

Memo



Stantec

File: Durham-York Residual Waste Environmental Assessment
(JW No. 1009497) Date: December 10, 2009

Reference: Revisions to Site Specific Human Health and Ecological Risk Assessment (July 31, 2009)

The following memo outlines minor revisions to the Site Specific Human Health and Ecological Risk Assessment (HHERA) based on commitments made to response to 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 Site Specific Human Health and Ecological Risk Assessment updated and submitted to the MOE December 10, 2009 with these revisions incorporated.

Required Changes or Amendments Based on Changes to Air Quality Technical Study

Changes that were made to the Air Quality Technical Study are detailed in their memo dated November 27, 2009. The following section clarifies where any of these changes could have impacted the HHERA and what was updated or not in the updated HHERA report.

Tables 7-7 and 7-8 of the Air Quality Technical Study

The Air Quality Technical Study had made a calculation error in the metals section of these tables in the report during the addition of background concentrations to the maximum predicted concentration to provide the "Total Concentration (Facility + Background)". However, the HHERA team used the raw data in the results file to separately generate our own Project Case – Background + Project Emissions. Therefore, this addition error was not carried forward in the HHERA and did not affect the reporting of the metal results in the HHERA. Thus no changes are required.

Table 7-13

A typo in the input file for the PM_{2.5} run for the facility plus on-site vehicle traffic for the 140,000 tpy scenario has been corrected and the Air Quality Team has provided the HHERA Team with the model re-run and the updated PM_{2.5}. This did not impact the 400,000 tpy scenario.

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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 or the HHERA. This could have impacted only Table 7-22 of the HHERA and Appendix E-5. However, as shown in the Table 1-1 the concentration change for the traffic case affected only the 4th significant figure. Given that CRs were reported to 2 significant figures there is no change in the resulting CR value. Hence, Table 7-22 and Appendix E-5 were not updated.

Table 1-1 Updated Results for PM_{2.5} On-site Vehicle Traffic updated Results

Chemical	Averaging Period	Baseline Traffic Case		Traffic Case	
		July 31, 2009	December 10, 2009	July 31, 2009	December 10, 2009
Particulate Matter PM _{2.5} ug/m ³	1 Hr	30.29	30.29	32.61	32.66
	24 Hr ³	21.12	21.12	21.64	21.66
	Annual	9.92	9.92	9.93	9.93

There were no other changes or technical updates from the Air Quality Technical Report that require additional work on behalf of the HHERA Technical Report.

Required Changes or Amendments Based Comments Received on the HHERA July 31, 2009 HHERA Technical Study Report

MOE Comment on TRVs to be Reviewed where Air Quality Benchmarks were Used.

Pertaining to comments received from the MOE, a full review of inhalation benchmarks, guidelines, standards and criteria was performed such that the most appropriate TRVs are used in the HHRA. This process involved, verifying the underlying rationale behind each TRV labeled benchmark to determine the true nature of the value. Additionally, for each chemical where an air quality benchmark was used to calculate a concentration ratio (CR), a search of TRV values from recognized regulatory bodies such as the MOE, US EPA IRIS, Health Canada, ATSDR Minimum Risk Levels (MRL), California EPA, and RIVM was conducted to ensure that where available a reference concentration (RfC) TRV it took precedent over the use of a benchmark.

Table 1-2 provides the results for those chemicals and averaging times where benchmarks or RfCs were updated. For the remaining chemicals, either the existing

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RfCs were deemed to continue to be protective of health, or there were no RfCs available for those previously reported benchmarks.

Table 1-2 Updated Inhalation Toxicological Reference Values

COPC	Exposure Period	Previous TRV (µg/m³)	New TRV (µg/m³)
Ammonia	1-hour	3200 (CalEPA, 2008)	1182 (ATSDR, 2004)
Boron	1-hour	50 (TCEQ, 2009)	10 (ATSDR, 2007)
Acetaldehyde	1-hour	Not Evaluated	470 (CalEPA, 2008)
Formaldehyde	24-hour	65 (MOE, 2008)	9 (CalEPA, 2008)
1,1,2-trichloroethylene	Annual	54 (TCEQ, 2009)	2.3 (MOE, 2008)

As demonstrated in Tables 1-3 and 1-4, use of the updated TRVs values did change the findings of the HHRA inhalation assessment. All risk estimates for these five COPC remain below the threshold concentration ratio of 1, and therefore, emissions of these COPC from the facility are not anticipated to pose an undue risk to receptors in the Local Risk Assessment Study Area.

