REPORT

CLASS EA STUDY FOR IMPROVEMENTS TO LANGSTAFF ROAD FROM WESTON ROAD TO HIGHWAY 7

VAUGHAN, ONTARIO

AIR QUALITY ASSESSMENT

RWDI #1603246

January 21, 2020

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI was retained by WSP to conduct an air quality assessment of the proposed improvement of Langstaff Road from Weston Road to Highway 7 improvements in Vaughan, Ontario. The objective of the assessment was to quantify how the project will affect air quality in the future. In general, the air quality assessment has been completed in support of the Langstaff Road Municipal Class Environmental Assessment Study.

The Project includes an extension of Langstaff Road between Keele Street to Creditstone Road, resulting in an increased volume of traffic on Langstaff Road. Other proposed improvements on Langstaff Road include the widening of Langstaff Road to six lanes between Weston and Dufferin Street and a grade separation with the Metrolinx GO Barrie line. The air quality assessment was restricted to Langstaff Road between Highway 7 and Dufferin Street since this is the only section of Langstaff Road with sensitive receptors in proximity to the roadway. The Langstaff Road study corridor is approximately 0.6 km in length and extends from Dufferin Street easterly to Highway 7.

The emission modelling was based on the U.S Environmental Protection Agency's roadway traffic emissions model, MOVES version 2014b, and the dispersion modelling was based on the US EPA's dispersion model AERMOD version 16216r. The background concentrations were estimated using air quality monitoring data collected by Environment and Climate Change Canada (ECCC).

A Future No-Build and Future-Build scenario were considered. The differences between the two scenarios represent the change in air quality due to the project. The No-Build scenario represents Langstaff Road without the improvements, and the Future-Build scenario represents it with improvements. For both the Future No-Build and Future Build scenario, vehicle emissions were represented using projected 2041 traffic volumes and 2041 vehicle emission factors.

Three worst-case air contaminants were chosen to assess the effects of the project on the surrounding air quality: NO_2, $PM_{2.5}$ and benzene.

The proposed project is expected to increase local air contaminant levels. $PM_{2.5}$ and benzene exceed their thresholds for the annual averaging time, at the most impacted receptor location for both the Future Build and Future No-Build scenarios. Predicted exceedances of the threshold is caused by the elevated background concentrations in the study area. $PM_{2.5}$ background accounts for 94% of the concentration at the worst-case receptor. The background concentration for benzene exceeds the threshold without contributions from the roadway.

Through the comparison of the Future No-Build and the Future Build scenarios it is evident that the proposed improvements to Langstaff Road have insignificant impacts on nearby receptors.

1 INTRODUCTION

RWDI was retained by WSP to conduct an air quality assessment of the proposed extension of Langstaff Road in Vaughan, Ontario. The objective of the assessment was to quantify how the project will affect air quality in the future. The air quality assessment has been completed in support of the Langstaff Road Municipal Class Environmental Assessment Study.

The scope of the study is itemized below:

- Use the US EPA vehicle emissions modelling MOVES2014b to predict tailpipe emissions associated with the traffic for the selected scenario / scenarios.
- Use the US EPA atmospheric dispersion model AERMOD version 16216r to predict maximum contaminant concentrations at representative sensitive receptors due to emissions from the project related traffic movement.
- Use representative historical monitoring data to establish background concentrations for each contaminant of interest, due to various other sources in the surrounding area other than those associated with the proposed project.
- Combine the dispersion model results with the background concentrations and compare to applicable air quality thresholds.

2 PROJECT DESCRIPTION

Langstaff Road is an arterial road that runs east-west through Vaughan from Highway 7 to Islington Avenue. The road is divided by the Canadian National MacMillan Rail Yard at Keele Street easterly and resumes on the west side at Creditstone Road. The Project includes connecting Langstaff Road between Keele Street and Creditstone Road with an overpass. Other improvements on Langstaff Road include the widening of Langstaff Road to six lanes between Weston and Dufferin Street, and a grade separation with the Metrolinx Go Barrie line. The air quality assessment area was restricted to Langstaff Road between Highway 7 and Dufferin Street since this is the only section of Langstaff Road with sensitive receptors in proximity to the roadway. Within the air quality study area, Langstaff Road is a two-lane roadway with two minor street intersections that include a right and left turn lane, respectively, and one major intersection that has a left turn lane.

For the purposes of this assessment, a future No-Build scenario was compared with a worst-case Future Build scenario to determine the air quality impacts of the Project.

3 INPUT DATA AND MODELS

3.1 Traffic Data

Projected 2041 traffic volumes and truck percentages were provided by WSP and traffic speeds were assessed at the posted speed limits. Heavy vehicle percentages were available for the existing traffic conditions only, it was assumed that the heavy vehicle percentages were the same in the future scenarios. Future average daily traffic (ADT) values were provided for combined eastbound and westbound traffic. In order to split future traffic volumes based on direction of travel, the 2013 weekday ADT values for Langstaff Road between Dufferin Street and Highway 7 and Dufferin Street between 407ETR and Langstaff Road were used. Table 3.1 provides a summary of the modelled traffic volume and speed data.

Heavy vehicle percentages provided by WSP were assumed to include single-unit trucks/buses and multi-unit trucks (FHWA categories 4-13) and the remainder of the vehicles were assumed to be automobiles and SUVs (FHWA 1-3). Table 4.1 provides a summary of the vehicle fleet distributions.

Table 3.1: 2041 Future Traffic Volumes, Speeds, and Fleet Distribution

Roadway Segment Name	ADT (Future Build)		ADT (Future No Build)		Heavy Vehicle Percentage		Posted Speed (km/h)
	EB/NB	WB/SB	EB/NB	WB/SB	FHWA 1-3	FHWA 4-13	
Langstaff Road between Staffern Drive/North Rivermede Road & Dufferin Street	21,601	15,598	13,974	9,020	5.6%	94.4%	60
Dufferin Street between 407ETR (Exit 73) and Langstaff Road	16,875	23,912	18,484	25,832	4.6%	95.4%	60
Langstaff Road between Dufferin Street & Timberview Drive	10,793	12,180	6,641	8,329	5.6%	94.4%	60
Dufferin Street between Langstaff and Summerridge	16,308	15,668	16,777	16,119	4.6%	95.4%	60

3.2 Land Use

Figure 1 shows the Project area for the air quality assessment and its surrounding land use, which is mostly commercial and residential land use.

3.3 Emissions Model

The U.S EPA's Motor Vehicle Emission Simulator (MOVES) is a model that has been developed for the purpose of estimating vehicular emissions using computer simulation techniques based on extensive previous testing of a wide range of vehicles. MOVES 2014b was used to generate vehicle emission factors for an emissions horizon year of 2041, which corresponds to the year for which traffic projections were provided.

