

Memo



Stantec

File: Durham-York Residual Waste Environmental Assessment (JW No. 1009497) Date: December 8, 2009

Reference: Revisions to Air Quality Technical Study Report (July 31, 2009)

The following memo outlines the revisions to the Air Quality Technical Study Report because of comments received during the consultation on the Durham / York Residual Waste Study Environmental Assessment submitted to the Ministry of the Environment July 31, 2009.

This memo is to be read in combination with the revised Air Quality Technical Study Report dated December 4, 2009.

PAGES I AND 40

In the description provided in the air quality report, the breakdown of the individual unit capacities contained a typographic error. The unit identified as having a capacity of 160,000 tonnes per year should actually be listed as 150,000 tonnes per year.

PAGE II

The discussion on odour detectability in the executive summary has been revised to include the following statements:

Odour emissions have historically been associated with waste processing facilities. The Facility design implicitly acknowledges this issue through the incorporation of odour mitigation measures for normal operation. Based on the proposed mitigation measures for odour control (e.g., enclosed loading, negative air pressure inside Facility, fully enclosed trucks), there is not expected to be substantive adverse environmental effects at off-property locations due to the onsite operations.

An odour mitigation plan will be developed after detailed design of the facility has been completed to address odour during normal operations, start-ups and shut-downs as well non-routine occurrences (process upsets). The odour mitigation plan will be submitted to the MOE during the environmental permitting process for the Facility.

PAGE 5

The description of the Air Quality Study Area (AQSA) contained a typographical error. The description of the AQSA should read as follows:

Reference: Revisions to Air Quality Technical Study Report (July 31, 2009)

For the purpose of this Technical Study Report, an AQSA was defined to suit the assessment needs. The AQSA was defined as an area approximately 20 km to the east and west of the Site, 10 km to the south (extending into Lake Ontario) and 20 km to the north of the Site. The overall dimensions of the AQSA were 40 km by 30 km.

PAGES 50-54

In the header to Table 4-2, the 2nd column from the right was miss-labelled Scenario 1A – MCR but should be labelled Scenario 1B – MCR (see corrected table header below).

Table 0-1 Maximum Facility HAP Emissions during Normal Operation (Scenarios 1 and 2)

Contaminant	Units	140,000 tpy Facility		400,000 tpy Facility	
		Scenario 1A - MCR	Scenario 2A - MCTD	Scenario 1B - MCR	Scenario 2B - MCTD

PAGES 57-58, SECTION 4.2.3

The discussion on odour emissions sources and controls in the proposed Facility has been expanded to include additional detail.

PAGES 76-76, SECTION 5.2.4

A new sub-section (5.2.4) has been added to Section 5 (Facility Design and Mitigation Measures) which addresses aspects of the facility design that mitigate odour emissions during normal operations. Development of an odour mitigation plan to address potential non-routine odour emissions is also discussed.

TABLES 7-7 AND 7-8

There was an error in Tables 7-7 and 7-8 in the metals section of each table, in which the background concentration for a different averaging period was added to the maximum predicted concentration. Excerpts of these tables, providing the corrected maximum cumulative metals concentrations (facility plus background) are provided below. This error only occurred in Tables 7-7 and 7-8 (summary tables) - the cumulative predictions presented in all other results tables and report appendices are correct.

Reference: Revisions to Air Quality Technical Study Report (July 31, 2009)

Table 0-1 Summary of Maximum Predicted Metals Concentrations at Special Receptors - Scenario 1B (MCR 400,000 tpy Facility).

