Suncor Energy
Sheridan Park
2489 North Sheridan Way
Mississauga, Ontario L5K 1A8
www.suncor.com

September 2012

As a company, it is very important for us to continue to listen and respond to the needs and expectations of those communities where we do business. Our position from the beginning has not changed: ***We share the Town of Oakville's objective of improving air quality in our community.***

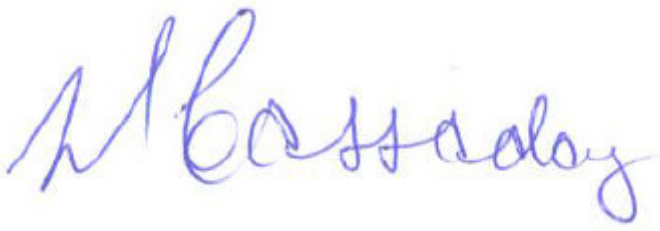
On behalf of Suncor Energy, we would like to share with you the study that has been undertaken on our behalf by Stantec Consulting in compliance the Town of Oakville's Air Quality By-law, Number 2010-035, "A by-law to assess and control the health effects of major emissions of fine particulate matter in the Town of Oakville."

As you review this work, you will see that it demonstrates conclusively that Suncor's Oakville Terminal is not significantly affecting the existing airshed in Oakville.

We would invite you to review the summary of steps that have been taken by Suncor to improve our position both in terms of the airshed, but also some of the actions we have made as a positive contributor to the community of Oakville.

If you have further questions about any of those activities, or about Stantec's report specifically, I would be happy to respond and provide any further information that I can.

Sincerely,



Mike Cassaday
Director, Fuel Quality & Regulatory Affairs

Oakville Terminal

September 2012

SUNCOR ENERGY

Key Message

- Voluntary and regulatory measures at our Oakville terminal have resulted in extraordinary reductions in emissions over the last 10 years.

SUNCOR ENERGY

Suncor Has a Strong Sustainability Culture

We maintain that energy development should occur in a way that provides economic prosperity, promotes social well-being and preserves a healthy environment.

Our Public Commitments to Environmental Excellence:

Water
Reduce fresh water consumption by 12% by 2015

Land disturbance
Increase reclamation of disturbed land by 100% by 2015

Air Emissions
Reduce air emissions by 10% by 2015

Energy Efficiency
Improve energy efficiency by 10% by 2015

See our 2012 Report on Sustainability at http://sustainability.suncor.com

2

History of Oakville Terminal

- City Service Refinery first commissioned in 1958, bought by BP Canada and expanded in 1972
- BP Canada bought by Petro-Canada in 1983
  - Refinery closed 2005
  - Process units and many tanks dismantled
  - Rail car off-loading facility built for Terminal Operations 2004
- Merger with Suncor 2009

3

Current Facility Operations

Product/streams enter via:

- Pipeline
  - Gasolines
  - Diesel
- Rail
  - Vacuum gas oil (VGO)
- Truck
  - Ethanol
- Marine
  - Gasoline / Diesel
  - currently less than 1 ship per month March - December

Product moved out

- Finished Product trucked out from North Terminal
- VGO trucked out of south loading racks to Mississauga Lubricants facility

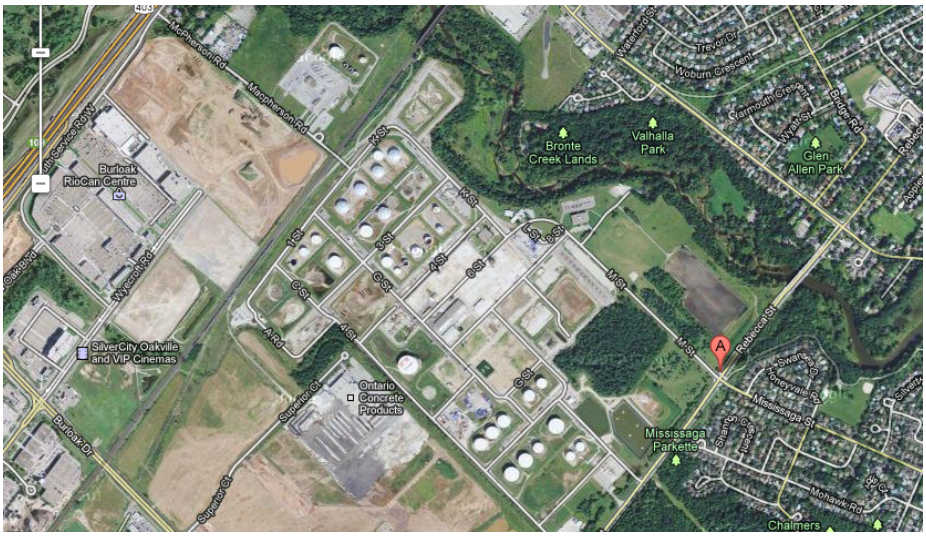
Storage

- 13 Gasoline Tanks
- 5 Distillate Tanks
- 2 VGO tanks

4

SUNCOR ENERGY

Google Maps View of Oakville Terminal



5

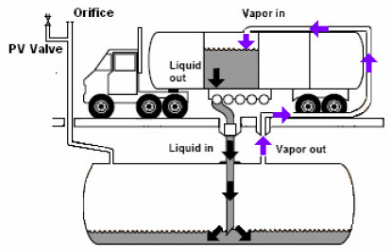
SUNCOR ENERGY

VOC Management "Best Practices" Have Been Implemented

Vapour Recovery Systems	Regulatory	Captures vapours from retail tank filling, truck filling at Terminal
Floating Roof Tanks for Gasoline, Diesel	Voluntary	Eliminates tank "breathing"
Enhanced Tank Roof Sealing Systems	Voluntary	Reduces leaks around floating roofs
Refinery Leak Detection and Repair (LDAR) Program	Voluntary	No measureable benefit for a Terminal, discontinued
Shut Down Refinery	Voluntary	VOC/SOx/NOx reduction is an outcome of this business decision
Dome Covers on Tanks	Voluntary	Reduces passive losses
Reduced Number of Tanks	Voluntary	Tanks are the major source of VOCs
Ethanol Blending in Gasoline	Regulatory	Net environmental benefit, but increases VOCs at a Terminal