MOVES allows the user to generate emission factors by time of day, which accounts for diurnal fluctuations in temperature and relative humidity. In the present analysis, four sets of emission factors were generated – morning (AM, 6:00am to 9:00am), mid-day (MD, 9:00am-4:00pm), evening (PM, 4:00pm-7:00pm), and overnight (ON, 7:00pm-6:00am).

Exhaust emissions vary widely by type of vehicle, and MOVES provides emission factors for several different categories. These individual emission factors were aggregated to produce a composite emission factor for each pollutant, representing the average vehicle. This required information on the mix of different vehicle types on each roadway.

For particulate matter, emissions result from the re-suspension of dust as vehicles travel over a roadway surface, in addition to tailpipe emissions. The road dust emissions were calculated based on the revised version of U.S. EPA's AP-42, Chapter 13.2.1 (EPA, 2011). The tailpipe emission factor for particulate matter, from MOVES, was added to the road dust emission factor to account for both emission sources.

3.4 Dispersion Model

Air contaminants emitted from vehicles on a roadway will drift downwind and disperse as they travel. The degree to which the contaminants disperse depends on the weather-related factors, such as wind speed and amount of turbulence. The typical approach to determine potential future downwind concentrations from a proposed project is to use a computer simulation that predicts the dispersal of air pollutants as they drift away from the roads. These simulations are referred to as dispersion models.

Dispersion modelling is a common approach for assessing local air quality near an emission source such as vehicular traffic. The U.S. EPA developed a model known as AERMOD. This is an approved dispersion model used for regulatory modelling in Ontario. The model considers contaminant emission data, historical hourly meteorological data, local terrain data, and the configuration of the roadway. The model uses this information to predict roadway contributions to air quality levels at selected locations (sensitive receptors) adjacent to the study area under a variety of meteorological conditions.

3.5 Meteorological Data

The Ministry of Environment, Conservation, and Parks (MECP) publishes meteorological datasets based on the location and land use of the study site. For this assessment the "suburban" dataset applicable to the project location, which is in the Ontario Central Region, was selected. This data set considers five years of meteorological data spanning 1996-2000.

4 ASSESSMENT METHODOLOGY

4.1 Modelled Scenarios

In order to quantify the effects of a project on the surrounding air quality, a Future No-Build and Future Build scenario were modelled. The differences between each represent the change in air quality due to the project. The Future No-Build scenario represents traffic volumes increases along Langstaff Road that are anticipated without overpass construction, and the Future Build scenario represents Langstaff Road with overpass construction. Other improvements on Langstaff Road include the widening of Langstaff Road to six lanes between Weston and Dufferin Street, and a grade separation with the Metrolinx Go Barrie line. For both the Future No-Build and Future Build scenario, vehicle emissions were represented using projected 2041 traffic volumes and 2041 vehicle emission factors.

4.2 Selection of Sensitive Receptors

Receptors were placed to ensure the worst-condition was captured. Receptors were placed at the dwellings and the daycare facility closest to Langstaff Road, to represent operable windows and outdoor amenity areas at nearby residences. Figure 1 shows the receptor locations selected for modelling.

4.3 Modelled Air Contaminants

The following key contaminants have commonly been assessed in air quality studies for Ontario roadway EA's: nitrogen dioxide, carbon monoxide, inhalable particulate matter, respirable particulate matter, benzene, 1,3-butadiene, formaldehyde, acetaldehyde and acrolein. For the present study, three worst-case air contaminants were chosen, consisting of those having the highest ratios of emission rate to air quality threshold. Table 4.1 lists the selected contaminants of interest.

When modelling NO_2 the proportion of nitrogen oxides that is in the form of nitrogen dioxide is considered in the modelling as an in-tailpipe ratio. This ratio was estimated using the ratio between NO_X and NO_2 emission rates provided by MOVES 2014b. The tailpipe ratio was determined to be 0.28.

Table 4.1: Contaminants of Interest

Contaminant	Symbol or Chemical Formula
Nitrogen Dioxide	NO_2
Respirable Particulate Matter	$PM_{2.5}$
Benzene	C_6H_6

4.4 Air Quality Thresholds

The Province of Ontario has ambient air quality criteria (AAQCs) that are used to judge the acceptability of airborne concentrations of NO_2 and Benzene. The Province does not have an AAQC for $PM_{2.5}$. Instead, the Federal Government has established Canadian Ambient Air Quality Standards (CAAQS) for $PM_{2.5}$ (Environment Canada, 2017). The benchmarks and standards are collectively referred to as air quality thresholds in this report. The thresholds are summarized in Table 4.2.

Table 4.2: Summary of Relevant Air Quality Thresholds (µg/m³)

Pollutant	Criterion (µg/m³)	Averaging Period	Source of Threshold Value
$PM_{2.5}$	27	24-hour	CAAQS
	8.8	Annual	CAAQS
NO_2	400	1-hour	AAQC
	200	24-hour	AAQC
	79	1-hour*	CAAQS
	22.6	Annual**	CAAQS
Benzene	0.45	Annual	AAQC
	2.3	24-hour	AAQC

*The 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations.
**The average over a single calendar year of all the 1-hour average NO_2 concentrations.

4.5 Background Air Quality Data

AERMOD predicted the contribution of the modelled roadways to concentrations of contaminants at nearby sensitive receptors. The predicted maximum concentrations were combined with estimated background concentrations that are due to other emission sources in the surrounding area (primarily other roadways), thus providing a prediction of maximum cumulative concentrations.

The background concentrations were estimated using air quality monitoring data collected by the Ontario Ministry of Environment, Conservations and Parks (MECP) and/or Environment and Climate Change Canada (ECCC) under its National Air Pollution Surveillance (NAPS) program. Data from the nearest representative monitoring stations were used. Background data for nitrogen dioxide, particulate matter (<2.5 microns), and ozone are from the Young Street and Hendon Avenue (Toronto North) station (NAPS ID 60421). Background data for benzene was not available at this station so data from the 461 Kipling Avenue station (NAPS ID 60435) was used.

For the purpose of predicting maximum 1-hour and 24-hour cumulative concentrations, the maximum modelled concentration at each receptor location was combined with the 90th percentile hourly background concentration from the monitoring data, as per common practice in Ontario EA's. A 3-year average (2014 through 2016) of these 90th percentile values was used. For the purpose of predicting maximum annual cumulative concentrations the average annual background concentration for the same 3-year period was used.

Table 4.3 shows the background concentrations that were entered to the dispersion model results for 1-hour and 24-hour modelling results. Table 4.4 shows the background concentrations that were used for annual modelling results.

