APPENDIX P

Peer Reviwer Comments and Disposition Table

APPENDIX P-1

Intrinsik Peer Reviwer Comment Table

Intrinsik Environmental Sciences Inc.

TO: Mirka Januszkiewicz
Director, Waste Management Services
The Regional Municipality of Durham Works Department

FROM: Intrinsik Environmental Sciences Inc. 12 June 2009

SUBJECT: Peer Review of the Draft EA for Durham/York Residual Waste Study – Site Specific Human and Ecological Risk Assessment Technical Study Report

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Dear Mirka:

Please find attached our review of the Report entitled "Human Health and Ecological Risk Assessment, Technical Study Report" dated May 2009. Intrinsik Environmental Sciences (Intrinsik) has reviewed the Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA) components of this report, including the Problem Formulation, Exposure Assessment, Toxicity Assessment, Risk Characterization and Appendices E, F, G, H, I, J, K, L and O. In addition, Intrinsik has reviewed supplemental information provided on June 8th, 2009. Intrinsik has not reviewed the methods or results of the air modeling (used to derive the EPC).

Specific review comments are provided in an Attachment to this letter. Overall, the report is well written and presented in a clear, logical and concise manner. All of the major components of typical HHRA and ERA (including problem formulation, exposure assessment, toxicity assessment, risk characterization and uncertainties) have been presented. In general, the approach seems to err on the side of conservatism (i.e., may substantially overestimate risks in some cases) and as such it is unlikely that risks are underestimated. It is our opinion that the HHRA and ERA will be acceptable once the issues outlined below are addressed.

Our review includes comments on the May 2009 version of the report as well as the supplemental information provided on June 8th. Based on a meeting held on June 5th, 2009, it is our understanding most of our comments will be addressed in subsequent drafts of the report. This will be confirmed as part of further review of subsequent drafts of this assessment.

We thank you for the opportunity to review this important work. If you require any additional information or clarification of our comments, please do not hesitate to contact either of the undersigned at your convenience at 905-364-7800 or via email (esigal@intrinsikscience.com and rhull@intrinsikscience.com).

Yours Sincerely,
INTRINSIK ENVIRONMENTAL SCIENCES INC.

Ruth N. Hull
Senior Scientist

Elliot Sigal
Executive Vice President.

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
1	HHRA	As indicated previously, overall, the HHRA is well written and presented in a clear, logical and concise manner. All of the major components of a typical HHRA (including problem formulation, exposure assessment, toxicity assessment, risk characterization and uncertainties) have been presented. The general selection and assessment of human receptors, exposure pathways and locations are appropriate.
		Disposition: **No further comment needed**.
2	HHRA	The HHRA clearly indicate that risks related to facility emissions are quite low and acceptable. All elevated risks relate to baseline risk evaluations. As such, further discussion is required regarding baseline risk estimates and these estimates need to be put into better perspective.
		Disposition: **Acknowledged. Text has been clarified in the Final Report.**
3	HHRA	Better explanation is required regarding upset scenarios and what conditions are considered within these scenarios. For instance, do upset conditions consider the possibility of partial or complete Air Pollution Control failure? Is the possibility of a power failure and diesel generator use considered?
		Disposition: **Acknowledged. Text has been clarified in the Final Report.**
4	HHRA	Regarding the diesel generator; does the assessment consider its regular operation as part of normal facility operations (to ensure its proper operation)?
		Disposition: **Acknowledged. Section 4.5 has been updated to include a discussion on diesel generators.**
5	HHRA	The evaluation of mixtures requires further discussion. It is our opinion that some basis of comparison for the mixture evaluation is required.
		Disposition: **Given that there is little to no regulatory guidance provided for chemical mixtures, these were included in the risk assessment for information purposes.**
6	HHRA	Use of a soil ingestion rate of 100 mg/event for children should be considered rather than the 80 mg/day rate that has been utilized

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **Acknowledged. Risk assessment model was updated with a value of 200 mg/day toddler soil ingestion rate as per other comments received. This increase did not have any significant impact on results of the risk assessment.**
7	HHRA	Regarding the 'Dust ingestion' rate calculation, there appears to be a unit error in the equation (should be mg/day) and the use of ½ finger surface area for the calculation seems small; further justification of this approach is necessary.
		Disposition: **Acknowledged. The unit error was a typo. In regards to the ½ finger surface area, values were taken from Ontario Ministry of Environment and Energy (MOEE, 1996) guidance, Appendix B.5 (Appendix A), Derivation of Soil S-1 Exposure Rates, Table A-1.** **MOEE (1996). Rationale for the development and application of generic soil, groundwater and sediment criteria for use at contaminated sites in Ontario. Ontario Ministry of Environment and Energy.**
8	HHRA	Consideration of 'fraction of winter that site is not snow covered' in dust calculations is not appropriate and should be removed
		Disposition: **Acknowledged. This was removed in the human health model and did not have any significant impact on the conclusions of the risk assessment.**
9	TRVs and Bioavailability Factors	Inhalation TRVs for each CAC and COPC (Tables 7-2 and 7-3), oral TRVs for each COPC (Table 7-4) and relative dermal bioavailability factors for selected COPC (Table 7-5) were checked against the referenced TRV sources. In cases where route-to-route extrapolation was conducted, the calculations were verified. The following notes are all considered relatively minor.
		Disposition: **No further comment needed**
10	TRVs and Bioavailability Factors	The 1-hour TRV for nitrogen dioxide (*i.e.*, 400 µg/m^3) is incorrectly referenced in Table 7-2. The source should be changed from TCEQ ESL (2008) to MOE AAQC (2008). This value is correctly referenced in Appendix H.
		Disposition: **Acknowledged. Text has been updated**
11	TRVs and Bioavailability Factors	There were inconsistencies in the selection of inhalation TRVs for CAC from Health Canada (2006). Both a "maximum desirable level" and a "maximum acceptable level" are provided under the National Ambient Air Quality Objectives and Guidelines in Canada (Health Canada, 2006). In several cases the less conservative "maximum acceptable level" was selected (*i.e.*, sulphur dioxide, nitrogen dioxide); however, in the case of carbon monoxide the more conservative "maximum desirable level" and in other cases. No rationale is provided for these selections

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **Acknowledged. To maintain consistency in the current assessment the more conservative "maximum desirable level" National Ambient Air Quality Objectives have now been selected as inhalation TRVs where applicable (i.e., Annual SO_2, NO_2, and TSP). Note, although more conservative inhalation TRVs have now been selected, risk estimates are still at levels below acceptable benchmarks.**
12	TRVs and Bioavailability Factors	The units associated with the 24-hour TRV for dioxins as toxic equivalents (TEQ) are incorrect. The MOE AAQC (2008) is 5 pg TEQ/m^3, not 5 µg TEQ/m^3 as is currently presented in Table 7-3 (pg. 114) and in Appendix H. A rough check (below) was conducted to verify whether the correct TRV was used in modeling acute (24-hour) non-carcinogenic inhalation risks. A more thorough review of the modeling procedures are recommended to verify if 24-hour CR were calculated correctly, or whether risks are underestimated. Calculation check for Dioxins as Toxic Equivalents: Baseline Case, MLC, 24-hour 24-hour CR = 3.9×10^{-9} (from appendix I, page 4) Baseline Air Concentration (24-hour) = 1.93×10^{-8} µg/m^3 $CR24\text{-}hour = \frac{[Air]24\text{-}hour}{RfC24\text{-}hour}$ Therefore the RfC used in the baseline model, $RfC24\text{-}hour = \frac{[Air]24\text{-}hour}{CR24\text{-}hour} = \frac{1.93 \times 10^{-8}\ \mu g/m^3}{3.9 \times 10^{-9}} = 4.95\ \mu g/m^3$ However, the MOE AAQC for Dioxins as Toxic Equivalents is 5 pg/m^3
		Disposition: **Acknowledged. Units for the 24-hour TRV used in the inhalation were incorrect. Units are now correct and results were updated to reflect the change in TRV. Note, although values were initially underestimated, revised risk estimates are still at levels well below the acceptable benchmark.**
13	TRVs and Bioavailability Factors	The annual average inhalation TRV for beryllium is incorrectly listed as 0.0007 µg/m^3 in Table 7-3. The CalEPA REL (2008) for beryllium is 0.007 µg/m^3 (note: the TRV is correctly referenced in Appendix H). A rough check was conducted (as above) to verify whether the correct TRV was used in chronic non-carcinogenic inhalation modeling for beryllium. It appears that this was just a typographical error that was not carried forward into the risk characterization model.

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **Acknowledged. This is a typographical error in Table 7-3. The table has been updated**
14	TRVs and Bioavailability Factors	The 24-hour inhalation TRV adopted for chromium (VI) is 1.5 µg/m^3 based on the MOE 24-hour AAQC for chromium (di- and trivalent forms). However, in the MOE Summary of Standards and Guidelines to support Ontario Regulation 419 (MOE, 2008) it is noted that this guideline is not recommended for chromium VI. "Based on the increased evidence for carcinogenicity of chromium VI compounds, the MOE has decided to revise the chromium guidelines with the intent of developing a standard for chromium (VI) compounds and a separate standard to include chromium (III) and chromium (II) compounds. Until a decision is made on the standard for chromium VI, the existing guideline will only be applied to chromium (III) and chromium (II) compounds (i.e. di- and trivalent forms of chromium only). Chromium VI compounds will be assessed separately like other contaminants with no MOE standards or guidelines." While the adoption of this 24-hour AAQC may be appropriate, rationale for such a selection is not provided in the HHRA toxicity profile for chromium (Appendix H).
		Disposition: **Agreed. The MOE 24-hour inhalation TRV is not applicable to the evaluation of Chromium (VI) and is no longer used in this assessment. Note, no other 24-hour TRVs for Chromium (VI) are available, therefore 24-hour Chromium (VI) concentration ratios were not calculated in this assessment.**
15	TRVs and Bioavailability Factors	Rationale was not provided for the adoption of the WHO (2000) acute 24-hour non-carcinogenic inhalation guideline for vanadium (1.0 µg/m^3) as the chronic inhalation exposure limit
		Disposition: **Acknowledged. The following rationale was added to the Vanadium toxicity profile, under the section "Chronic Inhalation Toxicity Reference Values":** **The WHO (2000) 24-hour guideline discussed above (1.0 µg/m^3) was selected as the chronic inhalation TRV for this assessment. Although WHO (2000) lists 1.0 µg/m^3 as a 24-hour exposure limit, the limit is derived from chronic inhalation studies of occupational workers, therefore can also be considered as a chronic exposure limit.**

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Comment Number	**Section Number**	**Comment and Disposition**
16	TRVs and Bioavailability Factors	A chronic (annual average) non-carcinogenic inhalation TRV for hexachlorobenzene was not adopted despite the fact that a long-term ESL is available from the Texas Commission on Environmental Quality. The toxicity profile for the compound states that, "A non-carcinogenic inhalation TRV has not been selected for this assessment because hexachlorobenzene is carcinogenic by inhalation. Non-carcinogenic effects as a result of exposure to hexachlorobenzene have been evaluated by several recognized organizations (Health Canada, US EPA, ATSDR and RIVM) and the data was determined to be inadequate or the route did not significantly contribute to the exposure." This rationale requires further explanation. In other cases, both a chronic non-carcinogenic inhalation TRV and a carcinogenic inhalation TRV are adopted (*e.g.*, arsenic, beryllium, cadmium, acetaldehyde, *etc*.).
		Disposition: **Agreed. The TCEQ long-term ESL of 0.025 µg/m3 is now adopted as a non-carcinogenic inhalation TRV for Hexachlorobenzene and inhalation results have been updated.**
17	TRVs and Bioavailability Factors	The 24-hour TRV for pentachlorophenol (*i.e.*, 20 µg/m^3) is incorrectly referenced in Table 7-3. The source should be changed from TCEQ ESL (2008) to MOE AAQC (2008). This value is correctly referenced in Appendix H.
		Disposition: **Acknowledged. This is a typographical error in Table 7-3. The table has been updated.**
18	TRVs and Bioavailability Factors	The chronic RfC available from the U.S. EPA (2009) for naphthalene (*i.e.*, 3 µg/m^3) is used as surrogate for the alkylated naphthalenes (1-methylnaphthalene and 2-methylnaphthalene). Rationale for why this considered appropriate is not provided in the toxicity profile.
		Disposition: **Acknowledged. The toxicity profile for Napthalene and Alkylated Napthalenes has been updated with the following text:** **There are no inhalation values derived from US EPA, WHO RIVM, Cal EPA, ATSDR or Health Canada for 1-methylnaphthalene and 2-methylnaphthalene. ATSDR (2005) however lists both 1-methylnaphthalene and 2-methylnaphthalene as naphthalene-related compounds; therefore, for this risk assessment the US EPA RfC of 3 µg/m^3 for naphthalene was selected as a surrogate to evaluate chronic 1-methylnaphthalene and 2-methylnaphthalene inhalation exposure.**
19	TRVs and Bioavailability Factors	Assumptions regarding relative dermal bioavailability factors (Table 7-5) made in the absence of a recommended value (*i.e.*, metals, assume 0.1; organic, assume 0.2), are not associated with supporting rationale.
		Disposition: **The reference to US EPA Region III guidance for default relative bioaccessibility factors for dermal contact have been added to the final report.**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
20	TRVs and Bioavailability Factors	Relative dermal bioavailability factors for boron and tin are not available in the Health Canada (2004) reference. A superscript "b" should be added to these values if they are assumed. The relative dermal bioavailability factor for phosphorus was not found on RAIS (2006) as referenced. The superscript "a" should be removed if this is an assumed value.
		Disposition: **Agreed. A superscript "b" has been added to boron, tin, and phosphorous in Table 7-5 in the report and respective toxicity profiles have also been updated.**
21	TRVs and Bioavailability Factors	The carcinogenic annual average inhalation TRV for benzene is incorrectly listed as 7.8×10^{-8} µg/m^3 in Table 7-3. The correct TRV from the U.S. EPA (2009) is 7.8×10^{-6} µg/m^3 (note: the TRV is correctly referenced in Appendix H). A rough check was conducted (as above) to verify whether the correct TRV was used in ILCR calculations for benzene. It appears that this was just a typographical error that was not carried forward into the risk characterization model.
		Disposition: **Acknowledged. This is a typographical error in Table 7-3. The table has been updated**
22	TRVs and Bioavailability Factors	The 1-hour TRV for ethylbenzene was adopted from the Alberta Environment Ambient Air Quality Objectives (AENV AAQO, 2007). This value was adopted by Alberta Environment based on the derivation conducted by the Texas Commission on Environmental Quality. This guideline was derived based on odour considerations as the critical effect.
		Disposition: **Agreed. This 1-hour TRV is an odour-based not a health-based value, therefore it is no longer used in the current assessment. Note, no other 1-hour TRV is available for ethylbenzene, therefore 1-hour ethylbenzene concentration ratios were not calculated in this assessment.**
23	TRVs and Bioavailability Factors	The chronic (annual average) non-carcinogenic inhalation REL for formaldehyde adopted from Cal EPA (2000) has been updated by the regulatory agency. As of 2008, the TRV has been raised from 3 µg/m^3 to 9 µg/m^3.
		Disposition: **Agreed. CalEPA recently re-evaluated its chronic formaldehyde REL; therefore, the updated CalEPA value of 9 µg/m^3 is now selected for use in this assessment. Note, risk estimates are still at levels below acceptable benchmarks with the change to a less conservative TRV.**
24	TRVs and Bioavailabilit	The 1-hour non-carcinogenic TRV for trichlorofluoromethane adopted from TCEQ (2008) is based on odour considerations as opposed to health based