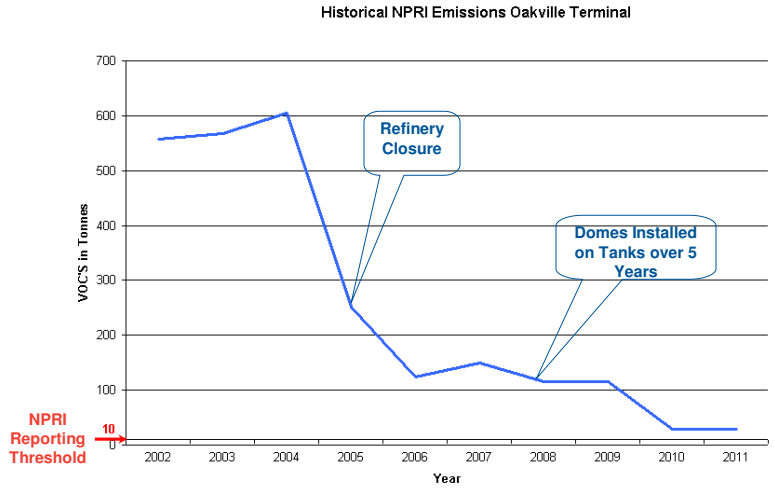
SUNCOR ENERGY

Vapour Recovery Occurs at Retail Sites and at the Terminal



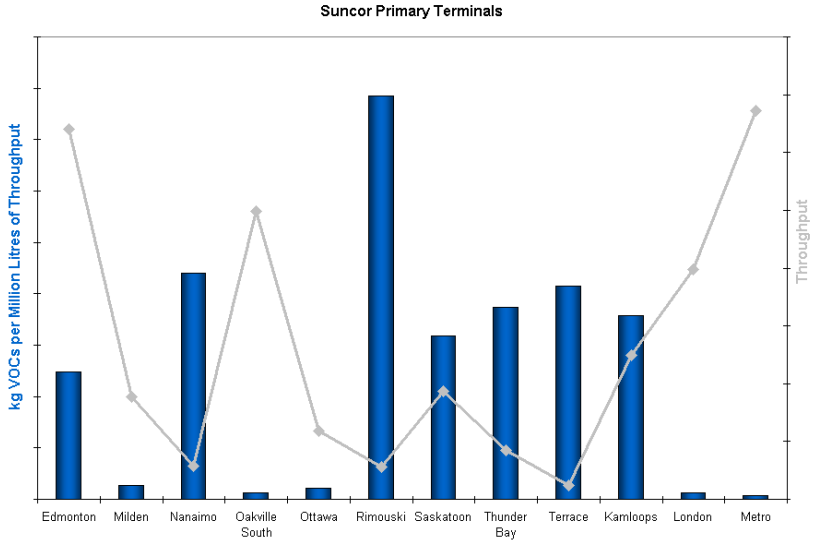
SUNCOR ENERGY

VOC Emissions Have Been Reduced 95% in the Past 10 Years



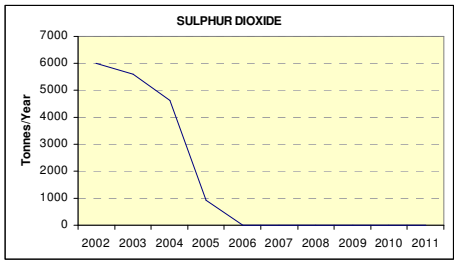
8

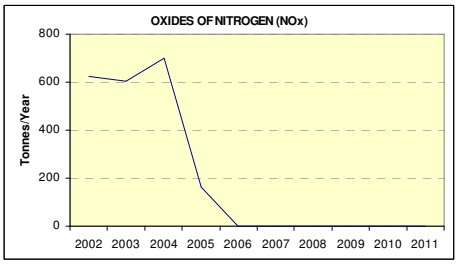
VOC Emissions Intensity at the Oakville Terminal is Extremely Low

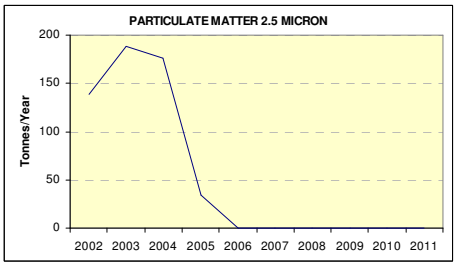


9

Other Pollutants Virtually Disappeared with the Refinery Closure







10

SUNCOR ENERGY

SUNCOR ENERGY

Summary of Changes / Improvements Made to Suncor's Oakville Terminal

Specific Air Quality Improvements:

Since the closure of the Oakville Refinery in 2005, a number of steps have been taken by Suncor to improve our Oakville Terminal operations, each of which has contributed to incremental improvements to air quality in the Clarkson Oakville airshed.

Among those changes that have occurred are the following:

1) The closure of the Oakville Refinery: In the Clarkson Airshed Study conducted by the Ministry of the Environment in 2003, our Oakville Refinery was identified as not having a significant impact on the airshed. Since that time, those refinery operations have ceased (2005) and the facility has been converted to a distribution terminal.

   These changes to our business have resulted in the virtual elimination of NOx, SOx, and PM2.5 emissions. Combined with subsequent improvements in the Terminal operation, we've also achieved greater than 95% reduction in VOCs.

2) Vapour Recovery Systems: While these modifications were required by regulation, they have contributed significantly to the reduction of VOCs in particular that are emitted by retail tank filling and trucking filling that takes place at the Oakville Terminal.

3) Voluntary Measures Implemented at Oakville Terminal: A number of voluntary measures have also been implemented at the Oakville Terminal that also improve the air quality for the community that surrounds our facility:
   a. Floating Roof Tanks for Gasoline & Diesel: This eliminates tank "breathing"
   b. Enhanced Tank Roof Sealing Systems: Reduce leaks around floating roofs
   c. Dome Covers on Tanks: This reduces passive losses from the tanks and associated emissions to the community from that loss.
   d. Decreased the physical number of tanks: Since this facility is no longer operated as a refinery, the requirement for storage of certain products such as crude oil are no longer needed. Therefore, we have been able to dismantle and remove a number of storage tanks from this location.
   e. There are no storage tanks in service at the truck loading area north of the railroad tracks.

4) Live Fire Training: Historically, Suncor has been proud to offer its live fire training area to be used by the Oakville Fire Department and other emergency services from the region. These agencies are routinely invited to train emergency services personnel so that they are better equipped to respond to hydrocarbon fires in the region effectively and safely.

5) Oakville Terminal's marine and pipeline capabilities make it a strategic facility for secure supply of fuels to the Western GTA. However, once the refinery operations ended supply lines were realigned, resulting in significantly reduced truck and activity around the facility.

Suncor's Role in the Community:

Beyond emissions reductions and facility improvements, Suncor's role in the community is important.

Among other activities, the Oakville Refinery implemented the first Community Advisory Committee of its kind in Canada. This committee met on a regular basis for over 15 years to review activities at the refinery, and more importantly to address concerns raised by the community. While no longer active, it was left that if specific concerns were raised by the community, the CAC could be recalled at the request of the Citizen Chair of the committee.

The Oakville CAC served as the model for other community consultation groups, including our own Public Liaison Committee at our Lubricants facility in Mississauga.

Suncor continues to support a number of community programs and initiatives in Oakville, including the use of land owned by Suncor to the Town of Oakville for Petro-Canada Park off of Bronte Road.

We were also happy, at the end of operations of the Oakville Refinery, to donate a state-of-the art emergency response vehicle (a fire truck) to the town, with a value of nearly $1 million. This vehicle is now operational in the Town's emergency services fleet and provides enhanced protection for the community for a number of different industrial situations.

Oakville Health Protection Air Quality By-Law Application for Approval – Revision 1

Suncor Energy Products Partnership Inc. (SEPPI) (Suncor), Oakville Distribution Terminal

February 19, 2013

Executive Summary

The Town of Oakville has undertaken a number of initiatives to protect the health of its residents by working to limit the emission of fine particulate matter (particles with an aerodynamic diameter less than 2.5 micrometres ($PM_{2.5}$) or FPM for short). FPM is unusual in that its presence in the air is not only the result of direct emissions from specific sources, but also of several other contaminants called precursor pollutants mixing and reacting in the air.

This application for the Town of Oakville Approval of the Suncor Energy Products Partnership Inc. (SEPPI) (Suncor), Oakville Distribution Terminal (Suncor Terminal) is being made in response to the Oakville Health Protection Air Quality By-Law 2010-035 (HPAQB). It follows the approach established in the document “Section 5 and 6 approval requirements for major emitters, v.5 June 2011”. The HPAQB seeks to safeguard the health, safety and well-being of Oakville residents by gathering information on emissions of FPM and its precursors, and regulating major emitters of these pollutants.

The major sources of FPM and its precursors at the Suncor Terminal include emissions from the natural gas fired boilers, storage tanks and releases related to product handling. A detailed assessment of the emissions sources was carried out using a combination of accepted methodologies that include the US Environmental Protection Agency (US EPA), the Canadian Petroleum Products Institute (CPPI) and source measurements where applicable. The detailed assessment includes extensive consideration of the variability of the emission rates to determine average and maximum potential contribution of emissions.

Based on the emission estimates and dispersion model analysis, the Suncor Terminal is shown to not significantly affect the existing airshed in Oakville. This conclusion is based on the facility induced FPM concentrations being predicted to be well less than 0.2 micrograms per cubic metre (ug/m^3) criterion established by the HPAQB. As a result, a health risk assessment is not required.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHEMENTS

1.0 Introduction

Stantec was retained by Suncor Energy Products Partnership Inc. (SEPPI) (Suncor) to conduct the assessment and prepare the report required for the Suncor Oakville Distribution Terminal under the Oakville Health Protection Air Quality By-Law (HPAQB) #2010-035. The HPAQB contains two levels of requirements, a reporting requirement and an approvals requirement. This report includes all the required information listed in Table 3-2 of the document *Guidance for Implementation of Oakville Health Protection Air Quality By-Law 2010-035* (the Guidance Document) dated June 2011.

