The Regional Municipality of York

Odour Management and Mitigation (Condition 9) Semi-Annual Report EA File No.: 02-04-03

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Executive Summary

The Southeast Collector (SEC) Trunk Sewer system conveys municipal wastewater 15 kilometres from the intersection of Ninth Line and Rouge Bank Drive in Markham, Ontario, to the intersection of Finch Avenue and Valley Farm Road in Pickering, Ontario. The operation of the system accommodates future growth in York Region and provides additional capacity for peak and extraneous flows. Furthermore, it increases redundancy to the existing York Durham Sewage System (YDSS) that is co-owned and co-managed by the Regional Municipalities of York and Durham (the Regions). The system was commissioned on January 27, 2015 and has since been in operation.

The SEC Trunk Sewer Individual Environmental Assessment (IEA) was approved on March 31, 2010 allowing the Regions to proceed with the undertaking subject to 13 Conditions (74 sub-conditions) introduced by the Minister of the Environment's Notice of Approval to Proceed with the Undertaking (Approval).

To address Condition 9 of the Approval, the Odour Management and Mitigation Plan (OMMP) was prepared and submitted to the Ministry of the Environment, Conservation and Parks[1] (MECP) on September 24, 2010. Subsequently, on December 5, 2014, an updated OMMP was provided to include the Operation Manuals for each of the four main components of the odour control system prior to commissioning. On March 24, 2015, the MECP provided comments on the updated OMMP. These comments and outcomes from the annual meeting held on May 19, 2015 including all other subsequent MECP comments have been fully addressed in the Revised Addendum to the updated OMMP dated June, 2016. There were no further comments from the MECP as per the MECP letter of June 17, 2016.

As per Condition 9.3 (e) annual meetings with the MECP Director progressed at the project specific level until 2017 where the decision was made to move the Condition 9 discussion items into the Agenda of regular quarterly liaison meetings between York Region and MECP at the senior management level.

Condition 9 requires submission of Odour Management and Mitigation Monitoring Reports to the MECP Director Environmental Approvals Branch, Central Regional Director and SeCAC (if applicable) on a semi-annual basis beginning six months following commencement of operation.

[1] *Formerly Ministry of the Environment and Climate Change (MOECC) and Ministry of the Environment (MOE)*

This report is subsequent to five Annual Reports (July 27th, 2015, July 31st, 2016, July 31st, 2017, July 30th, 2018 and July 30th, 2019) and three Semi-Annual Reports (January 31st, 2016, January 31st, 2017 and January 31st, 2018) prepared and submitted to satisfy Conditions 9.5 and 9.6 of the Approval. This Semi-Annual Condition 9 Report covers the period July 1st to December 31st, 2019.

The semi-annual Condition 9 Report will be posted on the york.ca website as per condition 9.7.

Odour Management and Mitigation Monitoring Report (Conditions 9.5 and 9.6)

Phase 1a:

Conducted in 2012 and 2013 and the results are discussed in previous reports.

Phase 1b /Phase 2 Year One Sampling:

The Phase 1b/Phase 2 Year One Sampling was conducted in Spring, Summer and Fall 2015 and the results are discussed in previous reports.

Phase 2 Year Two Sampling:

The Phase 2 Year Two (2) sampling was conducted in Spring, Summer and Fall 2016 and the results are discussed in previous reports.

Phase 2 Year Three Sampling:

The Phase 2 Year Three (3) sampling was conducted in Spring and Summer 2017 and the results are discussed in previous reports.

Phase 2 Year Four Sampling:

The Phase 2 Year Four (4) sampling was conducted in Summer 2018 and the results are discussed in previous reports.

Phase 2 Year Five Sampling:

The Phase 2 Year Five (5) sampling was conducted in Summer 2019.

The MECP Technical Support Section in accordance with Condition 11.6 conducted an audit on August 13th, 2019 during the Summer 2019 campaign. The MECP staff witnessed ammonia and ambient odour sampling at a sensitive receptor identified as

"R79" and confirmed that the sampling methods and procedures met all current MECP criteria for sampling requirements.

The results of the Summer 2019 sampling showed that the odour concentrations in all samples collected at the receptors were too low to be evaluated by the odour panel using the olfactometer. The sampling indicated there were no occurrences of detectable odour at the receptors.