Table 4.3: Ambient Air Measurements used for 1-hour and 24-hour Background

Hour of Day	Pollutant Concentration (ppb)			
	NO_2	$PM_{2.5}$	Benzene	O_3
1	28.3	18.3	0.7	36.3
2	26.3	18.7	0.7	35.6
3	26.2	17.7	0.7	35.7
4	25	18.1	0.7	34.7
5	25	18.2	0.7	33
6	28.6	18.3	0.7	31.6
7	31.7	18.4	0.7	30.7
8	32.9	18.3	0.7	30.7
9	30.5	16.9	0.7	34.3
10	26	16.9	0.7	39
11	21.7	16	0.7	43
12	18.7	15	0.7	47.3
13	17.7	15	0.7	50.7
14	16.9	14.7	0.7	51.7
15	17.6	15	0.7	52
16	19.8	14	0.7	52.2
17	21.3	14.6	0.7	51.6
18	24.1	15.6	0.7	51
19	25.8	15.4	0.7	47.7
20	26.7	16.7	0.7	44
21	27.7	16.7	0.7	40.7
22	28.6	17.3	0.7	38.7
23	29	17.3	0.7	37.6
24	29	18	0.7	36.6

Notes:
[1] 3-year 90th Percentile Concentration in Parts per Billion (ppb) by Hour of Day

Table 4.4: Ambient Air Measurements used for Annual Background

Pollutant	3-Year Average Concentration (µg m^{-3})
$PM_{2.5}$	8.7
Benzene	0.5
NO_2	12.8

4.6 Assessment of Construction Impacts

Construction impacts were not considered in this assessment as construction activities are temporary and would not pose any risk of long-term health impacts at the studied receptors.

5 RESULTS

Table 5.1 presents a summary of the predicted maximum cumulative concentrations (modelled plus background) at the most-impacted sensitive receptor for the Future No-Build scenario. The resultant concentrations are compared to applicable thresholds. Predicted maximum concentrations for all sensitive receptor locations are provided in Appendix A for the Future No-Build scenario.

Table 5.2 presents a summary of the predicted maximum cumulative concentrations at the most-impacted receptor for the Future Build scenario. The resultant concentrations are compared to applicable thresholds. Predicted maximum concentrations at all sensitive receptor locations are provided in Appendix B for the Future Build Scenario.

The resultant concentrations for the Future Build scenario were slightly higher than the concentrations for the Future No-Build scenario. Although the assessment indicates exceedances of the applicable thresholds for $PM_{2.5}$ and benzene for annual averaging time periods, the exceedances are primarily a result of elevated background concentration within the study area. The contribution of Langstaff Road is very small compared to the background levels and the change between the Future No-Build and Future Build scenarios is insignificant.

Table 5.1: Maximum Predicted Concentrations for the Future Build Scenario

Contaminant	Averaging Period	Most Impacted Receptor	Predicted Conc. (µg m^{-3})	Threshold (µg m^{-3})	Source of Threshold Value	% of Threshold
NO_2	1 Hour	S01	65.1	400	AAQC	16%
	1 Hour[1]	S01	65.0	79	CAAQS	82%
	24 Hour	S01	56.0	200	AAQC	28%
	Annual[2]	S01	17.2	22.6	CAAQS	76%
$PM_{2.5}$	24 Hour	S01	18.0	27	CAAQS	67%
	Annual	S01	9.2	8.8	CAAQS	104%
Benzene	24 Hour	S01	0.76	2.3	AAQC	33%
	Annual	S01	0.49	0.45	AAQC	110%

[1] The 3-year average of the annual 98th percentile of the NO_2 daily-maximum 1-hour average concentrations.
[2] The average over a single calendar year of all the 1-hour average NO_2 concentrations.

Table 5.2: Maximum Predicted Concentrations for the 2041 Future No-Build Scenario

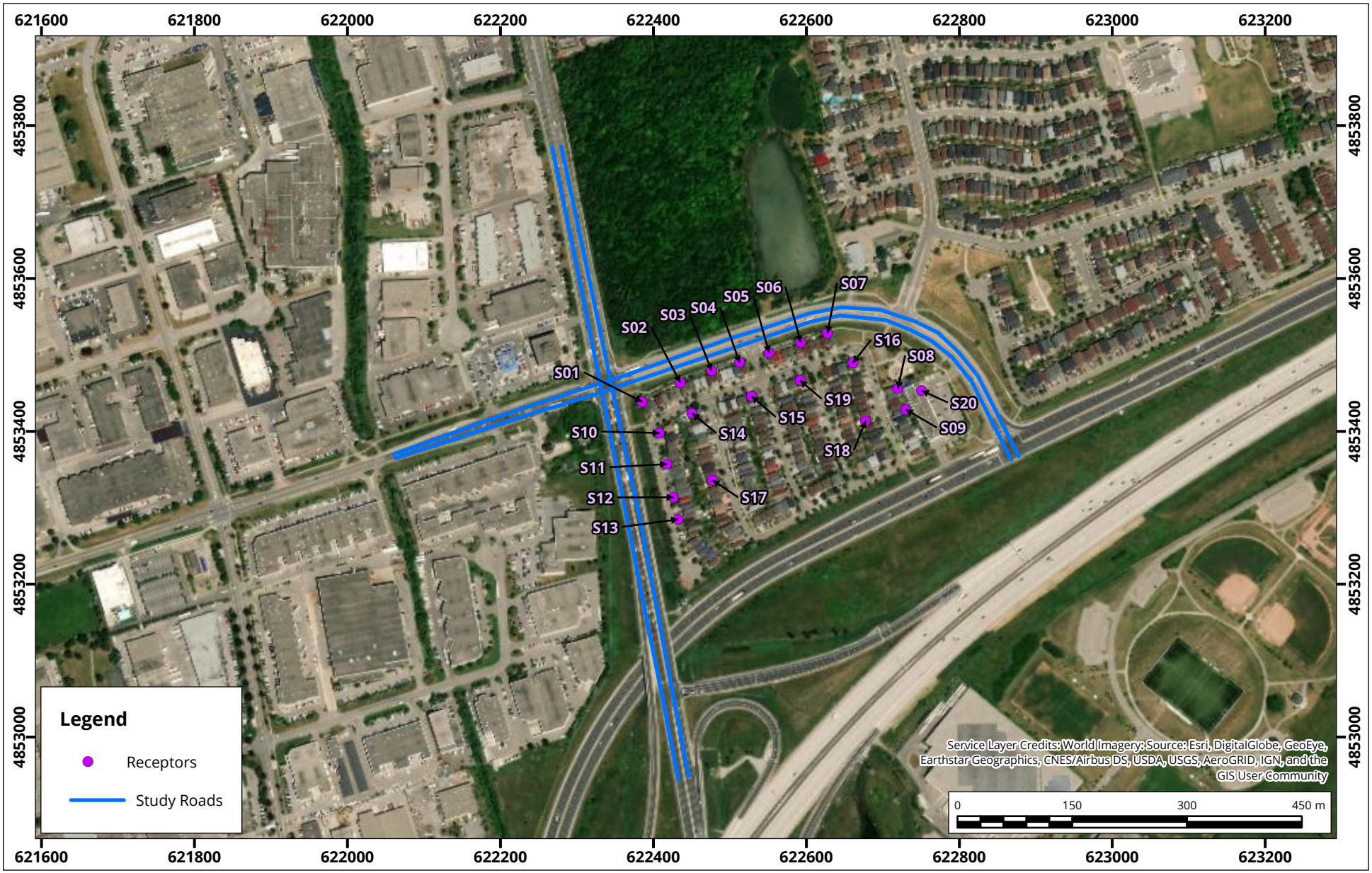
Contaminant	Averaging Period	Most Impacted Receptor	Predicted Conc. (µg m^{-3})	Threshold (µg m^{-3})	Source of Threshold Value	% of Threshold
NO_2	1 Hour	S01	64.9	400	AAQC	16%
	1 Hour[1]	S01	64.9	79	CAAQS	82%
	24 Hour	S01	55.0	200	AAQC	27%
	Annual[2]	S01	16.5	22.6	CAAQS	73%
$PM_{2.5}$	24 Hour	S01	17.8	27	CAAQS	66%
	Annual	S01	9.1	8.8	CAAQS	103%
Benzene	24 Hour	S01	0.000	2.3	AAQC	0%
	Annual	S01	0.49	0.45	AAQC	110%

