53E-03	4.96E-04	4.56E-03	2.42E-03	3.46E-04	4.56E-03	1.02E-01	1.12E-05
20	2096% Car and 4% Truck - 25 km/hr	25	96% Car and 4% Truck	5.20E+00	1.26E+00	3.93E-03	5.61E-04	5.30E-03	2.79E-03	4.04E-04	5.00E-03	1.09E-01	1.20E-05
21	2196% Car and 4% Truck - 20 km/hr	20	96% Car and 4% Truck	5.64E+00	1.32E+00	4.52E-03	6.58E-04	6.38E-03	3.34E-03	4.88E-04	5.57E-03	1.14E-01	1.33E-05
22	2296% Car and 4% Truck - 15 km/hr	15	96% Car and 4% Truck	6.38E+00	1.48E+00	5.49E-03	8.18E-04	8.15E-03	4.24E-03	6.25E-04	6.59E-03	1.27E-01	1.54E-05
23	2396% Car and 4% Truck - 10 km/hr	10	96% Car and 4% Truck	7.87E+00	1.86E+00	7.45E-03	1.14E-03	1.17E-02	6.02E-03	8.97E-04	8.69E-03	1.56E-01	1.97E-05
24	2496% Car and 4% Truck - 5 km/hr	5	96% Car and 4% Truck	1.22E+01	3.21E+00	1.32E-02	2.06E-03	2.10E-02	1.09E-02	1.62E-03	1.51E-02	2.61E-01	3.20E-05

Summary of g/VMT emission factors by contaminant/ link - 2017 (Excluding paved road resuspension)							
Link ID	Description	Assigned Average Speed (5-60 km/hr in 5 km/hr	Vehicle Distribution	Pollutant Name and ID			
				PM	PM10	PM2.5	CO2 Equivalent
1	95% Car and 5% Truck - 60 km/hr	60	95% Car and 5% Truck	9.35E-02	9.35E-02	5.15E-02	3.75E+02
2	95% Car and 5% Truck - 55 km/hr	55	95% Car and 5% Truck	1.04E-01	1.04E-01	5.51E-02	3.86E+02
3	95% Car and 5% Truck - 50 km/hr	50	95% Car and 5% Truck	1.21E-01	1.21E-01	6.51E-02	4.09E+02
4	95% Car and 5% Truck - 45 km/hr	45	95% Car and 5% Truck	1.34E-01	1.34E-01	6.85E-02	4.30E+02
5	95% Car and 5% Truck - 40 km/hr	40	95% Car and 5% Truck	1.47E-01	1.47E-01	7.25E-02	4.56E+02
6	95% Car and 5% Truck - 35 km/hr	35	95% Car and 5% Truck	1.57E-01	1.57E-01	7.74E-02	4.85E+02
7	95% Car and 5% Truck - 30 km/hr	30	95% Car and 5% Truck	1.74E-01	1.74E-01	8.48E-02	5.24E+02
8	95% Car and 5% Truck - 25 km/hr	25	95% Car and 5% Truck	1.96E-01	1.96E-01	9.33E-02	5.75E+02
9	95% Car and 5% Truck - 20 km/hr	20	95% Car and 5% Truck	2.21E-01	2.21E-01	1.00E-01	6.38E+02
10	95% Car and 5% Truck - 15 km/hr	15	95% Car and 5% Truck	2.73E-01	2.73E-01	1.17E-01	7.53E+02
11	95% Car and 5% Truck - 10 km/hr	10	95% Car and 5% Truck	3.69E-01	3.69E-01	1.53E-01	9.91E+02
12	95% Car and 5% Truck - 5 km/hr	5	95% Car and 5% Truck	5.71E-01	5.71E-01	2.54E-01	1.73E+03
13	96% Car and 4% Truck - 60 km/hr	60	96% Car and 4% Truck	8.42E-02	8.42E-02	4.41E-02	3.62E+02
14	96% Car and 4% Truck - 55 km/hr	55	96% Car and 4% Truck	9.37E-02	9.37E-02	4.72E-02	3.71E+02
15	96% Car and 4% Truck - 50 km/hr	50	96% Car and 4% Truck	1.09E-01	1.09E-01	5.55E-02	3.92E+02
16	96% Car and 4% Truck - 45 km/hr	45	96% Car and 4% Truck	1.21E-01	1.21E-01	5.85E-02	4.13E+02
17	96% Car and 4% Truck - 40 km/hr	40	96% Car and 4% Truck	1.34E-01	1.34E-01	6.20E-02	4.39E+02
18	96% Car and 4% Truck - 35 km/hr	35	96% Car and 4% Truck	1.43E-01	1.43E-01	6.65E-02	4.67E+02
19	96% Car and 4% Truck - 30 km/hr	30	96% Car and 4% Truck	1.59E-01	1.59E-01	7.32E-02	5.06E+02
20	96% Car and 4% Truck - 25 km/hr	25	96% Car and 4% Truck	1.77E-01	1.77E-01	8.03E-02	5.55E+02
21	96% Car and 4% Truck - 20 km/hr	20	96% Car and 4% Truck	1.99E-01	1.99E-01	8.61E-02	6.18E+02
22	96% Car and 4% Truck - 15 km/hr	15	96% Car and 4% Truck	2.46E-01	2.46E-01	1.01E-01	7.30E+02
23	96% Car and 4% Truck - 10 km/hr	10	96% Car and 4% Truck	3.30E-01	3.30E-01	1.31E-01	9.63E+02
24	96% Car and 4% Truck - 5 km/hr	5	96% Car and 4% Truck	5.18E-01	5.18E-01	2.17E-01	1.67E+03

Summary of g/VMT emission factors by contaminant/ link - 2041 (Excluding paved road resuspension)

Link ID	Description	Assigned Average Speed (5-60 km/hr in 5 km/hr)	Vehicle Distribution	Pollutant Name and ID									
				Carbon Monoxide	Oxides of Nitrogen (Nox)	Benzene	1,3-Butadiene	Formaldehyde	Acetaldehyde	Acrolein	Sulfur Dioxide	Nitrogen Dioxide (NO2)	Benz(a)pyrene
1	95% Car and 5% Truck - 60 km/hr	60	95% Car and 5% Truck	5.96E+01	8.97E-02	1.83E-04	1.91E-06	5.68E-04	1.88E-04	2.60E-05	1.94E-03	3.18E-02	7.63E-07
2	95% Car and 5% Truck - 55 km/hr	55	95% Car and 5% Truck	6.34E-01	9.21E-02	1.92E-04	2.06E-06	6.11E-04	2.02E-04	2.79E-05	1.99E-03	3.29E-02	7.89E-07
3	95% Car and 5% Truck - 50 km/hr	50	95% Car and 5% Truck	6.80E-01	1.01E-01	2.03E-04	2.17E-06	6.43E-04	2.12E-04	2.94E-05	2.13E-03	3.66E-02	8.21E-07
4	95% Car and 5% Truck - 45 km/hr	45	95% Car and 5% Truck	6.71E-01	1.02E-01	2.09E-04	2.39E-06	7.06E-04	2.32E-04	3.23E-05	2.23E-03	3.74E-02	8.63E-07
5	95% Car and 5% Truck - 40 km/hr	40	95% Car and 5% Truck	6.79E-01	1.05E-01	2.18E-04	2.66E-06	7.80E-04	2.56E-04	3.57E-05	2.35E-03	3.86E-02	9.19E-07
6	95% Car and 5% Truck - 35 km/hr	35	95% Car and 5% Truck	7.91E-01	1.11E-01	2.36E-04	2.94E-06	8.60E-04	2.82E-04	3.94E-05	2.49E-03	4.10E-02	1.02E-06
7	95% Car and 5% Truck - 30 km/hr	30	95% Car and 5% Truck	9.41E-01	1.20E-01	2.61E-04	3.34E-06	9.76E-04	3.20E-04	4.47E-05	2.68E-03	4.44E-02	1.14E-06
8	95% Car and 5% Truck - 25 km/hr	25	95% Car and 5% Truck	9.74E-01	1.32E-01	2.79E-04	4.03E-06	1.16E-03	3.80E-04	5.33E-05	2.94E-03	4.91E-02	1.24E-06
9	95% Car and 5% Truck - 20 km/hr	20	95% Car and 5% Truck	1.02E+00	1.42E-01	3.07E-04	5.07E-06	1.45E-03	4.71E-04	6.64E-05	3.24E-03	5.32E-02	1.38E-06
10	95% Car and 5% Truck - 15 km/hr	15	95% Car and 5% Truck	1.10E+00	1.63E-01	3.52E-04	6.69E-06	1.89E-03	6.14E-04	8.69E-05	3.80E-03	6.17E-02	1.61E-06
11	95% Car and 5% Truck - 10 km/hr	10	95% Car and 5% Truck	1.25E+00	2.09E-01	4.40E-04	9.85E-06	2.76E-03	8.91E-04	1.27E-04	5.00E-03	8.03E-02	2.07E-06
12	95% Car and 5% Truck - 5 km/hr	5	95% Car and 5% Truck	1.72E+00	3.71E-01	6.71E-04	1.72E-05	4.78E-03	1.54E-03	2.20E-04	8.72E-03	1.46E-01	3.46E-06
13	96% Car and 4% Truck - 60 km/hr	60	96% Car and 4% Truck	5.98E-01	7.52E-02	1.78E-04	1.53E-06	4.65E-04	1.55E-04	2.12E-05	1.82E-03	2.60E-02	7.71E-07
14	96% Car and 4% Truck - 55 km/hr	55	96% Car and 4% Truck	6.37E-01	7.70E-02	1.87E-04	1.65E-06	5.00E-04	1.66E-04	2.28E-05	1.87E-03	2.68E-02	7.97E-07
15	96% Car and 4% Truck - 50 km/hr	50	96% Car and 4% Truck	6.83E-01	8.40E-02	1.97E-04	1.73E-06	5.26E-04	1.75E-04	2.40E-05	1.99E-03	2.98E-02	8.29E-07
16	96% Car and 4% Truck - 45 km/hr	45	96% Car and 4% Truck	6.74E-01	8.49E-02	2.03E-04	1.91E-06	5.76E-04	1.91E-04	2.63E-05	2.09E-03	3.03E-02	8.71E-07
17	96% Car and 4% Truck - 40 km/hr	40	96% Car and 4% Truck	6.81E-01	8.66E-02	2.12E-04	2.13E-06	6.36E-04	2.10E-04	2.91E-05	2.21E-03	3.13E-02	9.28E-07
18	96% Car and 4% Truck - 35 km/hr	35	96% Car and 4% Truck	7.94E-01	9.20E-02	2.29E-04	2.35E-06	7.01E-04	2.32E-04	3.20E-05	2.34E-03	3.33E-02	1.03E-06
19	96% Car and 4% Truck - 30 km/hr	30	96% Car and 4% Truck	9.45E-01	9.95E-02	2.52E-04	2.68E-06	7.95E-04	2.63E-04	3.63E-05	2.53E-03	3.60E-02	1.16E-06
20	96% Car and 4% Truck - 25 km/hr	25	96% Car and 4% Truck	9.78E-01	1.09E-01	2.69E-04	3.22E-06	9.46E-04	3.11E-04	4.33E-05	2.77E-03	3.98E-02	1.25E-06
21	96% Car and 4% Truck - 20 km/hr	20	96% Car and 4% Truck	1.02E+00	1.17E-01	2.93E-04	4.05E-06	1.17E-03	3.84E-04	5.37E-05	3.06E-03	4.30E-02	1.39E-06
22	96% Car and 4% Truck - 15 km/hr	15	96% Car and 4% Truck	1.10E+00	1.33E-01	3.33E-04	5.35E-06	1.53E-03	4.99E-04	7.02E-05	3.61E-03	4.98E-02	1.62E-06
23	96% Car and 4% Truck - 10 km/hr	10	96% Car and 4% Truck	1.25E+00	1.70E-01	4.11E-04	7.88E-06	2.23E-03	7.21E-04	1.02E-04	4.75E-03	6.46E-02	2.09E-06
24	96% Car and 4% Truck - 5 km/hr	5	96% Car and 4% Truck	1.71E+00	2.98E-01	6.19E-04	1.38E-05	3.85E-03	1.24E-03	1.77E-04	8.28E-03	1.17E-01	3.49E-06

Summary of g/VMT emission factors by contaminant/ link - 2041 (Excluding paved road resuspension)							
Link ID	Description	Assigned Average Speed (5-60 km/hr in 5 km/hr	Vehicle Distribution	Pollutant Name and ID			
				PM	PM10	PM2.5	CO2 Equivalent
1	95% Car and 5% Truck - 60 km/hr	60	95% Car and 5% Truck	4.63E-02	4.63E-02	8.55E-03	2.44E+02
2	95% Car and 5% Truck - 55 km/hr	55	95% Car and 5% Truck	5.95E-02	5.39E-02	9.65E-03	2.51E+02
3	95% Car and 5% Truck - 50 km/hr	50	95% Car and 5% Truck	6.19E-02	6.19E-02	1.10E-02	2.69E+02
4	95% Car and 5% Truck - 45 km/hr	45	95% Car and 5% Truck	7.26E-02	7.26E-02	1.25E-02	2.81E+02
5	95% Car and 5% Truck - 40 km/hr	40	95% Car and 5% Truck	8.31E-02	8.31E-02	1.40E-02	2.96E+02
6	95% Car and 5% Truck - 35 km/hr	35	95% Car and 5% Truck	8.85E-02	8.85E-02	1.49E-02	3.14E+02
7	95% Car and 5% Truck - 30 km/hr	30	95% Car and 5% Truck	9.92E-02	9.92E-02	1.66E-02	3.39E+02
8	95% Car and 5% Truck - 25 km/hr	25	95% Car and 5% Truck	1.14E-01	1.14E-01	1.87E-02	3.72E+02
9	95% Car and 5% Truck - 20 km/hr	20	95% Car and 5% Truck	1.34E-01	1.34E-01	2.15E-02	4.09E+02
10	95% Car and 5% Truck - 15 km/hr	15	95% Car and 5% Truck	1.74E-01	1.74E-01	2.72E-02	4.81E+02
11	95% Car and 5% Truck - 10 km/hr	10	95% Car and 5% Truck	2.39E-01	2.39E-01	3.67E-02	6.32E+02
12	95% Car and 5% Truck - 5 km/hr	5	95% Car and 5% Truck	3.53E-01	3.53E-01	5.61E-02	1.10E+03
13	96% Car and 4% Truck - 60 km/hr	60	96% Car and 4% Truck	4.45E-02	4.45E-02	8.08E-03	2.30E+02
14	96% Car and 4% Truck - 55 km/hr	55	96% Car and 4% Truck	5.18E-02	5.18E-02	9.12E-03	2.36E+02
15	96% Car and 4% Truck - 50 km/hr	50	96% Car and 4% Truck	5.94E-02	5.94E-02	1.04E-02	2.52E+02
16	96% Car and 4% Truck - 45 km/hr	45	96% Car and 4% Truck	6.98E-02	6.98E-02	1.18E-02	2.64E+02
17	96% Car and 4% Truck - 40 km/hr	40	96% Car and 4% Truck	7.98E-02	7.98E-02	1.32E-02	2.79E+02
18	96% Car and 4% Truck - 35 km/hr	35	96% Car and 4% Truck	8.50E-02	8.50E-02	1.41E-02	2.96E+02
19	96% Car and 4% Truck - 30 km/hr	30	96% Car and 4% Truck	9.51E-02	9.51E-02	1.57E-02	3.20E+02
20	96% Car and 4% Truck - 25 km/hr	25	96% Car and 4% Truck	1.08E-01	1.08E-01	1.76E-02	3.51E+02
21	96% Car and 4% Truck - 20 km/hr	20	96% Car and 4% Truck	1.26E-01	1.26E-01	2.01E-02	3.88E+02
22	96% Car and 4% Truck - 15 km/hr	15	96% Car and 4% Truck	1.62E-01	1.62E-01	2.53E-02	4.57E+02
23	96% Car and 4% Truck - 10 km/hr	10	96% Car and 4% Truck	2.22E-01	2.22E-01	3.39E-02	6.01E+02
24	96% Car and 4% Truck - 5 km/hr	5	96% Car and 4% Truck	3.38E-01	3.38E-01	5.31E-02	1.05E+03

Square One EA - Paved Road Emissions - All Scenarios

Road	Average Vehicle Weight (tons)	Particle Size Factor k (g/VMT)			Silt Loading g/m ²	Emission Factor (g/VMT)		
		PM	PM10	PM2.5		PM	PM10	PM2.5
Paved roads (links) with ADT between 500-5,000. 95% Car and 5% Truck	2.6	5.24	1	0.25	0.20	3.223	0.615	0.154
Paved roads (links) with ADT between 5,000-10,000. 95% Car and 5% Truck	2.6	5.24	1	0.25	0.06	1.078	0.206	0.051
Paved roads (links) with ADT greater than 10,000. 95% Car and 5% Truck	2.6	5.24	1	0.25	0.03	0.573	0.109	0.027
Paved roads (links) with ADT between 500-5,000. 96% Car and 4% Truck	2.4	5.24	1	0.25	0.20	3.019	0.576	0.144
Paved roads (links) with ADT between 5,000-10,000. 96% Car and 4% Truck	2.4	5.24	1	0.25	0.06	1.009	0.193	0.048
Paved roads (links) with ADT greater than 10,000. 96% Car and 4% Truck	2.4	5.24	1	0.25	0.03	0.537	0.103	0.026

USEPA AP-42 Section 13.2.1 Paved Road for PM Emission Factors

$$E = k (sL)^{0.91} \times (W)^{1.02}$$

Where:

E = particulate emission factor

K = particulate size multiplier for particle size

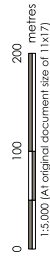
range and units of interest

sL – road surface silt loading

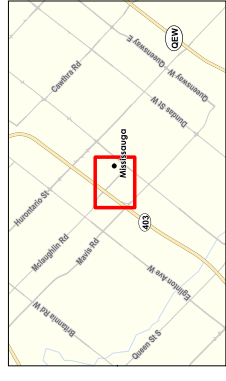
W – average weight (tons) of vehicle travelling the road