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Comment Number	**Section Number**	**Comment and Disposition**
	y Factors	Disposition: **Agreed. This 1-hour TRV is an odour-based not a health-based value, therefore it is no longer used in the current assessment. Note, no other 1-hour TRV is available for trichlorofluoromethane, therefore 1-hour trichlorofluoromethane concentration ratios were not calculated in this assessment.**
25	TRVs and Bioavailabilit y Factors	The 1-hour non-carcinogenic TRV for vinyl chloride (*i.e.*, 130 µg/m^3) was adopted from the Alberta Environment Ambient Air Quality Objectives (AENV AAQO, 2007). This value was adopted by Alberta Environment in 1999 based on the derivation conducted by the Texas Commission on Environmental Quality. The TCEQ no longer lists this value as the short-term ESL, but recommends 20,000 µg/m^3. The adoption of the AENV guideline is very conservative
		Disposition: **Agreed. TCEQ recently revised this AENV adopted 1-hour value for vinyl chloride from 130 µg/m^3 to 20,000 µg/m^3; therefore, the updated TCEQ value is now selected for use in this assessment. Note, risk estimates are still at levels below acceptable benchmarks with the change to a less conservative TRV.**
26	TRVs and Bioavailabilit y Factors	The risk assessment results (Appendix I) were verified using the human receptor characteristics (Appendix G), exposure point concentrations (Appendices B and E), and the exposure equations from the worked example (Appendix G).
		Disposition: **No further comment needed**
27	TRVs and Bioavailabilit y Factors	a) Risks for Non-carcinogens (Concentration Ratios) • Scenario verified for benzene and arsenic: baseline case, residential scenario (Max GLC, same results for all areas using baseline air concentration), acute (1-hour, 24-hour) and chronic (annual) • Scenario verified for antimony: Max GLC, normal operations, acute (1-hour, 24-hour) and chronic (annual) • Scenario verified for benzene: normal operations, Max GLC, acute (1-hour, 24-hour) and chronic (annual)
		Disposition: **No further comment needed**
28	Multi-Pathway Model Verification	b) Risks for Carcinogens (ILCR, LCR) • Scenario verified for benzene and arsenic: Max GLC, baseline case (LCR) • Scenario verified for benzene: Max GLC, normal operations (ILCR)

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Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **No further comment needed**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
29	Multi-Pathway Model Verification	a) **Calculating Human Exposure Rates and Risks for Non-carcinogens** o Scenario verified for 2,3,7,8-TCDD Equivalent: Tooley residential receptor, toddler, and normal operations (Project Alone Case) ▪ Pathways considered: ▪ Soil/Dust Ingestion – summer and winter (indoor and outdoor) ▪ Soil/Dust Dermal – summer and winter (indoor and outdoor) ▪ Food Consumption – ingestion of homegrown aboveground exposed and protected garden produce, ingestion of belowground garden produce, and ingestion of homegrown garden fruit o Scenario verified for 2,3,7,8-TCDD Equivalent: Hunter/Angler receptor, toddler, normal operations (Project Alone Case) ▪ Pathways considered: ▪ Ingestion of Wild Game ▪ Ingestion of Fish**.** o Scenario verified for 2,3,7,8-TCDD Equivalent: Swimmer receptor, toddler, normal operations (Project Alone Case) ▪ Pathways considered: ▪ Incidental Ingestion o Scenario verified for arsenic: Swimmer receptor, toddler, normal operations (Project Alone Case) o Pathways considered: ▪ Dermal Contact. This pathway was verified using receptor parameters provided in the Worked Example (Appendix G). Note: The ET value provided in for the swimmer toddler (Table 1-13, Appendix G) does not match the value provided in the worked example. o Scenario verified for 2,3,7,8-TCDD Equivalent: Farmer receptor, toddler, normal operations (Project Alone Case) ▪ Pathways considered: ▪ Ingestion of beef. ▪ Ingestion of milk. ▪ Ingestion of pork. ▪ Ingestion of poultry. • Ingestion of eggs. The fraction of each agricultural product consumed from the site that is used to verify calculations was provided in the worked example. This does not seem consistent with the main report text which indicates that the farmer receptor obtains all of their beef, pork, poultry, eggs, and milk from their farm. • Scenario verified for 2,3,7,8-TCDD Equivalent: Tooley residential receptor, infant, and normal operations (Project Alone Case). Pathways considered:

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: ▪ **No further comment needed.** ▪ **No further comment needed.** ▪ **No further comment needed.** ▪ **The values in the Tables 1-13 and 1-14 are incorrect and will be updated in the final version.** ▪ **No further comment needed.** ▪ **Text was updated in main report to read:** ▪ **"We have assumed that the farmer receptor obtains the majority of their agricultural products (e.g. beef, pork, poultry, eggs, and milk) from their farm."** ▪ **The chronic daily intake for each pathway involved in the calculation of breast milk for the mother as well as the receptor characteristics used will be provided in the final version.**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
30	Multi-Pathway Model Verification	b) **Calculating Human Exposure Rates and Risks (ILCR) for Carcinogens** o Scenario verified for Benzo(a)pyrene TEQ: Composite Tooley residential receptor, normal operations (Project Alone Case) ▪ Pathways considered: ▪ Soil/Dust Ingestion – Summer and Winter (indoor and outdoor) ▪ Soil/Dust Dermal – Summer and Winter (indoor and outdoor) ▪ Food Consumption – Ingestion of Homegrown Aboveground Exposed and Protected Garden Produce, and Ingestion of Belowground Garden Produce, and Ingestion of Homegrown Garden Fruit o Scenario verified for Benzo(a)pyrene TEQ: Composite Hunter/Angler receptor, normal operations (Project Alone Case) ▪ Pathways considered: ▪ Ingestion of Wild Game o Scenario verified for Bromoform: Composite Hunter/Angler receptor, normal operations (Project Alone Case) o Pathways considered: ▪ Ingestion of Fish. o Scenario verified for Arsenic: Composite swimmer, normal operations (Project Alone Case). Pathways considered: ▪ Incidental Ingestion o Scenario verified for Arsenic: Composite swimmer, normal operations (Project Alone Case). Pathways considered: o Dermal Contact. This pathway was verified using EPCs as provided in the Worked Example (Appendix G). Note: The surface water concentration found in the EPC Table for the swimming and recreation used does not match the value provided in the worked example. o Scenario verified for Arsenic: Composite Farmer receptor, normal operations (Project Alone Case). Pathways considered: ▪ Ingestion of beef. ▪ Ingestion of milk. ▪ Ingestion of pork. ▪ Ingestion of poultry. ▪ Ingestion of eggs. • The calculation of composite receptor parameters is not provided in the report. The inclusion of these calculations would add transparency to the calculation of cancer risks. It appears as though composite receptor parameters were calculated assuming a lifetime of 76 years, and an adult exposure duration of 56 years: • Averaging time of 27740 days (AT = 365 days/year*__76 years__), • Body weight = 63.3 years (amortized over life stages; BW = ((0.5/75)years*8.2kg)+((4.5/75)years*16.5kg)+((7/75) years*32.9kg)+((8/75) years *59.7kg)+((__56__/75) years*70.7kg) • Soil ingestion rate = 23.9 mg/day (amortized over life stages; IR = ((0.5/75)years*20mg/day)+((4.5/75)years*80mg/day)+((7/75) years*20mg/day)+((8/75)years*20mg/day)+((__56__/75)years*20mg/day)
APPENDIX A – COPC Screening		The exposure duration used in amortization of receptor parameters (see above) appears to be 75 years, despite the assumption of a 56

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: ▪ **No further comment needed.** ▪ **No further comment needed.** ▪ **No further comment needed.** ▪ **No further comment needed.** ▪ **Acknowledged. This has been corrected, and the value used in the worked example now matches the EPC provided in Appendix E.** ▪ **No further comment needed.** ▪ **An example of the calculation of the composite receptor is provided n Appendix G** ▪ **Acknowledged. The averaging time was corrected for a 75 year lifetime and is in fact 27,375 days. All calculations have been updated and the change did not have any significant impact on the results of the risk assessment.**
31	General	Numbering of equations provided in Appendix G is recommended.
		Disposition: **Acknowledged. This will be updated in the final version.**
32	General	The fraction of homegrown produce and agricultural products consumed from the site is not included in the receptor characteristic table (Tables 1-1 to 1-12). While the source of this information is cited in the main report, it should also be included in Appendix G.
		Disposition: **Acknowledged. This information has been added to Appendix G**.
33	General	The ingestion rate of breast milk (i.e., 0.742 L/day) is not included in the receptor parameter tables for infant receptors.
		Disposition: **Acknowledged. This information has been added to Appendix G.**

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Comment Number	**Section Number**	**Comment and Disposition**
34	General	Section 1.1.1. It is noted that, "The composite receptor incorporates all life stages of a receptor. Composite receptor parameters were derived by calculating a weighted average for each parameter from each of the five life stages." Exposure estimates were calculated for the composite receptor using weighted receptor parameters. Typically, exposure estimates are calculated for each of the five life stages and an overall weighted exposure value is then calculated from these stage-specific exposures, as opposed to first calculating a weighted average of each receptor parameter and using these parameters to directly calculate a "composite" receptor exposure.
		Disposition: **Acknowledged. Regardless of the path taken to obtain the weighted exposure value, the end result of either method would be identical**.
35	General	Section 2.1.4.1 (Worked Example). Dust Ingestion Rate Calculation for Toddlers. Rationale for how the receptor parameters were derived (e.g., the surface area of ½ finger, soil adherence factor of a finger, the frequency of finger mounting events, etc.) should be included. It is not clear whether these values were taken from the literature or were derived based on other known toddler receptor characteristics.
		Disposition: **Acknowledged. This will be updated in the final version**
36	General	Section 2.2.1 (Worked Example). The equation for the calculation chronic daily intake from ingestion of aboveground produce (CDIAGPROD) is incorrect. It should be changed so that various concentrations of COPC in produce are summed (instead of multiplied). i.e. $CDIAGPROD = Intake_{AGPROD} \times (Pd + Pr_{ag} + P_v)$
		Disposition: **Acknowledged. This has been corrected in Appendix G.**
37	General	Section 3.2.6 (Worked Example, Exposure from Surface Water). The text incorrectly states that the "following equations are used to assess the potential risk to a toddler resulting from...". The example is specific to a swimmer-composite receptor, not a toddler
		Disposition: **Acknowledged This has been corrected in Appendix G.**
38	General	The worked example does not consistently use the same COPC for sample calculations, making it difficult to follow. It would also add clarity if the worked example included risk calculations for each exposure pathway examined and a total (all pathways) risk value, for the same COPC used throughout calculations (i.e., arsenic, dioxins).

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Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **Unfortunately, not all pathways apply to each COPC-receptor combination, making it difficult to provide a worked example for one COPC-receptor combination. Additionally, the risk calculation is identical regardless of pathway, and it would be unnecessarily repetitive and disruptive to the flow of the worked example to demonstrate this calculation at the end of the each pathway's calculation.** **However, in order to provide another level of clarity in the worked example, a table has been added to the total risk calculation example, which demonstrates how calculated risk values for each pathway are summed to obtain a final total risk value.**
39	Appendix G	Sample calculations for the ingestion of agricultural products (i.e., beef, milk, pork, poultry, and eggs) for a farmer receptor are not provided in the worked example. Exposure equations for these pathways were not found elsewhere in the report**.**
		Disposition: **This information has been added to Appendix G.**
40	Appendix G	Although it may be inferred from the RfD provided, the COPC used in the sample calculation of non-carcinogenic hazard quotients (Section 2.2.10) is not specified in the example.
		Disposition: **This information has been added to Appendix G.**
41	Appendix G	A worked example of the calculation of LADD for carcinogens from ingestion of homegrown garden fruit is not provided
		Disposition: **This information has been added to Appendix G.**
42	Appendix E	Some exposure point concentrations presented in Appendix E do not match those presented in the main report. For example, the exposure point concentrations of 2,3,7,8-TCDD in beef and milk estimated for the farmer receptor cluster under normal operations (Table E.9, Appendix E) do not match those concentrations presented in Tables 6-12 and 6-14 of the main text. Also, the surface water concentration of arsenic presented in Table E.12 (Appendix E) (i.e., 5.68 x 10-7 mg/L) does not match the concentration used in the worked example (Section 3.2.6, Appendix G) (i.e., 5.3 x 10-7 mg/L). It should be confirmed that the exposure point concentrations presented in both the main text and appendices are consistent and represent the most recent version of data used in exposure and risk modelling.