Contaminant	Averaging Period	Criteria ¹ (µg/m ³)	Background Concentration (µg/m ³)	Maximum Predicted Concentration (µg/m ³)	Total Concentration (Facility + Background) (µg/m ³)	% of Criteria	Special receptor #	Description	UTM N (m)	UTM E (km)
Metals										
Aluminum	1 Hr		0.52	0.04	0.56		266	Future Industrial 8	680.40	4860.73
	24 Hr ⁴	4.8	0.21	4.66E-03	0.22	5%	266	Future Industrial 8	680.40	4860.73
	Annual		0.11	1.22E-04	0.11		7	ECO 7	681.58	4862.07
Antimony	1 Hr		7.35E-03	2.68E-03	0.01		266	Future Industrial 8	680.40	4860.73
	24 Hr	25	3.02E-03	3.21E-04	3.34E-03	<0.1%	266	Future Industrial 8	680.40	4860.73
	Annual		2.93E-03	8.43E-06	2.94E-03		7	ECO 7	681.58	4862.07
Arsenic	1 Hr		4.41E-03	4.12E-04	4.82E-03		266	Future Industrial 8	680.40	4860.73
	24 Hr ²	0.3	1.81E-03	4.92E-05	1.86E-03	1%	266	Future Industrial 8	680.40	4860.73
	Annual		1.80E-03	1.29E-06	1.80E-03		7	ECO 7	681.58	4862.07
Barium	1 Hr		0.02	2.07E-03	0.02		266	Future Industrial 8	680.40	4860.73
	24 Hr ²	10	8.18E-03	2.48E-04	8.43E-03	<0.1%	266	Future Industrial 8	680.40	4860.73
	Annual		4.95E-03	6.51E-06	4.96E-03		7	ECO 7	681.58	4862.07
Beryllium	1 Hr		7.35E-04	3.26E-04	1.06E-03		266	Future Industrial 8	680.40	4860.73
	24 Hr	0.01	3.02E-04	3.90E-05	3.41E-04	3%	266	Future Industrial 8	680.40	4860.73
	Annual		2.98E-04	1.03E-06	2.99E-04		7	ECO 7	681.58	4862.07
Boron	1 Hr		0.19	0.15	0.34		266	Future Industrial 8	680.40	4860.73
	24 Hr	120	0.08	0.02	0.09	<0.1%	266	Future Industrial 8	680.40	4860.73
	Annual		0.02	4.71E-04	0.02		7	ECO 7	681.58	4862.07
Cadmium (Cd)	1 Hr		1.47E-03	6.86E-03	8.33E-03		266	Future Industrial 8	680.40	4860.73
	24 Hr	0.025	6.04E-04	8.20E-04	1.42E-03	6%	266	Future Industrial 8	680.40	4860.73
	Annual ³	0.005	6.01E-04	2.15E-05	6.22E-04	12%	7	ECO 7	681.58	4862.07

Reference: Revisions to Air Quality Technical Study Report (July 31, 2009)

Table 0-1 Summary of Maximum Predicted Metals Concentrations at Special Receptors - Scenario 1B (MCR 400,000 tpy Facility).

Contaminant	Averaging Period	Criteria ¹ (µg/m ³)	Background Concentration (µg/m ³)	Maximum Predicted Concentration (µg/m ³)	Total Concentration (Facility + Background) (µg/m ³)	% of Criteria	Special receptor #	Description	UTM N (m)	UTM E (km)
Cadmium and Thallium (Cd + Th)	1 Hr			0.05			266	Future Industrial 8	680.40	4860.73
	24 Hr			5.39E-03			266	Future Industrial 8	680.40	4860.73
	Annual			1.42E-04			7	ECO 7	681.58	4862.07
Chromium (hexavalent)	1 Hr			3.14E-04			266	Future Industrial 8	680.40	4860.73
	24 Hr			3.75E-05			266	Future Industrial 8	680.40	4860.73
	Annual			9.85E-07			7	ECO 7	681.58	4862.07
Total Chromium (and compounds)	1 Hr		6.72E-03	2.20E-03	8.92E-03		266	Future Industrial 8	680.40	4860.73
	24 Hr ³	1.5	2.76E-03	2.64E-04	3.02E-03	<0.1%	266	Future Industrial 8	680.40	4860.73
	Annual		1.71E-03	6.92E-06	1.72E-03		7	ECO 7	681.58	4862.07
Cobalt	1 Hr		1.47E-03	5.68E-03	7.15E-03		266	Future Industrial 8	680.40	4860.73
	24 Hr ³	0.1	6.04E-04	6.79E-04	1.28E-03	1%	266	Future Industrial 8	680.40	4860.73
	Annual		5.96E-04	1.78E-05	6.13E-04		7	ECO 7	681.58	4862.07
Lead (Pb)	1 Hr		0.01	0.05	0.06		266	Future Industrial 8	680.40	4860.73
	24 Hr	0.5	4.98E-03	5.86E-03	0.01	2%	266	Future Industrial 8	680.40	4860.73
	Annual		3.29E-03	1.54E-04	3.44E-03		7	ECO 7	681.58	4862.07
Mercury (Hg) - Vapour/Particulate phase	1 Hr			0.01			266	Future Industrial 8	680.40	4860.73
	24 Hr	2		1.76E-03		<0.1%	266	Future Industrial 8	680.40	4860.73
	Annual			4.62E-05			7	ECO 7	681.58	4862.07
Nickel	1 Hr		0.01	0.09	0.10		266	Future Industrial 8	680.40	4860.73
	24 Hr	2	4.49E-03	0.01	0.01	<1.1%	266	Future Industrial 8	680.40	4860.73
	Annual		2.24E-03	2.68E-04	2.51E-03		7	ECO 7	681.58	4862.07
Phosphorus	1 Hr		0.18	0.05	0.22		266	Future Industrial 8	680.40	4860.73