The results of the ambient sampling for other contaminants at the six (6) sensitive receptors showed:

- NH_3 concentrations varied between 0.043 to 0.156 ppm; and
- H_2S and TRS compounds measured below the detection limit of the instrument (< 0.01 ppm).

Results of the dispersion modelling showed the following:

- Based on five-year meteorological data (refer to Table E-1):
  - Odour concentrations from 0.01 OU to 0.23 OU (1% to 23% of the internal MECP guidance level of 1 OU);
  - NH_3 concentration is 0.22 µg/m^3 (0.22%of the limit);
  - TRS Compounds concentration based on 24-hour averaging period is <0.31 µg/m^3 (<4.4% of the limit); and
  - TRS Compounds concentration based on 10-minute averaging period is <0.99 µg/m^3 (<7.6% of the limit).

The results of the dispersion modelling for the Summer 2019 sampling will be provided in the next report once the daily meteorological data for Summer 2019 is received from the MECP.

As noted in previous reports, the daily meteorological data for AERMOD version 16216 for Summer 2017 and 2018 was requested from the MECP but was not received in time to be included in the respective semi-annual reports. The requested data for Summer 2017 and 2018 was received in March 2019 and has therefore been included in this semi-annual report.

- The dispersion modelling results based on daily meteorological data for Summer 2017 and 2018 sampling are as follows (refer to Table E-2):
  - Odour concentrations are 0 OU at all sensitive receptor locations (0% of the internal MECP guidance level of 1 OU).

OCF Technology Performance:

Performance testing of the odour control facility was conducted on July 18th, 2019 and September 5th, 2019 by the equipment supplier BIOREM Technologies Inc. The results of the testing showed that the media and the system are performing well with no major adjustments required.

Table E-1: Phase 2 Year Five Emission Summary Table Based on Five-Year Meteorological Data (Summer 2019)

Sampling Season	Contaminant	Chemical Abstract Service Number	OCF Stack Measured Emission Rate	Air Dispersion Model Used*	Modelling Results Maximum Modelled Concentration	Modelling Results Modelled Concentration Location (Sensitive Receptor)	Averaging Period	MECP Limit	Limiting Effect	O.Reg. 419/05 Schedule #	Percentage of MECP Limit (%)
Summer 2019	Odour	N/A	745 OU/s	AERMOD version 16216r	0.21 OU	R65	10 min	1 OU	Odour	Internal MECP Guidance Level	21
					0.23 OU	R66	10 min	1 OU	Odour		23
					0.01 OU	R78	10 min	1 OU	Odour		1
					0.01 OU	R79	10 min	1 OU	Odour		1
					0.04 OU	R35	10 min	1 OU	Odour		4
					0.04 OU	R60	10 min	1 OU	Odour		4
	TRS	N/A	<0.0014 g/s	AERMOD version 16216r	<0.99 µg/m3	Property Line	10 min	13 µg/m^3	Odour	Schedule 3	<7.6
					<0.31 µg/m3	Property Line	24 hr	7 µg/m^3	Health	Schedule 3	<4.4
	Ammonia	7664-41-7	0.001 g/s	AERMOD version 16216r	0.22 µg/m3	Property Line	24 hr	100 µg/m^3	Health	Schedule 3	0.22

Notes: *N/A – "Not applicable". There is no Chemical Abstract Number for Odour and TRS.*
OU – Odour Unit

Table E-2: Phase 2 Year Three and Four Emission Summary Table Using Daily Meteorological Data (Summer 2017 and 2018)

Sampling Season	Contaminant	Chemical Abstract Service Number	OCF Stack Measured Emission Rate	Air Dispersion Model Used*	Modelling Results Maximum Modelled Concentration	Modelling Results Modelled Concentration Location (Sensitive Receptor)	Averaging Period	MECP Limit	Limiting Effect	O.Reg. 419/05 Schedule #	Percentage of MECP Limit (%)
Summer 2017	Odour	N/A	1,982 OU/s	AERMOD version 16216r	0 OU	R65	10 min	1 OU	Odour	Internal MECP Guidance Level	0
					0 OU	R66	10 min	1 OU	Odour		0
					0 OU	R78	10 min	1 OU	Odour		0
					0 OU	R79	10 min	1 OU	Odour		0
					0 OU	R35	10 min	1 OU	Odour		0
					0 OU	R60	10 min	1 OU	Odour		0
Summer 2018	Odour	N/A	933 OU/s	AERMOD version 16216r	0 OU	R65	10 min	1 OU	Odour	Internal MECP Guidance Level	0
					0 OU	R66	10 min	1 OU	Odour		0
					0 OU	R78	10 min	1 OU	Odour		0
					0 OU	R79	10 min	1 OU	Odour		0
					0 OU	R35	10 min	1 OU	Odour		0
					0 OU	R60	10 min	1 OU	Odour		0