- Legend
- Site Location
 - Links Used in Assessment

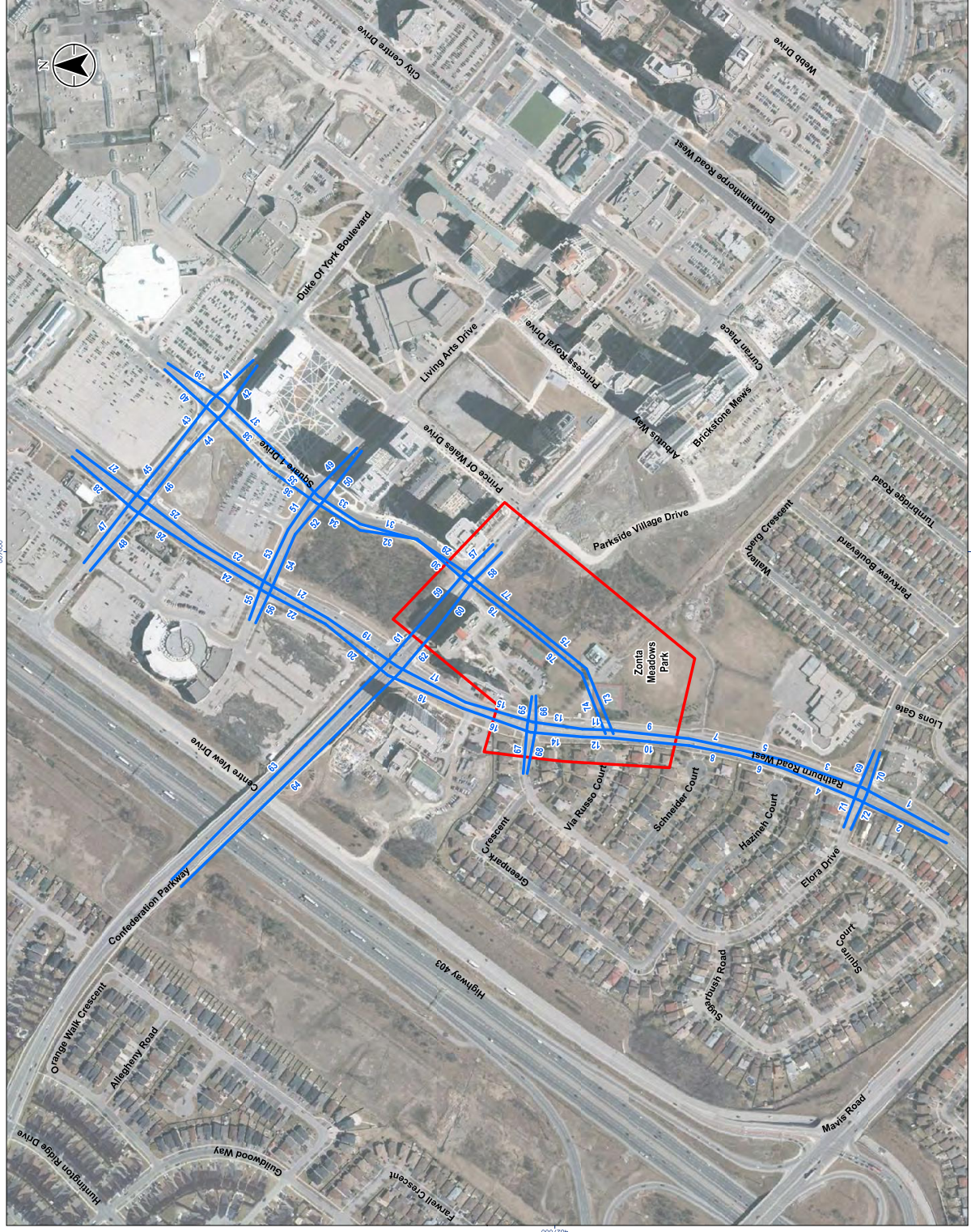


- Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry
 3. Orthomosaic © first Base Solutions, 2014; Imagery © Google, 2014
 4. Links 73 - 78 are not used in listing scenarios.



Project Location
City of
Mississauga
Client/Project
CITY OF MISSISSAUGA
SQUARE ONE DRIVE EXTENSION CLASS EA
ROAD TRAFFIC - AIR QUALITY REPORT

Figure No.
D1
Title
Links Used in Assessment



Disclaimer: Client assumes no responsibility for data specified in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or omission of the data.

Square One Extension Links

Link ID	Description	Volumes											
		Existing - No Extension						2041 - No Extension					
		Night	AM	Midday	PM	Night	AM	Midday	PM	Night	AM	Midday	PM
1	EB on Rathburn	319	734	911	595	514	1,181	1,455	974	514	1,181	1,455	974
2	WB on Rathburn	264	606	415	1,070	415	1,185	955	1,692	415	1,185	955	1,692
3	EB on Rathburn	300	690	856	519	486	1,118	1,387	885	518	1,191	1,478	891
4	WB on Rathburn	246	566	702	1,054	391	898	1,114	1,669	391	898	1,114	1,669
5	EB on Rathburn	300	690	856	519	486	1,118	1,387	885	518	1,191	1,478	891
6	WB on Rathburn	246	566	702	1,054	391	898	1,114	1,669	391	898	1,114	1,669
7	EB on Rathburn	300	690	856	519	486	1,118	1,387	885	518	1,191	1,478	891
8	WB on Rathburn	246	566	702	1,054	391	898	1,114	1,669	391	898	1,114	1,669
9	EB on Rathburn	300	690	856	519	486	1,118	1,387	885	518	1,191	1,478	891
10	WB on Rathburn	246	566	702	1,054	391	898	1,114	1,669	391	898	1,114	1,669
11	EB on Rathburn	300	690	856	519	486	1,118	1,387	885	476	1,093	1,356	736
12	WB on Rathburn	246	566	702	1,054	391	898	1,114	1,669	308	708	878	1,587
13	EB on Rathburn	300	690	856	519	486	1,118	1,387	885	476	1,093	1,356	735
14	WB on Rathburn	246	566	702	1,054	390	897	1,113	1,669	308	708	878	1,587
15	EB on Rathburn	324	745	924	515	521	1,197	1,485	859	478	1,099	1,364	705
16	WB on Rathburn	236	542	672	1,142	375	863	1,071	1,795	317	729	905	1,668
17	EB on Rathburn	358	822	1,020	533	569	1,307	1,622	885	526	1,209	1,500	730
18	WB on Rathburn	234	538	668	1,210	373	858	1,065	1,893	315	724	898	1,765
19	EB on Rathburn	510	1,172	1,454	859	788	1,811	2,247	1,302	758	1,743	2,163	1,223
20	WB on Rathburn	215	494	613	1,207	326	749	929	1,864	323	743	922	1,845
21	EB on Rathburn	510	1,172	1,454	859	788	1,811	2,247	1,302	758	1,743	2,163	1,223
22	WB on Rathburn	215	494	613	1,207	326	749	929	1,864	323	743	922	1,845
23	EB on Rathburn	499	1,147	1,423	942	733	1,694	2,089	1,438	711	1,635	2,029	1,368
24	WB on Rathburn	248	571	708	1,230	379	870	1,079	1,808	379	870	1,079	1,808
25	EB on Rathburn	499	1,147	1,423	942	733	1,694	2,089	1,438	711	1,635	2,029	1,368
26	WB on Rathburn	248	571	708	1,230	379	870	1,079	1,808	379	870	1,079	1,808
27	EB on Rathburn	438	1,052	1,305	957	673	1,547	1,919	1,460	673	1,547	1,919	1,460
28	WB on Rathburn	249	572	710	1,249	379	872	1,082	1,835	379	872	1,082	1,835
29	EB on SQ1	7	17	21	22	17	38	47	38	46	106	132	117
30	WB on SQ1	35	81	101	56	50	116	144	80	53	122	151	99
31	EB on SQ1	7	17	21	22	17	38	47	38	46	106	132	117
32	WB on SQ1	35	81	101	56	50	116	144	80	53	122	151	99
33	EB on SQ1	50	115	143	78	78	179	222	118	107	247	306	197
34	WB on SQ1	15	35	43	169	22	50	62	243	24	56	69	262
35	EB on SQ1	30	70	87	68	49	112	139	138	70	161	200	209
36	WB on SQ1	25	58	72	157	66	152	189	257	66	152	189	257
37	EB on SQ1	30	70	87	68	49	112	139	138	70	161	200	209
38	WB on SQ1	25	58	72	157	66	152	189	257	66	152	189	257
39	EB on SQ1	58	133	165	303	88	202	251	476	88	202	251	476
40	WB on SQ1	41	94	117	263	89	204	263	409	89	204	263	409
41	NB on Duke	83	190	236	683	119	273	339	981	119	273	339	981
42	SB on Duke	168	385	478	507	241	553	686	728	262	602	747	799
43	NB on Duke	97	224	278	726	140	322	400	1,043	140	322	400	1,043
44	SB on Duke	194	446	553	679	279	641	795	976	279	641	795	976
45	NB on Duke	97	224	278	726	140	322	400	1,043	140	322	400	1,043
46	SB on Duke	194	446	553	679	279	641	795	976	258	592	735	905
47	NB on Duke	114	263	326	637	164	378	469	915	164	378	469	915
48	SB on Duke	169	389	483	586	243	559	694	842	243	559	694	842
49	NB on Living Arts	78	180	223	219	131	300	372	333	131	300	372	333
50	SB on Living Arts	87	199	247	217	131	301	373	366	131	301	373	366
51	NB on Living Arts	95	219	272	217	191	438	543	368	199	458	568	377
52	SB on Living Arts	74	170	211	217	118	271	336	406	120	276	342	425
53	NB on Living Arts	71	163	202	235	123	283	351	513	121	278	345	434
54	SB on Living Arts	105	242	300	196	217	499	619	350	209	480	596	342
55	NB on Living Arts	16	36	45	46	23	52	65	66	23	52	65	66
56	SB on Living Arts	6	13	16	67	8	19	24	96	8	19	24	96
57	NB on Confederation	516	1,186	1,472	1,612	808	1,856	2,303	2,463	794	1,826	2,266	2,434
58	SB on Confederation	521	1,197	1,485	1,140	772	1,775	2,202	1,778	772	1,775	2,202	1,778
59	NB on Confederation	544	1,250	1,551	1,646	885	2,035	2,525	2,610	830	1,907	2,366	2,502

Square One Extension Links

Link ID	Description	Existing - No Extension			Volumes			2041 - No Extension			2041 - With Extension		
		Night	AM	PM	Night	AM	PM	Night	AM	PM	Night	AM	PM
60	SB on Confederation	512	1,176	1,459	788	1,812	2,248	775	1,782	1,941	775	1,782	1,866
61	NB on Confederation	544	1,250	1,561	885	2,035	2,525	829	1,906	2,610	829	1,906	2,501
62	SB on Confederation	512	1,176	1,459	788	1,812	2,248	775	1,782	1,941	775	1,782	1,866
63	NB on Confederation	520	1,195	1,463	820	1,885	2,339	820	1,885	2,666	820	1,885	2,666
64	SB on Confederation	659	1,515	1,880	989	2,274	2,822	989	2,274	2,442	989	2,274	2,442
65	NB on Elora E	34	79	98	24	114	141	16	36	34	16	36	10
66	SB on Elora E	16	36	45	23	52	65	13	30	112	13	30	40
67	NB on Elora E	10	22	27	14	32	40	13	29	92	13	29	85
68	SB on Elora E	25	58	72	36	83	103	37	7	37	3	7	9
69	NB on Elora W	62	143	177	89	205	254	89	205	227	89	205	227
70	SB on Elora W	101	233	289	146	335	416	146	335	289	146	335	289
71	NB on Elora W	20	47	58	73	168	84	30	70	105	30	70	112
72	SB on Elora W	58	133	165	83	191	237	116	267	80	116	267	331
73	EB on SQ1 Ext	0	0	0	0	0	0	0	120	0	52	120	225
74	WB on SQ1 Ext	0	0	0	0	0	0	0	212	0	92	212	152
75	EB on SQ1 Ext	0	0	0	0	0	0	0	120	0	52	120	225
76	WB on SQ1 Ext	0	0	0	0	0	0	0	212	0	92	212	152
77	EB on SQ1 Ext	0	0	0	0	0	0	0	184	0	80	184	182
78	WB on SQ1 Ext	0	0	0	0	0	0	0	125	0	54	125	184

Notes:

- Only AM and PM peak hourly volumes available. Night and Midday volumes are calculated based on their ratio vs AM peak volumes from the 2006 MTO Commercial Vehicle Survey (On Highway 401, between James Snow Parkway & Trafalgar Road. This was the closest available station in the data set. Data below:

Emission Scheme	Average Count	Ratio vs AM
Night	2534	0.44
AM	5825	1.00
Midday	7227	1.24
PM	8167	1.40

Sample calculation for Link 1:

Nighttime peak hourly volume (veh/hour) = AM peak hourly volume x Ratio vs AM
= 734 x 0.44 = 319 veh/hour

- Links 73-78 are only applicable when the Project has been implemented.

Square One Extension Links

Link ^a	Start of link		End of link	Road Width (m)	AADT Available (1/T/h)	Ratio ^b Not all AADT available. Ratio based on peak hour AADT and available AADT data	AADT ^c		Description	Vehicle Volumes Level of Ser ^d											
	End of link						2041			2041 - No Extension											
	Starting (m)	Finishing (m)					No Extension	With Extension		Negat	AM	Midday	PM	Negat	AM	Midday	PM				
1	608742	4825502	4825611	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
2	608743	4825503	4825612	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
3	608744	4825504	4825613	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
4	608745	4825505	4825614	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
5	608746	4825506	4825615	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
6	608747	4825507	4825616	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
7	608748	4825508	4825617	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
8	608749	4825509	4825618	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
9	608750	4825510	4825619	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
10	608751	4825511	4825620	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
11	608752	4825512	4825621	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
12	608753	4825513	4825622	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
13	608754	4825514	4825623	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
14	608755	4825515	4825624	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
15	608756	4825516	4825625	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
16	608757	4825517	4825626	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
17	608758	4825518	4825627	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
18	608759	4825519	4825628	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
19	608760	4825520	4825629	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
20	608761	4825521	4825630	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
21	608762	4825522	4825631	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
22	608763	4825523	4825632	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
23	608764	4825524	4825633	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
24	608765	4825525	4825634	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
25	608766	4825526	4825635	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
26	608767	4825527	4825636	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
27	608768	4825528	4825637	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
28	608769	4825529	4825638	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
29	608770	4825530	4825639	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
30	608771	4825531	4825640	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
31	608772	4825532	4825641	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
32	608773	4825533	4825642	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
33	608774	4825534	4825643	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
34	608775	4825535	4825644	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
35	608776	4825536	4825645	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
36	608777	4825537	4825646	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
37	608778	4825538	4825647	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
38	608779	4825539	4825648	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
39	608780	4825540	4825649	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
40	608781	4825541	4825650	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
41	608782	4825542	4825651	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
42	608783	4825543	4825652	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
43	608784	4825544	4825653	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
44	608785	4825545	4825654	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
45	608786	4825546	4825655	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
46	608787	4825547	4825656	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
47	608788	4825548	4825657	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
48	608789	4825549	4825658	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
49	608790	4825550	4825659	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
50	608791	4825551	4825660	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
51	608792	4825552	4825661	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
52	608793	4825553	4825662	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
53	608794	4825554	4825663	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
54	608795	4825555	4825664	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
55	608796	4825556	4825665	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
56	608797	4825557	4825666	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
57	608798	4825558	4825667	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
58	608799	4825559	4825668	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
59	608800	4825560	4825669	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
60	608801	4825561	4825670	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
61	608802	4825562	4825671	10.8	-	-	7006	12208	12208	0.4 ft on Railtown	315	734	911	395	514	1181	1465	514	1181	1465	774
62	608803	4825563	482																		

Square One Extension Links

Line ¹	Existing				2041 - No Extension				2041 - With Extension			
	Night	AM	Midday	PM	Night	AM	Midday	PM	Night	AM	Midday	PM
1	15	23	15	15	20	25	20	20	20	25	25	25
2	15	23	15	15	20	25	20	20	20	25	25	25
3	15	23	15	15	20	25	20	20	20	25	25	25
4	15	23	15	15	20	25	20	20	20	25	25	25
5	15	23	15	15	20	25	20	20	20	25	25	25
6	15	23	15	15	20	25	20	20	20	25	25	25
7	15	23	15	15	20	25	20	20	20	25	25	25
8	15	23	15	15	20	25	20	20	20	25	25	25
9	15	23	15	15	20	25	20	20	20	25	25	25
10	15	23	15	15	20	25	20	20	20	25	25	25
11	15	23	15	15	20	25	20	20	20	25	25	25
12	15	23	15	15	20	25	20	20	20	25	25	25
13	15	23	15	15	20	25	20	20	20	25	25	25
14	15	23	15	15	20	25	20	20	20	25	25	25
15	15	23	15	15	20	25	20	20	20	25	25	25
16	15	23	15	15	20	25	20	20	20	25	25	25
17	15	23	15	15	20	25	20	20	20	25	25	25
18	15	23	15	15	20	25	20	20	20	25	25	25
19	15	23	15	15	20	25	20	20	20	25	25	25
20	15	23	15	15	20	25	20	20	20	25	25	25
21	15	23	15	15	20	25	20	20	20	25	25	25
22	15	23	15	15	20	25	20	20	20	25	25	25
23	15	23	15	15	20	25	20	20	20	25	25	25
24	15	23	15	15	20	25	20	20	20	25	25	25
25	15	23	15	15	20	25	20	20	20	25	25	25
26	15	23	15	15	20	25	20	20	20	25	25	25
27	15	23	15	15	20	25	20	20	20	25	25	25
28	15	23	15	15	20	25	20	20	20	25	25	25
29	15	23	15	15	20	25	20	20	20	25	25	25
30	15	23	15	15	20	25	20	20	20	25	25	25
31	15	23	15	15	20	25	20	20	20	25	25	25
32	15	23	15	15	20	25	20	20	20	25	25	25
33	15	23	15	15	20	25	20	20	20	25	25	25
34	15	23	15	15	20	25	20	20	20	25	25	25
35	15	23	15	15	20	25	20	20	20	25	25	25
36	15	23	15	15	20	25	20	20	20	25	25	25
37	15	23	15	15	20	25	20	20	20	25	25	25
38	15	23	15	15	20	25	20	20	20	25	25	25
39	15	23	15	15	20	25	20	20	20	25	25	25
40	15	23	15	15	20	25	20	20	20	25	25	25
41	15	23	15	15	20	25	20	20	20	25	25	25
42	15	23	15	15	20	25	20	20	20	25	25	25
43	15	23	15	15	20	25	20	20	20	25	25	25
44	15	23	15	15	20	25	20	20	20	25	25	25
45	15	23	15	15	20	25	20	20	20	25	25	25
46	15	23	15	15	20	25	20	20	20	25	25	25
47	15	23	15	15	20	25	20	20	20	25	25	25
48	15	23	15	15	20	25	20	20	20	25	25	25
49	15	23	15	15	20	25	20	20	20	25	25	25
50	15	23	15	15	20	25	20	20	20	25	25	25
51	15	23	15	15	20	25	20	20	20	25	25	25
52	15	23	15	15	20	25	20	20	20	25	25	25
53	15	23	15	15	20	25	20	20	20	25	25	25
54	15	23	15	15	20	25	20	20	20	25	25	25
55	15	23	15	15	20	25	20	20	20	25	25	25
56	15	23	15	15	20	25	20	20	20	25	25	25
57	15	23	15	15	20	25	20	20	20	25	25	25
58	15	23	15	15	20	25	20	20	20	25	25	25
59	15	23	15	15	20	25	20	20	20	25	25	25
60	15	23	15	15	20	25	20	20	20	25	25	25
61	15	23	15	15	20	25	20	20	20	25	25	25
62	15	23	15	15	20	25	20	20	20	25	25	25
63	15	23	15	15	20	25	20	20	20	25	25	25
64	15	23	15	15	20	25	20	20	20	25	25	25
65	15	23	15	15	20	25	20	20	20	25	25	25
66	15	23	15	15	20	25	20	20	20	25	25	25
67	15	23	15	15	20	25	20	20	20	25	25	25
68	15	23	15	15	20	25	20	20	20	25	25	25
69	15	23	15	15	20	25	20	20	20	25	25	25
70	15	23	15	15	20	25	20	20	20	25	25	25
71	15	23	15	15	20	25	20	20	20	25	25	25
72	15	23	15	15	20	25	20	20	20	25	25	25
73	15	23	15	15	20	25	20	20	20	25	25	25
74	15	23	15	15	20	25	20	20	20	25	25	25
75	15	23	15	15	20	25	20	20	20	25	25	25
76	15	23	15	15	20	25	20	20	20	25	25	25
77	15	23	15	15	20	25	20	20	20	25	25	25
78	15	23	15	15	20	25	20	20	20	25	25	25

Square One Extension Links

Notes:

1. Link ID and coordinates selected based on available road traffic data

2. Road width + 3m on each side to account for the mixing zone created by the dispersion of the plume generated by the wake of moving vehicles (User's guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections (Revised), USEPA, September 1995). Lane widths available for Rathburn Road, Square One Drive and Confederation Parkway. Other lane widths estimated from Google Earth as recommended by Stantec Traffic Team.