Reference: Revisions to Air Quality Technical Study Report (July 31, 2009)

Table 0-1 Summary of Maximum Predicted Metals Concentrations at Special Receptors - Scenario 1B (MCR 400,000 tpy Facility).

Contaminant	Averaging Period	Criteria ¹ (µg/m ³)	Background Concentration (µg/m ³)	Maximum Predicted Concentration (µg/m ³)	Total Concentration (Facility + Background) (µg/m ³)	% of Criteria	Special receptor #	Description	UTM N (m)	UTM E (km)
	24 Hr ⁴	0.35	0.07	5.39E-03	0.08	22%	266	Future Industrial 8	680.40	4860.73
	Annual		0.05	1.42E-04	0.05		7	ECO 7	681.58	4862.07
Silver	1 Hr		8.33E-04	3.28E-03	4.12E-03		266	Future Industrial 8	680.40	4860.73
	24 Hr	1	3.42E-04	3.93E-04	7.35E-04	<0.1%	266	Future Industrial 8	680.40	4860.73
	Annual		3.43E-04	1.03E-05	3.54E-04		7	ECO 7	681.58	4862.07
Selenium	1 Hr		7.35E-03	4.70E-04	7.82E-03		266	Future Industrial 8	680.40	4860.73
	24 Hr ²	10	3.02E-03	5.62E-05	3.07E-03	<0.1%	266	Future Industrial 8	680.40	4860.73
	Annual		2.93E-03	1.48E-06	2.93E-03		7	ECO 7	681.58	4862.07
Thallium	1 Hr			0.04			266	Future Industrial 8	680.40	4860.73
	24 Hr ⁴	0.24		4.57E-03		<0.1%	266	Future Industrial 8	680.40	4860.73
	Annual			1.20E-04			7	ECO 7	681.58	4862.07
Tin	1 Hr		7.35E-03	0.02	0.02		266	Future Industrial 8	680.40	4860.73
	24 Hr	10	3.02E-03	2.06E-03	5.08E-03	<0.1%	266	Future Industrial 8	680.40	4860.73
	Annual		2.93E-03	5.42E-05	2.98E-03		7	ECO 7	681.58	4862.07
Vanadium	1 Hr		3.77E-03	1.14E-03	4.91E-03		266	Future Industrial 8	680.40	4860.73
	24 Hr	2	1.55E-03	1.36E-04	1.69E-03	<0.1%	266	Future Industrial 8	680.40	4860.73
	Annual		7.70E-04	3.58E-06	7.73E-04		7	ECO 7	681.58	4862.07
Zinc	1 Hr		0.10	0.20	0.30		266	Future Industrial 8	680.40	4860.73
	24 Hr	120	0.04	0.02	0.07	<0.1%	266	Future Industrial 8	680.40	4860.73
	Annual		0.03	6.14E-04	0.03		7	ECO 7	681.58	4862.07
Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn,	1 Hr		0.52	0.45	0.97		266	Future Industrial 8	680.40	4860.73
	24 Hr		0.21	0.05	0.27		266	Future Industrial 8	680.40	4860.73

Reference: Revisions to Air Quality Technical Study Report (July 31, 2009)

Table 0-1 Summary of Maximum Predicted Metals Concentrations at Special Receptors - Scenario 1B (MCR 400,000 tpy Facility).