2.0 Facility Description

2.1 OVERVIEW

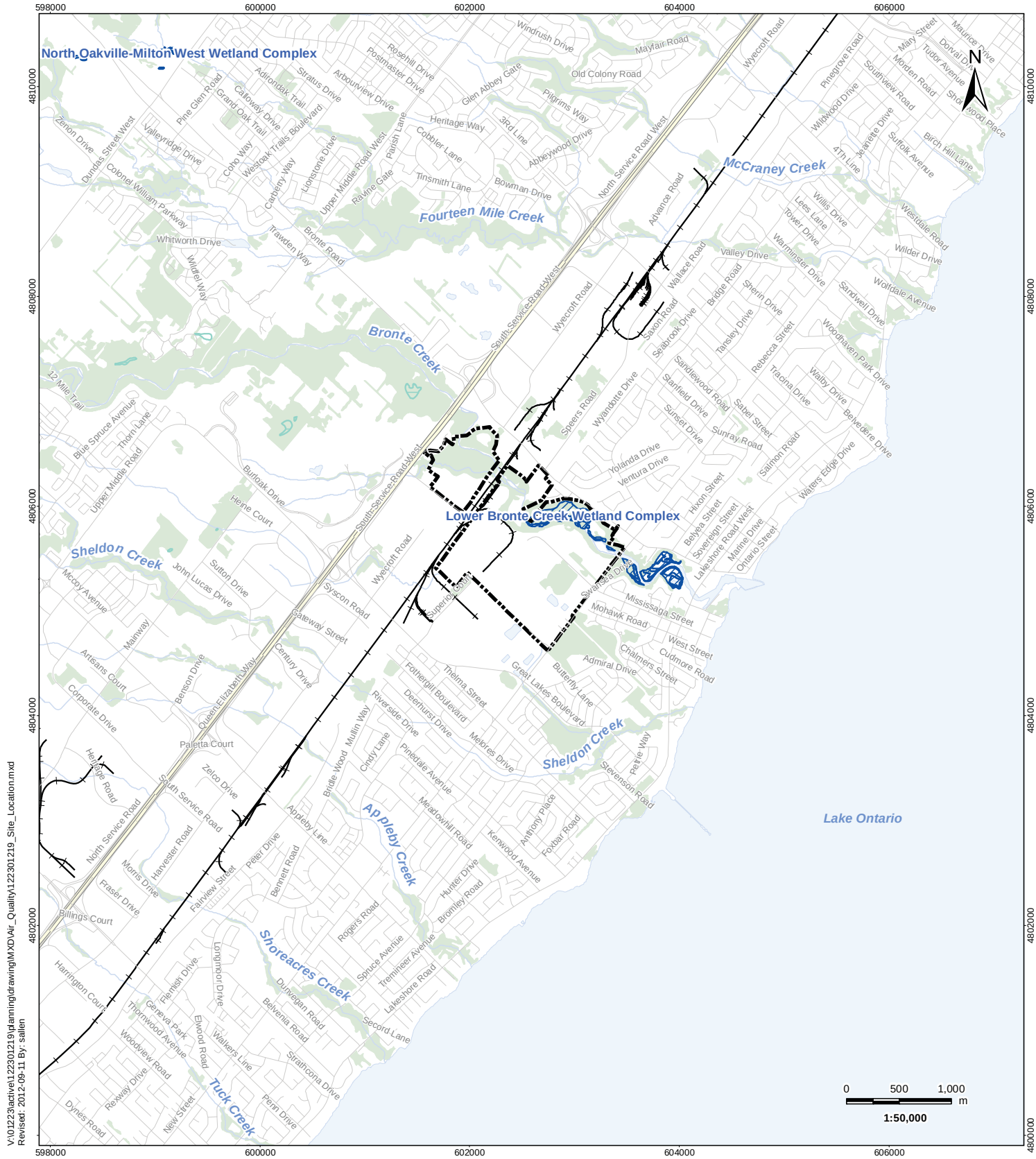
The Suncor Energy Petroleum Products Inc. Oakville Distribution Terminal is a petroleum storage terminal for receiving, storing and shipping petroleum products. It supplies the Ontario market with products from Suncor's Montreal or Sarnia Refinery, Imperial Oil's Nanticoke Refinery, as well as some products arriving from countries in Europe such as Finland.

2.2 LOCATION

The facility is located at 3275 Rebecca Street in Oakville, Ontario. Figure 2-1 shows the general location of the facility in the Town of Oakville (the Town). Figure 2-2 presents an aerial photo showing details of the environment around the facility in a 3 km radius. The nearest receptors to the site are a block of homes along the west side of Bronte Road and south side of Rebecca Street. Figure 2-2 also presents land zoning within the Town, the location of the nearest receptors and identifies facilities which have reported fine particulate matter (FPM) emissions to the National Pollutant Release Inventory (NPRI) for the years 2010 and 2011 within the 3 km radius.

2.3 BUILDINGS

The buildings and structures within the battery limits of the facility consist of a number of tank structures, a building housing the boilers and a few office buildings to the north. The buildings and structures were identified and included in the modelling. Detailed elevations of the structures are included on a site detail plot in Figure 3-1.



V:\01223\active\122301219\planning\drawing\MXD\Air_Quality\122301219_Site_Location.mxd
Revised: 2012-09-11 By: sallen

September 2012
122301219

Stantec

Legend

- Approximate Property Boundary
- Road
- Highway
- Railway
- Watercourse
- Waterbody
- Unevaluated Wetland
- Provincially Significant Wetland
- Wooded Area

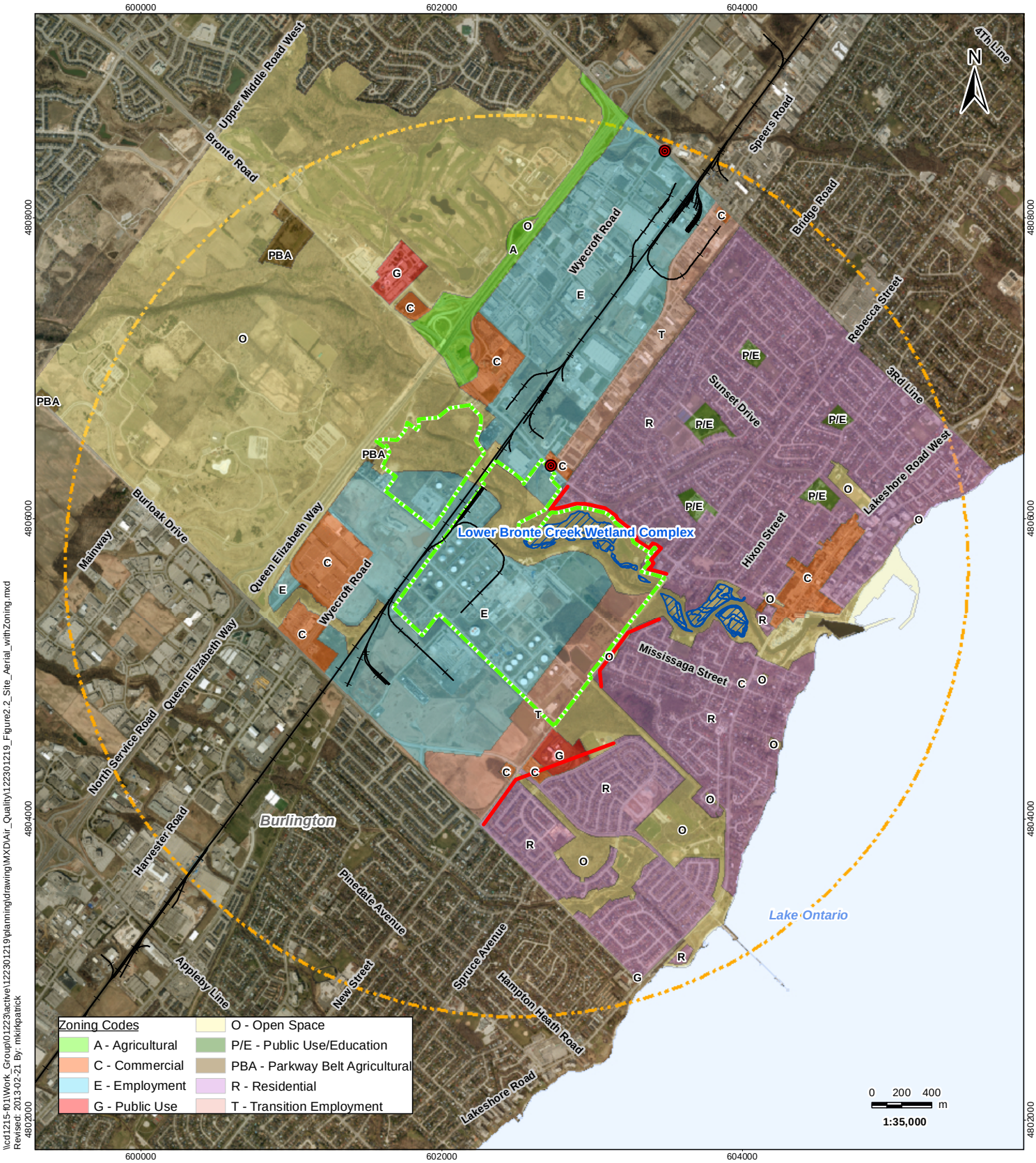
Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Client/Project
Suncor Energy Products Partnership
Suncor Air Quality Reporting