[1] The 3-year average of the annual 98th percentile of the NO_2 daily-maximum 1-hour average concentrations.
[2] The average over a single calendar year of all the 1-hour average NO_2 concentrations.

6 CONCLUSIONS

Modelling of the study area shows exceedances of the $PM_{2.5}$ and benzene annual standards resulting from elevated background concentrations. Comparing the Future Build and No-Build scenarios, improvements to Langstaff Road are not expected to have significant impacts on nearby sensitive receptors.

FIGURES



Site Plan Showing Significant Receptors and Modelled Roadways

True North

Map Projection: NAD 1983 UTM Zone 17N

Langstaff Road - Vaughan, Ontario

Project #: 1603246

Drawn by: MDKB	Figure: 1
Exact Scale:	1:7,000
Date Revised:	Nov 14, 2019

Map Document: C:\GIS\Langstaff Road\Work\Langstaff.aprx

APPENDIX A

Appendix A: Future No Build Modelling Results

NO_2 1-Hour

Receptor ID	Receptor name	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})[1]	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	400	7.3	64.9	16%
S02	Residence	622435.4	4853463.7	206.7	400	5.2	63.7	16%
S03	Residence	622476.3	4853479.2	207	400	4.8	63.4	16%
S04	Residence	622512.8	4853490	208	400	4.1	63.2	16%
S05	Residence	622551.4	4853502.9	208	400	3.9	63.0	16%
S06	Residence	622592.9	4853516.1	209	400	3.8	63.0	16%
S07	Residence	622627.7	4853528.3	209.43	400	4.0	63.0	16%
S08	Residence	622719.8	4853455.6	209.14	400	1.8	62.4	16%
S09	Residence	622730.1	4853428.5	209	400	1.6	62.4	16%
S12	Residence	622408	4853397.7	207	400	5.2	64.1	16%
S13	Residence	622417.9	4853357.3	207.92	400	5.1	64.0	16%
S14	Residence	622426.3	4853313.7	208	400	5.0	63.9	16%
S18	Residence	622432.5	4853284.9	209	400	5.0	63.9	16%
S10	Residence	622450.7	4853423.5	207.04	400	3.5	63.3	16%
S11	Residence	622528.4	4853445.9	208	400	2.5	62.8	16%
S15	Residence	622661	4853489.6	209.65	400	2.1	62.6	16%
S16	Residence	622477.3	4853336.1	208	400	2.7	63.1	16%
S17	Residence	622677.5	4853413.4	209	400	1.4	62.4	16%
S19	Residence	622591.8	4853466.6	209	400	2.1	62.6	16%
S20	Daycare	622751	4853453.3	209.01	400	1.9	62.5	16%

[1] Concentrations include hourly background data.

NO_2 1-Hour 98th Percentile

Receptor ID	Receptor name	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})[1]	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	79.0	7.1	64.9	82%
S02	Residence	622435.4	4853463.7	206.7	79.0	5.1	63.7	81%
S03	Residence	622476.3	4853479.2	207	79.0	4.7	63.4	80%
S04	Residence	622512.8	4853490	208	79.0	4.1	63.2	80%
S05	Residence	622551.4	4853502.9	208	79.0	3.8	63.0	80%
S06	Residence	622592.9	4853516.1	209	79.0	3.7	63.0	80%
S07	Residence	622627.7	4853528.3	209.43	79.0	3.9	63.0	80%
S08	Residence	622719.8	4853455.6	209.14	79.0	1.7	62.4	79%
S09	Residence	622730.1	4853428.5	209	79.0	1.5	62.4	79%
S12	Residence	622408	4853397.7	207	79.0	4.9	64.1	81%
S13	Residence	622417.9	4853357.3	207.92	79.0	4.5	64.0	81%
S14	Residence	622426.3	4853313.7	208	79.0	4.3	63.9	81%
S18	Residence	622432.5	4853284.9	209	79.0	4.1	63.9	81%
S10	Residence	622450.7	4853423.5	207.04	79.0	3.4	63.3	80%
S11	Residence	622528.4	4853445.9	208	79.0	2.4	62.8	79%
S15	Residence	622661	4853489.6	209.65	79.0	2.1	62.5	79%
S16	Residence	622477.3	4853336.1	208	79.0	2.6	63.0	80%
S17	Residence	622677.5	4853413.4	209	79.0	1.4	62.4	79%
S19	Residence	622591.8	4853466.6	209	79.0	2.1	62.6	79%
S20	Daycare	622751	4853453.3	209.01	79.0	1.9	62.5	79%

[1] Concentrations include hourly background data.