Contaminant	Averaging Period	Criteria ¹ (µg/m3)	Background Concentration (µg/m3)	Maximum Predicted Concentration (µg/m3)	Total Concentration (Facility + Background) (µg/m3)	% of Criteria	Special receptor #	Description	UTM N (m)	UTM E (km)
Sb)	Annual		0.11	1.42E-03	0.11		7	ECO 7	681.58	4862.07

Note 1:

¹ Reg419/05 Schedule 3 Criteria unless stated otherwise

² O. Reg. 419 Guidelines

³ Ontario's ambient air quality criteria

⁴ Jurisdictional Screening Level List (JSL)

⁵ National Ambient Air Quality Objectives (NAAQO) Max Desirable Level



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Table 0-2 Summary of Maximum Predicted Metals Concentrations at the Special Receptors - Scenario 2B (MCTD 400,000 tpy Facility)

Contaminant	Averaging Period	Criteria ¹ (µg/m ³)	Background Concentration (µg/m ³)	Maximum Predicted Concentration (µg/m ³)	Total Concentration (Facility + Background) (µg/m ³)	% of Criteria	Special receptor #	Description	UTM N (m)	UTM E (km)
Metals										
Aluminum	1 Hr		0.52	0.03	0.55		273	Future Industrial 11	680.25	4860.26
	24 Hr ⁴	4.8	0.21	4.60E-03	0.22	5%	266	Future Industrial 8	680.40	4860.73
Antimony	1 Hr		7.35E-03	2.35E-03	9.70E-03		273	Future Industrial 11	680.25	4860.26
	24 Hr	25	3.02E-03	3.17E-04	3.33E-03	<0.1%	266	Future Industrial 8	680.40	4860.73
Arsenic	1 Hr		4.41E-03	3.61E-04	4.77E-03		273	Future Industrial 11	680.25	4860.26
	24 Hr ²	0.3	1.81E-03	4.87E-05	1.86E-03	1%	266	Future Industrial 8	680.40	4860.73
Barium	1 Hr		0.02	1.82E-03	0.02		273	Future Industrial 11	680.25	4860.26
	24 Hr ²	10	8.18E-03	2.45E-04	8.43E-03	<0.1%	266	Future Industrial 8	680.40	4860.73
Beryllium	1 Hr		7.35E-04	2.86E-04	1.02E-03		273	Future Industrial 11	680.25	4860.26
	24 Hr	0.01	3.02E-04	3.86E-05	3.41E-04	3%	266	Future Industrial 8	680.40	4860.73
Boron	1 Hr		0.19	0.13	0.32		273	Future Industrial 11	680.25	4860.26
	24 Hr	120	0.08	0.02	0.09	<0.1%	266	Future Industrial 8	680.40	4860.73
Cadmium (Cd)	1 Hr		1.47E-03	6.01E-03	7.48E-03		273	Future Industrial 11	680.25	4860.26
	24 Hr	0.025	6.04E-04	8.11E-04	1.41E-03	6%	266	Future Industrial 8	680.40	4860.73
Cadmium and Thallium (Cd + Th)	1 Hr			0.04			273	Future Industrial 11	680.25	4860.26
	24 Hr			5.33E-03			266	Future Industrial 8	680.40	4860.73
Chromium (hexavalent)	1 Hr			2.75E-04			273	Future Industrial 11	680.25	4860.26
	24 Hr			3.71E-05			266	Future Industrial 8	680.40	4860.73
Total Chromium (and compounds)	1 Hr		6.72E-03	1.93E-03	8.65E-03		273	Future Industrial 11	680.25	4860.26
	24 Hr ³	1.5	2.76E-03	2.61E-04	3.02E-03	<0.1%	266	Future Industrial 8	680.40	4860.73

Reference: Revisions to Air Quality Technical Study Report (July 31, 2009)

Table 0-2 Summary of Maximum Predicted Metals Concentrations at the Special Receptors - Scenario 2B (MCTD 400,000 tpy Facility)