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **The loading tables in the main report have been updated and now specify which EPC-receptor combinations were considered to generate the loading data. Provided this information, the data present in the loading tables should now match the values found in Appendix E.** **All exposure point concentrations presented in the text and appendices have been reviewed and should now be in full agreement.**
43	Appendix E	Ambient air exposure point concentrations used in the calculations of acute and chronic CR values and ILCR values under normal (project alone) conditions and under upset operations (project along upset) are not provided in Appendix E.
		Disposition: **This information has been added to Appendix E**.
44	General	Appendix G title page, typographical error: "Characteristics"
		Disposition: **Acknowledged, this has been corrected**
45	General	Page 112, typographical error
		Disposition: **Acknowledged, this has been corrected**
46	Ecological Risk Assessment	**Selection of Receptor Locations**. The location of maximum deposition of chemicals of concern (COC) has not been identified. Is it within the 2-km radius (Section 8.3.1.1) which was subject to the comprehensive field surveys? The Baseline Study states that the Maximum Ground-Level Concentration (MGCL) is between 300 and 800 m of the stack. This information should be mentioned in the ERA. In addition, page 29/30 of the HHERA report states that the assessment was done at the location of maximum ground level concentrations as well as receptor locations. These results are not clearly shown or discussed in the ERA (was it not done for the ERA?) Additional detail should be provided regarding how the 22 receptor locations were chosen (*e.g.* relative to expected deposition patterns, prevailing winds, distance from the site, *etc.*).
		Disposition: **Additional discussion has been added to clarify the selection of ecological receptor locations. Conclusions of the risk assessment have not been impacted.**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
47	Ecological Risk Assessment	**Modification of Exposure Estimates for Migratory Species.** It is correct that several species migrate and hence will not be exposed to COC from the site during part of the year. However, many of the TRVs for wildlife were derived from shorter-term studies which exposed wildlife to chemicals during a sensitive life-stage (during reproduction). This is the time when wildlife also will be exposed to contaminants from the site. Therefore, it is not appropriate to modify the exposure estimate to account for migratory behaviour.
		Disposition: **We disagree with the rationale suggested for modifying the exposure estimate to account for migratory behaviour, but to derive a more conservative estimate of potential risk, migratory patterns of the American robin, belted kingfisher, mallard duck, and great blue heron have been removed and consequently, all VECs are assumed to spend 100% of their time within the LRASA for 12 months of the year. Please see Section 8.3.5 for VEC life history characteristics. Conclusions of the risk assessment have not been changed as a result of this modification.**
48	Ecological Risk Assessment	We agree that adult amphibians cannot be assessed. We disagree with the statement that "it is not adequate to assess only one life stage, regardless of sensitivity". In fact, the assessment of risk to wildlife often only assesses a sensitive life stage (reproduction). Amphibians are sensitive in their tadpole stage, and especially when undergoing metamorphosis. Toxicity data are available for some COC for amphibians during this life stage (exposure to COC in water). The 4th paragraph goes on to say there is no permanent or vernal pool habitat for amphibians on-site. However, habitat likely exists off-site in the study area. Therefore, this is not sufficient rationale for excluding amphibians.
		Disposition: **Additional discussion and rationale has been added regarding the exclusion of amphibians and reptiles from the ERA. .Conclusions of the risk assessment have not been impacted**
49	Ecological Risk Assessment	**Amphibians and Reptiles**. (Section 8.3.2.23, 3rd paragraph). We agree that adult amphibians cannot be assessed. We disagree with the statement that "it is not adequate to assess only one life stage, regardless of sensitivity". In fact, the assessment of risk to wildlife often only assesses a sensitive life stage (reproduction). Amphibians are sensitive in their tadpole stage, and especially when undergoing metamorphosis. Toxicity data are available for some COC for amphibians during this life stage (exposure to COC in water). The 4th paragraph goes on to say there is no permanent or vernal pool habitat for amphibians on-site. However, habitat likely exists off-site in the study area. Therefore, this is not sufficient rationale for excluding amphibians.
		Disposition: **Additional discussion and rationale has been added regarding the exclusion of amphibians and reptiles from the ERA. .Conclusions of the risk assessment have not been impacted**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
50	Ecological Risk Assessment	**Species at Risk**. (Section 8.3.2.24). The comment "It is difficult in ERAs..... water intake" could be said about most other species we assess in ERA. Assumptions about diet composition can be made, and generally body weight data are available. With these data, it is possible to estimate water, food, and soil ingestion rates. This is reasonably easy to do, and eliminates the need to select or use surrogates that may not be appropriate (*e.g.*, bobwhite/robin). In many cases, this is unlikely to change the conclusions of the ERA. There is insufficient discussion on the assessment of reptile and invertebrate species at risk. Table 8-3 refers to discussions in sections that are not found in the report (Sections 8.3.3.3 and 8.3.3.4); Section 8.3.3.23 does not specifically address risk to SAR reptiles. Additional rationale could be provided to eliminate further consideration of reptiles (*e.g.*, COC accumulation in to reptile dietary items) or, at a minimum, an assessment of indirect effects (*e.g.*, effects of COC on habitat) could be conducted. The concern for reptiles, amphibians and other SAR relates to the Conclusions section of the ERA (Section 8.10) See comment below.
		Disposition: **Additional discussion has been added regarding species at risk and surrogate species. Conclusions of the risk assessment have not been impacted**
51	Ecological Risk Assessment	**Dose Scaling**. (Section 8.5.6). The Ontario Ministry of the Environment recently (May, 2009) released guidance indicating that the "MOE no longer accepts the application of allometric dose scaling using acute toxicity information for estimating chronic effects data." This has been discussed in recent years, although the timing of the release of the guidance was surprising. It is unclear whether all Branches of MOE will require that dose scaling not be used, or whether there will be a phase-in period for this guidance or "grandfathering" for ERAs already under review. For several VECs (*e.g.* small mammals), this change is guidance is unlikely to have a significant influence of the ERA results or conclusions. However, it is recommended that the ERA consider the potential influence of this change on their results and conclusions. Toxicity data should be obtained to derive TRVs from species that are closely related, or with similar gut physiology.
		Disposition: **Additional discussion has been added regarding the allometric dose scaling approach and use of surrogate species with similar physiology. To illustrate the effect of body mass scaling on the quantitative assessment of risk, EHQs derived using a body mass scaled TRV and the non-body mass scaled TRV are presented. Moreover, a literature review exercise was conducted to find TRVs for actual VEC species and for surrogates with similar physiology. No changes to the ERA were made based on addressing this comment so conclusions of the risk assessment have not been impacted.**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
52	Ecological Risk Assessment	**Inhalation Toxicity** (Section 8.5.7). The argument for not conducting an assessment of inhalation risks is incomplete. Factors that make the human health assessment less conservative (relative to an assessment of wildlife) should also be acknowledged and discussed. a. The first sentence of this section is true, but the context for it is the assessment of contaminated sites, not the assessment of sources of airborne contaminants. b. The third bullet is misleading, because while 70 years sounds like a long time, it is 1 lifetime to people, but many generations (up to hundreds of generations) for some wildlife. c. There is no discussion of relative inhalation rates between people and wildlife, and how that would affect exposure. Were people assessed at the MPOI? While people may not live at the MPOI, wildlife may.
		Disposition: **Respectfully, JWSL disagrees with this comment. It is not clear from the reviewer's comment how individual lifespan vs. generational time of wildlife is related to inhalation toxicity. If the reviewer is hinting that wildlife may be able to adapt evolutionarily to CoC due to genetic change over time while humans will not have this advantage due to a single generation, the academic point is interesting, but is too broad off a hypothesis to assess in a ERA of this nature. Point C is acknowledged but inhalation rates were not used in the inhalation risk assessment as air concentrations of CoC were compared to air benchmarks. Finally, ecological risk based on the inhalation pathway was compared to human receptors found in the same receptor locations so each would be exposed to the same concentration.**
53	Ecological Risk Assessment	**Assessment of Avian Exposure to Dioxins**. Risks to birds from exposure to dioxins were not assessed (Appendix N lists "NA" for all avian species). Since a TRV is identified for birds, why were risks not estimated? If risks were estimated, were avian TEFs used in the calculation?
		Disposition: **Thank you for pointing out this omission. Risk was assessed for birds exposed to dioxins and is based on a TRV for 2,3,7,8,-TCDD. The ADD for birds was based on a 2,3,7,8 TCDD TEQ which used the WHO scheme (2005). Conclusions of the risk assessment have not been impacted.**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
54	Ecological Risk Assessment	**ERA Conclusions** (Section 8.10). The last 2 paragraphs of this section attempt to bring in the results of other assessments (noise, water quality, habitat disturbance). To characterize ecological effects from the various combinations of stressors. If this is done (which is a worthwhile task), then it deserves its own section (outside of the conclusions from the chemical stressor assessment), and more discussion of the issue. Each stressor type should have a summary of the results/conclusions regarding type, magnitude and uncertainty associated with the potential ecological impacts. The various combinations of stressors could then be discussed. For example, currently, the conclusion of the "noise assessment" is that wildlife would avoid the area with noise. This could be considered an impact, especially if high quality habitat is located in the affected area. The final statement in the ERA, that "the combination of chemical and non-chemical stressors (noise, habitat alteration) is not expected to have an effect on ecological receptors", is too significant a statement to have the limited support and rationale provided. In addition, the graphic is misleading, as it suggests that ecological effects can only occur when a combination of the 4 listed stressors occurs. However, ecological effects could occur simply due to "chemical stressors" or "habitat disturbance" or either of the other stressors, and any combination of these stressors. I recommend that this graphic be omitted.
		Disposition: **We agree that discussion of the potential effects resulting from a combination of environmental stressors deserves its own section. As a result, this discussion has been moved to Section 8.9. "Risk Characterization for Project Related Activities". While your comment about wildlife avoiding the area due to noise can be considered an impact is true, the significance and magnitude of this impact is assessed in the Acoustic Assessment Technical Study Report and outside the scope of this toxicologically based ERA. The graphic and this section were modified to show that risk can occur independently as well as in combination (of the chemical and non-chemical stressors).**
55	Ecological Risk Assessment	**Assessment Endpoints** (Section 8.3.1). Assessment endpoints should be presented for community receptors as well as wildlife populations.
		Disposition: **Text in Section 8.3.1 has been clarified to include community receptors in the discussion of assessment endpoints**
56	Ecological Risk Assessment	**Community Based Receptors** (Section 8.3.2.22). It is unclear whether aquatic plants were considered as VECs. The bullet list in this section has not included them. Consideration should be given to including aquatic plants as VECs, or rationale provided for excluding them.
		Disposition: **The description of community receptors assessed in the ERA has been clarified to read: "Freshwater receptors (*i.e.* fish, aquatic plants), Terrestrial plants. Benthic invertebrates, and Soil invertebrates" (Section 8.3.5.1).**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
57	Ecological Risk Assessment	**Table 8-4.** a. Sediment ingestion is not discussed in the "rationale" column of "Soil (and Sediment) Ingestion". The pathway of COC from air to sediment could be included for completeness. b. Ingestion of soil invertebrates is not discussed in the "rationale" column of "Ingestion of Terrestrial Vegetation, Soil Invertebrates and Small Mammal Prey". In addition, "birds" could be added to this, as they are identified as prey species. c. There could be confusion between the "Dermal Contact" row and the "Water Ingestion/Contact" row. I assume the first is specific to wildlife and the second to aquatic organisms. This should be clarified. Perhaps add "gill uptake" to the second one? d. Ingestion of Aquatic Invertebrates and Fish should also include "Aquatic Plants". What about sediment contact for benthic invertebrates?
		Disposition: **a. Discussion of sediment has been added to the rationale section of Table 8-4.** **b. Discussion of terrestrial invertebrate ingestion has been added to the rationale section of Table 8-4. "gill uptake" has been added to the rationale discussion for the inclusion of water ingestion/contact exposure pathway in Table 8-4.** **c. and d) Ingestion of aquatic plants has been included in Table 8-4.** **N/A**
58	Ecological Risk Assessment	**Figure 8-3.** Table 8-5 specifies "Benthic Invertebrates" *vs.* Figure 8-3 that lists "Sediment Receptors". Consider changing Figure 8-3 for clarity and consistency, because "sediment receptors" could include fish and aquatic plants.
		Disposition: **For consistency throughout the report, only the term "benthic invertebrates" has been used to describe these receptors.**
59	Ecological Risk Assessment	**Derivation of Exposure Point Concentrations** (Section 8.4.3). For the Baseline Case, it is unclear whether a single EPC was estimated, or whether EPCs were estimated for each of the 22 Receptor Locations. The Baseline Report states that samples were obtained within a 1-km radius of the site. This should be specified in the ERA, because Baseline Concentrations were not characterized at the 22 receptor locations; it is assumed that the data from the sampled area is representative. This issue is addressed somewhat in the second paragraph of Section 8.6.2.1. However, the transparency of the ERA would be improved if additional discussion was provided clearly outlining the data used to characterize baseline (*e.g.* from where it was sampled, the statistics used, how it was applied to the 22 receptor locations).
		Disposition: **Information regarding the baseline sampling program, including methodology for the statistics used and media sampling locations, is outlined in Section 5.0 of the HHERA Technical Report, as well as in the Baseline Report which now is included in Appendix B.**
60	Ecological Risk	**Exposure for Community-Based Receptors** (Section 8.4.5). Because it is not specified here, it is assumed the 95% UCLM was used as the EPC for these receptors. The statistic used should be specified, and rationale should be provided for using the particular EPC for non-mobile receptors.

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
	Assessment	**Disposition:** **Maximum detected values were used.**
61	Ecological Risk Assessment	**Third Paragraph** (Section 8.4.5). The statement "Generally, LOAELs used towards TRV derivation.....chronic exposure studies." This should be clarified to include the fact that some studies were not chronic, but were considered chronic due to the study being conducted during a sensitive life stage.
		Disposition: **Discussion regarding exposure duration may be found in Section 8.5.3, which states that: "Chronic exposures would generally be greater than 90 days in length, exceeding 50% of the animal's lifespan, or including a reproductive period.".**
62	Ecological Risk Assessment	**Phytotoxicity Benchmarks** (Section 8.5.1.5). Are any of these benchmarks actually based on phytotoxicity? It would be good to identify those AQO that actually take phytotoxicity into account. If none do, this should be acknowledged. It would add clarity to include the WHO standards (in the text and Table 8-6) that actually are based on protection of vegetation.
		Disposition: **As stated in Section 8.5.8.5: "… the Maximum Acceptable Level was used as the threshold for conducting the risk assessment of sulphur dioxide and nitrogen dioxide on vegetation", where: "the Maximum Acceptable Level is intended to provide adequate protection against effects on soil, water, vegetation, materials, animals, visibility, personal comfort and well-being;" (second bullet in Section 8.5.8.5). WHO benchmarks have been included in the assessment of potential phytotoxic affects, as well as in Table 8-6 and Section 4.2 in Appendix J.**
63	Ecological Risk Assessment	**The Provincial Sediment Quality Standards** (Section 8.6). These were updated in 2008, with the release of a new document. Please update your reference and any values accordingly.
		Disposition: **Sediment guidelines provided in the new document are carried forward directly from the previous document (MOE, 1993), and so no change to the benchmarks have been made. In the case of cobalt and silver, no applicable values are given, as stated by the reviewer. As such, the assessment approach for these COPC has been updated. Please refer to Appendix J for further information.**
64	Ecological Risk Assessment	**MDLs used as EPC** (Section 8.6.2.1). Did MDLs meet the MOE-recommended MDLs or were they evaluated due to matrix interference or other factors? It would strengthen your case to say the MDLs met recommended MDLs.
		Disposition: **The MOE recommended MDLs were not met in all cases due to matrix interferences. For specifics see the Environmental Baseline Study Report (now presented in Appendix B.)**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
65	Ecological Risk Assessment	**Risks from P and Zn** (Section 8.6.2.1). The ERA would benefit from a discussion of the possible ecological implications of the exceedance of the PWQO and sediment LEL for P and the PWQO for Zn. In sediment, if the 90th percentile concentration does not exceed the LEL by more than a factor of 2, MOE may consider the potential for ecological effects to be insignificant.
		Disposition: **In order to derive a more conservative estimate of potential risk, maximum detected values were used as EPC for surface water and sediment. The discussion of the potential effects was updated to reflect these changes.**
66	Ecological Risk Assessment	**EHQ = 1.0** (Section 8.6.2.1). An EHQ = 1.0 should not indicate unacceptable risk.
		Disposition: **Instances where potential risk was identified from an EHQ or an SR on parity with 1.0 have been removed from the report. Text within the report has also been modified to clarify that only EHQs or SRs greater than 1.0 indicate potential risk.**
67	Ecological Risk Assessment	**Last paragraph** (Section 8.6.2.1). The statement "baseline concentrations.... were determined to be no different than any other similar area in southern Ontario." Is not supported by data or a cited reference. This is particularly important for P and Zn in the aquatic environment.
		Disposition: **In the Environmental Baseline Study Report the comparison of the findings was completed against Table 1 (O.Reg.153.04).**
68	Ecological Risk Assessment	**Section 8.6.5.** The Project Case is defined as exposure from the Thermal Treatment Facility plus "baseline conditions (*i.e.* existing emissions facilities)". This suggests that only air emissions data were used and not baseline soil, water or sediment data. Should the "*i.e.,*" be modified to state "*i.e.,* current concentrations in ambient media" or something similar?
		Disposition: **Thank you for your comment. No change has been made.**
69	Ecological Risk Assessment	**First paragraph** (Section 8.6.5.1). Do Tables 8-8 to 8-12 present risks at the MPOI or are they simply the largest EHQs/SRs from the 22 receptor locations? This should be clarified.
		Disposition: **EHQ/SR tables represent the largest values from the 22 receptor locations.**
70	Ecological Risk Assessment	**General.** Throughout the wildlife TRV discussion, the statement "the lowest LOAEL" is used often. In fact, the lowest bounded LOAEL is used. This distinction (clarification) is important, because there are many LOAELs lower than the lowest bounded LOAEL. It is recommended that this edit be made, where applicable, throughout the appendix.
		Disposition: **Where appropriate, the statement "lowest LOAEL" has been corrected to read "lowest bounded LOAEL".**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
71	Ecological Risk Assessment	**TRVs used for each VEC.** Are the actual TRVs used in the ERA presented anywhere, or just the TRV upon which the ERA TRVs are based? It would improve transparency to have a table with all TRVs used in the ERA (for each VEC). The application of UF or scaling could then be checked.
		Disposition: **Agreed. A table listing all mammalian and avian TRVs (after the application of applicable scaling and/or uncertainty factors) has been included in Appendix J (Table 1, pp. 34-35).**
72	Ecological Risk Assessment	**Boron TRV for Mammals** (Section 3.2.5). The LOAEL is associated with sterility, which is an effect with significant implications on the population (as much as mortality would have). Consideration should be given to using the NOAEL from this study.
		Disposition: **Agreed. The boron TRV for mammals has been changed from the chronic LOAEL value (93.6 mg/kg-bw/day) to the chronic NOAEL value (28 mg/kg-bw/day). Discussion of the boron TRV for mammals can be found in Appendix J, Section 3.2.5.**
73	Ecological Risk Assessment	**Cadmium TRV for Mammals** (Section 3.2.6). The documentation for the TRV is misleading. The second sentence should specify "lowest bounded LOAEL" because the lowest LOAEL was not selected. In fact, there is a lower bounded LOAEL of 0.91 for sheep. Rationale should be given as to why this value was not selected (particularly since the text specifies that data for sheep were included in the database).
		Disposition: **Agreed. The second sentence has been corrected to read "lowest bounded LOAEL". Additionally, the cadmium TRV for mammals has been changed from a previously used value of 1.0 mg/kg-bw/day, to the lowest bounded LOAEL of 0.91 mg/kg-bw/day as given in the U.S. EPA's cadmium Eco-SSL document.**
74	Ecological Risk Assessment	**Lead TRV for Birds** (Section 3.2.11). A different approach was used for lead than any other COC. Although two relevant bounded LOAELs were available (both 4-5 wk duration, exposure in food, endpoint was progeny count), they were not used. Instead the geomean of NOAELs was used. The rationale given is that lead acetate was used in the study. While this is a relatively more bioavailable form of lead than other lead compounds, it was the form used for most of the studies in the database. Hence the geomean of NOAELs is based on the same compound. Additional rationale for supporting the use of the geomean of NOAELs instead of the bounded LOAEL should be provided.
		Disposition: **Additional rationale for the use of the lead TRV for birds has been provided in Appendix J, Section 3.2.11. No change to the TRV has been made.**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
75	Ecological Risk Assessment	**Lead TRV for Mammals** (Section 3.2.11). The first sentence is incorrect. The EPA uses the highest bounded NOAEL that is lower than the lowest bounded LOAEL. These values are not from the same study, as is implied by this sentence. There are 11 bounded LOAELs less than 40 mg/kg/d, for reproduction, growth and survival endpoints. Additional rationale should be provided for supporting the use of the geomean of NOAELs instead of the bounded LOAEL.
		Disposition: **The lead TRV for mammals has been changed to reflect a more consistent TRV selection methodology in the ERA. As such, a TRV of 4.7 mg/kg-bw/day has been chosen (corresponding to the highest bounded NOAEL lower than the lowest bounded LOAEL from the U.S. EPAs lead Eco-SSL document), in place of the previous value of 40.7 mg/kg-bw/day, which represented the geometric mean of NOAELs from the U.S. EPAs lead Eco-SSL document. Discussion of this TRV may be found in Appendix J, Section 3.2.11.**
76	Ecological Risk Assessment	**Nickel TRV for Mammals** (Section 3.2.15). It is unclear how the TRV of 2.71 mg/kg/d relates to the TRV of 10.21 mg/kg/d, as both are noted as being used in the ecological model. Is this an error in the Eco-SSL calculation, due to the original study dose being presented in mg/kg/d instead of the usual mg/kg? Which value is actually used?
		Disposition: **Review of the TRV of 2.71 mg/kg-bw/day given by the U.S. EPA Eco-SSL document reveals an error in the calculation likely due to the study dose being presented in mg/kg-bw/day, as surmised by the reviewer. As a result, the nickel TRV for mammals used in this assessment has been changed to lowest bounded LOAEL of 3.31 mg/kg-bw/day, from the Eco-SSL document. Discussion of this TRV may be found in Appendix J, Section 3.2.15.**
77	Ecological Risk Assessment	**Selenium TRVs** (Section 3.2.16). Rationale should be provided for not using the Eco-SSL document as a source of TRVs. This is inconsistent with the TRV selection process for other COCs. It is noted that the TRVs from the Eco-SSL document would be lower than those selected for use in the ERA.
		Disposition: **Based on the reviewer's comment, the selenium Eco-SSL document was further reviewed for bird and mammalian TRVs for use in this assessment. Accordingly, the mammalian TRV selected was changed from a value of 0.33 mg/kg-bw/day to a value of 0.304 mg/kg-bw/day. Discussion of selenium TRVs may be found in Appendix J, Section 3.2.16.**
78	Ecological Risk Assessment	**Thallium TRV for Mammals** (Section 3.2.18). Why was an UF of 5 applied to account for subchronic duration, instead of an UF of 3, as noted in Figure 2.1 and used for other COCs?
		Disposition: **The appendix erroneously states that an uncertainty factor of 5 was applied to the thallium TRV, while in actuality an uncertainty factor of 3 was applied, as is consistent for all other COPC in this assessment. This typo has been corrected.**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
79	Ecological Risk Assessment	**Vanadium TRV for Birds** (Section 3.2.20). As stated repeatedly in this appendix, LOAELs are used when toxicological data permit. Therefore, rationale should be provided for not using the Eco-SSL data, but instead using a NOAEL from Sample et al. (1996). Of the 28 bounded LOAELs presented in the Eco-SSL document (for survival, growth and reproduction endpoints), 26 are lower than the value selected for use as the TRV (from Sample et al.). Inconsistency in the process for selecting a TRV should be explained, or a value from the Eco-SSL used.
		Disposition: **The vanadium TRV for birds was changed to a value of 0.688 mg/kg-bw/day, corresponding to the LOAEL value from the study NOAEL chosen as the TRV in the U.S. EPA vanadium Eco-SSL document. Discussion of the vanadium TRV for birds may be found in Appendix J, Section 3.2.20.**
80	Ecological Risk Assessment	**Zinc TRV for Mammals** (Section 3.2.21). Rationale should be provided for not using the Eco-SSL document as a source of TRVs. This is inconsistent with the TRV selection process for other COCs. It is noted that the TRVs from the Eco-SSL document would be lower than those selected for use in the ERA. Six of the 15 bounded LOAELs (for survival, growth and reproduction) in the Eco-SSL document are lower than the selected TRV.
		Disposition: **Based on the reviewer's comment, the zinc TRV for mammals was changed from a value of 320 mg/kg-bw/day to a more conservative TRV of 75.9 mg/kg-bw/day, which corresponds to the lowest bounded LOAEL of TRVs in the U.S. EPA zinc Eco-SSL document. Further discussion may be found in Appendix J, Section 3.2.21.**
81	Ecological Risk Assessment	**Zinc TRV for Birds** (Section 3.2.21). Rationale should be provided for not using the Eco-SSL document as a source of TRVs. This is inconsistent with the TRV selection process for other COCs. It is noted that the TRVs from the Eco-SSL document would be lower than those selected for use in the ERA. Fourteen of the 34 bounded LOAELs (for survival, growth and reproduction) in the Eco-SSL document are lower than the selected TRV.
		Disposition: **Based on the reviewer's comment, the zinc TRV for birds was changed from a value of 131 mg/kg-bw/day to a more conservative TRV of 66.5 mg/kg-bw/day, which corresponds to the lowest bounded LOAEL of TRVs in the U.S. EPA zinc Eco-SSL document. Further discussion may be found in Appendix J, Section 3.2.21.**
82	Ecological Risk Assessment	**Wildlife TRVs for PAHs** (Section 3.3). The selected TRVs for birds and mammals for low and high MW PAHs are reasonable. However, the ERA would be more transparent if discussion was included regarding how the geometric mean of the NOAELs compared with the lowest LOAELs for survival, growth and reproduction. This is particularly true for the high MW PAHs because the lowest LOAELs for survival and growth (from studies of BaP) are lower than the geometric mean of NOAELs.
		Disposition: **Thank you for your comment. No change has been made to the Appendix.**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
83	Ecological Risk Assessment	**Dioxin TRV for Birds** (Section 3.4). It is unclear which TRV is used for the assessment of dioxins for birds. One value (0.000001 mg/kg/d) is identified as the reference dose, and another (0.00014 mg/kg/d) is identified as the chronic LOAEL. Which is used as the basis for the TRV?
		Disposition: **The discussion regarding dioxin/furan TRVs for birds has been clarified to clearly state the TRV used in this assessment (0.00014 mg/kg-bw/day).**
84	Ecological Risk Assessment	**Chloroform TRV for Mammals** (Section 3.5.2). Why wasn't the study presented in Sample et al. (1996) discussed? The LOAEL of 41 mg/kg/d is presented in Sample et al., which is lower than the LOAEL selected as the TRV (at which mortality occurred).
		Disposition: **The chloroform TRV for mammals was reviewed, and, based on the study by Palmer (1979) and referenced in Sample *et al.*, changed to a LOAEL value of 410 mg/kg-bw/day. While Sample *et al.*, applied a subchronic-to-chronic uncertainty factor of 0.1 to this value to arrive a final chronic LOAEL of 41 mg/kg-bw/day, Jacques Whitford applies a standard subchronic-to-chronic uncertainty factor of 3. Therefore, the final mammalian TRV for chloroform used in this assessment was 136 mg/kg-bw/day.**
85	Ecological Risk Assessment	**SO_2, NOx, F Phytotoxicity Benchmarks** (Section 4.2.1). A short discussion on the effects of these air pollutants on plants is provided. However, there is no discussion of the benchmarks used to assess phytotoxicity, or the concentrations in air associated with the listed effects. Additional detail on the actual benchmarks used (in particular, their basis) would add clarity to the assessment.
		Disposition: **Additional discussion has been provided**
86	Ecological Risk Assessment	**Plant Benchmark for PCP** (Section 4.2.5). It may be worth saying that the Eco-SSL for PCP for plants also is 5 mg/kg.
		Disposition: **Information on the U.S. EPA pentachlorophenol Eco-SSL has been added.**
87	Ecological Risk Assessment	**Plant Benchmarks for Inorganics** (Section 4.2.6). For consistency, it may be worth identifying those inorganics with Eco-SSLs for plants, especially since the Eco-SSL is used as the benchmark for lead. The arsenic Eco-SSL is 18 mg/kg, similar to the benchmarks selected (20 mg/kg). The cadmium Eco-SSL is 32 mg/kg, slightly higher than the benchmark selected (12 mg/kg). The cobalt Eco-SSL is 13 mg/kg, slightly lower than the selected benchmark (40 mg/kg). There also are Eco-SSLs for Ni, Se, Ag and Zn.
		Disposition: **Discussions of benchmarks provided in the U.S. EPA Eco-SSL documents, where available, were added to Appendix J.**
88	Ecological Risk	**Plant Benchmark for Tin** (Section 4.2.6). The Efroymson benchmark is 50 mg/kg, not 500 mg/kg (or 5 ppm), as listed in this appendix.