Figure No.
2-1

Title
Suncor Facility General Location in the Town of Oakville



\\cd1215-f01\Work_Group\01223\active\122301219\planning\drawing\MXD\Air_Quality\122301219_Figure2.2_Site_Aerial_withZoning.mxd
Revised: 2013-02-21 By: mkirkpatrick

February 2013
122301219

Stantec

Legend

- Site Location Buffer 3km
- Approximate Property Boundary
- Railway
- Waterbody
- Provincially Significant Wetland
- NPRI Listed PM 2.5 Sources within Impact Zone
- Nearest Boundaries with Receptors

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Client/Project
Suncor Energy Products Partnership
Suncor Air Quality Reporting

Figure No.
2.2

Title
Details in the Environment within 3 km of the Suncor Facility

2.4 RAW MATERIALS, PRODUCTS AND PROCESSES

The Oakville distribution terminal stores and transfers refined petroleum products of varying volatility. No refining takes place at this site. The emissions identified in this report have been quantified with established methodologies. The incoming streams of vacuum oils (heavy and light) and refined fuels are handled via shipping, pipelines and tanks. Releases of VOCs to the atmosphere occur primarily from venting of the displacement air in tankage, and from other minor sources.

Products of combustion are released to the atmosphere during natural gas combustion in the boilers. The boilers are required to produce steam for heating various tanks and rail cars for the handling of viscous vacuum oils.

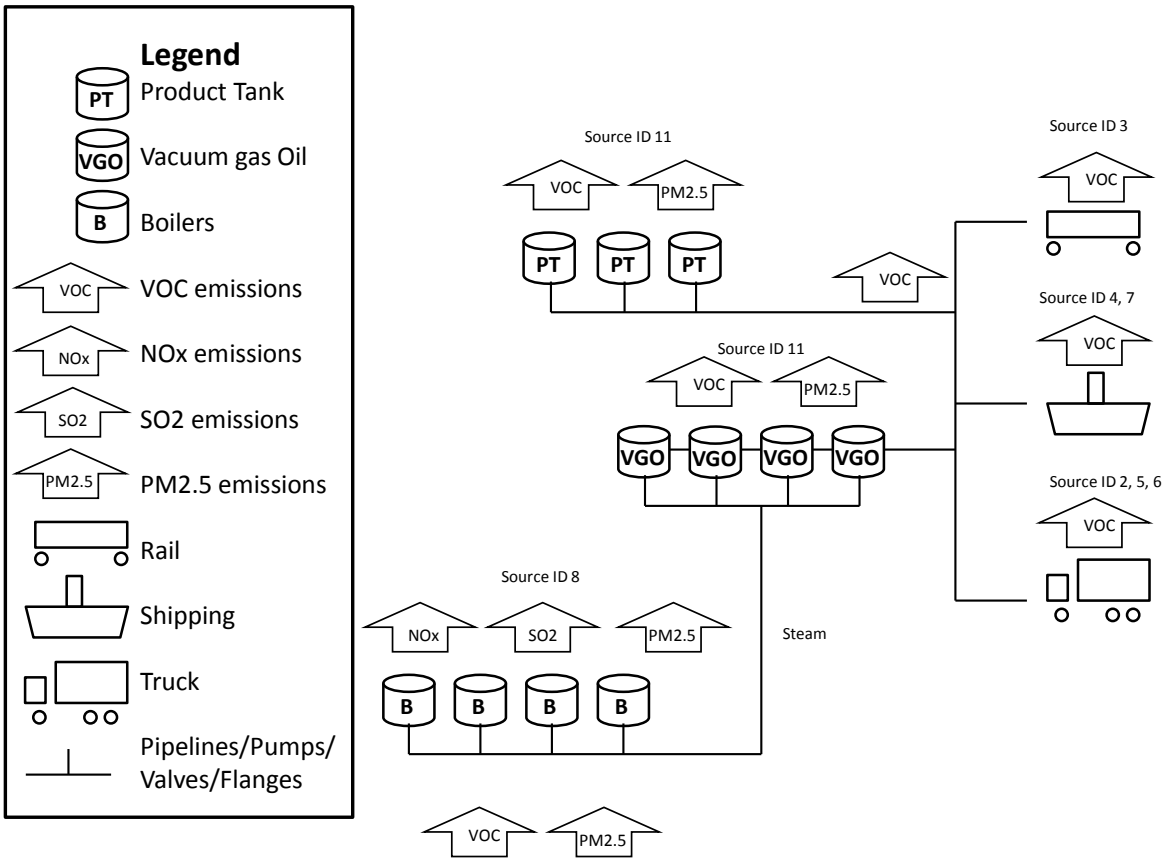
The terminal is generally in operation 24 hours per day year round, but physical limitations on each individual process typically limit emissions. In the assessment of air emissions, historical operations over the 2007 to 2010 calendar years were reviewed and a detailed operations scenario for the emissions calculations was developed. The basis for the emissions estimation is further detailed in Section 2.7 - Identification and Quantification of Substances Released to Air.

In Attachment 3, the detail calculations and assumptions used for production are presented, which identify the variability of individual processes.

Maintenance activities are ongoing with the continuous operations of the facility. This includes activities such as periodic painting of tanks which result in emissions of particulate matter and VOCs.

A summary of the key processes and a simplified process flow diagram relevant to the air contaminants emitted from the facility is presented in Figure 2-3.

Figure 2-3 Simplified Process Flow Diagram – Air Emission Sources



2.5 EMISSION SOURCES AND PROCESSES

The site has numerous tanks and buildings. The site plan presented in Figure 3-1 shows the locations of the site tanks and buildings.

Gasoline, diesel and furnace oil are received via two pipelines which can only operate one at a time. Products also arrive by ship from April to December each year at the terminal's dock located approximately 2 km south of the terminal on Lakeshore Road. Due to equipment constraints, only a single vessel can unload or load at any time. Vessel loading is infrequent and occurs only once or twice a year. Both light and heavy vacuum gas oil (VGO) is received via rail cars at the south terminal. Ethanol is brought in by trucks and off-loaded at the north terminal. Loading of products includes gasoline, diesel, and furnace oil to trucks in the north terminal (using 7 bottom loading racks) and VGO to trucks at the south terminal (using 4 loading racks).

A boiler system with 4 natural gas-fired steam boilers (one for backup), each rated at a maximum heat input of 12,246,951 BTU/hour is located within the facility. The boilers are used for heating rail car tanks and the tanks used to store VGO in order to liquefy the VGO sufficiently to flow. A storm water treatment system consisting of lagoons, API separators and oil/water separators treats site storm water runoff. The storm water treatment system was originally designed for the former refinery, which ceased operation in 2005. Currently, there is no process wastewater. Tank draw off is vacuumed by truck and disposed of offsite.

Emission sources and processes were discussed in detail in the Emissions Report (Stantec, 2011). A summary of the emission sources identified in the Emissions Report is provided below:

- Source ID 1: Tank emissions from receiving gasoline, diesel and furnace oil via two pipelines;
- Source ID 2: Tank emissions from truck unloading ethanol;
- Source ID 3: Tank emissions from rail car tanks unloading Vacuum Gas Oil (VGO);
- Source ID 4: Tank emissions from ship unloading gasoline and diesel;
- Source ID 5: Emissions from loading gasoline, diesel, and furnace oil to trucks;
- Source ID 6: Emissions from loading VGO to trucks;
- Source ID 7: Emissions from loading Light Straight Run Gas (LSR) to ships at the dock;
- Source ID 8: Emissions from natural gas-fired steam boilers;
- Source ID 9: Fugitive emissions from pumps, valves, and flanges;
- Source ID 10: Emissions from storm water treatment; and
- Source ID 11: Emissions from maintenance activities – painting of tanks.