The results tables within the HHERA report have not been updated in the main body of the report as this would reflect considerable effort to do so and given that it does not impact the overall findings or conclusions of the report. However, this discussion contained in the Ammended HHERA memo have been included as Section 7.14.1 of the HHERA Technical Study Report dated December 10, 2009 and all updated results are now included as Appendix I sections 11 through 14.

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Table 1-3 Updated Inhalation Exposure Results at Maximum Ground Level Concentration – 140,000 tpy

COPC	Exposure Period	Air Concentration at Maximum GLC – Project Alone Case (µg/m ³)	Air Concentration at Maximum GLC – Process Upset Case (µg/m ³)	Previous CR Results					Updated CR Results				
				Baseline Case	Project Alone Case	Project Case	Process Upset Case	Process Upset Project Case	Baseline Case	Project Alone Case	Project Case	Process Upset Case	Process Upset Project Case
Ammonia	1-hour	2.0	20	-	6.1E-04	6.1E-04	0.0061	0.0061	-	0.0017	0.0017	0.017	0.017
Boron	1-hour	0.055	0.55	0.0037	0.0011	0.0048	0.011	0.015	0.019	0.0055	0.024	0.055	0.074
Acetaldehyde	1-hour	2.6E-07	2.6E-06	-	-	-	-	-	0.0091	5.6E-10	0.0091	5.6E-09	0.0091
Formaldehyde	24-hour	0.0024	0.024	0.052	3.7E-05	0.052	3.7E-04	0.052	0.38	2.6E-04	0.38	0.0026	0.38
1,1,2-trichloroethylene	Annual	7.1E-07	2.0E-06	0.0050	1.3E-08	0.0050	3.7E-08	0.0050	0.12	3.1E-07	0.12	8.7E-07	0.12

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Table 1-4 Updated Inhalation Exposure Results at Maximum Ground Level Concentration – 400,000 tpy

COPC	Exposure Period	Air Concentration at Maximum GLC – Project Alone Case ($\mu\text{g}/\text{m}^3$)	Air Concentration at Maximum GLC – Process Upset Case ($\mu\text{g}/\text{m}^3$)	Previous CR Results					Updated CR Results				
				Baseline Case	Project Alone Case	Project Case	Process Upset Case	Process Upset Project Case	Baseline Case	Project Alone Case	Project Case	Process Upset Case	Process Upset Project Case
Ammonia	1-hour	4.2	33	-	0.0013	0.0013	0.010	0.010	-	0.0036	0.0036	0.028	0.028
Boron	1-hour	0.12	0.94	0.0037	0.0024	0.0061	0.019	0.023	0.019	0.012	0.031	0.094	0.11
Acetaldehyde	1-hour	4.2E-07	3.3E-06	-	-	-	-	-	0.0091	8.9E-10	0.0091	6.9E-09	0.0091
Formaldehyde	24-hour	0.0045	0.035	0.052	6.9E-05	0.052	5.4E-04	0.053	0.38	5.0E-04	0.38	0.0039	0.38
1,1,2-trichloroethylene	Annual	1.6E-06	4.4E-06	0.0050	2.9E-08	0.0050	8.2E-08	0.0050	0.12	6.9E-07	0.12	1.9E-06	0.12

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Baseline Air Quality Results for NO₂ being Similar to those Elsewhere in Ontario

A public comment was received on September 25th, 2009, requesting that data be provided to support the statement that any urban area in Ontario would have similar baseline results for nitrogen dioxide (NO₂) when compared to the Local Risk Assessment Study Area. Figure 1-1, obtained from Appendix A of the Air Quality Assessment Technical Study Report (submitted to the MOE on July 31, 2009), compares measured NO₂ levels at the Courtice Road monitoring station with measurements from selected ambient monitoring sites operated by the MOE across southwestern Ontario. A brief discussion has been added to Section 7.9.1.2 of the HHERA Technical Study Report dated December 10, 2009.