NO_2 24-Hours

Receptor ID	Receptor name	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})[1]	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	200	3.3	55.0	27%
S02	Residence	622435.4	4853463.7	206.7	200	2.3	53.8	27%
S03	Residence	622476.3	4853479.2	207	200	2.1	53.5	27%
S04	Residence	622512.8	4853490	208	200	1.9	53.1	27%
S05	Residence	622551.4	4853502.9	208	200	1.8	53.0	27%
S06	Residence	622592.9	4853516.1	209	200	1.7	52.9	26%
S07	Residence	622627.7	4853528.3	209.43	200	1.8	53.1	27%
S08	Residence	622719.8	4853455.6	209.14	200	0.8	52.0	26%
S09	Residence	622730.1	4853428.5	209	200	0.7	52.0	26%
S12	Residence	622408	4853397.7	207	200	2.2	53.6	27%
S13	Residence	622417.9	4853357.3	207.92	200	2.0	53.4	27%
S14	Residence	622426.3	4853313.7	208	200	1.9	53.3	27%
S18	Residence	622432.5	4853284.9	209	200	1.9	53.2	27%
S10	Residence	622450.7	4853423.5	207.04	200	1.6	52.7	26%
S11	Residence	622528.4	4853445.9	208	200	1.1	52.2	26%
S15	Residence	622661	4853489.6	209.65	200	1.0	52.1	26%
S16	Residence	622477.3	4853336.1	208	200	1.2	52.3	26%
S17	Residence	622677.5	4853413.4	209	200	0.7	51.9	26%
S19	Residence	622591.8	4853466.6	209	200	1.0	52.1	26%
S20	Daycare	622751	4853453.3	209.01	200	0.9	52.1	26%

[1] Concentrations include hourly background data.

NO_2 Annual

Receptor ID	Receptor name	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Background Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	22.6	3.8	12.8	16.5	73%
S02	Residence	622435.4	4853463.7	206.7	22.6	2.7	12.8	15.5	69%
S03	Residence	622476.3	4853479.2	207	22.6	2.5	12.8	15.3	68%
S04	Residence	622512.8	4853490	208	22.6	2.2	12.8	15.0	66%
S05	Residence	622551.4	4853502.9	208	22.6	2.1	12.8	14.9	66%
S06	Residence	622592.9	4853516.1	209	22.6	2.0	12.8	14.8	66%
S07	Residence	622627.7	4853528.3	209.43	22.6	2.2	12.8	14.9	66%
S08	Residence	622719.8	4853455.6	209.14	22.6	0.9	12.8	13.7	61%
S09	Residence	622730.1	4853428.5	209	22.6	0.8	12.8	13.6	60%
S12	Residence	622408	4853397.7	207	22.6	2.6	12.8	15.3	68%
S13	Residence	622417.9	4853357.3	207.92	22.6	2.3	12.8	15.1	67%
S14	Residence	622426.3	4853313.7	208	22.6	2.2	12.8	15.0	66%
S18	Residence	622432.5	4853284.9	209	22.6	2.1	12.8	14.9	66%
S10	Residence	622450.7	4853423.5	207.04	22.6	1.8	12.8	14.6	64%
S11	Residence	622528.4	4853445.9	208	22.6	1.3	12.8	14.0	62%
S15	Residence	622661	4853489.6	209.65	22.6	1.1	12.8	13.9	62%
S16	Residence	622477.3	4853336.1	208	22.6	1.3	12.8	14.1	63%
S17	Residence	622677.5	4853413.4	209	22.6	0.7	12.8	13.5	60%
S19	Residence	622591.8	4853466.6	209	22.6	1.1	12.8	13.9	62%
S20	Daycare	622751	4853453.3	209.01	22.6	1.0	12.8	13.8	61%

*CAAQS guidances defines the NO2 Annual Standard for 2025 to be the average over a single calender year of all the 1-hour concentrations. For this assessment the highest NO2 values for a single year was chosen from the 5-years modelling years, this was done to keep the modelling periods consistant across all criteria.

$PM_{2.5}$ 24-Hours

Receptor ID	Receptor name	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})[1]	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	27	1.2	17.8	66%
S02	Residence	622435.4	4853463.7	206.7	27	0.9	17.6	65%
S03	Residence	622476.3	4853479.2	207	27	0.8	17.5	65%
S04	Residence	622512.8	4853490	208	27	0.7	17.5	65%
S05	Residence	622551.4	4853502.9	208	27	0.7	17.5	65%
S06	Residence	622592.9	4853516.1	209	27	0.6	17.5	65%
S07	Residence	622627.7	4853528.3	209.43	27	0.7	17.5	65%
S08	Residence	622719.8	4853455.6	209.14	27	0.3	17.4	64%
S09	Residence	622730.1	4853428.5	209	27	0.3	17.4	64%
S12	Residence	622408	4853397.7	207	27	0.8	17.6	65%
S13	Residence	622417.9	4853357.3	207.92	27	0.8	17.5	65%
S14	Residence	622426.3	4853313.7	208	27	0.7	17.5	65%
S18	Residence	622432.5	4853284.9	209	27	0.7	17.5	65%
S10	Residence	622450.7	4853423.5	207.04	27	0.6	17.5	65%
S11	Residence	622528.4	4853445.9	208	27	0.4	17.4	64%
S15	Residence	622661	4853489.6	209.65	27	0.4	17.4	64%
S16	Residence	622477.3	4853336.1	208	27	0.4	17.4	65%
S17	Residence	622677.5	4853413.4	209	27	0.2	17.4	64%
S19	Residence	622591.8	4853466.6	209	27	0.4	17.4	64%
S20	Daycare	622751	4853453.3	209.01	27	0.3	17.4	64%

[1] Concentrations include hourly background data.

$PM_{2.5}$ Annual

Receptor ID	Receptor name	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Background Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	8.8	0.4	8.7	9.1	103%
S02	Residence	622435.4	4853463.7	206.7	8.8	0.3	8.7	9.0	102%
S03	Residence	622476.3	4853479.2	207	8.8	0.3	8.7	8.9	102%
S04	Residence	622512.8	4853490	208	8.8	0.2	8.7	8.9	101%
S05	Residence	622551.4	4853502.9	208	8.8	0.2	8.7	8.9	101%
S06	Residence	622592.9	4853516.1	209	8.8	0.2	8.7	8.9	101%
S07	Residence	622627.7	4853528.3	209.43	8.8	0.2	8.7	8.9	101%
S08	Residence	622719.8	4853455.6	209.14	8.8	0.1	8.7	8.8	100%
S09	Residence	622730.1	4853428.5	209	8.8	0.1	8.7	8.8	99%
S12	Residence	622408	4853397.7	207	8.8	0.3	8.7	9.0	102%
S13	Residence	622417.9	4853357.3	207.92	8.8	0.3	8.7	8.9	101%
S14	Residence	622426.3	4853313.7	208	8.8	0.2	8.7	8.9	101%
S18	Residence	622432.5	4853284.9	209	8.8	0.2	8.7	8.9	101%
S10	Residence	622450.7	4853423.5	207.04	8.8	0.2	8.7	8.9	101%
S11	Residence	622528.4	4853445.9	208	8.8	0.1	8.7	8.8	100%
S15	Residence	622661	4853489.6	209.65	8.8	0.1	8.7	8.8	100%
S16	Residence	622477.3	4853336.1	208	8.8	0.1	8.7	8.8	100%
S17	Residence	622677.5	4853413.4	209	8.8	0.1	8.7	8.7	99%
S19	Residence	622591.8	4853466.6	209	8.8	0.1	8.7	8.8	100%
S20	Daycare	622751	4853453.3	209.01	8.8	0.1	8.7	8.8	100%