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
	Assessment	**Disposition:** **The plant benchmark for tin has been corrected to 50 mg/kg in Appendix J as well as within the ecological model.**
89	Ecological Risk Assessment	**Soil Invertebrate Benchmarks for PAHs** (Section 4.3.1). The Eco-SSL for PAHs could be consulted for benchmarks for low- and high-MW PAHs, as you did for mammals. For example, there are data in the Eco-SSL document specifically for pyrene. In addition, the US EPA 1999 Combustion Guidance also contains benchmarks for soil invertebrates.
		Disposition: **Where available (and where a Provincial value was not already in use), the U.S. EPA Eco-SSL soil invertebrate PAH benchmarks for low- and high-molecular weight PAHs were adopted in the ecological model. Specifically, in keeping with the approach used for mammals, an overall value for each of the low- and high-molecular weight PAH classes was used (29 and 18 mg/kg, respectively).**
90	Ecological Risk Assessment	**Soil Invertebrate Benchmarks for Dioxins and PCBs** (Section 4.3.2 and 4.3.3). The US EPA 1999 Combustion Guidance contains benchmarks for soil invertebrates for dioxins and PCBs.
		Disposition: **Based on guidance provided by the U.S. EPA (1999), soil invertebrate benchmarks for dioxins/furans and PCBs have been added to the ecological model. Please see the discussion in Sections 4.3.2. and 4.3.3, Appendix J.**
91	Ecological Risk Assessment	**Soil Invertebrate Benchmarks for Other Organics** (Section 4.3.4). The applicability of microbial benchmarks for the assessment of soil invertebrates should be discussed
		Disposition: **Thank you for your comment. No change has been made.**
92	Ecological Risk Assessment	**Soil Invertebrate Benchmarks for Inorganics** (Section 4.3.5). For consistency, it may be worth identifying those inorganics with Eco-SSLs for invertebrates, especially since the Eco-SSL is used as the benchmark for lead.
		Disposition: **Discussions of benchmarks provided in the U.S. EPA Eco-SSL documents, where available, were added to Appendix J.**
93	Ecological Risk Assessment	**Aquatic Benchmarks: Organics with PWQO** (Section 4.4.2). Please check the PWQOs for phenanthrene and benz(a)anthracene.
		Disposition: **Upon review the benchmark used for benz(a)anthracene was determined to be correct, and was not changed. The benchmark used for phenanthrene was determined to be incorrect, and was subsequently corrected in the ecological model and Appendix J.**
94	Ecological Risk	**Aquatic Benchmarks: Inorganics with PWQO** (Section 4.4.5). Please check the PWQO for vanadium. Also, it is noted that for some inorganics, the PWQO is selected, and for others, the revised PWQO is selected. Any rationale for using one over the other?

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
	Assessment	**Disposition:** **Upon review the benchmark used for vanadium was determined to be incorrect, and was subsequently corrected in the ecological model and Appendix J. Where a revised PWQO was available, this value was preferentially used in the ecological model. No change has been made.**
95	Ecological Risk Assessment	**Sediment Benchmarks** (Section 4.5.2). The MOE Sediment Guidelines document has been replaced by their 2008 document. The reference should be updated accordingly. In addition, the cobalt and silver values are no longer within the 2008 document, so should not be used.
		Disposition: **The reference to the 2008 document has been updated accordingly. Sediment guidelines provided in the new document are carried forward directly from the previous document (MOE, 1993), and so no change to the benchmarks have been made. In the case of cobalt and silver, no applicable values are given, as stated by the reviewer. As such, the assessment approach for these COPC has been updated. Please refer to Appendix J for further information.**
96	Ecological Risk Assessment	**Soil to Terrestrial Invertebrates, UP_{SI}** Some of the comments on Appendix K could have significant influences on the ERA results.
		Disposition: **N/A**
97	Ecological Risk Assessment	To improve clarity of the report, the appendix should outline all assumptions and values used in the calculations of uptake factors for soil-to-terrestrial invertebrates. More specifically, a) The concentration of each COPC in soil used in the calculation of UP_{SI} is not provided in Section 1.1.2. In order to verify UP_{SI} calculations, it was assumed that C_{soil} was equal to the 95% UCLM soil concentration provided in the Baseline Study Report (or the maximum value when the 95% UCLM was not available). b) Assumptions regarding model parameters used in Equation 6 are not referenced and there is no rationale provided for the application of such values. c) Log K_{oc} values were calculated as Log K_{ow} x 0.41. Are the Log K_{ow} values used in uptake factor calculations the same as those provided for each COPC in Appendix D? If so, reference to this should be made in the text. Point estimates of UP_{SI} obtained from Sample *et al.* (1998) for barium, beryllium, cobalt, silver, and vanadium were the median value from a single study. This is not stated in the text.

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: a) All exposure point concentrations used in this assessment are provided in Appendix B and M. b) and c: The text following Equation 6 in Appendix K has been clarified to state: "K_{OW} values used in the uptake equations were the same as those listed in Appendix D." The second paragraph of Section 1.1.1.2 states that UP_{SI} for barium, beryllium, cobalt, silver, and vanadium were based on point estimates
98	Ecological Risk Assessment	The calculated UP_{SI} values were verified for all inorganic COPC (Section 1.1.1.1). Verification of these calculations required that the equation to calculate Log K_{oc} is formatted as follows: Log K_{oc} = Log (K_{ow} x 0.41). Brackets should be added into the text to make this clear. Alternatively, if the equation should be Log K_{oc} = (Log K_{ow}) x 0.41 (which I think is more likely), then the values in the ERA are incorrect. A reference should also be provided for this equation.
		Disposition: **The calculation of K_{oc} is based on the equation: $K_{oc} = K_{ow}$ x 0.41 (Karickhoff 1981), and thus, Log K_{oc} = Log (K_{ow} x 0.41).**
99	Ecological Risk Assessment	The calculated UP_{SI} values were verified for all inorganic COPC (Section 1.1.1.2), with the exception of nickel. The median uptake factor for nickel provided in Table 1 *(i.e.,* 1.06 mg/kg-dry tissue/mg/kg-dry soil) does not match the value provided in the text *(i.e*., 1.656 mg/kg-dry tissue/mg/kg-dry soil), which is the mean value from Sample *et al*. (1998).
		Disposition: **The median nickel uptake factor of 1.06 mg/kg-dry tissue/mg/kg-dry soil from Sample *et al*. was used in this assessment. The value provided in the text has been corrected.**
100	Ecological Risk Assessment	The soil-to-terrestrial invertebrate uptake factor calculated for PCBs was verified using Equation 5 and assuming a soil concentration of 0.01 mg/kg (minimum value). The use of a minimum concentration is not consistent with what was done for other organic compounds (using the 95% UCLM soil concentration). Rationale should be included for selecting this soil concentration.
		Disposition: **The soil PCB concentration selected for use in the ERA is based on the method detection limit, as PCBs were not detected in 11 soil samples collected and analyzed during the baseline study. The use of the method detection limit conforms to the methodology employed in the HHERA for determination of the baseline concentrations used in this assessment, as outlined in Section 5.1.2 of the main report.**
101	Ecological Risk Assessment	The calculated soil-to-terrestrial invertebrate uptake factors could not be verified for 2,3,7,8-TCDD Equivalents using Equation 4 and the 95% UCLM soil concentration for TEQ (*i.e.,* 1.8 pg/g) provided in the Baseline Study Report. It is recommended that the calculation of this uptake factor be reviewed to ensure it is correct.
		Disposition: **A review of this uptake factor confirms that the calculation of this uptake factor is correct.**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
102	Ecological Risk Assessment	**Sediment to Aquatic Plants, $UP_{SAF(fw)}$** The concentrations (sediment and soil concentrations) of COPC used in the uptake factor equations should be stated. It was assumed that concentrations were the 95% UCLM (or the maximum value when the 95% UCLM was not available) baseline concentration (found in the Baseline Report).
		Disposition: **All exposure point concentrations used in this assessment are provided in Appendix M.**
103	Ecological Risk Assessment	The calculated $U_{PSAF(fw)}$ for organics (using Equation 10) were verified for PAHs, and most inorganic compounds (using Equation 12 and Table 2 equations). There were several cases in which the calculated $U_{PSAF(fw)}$ could not be verified. It is recommended that the calculations of sediment to aquatic plant uptake factors ($UP_{SAF(fw)}$) be reviewed for these compounds: a) All organic COPC with a log K_{ow} less than 3.9 (*i.e.*, all COPC with the uptake factor reference Ryan et al, 1998). The equation provided in Table 2 for the calculation of UP_{SP} is unclear. There appears to be a missing bracket. Uptake factors for beryllium, lead, inorganic mercury, and nickel could not be duplicated using the COPC-specific equation from Table 2, Equation 12, and the 95% UCLM baseline soil concentrations.
		Disposition: **Note that Table 2 has been removed from Appendix K to reduce reader confusion and improve the clarity and readability of the appendix.** **a) The equation in question (now Equation 13) has been reviewed and a bracket inserted.** **Uptake factors for these compounds were reviewed, and were deemed to be correct. It is believed the reviewer's confusion stems from the fact that sediment (not soil) concentrations were applied to the soil to plant uptake equations in order to estimate aquatic plant uptake from sediment. Sediment Exposure point concentrations used in this assessment may be found in Appendix M.**
104	Ecological Risk Assessment	While rationale is provided in section 1.1.1 (Soil to Terrestrial Invertebrates UP_{SI}) for the selection of soil-to-earthworm bioaccumulation model and point estimate UP_{SI} for inorganic compounds, the equivalent text is necessary in section 1.1.2 (Sediment to Aquatic Plants, $UP_{SAF(fw)}$). There is no indication of how the soil-to-terrestrial plant uptake models for estimation of UP_{SP} and point estimates of UP_{SP} (Table 2) used in the calculation of $UP_{SAF(fw)}$ were derived. To confirm these values it was necessary to extensively search through the references (U.S. EPA, 2007; Bechtel Jacobs, 1998) to elucidate the equations used and make assumptions regarding what concentrations of COPC in soil were used in calculations.