3. An average ratio between all available AADT link data and their respective peak vehicle volumes was determined. This ratio was then used to determine AADT for links without this data..

Sample calculation for Link 3:

$$\text{AADT/Max Volume Average Ratio} = \text{Average}(\text{AADT}_{2017} / \text{Max hourly volume}_{2017}, \text{AADT}_{2041} / \text{Max hourly volume}_{2041}) = \text{Average}(7200/856, 13,200/1,478) = 8.67$$

This is done for all links with AADT data and the overall average is determined to be 8.34. This ratio is then applied to all links without AADT data and rounded to the nearest 100. Sample calculation for Link 1:

$$\begin{aligned}\text{AADT} &= [\text{AADT/max Volume Average Ratio}] \times \text{Max Volume} \\ &= 8.34 \times 911 = 7600\end{aligned}$$

4. Available AADT data from Stantec Memo "City of Mississauga, Square One Drive Extension Class EA, AADT volumes - Existing Conditions and Future Scenarios", April 26, 2017

5. Average release height for passenger vehicles

6. AM/ PM Peak Hourly Volumes. Stantec Consulting Ltd. (2017a). FINAL DRAFT Transportation and Traffic Analysis Report, March 2017.

7. Stantec traffic team. Stantec, 2017, "Average Speeds", internal communication between M. Kaczmarek and T. Hung, June 2017

8. Links 73-78 are not used for the Existing Scenario and "No Extension" Scenario

Appendix E GREENHOUSE GAS EMISSIONS

Square One Extension EA - Greenhouse Gas Emissions

Link ¹	Start of Link		End of Link		Length (m) ²	Length (miles)	AADT ³			Annual Miles travelled (VMT/ year) ⁴		
	Easting (m)	Northing (m)	Easting (m)	Northing (m)			Existing	No Extension	Extension	Existing	No Extension	Extension
1	608643	4826503	608702	4826611	123	0.08	7600	12200	12200	212125	340517	340517
2	608687	4826617	608632	4826505	125	0.08	8900	14100	14100	251863	399019	399019
3	608702	4826611	608736	4826717	102	0.06	7200	11600	13200	166306	267937	304894
4	608726	4826710	608687	4826617	101	0.06	9200	13900	14700	210422	317921	336219
5	608736	4826707	608750	4826766	61	0.04	7200	11600	13200	99020	159532	181537
6	608743	4826768	608726	4826710	60	0.04	9200	13900	14700	126112	190539	201505
7	608750	4826766	608764	4826831	66	0.04	7200	11600	13200	108577	174929	199057
8	608755	4826830	608743	4826768	63	0.04	9200	13900	14700	131768	199084	210542
9	608764	4826831	608775	4826932	102	0.06	7200	11600	13200	165905	267291	304158
10	608765	4826931	608755	4826830	101	0.06	9200	13900	14700	211773	319962	338377
11	608775	4826932	608776	4826965	33	0.02	7200	11600	11600	53913	86859	86859
12	608766	4826965	608765	4826931	34	0.02	9200	13900	13100	70974	107232	101061
13	608776	4827028	608785	4827028	64	0.04	7200	11600	11600	103921	167428	167428
14	608772	4827031	608766	4826965	66	0.04	9200	13900	13100	138281	208925	196900
15	608785	4827028	608810	4827113	89	0.06	8100	12400	12300	162766	249173	247163
16	608802	4827116	608772	4827031	90	0.06	10100	15000	14200	206479	306653	290298
17	608810	4827113	608855	4827199	97	0.06	8100	13500	12300	178311	297184	270768
18	608844	4827211	608802	4827116	104	0.06	10100	15800	14200	237934	372213	334521
19	608855	4827199	608916	4827287	107	0.07	12100	18700	18000	293844	454122	437123
20	608909	4827290	608844	4827211	102	0.06	10100	15500	15400	234345	359638	357318
21	608916	4827287	608960	4827363	88	0.05	12100	18700	18000	240998	372451	358509
22	608949	4827366	608909	4827290	86	0.05	10100	15500	15400	196732	301916	299968
23	608960	4827363	609011	4827449	100	0.06	11900	17400	16900	269852	394574	383235
24	609002	4827453	608949	4827366	102	0.06	10300	15100	15100	237979	348881	348881
25	609011	4827449	609068	4827523	93	0.06	11900	17400	16900	252100	368617	358025
26	609053	4827532	609002	4827453	94	0.06	10300	15100	15100	219663	322030	322030
27	609068	4827523	609128	4827604	101	0.06	10900	16000	16000	249195	365790	365790
28	609120	4827610	609053	4827532	103	0.06	10400	15300	15300	242536	356808	356808
29	608971	4827109	609016	4827176	81	0.05	200	400	1100	3661	7322	20135
30	609016	4827174	608964	4827114	79	0.05	800	1200	1300	14406	21609	23410
31	609016	4827176	609035	4827246	73	0.05	200	400	1100	3290	6580	18096
32	609027	4827246	609016	4827174	73	0.05	800	1200	1300	13215	19823	21475
33	609035	4827246	609070	4827299	64	0.04	1200	1900	2600	17286	27369	37453
34	609062	4827302	609027	4827246	66	0.04	1400	2000	2200	20968	29955	32950
35	609070	4827299	609124	4827350	74	0.05	700	1200	1700	11792	20215	28638
36	609104	4827361	609062	4827302	72	0.05	1300	2100	2100	21353	34493	34493
37	609124	4827350	609192	4827421	98	0.06	700	1200	1700	15608	26756	37905
38	609173	4827430	609104	4827361	98	0.06	1300	2100	2100	28771	46476	46476
39	609192	4827421	609238	4827489	82	0.05	2500	4000	4000	46549	74479	74479
40	609230	4827493	609173	4827430	85	0.05	2200	3400	3400	42391	65514	65514
41	609242	4827381	609191	4827434	74	0.05	5700	8200	8200	95086	136791	136791

Square One Extension EA - Greenhouse Gas Emissions

Link ¹	Start of Link		End of Link		CO2 Equivalent Emission Factor (g/VMT) ⁵											
	Easting (m)	Northing (m)	Easting (m)	Northing (m)	2017 - Existing			2041 - No Extension			2041 - With Extension					
					Night	AM	Midday	PM	Night	AM	Midday	PM	Night	AM	Midday	PM
1	608643	4826503	608702	4826611	753	575	753	753	409	372	409	409	372	409	409	409
2	608687	4826617	608632	4826505	386	386	386	386	251	251	251	251	251	251	251	251
3	608702	4826611	608736	4826707	386	386	386	386	251	251	251	251	251	251	251	251
4	608726	4826710	608687	4826617	575	524	575	575	372	314	372	372	409	339	409	409
5	608736	4826707	608750	4826766	386	386	386	386	251	251	251	251	251	251	251	251
6	608743	4826768	608726	4826710	575	524	575	575	372	314	372	372	409	339	409	409
7	608750	4826766	608764	4826831	386	386	386	386	251	251	251	251	372	372	372	339
8	608755	4826830	608743	4826768	575	524	575	575	372	314	372	372	269	269	269	269
9	608764	4826831	608775	4826932	638	456	638	638	339	296	339	339	372	372	372	339
10	608765	4826931	608755	4826830	409	386	409	409	251	251	251	251	269	269	269	269
11	608775	4826932	608776	4826965	638	456	638	638	339	296	339	339	372	372	372	339
12	608766	4826965	608765	4826931	409	386	409	409	251	251	251	251	409	409	409	409
13	608776	4826965	608785	4827028	638	456	638	638	339	296	339	339	281	281	281	269
14	608772	4827031	608766	4826965	409	386	409	409	251	251	251	251	314	296	314	314
15	608785	4827028	608810	4827113	456	456	456	430	481	481	481	296	409	409	409	269
16	608802	4827116	608772	4827031	991	575	991	991	409	409	409	409	269	269	269	269
17	608810	4827113	608855	4827199	1725	1725	1725	1725	1102	1102	1102	1102	1102	1102	1102	1102
18	608844	4827211	608802	4827116	456	409	456	456	281	269	281	281	269	269	269	269
19	608855	4827199	608916	4827287	456	456	456	430	481	481	481	481	409	409	409	339
20	608909	4827290	608844	4827211	1725	1725	1725	1725	1102	1102	1102	1102	1102	1102	1102	1102
21	608916	4827287	608960	4827363	991	991	991	991	1102	632	1102	1102	632	1102	1102	1102
22	608949	4827366	608909	4827290	991	430	991	991	1102	1102	1102	1102	372	1102	1102	1102
23	608960	4827363	609011	4827449	485	485	485	456	409	372	409	409	372	372	372	339
24	609002	4827453	608949	4827366	1725	753	1725	1725	1102	632	1102	1102	632	1102	1102	1102
25	609011	4827449	609068	4827523	1725	991	1725	1725	1102	632	1102	1102	632	1102	1102	1102
26	609053	4827532	609002	4827453	638	409	638	638	1102	281	1102	1102	251	1102	1102	1102
27	609068	4827523	609128	4827604	386	386	386	386	251	251	251	251	251	251	251	251
28	609120	4827610	609053	4827532	991	753	991	991	1102	481	1102	1102	372	1102	1102	1102
29	608971	4827109	609016	4827176	524	524	524	524	409	409	409	339	372	339	372	372
30	609016	4827174	608964	4827114	1725	753	1725	1725	1102	1102	1102	1102	1102	1102	1102	1102
31	609016	4827176	609035	4827246	991	991	991	991	632	632	632	632	632	632	632	632
32	609027	4827246	609016	4827174	1725	753	1725	1725	1102	1102	1102	1102	1102	1102	1102	1102
33	609035	4827246	609070	4827299	991	991	991	991	632	632	632	632	632	632	632	632
34	609062	4827302	609027	4827246	456	409	456	456	314	269	314	314	339	281	339	339
35	609070	4827299	609124	4827350	409	409	409	409	269	269	269	269	269	269	269	269
36	609104	4827361	609062	4827302	1725	1725	1725	1725	991	632	632	632	632	632	632	632
37	609124	4827350	609192	4827421	753	753	753	753	1102	1102	1102	1102	1102	1102	1102	1102
38	609173	4827430	609104	4827361	753	753	753	753	269	269	269	269	269	269	269	269
39	609192	4827421	609238	4827489	430	430	430	430	269	269	269	269	269	269	269	269
40	609230	4827493	609173	4827430	638	524	638	638	1102	1102	1102	1102	1102	1102	1102	1102
41	609242	4827381	609191	4827434	753	575	753	753	1102	481	1102	1102	1102	481	1102	1102

Square One Extension EA - Greenhouse Gas Emissions

Link ¹	Start of Link		End of Link		Vehicle Volumes (veh/hour) ⁶											
	Start of Link		End of Link		2017 - Existing				2041 - No Extension				2041 - With Extension			
	Easting (m)	Northing (m)	Easting (m)	Northing (m)	Night	AM	Midday	PM	Night	AM	Midday	PM	Night	AM	Midday	PM
1	608643	4826503	608702	4826611	319	734	911	595	514	1181	1465	974	514	1181	1465	974
2	608687	4826617	608632	4826505	264	606	752	1070	415	955	1185	1692	415	955	1185	1692
3	608702	4826611	608736	4826707	300	690	856	519	486	1118	1387	865	518	1191	1478	891
4	608726	4826710	608687	4826617	246	566	702	1054	391	898	1114	1669	391	898	1114	1669
5	608736	4826707	608750	4826766	300	690	856	519	486	1118	1387	865	518	1191	1478	891
6	608743	4826768	608726	4826710	246	566	702	1054	391	898	1114	1669	391	898	1114	1669
7	608750	4826766	608764	4826831	300	690	856	519	486	1118	1387	865	518	1191	1478	891
8	608755	4826830	608743	4826768	246	566	702	1054	391	898	1114	1669	391	898	1114	1669
9	608764	4826831	608775	4826932	300	690	856	519	486	1118	1387	865	518	1191	1478	891
10	608765	4826931	608755	4826830	246	566	702	1054	391	898	1114	1669	391	898	1114	1669
11	608775	4826932	608776	4826965	300	690	856	519	486	1118	1387	865	476	1093	1356	736
12	608766	4826965	608765	4826931	246	566	702	1054	391	898	1114	1669	308	708	878	1587
13	608776	4826965	608785	4827028	300	690	856	519	486	1118	1387	865	476	1093	1356	735
14	608772	4827031	608766	4826965	246	566	702	1054	390	897	1113	1669	308	708	878	1587
15	608785	4827028	608810	4827113	324	745	924	515	521	1197	1485	859	478	1099	1364	705
16	608802	4827116	608772	4827031	236	542	672	1142	375	863	1071	1795	317	729	905	1668
17	608810	4827113	608855	4827199	358	822	1020	533	569	1307	1622	885	526	1209	1500	730
18	608844	4827211	608802	4827116	234	538	668	1210	373	858	1065	1893	315	724	898	1765
19	608855	4827199	608916	4827287	510	1172	1454	859	788	1811	2247	1302	758	1743	2163	1223
20	608909	4827290	608844	4827211	215	494	613	1207	326	749	929	1864	323	743	922	1845
21	608916	4827287	608960	4827363	510	1172	1454	859	788	1811	2247	1302	758	1743	2163	1223
22	608949	4827366	608909	4827290	215	494	613	1207	326	749	929	1864	323	743	922	1845
23	608960	4827363	609011	4827449	499	1147	1423	942	733	1684	2089	1438	711	1635	2029	1368
24	609002	4827453	608949	4827366	248	571	708	1230	379	870	1079	1808	379	870	1079	1808
25	609011	4827449	609068	4827523	499	1147	1423	942	733	1684	2089	1438	711	1635	2029	1368
26	609053	4827532	609002	4827453	248	571	708	1230	379	870	1079	1808	379	870	1079	1808
27	609068	4827523	609128	4827604	458	1052	1305	957	673	1547	1919	1460	673	1547	1919	1460
28	609120	4827610	609053	4827532	249	572	710	1249	379	872	1082	1835	379	872	1082	1835
29	608971	4827109	609016	4827176	7	17	21	22	17	38	47	38	46	106	132	117
30	609016	4827174	608964	4827114	35	81	101	56	50	116	144	80	53	122	151	99
31	609016	4827176	609035	4827246	7	17	21	22	17	38	47	38	46	106	132	117
32	609027	4827246	609016	4827174	35	81	101	56	50	116	144	80	53	122	151	99
33	609035	4827246	609070	4827299	50	115	143	78	78	179	222	118	107	247	306	197
34	609062	4827302	609027	4827246	15	35	43	169	22	50	62	243	24	56	69	262
35	609070	4827299	609124	4827350	30	70	87	68	49	112	139	138	70	161	200	209
36	609104	4827361	609062	4827302	25	58	72	157	66	152	189	257	66	152	189	257
37	609124	4827350	609192	4827421	30	70	87	68	49	112	139	138	70	161	200	209
38	609173	4827430	609104	4827361	25	58	72	157	66	152	189	257	66	152	189	257
39	609192	4827421	609238	4827489	58	133	165	303	88	202	251	476	88	202	251	476
40	609230	4827493	609173	4827430	41	94	117	263	89	204	253	409	89	204	253	409
41	609242	4827381	609191	4827434	83	190	236	683	119	273	339	981	119	273	339	981