Benzene 24-Hour

Receptor ID	Receptor name	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})[1]	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	2.3	0.025	0.76	33%
S02	Residence	622435.4	4853463.7	206.7	2.3	0.018	0.75	33%
S03	Residence	622476.3	4853479.2	207	2.3	0.016	0.75	32%
S04	Residence	622512.8	4853490	208	2.3	0.014	0.74	32%
S05	Residence	622551.4	4853502.9	208	2.3	0.013	0.74	32%
S06	Residence	622592.9	4853516.1	209	2.3	0.012	0.74	32%
S07	Residence	622627.7	4853528.3	209.43	2.3	0.013	0.74	32%
S08	Residence	622719.8	4853455.6	209.14	2.3	0.006	0.74	32%
S09	Residence	622730.1	4853428.5	209	2.3	0.005	0.74	32%
S12	Residence	622408	4853397.7	207	2.3	0.017	0.75	32%
S13	Residence	622417.9	4853357.3	207.92	2.3	0.016	0.75	32%
S14	Residence	622426.3	4853313.7	208	2.3	0.015	0.75	32%
S18	Residence	622432.5	4853284.9	209	2.3	0.015	0.74	32%
S10	Residence	622450.7	4853423.5	207.04	2.3	0.012	0.74	32%
S11	Residence	622528.4	4853445.9	208	2.3	0.009	0.74	32%
S15	Residence	622661	4853489.6	209.65	2.3	0.007	0.74	32%
S16	Residence	622477.3	4853336.1	208	2.3	0.009	0.74	32%
S17	Residence	622677.5	4853413.4	209	2.3	0.005	0.73	32%
S19	Residence	622591.8	4853466.6	209	2.3	0.007	0.74	32%
S20	Daycare	622751	4853453.3	209.01	2.3	0.006	0.74	32%

[1] Concentrations include hourly background data.

Benzene Annual

Receptor ID	Receptor name	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Background Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	0.45	0.009	0.5	0.5	110%
S02	Residence	622435.4	4853463.7	206.7	0.45	0.006	0.5	0.5	109%
S03	Residence	622476.3	4853479.2	207	0.45	0.006	0.5	0.5	109%
S04	Residence	622512.8	4853490	208	0.45	0.005	0.5	0.5	109%
S05	Residence	622551.4	4853502.9	208	0.45	0.005	0.5	0.5	109%
S06	Residence	622592.9	4853516.1	209	0.45	0.004	0.5	0.5	109%
S07	Residence	622627.7	4853528.3	209.43	0.45	0.005	0.5	0.5	109%
S08	Residence	622719.8	4853455.6	209.14	0.45	0.002	0.5	0.5	108%
S09	Residence	622730.1	4853428.5	209	0.45	0.002	0.5	0.5	108%
S12	Residence	622408	4853397.7	207	0.45	0.006	0.5	0.5	109%
S13	Residence	622417.9	4853357.3	207.92	0.45	0.005	0.5	0.5	109%
S14	Residence	622426.3	4853313.7	208	0.45	0.005	0.5	0.5	109%
S18	Residence	622432.5	4853284.9	209	0.45	0.005	0.5	0.5	109%
S10	Residence	622450.7	4853423.5	207.04	0.45	0.004	0.5	0.5	108%
S11	Residence	622528.4	4853445.9	208	0.45	0.003	0.5	0.5	108%
S15	Residence	622661	4853489.6	209.65	0.45	0.002	0.5	0.5	108%
S16	Residence	622477.3	4853336.1	208	0.45	0.003	0.5	0.5	108%
S17	Residence	622677.5	4853413.4	209	0.45	0.002	0.5	0.5	108%
S19	Residence	622591.8	4853466.6	209	0.45	0.002	0.5	0.5	108%
S20	Daycare	622751	4853453.3	209.01	0.45	0.002	0.5	0.5	108%

APPENDIX B

Appendix B: Future Build Modelling Results

NO_2 1-Hour

Receptor ID	Receptor Discription	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})[1]	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	400	8.5	65.1	16%
S02	Residence	622435.4	4853463.7	206.7	400	6.9	64.0	16%
S03	Residence	622476.3	4853479.2	207	400	6.5	63.7	16%
S04	Residence	622512.8	4853490	208	400	5.8	63.5	16%
S05	Residence	622551.4	4853502.9	208	400	5.6	63.4	16%
S06	Residence	622592.9	4853516.1	209	400	5.4	63.3	16%
S07	Residence	622627.7	4853528.3	209.43	400	5.8	63.4	16%
S08	Residence	622719.8	4853455.6	209.14	400	2.4	62.6	16%
S09	Residence	622730.1	4853428.5	209	400	2.1	62.5	16%
S12	Residence	622408	4853397.7	207	400	5.6	64.1	16%
S13	Residence	622417.9	4853357.3	207.92	400	5.3	64.0	16%
S14	Residence	622426.3	4853313.7	208	400	5.1	63.9	16%
S18	Residence	622432.5	4853284.9	209	400	5.1	63.8	16%
S10	Residence	622450.7	4853423.5	207.04	400	4.1	63.4	16%
S11	Residence	622528.4	4853445.9	208	400	3.1	62.9	16%
S15	Residence	622661	4853489.6	209.65	400	2.9	62.7	16%
S16	Residence	622477.3	4853336.1	208	400	2.9	63.1	16%
S17	Residence	622677.5	4853413.4	209	400	1.9	62.5	16%
S19	Residence	622591.8	4853466.6	209	400	2.8	62.8	16%
S20	Daycare	622751	4853453.3	209.01	400	2.7	62.7	16%

[1] Concentrations include hourly background data.