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **Section 1.1.2 has been reorganized and further text has been added in an effort to improve the clarity and the readability of the section. Additional supporting rationale for the selection of the various uptake factors used in this assessment has also been added. UP_{SP} references have been clarified and are displayed in Table 2 (Formerly Table 3).**
105	Ecological Risk Assessment	It is unclear why a point estimate of UP_{SP} (Table 2) was used over the soil-to-terrestrial plant uptake model for arsenic from Bechtel Jacobs (1998). This is inconsistent with the method used for cadmium, lead, mercury, nickel, selenium, and zinc. It is also unclear from where the point estimates of UP_{SP} for boron, methyl mercury, thallium and tin were adopted (not BJC, 1998). Although the value of the point estimate of UP_{SP} for silver (0.0346) is close to the 90th percentile uptake factor provided in Bechtel Jacobs (1998) (*i.e.,* 0.0367), it is unclear whether the value of 0.0346 was intentionally selected or was taken in error (should median of 0.014 have been used?).
		Disposition: **The soil to terrestrial plant uptake models for inorganics were primarily based on guidance provided by the U.S. EPA (Table 4a, in: *Attachment 4-1, Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs)*), except where noted in Table 2, Appendix K (formerly Table 3). Selection of soil to terrestrial plant uptake factors was based on the professional judgement of Jacques Whitford Scientists.**
106	Ecological Risk Assessment	The uptake factor reference for barium provided in Table 3 is incorrectly cited as U.S. EPA (2007). This should be changed to Bechtel Jacobs (1998).
		Disposition: **Clarification has been added to Appendix K, Table 2 (formerly Table 3).**
107	Ecological Risk Assessment	**Sediment to Benthic Invertebrates, UP_{SBI}** The calculated $UP_{SBI(fw)}$ for organics (section 1.1.3.1) cannot be verified because the COPC-specific metabolic factors used in Equation 15 are not provided. This information should be added to Table 4 to add transparency to the sediment-to-benthic-invertebrate modeling.
		Disposition: **Agreed. A column containing COPC specific metabolic factors used in Equation 15 has been added to Table 3 (formerly Table 4).**
108	Ecological Risk Assessment	The calculated $UP_{SBI(fw)}$ for organics (section 1.1.3.2) were verified for arsenic, cadmium, chromium (total), and lead using the BSAF models available from ORNL (1998).
		Disposition: **N/A**
109	Ecological Risk	The derivation of sediment-to-benthic-invertebrate uptake factors for all other inorganic COPC was not checked as the values used in the calculation of arithmetic and geometric means were not provided.

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
	Assessment	**Disposition:** **N/A**
110	Ecological Risk Assessment	The regression equations derived using both depurated and non-depurated ("all" dataset) data were used in the calculation of $UP_{SBI(fw)}$ for arsenic, cadmium, chromium (total), lead and zinc. This selection did not always correspond with the recommended regression equation as noted in ORNL (1998). Rationale for the selection of particular regression equations should be included. **Disposition:** **The selection of appropriate BSAFs was based on the professional judgement of Jacques Whitford scientists.**
111	Ecological Risk Assessment	Receptor parameters were reviewed. In all cases where calculations were done, values were verified (including calculated intake factors). However, some assumptions had to be made to be able to complete the calculations. To improve clarity of the report, the appendix should outline all assumptions and values used in the calculations. All of these comments are considered minor. **Disposition:** **No changes.**
112	Ecological Risk Assessment	a) The source for receptor body weight is not specified, and the process followed for selection of receptor body weights was inconsistent. In most cases, body weights were selected from values presented in U.S. EPA 1993. A more detailed explanation of how body weights were selected/derived would be beneficial to indicate why different methodologies were used for some receptors. I. The value used for modelling purposes was derived by taking an average of all body weights (including male and female weights) tabulated for the specific receptor (*i.e.*, eastern cottontail, muskrat, red fox, American robin, belted kingfisher, great blue heron, mallard, and red-tailed hawk). II. For the meadow vole, several body weights were used in the averaging, while other referenced values were excluded without explanation. It appears that only body weights of animals collected from Quebec and Ontario were used and not those from Indiana and Manitoba. This should be stated. III. In the case of mink, although the selected body weight is reasonable, averaging of the body weights tabulated in U.S. EPA 1993 does not provided the value used in the ERA (perhaps it was from Sample and Suter, 1994?). IV. For the masked shrew, a body weight of 5 g was used when a range from 3 to 6 g was presented in U.S. EPA (1993); this is a reasonable assumption. For white-tailed deer and wild turkey, data for the receptors were not provided in U.S. EPA (1993); body weights were found in outside references. The body weight for females only was used for wild turkey (based on data in Sample and Suter, 1994). **Disposition:** **I. N/A** **II. Body weights for the meadow vole were in fact taken only from animals collected in Quebec and Ontario.** **III. The body weight of the mink was derived from the U.S. EPA (1993) document, averaging the mean adult body weights of wild mink only.** **IV. The selection of receptor biophysical parameters was based on the professional judgement of Jacques Whitford scientists.** **No changes have been made.**

Reviewer's Name & Organization: Intrinsik Environmental Sciences Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
113	Ecological Risk Assessment	The values used as the percent soil/sediment for each dietary compartment are estimated based on diet composition and behaviour. This is reasonable. However, the use of 3 significant digits is inappropriate
		Disposition: **Agreed. Changes have been made.**
114	Ecological Risk Assessment	The assumed moisture content of various food items used in the calculation of food ingestion rates on a wet weight basis (kg wet weight/day) from food ingestion rates on a dry weight basis should be included. Without this information, it was difficult to confirm the food intake rates used for modelling purposes. The food ingestion rate for white-tailed deer was confirmed by assuming a 62.6% moisture content of vegetation (averaging all vegetation moisture contents, pg. 4-14, U.S. EPA, 1993).
		Disposition: **Soil and sediment values were reported on a dry weight basis, plant and animal matter were reported on a wet weight basis.**
115	Ecological Risk Assessment	The calculations in the worked example were verified. Transparency of this appendix would be improved if units were carried through the example calculations.
		Disposition: **No change to Appendix O has been made.**

APPENDIX P-2

SENES Peer Reviwer Comment Table

SENES Consultants Limited

TO:	Faye Langmaid	34574-2
FROM:	SENES Consultants Limited	July 6 2009
SUBJECT:	Peer Review of the Draft EA for Durham/York Residual Waste Study – Site Specific Human and Ecological Risk Assessment Technical Study Report	

Attached is the draft peer review of the Site Specific Human and Ecological Risk Assessment Technical Study Report of the Draft EA for Durham/York Residual Waste Study. Please note that this peer review report is a draft version and subject to further discussion with the Region's consultants before being finalized.

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
1	General	The comments provided in this assessment are only for the 140,000 tonne scenario as this scenario was the only one provided at the time of the review. Based on discussions with Jacques Whitford at the June 5th Peer Review Meeting, they are currently in the process of modelling the 400,000 tonne scenario and that will be available sometime around June 15th. The methodology for carrying out the Air Quality modelling and calculations for the HHERA will be the same as what has been provided in this document therefore the review of the 400,000 tonne scenario will only involve a review of the results and discussion. Disposition: **The 400,000 tpy scenario has been incorporated into the report.**	Accepted by Reviewer ☒ Yes ☐ No
2	General	Based on discussions with Jacques Whitford at the June 5th Peer Review Meeting, it is our understanding that a number of changes have been made to the document since it was sent out for comment. These changes were made as a result of comments by the peer reviewers for the Durham Region as well as the peer reviewers for the Durham Medical Officer of Health. However, the comments presented here are based on the May 2009 report that was sent out for review. Disposition: **Major updates have been incorporated into the report and are summarized after the Executive Summary of the June 12th draft.** Disposition on Response: **Noted.**	Accepted by Reviewer ☒ Yes ☐ No It should be noted that a number of sections have been changed in the updated risk assessment which makes the review of the changes very difficult.
3	General	The Air Quality peer reviewer noted that generally the air quality assessment appears to have been done in a professional manner and the documentation is comprehensive and complete, save minor textual inconsistencies. There is however a fundamental concern with the generation of the CALMET meteorological wind fields, which if inappropriately represented will introduce bias in the results and potentially over or underestimate impacts at various locations. The review of the HHERA document is based on the fact that the predicted concentrations will not change substantially from those presented in the HHERA document. **Disposition:** **Since receipt of these comments the Air Quality team has rerun their models, updated with comments from Senes and the MOE. Overall, this led to minor or insignificant changes in the ground level concentrations or the deposition values used in the risk assessment. These findings will be provided in the final draft but in no way affect the conclusions or findings of the risk assessment.**	Accepted by Reviewer ☒ Yes ☐ No
4	Section 1.2	**The purpose of the report is very weak and does not indicate that the focus of the risk assessment is only related to air emissions.**	

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition: **This Section of the Technical Report has been updated to reflect that the risk assessment was only related to air emissions from the Thermal Treatment Facility.**	Accepted by Reviewer ☒ Yes ☐ No
5	Section 3.1	Figure 3.4 was missing from the document and was subsequently sent by email, this figure needs to be incorporated in the document. Disposition: **The figure has been included in the updated Technical Report.**	Accepted by Reviewer ☒ Yes ☐ No
6	Section 3.1.1	Minor typographical error – on page 11 Last paragraph in this section is missing a period at the end of the sentence. Disposition: **Text has been updated.**	Accepted by Reviewer ☒ Yes ☐ No
7	Section 3.1.1.3	There is no description of the form of ammonia that would be used in the Selective Non Catalytic Reduction System of the facility as well as how it would be shipped to the facility. Disposition: **Aqueous ammonia would be used in the SNCR system. The method of shipment has not been specified by Covanta. The text has been updated to reflect the form of ammonia used and to provide further comment on how details would be expected to be part of the EPA approval process.**	Accepted by Reviewer ☒ Yes ☐ No
8	Section 3.1.1.6	Minor typographical error with the spelling of "would" in the first paragraph. Disposition: Text has been updated.	Accepted by Reviewer ☒ Yes ☐ No
9	Section 3.2.1	More clarification is needed on the selection of the receptor locations as it is not clear as to how the final group of receptors were selected based on the original Inhalation Receptor groupings provided in Table 3-1.	

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition: **The Inhalation Receptor Groupings provided Table 3-1 are the final receptor groupings characterized in the risk assessment. Further clarification has been added to the text as follows:** **"Risk characterization was then performed on the resulting 15 receptor groupings (Table 3-1), which represent the originally selected 309 receptor locations."** **The text will be further updated to include a discussion of how these receptor locations were selected within the 10 km radius of the Facility in the updated Technical Report.**	Accepted by Reviewer ☒ Yes ☐ No
10	Section 3.2.2	No adequate rationale has been provided for the selection of the receptor locations for the multi-pathways assessment. Disposition: **This Section of the Technical report has been updated to include additional rationale for the selection of the receptor locations for the multi-pathway assessment.** **The text will be further updated to include a discussion of how these receptor locations were selected within the 10 km radius of the Facility in the final report.**	Accepted by Reviewer ☒ Yes ☐ No
11	Section 3.2.3	No adequate rationale has been provided for the selection of the ecological receptor locations. Disposition: **Section 8.3.4 provides a full description and rationale for each ecological receptor location. A reference to Section 8.3.4 has been added to this section.**	Accepted by Reviewer ☒ Yes ☐ No
12	Section 3.3	In Table 3.6 it indicates that the cumulative case was only evaluated qualitatively in the *Air Quality Assessment Technical Study Report.* Provide a rationale as to why the cumulative case was not evaluated within the HHERA. Disposition: **The cumulative effects case was not quantitatively assessed during the risk assessment as sufficient details on "other" future projects and emissions rates were not available to the team at the time of the preparation of the Technical Report. This will be investigated further prior to release of the EA to the MOE, however, it is unlikely that this information will be available in a quantitative manner. It should also be noted that the completion of a cumulative effects assessment was not contemplated within the context of the Approved EA TOR.** Disposition on Response: **This has been made clear in section 3.4.3.6 of the final report.**	Accepted by Reviewer ☒ Yes ☐ No As long as a clear statement relating to this disposition is put in the report.

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
13	Section 3.3.1.2	This section indicates that the traffic estimates from URS Canada Inc were combined with baseline ambient conditions to produce the baseline traffic case. It is not apparent in the report or appendices as to where these concentrations are presented. Disposition: **Traffic Data used in the assessment of the Baseline Traffic Case and Traffic Case will be provided in Appendix E of the updated Technical Report and was provided by the Air Quality Modeling Team.**	Accepted by Reviewer ☒ Yes ☐ No
14	Section 3.3.3.3	Not enough information is provided for The Process Upset Case and therefore it is difficult to understand this Scenario. No rationale is provided for why it was assumed that the facility would run at the Upset Conditions 5% of the year for CACs and metals and 20% of the year for other COPC. Why would Upset Conditions not be the same regardless of the COPC? In addition no rationale has been provided for the use of a factor of 10 for the emission rates of the short term ground level COPC concentrations. As discussed in the June 5th meeting, the Upset Case needs to be clearly defined as it is Upset Conditions and not normal operating conditions that are of most concern for this type of facility. Disposition: **Section 3.4.3.3. of the Report has been updated to include a better discussion of the Process Upset Cases evaluated in the risk assessment.**	Accepted by Reviewer ☒ Yes ☐ No
15	Section 3.3.3.4	It is unclear how this Case is different from what was presented in Section 3.3.3.3 as no description of this case is provided. Disposition: **This Section has been updated in the Report to differentiate it from Section 3.3.3.3.**	Accepted by Reviewer ☒ Yes ☐ No
16	Section 3.3.3.5	This section describes the Traffic Case. Why was PM_{10} not evaluated as this constituent is associated with vehicular emissions? Disposition: **PM_{10} has been added to the Traffic Case Assessment.** Disposition on Response: **PM_{10} is included in the Report.**	Accepted by Reviewer ☒ Yes ☐ No As long as it is added to the evaluation as it is not present in the June 11 updated document.
17	Section 3.3.3.6	It is unclear how this Section and the Subsections were used in the assessment as in Table 3.6 it indicated that the Future and Existing Conditions Case was evaluated qualitatively in the Air Quality TSD. There are typographical issues with the Subsection numbering. In Section 3.3.3.6.3, no rationale is provided as to why the aggregate transfer station and the GO transit line/station are expected to have little effect on the regional air quality. In addition, no discussion was provided on the St. Mary's, Darlington NGS and 401-407 Eastlink.	Accepted by Reviewer ☒ Yes ☐ No As long as the typographical