Emissions from storm water treatment were considered negligible, as there is currently no process wastewater, and the storm water treatment system only collects storm water and drainage water from loading and unloading areas. Sampling and testing of the final effluent discharge concentration and loadings of the lagoons are provided in Attachment 2. All other emissions sources were included in the emission calculations and reporting.

Detailed information on the facility and emission sources is contained in the reporting tables "Facility Information" and "Facility Activities" provided in Attachment 3.

2.6 EMISSION CONTROL EQUIPMENT AND PROCEDURES AND EMISSIONS MONITORING

Emissions controls from many of the facility processes relate to correct operating procedures to ensure releases to the atmosphere do not occur.

A vapour recovery unit (VRU) is used to control VOC emissions from the loading of gasoline or diesel to trucks in the North Terminal. Performance of the system has been quantified by measurements over the period of 2003 to 2010.

The product storage tanks in the facility follow CCME requirements and are all internal, floating roof tanks to minimize breathing losses.

The gasoline tanks at Oakville have enhanced emissions controls as there are dome roof covers as well as internal floaters. Including these dome roofs in the "tanks" emission estimation program would further reduce the emissions estimates. This further reduction to the "tanks" estimation has not been included to ensure our emissions estimates are conservative.

2.7 IDENTIFICATION AND QUANTIFICATION OF SUBSTANCES RELEASED TO AIR

Table 2-1 presents the reportable substances and reporting thresholds associated with the facility's operations. These substances meet their respective reporting thresholds as defined in Section 1 of the By-law.

Table 2-1 HPAQB Reportable Substances Associated with the Facility Operation

Contaminant	CAS#	Reporting Threshold (kg/year)	Report to HPQAB
VOCs	N/A	10	Yes
Nitrogen Oxides	11104-93-1	10	Yes
Sulphur Dioxide	7446-09-5	10	Yes
$PM_{2.5}$	N/A	1	Yes

2.7.1 EMISSIONS SCENARIOS

Under Section 5 of the HPAQB, the modelling assessment is required to include average daily and annual, and maximum daily and annual operating conditions. The following emission scenarios and assumptions were used for the facility.

2.7.1.1 Average Daily and Annual Emission Scenarios

These scenarios include emissions from Sources 1 to 9 as defined on page 6. The average operating scenarios were based on actual data from the years 2007 to 2010 and are reflective of the 2011-2012 operations at the facility. The scenarios included:

- For Sources 1 to 4, tank emissions were based on the average throughput from years 2007 to 2010.
- Loading emissions from Sources 5 to 7 were also based on the average throughput from years 2007 to 2010.
- Natural gas combustion emissions from the boilers (Source 8) were based on the average natural gas consumption from 2007 to 2010.
- Source 9, fugitive emissions from connectors (pumps, valves and flanges) at the facility were based on estimates of the number of pumps, valves and flanges in the facility and emission factors provided in Chapter 3, Process Fugitive Emissions, in the *Canadian Petroleum Products Institute (CPPI) Codes of Practice – Refineries and Terminals*. The tanks are visually inspected every year to check for tank integrity and rusting. The tanks are painted if deemed necessary. Emissions from this source therefore vary from year to year. In general, paint can last approximately 10 years, and deterioration of paint may depend on the paints used, how the paint was applied, weather conditions etc. Fugitive emissions from maintenance activities (Source 11) were estimated based on an average of 1 tank being painted during the year. The tank is first sandblasted to remove the old paint and then repainted using primer and epoxy coating. Either wet blast or concealed blasting is used. Emissions are contained within an enclosed area and not released to the environment. Emissions from sandblasting were therefore considered insignificant. Emissions from painting and coating were estimated based on product information contained in the product material safety data sheets (MSDSs) and product information sheets available from the paint manufacturer (Sherwin Williams Company). Product MSDS and information sheets are provided in Attachment 4.

The resulting emissions are expected to be a conservative estimate for the average daily and annual scenarios. Detailed descriptions of each emission source for each scenario are presented in the supporting documents in Attachment 5.

2.7.1.2 Maximum Daily Emissions Scenario

This scenario included emissions from Sources 1 to 9 and 11. For the maximum daily emission scenario, it was assumed that all sources that can operate at the same time are operating at their individual maximum rates. For example, the dock can only accommodate either ship loading or unloading at any one time, therefore, only ship loading (which is more conservative as a higher product flow rate and consequently a higher emission rate relative to ship unloading) is included in the maximum daily scenario. The maximum daily scenario only includes one pipeline in operation, as only one can operate at a given time. For Source 11, emissions from maintenance activities, for the maximum daily scenario it was conservatively assumed that 2 tanks were painted within the year, and it was assumed that each tank would take approximately 6 days to paint (2 days for one coat of primer, and 2 days each for 2 coats of finish). Standing losses of the tanks that are not being filled are also included in this scenario. A detailed description of each emission source for the maximum daily emission scenario is presented in the supporting documents in Attachment 5.

2.7.1.3 Maximum Annual Emissions Scenario

For the maximum annual scenario, it was conservatively assumed that the maximum throughput of each product brought into the facility through the pipeline and vessels is twice that of the average annual throughput. Emissions from gasoline, diesel, and furnace oil loading to trucks were also conservatively assumed to be twice their annual average throughputs. Maximum annual emissions from receiving ethanol and VGO were based on the maximum number and maximum capacity of trucks or rail cars arriving at the facility. VGO loading to trucks was also based on the maximum number and maximum capacity of trucks loaded during the year. The maximum annual scenario assumed that 3 of the boilers are operating 6 months during the year (during the colder months), and 2 boilers are operating for the other 6 months (during warmer months). This is a conservative assumption as the 3 boilers operate at the same time only during very cold weather, and typically only one boiler operates during warm weather. Fugitive emissions from connectors (pumps, valves and flanges) at the facility were based on the same methodology used for the average emissions scenarios. Emissions from maintenance activities were conservatively based on 2 tanks being painted within the year. Detailed descriptions of each emission source for the maximum annual emission scenario are presented in the supporting documents in Attachment 5.

2.7.1.4 Frequency of Achieving Maximum Emissions

In developing the emissions estimates and emissions scenarios for this HPAQB bylaw submission, the sources of emissions and reasonable operating scenarios were identified in the engineering calculations used to estimate the releases. Table 2-2, the emissions summary table shows the average and maximum values of emissions broken down on a species, source and

operation basis. There are four (4) species: VOC's, Toluene, Xylene and PM2.5. There are eleven (11) emissions sources associated with eleven distinct operations. Operating scenarios from 2007 to 2010 were considered to generate information representative of the 2011 to 2012 facility operations. Based on the product mix, facility through put and operating constraints as detailed in sections 2.7.1.1 through 2.7.1.3, there is no clear and representative calculation to determine a 90% of worst-case calculated emission basis. Determining 90% of worst case emissions would be straight forward and meaningful if all emissions data were measured via continuous emissions monitoring, but is not a reasonable representation of the multiple data calculations necessary to characterize the complex operations at the Suncor facility.

2.7.2 EMISSION CALCULATION METHODOLOGY

The following emission calculation methodologies were used for this assessment:

- Source ID's 1 – 4: Emissions from tank loading of gasoline, diesel, furnace oil, VGO and ethanol (via pipeline, vessels, rail cars and trucks) were calculated using the TANKS Emissions Estimation Software, Version 4.09D, which was based on the emission estimation procedures from U.S. EPA AP-42 Chapter 7, Liquid Storage Tanks.
- Source ID 5: The average of the measured emissions from the vapour recovery system from 2003 to 2010 (reference: "Source Testing of the Vapour Recovery Unit (VRU), Suncor Energy Inc. Oakville Terminal", prepared by Church and Trought, dated October 2010) were used for calculating emissions from loading gasoline and diesel to trucks.
- Source ID 6 – 7: Emissions from truck loading VGO and ship loading of gasoline were calculated based on the methodology and emission factors presented in the CPPI Codes of Practice – Refineries and Terminals, Chapter 5 - Releases from Loading Operations.
- Source ID 8: Emission factors for natural gas combustion for estimating boiler emissions were taken from U.S. EPA AP-42 Chapter 1.4 "Natural Gas Combustion".
- Source ID 9: Fugitive emissions from fugitive leaks were calculated based on the methodology and emission factors presented in the CPPI Codes of Practice – Refineries and Terminals, Chapter 3 - Process Fugitive Emissions.
- Source ID 11: Emissions from painting of tanks were calculated using a mass balance approach and emissions information from the product MSDS and product information sheets available from the paint manufacturer.