Square One Extension EA - Greenhouse Gas Emissions

Link ¹	Start of Link		End of Link		Overall Weighted CO2 Equivalent Emission Factor (g/VMT) ⁷				Annual CO2 Equivalent Emissions (kg CO2/ year)			
	Easting (m)	Northing (m)	Easting (m)	Northing (m)	2017 - Existing	2041 - No Extension	2041 - Extension	2041 - No Extension	2017 - Existing	2041 - No Extension	2041 - Extension	
1	608643	4826503	608702	4826611	701.9	398.5	398.5	398.5	148891	135700	135700	
2	608687	4826617	608632	4826505	385.7	250.8	250.8	250.8	97143	100068	100068	
3	608702	4826611	608736	4826707	385.7	250.8	250.8	250.8	64144	67195	76463	
4	608726	4826710	608687	4826617	563.7	358.9	358.9	358.9	118608	114117	132366	
5	608736	4826707	608750	4826766	385.7	250.8	250.8	250.8	38192	40008	45527	
6	608743	4826768	608726	4826710	563.7	358.9	358.9	358.9	71085	68394	79331	
7	608750	4826766	608764	4826831	385.7	250.8	250.8	250.8	41878	43870	72538	
8	608755	4826830	608743	4826768	563.7	358.9	358.9	358.9	74273	71461	56611	
9	608764	4826831	608775	4826932	585.0	326.4	326.4	326.4	97062	87240	110837	
10	608765	4826931	608755	4826830	403.7	250.8	250.8	250.8	85494	80242	90983	
11	608775	4826932	608776	4826965	585.0	326.4	326.4	326.4	31541	28349	31702	
12	608766	4826965	608765	4826931	403.7	250.8	250.8	250.8	28652	26892	41361	
13	608776	4826965	608785	4827028	585.0	326.4	326.4	326.4	278.7	60799	54646	46658
14	608772	4827031	608766	4826965	403.7	250.8	250.8	250.8	310.6	55825	52395	61151
15	608785	4827028	608810	4827113	450.6	441.6	441.6	441.6	382.1	73339	110044	94447
16	608802	4827116	608772	4827031	904.3	409.3	409.3	409.3	268.9	186721	125503	78055
17	608810	4827113	608855	4827199	1725.1	1102.0	1102.0	1102.0	307597	327500	298389	
18	608844	4827211	608802	4827116	446.3	278.6	278.6	268.9	106201	103709	89946	
19	608855	4827199	608916	4827287	450.3	480.6	480.6	394.6	132326	218246	172486	
20	608909	4827290	608844	4827211	1725.1	1102.0	1102.0	1102.0	404259	396325	393768	
21	608916	4827287	608960	4827363	991.4	963.4	963.4	962.7	238929	358837	345150	
22	608949	4827366	608909	4827290	881.7	1102.0	1102.0	960.4	173467	332714	288098	
23	608960	4827363	609011	4827449	478.0	398.6	398.6	363.8	129001	157277	139405	
24	609002	4827453	608949	4827366	1523.7	1003.1	1003.1	1003.1	362617	349950	349950	
25	609011	4827449	609068	4827523	1515.3	968.7	968.7	968.1	381999	357095	346601	
26	609053	4827532	609002	4827453	590.7	929.3	929.3	923.0	129760	299276	297220	
27	609068	4827523	609128	4827604	385.7	250.8	250.8	250.8	96113	91735	91735	
28	609120	4827610	609053	4827532	942.4	972.0	972.0	949.2	228557	346817	338683	
29	608971	4827109	609016	4827176	524.2	390.1	390.1	362.9	1919	2856	7307	
30	609016	4827174	608964	4827114	1436.6	1102.0	1102.0	1102.0	20696	23813	25798	
31	609016	4827176	609035	4827246	913.1	631.6	631.6	631.6	3004	4156	11429	
32	609027	4827246	609016	4827174	1436.6	1102.0	1102.0	1102.0	18986	21845	23665	
33	609035	4827246	609070	4827299	943.2	631.6	631.6	631.6	16305	17287	23656	
34	609062	4827302	609027	4827246	449.6	308.2	308.2	330.8	9428	9231	10900	
35	609070	4827299	609124	4827350	408.8	268.9	268.9	268.9	4821	5435	7700	
36	609104	4827361	609062	4827302	1355.9	631.6	631.6	631.6	28952	21787	21787	
37	609124	4827350	609192	4827421	722.4	1102.0	1102.0	1102.0	11275	29486	41771	
38	609173	4827430	609104	4827361	753.0	268.9	268.9	268.9	21665	12496	12496	
39	609192	4827421	609238	4827489	429.9	268.9	268.9	268.9	20014	20026	20026	
40	609230	4827493	609173	4827430	617.4	1102.0	1102.0	1102.0	26173	72197	72197	
41	609242	4827381	609191	4827434	724.6	1002.9	1002.9	1002.9	68900	137190	137190	

Square One Extension EA - Greenhouse Gas Emissions

Link ¹	Start of Link		End of Link		Overall Weighted CO2 Equivalent Emission Factor (g/VMT) ⁷				Annual CO2 Equivalent Emissions (kg CO2/ year)		
	Easting (m)	Northing (m)	Easting (m)	Northing (m)	2041 - No Extension		2041 - Extension	2017 - Existing	2041 - No Extension	2041 - Extension	
					2017 - Existing	2041 - No Extension					
42	609175	4827419	609235	4827376	455.9	250.8	268.9	32058	25612	30160	
43	609191	4827434	609129	4827482	451.5	570.3	444.8	48980	88234	68817	
44	609119	4827471	609175	4827419	934.6	595.6	595.6	92333	83622	83622	
45	609129	4827482	609066	4827533	1725.1	1102.0	1102.0	193446	176251	176251	
46	609056	4827520	609119	4827471	546.5	436.7	353.7	56387	64032	48023	
47	609066	4827533	608986	4827595	385.7	250.8	250.8	46924	43752	43752	
48	608976	4827587	609056	4827520	1725.1	1102.0	1102.0	200050	182567	182567	
49	609131	4827250	609073	4827306	638.2	480.6	480.6	22174	27242	27242	
50	609062	4827294	609127	4827244	402.1	250.8	250.8	15706	14460	14460	
51	609073	4827306	609028	4827337	424.2	428.2	326.6	12093	23881	19021	
52	609022	4827328	609062	4827294	715.9	441.5	440.8	15344	17872	18368	
53	609028	4827337	608958	4827370	1725.1	1102.0	1102.0	60556	83172	79303	
54	608951	4827359	609022	4827328	478.1	310.5	296.4	21002	28369	26039	
55	608958	4827370	608914	4827386	401.4	271.4	263.1	1705	1729	1676	
56	608910	4827378	608951	4827359	1578.5	1021.7	1021.7	9706	8377	8377	
57	609009	4827078	608972	4827115	1361.6	1048.4	1048.4	284393	255047	342137	
58	608961	4827105	608999	4827067	371.4	236.1	236.1	68804	52948	62444	
59	608972	4827115	608913	4827166	1495.9	1048.4	1048.4	476258	404231	526613	
60	608901	4827151	608961	4827105	371.4	437.1	387.9	94250	140160	148341	
61	608913	4827166	608857	4827215	1674.1	1048.4	1048.4	508549	385695	502465	
62	608846	4827197	608901	4827151	371.4	341.8	342.0	89384	103952	124016	
63	608857	4827215	608586	4827484	371.4	236.1	236.1	463146	453907	453907	
64	608577	4827472	608846	4827197	730.4	1048.4	929.1	1000457	2149455	1904972	
65	608817	4827029	608780	4827035	1650.1	1032.5	409.3	11223	10533	1392	
66	608778	4827024	608818	4827024	429.9	281.1	281.1	2730	2295	765	
67	608780	4827035	608720	4827040	429.9	281.1	338.6	2935	3071	3237	
68	608720	4827035	608778	4827024	918.6	997.7	371.6	7380	12022	498	
69	608749	4826596	608697	4826618	666.1	448.7	448.7	12794	12066	12066	
70	608693	4826606	608746	4826589	429.9	281.1	281.1	13026	12421	12421	
71	608697	4826618	608652	4826635	408.8	268.9	268.9	2676	2640	2640	
72	608649	4826626	608693	4826606	1556.5	1003.1	591.3	23887	21992	18148	
73	608770	4826926	608852	4826960	0.0	0.0	314.2	0	0	16446	
74	608846	4826966	608770	4826936	0.0	0.0	970.6	0	0	41370	
75	608852	4826960	608905	4827026	0.0	0.0	1102.0	0	0	55006	
76	608900	4827031	608846	4826966	0.0	0.0	970.6	0	0	42787	
77	608905	4827026	608971	4827109	0.0	0.0	1102.0	0	0	68910	
78	608964	4827114	608900	4827031	0.0	0.0	409.3	0	0	22376	
total	-	-	-	-	-	-	-	8,106,965	9,815,016	10,011,782	

Square One Extension EA - Greenhouse Gas Emissions

Notes:

1. Link ID and coordinates selected based on available road traffic data.
2. Calculated based on each link's starting and ending coordinates. Sample calculation for Link 1:

$$\begin{aligned}\text{Length (m)} &= \text{SQRT}((Y_2 - Y_1)^2 + (X_2 - X_1)^2) \\ &= \text{SQRT}((4826503 - 4826611)^2 + (608702 - 608643)^2) \\ &= 123\text{m}\end{aligned}$$

3. Stantec Memo "City of Mississauga, Square One Drive Extension Class EA, AADT volumes - Existing Conditions and Future Scenarios", April 26, 2017. See Appendix D.
4. Calculated. Sample calculation for Link 1:

$$\begin{aligned}\text{Annual Vehicle miles travelled in one year (VMT/year)} &= \\ &= \text{AADT} \times \text{Link Length (mil)} \times 365 \text{ day/year} \\ &= 7,600 \times 0.08 \times 365 \\ &= 212,125 \text{ VMT/year}\end{aligned}$$

5. MOVES emission factor assigned to each link for each time period of the day
6. Stantec Consulting Ltd. (2017a). FINAL DRAFT Transportation and Traffic Analysis Report, March 2017. See Appendix D.
7. Weighted CO₂ equivalent emission factor calculated for each link. Sample calculation for Link 1:

$$\begin{aligned}\text{Weighted CO}_2 \text{ Emission Factor (EF)} \left(\frac{\text{g}}{\text{VMT}} \right) &= \frac{\text{EF}_{\text{Night}} \times \text{Volume}_{\text{Night}} + \text{EF}_{\text{AM}} \times \text{Volume}_{\text{AM}} + \text{EF}_{\text{Midday}} \times \text{Volume}_{\text{Midday}} + \text{EF}_{\text{PM}} \times \text{Volume}_{\text{PM}}}{\text{Volume}_{\text{Night}} + \text{Volume}_{\text{AM}} + \text{Volume}_{\text{Midday}} + \text{Volume}_{\text{PM}}} \\ &= \frac{753 \times 319 + 575 \times 734 + 753 \times 911 + 753 \times 595}{319 + 734 + 911 + 595} \\ &= 701.9 \text{ g/VMT}\end{aligned}$$

8. Annual CO₂ Equivalent Emission. Sample Calculation for Link 1:

$$\begin{aligned}\text{Annual CO}_2 \text{ Equivalent Emissions (kg CO}_2 \text{ / year)} &= \\ &= \text{Annual miles travelled per year (VMT/year)} \times \text{Weighted CO}_2 \text{ Emission Factor (g/VMT)} / \\ &1000 \text{ g / kg} \\ &= 212,125 \times 701.9 / 1000 \\ &= 148891 \text{ kg CO}_2 \text{ / year}\end{aligned}$$

Appendix F SAMPLE MODEL FILES

'Square One - 2017 Existing - PM' 60 125 1.8 0.15 15 1 0
 1 1 12 12 31 12
 94791 12 14733 12
 1 1 'U'

'NR01'	608747	4826963	1.8	
'NR02'	608831	4827062	1.8	
'NR03'	608922	4827095	1.8	
'NR04'	609001	4827104	1.8	
'NR05'	608742	4826980	1.8	
'NR06'	609042	4827080	1.8	
'R01 - Commercial'	608713	4826582	1.8	
'R02 - School'	608773	4826661	1.8	
'R03 - Residence'	608677	4826647	1.8	
'R04 - Residence'	608789	4827163	1.8	
'R05 - Residence'	608765	4827243	1.8	
'R06 - Commercial'	608862	4827478	1.8	
'R07 - Commercial'	609065	4827589	1.8	
'R08 - Commercial'	609072	4827261	1.8	
'R09 - College'	609171	4827369	1.8	

2 'P'

1 1 1 1 1 1 1

'Square One - 2017 Existing - PM' 78

1 1

'EB on Rathburn' 'AG' 608643.0

4826503.0 608702.0 4826611.0 0.2 10

2 1

'WB on Rathburn' 'AG' 608687.0

4826617.0 608632.0 4826505.0 0.2 10

3 1

'EB on Rathburn' 'AG' 608702.0

4826611.0 608736.0 4826707.0 0.2 10

4 1

'WB on Rathburn' 'AG' 608726.0

4826710.0 608687.0 4826617.0 0.2 10

5 1

'EB on Rathburn' 'AG' 608736.0

4826707.0 608750.0 4826766.0 0.2 10

6 1

'WB on Rathburn' 'AG' 608743.0

4826768.0 608726.0 4826710.0 0.2 10

7 1

'EB on Rathburn' 'AG' 608750.0

4826766.0 608764.0 4826831.0 0.2 10

8 1

'WB on Rathburn' 'AG' 608755.0

4826830.0 608743.0 4826768.0 0.2 10

9 1

'EB on Rathburn' 'AG' 608764.0

4826831.0 608775.0 4826932.0 0.2 10

10 1

'WB on Rathburn'	'AG'				608765.0
4826931.0	608755.0	4826830.0	0.2	10	
11	1				
'EB on Rathburn'	'AG'				608775.0
4826932.0	608776.0	4826965.0	0.2	10	
12	1				
'WB on Rathburn'	'AG'				608766.0
4826965.0	608765.0	4826931.0	0.2	10	
13	1				
'EB on Rathburn'	'AG'				608776.0
4826965.0	608785.0	4827028.0	0.2	10	
14	1				
'WB on Rathburn'	'AG'				608772.0
4827031.0	608766.0	4826965.0	0.2	10	
15	1				
'EB on Rathburn'	'AG'				608785.0
4827028.0	608810.0	4827113.0	0.2	10	
16	1				
'WB on Rathburn'	'AG'				608802.0
4827116.0	608772.0	4827031.0	0.2	10	
17	1				
'EB on Rathburn'	'AG'				608810.0
4827113.0	608855.0	4827199.0	0.2	10	
18	1				
'WB on Rathburn'	'AG'				608844.0
4827211.0	608802.0	4827116.0	0.2	10	
19	1				
'EB on Rathburn'	'AG'				608855.0
4827199.0	608916.0	4827287.0	0.2	10	
20	1				
'WB on Rathburn'	'AG'				608909.0
4827290.0	608844.0	4827211.0	0.2	10	
21	1				
'EB on Rathburn'	'AG'				608916.0
4827287.0	608960.0	4827363.0	0.2	10	
22	1				
'WB on Rathburn'	'AG'				608949.0
4827366.0	608909.0	4827290.0	0.2	10	
23	1				
'EB on Rathburn'	'AG'				608960.0
4827363.0	609011.0	4827449.0	0.2	10	
24	1				
'WB on Rathburn'	'AG'				609002.0
4827453.0	608949.0	4827366.0	0.2	10	
25	1				
'EB on Rathburn'	'AG'				609011.0
4827449.0	609068.0	4827523.0	0.2	10	
26	1				
'WB on Rathburn'	'AG'				609053.0
4827532.0	609002.0	4827453.0	0.2	10	
27	1				
'EB on Rathburn'	'AG'				609068.0

4827523.0	609128.0	4827604.0	0.2	10	
28	1				
'WB on Rathburn'	'AG'				609120.0
4827610.0	609053.0	4827532.0	0.2	10	
29	1				
'EB on SQ1'	'AG'				608971.0
4827109.0	609016.0	4827176.0	0.2	7.6	
30	1				
'WB on SQ1'	'AG'				609016.0
4827174.0	608964.0	4827114.0	0.2	7.6	
31	1				
'EB on SQ1'	'AG'				609016.0
4827176.0	609035.0	4827246.0	0.2	7.6	
32	1				
'WB on SQ1'	'AG'				609027.0
4827246.0	609016.0	4827174.0	0.2	7.6	
33	1				
'EB on SQ1'	'AG'				609035.0
4827246.0	609070.0	4827299.0	0.2	7.6	
34	1				
'WB on SQ1'	'AG'				609062.0
4827302.0	609027.0	4827246.0	0.2	7.6	
35	1				
'EB on SQ1'	'AG'				609070.0
4827299.0	609124.0	4827350.0	0.2	7.6	
36	1				
'WB on SQ1'	'AG'				609104.0
4827361.0	609062.0	4827302.0	0.2	7.6	
37	1				
'EB on SQ1'	'AG'				609124.0
4827350.0	609192.0	4827421.0	0.2	7.6	
38	1				
'WB on SQ1'	'AG'				609173.0
4827430.0	609104.0	4827361.0	0.2	7.6	
39	1				
'EB on SQ1'	'AG'				609192.0
4827421.0	609238.0	4827489.0	0.2	7.6	
40	1				
'WB on SQ1'	'AG'				609230.0
4827493.0	609173.0	4827430.0	0.2	7.6	
41	1				
'NB on Duke'	'AG'				609242.0
4827381.0	609191.0	4827434.0	0.2	10	
42	1				
'SB on Duke'	'AG'				609175.0
4827419.0	609235.0	4827376.0	0.2	10	
43	1				
'NB on Duke'	'AG'				609191.0
4827434.0	609129.0	4827482.0	0.2	10	
44	1				
'SB on Duke'	'AG'				609119.0
4827471.0	609175.0	4827419.0	0.2	10	

45	1						
		'NB on Duke'	'AG'				609129.0
4827482.0	609066.0	4827533.0	0.2	10			
46	1						
		'SB on Duke'	'AG'				609056.0
4827520.0	609119.0	4827471.0	0.2	10			
47	1						
		'NB on Duke'	'AG'				609066.0
4827533.0	608986.0	4827595.0	0.2	10			
48	1						
		'SB on Duke'	'AG'				608976.0
4827587.0	609056.0	4827520.0	0.2	10			
49	1						
		'NB on Living Arts'	'AG'				609131.0
4827250.0	609073.0	4827306.0	0.2	10			
50	1						
		'SB on Living Arts'	'AG'				609062.0
4827294.0	609127.0	4827244.0	0.2	8			
51	1						
		'NB on Living Arts'	'AG'				609073.0
4827306.0	609028.0	4827337.0	0.2	10			
52	1						
		'SB on Living Arts'	'AG'				609022.0
4827328.0	609062.0	4827294.0	0.2	8			
53	1						
		'NB on Living Arts'	'AG'				609028.0
4827337.0	608958.0	4827370.0	0.2	10			
54	1						
		'SB on Living Arts'	'AG'				608951.0
4827359.0	609022.0	4827328.0	0.2	8			
55	1						
		'NB on Living Arts'	'AG'				608958.0
4827370.0	608914.0	4827386.0	0.2	10			
56	1						
		'SB on Living Arts'	'AG'				608910.0
4827378.0	608951.0	4827359.0	0.2	8			
57	1						
		'NB on Confederation'	'AG'				609009.0
4827078.0	608972.0	4827115.0	0.2	10			
58	1						
		'SB on Confederation'	'AG'				608961.0
4827105.0	608999.0	4827067.0	0.2	10			
59	1						
		'NB on Confederation'	'AG'				608972.0
4827115.0	608913.0	4827166.0	0.2	10			
60	1						
		'SB on Confederation'	'AG'				608901.0
4827151.0	608961.0	4827105.0	0.2	10			
61	1						
		'NB on Confederation'	'AG'				608913.0
4827166.0	608857.0	4827215.0	0.2	10			
62	1						