Notes: *N/A – Not applicable. There is no Chemical Abstract Service Number for Odour.*
OU – Odour Unit

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1. Introduction

The Southeast Collector (SEC) Trunk Sewer system conveys municipal wastewater 15 kilometres from the intersection of the Ninth Line and Rouge Bank Drive in Markham, Ontario, to the intersection of Finch Avenue and Valley Farm Road in Pickering, Ontario. The operation of the system accommodates the future growth in York Region, and provides additional capacity for peak and extraneous flows. Furthermore, it increases redundancy to the existing York Durham Sewage System (YDSS) that is co-owned and co-managed by the Regional Municipalities of York and Durham (the Regions).

The system is equipped with an odour control system to reduce the creation of odour-containing compounds inside the trunk sewer, limit the corrosion of the sewer headspace/shafts, maintain the trunk sewer headspace under negative pressure, and collect and treat odour emissions before release to the natural environment. The four main components of the odour control system are the Corrosion Control Facility (CCF) at Shaft 13, the Odour Control Facility (OCF) at York-Durham Line, and the Air Handling Facilities (AHF) at Shaft 4 and at Shaft 6/7.

The system was commissioned on January 27th, 2015; it has been in operation for over five years.

1.1 Summary of Condition 9 Requirements and Updates

The SEC Trunk Sewer Individual Environmental Assessment (IEA) was approved on March 31, 2010 allowing the Regions to proceed with the undertaking, subject to 13 Conditions (74 sub-conditions) under the Minister of the Environment's Notice of Approval to Proceed with the Undertaking (Approval).

To address Condition 9 of the Approval, the Odour Management and Mitigation Plan (OMMP) was prepared and submitted to the Ministry of the Environment, Conservation and Parks[2] (MECP) on September 24, 2010. Subsequently, on December 5, 2014, an updated OMMP was submitted to include the respective Operation Manual for each of the four main components (CCF, OCF, Shaft 4 AHF and Shaft 6/7 AHF) of the odour control system prior to commissioning. On March 24, 2015, the MECP provided comments on the updated OMMP. These comments and outcomes from the annual meeting held on May 19, 2015 including all other subsequent MECP comments have

[2] Formerly Ministry of the Environment and Climate Change (MOECC) and Ministry of the Environment (MOE)

been fully addressed in the Revised Addendum to the updated OMMP dated June, 2016. There were no further comments from the MECP as per MECP letter of June 17, 2016.

As per Condition 9.3 (e), annual meetings with the MECP Director progressed at the project specific level until 2017, where the decision was made to move the Condition 9 discussion items into the Agenda of the regular quarterly liaison meetings between York Region and MECP at the senior management level.

This report is subsequent to five Annual Reports (July 27th, 2015, July 31st, 2016, July 31st, 2017, July 30th, 2018 and July 30th, 2019) and three Semi-Annual Reports (January 31st, 2016, January 31st, 2017 and January 31st, 2018)) prepared and submitted to satisfy Conditions 9.5 and 9.6 of the Approval. This Semi-Annual Condition 9 Report covers the period July 1st to December 31st, 2019. The semi-annual Condition 9 Report will be posted on the york.ca website as per condition 9.7.

One of the objectives of the OMMP is to conduct monitoring to confirm that the OCF meets the designed performance as set out in the SEC IEA.

The sampling program included sampling for odour, hydrogen sulphide (H_2S), ammonia (NH_3), and total reduced sulphur (TRS) compounds at six sensitive receptors and at the new OCF stack. The list of the sensitive receptors is provided in Table 1 below.