Contaminant	Averaging Period	Criteria ¹ (µg/m ³)	Background Concentration (µg/m ³)	Maximum Predicted Concentration (µg/m ³)	Total Concentration (Facility + Background) (µg/m ³)	% of Criteria	Special receptor #	Description	UTM N (m)	UTM E (km)
Cobalt	1 Hr		1.47E-03	4.98E-03	6.45E-03		273	Future Industrial 11	680.25	4860.26
	24 Hr ³	0.1	6.04E-04	6.71E-04	1.28E-03	1%	266	Future Industrial 8	680.40	4860.73
Lead (Pb)	1 Hr		0.01	0.04	0.06		273	Future Industrial 11	680.25	4860.26
	24 Hr	0.5	4.98E-03	5.79E-03	0.01	2%	266	Future Industrial 8	680.40	4860.73
Mercury (Hg) - Vapour/Particulate phase	1 Hr			0.01			273	Future Industrial 11	680.25	4860.26
	24 Hr	2		1.74E-03		<0.1%	266	Future Industrial 8	680.40	4860.73
Nickel	1 Hr		0.01	0.07	0.09		273	Future Industrial 11	680.25	4860.26
	24 Hr	2	4.49E-03	0.01	0.01	<1.1%	266	Future Industrial 8	680.40	4860.73
Phosphorus	1 Hr		0.18	0.04	0.21		273	Future Industrial 11	680.25	4860.26
	24 Hr ⁴	0.35	0.07	5.33E-03	0.08	22%	266	Future Industrial 8	680.40	4860.73
Silver	1 Hr		8.33E-04	2.88E-03	3.71E-03		273	Future Industrial 11	680.25	4860.26
	24 Hr	1	3.42E-04	3.88E-04	7.30E-04	<0.1%	266	Future Industrial 8	680.40	4860.73
Selenium	1 Hr		7.35E-03	4.12E-04	7.76E-03		273	Future Industrial 11	680.25	4860.26
	24 Hr ²	10	3.02E-03	5.56E-05	3.07E-03	<0.1%	266	Future Industrial 8	680.40	4860.73
Thallium	1 Hr			0.03			273	Future Industrial 11	680.25	4860.26
	24 Hr ⁴	0.24		4.52E-03		<0.1%	266	Future Industrial 8	680.40	4860.73
Tin	1 Hr		7.35E-03	0.02	0.02		273	Future Industrial 11	680.25	4860.26
	24 Hr	10	3.02E-03	2.04E-03	5.06E-03	<0.1%	266	Future Industrial 8	680.40	4860.73
Vanadium	1 Hr		3.77E-03	9.99E-04	4.77E-03		273	Future Industrial 11	680.25	4860.26
	24 Hr	2	1.55E-03	1.35E-04	1.68E-03	<0.1%	266	Future Industrial 8	680.40	4860.73
Zinc	1 Hr		0.10	0.17	0.27		273	Future Industrial 11	680.25	4860.26
	24 Hr	120	0.04	0.02	0.07	<0.1%	266	Future Industrial 8	680.40	4860.73
Sum of (As, Ni, Co,	1 Hr		0.52	0.40	0.91		273	Future Industrial 11	680.25	4860.26

Reference: Revisions to Air Quality Technical Study Report (July 31, 2009)

Table 0-2 Summary of Maximum Predicted Metals Concentrations at the Special Receptors - Scenario 2B (MCTD 400,000 tpy Facility)

Contaminant	Averaging Period	Criteria ¹ (µg/m ³)	Background Concentration (µg/m ³)	Maximum Predicted Concentration (µg/m ³)	Total Concentration (Facility + Background) (µg/m ³)	% of Criteria	Special receptor #	Description	UTM N (m)	UTM E (km)
Pb, Cr, Cu, V, Mn, Sb)	24 Hr		0.21	0.05	0.26		266	Future Industrial 8	680.40	4860.73

Note 1:

¹ Reg419/05 Schedule 3 Criteria unless stated otherwise

² O. Reg. 419 Guidelines

³ Ontario's ambient air quality criteria

⁴ Jurisdictional Screening Level List (JSL)

⁵ National Ambient Air Quality Objectives (NAAQO) Max Desirable Level

Reference: Revisions to Air Quality Technical Study Report (July 31, 2009)

TABLE 7-13

A typo in the input file for the PM_{2.5} run for the facility plus on-site vehicle traffic has been corrected, the model re-run and the updated PM_{2.5} results are presented in the following table. The maximum predicted 24-hour-average PM_{2.5} concentration due to the Facility alone increased by 0.7 µg/m³ (10% greater than the previously predicted level). When cumulative environmental effects were considered by adding background levels to the maximum predicted GLC for PM_{2.5}, the total predicted maximum GLC (with background) increased by less than 0.1% above the previously predicted level. The maximum predicted concentration (with background) is still below the applicable limit and the change in model predictions for this scenario does not affect the results or conclusions of the Air Quality Assessment.