'SB on Confederation'	'AG'				608846.0
4827197.0	608901.0	4827151.0	0.2	10	
63	1				
'NB on Confederation'	'AG'				608857.0
4827215.0	608586.0	4827484.0	0.2	10	
64	1				
'SB on Confederation'	'AG'				608577.0
4827472.0	608846.0	4827197.0	0.2	10	
65	1				
'NB on Elora E'	'AG'				608817.0
4827029.0	608780.0	4827035.0	0.2	7	
66	1				
'SB on Elora E'	'AG'				608778.0
4827024.0	608818.0	4827024.0	0.2	7	
67	1				
'NB on Elora E'	'AG'				608780.0
4827035.0	608720.0	4827040.0	0.2	7	
68	1				
'SB on Elora E'	'AG'				608720.0
4827035.0	608778.0	4827024.0	0.2	7	
69	1				
'NB on Elora W'	'AG'				608749.0
4826596.0	608697.0	4826618.0	0.2	7	
70	1				
'SB on Elora W'	'AG'				608693.0
4826606.0	608746.0	4826589.0	0.2	7	
71	1				
'NB on Elora W'	'AG'				608697.0
4826618.0	608652.0	4826635.0	0.2	7	
72	1				
'SB on Elora W'	'AG'				608649.0
4826626.0	608693.0	4826606.0	0.2	7	
73	1				
'EB on SQ1 Ext'	'AG'				608770.0
4826926.0	608852.0	4826960.0	0.2	6.35	
74	1				
'WB on SQ1 Ext'	'AG'				608846.0
4826966.0	608770.0	4826936.0	0.2	6.35	
75	1				
'EB on SQ1 Ext'	'AG'				608852.0
4826960.0	608905.0	4827026.0	0.2	6.35	
76	1				
'WB on SQ1 Ext'	'AG'				608900.0
4827031.0	608846.0	4826966.0	0.2	6.35	
77	1				
'EB on SQ1 Ext'	'AG'				608905.0
4827026.0	608971.0	4827109.0	0.2	6.35	
78	1				
'WB on SQ1 Ext'	'AG'				608964.0
4827114.0	608900.0	4827031.0	0.2	6.35	
1	0				

1	319	1.350437
2	264	1.181373
3	300	1.181373
4	246	1.273477
5	300	1.181373
6	246	1.273477
7	300	1.181373
8	246	1.273477
9	300	1.298296
10	246	1.198772
11	300	1.298296
12	246	1.198772
13	300	1.298296
14	246	1.198772
15	324	1.224905
16	236	0.942009
17	358	1.648376
18	234	0.720829
19	510	0.720829
20	215	1.1443
21	510	0.942009
22	215	0.942009
23	499	0.730685
24	248	1.1443
25	499	1.1443
26	248	0.79422
27	458	0.677297
28	249	0.942009
29	7	3.397181
30	35	3.793727
31	7	3.591436
32	35	3.793727
33	50	3.591436
34	15	3.370256
35	30	3.344123
36	25	3.793727
37	30	3.495788
38	25	3.495788
39	58	3.357047
40	41	3.443647
41	83	1.350437
42	168	3.370256
43	97	1.224905
44	194	1.446085
45	97	1.648376
46	194	1.273477
47	114	1.181373
48	169	3.793727
49	78	3.443647
50	87	3.344123
51	95	3.357047
52	74	3.495788

53	71	3.793727
54	105	3.380113
55	16	3.344123
56	6	3.793727
57	516	1.05559
58	521	0.630895
59	544	1.05559
60	512	0.630895
61	544	1.05559
62	512	0.630895
63	520	0.630895
64	659	0.783063
65	34	3.793727
66	16	3.357047
67	10	3.357047
68	25	3.591436
69	62	3.495788
70	101	3.357047
71	20	3.344123
72	58	3.793727
73	0	0
74	0	0
75	0	0
76	0	0
77	0	0
78	0	0
2	0	
1	319	1.350437
2	264	1.181373
3	300	1.181373
4	246	1.273477
5	300	1.181373
6	246	1.273477
7	300	1.181373
8	246	1.273477
9	300	1.298296
10	246	1.198772
11	300	1.298296
12	246	1.198772
13	300	1.298296
14	246	1.198772
15	324	1.224905
16	236	0.942009
17	358	1.648376
18	234	0.720829
19	510	0.720829
20	215	1.1443
21	510	0.942009
22	215	0.942009
23	499	0.730685
24	248	1.1443
25	499	1.1443

26	248	0.79422
27	458	0.677297
28	249	0.942009
29	7	3.397181
30	35	3.793727
31	7	3.591436
32	35	3.793727
33	50	3.591436
34	15	3.370256
35	30	3.344123
36	25	3.793727
37	30	3.495788
38	25	3.495788
39	58	3.357047
40	41	3.443647
41	83	1.350437
42	168	3.370256
43	97	1.224905
44	194	1.446085
45	97	1.648376
46	194	1.273477
47	114	1.181373
48	169	3.793727
49	78	3.443647
50	87	3.344123
51	95	3.357047
52	74	3.495788
53	71	3.793727
54	105	3.380113
55	16	3.344123
56	6	3.793727
57	516	1.05559
58	521	0.630895
59	544	1.05559
60	512	0.630895
61	544	1.05559
62	512	0.630895
63	520	0.630895
64	659	0.783063
65	34	3.793727
66	16	3.357047
67	10	3.357047
68	25	3.591436
69	62	3.495788
70	101	3.357047
71	20	3.344123
72	58	3.793727
73	0	0
74	0	0
75	0	0
76	0	0
77	0	0

78	0	0
3	0	
1	319	1.350437
2	264	1.181373
3	300	1.181373
4	246	1.273477
5	300	1.181373
6	246	1.273477
7	300	1.181373
8	246	1.273477
9	300	1.298296
10	246	1.198772
11	300	1.298296
12	246	1.198772
13	300	1.298296
14	246	1.198772
15	324	1.224905
16	236	0.942009
17	358	1.648376
18	234	0.720829
19	510	0.720829
20	215	1.1443
21	510	0.942009
22	215	0.942009
23	499	0.730685
24	248	1.1443
25	499	1.1443
26	248	0.79422
27	458	0.677297
28	249	0.942009
29	7	3.397181
30	35	3.793727
31	7	3.591436
32	35	3.793727
33	50	3.591436
34	15	3.370256
35	30	3.344123
36	25	3.793727
37	30	3.495788
38	25	3.495788
39	58	3.357047
40	41	3.443647
41	83	1.350437
42	168	3.370256
43	97	1.224905
44	194	1.446085
45	97	1.648376
46	194	1.273477
47	114	1.181373
48	169	3.793727
49	78	3.443647
50	87	3.344123

51	95	3.357047
52	74	3.495788
53	71	3.793727
54	105	3.380113
55	16	3.344123
56	6	3.793727
57	516	1.05559
58	521	0.630895
59	544	1.05559
60	512	0.630895
61	544	1.05559
62	512	0.630895
63	520	0.630895
64	659	0.783063
65	34	3.793727
66	16	3.357047
67	10	3.357047
68	25	3.591436
69	62	3.495788
70	101	3.357047
71	20	3.344123
72	58	3.793727
73	0	0
74	0	0
75	0	0
76	0	0
77	0	0
78	0	0
4	0	
1	319	1.350437
2	264	1.181373
3	300	1.181373
4	246	1.273477
5	300	1.181373
6	246	1.273477
7	300	1.181373
8	246	1.273477
9	300	1.298296
10	246	1.198772
11	300	1.298296
12	246	1.198772
13	300	1.298296
14	246	1.198772
15	324	1.224905
16	236	0.942009
17	358	1.648376
18	234	0.720829
19	510	0.720829
20	215	1.1443
21	510	0.942009
22	215	0.942009
23	499	0.730685

24	248	1.1443
25	499	1.1443
26	248	0.79422
27	458	0.677297
28	249	0.942009
29	7	3.397181
30	35	3.793727
31	7	3.591436
32	35	3.793727
33	50	3.591436
34	15	3.370256
35	30	3.344123
36	25	3.793727
37	30	3.495788
38	25	3.495788
39	58	3.357047
40	41	3.443647
41	83	1.350437
42	168	3.370256
43	97	1.224905
44	194	1.446085
45	97	1.648376
46	194	1.273477
47	114	1.181373
48	169	3.793727
49	78	3.443647
50	87	3.344123
51	95	3.357047
52	74	3.495788
53	71	3.793727
54	105	3.380113
55	16	3.344123
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16	236	0.942009
17	358	1.648376
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27	458	0.677297
28	249	0.942009
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39	58	3.357047
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22	613	0.942009
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52	211	3.495788
53	202	3.793727
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59	1551	1.05559
60	1459	0.630895
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62	1459	0.630895
63	1483	0.630895
64	1880	0.783063
65	98	3.793727

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67	27	3.357047
68	72	3.591436
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71	58	3.344123
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17	1020	1.648376
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22	613	0.942009
23	1423	0.730685
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27	1305	0.677297
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36	72	3.793727
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17	533	1.648376
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27	957	0.677297
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23	499	0.730685
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26	248	0.79422
27	458	0.677297
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37	30	3.495788
38	25	3.495788
39	58	3.357047
40	41	3.443647
41	83	1.350437
42	168	3.370256
43	97	1.224905
44	194	1.446085
45	97	1.648376
46	194	1.273477
47	114	1.181373
48	169	3.793727
49	78	3.443647
50	87	3.344123
51	95	3.357047
52	74	3.495788
53	71	3.793727
54	105	3.380113
55	16	3.344123

56	6	3.793727
57	516	1.05559
58	521	0.630895
59	544	1.05559
60	512	0.630895
61	544	1.05559
62	512	0.630895
63	520	0.630895
64	659	0.783063
65	34	3.793727
66	16	3.357047
67	10	3.357047
68	25	3.591436
69	62	3.495788
70	101	3.357047
71	20	3.344123
72	58	3.793727
73	0	0
74	0	0
75	0	0
76	0	0
77	0	0
78	0	0

CAL3QHCR (Dated: 13196)

DATE : 07/18/17
PAGE: 1
TIME : 16:09:57

JOB: Square One - 2017 Existing - PM
RUN: Square One - 2017 Existing - PM

=====
General Information
=====

Run start date: 01/01/12 Julian: 1
 end date: 12/31/12 Julian: 366

A Tier 2 approach was used for input data preparation.

The MODE flag has been set to P for calculating PM averages.

Ambient background concentrations are included in the averages below.

Site & Meteorological Constants

VS = 1.8 CM/S VD = 0.2 CM/S Z0 = 125. CM
ATIM = 60.

Met. Sfc. Sta. Id & Yr = 94791 12
Upper Air Sta. Id & Yr = 14733 12

Urban mixing heights were processed.

In 2012, Julian day 1 is a Sunday.

The patterns from the input file
have been assigned as follows:

Pattern # 1 is assigned to Monday.
Pattern # 1 is assigned to Tuesday.
Pattern # 1 is assigned to Wednesday.
Pattern # 1 is assigned to Thursday.
Pattern # 1 is assigned to Friday.
Pattern # 1 is assigned to Saturday.
Pattern # 1 is assigned to Sunday.

Link Data Constants - (Variable data in *.LNK file)

LINK DESCRIPTION					LINK COORDINATES (M)		
* LENGTH	BRG	TYPE	H	W	NLANES		
Y2	*	(M)	(DEG)	(M)	(M)	X1	Y1 X2

*-----							
*-----							
		1. EB on Rathburn			* 608643.0	*****	608702.0
*****	*	123.	29. AG		0.2 10.0		
		2. WB on Rathburn			* 608687.0	*****	608632.0
*****	*	125.	206. AG		0.2 10.0		
		3. EB on Rathburn			* 608702.0	*****	608736.0
*****	*	102.	20. AG		0.2 10.0		
		4. WB on Rathburn			* 608726.0	*****	608687.0
*****	*	101.	203. AG		0.2 10.0		
		5. EB on Rathburn			* 608736.0	*****	608750.0
*****	*	61.	13. AG		0.2 10.0		
		6. WB on Rathburn			* 608743.0	*****	608726.0
*****	*	60.	196. AG		0.2 10.0		
		7. EB on Rathburn			* 608750.0	*****	608764.0
*****	*	66.	12. AG		0.2 10.0		

CAL3QHCR (Dated: 13196)

DATE : 07/18/17
PAGE: 2
TIME : 16:09:57

JOB: Square One - 2017 Existing - PM
RUN: Square One - 2017 Existing - PM

Link Data Constants - (Variable data in *.LNK file)

```
-----
*          LINK DESCRIPTION          *          LINK COORDINATES (M)
*  LENGTH  BRG  TYPE  H  W  NLANS  *
*          *          *          *          *          *
Y2  *      (M)  (DEG)          (M)  (M)          Y1          X2
*-----
*-----
*          8. WB on Rathburn          * 608755.0  * 608743.0
***** *          63. 191. AG          0.2 10.0
*          9. EB on Rathburn          * 608764.0  * 608775.0
***** *          102. 6. AG          0.2 10.0
*          10. WB on Rathburn          * 608765.0  * 608755.0
***** *          101. 186. AG          0.2 10.0
*          11. EB on Rathburn          * 608775.0  * 608776.0
***** *          33. 2. AG          0.2 10.0
*          12. WB on Rathburn          * 608766.0  * 608765.0
***** *          34. 182. AG          0.2 10.0
*          13. EB on Rathburn          * 608776.0  * 608785.0
***** *          64. 8. AG          0.2 10.0
*          14. WB on Rathburn          * 608772.0  * 608766.0
***** *          66. 185. AG          0.2 10.0
*          15. EB on Rathburn          * 608785.0  * 608810.0
***** *          89. 16. AG          0.2 10.0
*          16. WB on Rathburn          * 608802.0  * 608772.0
***** *          90. 199. AG          0.2 10.0
*          17. EB on Rathburn          * 608810.0  * 608855.0
***** *          97. 28. AG          0.2 10.0
*          18. WB on Rathburn          * 608844.0  * 608802.0
***** *          104. 204. AG          0.2 10.0
*          19. EB on Rathburn          * 608855.0  * 608916.0
***** *          107. 35. AG          0.2 10.0
*          20. WB on Rathburn          * 608909.0  * 608844.0
***** *          102. 219. AG          0.2 10.0
*          21. EB on Rathburn          * 608916.0  * 608960.0
***** *          88. 30. AG          0.2 10.0
*          22. WB on Rathburn          * 608949.0  * 608909.0
***** *          86. 208. AG          0.2 10.0
*          23. EB on Rathburn          * 608960.0  * 609011.0
***** *          100. 31. AG          0.2 10.0
```

24. WB on Rathburn	* 609002.0	*****	608949.0
***** * 102. 211. AG	0.2 10.0		
25. EB on Rathburn	* 609011.0	*****	609068.0
***** * 93. 38. AG	0.2 10.0		
26. WB on Rathburn	* 609053.0	*****	609002.0
***** * 94. 213. AG	0.2 10.0		
27. EB on Rathburn	* 609068.0	*****	609128.0
***** * 101. 37. AG	0.2 10.0		
28. WB on Rathburn	* 609120.0	*****	609053.0
***** * 103. 221. AG	0.2 10.0		
29. EB on SQ1	* 608971.0	*****	609016.0
***** * 81. 34. AG	0.2 7.6		
30. WB on SQ1	* 609016.0	*****	608964.0
***** * 79. 221. AG	0.2 7.6		
31. EB on SQ1	* 609016.0	*****	609035.0
***** * 73. 15. AG	0.2 7.6		
32. WB on SQ1	* 609027.0	*****	609016.0
***** * 73. 189. AG	0.2 7.6		
33. EB on SQ1	* 609035.0	*****	609070.0
***** * 64. 33. AG	0.2 7.6		
34. WB on SQ1	* 609062.0	*****	609027.0
***** * 66. 212. AG	0.2 7.6		
35. EB on SQ1	* 609070.0	*****	609124.0
***** * 74. 47. AG	0.2 7.6		
36. WB on SQ1	* 609104.0	*****	609062.0
***** * 72. 215. AG	0.2 7.6		
37. EB on SQ1	* 609124.0	*****	609192.0
***** * 98. 44. AG	0.2 7.6		
38. WB on SQ1	* 609173.0	*****	609104.0
***** * 98. 225. AG	0.2 7.6		
39. EB on SQ1	* 609192.0	*****	609238.0
***** * 82. 34. AG	0.2 7.6		
40. WB on SQ1	* 609230.0	*****	609173.0
***** * 85. 222. AG	0.2 7.6		
41. NB on Duke	* 609242.0	*****	609191.0
***** * 74. 316. AG	0.2 10.0		
42. SB on Duke	* 609175.0	*****	609235.0
***** * 74. 126. AG	0.2 10.0		
43. NB on Duke	* 609191.0	*****	609129.0
***** * 78. 308. AG	0.2 10.0		
44. SB on Duke	* 609119.0	*****	609175.0
***** * 76. 133. AG	0.2 10.0		
45. NB on Duke	* 609129.0	*****	609066.0
***** * 81. 309. AG	0.2 10.0		
46. SB on Duke	* 609056.0	*****	609119.0
***** * 80. 128. AG	0.2 10.0		
47. NB on Duke	* 609066.0	*****	608986.0
***** * 101. 308. AG	0.2 10.0		
48. SB on Duke	* 608976.0	*****	609056.0
***** * 104. 130. AG	0.2 10.0		