Table 1: Sensitive Receptors

Receptor	UTM Easting (m)	UTM Northing (m)	Description	Distance from OCF (m)
R65	646,958	4,857,619	Residence South of OCF near Shaft 9	325
R66	646,877	4,858,371	Residence North of OCF near Shaft 9	255
R78	651,557	4,856,578	Residence East of AHF at Shaft 4	85
R79	651,366	4,856,525	Residence Southwest of AHF at Shaft 4	110
R35	648,270	4,855,617	Residence Southwest of AHF at Shaft 6/7	400
R60	648,522	4,856,553	Residence North of AHF at Shaft 6/7	630

Condition 9 sampling program includes the following Phases and was conducted as per the Schedule shown in Table 2.

- **Phase 1**

  a) Pre-Operation Off-Site Ambient Monitoring
  b) Start-up of Operations Combined On-Site Source Monitoring and Off-Site Ambient Monitoring (2015)

- **Phase 2:** Post Operation Combined On-Site Source Monitoring and Off-Site Ambient Monitoring (2015-2019)

Table 2: Odour Testing Schedule

Phase	Description	Year	Total Number of Sampling Campaigns	Sampling Seasons	Status
1A	Pre-Operation – Ambient Air Monitoring	2012	3	Spring, Summer, Fall	Complete
		2013	3	Winter, Spring, Summer	Complete
1B	Start-up Operations – Ambient Air Monitoring and Air Emissions Testing	One	3	Spring, Summer, Fall (2015)	Complete
2	Post Operation – Ambient Air Monitoring and Air Emissions Testing	One	3	Spring, Summer, Fall (2015)	Complete
		Two	3	Spring, Summer, Fall (2016)	Complete
		Three	2	Early Spring, Summer (2017)	Complete
		Four	1	Summer (2018)	Complete
		Five	1	Summer (2019)	Complete

1.2 Purpose and Objective

This report is prepared in accordance with Conditions 9.5, and 9.6 of the Approval.

Specifically, Conditions 9.5, and 9.6 state:

9.5 The proponent shall prepare and submit twice annually to the Director, Regional Director and SeCAC (if applicable), Odour Management and Mitigation Monitoring Reports beginning six months following the commencement of operation of the undertaking.

9.6 The proponent shall include in each of the Odour Management and Mitigation Monitoring Reports submitted in accordance with Condition 9.5, a report on the performance of the technology used for odour control at the Odour Control Facility.

This report covers the period July 1st to December 31st, 2019 reporting requirements for Condition 9. The structure of the Report is set-up to follow the above conditions.

2. Odour Management and Mitigation Monitoring Reporting (Conditions 9.5 and 9.6)

2.1 Phase 2 Year Five Sampling

2.1.1 Ambient Sampling

The Phase 2 Year Five sampling was completed in Summer 2019.

Results of the Summer 2019 sampling showed that the odour concentrations in all samples collected were too low to be evaluated by the odour panel using the olfactometer. The sampling indicated that there were no occurrences of detectable odour at the receptors.

The MECP Technical Support Section in accordance with Condition 11.6 conducted an audit on August 13th, 2019 during the Summer 2019 campaign. The MECP staff witnessed ammonia and ambient odour sampling at a sensitive receptor identified as "R79" and confirmed that the sampling methods and procedures met all current MECP criteria for sampling requirements.

The table below summarized the results.

Table 3: Phase 2 Year Five Summer 2019 Odour Occurrences Above 1 OU

Receptor	Description	Number of Occurrences > 1 OU		
		Upwind	Downwind	Total
R65	Residence – South of OCF near Shaft 9	0	0	0
R66	Residence – North of OCF near Shaft 9	0	0	0
R78	Residence – East of AHF at Shaft 4	0	0	0
R79	Residence – Southwest of AHF at Shaft 4	0	0	0
R35	Residence – Southwest of AHF at Shaft 6/7	0	0	0
R60	Residence – North of AHF at Shaft 6/7	0	0	0
Total Occurrences		**0**	**0**	**0**
Total Number of Samples		**6***	**6****	**12*****
Percent of the number of Occurrences > 1 OU		**0%**	**0%**	**0%**

Notes: * *Calculated against six upwind receptor samples.*
** *Calculated against six downwind receptor samples.*
*** *Calculated against 12 total upwind and downwind receptor samples.*

As shown in Table 3, there were 0 occurrences out of 12 total samples where the odour concentrations were measured above 1 OU.

The results of the Summer 2019 sampling season for other contaminants showed:

- NH_3 concentrations varied between 0.043 to 0.156 ppm; and
- H_2S and TRS compounds were measured below detection limit of the instrument (0.01 ppm).