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition: **Typographical errors with the subsection numbering have been resolved. Additional discussion and clarification has been added throughout this section.** Disposition on Response: **This has been done for the Report.**	errors are corrected and additional statements are added as it is not present in the June 11 updated document.
18	Section 4.2	Table 4.2 presents the list of COPC that were evaluated in the assessment. Why were acrolein and 1,3-butadiene not evaluated as they are known to be associated with the incineration of garbage? Disposition: **Section 4.2.2 has been updated to include a discussion on acrolein and 1,3-butadiene.** **During the peer review process, a question was posed about the exclusion of acrolein and 1,3-butadiene from the COPC list. Acrolein is released to the environment through the incomplete combustion of organic matter. The main combustion source of acrolein is from gas and diesel motor vehicle emissions (CEPA, 1999). It is likely that acrolein would be emitted from a Thermal Treatment Facility, but the Air Quality Team was unable to locate any emission factors for acrolein for incineration facilities during their review of Canadian, US EPA or CalEPA data sources. Given that motor vehicle emissions to the environment far exceed those that would be expected from a Thermal Treatment Facility (CEPA, 1999), it is not anticipated that its exclusion from the HHRA would alter the overall conclusions of the report.** **Although 1,3-butadiene was identified as a COPC in the *Air Quality Assessment Technical Study Report* (Jacques Whitford, 2009e), no credible sources of emissions data for this contaminant were found during the extensive literature review performed for the assessment. Therefore, 1,3-butadiene was considered, but not modelled by the Air Quality Team."** Disposition on Response: **The above statement regarding 1,3-butadiene has been added to the Report.**	Accepted by Reviewer ☐ Yes ☒ No Only acrolein was addressed in the update. A statement needs to be added for 1,3-butadiene.
19	Section 5.1	It seems like a very small sample of forage samples (i.e. 5) were collected in the study area. No rationale was presented to indicate that this small sample was adequate enough to describe baseline conditions in the area. Similarly only 11 browse samples were collected. Provide a rationale in this section to indicate whether the number of samples collected adequately represents baseline conditions.	Accepted by Reviewer ☒ Yes ☐ No

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition: **The text regarding forage samples was incorrect. Text was updated to reflect that 11 forage samples were collected from the 17 sampling locations within the baseline assessment area.** **Regardless for the purpose of the HHERA the MOE has requested that maximum concentrations be used with the exception of the soil data. This will be updated in the Report. Although it may slightly alter the baseline risk assessment, it will not impact the conclusions or the results of the HHERA.** Disposition on Response: **This has been added to the Report.**	As long as it is added to the text as it is not present in the June 11 updated document.
20	Section 5.1.2	Provide a rationale as to why a small sample size (i.e. 5 samples) is adequate enough to evaluate a 95th UCLM. Disposition: **See response to Comment 19.**	Accepted by Reviewer ☒ Yes ☐ No
21	Section 6.1	Countor plots have been provided for the ambient exposure point concentrations; however, a table summarizing the air concentrations used in the assessment has not been provided. Disposition: **A summary table is now provided in Appendix E to the Report.**	Accepted by Reviewer ☒ Yes ☐ No
22	Section 6.2	It is unclear why the COPC list in Table 6-1 is different from the original list provided in Table 4-2. Provide a rationale for this difference. Disposition: **Not all COPC presented in Table 4-2 were considered relevant to the Baseline Loading tables due to the physical-chemical properties of the COPC. Specifically not all COPC released from the Thermal Treatment Facility will persist or accumulate in the environment. Chemicals that have the potential to persist and accumulate in the environment were carried forward into the multi-pathway assessment and subsequently included in the Baseline Loading Tables. O-terphenyl was added to the Baseline Loading Tables.** Disposition on Response: **An introductory paragraph regarding the loading tables has been added to the document explaining the rationale behind the selection of COPC for the loading tables.**	Accepted by Reviewer ☒ Yes ☐ No As long as a rationale is provided in the section to clarify the discrepancy so that the report is transparent.
23	Sections 6.3-6.5	Provide a rationale for why the COPC list in Tables 6.2 to 6.15 differs from the original list provided in Table 4-2.	

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Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition: **See response to comment 22.**	Accepted by Reviewer ☒ Yes ☐ No See above
24	HHRA, Section 6.3, Table 6.2	While the increased emissions during upset conditions (a factor of 2.8 or 1.45) are reflected in environmental media concentrations (soil, water, etc), the concentrations of majority of chlorinated aromatics in surface water , sediments, small mammals, and fish remained essentially the same for both scenarios despite a sharp increase in emissions during upset conditions. This could not be explained using available information from the HHRA document. Disposition: **Loading calculations will be reviewed to ensure that the calculation of chlorinated aromatics is appropriate and if so, a rationale for the lack of increase will be provided.**	Accepted by Reviewer ☒ Yes ☐ No
25	Section 6.6	This Section indicates that only dioxins and furans and PCBs were evaluated in breast milk yet in Table 7-18, hazard quotients have been provided for a larger list of COPC. This discrepancy needs to be resolved. Disposition: **The Report has been updated to reflect that all organic COPC (except metals) have been evaluated for farmer and resident infants. The metals risk assessment results were provided for dust ingestion.**	Accepted by Reviewer ☒ Yes ☐ No
26	Section 7.3.3	Sensitive receptors have not been discussed nor characterized. This section should include some discussion of the potentially sensitive subgroups of the population as they will be potentially most affected by the emissions from the facility. Only a daycare/school was discussed what about retirement homes are there any in the area? Disposition: **A large number of receptors, including retirement homes, were assessed and discussed in the inhalation assessment. The receptors chosen for the multi-pathway assessment were deemed those most sensitive to multi-pathway exposure. This is further described in Section 7.4 (Receptor Characterization).** **Text in the Report has been updated to clearly reflect this.**	Accepted by Reviewer ☒ Yes ☐ No

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Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
27	Section 7.3.4.1	A wide range of values are reported in the literature for soil ingestion rates (SIRs). This section does not provide any discussion or recognition of the different SIRs. The Health Canada SIRs used in this section are all lower for the toddler than other SIRs used such as 100 mg/d. In addition the MOE posted the following document in October 2008 to the Environmental Registry *"The Rationale for the Development of Generic Soil and Groundwater Standards for Use at Contaminated Sites in Ontario"* (http://www.ene.gov.on.ca/envision/env_reg/er/documents/2008/010-4642%203.pdf). This document contains the SIRs the Ministry considers appropriate for use in assessing this exposure pathway which are much higher than the ones used in this assessment. Thus, this section should provide adequate discussion on the SIRs and provide a rationale for the values selected. Based on the June 5th Peer Review meeting, it is our understanding that calculations have been redone using an SIR of 100 mg/d for the toddler. The use of this value needs to be supported by a detailed rationale. In addition provide a rationale as to how the dust ingestion rate was calculated in Appendix G. Disposition: **The June 12th report has been updated to include the toddler SIR to 100 mg/d.** Disposition on Response: **The document has been updated to include a toddler SIR of 200 mg/d, as per the recent October 2008 MOE posting. Rationale for this has been provided in the report.**	Accepted by Reviewer ☐ Yes ☒ No While the calculation may reflect an SIR of 100 mg/d, the text still indicates that the SIR is from Health Canada. As indicated in this comment, more discussion and rationale is necessary in this section to support the selection of the SIRs used in the assessment.
28	Section 7.3.4.1	For breast milk ingestion it is indicated that the infant is "assumed to be exclusively breast fed (meaning their intake of all other foods and water is set to zero)"; however in Table 1-1 in Appendix G which has the receptor characteristics there is a value for the water ingestion rate and wild game ingestion rate. Disposition: **The table has been updated.**	Accepted by Reviewer ☒ Yes ☐ No
29	Section 7.3.4.1	Skin surface Areas have been obtained from Health Canada 2004 which provides information on total area, arms, hands, legs and feet. However in Appendix G different skin surface areas are provided for Summer and Winter with no rationale as to how these values have been derived. Disposition: **Skin surface areas for summer include head, legs and arms, while skin surface areas for winter include only the head. Description of this rationale has been added to the appropriate sections of the Report which outline dermal soil/dust exposure.** Disposition on Response: **Rationale has been added to section 7.3.4.1 of the report.**	Accepted by Reviewer ☒ Yes ☐ No As long as it is added to the text as it is not present in the June 11 updated document.

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Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
30	Section 7.3.4.1	In Appendix G, the characteristics of a composite receptor have been provided by using a weighted average of the various ingestion rates instead of considering each life stage separately and then considering the exposure. It was acknowledged in the June 5, 2009 meeting that calculations will be provided in the Uncertainty Section. This should be done. Disposition: **An example of the calculation used to estimate composite receptor properties has been added to Appendix G of the Report.** Disposition on Response: **This has been added to the uncertainty section in the report.**	Accepted by Reviewer ☐ Yes ☒ No At the June 5th meeting, it was agreed that this would be added to the Uncertainty Section of the report to reflect the different ways in calculating the risks to the composite receptor (i.e. weighted average vs calculation for each life stage then summing together).
31	Section 7.3.4.1	The document indicates that ingestion rates for beef, chicken, pork, dairy and eggs were taken from EPA 2005. Appendix G provides the values used in the report. It is difficult to reconcile the ingestion values for these different food groups in Appendix G with the Tables from the EPA 2005 document. A rationale needs to be provided in the Appendix as to how these values were derived for the toddler and composite farmer receptors. The text indicates that the rates are specific to a child and adult farmer receptor. This needs to be corrected. Disposition: **Child and adult consumption rates were used as proxies for toddler and adult consumption rates for ingestion of aboveground-exposed, aboveground-protected and belowground produce and agricultural products only. All other relevant consumption rates related to toddler-specific and adult-specific consumption rates. Consumption rates were taken from US EPA HHRAP guidance. Additional rationale and discussion has been added to Appendix G of the Report.** Disposition on Response: **Exact references to the Table in US EPA HHRAP from which the values were obtained has been added to Appendix G, as well as a description of the adjustment performed.**	Accepted by Reviewer ☐ Yes ☒ No More information than what is provided here is needed as when the 2005 document was checked, the numbers did not match what was presented in the Appendix. The value selected from the table in the 2005 document is needed and how it was adjusted to be used in the assessment.
32	Section 7.4.3	This section is supposed to present the results of the exposure analysis; however no results are presented in this section or in an Appendix. Appendix G only provides a worked example, Appendix B the baseline concentrations and Appendix C the equations used to calculate the exposure. Exposure results are necessary to check the intermediate steps in the risk assessment.	Accepted by Reviewer ☐ Yes ☒ No

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition: **EPCs are now provided in Appendix E of the Report.**	This comment does not relate to EPCs but to the calculations of exposure (i.e. in mg/kg-d) for each pathway that were used to calculate the risk. These have not been provided in the report.
33	General	Overall, the methodology used to calculate the COPC concentrations in the environmental media and point of exposure COPC concentrations is sound. However, some specific clarifications are needed for these calculations within the context of ecological risk assessment.	Accepted by Reviewer ☒ Yes ☐ No
		Disposition: **Appendix K (Biological Uptake Factors) provides rationale for calculations conducted within the Ecological Risk Assessment surrounding aquatic plants, soil invertebrates and benthic invertebrates. Exposure point concentration calculations for other media, which are common to both the HHRA and ERA are provided in Appendix C of the Report.**	
34	Appendix B, Section 1.1	The US EPA (2005) Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities (HHRAP) provides recommendation for HHRA and does not provide recommendations on how to Develop a site-specific ecological risk assessment. EPA had previously published its recommendations for conducting screening level ecological combustion risk assessments in a separate document, the Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities (SLERAP) Peer Review Draft (U.S. EPA 1999). , is currently undergoing substantial revision. Until revisions are complete, we can't recommend using the SLERAP. The media considered for HHRA in this document were (Figure 1.1 of HHRAP) 1. Air for Direct Inhalation 2. Soil 3. Produce 4. Meats, Milk, and Eggs 5. Drinking Water and Fish	Accepted by Reviewer ☐ Yes ☒ No This response does not indicated as to how the document will be changed to respond to the comment.
		Disposition: **SLERAP (1999) was reviewed but was not relied upon to any great degree in the assessment. Guidance from MOE, CCME, Ohio EPA, ORNL and other regulatory bodies was consulted for guidance on conducting the ERA.**	

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Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition on Response: **There is currently no mention of SLERAP in Section 1.1 of Appendix B. The document does not specify that SLERAP was relied upon to any great degree in the assessment, but rather indicates, as per the previous disposition, that it was reviewed along with other documents in the conduct of the ERA. As a result, no change to the document is deemed necessary.**	
35	Appendix C, General	It is understood that indoor air, grain, beef, pork, chicken, egg, dairy products, and fruits are also used in calculation of intake by receptors. If this appendix is meant to provide a complete methodology to calculate point of exposure concentrations, it should provide the equations and methodology used to estimate the above exposure media concentrations. They are missing from the document. Disposition: **Intake via indoor air and grain were not predicted in the HHRA. However, predictive equations for beef, pork, chicken, egg, dairy and fruit have been added to Appendix C of the Report.** Disposition on Response: **Noted. Clarity in the report and Appendix C has been assured.**	Accepted by Reviewer ☒ Yes ☐ No As long as the report is very clear as to what exposure pathways were considered.
36	Appendix C, Section 1.2.2	Brackets are used incorrectly in the equation. This is the same problem with some other equations as well. It should be ensured that the calculations used the equations with proper location of brackets. Disposition: **All equations have been reviewed and proper bracketing has been ensured.**	Accepted by Reviewer ☒ Yes ☐ No
37	Appendix C, Section 1.2.2, Section 1.3.1	The units for Dydv, Dywv, Dydp, and Dywp are incorrect in equations for soil and above ground produce concentration. As such both sides of the equations have different dimensions. Please note that terms are unitized deposition rates not yearly average deposing rates (Q was considered to be 1). Disposition: **The units of these parameters will be reviewed and proper units will be ensured in displaying the calculations and in the model itself.**	Accepted by Reviewer ☒ Yes ☐ No
38	Appendix C, Section 1.4.1	The equation for calculating the concentration in wild game tissue is incorrect. The $Ba_{wildgame}$ should be multiplied by forgae intake as well as soil intake. In addition the equation for calculating $Ba_{wildgame}$ is applicable only for organic compounds. It is not clear, from the document , how $Ba_{wildgame}$ for metals are calculated.	Accepted by Reviewer

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Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition: **As outlined in Appendix C, the equation for $C_{wildgame}$ includes Q_s, C_s, and B_s, or the quantity of soil eaten by wild game each day, the average soil concentration over exposure duration and the soil bioavailability factor. Soil intake is thus combined with forage intake and multiplied by $Ba_{wildgame}$ to obtain the tissue concentration.** **The calculation of Ba_{game} for metals is based on Baes et al. (1984), as per US EPA HHRAP. A description of this calculation will be added to Appendix C.**	☒ Yes ☐ No
39	Appendix C, General Section 3.3.3.3 of HHRA	It appears that the upset factor (1.45 or 10 times for 5% of the time for metals and 2.8 or 10 times for 20% of time) used for prediction plant emissions during upset conditions are consistent based on a methodology used by California Air Resources Board (CARB) (1990). This should be referenced in the document. Disposition: **CARB(1990) is now referenced in the Report.**	Accepted by Reviewer ☒ Yes ☐ No
40	Appendix C Section 1.5.8	This section should explain the difference between BCF and BAF and their application in calculating fish concentrations. Also, it is not clear why BAF is based on fish fresh weight and BCF is not. Usually both of these factors should be used on a fresh weigh basis. Disposition: **A paragraph explaining the difference between BCF and BAF has been added to Section 1.5.8. of Appendix C. Units for BAF have also been updated to reflect that the BAF is expressed on a fresh weight basis.**	Accepted by Reviewer ☒ Yes ☐ No
41	Appendix C Section 1.5.8	The BSAF is not unitless. It is usually expressed as kg sediments/kg fish FW. It is significant to provide the unit, even though the factor is dimensionless, as it make a difference if the fish concentration is calculated on a fresh weight basis. Disposition: **Appendix C has been updated to reflect the basis of the calculation.**	Accepted by Reviewer ☒ Yes ☐ No
42	Appendix C Section 1.5.8	While application of BSAF for calculation of concentrations in benthic fish or bottom feeders which spent most of the time at the vicinity of bottom sediments is appropriate, this may not be the case for plagic fish which spent most of the time in water column. There should be a discussion about this. Disposition: **As outlined in Appendix C, the BSAF calculation was applied only to extremely hydrophobic chemicals such as dioxins, furans and PCBs. This use of the BSAF factor takes into account the highest possible exposure (expected to occur in sediment) to any fish (including pelagic). By using this conservative approach the pelagic fish population is expected to be protected.**	Accepted by Reviewer ☒ Yes ☐ No