NO_2 1-Hour 98th Percentile

Receptor ID	Receptor Discription	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})[1]	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	79.0	8.3	65.0	82%
S02	Residence	622435.4	4853463.7	206.7	79.0	6.7	64.0	81%
S03	Residence	622476.3	4853479.2	207	79.0	6.4	63.7	81%
S04	Residence	622512.8	4853490	208	79.0	5.6	63.5	80%
S05	Residence	622551.4	4853502.9	208	79.0	5.5	63.4	80%
S06	Residence	622592.9	4853516.1	209	79.0	5.3	63.3	80%
S07	Residence	622627.7	4853528.3	209.43	79.0	5.7	63.4	80%
S08	Residence	622719.8	4853455.6	209.14	79.0	2.4	62.6	79%
S09	Residence	622730.1	4853428.5	209	79.0	2.1	62.5	79%
S12	Residence	622408	4853397.7	207	79.0	5.4	64.1	81%
S13	Residence	622417.9	4853357.3	207.92	79.0	4.7	63.9	81%
S14	Residence	622426.3	4853313.7	208	79.0	4.4	63.9	81%
S18	Residence	622432.5	4853284.9	209	79.0	4.2	63.8	81%
S10	Residence	622450.7	4853423.5	207.04	79.0	4.0	63.4	80%
S11	Residence	622528.4	4853445.9	208	79.0	3.0	62.9	80%
S15	Residence	622661	4853489.6	209.65	79.0	2.9	62.7	79%
S16	Residence	622477.3	4853336.1	208	79.0	2.8	63.1	80%
S17	Residence	622677.5	4853413.4	209	79.0	1.8	62.5	79%
S19	Residence	622591.8	4853466.6	209	79.0	2.8	62.8	79%
S20	Daycare	622751	4853453.3	209.01	79.0	2.7	62.6	79%

[1] Concentrations include hourly background data.

NO_2 24-Hours

Receptor ID	Receptor Discription	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})[1]	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	200	3.8	56.0	28%
S02	Residence	622435.4	4853463.7	206.7	200	3.1	54.7	27%
S03	Residence	622476.3	4853479.2	207	200	2.9	54.6	27%
S04	Residence	622512.8	4853490	208	200	2.6	54.1	27%
S05	Residence	622551.4	4853502.9	208	200	2.5	54.0	27%
S06	Residence	622592.9	4853516.1	209	200	2.4	53.9	27%
S07	Residence	622627.7	4853528.3	209.43	200	2.6	54.2	27%
S08	Residence	622719.8	4853455.6	209.14	200	1.1	52.3	26%
S09	Residence	622730.1	4853428.5	209	200	0.9	52.2	26%
S12	Residence	622408	4853397.7	207	200	2.4	53.9	27%
S13	Residence	622417.9	4853357.3	207.92	200	2.1	53.5	27%
S14	Residence	622426.3	4853313.7	208	200	2.0	53.4	27%
S18	Residence	622432.5	4853284.9	209	200	1.9	53.3	27%
S10	Residence	622450.7	4853423.5	207.04	200	1.9	53.1	27%
S11	Residence	622528.4	4853445.9	208	200	1.4	52.5	26%
S15	Residence	622661	4853489.6	209.65	200	1.3	52.4	26%
S16	Residence	622477.3	4853336.1	208	200	1.3	52.4	26%
S17	Residence	622677.5	4853413.4	209	200	0.8	52.1	26%
S19	Residence	622591.8	4853466.6	209	200	1.3	52.4	26%
S20	Daycare	622751	4853453.3	209.01	200	1.2	52.4	26%

[1] Concentrations include hourly background data.

NO_2 Annual

Receptor ID	Receptor Discription	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Background Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	22.6	4.4	12.8	17.2	76%
S02	Residence	622435.4	4853463.7	206.7	22.6	3.6	12.8	16.4	73%
S03	Residence	622476.3	4853479.2	207	22.6	3.5	12.8	16.3	72%
S04	Residence	622512.8	4853490	208	22.6	3.1	12.8	15.9	70%
S05	Residence	622551.4	4853502.9	208	22.6	3.0	12.8	15.8	70%
S06	Residence	622592.9	4853516.1	209	22.6	2.9	12.8	15.7	70%
S07	Residence	622627.7	4853528.3	209.43	22.6	3.2	12.8	16.0	71%
S08	Residence	622719.8	4853455.6	209.14	22.6	1.3	12.8	14.1	62%
S09	Residence	622730.1	4853428.5	209	22.6	1.1	12.8	13.9	62%
S12	Residence	622408	4853397.7	207	22.6	2.8	12.8	15.6	69%
S13	Residence	622417.9	4853357.3	207.92	22.6	2.5	12.8	15.2	67%
S14	Residence	622426.3	4853313.7	208	22.6	2.3	12.8	15.0	67%
S18	Residence	622432.5	4853284.9	209	22.6	2.2	12.8	14.9	66%
S10	Residence	622450.7	4853423.5	207.04	22.6	2.1	12.8	14.9	66%
S11	Residence	622528.4	4853445.9	208	22.6	1.6	12.8	14.4	64%
S15	Residence	622661	4853489.6	209.65	22.6	1.6	12.8	14.3	64%
S16	Residence	622477.3	4853336.1	208	22.6	1.5	12.8	14.2	63%
S17	Residence	622677.5	4853413.4	209	22.6	1.0	12.8	13.8	61%
S19	Residence	622591.8	4853466.6	209	22.6	1.5	12.8	14.3	63%
S20	Daycare	622751	4853453.3	209.01	22.6	1.5	12.8	14.2	63%

*CAAQS guidances defines the NO_2 Annual Standard for 2025 to be the average over a single calender year of all the 1-hour concentrations. For this assessment the highest NO_2 values for a single year was chosen from the 5-years modelling years, this was done to keep the modelling periods consistant across all criteria.

$PM_{2.5}$ 24-Hours

Receptor ID	Receptor Discription	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})[1]	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	27	1.4	18.0	67%
S02	Residence	622435.4	4853463.7	206.7	27	1.1	17.8	66%
S03	Residence	622476.3	4853479.2	207	27	1.1	17.7	66%
S04	Residence	622512.8	4853490	208	27	1.0	17.6	65%
S05	Residence	622551.4	4853502.9	208	27	0.9	17.6	65%
S06	Residence	622592.9	4853516.1	209	27	0.9	17.6	65%
S07	Residence	622627.7	4853528.3	209.43	27	1.0	17.6	65%
S08	Residence	622719.8	4853455.6	209.14	27	0.4	17.4	64%
S09	Residence	622730.1	4853428.5	209	27	0.3	17.4	64%
S12	Residence	622408	4853397.7	207	27	0.9	17.6	65%
S13	Residence	622417.9	4853357.3	207.92	27	0.8	17.5	65%
S14	Residence	622426.3	4853313.7	208	27	0.7	17.5	65%
S18	Residence	622432.5	4853284.9	209	27	0.7	17.5	65%
S10	Residence	622450.7	4853423.5	207.04	27	0.7	17.5	65%
S11	Residence	622528.4	4853445.9	208	27	0.5	17.4	65%
S15	Residence	622661	4853489.6	209.65	27	0.5	17.4	65%
S16	Residence	622477.3	4853336.1	208	27	0.5	17.4	65%
S17	Residence	622677.5	4853413.4	209	27	0.3	17.4	64%
S19	Residence	622591.8	4853466.6	209	27	0.5	17.4	65%
S20	Daycare	622751	4853453.3	209.01	27	0.5	17.4	65%