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 3

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

Link Data Constants - (Variable data in *.LNK file)

```
-----
*          LINK DESCRIPTION          *          LINK COORDINATES (M)
*  LENGTH  BRG  TYPE  H  W  NLANS  X1  Y1  X2
Y2  *      (M)  (DEG)      (M)  (M)
*-----
*-----
49. NB on Living Arts  * 609131.0  ***** 609073.0
***** *      81.  314.  AG  0.2  10.0
50. SB on Living Arts  * 609062.0  ***** 609127.0
***** *      82.  128.  AG  0.2   8.0
51. NB on Living Arts  * 609073.0  ***** 609028.0
***** *      55.  305.  AG  0.2  10.0
52. SB on Living Arts  * 609022.0  ***** 609062.0
***** *      52.  130.  AG  0.2   8.0
53. NB on Living Arts  * 609028.0  ***** 608958.0
***** *      77.  295.  AG  0.2  10.0
54. SB on Living Arts  * 608951.0  ***** 609022.0
***** *      77.  114.  AG  0.2   8.0
55. NB on Living Arts  * 608958.0  ***** 608914.0
***** *      47.  290.  AG  0.2  10.0
56. SB on Living Arts  * 608910.0  ***** 608951.0
***** *      45.  115.  AG  0.2   8.0
57. NB on Confederation * 609009.0  ***** 608972.0
***** *      52.  315.  AG  0.2  10.0
58. SB on Confederation * 608961.0  ***** 608999.0
***** *      54.  135.  AG  0.2  10.0
59. NB on Confederation * 608972.0  ***** 608913.0
***** *      78.  311.  AG  0.2  10.0
60. SB on Confederation * 608901.0  ***** 608961.0
***** *      76.  127.  AG  0.2  10.0
61. NB on Confederation * 608913.0  ***** 608857.0
***** *      74.  311.  AG  0.2  10.0
62. SB on Confederation * 608846.0  ***** 608901.0
***** *      72.  130.  AG  0.2  10.0
63. NB on Confederation * 608857.0  ***** 608586.0
***** *     382.  315.  AG  0.2  10.0
64. SB on Confederation * 608577.0  ***** 608846.0
***** *     385.  136.  AG  0.2  10.0
```

65. NB on Elora E	* 608817.0	*****	608780.0
***** * 37. 279. AG	0.2 7.0		
66. SB on Elora E	* 608778.0	*****	608818.0
***** * 40. 90. AG	0.2 7.0		
67. NB on Elora E	* 608780.0	*****	608720.0
***** * 60. 275. AG	0.2 7.0		
68. SB on Elora E	* 608720.0	*****	608778.0
***** * 59. 101. AG	0.2 7.0		
69. NB on Elora W	* 608749.0	*****	608697.0
***** * 56. 293. AG	0.2 7.0		
70. SB on Elora W	* 608693.0	*****	608746.0
***** * 56. 108. AG	0.2 7.0		
71. NB on Elora W	* 608697.0	*****	608652.0
***** * 48. 291. AG	0.2 7.0		
72. SB on Elora W	* 608649.0	*****	608693.0
***** * 48. 114. AG	0.2 7.0		
73. EB on SQ1 Ext	* 608770.0	*****	608852.0
***** * 89. 67. AG	0.2 6.3		
74. WB on SQ1 Ext	* 608846.0	*****	608770.0
***** * 82. 248. AG	0.2 6.3		
75. EB on SQ1 Ext	* 608852.0	*****	608905.0
***** * 85. 39. AG	0.2 6.3		
76. WB on SQ1 Ext	* 608900.0	*****	608846.0
***** * 85. 220. AG	0.2 6.3		
77. EB on SQ1 Ext	* 608905.0	*****	608971.0
***** * 106. 38. AG	0.2 6.3		
78. WB on SQ1 Ext	* 608964.0	*****	608900.0
***** * 105. 218. AG	0.2 6.3		

Receptor Data

RECEPTOR		* *	COORDINATES (M)	
			X	Y
Z	-----			
*-----	-----			
1.8	1. NR01	*	608747.0	*****
1.8	2. NR02	*	608831.0	*****
1.8	3. NR03	*	608922.0	*****
1.8	4. NR04	*	609001.0	*****
1.8				

CAL3QHCR (Dated: 13196)

DATE : 07/18/17
PAGE: 4
TIME : 16:09:57

JOB: Square One - 2017 Existing - PM
RUN: Square One - 2017 Existing - PM

Receptor Data

RECEPTOR		*	COORDINATES (M)	
		*	X	Y
Z	-----			
*	-----			
1.8	5. NR05	*	608742.0	*****
1.8	6. NR06	*	609042.0	*****
1.8	7. R01 - Commercial	*	608713.0	*****
1.8	8. R02 - School	*	608773.0	*****
1.8	9. R03 - Residence	*	608677.0	*****
1.8	10. R04 - Residence	*	608789.0	*****
1.8	11. R05 - Residence	*	608765.0	*****
1.8	12. R06 - Commercial	*	608862.0	*****
1.8	13. R07 - Commercial	*	609065.0	*****
1.8	14. R08 - Commercial	*	609072.0	*****
1.8	15. R09 - College	*	609171.0	*****

Model Results

Remarks : In search of the wind direction corresponding to the maximum concentration, only the first direction, of the directions with the same maximum concentrations, is indicated as the maximum.

* MAXIMUM HOURLY CONCENTRATIONS WITH ANY AMBIENT BACKGROUND CONCENTRATIONS (BKG) ADDED

```

*      (MICROGRAMS/M**3)
*      REC0001  REC0002  REC0003  REC0004  REC0005
REC0006  REC0007  REC0008  REC0009  REC0010
-----
*-----
-----
MAX+BKG * 88.4511 47.9926 56.9700 81.1033 84.0533
49.9989 73.7751 38.0132 59.1286 80.1521
- BKG * 0.0000 0.0000 0.0000 0.0000 0.0000
0.0000 0.0000 0.0000 0.0000 0.0000
-----
*-----
-----
MAX * 88.4511 47.9926 56.9700 81.1033 84.0533
49.9989 73.7751 38.0132 59.1286 80.1521
WIND DIR* 36 344 14 277 36
296 358 358 26 52
JULIAN * 320 363 281 129 320
321 122 122 363 322
HOUR * 19 15 18 20 19
8 20 20 19 20
*      REC0011  REC0012  REC0013  REC0014  REC0015
-----
*-----
-----
MAX+BKG * 66.8812 32.1138 79.2738 60.4249 51.3420
- BKG * 0.0000 0.0000 0.0000 0.0000 0.0000
-----
*-----
-----
MAX * 66.8812 32.1138 79.2738 60.4249 51.3420
WIND DIR* 76 185 185 358 26
JULIAN * 342 275 275 122 123
HOUR * 17 19 19 20 19

```

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 5

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

THE HIGHEST CONCENTRATION OF 88.4511 UG/M**3 OCCURRED
AT RECEPTOR REC0001.

CAL3QHCR (Dated: 13196)

DATE : 07/18/17
PAGE: 6
TIME : 16:09:57

JOB: Square One - 2017 Existing - PM
RUN: Square One - 2017 Existing - PM

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Output Section
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NOTES PERTAINING TO THE REPORT

1. THE HIGHEST AVERAGE IN EACH OF THE FIRST TWO COLUMNS OF EACH TABLE BELOW ARE SUFFIXED BY AN ASTERISK (*).

FOR PM OUTPUT, THERE IS ONLY ONE COLUMN AND ASTERISK FOR THE ANNUAL AVERAGE/PERIOD OF CONCERN TABLE.

2. THE NUMBERS IN PARENTHESES ARE THE JULIAN DAY AND ENDING HOUR FOR THE PRECEDING AVERAGE.

3. THE NUMBER OF CALM HOURS USED IN PRODUCING EACH AVERAGE ARE PREFIXED BY A C.

PRIMARY AND SECONDARY AVERAGES.

SIX HIGHEST 24-HOUR END-TO-END AVERAGE CONCENTRATIONS IN MICROGRAMS/M**3
INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Third Highest Sixth Highest				Highest Fourth Highest				Second Highest Fifth Highest			
Ending Ending				Ending Ending				Ending Ending			
Rcptr				No.				Conc			
Conc	Day	Hr	Calm	Conc	Day	Hr	Calm	Conc	Day	Hr	Calm
Conc	Day	Hr	Calm	Conc	Day	Hr	Calm	Conc	Day	Hr	Calm
				1	20.6620	(324,24)	C 0	20.2070	(322,24)	C 0	
18.3218	(320,24)	C 0		16.1036	(276,24)	C 0		16.0963	(325,24)	C 0	
15.8398	(80,24)	C 0									
				2	16.7602	(227,24)	C 0	15.6606	(322,24)	C 0	
14.6757	(321,24)	C 0		13.7897	(342,24)	C 0		13.5450	(324,24)	C 0	
13.2759	(363,24)	C 0									
				3	20.1152	(322,24)	C 0	18.5095	(227,24)	C 0	
16.3282	(324,24)	C 0		15.9865	(321,24)	C 0		15.6233	(363,24)	C 0	

15.5694 (320,24) C 0
 4 23.1326 (39,24) C 0 21.5832 (25,24) C 0
 21.4280 (20,24) C 0 20.5413 (51,24) C 0 20.4801 (129,24) C 0
 20.1220 (235,24) C 0
 5 17.5351 (322,24) C 0 17.3994 (324,24) C 0
 16.3598 (320,24) C 0 14.1955 (276,24) C 0 13.9347 (80,24) C 0
 13.8212 (325,24) C 0
 6 11.8279 (129,24) C 0 11.6969 (321,24) C 0
 11.3561 (39,24) C 0 11.2884 (281,24) C 0 10.9702 (122,24) C 0
 10.9259 (25,24) C 0
 7 26.0875*(227,24) C 0 24.5207*(321,24) C 0
 22.7337 (322,24) C 0 21.1012 (324,24) C 0 20.6413 (281,24) C 0
 20.0637 (360,24) C 0
 8 10.9848 (227,24) C 0 10.9697 (321,24) C 0
 9.0255 (281,24) C 0 9.0133 (122,24) C 0 8.3192 (342,24) C 0
 8.0745 (305,24) C 0
 9 16.9981 (324,24) C 0 16.9055 (80,24) C 0
 16.7951 (299,24) C 0 15.8789 (15,24) C 0 15.6328 (322,24) C 0
 15.5747 (325,24) C 0
 10 19.5848 (322,24) C 0 18.8976 (320,24) C 0
 18.2264 (80,24) C 0 18.1035 (298,24) C 0 17.5956 (276,24) C 0
 17.0327 (312,24) C 0
 11 23.7780 (322,24) C 0 21.0475 (298,24) C 0
 20.2061 (320,24) C 0 19.2667 (80,24) C 0 19.0915 (276,24) C 0
 17.4033 (336,24) C 0
 12 8.7235 (80,24) C 0 8.5386 (342,24) C 0
 7.9793 (299,24) C 0 7.1905 (298,24) C 0 7.0240 (291,24) C 0
 6.9566 (327,24) C 0
 13 18.1993 (45,24) C 0 18.1746 (327,24) C 0
 17.6041 (342,24) C 0 15.6994 (264,24) C 0 15.3600 (283,24) C 0
 15.1551 (316,24) C 0
 14 19.9879 (227,24) C 0 19.1782 (322,24) C 0
 18.1227 (321,24) C 0 17.6604 (363,24) C 0 16.1878 (281,24) C 0
 16.1041 (342,24) C 0
 15 13.4455 (363,24) C 0 13.1981 (227,24) C 0
 12.9420 (322,24) C 0 12.6665 (342,24) C 0 12.2679 (281,24) C 0
 11.9201 (321,24) C 0

THE HIGHEST ANNUAL AVERAGE CONCENTRATIONS
 IN MICROGRAMS/M**3
 INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Receptor Number	Maximum Conc	Ending Day Hr	Calm
1	5.3221	(366,24)	C 0
2	5.3514	(366,24)	C 0
3	5.4978	(366,24)	C 0
4	8.9541*	(366,24)	C 0

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 7

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

THE HIGHEST ANNUAL AVERAGE CONCENTRATIONS
IN MICROGRAMS/M**3
INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Receptor Number	Maximum Conc	Ending Day Hr	Calm
5	4.5391	(366,24)	C 0
6	3.6879	(366,24)	C 0
7	7.3368	(366,24)	C 0
8	3.5677	(366,24)	C 0
9	5.4170	(366,24)	C 0
10	5.4360	(366,24)	C 0
11	6.1200	(366,24)	C 0
12	2.5135	(366,24)	C 0
13	5.4988	(366,24)	C 0
14	6.5664	(366,24)	C 0
15	4.8572	(366,24)	C 0

MAXIMUM 24-HOUR AVERAGED LINK CONTRIBUTIONS
IN MICROGRAMS/M**3
INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Rcpttr Link No.	Total Link Conc	Ending Link Day Hr	Ambient Link Backgnd	Total Link	Link +1	Link +2	Link +3
+4	+5	+6	+7	+8	+9	+10			
		1	20.6620	(324,24)	0.00	20.6620	0.0102		
0.0061	0.0188	0.0141	0.0241	0.0195	0.0594	0.0470	1.3961		
1.6178									
					Links	10+	0.77	3.31	1.51
2.66	1.37	0.91	0.88	0.28	0.32	0.21			
					Links	20+	0.16	0.06	0.10
0.07	0.10	0.04	0.05	0.04	0.00	0.02			
					Links	30+	0.00	0.01	0.01
0.00	0.01	0.01	0.01	0.01	0.01	0.01			
					Links	40+	0.01	0.03	0.01
0.02	0.02	0.03	0.03	0.13	0.02	0.02			
					Links	50+	0.03	0.02	0.05
0.07	0.01	0.00	0.03	0.02	0.17	0.10			
					Links	60+	0.39	0.24	0.83
1.32	0.19	0.08	0.17	0.43	0.00	0.01			

						Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00				
		2	16.7602	(227,24)		0.00	16.7602	0.0367		
0.0378	0.0360	0.0518	0.0304	0.0463	0.0465	0.0648	0.1326			
0.1304										
						Links	10+	0.06	0.05	0.17
0.11	1.96	0.91	3.96	1.33	0.52	0.56				
						Links	20+	0.13	0.08	0.05
0.06	0.04	0.02	0.02	0.01	0.01	0.04				
						Links	30+	0.01	0.05	0.05
0.01	0.03	0.02	0.03	0.02	0.01	0.01				
						Links	40+	0.02	0.11	0.02
0.04	0.01	0.02	0.02	0.08	0.08	0.08				
						Links	50+	0.05	0.04	0.04
0.05	0.01	0.01	0.04	0.03	0.38	0.27				
						Links	60+	0.67	0.53	1.21
1.78	0.09	0.04	0.02	0.04	0.01	0.02				
						Links	70+	0.00	0.01	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00				

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 8

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

MAXIMUM 24-HOUR AVERAGED LINK CONTRIBUTIONS
IN MICROGRAMS/M**3
INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Reptr Link No.	Total Link Conc	Ending Link Day Hr	Ambient Link Backgnd	Total Link	Link +1	Link +2	Link +3
+4	+5	+6	+7	+8	+9	+10			
		3	20.1152	(322,24)		0.00	20.1152	0.0000	
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
0.0000									
						Links 10+	0.00	0.00	0.00
0.00	0.00	0.00	0.25	0.06	0.76	0.49			
						Links 20+	0.50	0.27	0.23
0.21	0.17	0.07	0.09	0.07	0.08	0.39			
						Links 30+	0.03	0.11	0.08
0.04	0.04	0.04	0.03	0.03	0.04	0.03			
						Links 40+	0.04	0.11	0.03
0.06	0.04	0.06	0.05	0.23	0.14	0.15			
						Links 50+	0.12	0.10	0.17
0.22	0.02	0.02	0.95	0.63	4.83	4.57			
						Links 60+	1.74	0.78	0.44
0.49	0.00	0.00	0.00	0.00	0.00	0.00			
						Links 70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		4	23.1326	(39,24)		0.00	23.1326	0.0001	
0.0001	0.0002	0.0003	0.0005	0.0005	0.0006	0.0020	0.0020	0.0264	
0.0223									
						Links 10+	0.03	0.03	0.17
0.15	0.61	0.40	0.79	0.25	0.20	0.12			
						Links 20+	0.04	0.01	0.01
0.01	0.01	0.00	0.00	0.00	0.13	0.47			
						Links 30+	0.00	0.01	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
						Links 40+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.01	0.00	0.00			
						Links 50+	0.00	0.00	0.01
0.01	0.00	0.00	10.18	2.68	2.78	1.99			

0.62	0.05	0.02	0.03	0.05	0.00	0.00	Links	60+	0.52	0.29	0.38
						0.00	Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00					
		5	17.5351	(322,24)		0.00		17.5351	0.0000		
0.0000	0.0000	0.0000	0.0003	0.0002	0.0036	0.0029		0.2669			
0.2337											
							Links	10+	0.75	1.48	2.07
3.59	1.32	0.89	0.61	0.18	0.23	0.16					
						0.05	Links	20+	0.14	0.05	0.09
0.06	0.09	0.04	0.05	0.04	0.01	0.05					
						0.03	Links	30+	0.01	0.03	0.02
0.03	0.01	0.02	0.02	0.03	0.04	0.03					
						0.06	Links	40+	0.04	0.08	0.02
0.03	0.02	0.03	0.03	0.14	0.06	0.06					
						0.17	Links	50+	0.03	0.03	0.05
0.06	0.01	0.00	0.17	0.10	0.32	0.17					
						0.00	Links	60+	0.28	0.16	0.74
1.18	0.16	0.15	0.22	0.55	0.00	0.00					
						0.00	Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00					
		6	11.8279	(129,24)		0.00		11.8279	0.0025		
0.0014	0.0015	0.0009	0.0005	0.0003	0.0002	0.0001		0.0001	0.0001		
0.0001											
							Links	10+	0.00	0.00	0.01
0.01	0.10	0.12	0.54	0.23	0.30	0.24					
						0.33	Links	20+	0.12	0.08	0.06
0.07	0.06	0.02	0.03	0.02	0.08	0.33					
						0.02	Links	30+	0.02	0.07	0.04
0.02	0.01	0.02	0.01	0.02	0.02	0.02					
						0.06	Links	40+	0.01	0.03	0.02
0.02	0.02	0.02	0.01	0.07	0.06	0.06					
						0.78	Links	50+	0.05	0.04	0.06
0.06	0.01	0.01	2.80	0.84	1.64	0.78					
						0.00	Links	60+	0.67	0.35	0.58
0.92	0.00	0.00	0.00	0.00	0.00	0.00					
						0.00	Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00					