Reference: Revisions to Air Quality Technical Study Report (July 31, 2009)

Table 0-1 Summary of Maximum Predicted Ground Level Concentrations over the Special Receptors due to the 140,000 tpy Facility Stationary Sources (Scenario 1A, MCR) and Onsite Vehicle Traffic.

Contaminant	CAS #	Averaging Period	Criteria ¹ (µg/m ³)	Background Concentration (µg/m ³)	Maximum Predicted Concentration (µg/m ³)	Total Concentration (Facility + background) (µg/m ³)	% of Criteria	Special Receptor #	Description	UTM E (km)	UTM N (km)
Sulphur Dioxide (SO ₂)	7446-09-5	1 Hr	900	19.5	19.60	39.1	4%	273	Future Industrial 11	680.25	4860.26
		24 Hr	300	19.3	2.29	21.6	7%	266	Future Industrial 8	680.40	4860.73
		Annual	60	5.9	0.05	6.0	10%	7	ECO 7	681.58	4862.07
Nitrogen Dioxide (NO ₂)	10102-44-0	1 Hr	400	64.6	67.71	132.3	33%	273	Future Industrial 11	680.25	4860.26
		24 Hr	200	58.2	7.98	66.2	33%	266	Future Industrial 8	680.40	4860.73
		Annual	100	37	0.18	37.2	37%	282	Farmer	681.39	4861.67
Carbon Monoxide (CO)	630-08-0	1 Hr	35000	1035	45.81	1081.2	3%	265	Future Industrial 7	680.82	4860.22
		8 Hr	15700	1036	8.30	1044.3	7%	266	Future Industrial 8	680.40	4860.73
		24 Hr		1029	3.07	1032.1		266	Future Industrial 8	680.82	4860.22
		Annual		632	0.14	631.8		265	Future Industrial 7	680.82	4860.22
Particulate Matter (PM _{2.5})	PM _{2.5}	1 Hr		22.8	5.92	28.7		14	Future Industrial 10	680.61	4860.72
		24 Hr	30 ²	20.4	0.71	21.1	70%	266	Future Industrial 8	680.40	4860.73
		Annual		9.8	0.03	9.8		265	Future Industrial 7	680.82	4860.22

Notes:

¹ Federal NAAQO Maximum Acceptable Levels unless otherwise noted

² Canada Wide Standard

³ Ontario's ambient air quality criteria

Reference: Revisions to Air Quality Technical Study Report (July 31, 2009)

PAGE 281 – SUMMARY AND CONCLUSIONS

Details on the development of an odour mitigation plan have been added to the discussion on odour detectability.

APPENDIX A – SECTION A2-3

A revised Table A2-5 incorporating reviewer comments is presented below. Please note that the values in this table and subsequent figures and tables in this section of the report have been updated to reflect additional QA of the data based on reviewer comments.

Table A0-1 Summary of Ambient PM_{2.5} Measurements (µg/m³)

Averaging Period	AAQC		Value
1 hour	-	Maximum measured	65
24 hour	30 ⁽¹⁾	Maximum measured	40.4
		98 th percentile measurement ⁽²⁾	28.6 ⁽²⁾
		Minimum	1.7
		Median	10.2
		Standard Deviation	6.5
		# of Exceedances ⁽²⁾	0
Annual	N/A	Average	10.2 ⁽³⁾
		# of Exceedances	N/A

Notes:

1 – Canada Wide Standard (based on the maximum 98th percentile of the daily average values over the most recent 3 consecutive years)

2 – Based on 98th percentile measurement for comparison to the CWS

3 – Value previously reported as 9.8 in the July version of the report and updated due to additional QA of the monitoring data. Due to the minor change in magnitude, the background annual concentration used in this report was not updated from the value previously used in the July version of the report.

APPENDIX A – SECTION A2-4

Table A2-7 and subsequent figures and tables in the section have been revised to incorporate additional QA of the ozone data based on reviewer comments.