$PM_{2.5}$ Annual

Receptor ID	Receptor Discription	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Background Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	8.8	0.5	8.7	9.2	104%
S02	Residence	622435.4	4853463.7	206.7	8.8	0.4	8.7	9.1	103%
S03	Residence	622476.3	4853479.2	207	8.8	0.4	8.7	9.1	103%
S04	Residence	622512.8	4853490	208	8.8	0.3	8.7	9.0	102%
S05	Residence	622551.4	4853502.9	208	8.8	0.3	8.7	9.0	102%
S06	Residence	622592.9	4853516.1	209	8.8	0.3	8.7	9.0	102%
S07	Residence	622627.7	4853528.3	209.43	8.8	0.4	8.7	9.0	103%
S08	Residence	622719.8	4853455.6	209.14	8.8	0.1	8.7	8.8	100%
S09	Residence	622730.1	4853428.5	209	8.8	0.1	8.7	8.8	100%
S12	Residence	622408	4853397.7	207	8.8	0.3	8.7	9.0	102%
S13	Residence	622417.9	4853357.3	207.92	8.8	0.3	8.7	8.9	102%
S14	Residence	622426.3	4853313.7	208	8.8	0.3	8.7	8.9	101%
S18	Residence	622432.5	4853284.9	209	8.8	0.2	8.7	8.9	101%
S10	Residence	622450.7	4853423.5	207.04	8.8	0.2	8.7	8.9	101%
S11	Residence	622528.4	4853445.9	208	8.8	0.2	8.7	8.8	100%
S15	Residence	622661	4853489.6	209.65	8.8	0.2	8.7	8.8	100%
S16	Residence	622477.3	4853336.1	208	8.8	0.2	8.7	8.8	100%
S17	Residence	622677.5	4853413.4	209	8.8	0.1	8.7	8.8	100%
S19	Residence	622591.8	4853466.6	209	8.8	0.2	8.7	8.8	100%
S20	Daycare	622751	4853453.3	209.01	8.8	0.2	8.7	8.8	100%

Benzene 24-Hour

Receptor ID	Receptor Discription	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})[1]	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	2.3	0.029	0.76	33%
S02	Residence	622435.4	4853463.7	206.7	2.3	0.023	0.75	33%
S03	Residence	622476.3	4853479.2	207	2.3	0.022	0.75	33%
S04	Residence	622512.8	4853490	208	2.3	0.019	0.75	33%
S05	Residence	622551.4	4853502.9	208	2.3	0.018	0.75	33%
S06	Residence	622592.9	4853516.1	209	2.3	0.018	0.75	33%
S07	Residence	622627.7	4853528.3	209.43	2.3	0.019	0.75	33%
S08	Residence	622719.8	4853455.6	209.14	2.3	0.008	0.74	32%
S09	Residence	622730.1	4853428.5	209	2.3	0.007	0.74	32%
S12	Residence	622408	4853397.7	207	2.3	0.019	0.75	33%
S13	Residence	622417.9	4853357.3	207.92	2.3	0.016	0.75	33%
S14	Residence	622426.3	4853313.7	208	2.3	0.015	0.75	32%
S18	Residence	622432.5	4853284.9	209	2.3	0.015	0.75	32%
S10	Residence	622450.7	4853423.5	207.04	2.3	0.014	0.75	32%
S11	Residence	622528.4	4853445.9	208	2.3	0.011	0.74	32%
S15	Residence	622661	4853489.6	209.65	2.3	0.010	0.74	32%
S16	Residence	622477.3	4853336.1	208	2.3	0.010	0.74	32%
S17	Residence	622677.5	4853413.4	209	2.3	0.006	0.74	32%
S19	Residence	622591.8	4853466.6	209	2.3	0.010	0.74	32%
S20	Daycare	622751	4853453.3	209.01	2.3	0.009	0.74	32%

[1] Concentrations include hourly background data.

Benzene Annual

Receptor ID	Receptor Discription	X (m)	Y (m)	Elevation (m)	Limit (ug m^{-3})	Project Contribution Concentration (ug m^{-3})	Background Concentration (ug m^{-3})	Combined Concentration (ug m^{-3})	Percentage of Limit (%)
S01	Residence	622385.4	4853438.6	205.71	0.45	0.010	0.5	0.5	110%
S02	Residence	622435.4	4853463.7	206.7	0.45	0.008	0.5	0.5	109%
S03	Residence	622476.3	4853479.2	207	0.45	0.008	0.5	0.5	109%
S04	Residence	622512.8	4853490	208	0.45	0.007	0.5	0.5	109%
S05	Residence	622551.4	4853502.9	208	0.45	0.007	0.5	0.5	109%
S06	Residence	622592.9	4853516.1	209	0.45	0.006	0.5	0.5	109%
S07	Residence	622627.7	4853528.3	209.43	0.45	0.007	0.5	0.5	109%
S08	Residence	622719.8	4853455.6	209.14	0.45	0.003	0.5	0.5	108%
S09	Residence	622730.1	4853428.5	209	0.45	0.002	0.5	0.5	108%
S12	Residence	622408	4853397.7	207	0.45	0.006	0.5	0.5	109%
S13	Residence	622417.9	4853357.3	207.92	0.45	0.006	0.5	0.5	109%
S14	Residence	622426.3	4853313.7	208	0.45	0.005	0.5	0.5	109%
S18	Residence	622432.5	4853284.9	209	0.45	0.005	0.5	0.5	109%
S10	Residence	622450.7	4853423.5	207.04	0.45	0.005	0.5	0.5	109%
S11	Residence	622528.4	4853445.9	208	0.45	0.003	0.5	0.5	108%
S15	Residence	622661	4853489.6	209.65	0.45	0.003	0.5	0.5	108%
S16	Residence	622477.3	4853336.1	208	0.45	0.003	0.5	0.5	108%
S17	Residence	622677.5	4853413.4	209	0.45	0.002	0.5	0.5	108%
S19	Residence	622591.8	4853466.6	209	0.45	0.003	0.5	0.5	108%
S20	Daycare	622751	4853453.3	209.01	0.45	0.003	0.5	0.5	108%