2.1.2 Stack Sampling and Dispersion Modelling

Results of the dispersion modelling for Summer 2019 showed the following:

- Based on five-year meteorological data:
  - Odour concentrations from 0.01 OU to 0.23 OU (1% to 23% of the internal MECP guidance level of 1 OU);
  - NH_3 concentration is 0.22 µg/m^3 (0.22% of the limit);
  - TRS Compounds concentrations based on 24-hour averaging period is <0.31 µg/m^3 (<4.4 µg/m^3 of the limit); and
  - TRS Compounds concentration based on 10-minute averaging period is <0.99 µg/m^3 (<7.6% of the limit).

The results for Summer 2019 based on daily meteorological data will be provided in the next report once the daily meteorological data for Summer 2019 is received from the MECP.

As noted in previous reports the daily meteorological data for AERMOD version 16216 for Summer 2017 and 2018 was requested from the MECP but was not received in time to be included in the respective semi-annual reports. The requested data for Summer 2017 and 2018 was received in March 2019 and has therefore been included in this semi-annual report.

- The dispersion modelling results based on daily meteorological data for Summer 2017 and 2018 sampling are as follows:
  - Odour concentration is 0 OU at all sensitive receptor locations (0% of the internal MOECC level of 1 OU)

The details of the inputs to the dispersion modeling results for Summer 2019 using the five-year meteorological data and the dispersion modeling results for Summer 2017 and 2018 using the daily meteorological data are provided in Tables 4 to 8. Note that inputs for Summer 2017 and Summer 2018 were previously reported, but have been included

again as a reference for the Summer 2017 and Summer 2018 dispersion modelling results using the daily meteorological data.

Table 4 is a MECP template which provides a summary of the sampling results for odour, TRS, and ammonia at the OCF stack during the time that sampling was conducted. The information provided in Table 4 was used as inputs to the dispersion model and represents the highest emissions rates of the sampled concentrations during each sampling event.

The ammonia emission rate is based on the sampled concentration at the OCF stack while the TRS is calculated following the MECP formula as the sum of the sampled emission rates of Hydrogen Sulphide, Methyl Mercaptan, Dimethyl Sulphide and Dimethyl Disulphide. The summary of the calculations is provided in Table 5.

Table 6 provides a summary of the odour sampling results during the day of sampling at each sensitive receptor location. Table 6 was used as input to the dispersion modelling when the daily meteorological data provided by the MECP on each day of sampling was used.

Table 7 is a MECP template that provides the summary of the results of the dispersion modelling based on the five-year meteorological data for Summer 2019. The table shows the highest emission rates of odour, TRS, and ammonia measured at the OCF stack when the ambient sampling at the identified sensitive receptor is conducted. The table also includes the results of the AERMOD dispersion model showing the maximum concentration of odour at each sensitive receptor location and the maximum concentrations of TRS and ammonia at the property line.

Table 8 is the summary of the dispersion modelling results for odour at each of the sensitive receptor locations using the daily meteorological data for Summer 2017 and Summer 2018 sampling.

Liquid sampling and sewage flow rates were collected at each stack testing conducted.

Table 4: Phase 2 Year Three, Four and Five Summer 2017, 2018 and 2019 Sampling Source Summary Table

Source Description	Sampling Season	OCF Stack Source Data				OCF Stack Emission Data						
		Flow-rate (m^3/s)	Exit Temp. (°C)	Diameter (m)	Height Above Grade (m)	Contaminant	Chemical Abstract Service Number	Maximum Emission Rate	Averaging Period	Estimating Technique	Data Quality	% of Overall Emissions (%)[1]
OCF Stack	Summer 2017	14.2	22.8	1.05	12	Odour	N/A	1,982 OU/s	10 min	ST	AA	100
						TRS	N/A	<0.0015 g/s	10 min & 24 hr	ST	AA	100
						Ammonia	7664-41-7	0.0014 g/s	24 hr	ST	AA	100
OCF Stack	Summer 2018	15.0	23.6	1.05	12	Odour	N/A	933 OU/s	10 min	ST	AA	100
						TRS	N/A	<0.0015 g/s	10 min & 24 hr	ST	AA	100
						Ammonia	7664-41-7	0.0022 g/s	24 hr	ST	AA	100
OCF Stack	Summer 2019	13.3	22.9	1.05	12	Odour	N/A	745 OU/s	10 min	ST	AA	100
						TRS	N/A	<0.0014 g/s	10 min & 24 hr	ST	AA	100
						Ammonia	7664-41-7	0.001 g/s	24 hr	ST	AA	100

Notes: *N/A – "Not applicable". There is no Chemical Abstract Number for Odour and TRS.*
OU – Odour Unit
ST – "Source Testing"
AA – "Above Average"
[1.] The OCF Stack is the only emission source and therefore represents 100% of the overall emissions at the OCF.