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 9

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

MAXIMUM 24-HOUR AVERAGED LINK CONTRIBUTIONS IN MICROGRAMS/M**3 INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Reptr Link No.	Total Link Conc	Ending Link Day Hr	Ambient Link Backgnd	Total Link	Link +1	Link +2	Link +3
+4	+5	+6	+7	+8	+9	+10			
		7	26.0875	(227,24)		0.00	26.0875	3.1478	
1.3327	4.4033	3.0327	0.5596	0.7378	0.3316	0.4061	0.3394		
0.3773									
						Links 10+	0.08	0.09	0.14
0.16	0.14	0.12	0.14	0.07	0.06	0.05			
						Links 20+	0.04	0.02	0.02
0.02	0.02	0.01	0.01	0.01	0.00	0.00			
						Links 30+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
						Links 40+	0.00	0.01	0.00
0.00	0.00	0.01	0.01	0.04	0.00	0.01			
						Links 50+	0.01	0.00	0.01
0.01	0.00	0.00	0.01	0.01	0.03	0.02			
						Links 60+	0.07	0.04	0.39
0.59	0.02	0.01	0.02	0.03	2.56	5.78			
						Links 70+	0.13	0.39	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		8	10.9848	(227,24)		0.00	10.9848	0.1115	
0.0769	1.0612	0.8097	0.7040	0.5269	0.8794	0.7764	0.8609		
0.8063									
						Links 10+	0.18	0.18	0.28
0.28	0.28	0.21	0.28	0.13	0.11	0.10			
						Links 20+	0.06	0.04	0.04
0.04	0.03	0.01	0.01	0.01	0.00	0.01			
						Links 30+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
						Links 40+	0.00	0.01	0.00
0.01	0.01	0.01	0.01	0.06	0.01	0.01			
						Links 50+	0.01	0.01	0.02
0.02	0.00	0.00	0.02	0.02	0.06	0.04			

0.66	0.04	0.02	0.02	0.04	0.10	0.12	Links	60+	0.14	0.08	0.45
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links	70+	0.02	0.05	0.00
		9	16.9981	(324,24)		0.00		16.9981	1.0708		
0.7283	1.3377	4.8570	0.5994	0.6699	0.4510	0.4116		0.4448			
0.3783							Links	10+	0.10	0.09	0.16
0.15	0.16	0.10	0.19	0.06	0.09	0.06	Links	20+	0.07	0.03	0.05
0.03	0.05	0.02	0.03	0.02	0.00	0.02	Links	30+	0.00	0.01	0.02
0.00	0.01	0.01	0.01	0.01	0.01	0.01	Links	40+	0.01	0.04	0.01
0.02	0.01	0.02	0.01	0.07	0.03	0.03	Links	50+	0.02	0.02	0.03
0.04	0.00	0.00	0.04	0.03	0.09	0.06	Links	60+	0.11	0.06	0.37
0.59	0.02	0.01	0.01	0.03	0.87	1.15	Links	70+	0.42	0.21	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00					
		10	19.5848	(322,24)		0.00		19.5848	0.0000		
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0001		
0.0000							Links	10+	0.00	0.00	0.00
0.00	0.10	0.06	2.82	2.34	0.80	0.93	Links	20+	0.28	0.19	0.15
0.15	0.11	0.05	0.05	0.05	0.01	0.03	Links	30+	0.01	0.04	0.05
0.03	0.03	0.05	0.03	0.05	0.06	0.06	Links	40+	0.04	0.12	0.05
0.07	0.05	0.05	0.04	0.18	0.08	0.09	Links	50+	0.09	0.08	0.13
0.14	0.02	0.01	0.08	0.06	0.22	0.11	Links	60+	1.11	0.64	2.64
4.97	0.00	0.00	0.00	0.00	0.00	0.00	Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00					

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 10

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

MAXIMUM 24-HOUR AVERAGED LINK CONTRIBUTIONS IN MICROGRAMS/M**3 INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Reptr Link	Total Link	Ending Link	Ambient Link	Total Link	Link	Link	Link
+4	+5	No.	Conc	Day Hr	Backgnd	Link	+1	+2	+3
+4	+5	+6	+7	+8	+9	+10			
		11	23.7780	(322,24)		0.00	23.7780	0.0000	
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	
0.0001									
						Links	10+	0.00	0.00
0.00	0.02	0.02	0.60	0.59	0.39	0.38			
						Links	20+	0.38	0.26
0.28	0.17	0.10	0.06	0.08	0.01	0.02			0.20
						Links	30+	0.00	0.02
0.01	0.02	0.02	0.03	0.03	0.05	0.04			0.03
						Links	40+	0.02	0.09
0.07	0.08	0.07	0.05	0.19	0.05	0.05			0.05
						Links	50+	0.07	0.05
0.16	0.02	0.02	0.16	0.08	0.33	0.17			0.15
						Links	60+	0.44	0.32
12.01	0.00	0.00	0.00	0.00	0.00	0.00			5.22
						Links	70+	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00
		12	8.7235	(80,24)		0.00	8.7235	0.0221	
0.0165	0.0164	0.0148	0.0107	0.0097	0.0130	0.0111	0.0111	0.0257	
0.0199									
						Links	10+	0.01	0.01
0.02	0.04	0.02	0.09	0.03	0.11	0.07			0.02
						Links	20+	0.42	0.16
0.40	0.65	0.54	0.34	0.41	0.00	0.02			0.48
						Links	30+	0.01	0.04
0.02	0.04	0.04	0.02	0.03	0.08	0.09			0.07
						Links	40+	0.03	0.09
0.10	0.37	0.30	0.26	1.16	0.12	0.13			0.10
						Links	50+	0.14	0.11
0.34	0.06	0.02	0.05	0.03	0.08	0.04			0.28

						Links	60+	0.07	0.04	0.15
0.21	0.00	0.00	0.00	0.01	0.00	0.01				
						Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00				
		13	18.1993	(45,24)		0.00	18.1993	0.0216		
0.0172	0.0180	0.0172	0.0124	0.0120	0.0155	0.0141	0.0314			
0.0256										
						Links	10+	0.01	0.01	0.03
0.02	0.05	0.03	0.12	0.04	0.12	0.08				
						Links	20+	0.20	0.08	0.36
0.28	2.33	0.99	0.80	2.76	0.01	0.04				
						Links	30+	0.01	0.05	0.09
0.09	0.07	0.15	0.02	0.06	0.00	0.00				
						Links	40+	0.00	0.00	0.01
0.03	1.00	1.06	1.34	3.32	0.19	0.19				
						Links	50+	0.22	0.17	0.20
0.18	0.02	0.01	0.13	0.06	0.14	0.06				
						Links	60+	0.10	0.05	0.23
0.34	0.01	0.00	0.00	0.01	0.01	0.01				
						Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00				
		14	19.9879	(227,24)		0.00	19.9879	0.0185		
0.0130	0.0139	0.0114	0.0083	0.0069	0.0084	0.0066	0.0104			
0.0070										
						Links	10+	0.00	0.00	0.00
0.00	0.01	0.01	0.07	0.02	0.19	0.13				
						Links	20+	0.28	0.13	0.20
0.16	0.77	0.29	0.38	0.39	0.01	0.03				
						Links	30+	0.02	0.09	1.78
0.49	0.64	0.99	0.07	0.10	0.06	0.03				
						Links	40+	0.05	0.27	0.06
0.16	0.31	0.41	0.18	0.66	2.19	4.48				
						Links	50+	1.54	0.78	0.23
0.26	0.01	0.01	0.09	0.04	0.05	0.02				
						Links	60+	0.10	0.04	0.23
0.33	0.00	0.00	0.00	0.00	0.00	0.01				
						Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00				

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 11

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

MAXIMUM 24-HOUR AVERAGED LINK CONTRIBUTIONS
IN MICROGRAMS/M**3
INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Rcpt Link	Total Link	Ending Link	Ambient Link	Total Link	Link	Link	Link
+4	+5	No. +6	Conc +7	Day Hr +8	Backgnd +9	Link +10	+1	+2	+3
		15	13.4455	(363,24)		0.00	13.4455	0.0001	
0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0004	0.0004	0.0022	
0.0018									
						Links 10+	0.00	0.00	0.01
0.00	0.01	0.01	0.03	0.01	0.03	0.02			
						Links 20+	0.19	0.07	0.48
0.32	0.41	0.13	0.24	0.18	0.00	0.00			
						Links 30+	0.00	0.01	0.02
0.01	0.06	0.07	1.57	0.73	0.79	0.51			
						Links 40+	0.95	3.17	0.40
0.84	0.17	0.25	0.07	0.36	0.03	0.03			
						Links 50+	0.08	0.04	0.21
0.20	0.03	0.01	0.00	0.00	0.02	0.01			
						Links 60+	0.03	0.01	0.25
0.36	0.00	0.00	0.00	0.00	0.00	0.00			
						Links 70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			

SECOND HIGHEST 24-HOUR AVERAGED LINK CONTRIBUTIONS
IN MICROGRAMS/M**3
INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Rcpt Link	Total Link	Ending Link	Ambient Link	Total Link	Link	Link	Link
+4	+5	No. +6	Conc +7	Day Hr +8	Backgnd +9	Link +10	+1	+2	+3
		1	20.2070	(322,24)		0.00	20.2070	0.0000	
0.0000	0.0000	0.0000	0.0002	0.0002	0.0002	0.0035	0.0025	0.4954	
0.4560									

4.11	1.32	0.78	0.58	0.19	0.23	Links 10+	1.18	2.77	2.59
						0.15			
0.06	0.09	0.04	0.05	0.04	0.01	Links 20+	0.14	0.05	0.09
						0.05			
0.02	0.01	0.02	0.01	0.02	0.03	Links 30+	0.01	0.02	0.02
						0.03			
0.03	0.02	0.03	0.03	0.14	0.05	Links 40+	0.03	0.07	0.02
						0.06			
0.07	0.01	0.00	0.18	0.11	0.30	Links 50+	0.03	0.03	0.05
						0.16			
1.11	0.18	0.12	0.16	0.38	0.00	Links 60+	0.28	0.16	0.69
						0.00			
0.00	0.00	0.00	0.00	0.00	0.00	Links 70+	0.00	0.00	0.00
						0.00			
		2	15.6606	(322,24)		0.00	15.6606	0.0000	
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
0.0000									
						Links 10+	0.00	0.00	0.00
0.00	0.96	0.28	3.22	1.00	0.55	0.43			
						Links 20+	0.29	0.11	0.16
0.11	0.13	0.05	0.07	0.05	0.02	0.10			
						Links 30+	0.01	0.06	0.04
0.04	0.02	0.03	0.02	0.03	0.04	0.04			
						Links 40+	0.04	0.10	0.03
0.04	0.03	0.05	0.04	0.18	0.10	0.11			
						Links 50+	0.07	0.06	0.10
0.14	0.01	0.01	0.28	0.17	0.86	0.52			
						Links 60+	1.21	0.80	1.07
1.76	0.00	0.00	0.00	0.00	0.00	0.00			
						Links 70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 12

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

SECOND HIGHEST 24-HOUR AVERAGED LINK CONTRIBUTIONS IN MICROGRAMS/M**3 INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Reptr Link No.	Total Link Conc	Ending Link Day Hr	Ambient Link Backgnd	Total Link	Link +1	Link +2	Link +3
+4	+5	+6	+7	+8	+9	+10			
		3	18.5095	(227,24)		0.00	18.5095	0.0291	
0.0225	0.0249	0.0233	0.0180	0.0166	0.0225	0.0186	0.0363		
0.0240									
					Links	10+	0.01	0.01	0.04
0.03	0.27	0.15	0.61	0.20	0.73	0.54			
					Links	20+	0.80	0.46	0.28
0.32	0.15	0.08	0.04	0.04	0.04	0.24			
					Links	30+	0.02	0.08	0.04
0.01	0.02	0.02	0.03	0.02	0.03	0.02			
					Links	40+	0.02	0.11	0.01
0.03	0.02	0.03	0.06	0.30	0.10	0.11			
					Links	50+	0.04	0.04	0.17
0.22	0.04	0.03	0.25	0.22	4.29	4.00			
					Links	60+	1.55	0.48	0.30
0.48	0.01	0.00	0.01	0.01	0.01	0.01			
					Links	70+	0.00	0.01	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		4	21.5832	(25,24)		0.00	21.5832	0.0000	
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0004	0.0083	
0.0150									
					Links	10+	0.02	0.03	0.11
0.16	0.37	0.34	0.75	0.32	0.13	0.08			
					Links	20+	0.05	0.02	0.03
0.02	0.03	0.01	0.01	0.01	0.14	0.47			
					Links	30+	0.01	0.05	0.02
0.01	0.01	0.01	0.01	0.01	0.01	0.01			
					Links	40+	0.00	0.03	0.01
0.02	0.01	0.01	0.01	0.03	0.04	0.04			
					Links	50+	0.03	0.02	0.03
0.03	0.00	0.00	9.83	1.80	2.96	1.93			

0.42	0.03	0.03	0.03	0.03	0.00	0.00	Links	60+	0.39	0.33	0.22
							Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00					
		5	17.3994	(324,24)		0.00		17.3994	0.0105		
0.0064	0.0186	0.0142	0.0225	0.0185	0.0531	0.0436		0.8809			
0.9226											
							Links	10+	0.92	2.75	0.73
1.58	1.33	0.94	0.93	0.21	0.34	0.22	Links	20+	0.16	0.06	0.10
							Links	30+	0.00	0.01	0.01
0.07	0.10	0.04	0.05	0.04	0.00	0.01	Links	40+	0.00	0.03	0.01
							Links	50+	0.03	0.02	0.05
0.00	0.01	0.01	0.01	0.01	0.01	0.01	Links	60+	0.39	0.23	0.89
							Links	70+	0.00	0.00	0.00
0.02	0.02	0.03	0.03	0.13	0.02	0.02					
0.07	0.01	0.00	0.02	0.02	0.13	0.08					
1.43	0.14	0.05	0.24	0.62	0.00	0.01					
0.00	0.00	0.00	0.00	0.00	0.00	0.00					
		6	11.6969	(321,24)		0.00		11.6969	0.0113		
0.0085	0.0117	0.0105	0.0099	0.0088	0.0145	0.0120		0.0318			
0.0229											
							Links	10+	0.01	0.01	0.01
0.01	0.02	0.01	0.40	0.11	0.19	0.11	Links	20+	0.16	0.07	0.24
							Links	30+	0.07	0.27	0.21
0.26	0.36	0.20	0.15	0.18	0.06	0.29	Links	40+	0.01	0.05	0.04
							Links	50+	0.28	0.25	0.23
0.19	0.07	0.12	0.03	0.05	0.02	0.02	Links	60+	0.42	0.27	0.32
							Links	70+	0.00	0.00	0.00
0.08	0.13	0.15	0.12	0.46	0.22	0.27					
0.21	0.01	0.01	1.39	0.41	1.06	0.58					
0.61	0.00	0.00	0.00	0.00	0.00	0.00					
0.00	0.00	0.00	0.00	0.00	0.00	0.00					

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 13

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

SECOND HIGHEST 24-HOUR AVERAGED LINK CONTRIBUTIONS
IN MICROGRAMS/M**3
INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Reptr Link No.	Total Link Conc	Ending Link Day Hr	Ambient Link Backgnd	Total Link	Link +1	Link +2	Link +3
+4	+5	+6	+7	+8	+9	+10			
		7	24.5207	(321,24)		0.00	24.5207	3.7561	
1.4934	3.7737	3.0195	0.4870	0.7085	0.2917	0.3910	0.2961		
0.3633									
						Links 10+	0.07	0.09	0.12
0.15	0.13	0.11	0.13	0.07	0.06	0.06			
						Links 20+	0.04	0.02	0.02
0.02	0.02	0.01	0.01	0.01	0.00	0.00			
						Links 30+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
						Links 40+	0.00	0.01	0.00
0.00	0.00	0.01	0.01	0.04	0.00	0.01			
						Links 50+	0.01	0.01	0.01
0.02	0.00	0.00	0.01	0.01	0.03	0.02			
						Links 60+	0.07	0.04	0.38
0.53	0.01	0.01	0.02	0.02	2.04	4.62			
						Links 70+	0.15	0.68	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		8	10.9697	(321,24)		0.00	10.9697	0.1994	
0.1265	1.2988	0.8689	0.7666	0.6017	0.7444	0.7814	0.7069		
0.7822									
						Links 10+	0.15	0.18	0.23
0.27	0.23	0.21	0.24	0.13	0.10	0.11			
						Links 20+	0.06	0.04	0.04
0.04	0.03	0.02	0.02	0.01	0.00	0.01			
						Links 30+	0.00	0.01	0.01
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
						Links 40+	0.00	0.01	0.00
0.01	0.01	0.01	0.01	0.06	0.01	0.01			
						Links 50+	0.01	0.01	0.02
0.03	0.00	0.00	0.02	0.01	0.06	0.04			

0.59	0.03	0.02	0.03	0.03	0.11	0.14	Links	60+	0.13	0.08	0.43
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links	70+	0.01	0.03	0.00
		9	16.9055	(80,24)		0.00			16.9055	1.2877	
0.9413	3.6323	7.2349	0.1321	0.1139	0.0562	0.0455			0.0415		
0.0314							Links	10+	0.01	0.01	0.01
0.01	0.01	0.01	0.01	0.00	0.01	0.01	Links	20+	0.01	0.00	0.01
0.01	0.01	0.00	0.00	0.00	0.00	0.01	Links	30+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links	40+	0.00	0.01	0.00
0.01	0.00	0.01	0.00	0.01	0.01	0.01	Links	50+	0.01	0.01	0.01
0.01	0.00	0.00	0.02	0.01	0.02	0.01	Links	60+	0.01	0.01	0.04
0.07	0.00	0.00	0.00	0.00	0.88	1.10	Links	70+	0.37	0.58	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00					
		10	18.8976	(320,24)		0.00			18.8976	0.0000	
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	
0.0000							Links	10+	0.00	0.00	0.00
0.00	0.04	0.01	3.10	2.25	0.93	0.94	Links	20+	0.32	0.24	0.17
0.22	0.15	0.10	0.07	0.10	0.01	0.06	Links	30+	0.02	0.07	0.08
0.06	0.03	0.04	0.03	0.03	0.04	0.03	Links	40+	0.03	0.12	0.03
0.05	0.07	0.06	0.06	0.24	0.15	0.15	Links	50+	0.11	0.09	0.14
0.15	0.02	0.02	0.12	0.06	0.57	0.25	Links	60+	1.79	1.04	1.54
2.88	0.00	0.00	0.00	0.00	0.00	0.00	Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00					