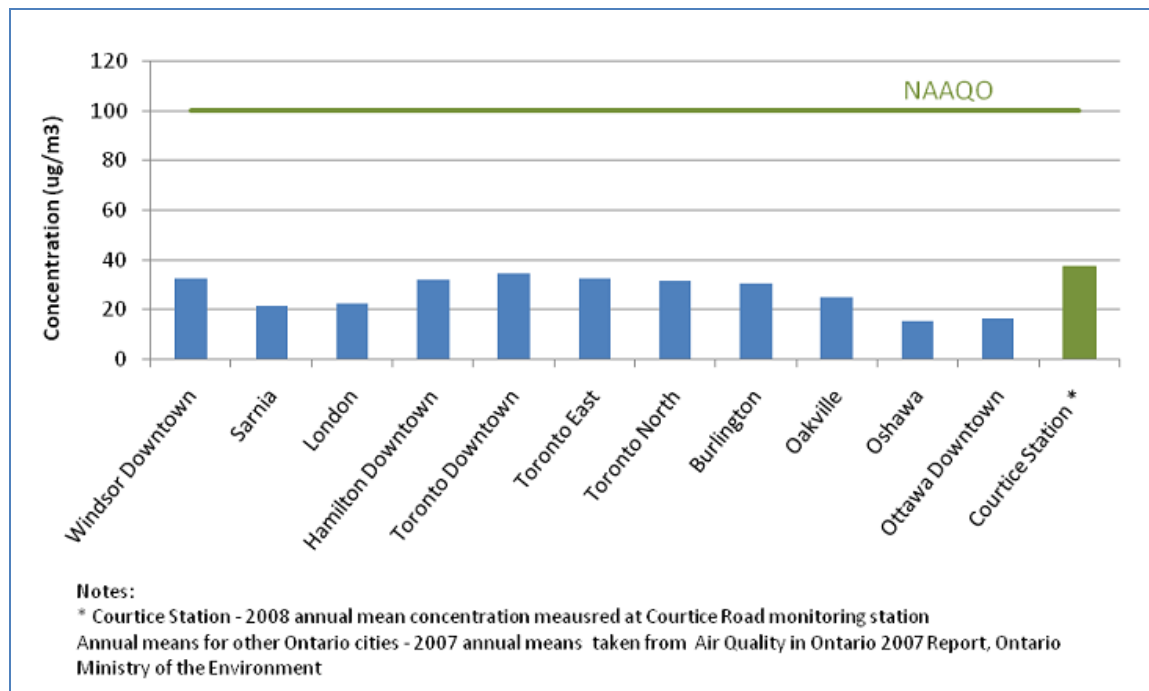


Figure 1-1 Comparison of NO₂ levels in Southwestern Ontario (Figure A-2-4 of Appendix A, Air Quality Assessment Technical Study Report - July 31st, 2009)

As stated in the Air Quality Assessment Technical Study Report,

The measured annual NO₂ level at the Courtice Road station was similar to that in other urbanized areas of Ontario such as Toronto, Hamilton and Windsor, and was well below the annual NAAQO maximum acceptable level of 100 µg/m³.

Quantitative Assessment of Emissions from the Highway 407 Expansion

In a separate public comment, it was acknowledged that the Air Quality Assessment Technical Study Report provided quantitative estimates of overall emissions from the proposed Highway 407 expansion located near the site of the facility, and it was requested that a quantitative analysis of the impact of this future expansion be

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completed. Table 4-9 of the Air Quality Assessment Technical Study Report has been included here as Table 1-5.

Table 1-5 Comparison of Emissions – Facility and Highway 407 Expansion (Table 4-9 of Air Quality Assessment Technical Study Report - July 31st, 2009)

Contaminant	407 Emissions 2013 (tpy)	407 Emissions 2031 (tpy)	140,000 tpy Facility Emissions (tpy)	400,000 tpy Facility Emissions (tpy)	Community and Industrial Emissions (tpy)
Carbon Monoxide (CO)	777	1,271	56	159	40,512
Nitrogen Oxides (NO ₂)	97	159	151	428	10,950
Particulate <10 µm (PM ₁₀)	2	4	11	32	15,805
Particulate <2.5 µm (PM _{2.5})	1	2	11	32	3,765
Volatile Organic Compounds (VOC)	33	54	61	173	11,884

As stated in the Air Quality Assessment Technical Study Report,

As can be seen from the table, the proposed Highway 407 may potentially contribute to CO emissions in the area, while the Facility CO emissions for either capacity are relatively small. Facility NO_x emissions are higher in magnitude than Highway 407 emissions, but both are small relative to the community and industrial emissions. For particulate and VOC emissions, the Facility and Highway 407 emissions are small relative to community/industrial emissions. Thus, while the proposed 407 expansion has the potential to cause changes in air quality in the AQSA, the magnitude of emissions are small compared to existing regional emissions. As such, the potential cumulative changes in air quality due emissions from the 407 expansion in addition to emissions from the Facility were assessed, considered nominal and therefore assessed qualitatively (not modeled) in this study.

Based on the above rationale a quantitative assessment of cumulative health impacts from the Facility and the Highway 407 Expansion is not required. However, text to this effect has been included in Section 3.4.3.6 of the HHERA Technical Study Report dated December 10, 2009.