Table 5: Phase 2 Year Three, Four and Five Summer 2017, 2018 and 2019 OCF Stack Measured Total Reduced Sulphur Compounds and Ammonia Emission Rates

Sampling Season	Maximum Emission Rate (mg/s)				Maximum Emission Rate (g/s)	
	Hydrogen Sulphide	Methyl Mercaptan	Dimethyl Sulphide	Dimethyl Disulphide	TRS	Ammonia
Summer 2017	<0.21	<0.29	<0.38	<0.57	<0.0015	0.0014
Summer 2018	<0.22	<0.31	<0.40	<0.61	<0.0015	0.0022
Summer 2019	<0.20	<0.29	<0.37	<0.57	<0.0014	0.001

Table 6: Phase 2 Year Three, Four and Five Summer 2017, 2018 and 2019 Sampling Odour Source Summary Table

Source Description	Sampling Season	Location of Ambient Sampling	OCF Stack Source Data				OCF Stack Emission Data						
			Flow-rate (m^3/s)	Exit Temp. (°C)	Diameter (m)	Height Above Grade (m)	Contaminant	Chemical Abstract Service Number	Emission Rate (OU/s)	Averaging Period	Estimating Technique	Data Quality	% of Overall Emissions (%)[1]
OCF Stack	Summer 2017	R65	14.4	23.3	1.05	12	Odour	N/A	567	10 min	ST	AA	100
		R66	14.4	21.8	1.05	12	Odour	N/A	688	10 min	ST	AA	100
		R78	13.1	22.6	1.05	12	Odour	N/A	830	10 min	ST	AA	100
		R79	14.4	23.1	1.05	12	Odour	N/A	1,301	10 min	ST	AA	100
		R35	15.0	23.3	1.05	12	Odour	N/A	807	10 min	ST	AA	100
		R60	13.9	22.7	1.05	12	Odour	N/A	1,982	10 min	ST	AA	100
OCF Stack	Summer 2018	R65	15.1	22.8	1.05	12	Odour	N/A	933	10 min	ST	AA	100
		R66	14.3	23.4	1.05	12	Odour	N/A	516	10 min	ST	AA	100
		R78	14.6	24.1	1.05	12	Odour	N/A	420	10 min	ST	AA	100
		R79	16.1	23.0	1.05	12	Odour	N/A	571	10 min	ST	AA	100
		R35	14.3	24.4	1.05	12	Odour	N/A	511	10 min	ST	AA	100
		R60	15.4	23.8	1.05	12	Odour	N/A	301	10 min	ST	AA	100
OCF Stack	Summer 2019	R65	13.9	23.2	1.05	12	Odour	N/A	641	10 min	ST	AA	100
		R66	11.7	22.8	1.05	12	Odour	N/A	273	10 min	ST	AA	100
		R78	14.3	22.2	1.05	12	Odour	N/A	745	10 min	ST	AA	100
		R79	14.7	24.1	1.05	12	Odour	N/A	476	10 min	ST	AA	100
		R35	11.9	22.2	1.05	12	Odour	N/A	347	10 min	ST	AA	100
		R60	12.2	23.0	1.05	12	Odour	N/A	399	10 min	ST	AA	100

Table 7: Phase 2 Year Five Emission Summary Table Based on Five-Year Meteorological Data (Summer 2019)