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43	Appendix C, 1.5.8	US EPA document says: *"The MF presented above for BEHP applies only to mammalian species, including beef cattle, dairy cattle, and pigs. It does not relate to metabolism in produce, chicken, or fish. In addition, since exposures evaluated in this guidance are intake driven, using an MF applies only to estimating COPC concentrations in food sources used in evaluating indirect human exposure, including ingestion of beef, milk, and pork. In summary, an MF is not applicable for direct exposures to air, soil, or water, or to ingestion of produce, chicken, or fish."* However MF was used to calculate the fish concentration. It may underestimate the fish concentrations by a factor of 100 for PAH compounds. Disposition: **The use of a MF in the calculation of concentrations of PAHs in media such as fish, beef, milk, pork, poultry and eggs, is based on rationale from Hofelt et al. (2001). This rationale is described in Section 1.4.1 of Appendix C. A reference to this section has been added to Section 1.5.8.** **Briefly, Hofelt et al. states that the assumption of a MF of 1 for PAHs can result in an overestimation of the tissue concentration that, in turn, results in an overestimation of risk. The article also states that the USEPA has recommended a reduction in the fish bioaccumulation factors provided in HHRAP by three orders of magnitude – equivalent to a fish metabolic factor of 0.001 – based on empirically derived fish bioconcentration factors. The Report documents the use of a metabolic factor of 0.01 – which incorporates a conservative safety factor of 10%.**	Accepted by Reviewer ☒ Yes ☐ No
44	Appendix D, General	It should be clear that all the transfer factors provided for all COPC is on the FW or DW basis. There is a significant difference between calculations based on FW and calculations based on DW. The unitless numbers provided does not indicate which basis was used. Disposition: **Appendix D has been modified to specify the basis for all unitless biotransfer factors.**	Accepted by Reviewer ☒ Yes ☐ No
45	Appendix D, General	Based on the methodology provided in Appendix C, Section 1.4.1, the transfer factor (Ba) for wild game was calculated using Ba for beef. The transfer factor (Ba) for beef was also calculated using Ba for fat. However, in Appendix D, numerical values (cited from EPA 2005) were provided for both. It should be clear which method was used to calculate the tissue concentration of wild game. Generally, there may be cases where both empirical values and equations were provided for a parameter. In those cases the document should be clear which method was used.	Accepted by Reviewer ☒ Yes ☐ No

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Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition: **Where a COPC is present, the HHRAP database provides Ba_{beef}. The HHRAP details that this value is based on Ba_{fat} as described in Appendix C. For all COPC, Ba_{game} has been calculated from Ba_{beef}. All Ba_{beef} and Ba_{game} values are correctly cited as having been obtained from HHRAP (if the COPC is included in the HHRAP database), or as having been calculated based on an equation from HHRAP (as described in Appendix C).**	
46	Appendix E, General	The point of exposure concentrations for Project Case (Baseline + Project) and Process Upset Project Case (Baseline+ Upset Conditions) were not provided. Disposition: **Project Case and Process Upset Project Case risk estimates were calculated by taking the sum of the Baseline Case and Project Alone Case/Process Upset Case risk estimates.** Disposition on Response: **Noted. Clarity in the report has been assured.**	Accepted by Reviewer ☒ Yes ☐ No As long as the report is clear about the approach.
47	Appendix E, General	Calculated Indoor air concentrations should be provided for receptor clusters where appropriate. Disposition: **Appendix E has been updated to provide separate inhalation (i.e. air) and multi-pathway exposure point concentrations. As inhalation is assessed separately, air concentrations have been removed from the multi-pathway exposure point concentration tables.**	Accepted by Reviewer ☒ Yes ☐ No
48	Section 7.5 General	This Section provides all the toxicity reference values (TRVs) that were used in the assessment. There are a number of inconsistencies in this Section. Based on discussions at the June 5th peer review meeting it is our understanding that this section and the TRVs have been updated. Nonetheless, a few comments relating to issues with the TRVs will be provided. Disposition: The Toxicological Profiles have been updated. Disposition on Response: **The toxicological profiles were not updated for a number of chemicals, however, the WHO guidelines were considered as air quality benchmarks and not as toxicity reference values in this assessment. Therefore, there is comment on these values in Table 7-4 but the reviewer is correct that this information was not added to the profiles. Again, these values were provided for information purposes in the HHERA.**	Accepted by Reviewer ☐ Yes ☒ No The toxicity Profiles have not been updated to reflect the WHO guidelines that were used as discussed by JWEL in response to comment 51.

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49	Section 7.5 General	The TRVs taken from Health Canada were referenced to a 2004 document. The HHRA should note, however, that the literature cut-off date for these TRVs was 1992. Similarly, when referencing TRVs taken from USEPA IRIS, the year that the TRV was published, in addition to the year that IRIS was accessed to get the TRV, should be indicated Disposition: **Jacques Whitford is aware of the cut off dates used for the Health Canada 2004 document.** **The references to US EPA are all properly documented in the Report**.	Accepted by Reviewer ☒ Yes ☐ No
50	Section 7.5 General	Not all of the values presented in the table as TRVs are actually TRVs. For example, the reliance on air guidelines as sources of TRVs may not be appropriate. Air guidelines may not be based on health effects and thus concentration ratios obtained using these values would not be considered valid. The values used to assess health risks in the HHRA must all be actual TRVs. Disposition: **It is stated in Section 7.5 of the Report under Benchmark (Inhalation), "for this assessment only health-based benchmarks were used". We acknowledge, however, that for benchmarks related to particulate matter, values are often derived based on policy and not only health.** **It is recognized that these are benchmark values, however, when these values were used there was a lack of toxicological information from any of the reliable agencies that provide RfCs.** Disposition on Response: **Discussion of AAQCs has been added to the uncertainty section.**	Accepted by Reviewer ☒ Yes ☐ No As long as this is discussed in the Uncertainty Section that the use of the Concentration ratios based on AAQCs may not be fully protective of all health effects.
51	Section 7.6 Table 7.2	It is curious to note that WHO guideline values were uses for the CACs in the generic risk assessment and they have not been used in this assessment. No rationale has been provided as to why these values were not used in this assessment. Based on the June 5th discussion, it is our understanding that the WHO values will be used. Disposition: **The WHO guideline values for PM_{10}, $PM_{2.5}$, NO_2 and SO_2 have been added to the inhalation assessment documented in the Report.** Disposition on Response: See response Comment 48.	Accepted by Reviewer ☒ Yes ☐ No However, the toxicity profiles in Appendix H need to be updated –see Comment 48
52	Section 7.6 Table 7.2	Similarly, why was the value for hydrogen fluoride changed from the original value that was used in the generic HHRA?	Accepted by Reviewer

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		Disposition: **As outlined in the toxicity profile for hydrogen fluoride, the Texas Commission on Environmental Quality recently updated its 1-hour value for hydrogen fluoride to 25 µg/m^3. Further details regarding the derivation of this value are found in the toxicity profile.**	☒ Yes ☐ No
53	Section 7.6 Table 7.2	The values presented for particulate matter PM10 and PM2.5 do not reflect the current science on particulate matter. The National Ambient Air Quality Objective for Particulate Matter has reference levels for health based values of 15 µg/m^3 for 24-h PM2.5 and 25 ug/m^3 for 24-h PM10. In addition the California Air Resources Board (2008) provides a summary of the latest research on PM2.5. It should be noted that in some cases scientists think that there is no threshold that is safe for exposure to PM2.5 and others think ranges from 3 µg/m3 to 7 µg/m3 are protective of health for PM2.5. The discussion in Appendix H is inadequate as it does not reflect the latest literature on particulate matter. Disposition: **The $PM_{2.5}$ values have been updated with the WHO criteria. That being said it is acknowledged that there is considerable debate in the literature and by regulatory agencies from around the world on appropriate PM2.5 values. It should be noted that the addition of PM2.5 at the MGLC from the Facility itself will be lower than the values cited above.** **Regardless the Report has been updated with a further discussion on this matter.** Disposition on Response: **Again this is acknowledged and the report authors believe that there has been adequate discussion on PM included in the report.**	Accepted by Reviewer ☐ Yes ☒ No This is inadequate and as discussed in the original comment a proper discussion on the science relating to PM2.5 is requested. The WHO criteria are not protective of health and the WHO in their document indicate a level of 3 to 5 µg/m^3 where health effects have been observed. All of this should be discussed and an appropriate value selected.
54	Section 7.6 Table 7.3	CalEPA 2003, considers naphthalene to have carcinogenic properties. Therefore, the toxicity profile for naphthalene should be more detailed, particularly in light of the potential mutagenicity and carcinogenicily of naphthalene. Disposition: **There is considerable debate in the scientific community on the potential carcinogenic nature of naphthalene. Text from CalEPA (2003) has been added to the discussion on the carcinogenicity and mutagenicity of naphthalene, but since IARC, Health Canada and US EPA only consider naphthalene as a possible carcinogen to humans and US EPA considers the current data to be inadequate to derive carcinogenic inhalation or oral TRVs, naphthalene has been evaluated as a non-carcinogenic substance in this risk assessment.**	Accepted by Reviewer ☒ Yes ☐ No As long as this is done as it is not in the June 11 document.

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		Disposition on Response: **This has been added to the Report.**	
55	Section 7.6 Table 7.3 and 7.4	For lead, rationale needs to be provided as to why the MOE values which have been derived from a blood lead level have not been used. Disposition: **The oral TRV for lead has been updated to the MOE value in the final version of the risk assessment.**	Accepted by Reviewer ☒ Yes ☐ No
56	Section 7.6 Table 7.3	The annual average for beryllium was cited as 0.0007 µg/m^3 (CalEPA REL, 2008) in the report but the value was found to be 0.007 µg/m^3 (CalEPA REL, 2008). Disposition: **This is a typographical error in Table 7-3. The table has been updated.**	Accepted by Reviewer ☒ Yes ☐ No
57	Section 7.6 Table 7.3 and 7.4	Even though it was stated in appendix H that naphthalene was used as a surrogate for 1-methynaphthalene and 2-methylnaphthalene it should be stated in the chart as well. Disposition: **Tables 7.3 and 7.4 have been updated to reflect that that naphthalene was used as a surrogate for 1-methynaphthalene and 2-methylnaphthalene** Disposition on Response: **This has been added to the Report.**	Accepted by Reviewer ☒ Yes ☐ No As long as this is done as it is not in the June 11 document.
58	Section 7.6 Table 7.3	We were unable to find the Cadmium annual average of 0.005 ug/m^3 (MOE AAQC) in the MOE AAQC 2008 document, where did the number from? Disposition: **The MOE AAQC 2008 documents lists an annual average of 0.005 µg/m3 for Cadmium (and Cadmium Compounds), list #51.** Disposition on Response: **The annual average of 0.005 µg/m3 for Cadmium (and Cadmium Compounds) was mistakenly referenced in the original disposition. This value was obtained from Ontario Air Standards for Cadmium and Cadmium Compounds (MOE, 2007). This document can be obtained at:** **http://www.ene.gov.on.ca/envision/env_reg/er/documents/2007/PA04E0015-f.pdf**	Accepted by Reviewer ☐ Yes ☒ No The MOE February 2008 Air Quality Standards does not have an annual average value for Cadmium. It is not #51 in the list. #51 in the list is Butyl-benzene sulphonamide. Cadmium and Cadmium compounds in #53 and no annual value is presented.

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Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
59	Section 7.6 Table 7.3	Benzene: an acute value of 0.009ppm was used which does not match the given critical effects description. Also an acute value is inappropriate for a 24 hour duration. The more appropriate value would be an intermediate duration value of 0.006ppm, which also matches the given critical effects description. Disposition: **The critical endpoint matches are provided in the ATSDR document, Compendium of Papers on MRLs and Health Effects: Health effects classification and its role in the derivation of minimal risk levels: Immunological effects (http://www.atsdr.cdc.gov/mrls/articles/health_effects_classification_and_its_role_in_the_derivation_of_mrls_immunological_effects.pdf).** **In respect to the benzene acute 24-hour inhalation value, we believe the acute value of 0.009 ppm is more appropriate as a 24-hour value than the intermediate MRL for benzene given that this dose reflects a 1-14 day time period, as compared to >14-365 days for the intermediate dose (i.e., a subchronic dose).**	Accepted by Reviewer ☒ Yes ☐ No
60	Section 7.6 Table 7.3	Where did the acetaldehyde carcinogenic annual average value come from, the compound could not be found in the Health Canada 2004 report listed in the references. Disposition: **As stated in the toxicity profile for Acetaldehyde, the Health Canada reference for this value is:** **Health Canada. 2004. Health-based Guidance Values for Substances on the Second Priority Substances List. http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/contaminants/psl2-lsp2/acetaldehyde/acetaldehyde_fin-eng.pdf**.	Accepted by Reviewer ☒ Yes ☐ No
61	Section 7.6 Table 7.3	Where did the formaldehyde annual average of 3 ug/m^3 (CalEPA REl. 2008) come from, the value and the description are not consistent with the given description in the 2009 report. Disposition: **This value has been updated in the Report. CalEPA recently re-evaluated its chronic formaldehyde REL to 9 µg/m^3; therefore, the updated CaLEPA was selected for use in this assessment**	Accepted by Reviewer ☒ Yes ☐ No
62	Section 7.6 Table 7.3	Where did the 1,1,1-trichloroethane number come from as there is not a an entry for 1,1,1-trichloroethane in the US EPA IRIS database. Disposition: **Values are from the IRIS profile for 1,1,1-trichloroethane, under the subheading: "I.B.1.1. Acute Inhalation RfC Summary", http://www.epa.gov/iris/subst/0197.htm#refinhal**	Accepted by Reviewer ☒ Yes ☐ No
63	Section 7.6 Table 7.3	Why was the annual average for 1,1,trichloroethylene listed as no value when there is an annual average value of 54 µg/m^3 (TCEQ REL. 2008).	Accepted by Reviewer

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition: **This value has been added to the inhalation assessment in the Report.**	☒ Yes ☐ No
64	Section 7.6 Table 7.3 and 7.4	Where did the TEF for benzo(e) pyrene and dibenzo(a,c) anthracene come from as relative potency factors could not be found in IPCS 1998. Disposition: **The TEF factors used for the abovementioned PAHS are from Table AI.9. Relative potencies of indicator polycyclic aromatic hydrocarbons.**	Accepted by Reviewer ☒ Yes ☐ No
65	Section 7.6 Table 7.4	Why were dioxin-like PCBs not considered in the assessment? Disposition: **Section 4.4 has been updated to include a discussion on dioxin-like PCBs.** **Further information on dioxin-like PCBs will also be added to the Report in the section regarding uncertainty**. Disposition on Response: **This has been included in Table 7-85 of the risk assessment.**	Accepted by Reviewer ☒ Yes ☐ No As long as information is presented in the Uncertainty Section.
66	Section 7.6 Table 7.4	Why was the methyl mercury value of $2x10^{-4}$ mg/kg-d (Heath Canada 2004) used instead of the more conservative value of $1x10^{-4}$ mg/kg-d (IRIS 2001). Disposition: **The Health Canada value of $2x10^{-4}$ mg/kg-d was selected for use in this assessment because it is the provisional tolerable daily intake for pregnant women and toddlers in Canada and is consistent with WHO/FAO Expert Committee on Food Additives (JECFA) recommended provisional tolerable weekly intake for methylmercury of 0.00016 mg/kg bw/week (equivalent to 0.00023 mg methylmercury/kg bw/day) in order to sufficiently protect the developing fetus. We believe this value to be more applicable to the current risk assessment.**	Accepted by Reviewer ☒ Yes ☐ No
67	Section 7.6 Table 7.4	Why is perylene listed with a TEF value if it is not considered a carcinogen Disposition: **Perylene is considered a carcinogenic according to WHO, as stated in Environmental Health Criteria document 202 (IPCS, 1998), Table AI.9. Relative potencies of indicator polycyclic aromatic hydrocarbons.**	Accepted by Reviewer ☒ Yes ☐ No

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
68	Section 7.6 Table 7.4	Acenaphthene has a non-carcinogen value of $6x10^{-2}$ mg/kg-d (IRIS 1994) which was not included. Disposition: **This has been updated in the Report.** Disposition on Response: **This has been added to the Report.**	Accepted by Reviewer ☒ Yes ☐ No As long as added to the report as not in the June 11 version
69	Section 7.8.1.1	As discussed Comment 50, ambient air quality standards were used for comparison for the metals and CAC. As these AAQC may not be true health-based values, the limitations of this approach should be discussed. Disposition: **Please see response to comment #50 above.** Disposition on Response: **Please see response to comment #50 above.**	Accepted by Reviewer ☒ Yes ☐ No As long as this is discussed in the Uncertainty Section that the use of the Concentration ratios based on AAQCs may not be fully protective of all health effects
70	Section 7.8.1.1	The evaluation of health-based effects from particulate matter is not appropriate and needs to be revisited. Disposition: **Please see response to comment #53 above.**	Accepted by Reviewer ☐ Yes ☐ No
71	Section 7.8.3.1	The use of the lower WHO values will result in exceedances in the baseline case and thus a frequency analysis will need to be presented for the Project Case. Disposition: **A full discussion of all WHO results has been provided in the report and where relevant frequency analysis has been provided for discussion.**	Accepted by Reviewer ☒ Yes ☐ No
72	Section 7.10	There is a discussion on transfer factors used to calculate concentrations in various media under food chain effects. The following statement is provided "Typically these assumptions are conservative and tend to overestimate rather than underestimate risks". Caution needs to be exercised in using this statement because for a number of chemicals this statement is not correct. The Analysis of this should be neutral and not overestimate. In addition food chain uptakes have no relation to the Toxicity Assessment and this row should be moved to the Exposure Assessment Section.	Accepted by Reviewer ☒ Yes ☐ No As long as in final report as not in