Detailed emission calculations, assumptions and supporting information are presented in Attachment 5.

2.7.3 SUMMARY OF ESTIMATED EMISSIONS

The calculated facility emissions reportable under the HPAQB and associated source classification code (SCC) are summarized in Table 2-2.

Table 2-2 Emissions Summary Table

Emission Source ID	Description	Source Classification Code (SCC)	Contaminant	Average Daily Emissions (kg/day)	Average Annual Emissions (kg/year)	Max Daily Emissions (kg/day)	Max Annual Emissions (kg/year)
1	Pipeline Receiving to Tanks - Gasoline / Diesel	4-06-005-01	VOCs	190	69408	191	91081
2	Truck unloading to Tanks - Ethanol	4-07-008-09					
3	Rail Car Tanks unloading to Tanks - Vacuum Gas Oil	4-06-001-34					
4	Ship unloading to Tanks - Gasoline / Diesel	4-06-002-31					
1	Pipeline Receiving to Tanks - Gasoline / Diesel	4-06-005-01	Toluene	27	9952	48	14150
2	Truck unloading to Tanks - Ethanol	4-07-008-09					
3	Rail Car Tanks unloading to Tanks - Vacuum Gas Oil	4-06-001-34					
4	Ship unloading to Tanks - Gasoline / Diesel	4-06-002-31					
1	Pipeline Receiving to Tanks - Gasoline / Diesel	4-06-005-01	Xylene	11	4141	20	5916
2	Truck unloading to Tanks - Ethanol	4-07-008-09					
3	Rail Car Tanks unloading to Tanks - Vacuum Gas Oil	4-06-001-34					
4	Ship unloading to Tanks - Gasoline / Diesel	4-06-002-31					
5	Loading to Trucks - Gasoline and Diesel	4-06-001-26	VOCs	55	19922	128	38712
			Toluene	0.6	210	1	407
			Xylene	0.9	326	2	633

Table 2-2 Emissions Summary Table

Emission Source ID	Description	Source Classification Code (SCC)	Contaminant	Average Daily Emissions (kg/day)	Average Annual Emissions (kg/year)	Max Daily Emissions (kg/day)	Max Annual Emissions (kg/year)
6	Loading to Trucks - Vacuum Gas Oil (VGO)	4-04-001-50	VOCs	2.0	716	3	931
			Toluene	0.5	186	0.7	242
			Xylene	0.2	79	0.3	102
7	Tank loading to Ship - Light Straight Run Gas (LSR)	4-04-001-50	VOCs	11.2	4102	2051	5127
			Toluene	0.1	24	12	30
			Xylene	0.03	9	5	12
8	Natural Gas-Fired Steam Boilers	1-02-006-02	NOx (as NO2)	17.8	6509	39	11934
			CO	15.0	5468	33	10024
			$PM_{2.5}$	1.36	495	3	907
			SO_2	0.11	39	0.2	72
9	Fugitive Emissions from Connectors (Pump / Valves / Flanges)	4-04-001-51	VOCs	0.28	103	0.3	103
			Toluene	0.004	1.28	0.004	1
			Xylene	0.01	2.45	0.01	2
10	Storm Water Treatment [1]	NA	VOCs	N/A	N/A	N/A	N/A
11	Maintenance - Painting of Tanks	4-02-001-10	VOCs	0.9	331	55	661
			Xylene	0.5	167	28	333
			$PM_{2.5}$	1.98E-08	7.21E-06	1.20E-06	1.44E-05

Notes:
1. All PM is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors may be used to estimate $PM_{2.5}$ emissions as well. (reference: U.S. EPA Chapter 1.4)

2.7.4 SUMMARY OF FPM EMISSIONS FROM OTHER FACILITIES

There are other facilities within a 3 km radius of the Suncor Oakville facility which release $PM_{2.5}$ emissions. $PM_{2.5}$ emissions reported to the NPRI from facilities within the 3 km radius of the Suncor Oakville facility for the years 2010 and 2011 are reported in Table 2-3. Figure 2-2 presents the location of these facilities in relation to the Suncor Oakville facility.

Table 2-3 FPM Emissions Reported to the NPRI

Company	Address	NPRI ID	$PM_{2.5}$ emissions (tonnes)	
			2010	2011
Dufferin Construction Company A division of Holcim (Canada) - Bronte Asphalt Plant	731 Third Line, Oakville, ON. L6L 4B2	7269	2.7	1.3
Mancor Industries - Speers Road	2485 Speers Road, Oakville, ON. L6L 2X9	7305	0.225	0.272

2.8 OPERATIONAL PRACTICES AT SUNCOR OAKVILLE

Several key operational practices that have been adopted at the Suncor Oakville facility have provided significant air emissions reductions with ongoing potential for further improvement.

A table of current practices including comments as to the VOC, SOx and NOx reduction potential is illustrated in Table 2-4, Beneficial Operational Practices.

Table 2-4 Beneficial Operational Practices

Practice	Comment
Elimination of any refining capability	This business decision was implemented in 2005, and equipment supporting these activities has been permanently removed from site
Vapour Recovery Systems	Captures vapour from truck filling at the terminal, as well as retail tank filling
Floating Roof Tanks for Gasoline, Diesel	Reduction of Tank “breathing”
Enhanced Tank Roof Sealing Systems	Reduction of unintended vapour leakage around tank roofs
Dome Covers on Tanks	Secondary containment of passive vapour losses
Decrease the number of Storage Tanks	Reduction in required product storage as facility operations have evolved
Continuous Emission Monitoring	This is installed on the current vapour recovery system
Corporate risk management	Corporate culture of managing risk, operating safely and mitigating environmental impacts. A formal risk management process for identification, assessment and mitigation of risks is carried out for the operational excellence management system (OEMS)

3.0 Evaluation

3.1 MODELLING APPROACH AND MODEL SELECTION

Dispersion modelling was conducted with the US EPA CALPUFF model according to the requirements of the Guidance Document. CALPUFF Version 5.8, Level 070623 and CALPOST Version 5.6394, Level 070622 were used in this assessment.

3.2 MODEL INPUTS

With the exception of the CALPUFF input files (including site specific building downwash information) all the other model inputs were provided by the Town. Model options used in the CALPUFF input were set based on the requirements specified in Section 3.2.1.3.4 of the Guidance Document. The CALPUFF input files are included in electronic format with this application package.

3.2.1 Facility Emissions Estimation Methods and Source Parameters

The emission estimation methodology and aggregated emission rates are described in Section 2.7. Summaries of emission rates and source parameters used in dispersion modelling are presented in Tables 3-1 and 3-2 for the average and maximum emissions scenarios respectively.

Emission rates for the dispersion modelling were calculated from the daily emission rates for both average and maximum scenarios. It was conservatively assumed that all sources were operating 24 hours a day throughout the year. This is conservative because in some cases (e.g. tank painting and ship loading) emissions may only happen a few days a year and be limited to only a few hours a day.