Sampling Season	Contaminant	Chemical Abstract Service Number	OCF Stack Measured Emission Rate	Air Dispersion Model Used*	Modelling Results Maximum Modelled Concentration	Modelling Results Modelled Concentration Location (Sensitive Receptor)	Averaging Period	MECP Limit	Limiting Effect	O.Reg. 419/05 Schedule #	Percentage of MECP Limit (%)
Summer 2019	Odour	N/A	745 OU/s	AERMOD version 16216r	0.21 OU	R65	10 min	1 OU	Odour	Internal MECP Guidance Level	21
					0.23 OU	R66	10 min	1 OU	Odour		23
					0.01 OU	R78	10 min	1 OU	Odour		1
					0.01 OU	R79	10 min	1 OU	Odour		1
					0.04 OU	R35	10 min	1 OU	Odour		4
					0.04 OU	R60	10 min	1 OU	Odour		4
	TRS	N/A	<0.0014 g/s	AERMOD version 16216r	<0.99 µg/m3	Property Line	10 min	13 µg/m^3	Odour	Schedule 3	<7.6
					<0.31 µg/m3	Property Line	24 hr	7 µg/m^3	Health	Schedule 3	<4.4
	Ammonia	7664-41-7	0.001 g/s	AERMOD version 16216r	0.22 µg/m3	Property Line	24 hr	100 µg/m^3	Health	Schedule 3	0.22

Notes: *N/A – "Not applicable". There is no Chemical Abstract Number for Odour and TRS.*
OU – Odour Unit
Meteorological anomalies were not removed in the modelling.

Table 8: Phase 2 Year Three and Four Emission Summary Table Using Daily Meteorological Data (Summer 2017 and 2018)

Sampling Season	Contaminant	Chemical Abstract Service Number	OCF Stack Measured Emission Rate	Air Dispersion Model Used*	Modelling Results Maximum Modelled Concentration	Modelling Results Modelled Concentration Location (Sensitive Receptor)	Averaging Period	MECP Limit	Limiting Effect	O.Reg. 419/05 Schedule #	Percentage of MECP Limit (%)
Summer 2017	Odour	N/A	1,982 OU/s	AERMOD version 16216r	0 OU	R65	10 min	1 OU	Odour	Internal MECP Guidance Level	0
					0 OU	R66	10 min	1 OU	Odour		0
					0 OU	R78	10 min	1 OU	Odour		0
					0 OU	R79	10 min	1 OU	Odour		0
					0 OU	R35	10 min	1 OU	Odour		0
					0 OU	R60	10 min	1 OU	Odour		0
Summer 2018	Odour	N/A	933 OU/s	AERMOD version 16216r	0 OU	R65	10 min	1 OU	Odour	Internal MECP Guidance Level	0
					0 OU	R66	10 min	1 OU	Odour		0
					0 OU	R78	10 min	1 OU	Odour		0
					0 OU	R79	10 min	1 OU	Odour		0
					0 OU	R35	10 min	1 OU	Odour		0
					0 OU	R60	10 min	1 OU	Odour		0

Notes: *N/A – Not applicable. There is no Chemical Abstract Service Number for Odour.*
OU – Odour Unit

2.2 OCF Technology Performance

Performance testing of the odour control facility was conducted on July 18th, 2019 and September 5th, 2019 by the equipment supplier BIOREM Technologies Inc. (BIOREM).

The results of these performance tests are presented in this report.

The results of the tests showed that the moisture level of the biofilter media was slightly above the desired range. However, BIOREM noted that no immediate action is required at this time because the moisture levels are not in the range of concern. BIOREM will continue to monitor the media moisture levels and provide further recommendations to the Region as required.

Overall, the results of the testing are showing that the media and the system are in good shape and performing well without issues.

Table 2 below shows the average results of the samples taken during the date of testing.

Table 9: Summary of the SEC OCF Media Testing

Parameters	Desired Range	July 18, 2019	September 5, 2019
Moisture of Biofilter (%)	20 – 30	35.8 – 37.2	35.7 – 39.6
Moisture of Biotrickling Filter (%)	50 – 100	117.1 – 134.6	127.1 – 151.0
pH of Biofilter	5 – 9	6.75 – 7.76	8.7 – 8.73
pH of Biotrickling Filter	1 – 4	2.2 – 2.57	1.91 – 2.21
NO_3 (ppm)	-	<1 – 9.0	<0.5 – 4.0
Phosphorus (ppm)	-	<1 – 8.1	<1 – 9.5

2.3 Statement of Accommodation

Accessible formats or communication supports for this report are available upon request. Please contact Environmental Services Reception Desk at 1-877-464-9675 ext. 73000.