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 14

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

SECOND HIGHEST 24-HOUR AVERAGED LINK CONTRIBUTIONS
IN MICROGRAMS/M**3
INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Reptr Link No.	Total Link Conc	Ending Link Day Hr	Ambient Link Backgnd	Total Link	Link +1	Link +2	Link +3
+4	+5	+6	+7	+8	+9	+10			
		11	21.0475	(298,24)		0.00	21.0475	0.0000	
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
0.0000									
						Links 10+	0.00	0.00	0.00
0.00	0.00	0.00	0.24	0.13	1.69	2.02			
						Links 20+	0.44	0.21	0.09
0.06	0.04	0.01	0.01	0.01	0.01	0.07			
						Links 30+	0.03	0.13	0.12
0.11	0.05	0.07	0.03	0.04	0.04	0.03			
						Links 40+	0.04	0.14	0.02
0.05	0.01	0.02	0.00	0.01	0.24	0.25			
						Links 50+	0.14	0.13	0.13
0.17	0.01	0.00	0.06	0.03	0.24	0.08			
						Links 60+	1.05	0.25	3.65
8.66	0.00	0.00	0.00	0.00	0.00	0.00			
						Links 70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		12	8.5386	(342,24)		0.00	8.5386	0.0370	
0.0313	0.0239	0.0236	0.0144	0.0139	0.0169	0.0169	0.0155	0.0328	
0.0286									
						Links 10+	0.01	0.01	0.03
0.03	0.05	0.03	0.09	0.04	0.21	0.21			
						Links 20+	0.42	0.32	0.15
0.24	0.40	0.35	0.13	0.25	0.01	0.04			
						Links 30+	0.01	0.03	0.02
0.01	0.01	0.01	0.02	0.04	0.10	0.09			
						Links 40+	0.06	0.12	0.10
0.13	0.21	0.18	0.21	0.72	0.02	0.03			
						Links 50+	0.03	0.02	0.07
0.09	0.03	0.03	0.14	0.08	0.24	0.11			

1.20	0.01	0.00	0.00	0.01	0.01	0.01	Links 60+	0.17	0.06	0.84
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 70+	0.00	0.01	0.00
0.0259	0.0207	0.0274	0.0147	0.0188	0.0179	0.0217	0.0343			
0.0373										
0.03	0.04	0.04	0.10	0.04	0.10	0.10	Links 10+	0.01	0.01	0.03
0.36	2.04	0.93	1.85	2.89	0.01	0.03	Links 20+	0.18	0.11	0.34
0.04	0.07	0.09	0.10	0.12	0.05	0.05	Links 30+	0.01	0.04	0.08
0.34	1.06	1.14	0.95	2.33	0.17	0.17	Links 40+	0.03	0.24	0.11
0.17	0.01	0.01	0.09	0.05	0.14	0.06	Links 50+	0.17	0.12	0.18
0.15	0.00	0.00	0.00	0.00	0.01	0.01	Links 60+	0.11	0.05	0.11
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 70+	0.00	0.00	0.00
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 10+	0.00	0.00	0.00
0.21	0.61	0.23	0.24	0.23	0.00	0.00	Links 20+	0.02	0.01	0.34
0.22	0.70	0.74	0.18	0.16	0.12	0.10	Links 30+	0.00	0.00	1.19
0.23	0.19	0.25	0.13	0.54	3.18	5.67	Links 40+	0.14	0.44	0.10
0.19	0.00	0.00	0.00	0.00	0.00	0.00	Links 50+	1.54	1.02	0.25
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 60+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00				

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 15

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

SECOND HIGHEST 24-HOUR AVERAGED LINK CONTRIBUTIONS IN MICROGRAMS/M**3 INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Rcpt Link	Total Link	Ending Link	Ambient Link	Total Link	Link	Link	Link
+4	+5	No. +6	Conc +7	Day Hr +8	Backgnd +9	Link +10	+1	+2	+3
		15	13.1981	(227,24)		0.00	13.1981	0.0140	
0.0096	0.0099	0.0080	0.0056	0.0046	0.0054	0.0042	0.0063		
0.0043									
						Links 10+	0.00	0.00	0.00
0.00	0.00	0.00	0.02	0.01	0.03	0.02			
						Links 20+	0.12	0.05	0.17
0.14	0.25	0.10	0.21	0.16	0.00	0.01			
						Links 30+	0.00	0.01	0.02
0.00	0.06	0.06	1.89	0.87	0.39	0.76			
						Links 40+	0.30	3.20	0.99
1.77	0.14	0.14	0.05	0.21	0.10	0.08			
						Links 50+	0.08	0.05	0.11
0.12	0.01	0.00	0.02	0.01	0.01	0.01			
						Links 60+	0.02	0.01	0.14
0.20	0.00	0.00	0.00	0.00	0.00	0.01			
						Links 70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			

MAXIMUM ANNUAL AVERAGED LINK CONTRIBUTIONS IN MICROGRAMS/M**3 INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Rcpt Link	Total Link	Ending Link	Ambient Link	Total Link	Link	Link	Link
+4	+5	No. +6	Conc +7	Day Hr +8	Backgnd +9	Link +10	+1	+2	+3
		1	5.3221	(366,24)		0.00	5.3221	0.0246	
0.0227	0.0314	0.0358	0.0341	0.0399	0.0723	0.0799	0.5524		
0.6258									

0.62	0.14	0.13	0.09	0.04	0.03	0.02	Links	10+	0.49	0.99	0.38
						0.00	Links	20+	0.02	0.01	0.01
0.01	0.01	0.00	0.01	0.00	0.00	0.00	Links	30+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links	40+	0.00	0.01	0.00
0.00	0.00	0.00	0.00	0.02	0.01	0.01	Links	50+	0.00	0.00	0.01
0.01	0.00	0.00	0.02	0.01	0.03	0.02	Links	60+	0.04	0.02	0.15
0.24	0.02	0.01	0.03	0.07	0.01	0.01	Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00					
		2	5.3514	(366,24)		0.00		5.3513	0.0150		
0.0140	0.0153	0.0173	0.0131	0.0150	0.0206	0.0221			0.0656		
0.0626											
						0.09	Links	10+	0.04	0.04	0.21
0.19	1.16	0.56	0.73	0.24	0.10	0.01	Links	20+	0.04	0.02	0.02
0.02	0.02	0.01	0.01	0.01	0.00	0.00	Links	30+	0.00	0.01	0.01
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links	40+	0.00	0.01	0.00
0.01	0.00	0.01	0.01	0.03	0.01	0.01	Links	50+	0.01	0.01	0.01
0.02	0.00	0.00	0.06	0.04	0.10	0.07	Links	60+	0.16	0.11	0.25
0.40	0.09	0.04	0.02	0.04	0.00	0.01	Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00					

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 16

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

MAXIMUM ANNUAL AVERAGED LINK CONTRIBUTIONS IN MICROGRAMS/M**3 INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Reptr Link No.	Total Link Conc	Ending Link Day Hr	Ambient Link Backgnd	Total Link	Link +1	Link +2	Link +3
+4	+5	+6	+7	+8	+9	+10			
		3	5.4978	(366,24)		0.00	5.4978	0.0131	
0.0122	0.0126	0.0143	0.0103	0.0117	0.0154	0.0165	0.0430		
0.0405									
						Links 10+	0.02	0.02	0.06
0.06	0.19	0.11	0.33	0.11	0.18	0.13			
						Links 20+	0.12	0.06	0.05
0.05	0.03	0.02	0.01	0.01	0.01	0.05			
						Links 30+	0.00	0.02	0.01
0.01	0.00	0.01	0.00	0.00	0.01	0.00			
						Links 40+	0.00	0.01	0.00
0.01	0.01	0.01	0.01	0.05	0.02	0.02			
						Links 50+	0.02	0.01	0.03
0.04	0.01	0.00	0.29	0.25	0.85	0.85			
						Links 60+	0.42	0.21	0.17
0.27	0.02	0.01	0.01	0.01	0.00	0.01			
						Links 70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		4	8.9541	(366,24)		0.00	8.9541	0.0125	
0.0115	0.0118	0.0132	0.0093	0.0105	0.0134	0.0140	0.0333		
0.0305									
						Links 10+	0.02	0.01	0.04
0.03	0.08	0.05	0.17	0.06	0.09	0.07			
						Links 20+	0.09	0.04	0.07
0.06	0.06	0.03	0.02	0.02	0.08	0.32			
						Links 30+	0.01	0.07	0.03
0.02	0.01	0.01	0.01	0.01	0.01	0.01			
						Links 40+	0.00	0.02	0.01
0.01	0.01	0.02	0.02	0.07	0.03	0.04			
						Links 50+	0.04	0.03	0.06
0.07	0.00	0.00	4.00	0.87	0.84	0.40			

0.19	0.01	0.00	0.00	0.01	0.00	0.00	Links 60+	0.18	0.09	0.13
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 70+	0.00	0.00	0.00
		5	4.5391	(366,24)		0.00		4.5391	0.0235	
0.0218	0.0294	0.0338	0.0309	0.0365	0.0620	0.0696		0.3800		
0.4098										
0.73	0.15	0.13	0.09	0.02	0.03	0.02	Links 10+	0.33	0.55	0.45
0.01	0.01	0.00	0.01	0.00	0.00	0.01	Links 20+	0.02	0.01	0.01
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 30+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.02	0.01	0.01	Links 40+	0.00	0.01	0.00
0.01	0.00	0.00	0.02	0.01	0.03	0.02	Links 50+	0.00	0.00	0.01
0.25	0.02	0.02	0.05	0.10	0.01	0.01	Links 60+	0.04	0.02	0.16
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 70+	0.00	0.00	0.00
		6	3.6879	(366,24)		0.00		3.6879	0.0129	
0.0118	0.0122	0.0135	0.0097	0.0106	0.0137	0.0140		0.0324		
0.0289										
0.03	0.07	0.04	0.11	0.04	0.06	0.05	Links 10+	0.01	0.01	0.03
0.05	0.06	0.03	0.02	0.02	0.02	0.09	Links 20+	0.06	0.03	0.05
0.02	0.01	0.02	0.01	0.01	0.01	0.01	Links 30+	0.01	0.06	0.04
0.02	0.02	0.02	0.02	0.07	0.05	0.06	Links 40+	0.01	0.02	0.01
0.05	0.00	0.00	0.74	0.35	0.28	0.15	Links 50+	0.05	0.04	0.05
0.15	0.01	0.00	0.00	0.01	0.00	0.01	Links 60+	0.11	0.06	0.10
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 70+	0.00	0.00	0.00

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 17

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

MAXIMUM ANNUAL AVERAGED LINK CONTRIBUTIONS IN MICROGRAMS/M**3 INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Reptr Link No.	Total Link Conc	Ending Link Day Hr	Ambient Link Backgnd	Total Link	Link +1	Link +2	Link +3
+4	+5	+6	+7	+8	+9	+10			
		7	7.3368	(366,24)		0.00	7.3368	1.9125	
0.9508	0.7902	0.6098	0.0931	0.1094	0.0555	0.0616	0.0553		
0.0561									
					Links	10+	0.01	0.01	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01			
					Links	20+	0.01	0.00	0.01
0.01	0.01	0.00	0.00	0.00	0.00	0.00			
					Links	30+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
					Links	40+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.01	0.00	0.00			
					Links	50+	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.00	0.01	0.01			
					Links	60+	0.01	0.01	0.05
0.08	0.00	0.00	0.00	0.00	0.54	1.40			
					Links	70+	0.06	0.19	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		8	3.5677	(366,24)		0.00	3.5677	0.1952	
0.1620	0.6675	0.5273	0.2515	0.2162	0.1564	0.1455	0.1285		
0.1186									
					Links	10+	0.03	0.03	0.04
0.04	0.04	0.03	0.04	0.02	0.02	0.02			
					Links	20+	0.01	0.01	0.01
0.01	0.01	0.00	0.00	0.00	0.00	0.00			
					Links	30+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
					Links	40+	0.00	0.01	0.00
0.00	0.00	0.00	0.00	0.01	0.00	0.00			
					Links	50+	0.00	0.00	0.01
0.01	0.00	0.00	0.01	0.01	0.02	0.01			

0.10	0.01	0.00	0.00	0.01	0.11	0.13	Links 60+	0.02	0.01	0.07
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 70+	0.02	0.05	0.00
		9	5.4170	(366,24)		0.00		5.4171	0.6014	
0.6288	0.6836	1.5893	0.0710	0.0848	0.0436	0.0487		0.0457		
0.0475							Links 10+	0.01	0.01	0.02
0.02	0.02	0.02	0.02	0.01	0.01	0.01	Links 20+	0.01	0.00	0.01
0.01	0.01	0.00	0.00	0.00	0.00	0.00	Links 30+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 40+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.01	0.00	0.00	Links 50+	0.00	0.00	0.00
0.00	0.00	0.00	0.01	0.00	0.01	0.01	Links 60+	0.01	0.01	0.06
0.09	0.00	0.00	0.00	0.00	0.22	0.31	Links 70+	0.26	0.32	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00				
		10	5.4360	(366,24)		0.00		5.4361	0.0123	
0.0114	0.0123	0.0141	0.0101	0.0118	0.0149	0.0165		0.0404		
0.0397							Links 10+	0.02	0.02	0.06
0.06	0.34	0.29	1.07	0.69	0.10	0.09	Links 20+	0.04	0.02	0.02
0.02	0.02	0.01	0.01	0.01	0.00	0.02	Links 30+	0.00	0.01	0.01
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Links 40+	0.00	0.01	0.00
0.01	0.01	0.01	0.01	0.03	0.01	0.01	Links 50+	0.01	0.01	0.01
0.02	0.00	0.00	0.04	0.03	0.13	0.07	Links 60+	0.21	0.15	0.51
0.96	0.02	0.01	0.01	0.01	0.00	0.01	Links 70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00				

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 18

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

MAXIMUM ANNUAL AVERAGED LINK CONTRIBUTIONS
IN MICROGRAMS/M**3
INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Reptr Link No.	Total Link Conc	Ending Link Day Hr	Ambient Link Backgnd	Total Link	Link +1	Link +2	Link +3
+4	+5	+6	+7	+8	+9	+10			
		11	6.1200	(366,24)		0.00	6.1200	0.0109	
0.0102	0.0106	0.0123	0.0084	0.0100	0.0119	0.0134	0.0295		
0.0300									
						Links 10+	0.01	0.01	0.04
0.04	0.11	0.10	0.35	0.21	0.14	0.16			
						Links 20+	0.05	0.03	0.02
0.02	0.02	0.01	0.01	0.01	0.00	0.01			
						Links 30+	0.00	0.01	0.01
0.01	0.00	0.01	0.00	0.00	0.01	0.00			
						Links 40+	0.00	0.01	0.00
0.01	0.01	0.01	0.01	0.03	0.02	0.02			
						Links 50+	0.01	0.01	0.02
0.02	0.00	0.00	0.03	0.02	0.08	0.05			
						Links 60+	0.16	0.09	1.15
2.76	0.01	0.01	0.01	0.01	0.00	0.00			
						Links 70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		12	2.5135	(366,24)		0.00	2.5135	0.0061	
0.0056	0.0052	0.0059	0.0037	0.0043	0.0047	0.0052	0.0098		
0.0097									
						Links 10+	0.00	0.00	0.01
0.01	0.02	0.01	0.04	0.02	0.07	0.07			
						Links 20+	0.15	0.11	0.11
0.15	0.10	0.05	0.03	0.03	0.00	0.01			
						Links 30+	0.00	0.01	0.01
0.01	0.01	0.01	0.01	0.01	0.01	0.01			
						Links 40+	0.01	0.03	0.01
0.02	0.03	0.03	0.02	0.12	0.02	0.03			
						Links 50+	0.03	0.02	0.07
0.07	0.02	0.01	0.03	0.02	0.06	0.03			

						Links	60+	0.06	0.03	0.25
0.32	0.00	0.00	0.00	0.00	0.00	0.00				
						Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00				
		13	5.4988	(366,24)		0.00		5.4988	0.0041	
0.0038	0.0035	0.0040	0.0025	0.0028	0.0031	0.0033		0.0062		
0.0060										
						Links	10+	0.00	0.00	0.01
0.01	0.01	0.01	0.02	0.01	0.02	0.02				
						Links	20+	0.03	0.02	0.06
0.06	0.29	0.14	0.73	1.19	0.00	0.00				
						Links	30+	0.00	0.00	0.01
0.01	0.01	0.02	0.02	0.04	0.05	0.05				
						Links	40+	0.03	0.11	0.07
0.11	0.30	0.22	0.37	1.01	0.03	0.03				
						Links	50+	0.02	0.01	0.03
0.03	0.00	0.00	0.01	0.01	0.02	0.01				
						Links	60+	0.02	0.01	0.08
0.11	0.00	0.00	0.00	0.00	0.00	0.00				
						Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00				
		14	6.5664	(366,24)		0.00		6.5664	0.0084	
0.0077	0.0073	0.0082	0.0053	0.0060	0.0070	0.0075		0.0155		
0.0147										
						Links	10+	0.01	0.01	0.01
0.01	0.03	0.02	0.08	0.03	0.11	0.09				
						Links	20+	0.15	0.07	0.10
0.09	0.14	0.06	0.06	0.05	0.01	0.03				
						Links	30+	0.03	0.10	0.70
0.24	0.12	0.16	0.02	0.03	0.02	0.01				
						Links	40+	0.01	0.05	0.02
0.04	0.04	0.06	0.03	0.13	0.61	1.18				
						Links	50+	0.37	0.29	0.12
0.13	0.01	0.00	0.05	0.03	0.11	0.05				
						Links	60+	0.11	0.05	0.15
0.21	0.00	0.00	0.00	0.00	0.00	0.00				
						Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00				

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 19

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

LINK CONTRIBUTION TABLES

MAXIMUM ANNUAL AVERAGED LINK CONTRIBUTIONS IN MICROGRAMS/M**3 INCLUDING AMBIENT BACKGROUND CONCENTRATIONS.

Link	Link	Reptr Link No.	Total Link Conc	Ending Link Day Hr	Ambient Link Backgnd	Total Link	Link +1	Link +2	Link +3
+4	+5	+6	+7	+8	+9	+10			
		15	4.8572	(366,24)		0.00	4.8572	0.0065	
0.0060	0.0055	0.0061	0.0039	0.0043	0.0049	0.0052	0.0101		
0.0096									
					Links	10+	0.00	0.00	0.01
0.01	0.02	0.01	0.04	0.01	0.04	0.03			
					Links	20+	0.08	0.04	0.10
0.09	0.13	0.05	0.07	0.06	0.00	0.01			
					Links	30+	0.00	0.01	0.03
0.02	0.07	0.07	0.59	0.29	0.12	0.14			
					Links	40+	0.12	0.82	0.17
0.37	0.07	0.08	0.03	0.12	0.11	0.09			
					Links	50+	0.09	0.05	0.08
0.08	0.01	0.00	0.02	0.01	0.04	0.02			
					Links	60+	0.04	0.02	0.10
0.13	0.00	0.00	0.00	0.00	0.00	0.00			
					Links	70+	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00			

CAL3QHCR (Dated: 13196)

DATE : 07/18/17

PAGE: 20

TIME : 16:09:57

JOB: Square One - 2017 Existing - PM

RUN: Square One - 2017 Existing - PM

CALM

DURATION FREQUENCY

Hours of Consecutive Calm Winds Significant Occurrences	Frequency of Occurrence	(Julian day/hour ending) of
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No calm wind hours were encountered during this processing period.

Program terminated normally