Table 3-1 Average Scenario Emission Rates

Source ID	Description	Source Type	UTM E (m)	UTM N (m)	Elevation (m)	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Temperature (K)	Sigma Y (m)	Sigma Z (m)	Average Scenario Emission Rates (g/s)				
												SO_2	NO_x	$PM_{2.5}$	Toluene	Xylene
STCK1	Boiler	Point	602718	4805137	91	9.1	0.76	10.8	626	-	-	4.1E-04	6.9E-02	5.2E-03	0.0E+00	0.0E+00
STCK2	Boiler	Point	602715	4805134	91	9.1	0.76	10.8	626	-	-	4.1E-04	6.9E-02	5.2E-03	0.0E+00	0.0E+00
STCK3	Boiler	Point	602712	4805131	91	9.1	0.76	10.8	626	-	-	4.1E-04	6.9E-02	5.2E-03	0.0E+00	0.0E+00
STCK4	Boiler	Point	602722	4805133	91	9.1	0.76	10.8	626	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TANK23	Tank	Point	601859	4805572	102	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	7.3E-05	1.7E-04
TANK25	Tank	Point	601889	4805605	102	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	9.0E-05	2.1E-04
TANK125	Tank	Point	602578	4804941	92	17.1	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	2.2E-04	5.2E-04
TANK24	Tank	Point	601990	4805572	100	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	2.8E-04	6.6E-04
TANK121	Tank	Point	602591	4805147	92	18.29	0.001	0.001	338.7	-	-	0.0E+00	0.0E+00	0.0E+00	2.0E-01	8.4E-02
TANK143	Tank	Point	602718	4804954	91	14.63	0.001	0.001	338.7	-	-	0.0E+00	0.0E+00	0.0E+00	1.1E-01	4.4E-02
TANK144	Tank	Point	602749	4804984	91	14.63	0.001	0.001	338.7	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TANK15	Tank	Point	602241	4805603	94	14.72	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	4.5E-04	1.7E-04
TANK51	Tank	Point	602010	4805748	102	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	4.3E-04	1.7E-04
TANK52	Tank	Point	602140	4805728	96	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	4.2E-04	1.7E-04
TANK53	Tank	Point	602067	4805805	99	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	4.3E-04	1.7E-04
TANK57	Tank	Point	602172	4805913	97	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	4.3E-04	1.7E-04
TANK120	Tank	Point	602630	4805187	91	18.29	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	5.4E-04	2.0E-04
TANK123	Tank	Point	602476	4805027	92	18.29	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	6.2E-04	2.6E-04
TANK124	Tank	Point	602439	4804991	92	17.1	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	4.0E-06	1.2E-05
TANK126	Tank	Point	602535	4804897	91	18.29	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	5.6E-04	2.3E-04
TANK55	Tank	Point	602121	4805860	97	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TANK63	Tank	Point	602122	4805912	100	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TANK58	Tank	Point	602313	4805678	92	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	6.5E-05	2.7E-05
TANK64	Tank	Point	602150	4805574	95	17.1	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	1.2E-04	4.6E-05
TRUCKLOAD	VRU	Point	601963	4806213	106	2	0.15	5.2	298.5	-	-	0.0E+00	0.0E+00	0.0E+00	6.6E-03	1.0E-02
VGO	VGO	Volume	602835	4804906	89	3	-	-	-	9.61	0.70	0.0E+00	0.0E+00	0.0E+00	5.9E-03	2.5E-03
PAINT1	Tank Painting	Volume	602717	4804954	91	7	-	-	-	7.4	6.8	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.3E-03
PAINT2	Tank Painting	Volume	602748	4804984	91	7	-	-	-	7.0	6.8	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
FUGITIVE1	Fugitive Emissions	Volume	602088	4805689	98	0	-	-	-	104.65	0.47	0.0E+00	0.0E+00	0.0E+00	2.0E-08	3.9E-08
FUGITIVE2	Fugitive Emissions	Volume	602584	4805077	92	0	-	-	-	104.65	0.47	0.0E+00	0.0E+00	0.0E+00	2.0E-08	3.9E-08
SHIP	Ship Loading Emissions	Volume	604241	4802924	75	5	-	-	-	28.47	2.33	0.0E+00	0.0E+00	0.0E+00	7.5E-07	3.0E-07

Notes:

1. Based on MOE guideline for tanks exit velocity was assumed to be 0.001 m/s to remove plume rise and diameter was assumed to be 0.001 m to remove stack tip downwash

2. Based on information from Suncor temperature was assumed to be 150 F for the three VGO tanks. Temperature of the other tanks was conservatively assumed to be 0 C to minimize plume rise

Table 3-2 Maximum Scenario Emission Rate

Source ID	Description	Source Type	UTM E (m)	UTM N (m)	Elevation (m)	Stack Height (m)	Stack Diameter (m)	Exit Velocity (m/s)	Temperature (K)	Sigma Y (m)	Sigma Z (m)	Maximum Scenario Emission Rate (g/s)				
												SO_2	NO_x	$PM_{2.5}$	Toluene	Xylene
STCK1	Boiler	Point	602718	4805137	91	9.1	0.76	10.8	626	-	-	9.1E-04	1.5E-01	1.1E-02	0.0E+00	0.0E+00
STCK2	Boiler	Point	602715	4805134	91	9.1	0.76	10.8	626	-	-	9.1E-04	1.5E-01	1.1E-02	0.0E+00	0.0E+00
STCK3	Boiler	Point	602712	4805131	91	9.1	0.76	10.8	626	-	-	9.1E-04	1.5E-01	1.1E-02	0.0E+00	0.0E+00
STCK4	Boiler	Point	602722	4805133	91	9.1	0.76	10.8	626	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TANK23	Tank	Point	601859	4805572	102	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	3.5E-05	8.8E-05
TANK25	Tank	Point	601889	4805605	102	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	4.5E-05	1.1E-04
TANK125	Tank	Point	602578	4804941	92	17.1	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	8.2E-05	2.0E-04
TANK24	Tank	Point	601990	4805572	100	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	8.4E-05	2.1E-04
TANK121	Tank	Point	602591	4805147	92	18.29	0.001	0.001	338.7	-	-	0.0E+00	0.0E+00	0.0E+00	5.5E-01	2.3E-01
TANK143	Tank	Point	602718	4804954	91	14.63	0.001	0.001	338.7	-	-	0.0E+00	0.0E+00	0.0E+00	1.6E-02	6.7E-03
TANK144	Tank	Point	602749	4804984	91	14.63	0.001	0.001	338.7	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TANK15	Tank	Point	602241	4805603	94	14.72	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	3.4E-03	3.1E-03
TANK51	Tank	Point	602010	4805748	102	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	4.7E-04	1.3E-04
TANK52	Tank	Point	602140	4805728	96	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	4.7E-04	1.3E-04
TANK53	Tank	Point	602067	4805805	99	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	4.7E-04	1.3E-04
TANK57	Tank	Point	602172	4805913	97	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	4.7E-04	1.3E-04
TANK120	Tank	Point	602630	4805187	91	18.29	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	6.2E-04	1.7E-04
TANK123	Tank	Point	602476	4805027	92	18.29	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	6.7E-04	1.8E-04
TANK124	Tank	Point	602439	4804991	92	17.1	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	5.2E-06	1.3E-05
TANK126	Tank	Point	602535	4804897	91	18.29	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	7.7E-04	2.1E-04
TANK55	Tank	Point	602121	4805860	97	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TANK63	Tank	Point	602122	4805912	100	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TANK58	Tank	Point	602313	4805678	92	14.63	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	8.2E-05	2.8E-05
TANK64	Tank	Point	602150	4805574	95	17.1	0.001	0.001	273	-	-	0.0E+00	0.0E+00	0.0E+00	1.5E-04	5.1E-05
TRUCKLOAD	VRU	Point	601963	4806213	106	2	0.15	5.2	298.5	-	-	0.0E+00	0.0E+00	0.0E+00	1.6E-02	2.4E-02
VGO	VGO	Volume	602835	4804906	89	3	-	-	-	9.61	0.70	0.0E+00	0.0E+00	0.0E+00	7.7E-03	3.2E-03
PAINT1	Tank Painting	Volume	602717	4804954	91	7	-	-	-	7.4	6.8	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-01
PAINT2	Tank Painting	Volume	602748	4804984	91	7	-	-	-	7.0	6.8	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-01
FUGITIVE1	Fugitive Emissions	Volume	602088	4805689	98	0	-	-	-	104.65	0.47	0.0E+00	0.0E+00	0.0E+00	2.0E-08	3.9E-08
FUGITIVE2	Fugitive Emissions	Volume	602584	4805077	92	0	-	-	-	104.65	0.47	0.0E+00	0.0E+00	0.0E+00	2.0E-08	3.9E-08
SHIP	Ship Loading Emissions	Volume	604241	4802924	75	5	-	-	-	28.47	2.33	0.0E+00	0.0E+00	0.0E+00	1.4E-04	5.5E-05

Notes:

1. Based on MOE guideline for tanks exit velocity was assumed to be 0.001 m/s to remove plume rise and diameter was assumed to be 0.001 m to remove stack tip downwash

2. Based on information from Suncor temperature was assumed to be 150 F for the three VGO tanks. Temperature of the other tanks was conservatively assumed to be 0 C to minimize plume rise

3.2.2 Land Use and Meteorological data

Meteorological data in the form of a CALMET output file was provided to Stantec by the Town for the 2004 to 2008 modelling period. The land use data for the study area is included in the pre-processed file provided to Stantec.

3.2.3 Terrain Data

Digital elevation data was provided to Stantec by the Town in DEM format, which were obtained from www.geobase.ca and www.webgis.com websites.

3.2.4 Background Concentrations (Ozone, NH_3, and FPM)

Background ozone and FPM concentrations in the form of hourly time history files were provided by the Town. Ammonia background concentrations were set based on values provided in Section 3.2.1.3.4 of the Guidance Document (2.5 ug/m^3 and 5.5 ug/m^3 for average and worst case scenarios respectively).

3.2.5 Chemistry Model(s) used and Species Modelled

Two sets of model runs were performed using the 5-species MESOPUFF and 5-species SOA chemistry options as outlined in the Guidance Document. The results of these simulations were then combined in a post-processing stage using the POSTUTIL program included in the CALPUFF modelling system.

The following species were included for each option:

- 5-species MESOPUFF chemistry (SO_2, SO_4, NO_X, HNO_3, NO_3); and,
- 5-species SOA chemistry (toluene, xylene, β-pinene, α-pinene, SOA).

3.2.6 Grids and Receptors

A 100 km by 100 km modelling domain was used in the CALPUFF model. The south west corner of the modelling domain was set at 553,000 km and 4762.000 km (in UTM coordinates). Modelling receptors spaced at 1 km were provided by the Town in the file supplied to Stantec and were used in the modelling assessment.

3.2.7 Building Downwash

Wind dependent building/obstacle dimensions are required as an input to the CALPUFFmodel. The modelling system includes a building pre-processor that objectively determines the height, width and length of obstacles for 36 wind directions. Figure 3-1 shows the buildings and structures identified within the Facility and were included in the Building Profile Input Processor (BPIP) model.

The BPIP input file is provided in Attachment 6.

602000

4806000

4804000

Building ID	Associated Source (s)	Building Height (m)	Elevation (m)
BLD_1	STCK1 to STCK4	6.9	91
BLD_2	-	2.6	91
BLD_3	-	3.4	91
BLD_4	-	2.6	91
BLD_5	TANK120	18.3	91
BLD_6	TANK121	18.3	92
BLD_7	-	18.3	91
BLD_8	TANK144, PAINT2	14.6	91
BLD_9	TANK143, PAINT1	14.6	91
BLD_10	-	17.1	91
BLD_11	TANK125	17.1	92
BLD_12	TANK126	18.3	91
BLD_13	-	18.3	92
BLD_14	TANK123	18.3	92
BLD_15	TANK124	17.1	92
BLD_16	-	18.3	95
BLD_17	TANK23	14.6	102
BLD_18	TANK25	14.6	102
BLD_19	-	14.6	102
BLD_20	TANK24	14.6	100
BLD_21	-	14.6	98
BLD_22	TANK52	14.6	96
BLD_23	TANK51	14.6	102
BLD_24	TANK53	14.6	99
BLD_25	TANK55	14.6	97
BLD_26	TANK63	14.6	100
BLD_27	TANK57	14.6	97
BLD_28	-	14.6	92
BLD_29	TANK58	14.6	92
BLD_30	-	14.6	92
BLD_31	TANK15	14.7	94
BLD_32	-	14.7	94
BLD_33	-	12.2	95
BLD_34	TANK64	17.1	95
BLD_35	-	4.0	106
BLD_36	-	3.0	106
BLD_37	-	3.0	106
BLD_90	-	14.6	105
BLD_91	-	14.6	105
BLD_92	-	14.6	105
BLD_93	-	14.6	102
BLD_94	-	14.6	105

V:\01223\active\122301219\planning\drawing\MXD\Air_Quality\122301219_Site_Detail.mxd
Revised: 2012-09-11 By: sallen

0 200 400 m

1:10,000

September 2012
122301219

Legend

- Approximate Property Boundary
- Building
- Road
- Highway
- Railway
- Watercourse
- Waterbody
- Provincially Significant Wetland

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.

Client/Project

Suncor Energy Products Partnership
Suncor Air Quality Reporting

Figure No. 3-1

Title

Building and Structures Identified and Used in the BPIP Model, Site Plan

4.0 Model Results and Mapping

Table 4-1 below summarizes the maximum annual average ground level FPM concentrations predicted by the CALPUFF model due to the Suncor facility average and maximum emissions scenarios. . The model predictions include emissions from facility sources as well as the representative background air concentrations as provided by the Town.

Table 4-1 Facility FPM Emissions

Scenario	Averaging Period	UTM E (km)	UTM N (km)	Concentration (µg/m^3)	HPAQ limit (µg/m^3)	% of limit
Average Scenario						
FPM	Annual	602.353	4804.892	0.019	0.2	9.4%
FPM + Background	Annual	603.103	4805.392	7.6	-	-
Max Scenario						
FPM	Annual	602.353	4804.892	0.05	0.2	25.1%
FPM + Background	Annual	602.228	4805.017	8.9	-	-

An affected airshed is defined by the HPAQB as any airshed receiving any increase in concentration of FPM of more than 0.2 micrograms per cubic metre (µg/m^3), expressed as an annual average, due to a major emission as determined on a maximum annual emission basis. The results presented in Table 4-1 show that both the predicted average and maximum contribution from the Suncor facility are well below the 0.2µg/m^3 limit.

As an affected airshed is not identified, further mapping of the affected airshed within the town is not required and is not provided in this report.

A summary table of the maximal total facility –induced (MTFI) FPM concentration value and the maximal cumulative (MC) FPM concentration is presented in Table 4-2. The Suncor Energy Oakville Distribution Terminal is an existing facility and therefore the MC value is equal to the background FPM measurement data.

Table 4-2 Modelling Results

	"Average Emissions" Median Concentration ($\mu g/m^3$)		"Maximal Emissions" Concentration ($\mu g/m^3$)	
	MTFI	**MC***	**MTFI**	**MC***
Annual Value	0.018	NA-existing facility	0.050	NA-existing facility

*Note that for existing facilities the MC value is based on the background FPM data alone.

5.0 Conclusions

This application to the Town of Oakville for Approval of the Suncor Energy Oakville Distribution Terminal (Suncor Terminal) is being made in response to the Oakville Health Protection Air Quality By-Law 2010-035 (HPAQB). It follows the approach established in the Town of Oakville guidance document "Section 5 and 6 Approval Requirements for Major Emitters, v.5 June 2011". The HPAQB seeks to safeguard the health, safety and well-being of Oakville residents by gathering information on emissions of fine particulate matter (FPM) and its precursors, and regulating major emitters of these pollutants.

The major sources of FPM and its precursors at the Suncor Terminal include emissions from natural gas fired boilers, storage tanks and releases related to product handling. A detailed assessment of the emissions sources was carried out using a combination of accepted methodologies that include the US Environmental Protection Agency (US EPA), the Canadian Petroleum Products Institute (CPPI) and source measurements where applicable. The detailed assessment included extensive consideration of the variability of the emission rates to determine average and maximum emissions scenarios.

Based on the emission estimates and dispersion modelling analysis, the Suncor Terminal is predicted to not significantly affect the existing airshed in Oakville. This conclusion is based on the maximum predicted facility induced FPM concentrations being less than the 0.2 $\mu g/m^3$ criterion established by the HPAQB. As a result, a health risk assessment is not required.

Respectfully Submitted,

STANTEC CONSULTING LTD.

Original signed by

Prepared by:

Allan E. Prits, P.Eng.
Senior Associate, Atmospheric Environments
Tel: (905) 631-3927
Fax: (905) 631-8960
allan.prits@stantec.com

Original signed by

Reviewed by:

Gregory Crooks, M.Eng., P.Eng.
Principal, Environmental Services
Tel: (416) 598-7687
Fax: (416) 596-6680
gregory.crooks@stantec.com

V:\01223\active\122301219\planning\report\final\122301219_HPAQB_submission_ 2013Feb19_Revision-1.docx