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition: **The Report has been updated accordingly**. Disposition on Response: **The Report has indeed been modified accordingly**.	June 11 Report.
73	Section 7.10	There is no discussion on the assumptions used in deriving the Upset Conditions. Disposition: **Discussion of Upset Conditions have been added to the list of assumptions provided in Table 7-84 in the Report.** Disposition on Response: **This has been added to the Report.**	Accepted by Reviewer ☒ Yes ☐ No As long as in final report as not in June 11 Report.
74	Section 7.10	There is no discussion on the use of AAQCs as TRVs rather than health based numbers. The use of AAQCs underestimate the risk. Disposition: Section 7.5 under benchmark (inhalation) discussed the use of air benchmarks as TRVs. We do not believe the use of AAQCs will underestimate risk as they are all health-based (with the exception of those used for particulate matter). This has been updated in the Report. Disposition on Response: **Again there is considerable debate about the level of PM2.5 and whether potential risk can be quantified in the scientific literature at low levels. It is acknowledged that use of AAQC is a limitation.**	Accepted by Reviewer ☐ Yes ☒ No The use of AAQC values do underestimate risk as shown for PM2.5 for example, health effects are seen at values that are below the WHO values. This should be reflected in the report.
75	Section 8.3.2.21	Generally mallards are considered to be present in the aquatic environment and consume aquatic plants and invertebrates. It is interesting to not that in this assessment mallards were assumed to consume terrestrial vegetation and soil.	Accepted by Reviewer

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition: **Mallards are indeed known to be closely associated with the aquatic environment, and, as reflected in this ERA, consume foods primarily associated with this habitat (approximately 88%). However, it is also known that mallards are not exclusively aquatic species and will frequent terrestrial habitats to forage (seeds, tubers, stems of terrestrial plants), which is also reflected in the assessment (terrestrial forage accounting for approximately 12% of their diet). Sediment (and soil) ingestion rates were estimated based on dietary intake of these foods, assuming that each dietary component was associated with a fixed percentage of soil/sediment. Please refer to Appendix L, Section 4.1, for more information.**	☒ Yes ☐ No
76	Section 8.3.2.21	The food intake for the muskrat seems low based on the allometric equations provided in Appendix L. Disposition: **The food intake rate for the muskrat was verified to be correct, based on the allometric equation for rodents provided in Appendix L (FI = 0.621 Wt $^{0.564}$), and incorporating a dry weight to wet weight conversion factor.**	Accepted by Reviewer ☒ Yes ☐ No
77	Appendix L	In general, the ecological profiles appear reasonable although there are some parameters that we could not verify in the Appendix such as the body weight for the shrew seems to be low, the food intake for the muskrat is low compared to the body weight, the body weight seems low for the white-tailed deer. No references are cited in the Tables in Appendix L and these should be provided. Disposition: **All receptor parameters were verified as correct. Section 8.3.5 of the main report details receptor characteristics and sources of information.**	Accepted by Reviewer ☒ Yes ☐ No
78	Section 8.4 Table 8-4	Inhalation is not considered in the ERA and thus the checkmark should be removed from this table. Disposition: **Inhalation is considered in the ERA, albeit qualitatively based on inferences from the HHRA. Please refer to Section 8.8 for the inhalation risk characterization discussion.**	Accepted by Reviewer ☒ Yes ☐ No
79	Section 8.4 Figure 8.3	Small mammals were not broken up into various groups so it was difficult to determine what small mammals the predatory species were consuming. In addition in Appendix L there is no breakdown of the prey either. This is needed to improve transparency of the report. Disposition: **Dietary information for each receptor is discussed in Section 8.3.5 of the Report**.	Accepted by Reviewer ☐ Yes ☒ No This is not discussed in this section. For example for fox it says that they consume small

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
		Disposition on Response: **The standard methodology for ingestion calculation for various VECs as presented in the The Wildlife Exposure Factors Handbook (US EPA) was used and cited in the report. If the reviewer insists of presenting this information, rather than referencing it, the information will be added.**	mammals and there is no breakdown as to what makes up small mammals – is it all voles, is it a mixture of voles and shrews?
80	Section 8.5	There is a discussion of scaling in this section; however an acknowledgement should be provided to indicate that while scaling is still being used in ERAs that there is a movement away from scaling and what the potential effect of this would be on the results. In addition the MOE has indicated that they do not support allometric scaling. Disposition: **Text has been added to the Report to address the use of the allometric scaling. In addition, alternate approaches to allometric scaling in the section regarding uncertainty will be provided and a discussion on how this would not affect the overall conclusions contained in the Report will be provided.**	Accepted by Reviewer ☒ Yes ☐ No
81	Section 8.5	We do not support the use of AAQC's for the evaluation of vegetation effects from exposure to NO_2 and SO_2. The WHO values should be used. Disposition: **As stated in Section 8.5.8.5: "… the Maximum Acceptable Level was used as the threshold for conducting the risk assessment of sulphur dioxide and nitrogen dioxide on vegetation.", where: "the Maximum Acceptable Level is intended to provide adequate protection against effects on soil, water, *vegetation*, materials, animals, visibility, personal comfort and well-being;" (second bullet in Section 8.5.8.5). WHO benchmarks have been included in the Report.**	Accepted by Reviewer ☒ Yes ☐ No
82	Section 8.6	No intakes to the ecological receptors were provided so it is difficult to verify the results presented. Disposition: **Intakes for all non community-based ecological receptors assessed in the ERA are provided in Appendix L. Exposure point concentrations used in the ERA for all assessment scenarios are provided in Appendix M. A worked example, detailing the risk characterization process using information found in each of Appendix L and M, is provided in Appendix O.** Disposition on Response: **The ADD (along with the EHQs) were presented in Appendix N.**	Accepted by Reviewer ☐ Yes ☒ No This comment relates to the fact that concentrations of the average daily dose were not provided in the report. These are intermediate steps in the risk assessment and without these values it is difficult to check the calculations.
83	Section 8.9 and Table 8-	There is an extensive discussion on uncertainty and a table summarizing the assumptions. However the discussion and the table do not discuss the effect of these uncertainties on the assessment.	Accepted by Reviewer

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
	19	Disposition: **The effects of these uncertainties have been discussed in section 8.10 pof the Report.** Disposition on Response: **Additional discussion has been added regarding the allometric dose scaling approach and use of surrogate species with similar physiology. To illustrate the effect of body mass scaling on the quantitative assessment of risk, EHQs derived using a body mass scaled TRV and the non-body mass scaled TRV are presented. Moreover, a literature review exercise was conducted to find TRVs for actual VEC species and for surrogates with similar physiology. No changes to the ERA were made based on addressing this comment so conclusions of the risk assessment have not been impacted.** **The column for the analysis likely to over/underestimate risk was deliberately removed from the ERA Table because it was found to always show that the risk to ecological receptors was overestimated and it would have appeared redundant as the same information was presented in section 8.10.**	☐ Yes ☒ No The information provided in Table 8.10 is not adequate. For example, the TRV discussion provides no indication whether the TRVs selected, overestimate, underestimate, or are neutral to the risks. Similarly no discussion as to how allometric scaling affects the uncertainty. This table should be similar to the one for the human health assessment. In addition, the Table in Section 8.10 does not discuss all of the assumptions.
84	Section 8.9.5	There was a discussion of using uncertainty factors of 3 and 10 to adjust from a subchronic to a chronic exposure and from an acute to a chronic TRV. Disposition: **That is correct.**	Accepted by Reviewer ☒ Yes ☐ No
85	Section 8.9.6	There is no discussion on the affect of using uptake factors to predict COPC concentrations in certain media and biota. Disposition: **Section 8.10.7 discusses the exposure prediction limitations, including the use of uptake factors (UP).**	Accepted by Reviewer ☒ Yes ☐ No
86	Appendix A, General	Rationale should be provided why compounds such as acroleyne, butadiene, methylene chloride phthalates, CO and Cl_2 were not considered for screening of COPC. Disposition: **This has been provided in the Report.**	Accepted by Reviewer ☒ Yes ☐ No
87	Appendix A, Section 1, Table 2	The document should identify the environmental media whose half-life was considered. We assumed that the half-life for soil was considered. Disposition: **Table 2 has been updated to specify the environmental media for half-life, which was soil.**	Accepted by Reviewer ☒ Yes ☐ No

Reviewer's Name & Organization Harriet Phillips and Mehran Monabbati, SENES Consultants Limited			Date of comments: 09/06/2009 Disposition: 29/06/2009 Reviewer: 06/07/2009
Comment Number	**Section Number**	**REVIEWER'S COMMENTS/AUTHOR'S DISPOSITION**	**DISPOSITION BY AUTHOR AND REVIEWER**
88	Appendix A, Section 1, Table 3	For the COPC that were considered for inhalation pathway only, the environmental persistence is more represented by half-life in air. Was this considered in COPC screening? Disposition: **Half-life in air was not considered for COPC screening of the inhalation pathway, as all potential COPC were assessed for the inhalation pathway, regardless of environmental persistence.** Disposition on Response: **Noted. Clarity in the Report has been ensured.**	Accepted by Reviewer ☒ Yes ☐ No As long as it is clarified in the document.
89	Appendix A, Section 1, Table 2	Unit for $t_{1/2}$ should be identified. Disposition: **The units (days) have been to Table 2 of the Report.**	Accepted by Reviewer ☒ Yes ☐ No
90	Appendix A, Section 1, Table 3	For clarity, HCl, HF, and NH_3 should be listed under a heading other than under CAC's. Disposition: **While Jacques Whitford recognises that HCl and HF are not defined by Environmental Canada as CACs, it is believed that this category is the best placement for these substances. NH_3 is considered a CAC by Environment Canada. Clarity will be provided in the Report.**	Accepted by Reviewer ☒ Yes ☐ No
91	General	The document is poor in referencing, page numbering, equation numbering, etc. Disposition: **All referencing, pages and equations numbering have been updated.**	Accepted by Reviewer ☒ Yes ☐ No
92	General	The comments provided above will not affect the conclusions of the assessment; however they will result in improvements to the transparency of the report. Disposition: **No further comment needed.**	Accepted by Reviewer ☒ Yes ☐ No

APPENDIX P-3

Environmental & Occupational Health Plus Inc.
Peer Reviwer Comment Table

Environmental & Occupational Health Plus Inc.

June 2009

TO: Dr. Robert Kyle, Commissioner & Medical Officer of Health, Durham Region Health Department

FROM: Lesbia F. Smith, MD & Ross Wilson, MSc, DABT

SUBJECT: **"***Review of JW Site Specific Human Health Risk Assessment, May 2009 and Environmental Surveillance"*

Reviewer's Name & Organization: Lesbia Smith, MD, Ross Wilson, MSc, DABT; Environmental & Occupational Health Plus Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
1	Assumed Air Concentrations	Could your team please direct me to the precise tables from the Air Quality Report that provides the assumed air concentrations for each receptor group that has quantitative risk estimates in the HHRA? For example, which table provides the assumed annual air concentration of PM2.5 at the schools?
		Disposition: **These tables were not present in the Risk Assessment or Air Quality Draft Reports. They have now been generated and are attached for your viewing.** **These will also be included in the final HHERA in an appendix.**
2	Figure 3-4	I cannot find this figure in either the hard-copy or PDF. Please provide the location of this figure.
		Disposition **This Figure was mistakenly excluded from the Draft Report and will be included in the Final Report. It has been attached for your viewing. This figure will also be included in the final HHERA.**
3	Dioxin-like PCBs	Are dioxin-like PCBs expected to be emitted from the facility? If so, are these included in the estimated concentrations as 2,3,7,8-TCDD equivalents?

Reviewer's Name & Organization: Lesbia Smith, MD, Ross Wilson, MSc, DABT; Environmental & Occupational Health Plus Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
APPENDIX A – COPC Screenin		Disposition **The dioxin values provided by the Air Quality Team are on a 2,3,7,8-TCDD TEQ basis. They are not specifically speciated dioxin mixture of congeners as they are based on 2,3,7,8-TCDD TEQ stack tests. However, that being said the TEF structure follows that of the WHO 1998 schema. The dioxins and furans emitted from an EFW facility are predominately formed during the incineration process, while the PCB dioxin-like congeners would not be expected to be generated during this process, rather are a small part of the existing waste stream.** **Even if the PCB dioxin like congeners are emitted during the incineration process they are expected to be a small contributor to the overall toxicity. This is especially true with the TEF scheme for dioxin-like congeners as shown in the following table. Their TEFs are generally orders of magnitude below those of the dioxin or furan congeners and would not be overall anticipated to be a major contributor to the exposure concentration in the risk assessment.** **Compound** — **WHO 1998 TEI** *chlorinated dibenzo-p-dioxins* 2,3,7,8-TCDD — 1 1,2,3,7,8-PeCDD — 1 1,2,3,4,7,8-HxCDD — 0.1 1,2,3,6,7,8-HxCDD — 0.1 1,2,3,7,8,9-HxCDD — 0.1 1,2,3,4,6,7,8-HpCDD — 0.01 OCDD — 0.0001 *chlorinated dibenzofurans* 2,3,7,8-TCDF — 0.1 1,2,3,7,8-PeCDF — 0.05 2,3,4,7,8-PeCDF — 0.5 1,2,3,4,7,8-HxCDF — 0.1 1,2,3,6,7,8-HxCDF — 0.1 1,2,3,7,8,9-HxCDF — 0.1 2,3,4,6,7,8-HxCDF — 0.1 1,2,3,4,6,7,8-HpCDF — 0.01 1,2,3,4,7,8,9-HpCDF — 0.01 OCDF — 0.0001 *non-ortho substituted PCBs* PCB 77 — 0.0001 PCB 81 — 0.0001 PCB 126 — 0.1 PCB 169 — 0.01 *mono-ortho substituted PCBs* 105 — 0.0001 114 — 0.0005 118 — 0.0001 123 — 0.0001 156 — 0.0005 157 — 0.0005 167 — 0.00001 189 — 0.0001

Reviewer's Name & Organization: Lesbia Smith, MD, Ross Wilson, MSc, DABT; Environmental & Occupational Health Plus Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
4	Fish Consumption	For fish, 6.3 g/day but with only 0.32 of the fish coming from the area, results in an estimate of about 2 g/day or 6 servings per year. Is that reasonable for a person fishing in this area? Would conclusions change for greater consumption rates?
		Disposition **The fish consumption value was a typo in the appendix table and not in the model. Consumption rates were taken from Table 10-61 of the EPA exposure factors handbook. For a toddler, total fish consumption was modelled as 11.4 g (as consumed) / day or 4161 g/year. For the composite receptor it was and for a composite is 25.1 g/day (calculated), or 9162 g/year.** **Health Canada in their *Human Health Risk Assessment of Mercury in Fish and Health Benefits of Fish Consumption* on pg 53 Table 4 provide portion sizes for fin fish by age group of being 106 g/serving toddler and 145 g/serving adult.** **This works out to 39 meals of fish a year for toddlers and 61 meals a year for composite receptor. The EPA exposure factors handbook also provides Table 13-71 a fraction of food home produced or in this case fished of 32.5% of the fish consumed by a fishing family. This 32.5% was applied to the total fish intake from Table 10-61 to give meals per year of 13 for toddler and 20 for adults.** **On further inspection of Table 10-61 of the EPA exposures factor handbook the Recreational Fish g/d would have been a better value to select or in this case 5.63 g/d for toddlers and 11.5 g/d for adults, without providing a % fish caught factor or that of 100%.** **By doing so this would have changed the meals/year to 19 /year for toddler and 28/year for adult. Or essentially increasing consumption by 1.5x of that previously used in the model. This updated fish consumption rate will be used in the final report but is not anticipated to change the overall conclusions.**
5	Wild Game Consumption	The wild game consumption rate (adults = 0.7 g/day), works out to be about 2 servings of wild game per year. Is that a reasonable estimate for a hunter?

Reviewer's Name & Organization: Lesbia Smith, MD, Ross Wilson, MSc, DABT; Environmental & Occupational Health Plus Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition **The wild game consumption rate was incorrectly from Table 11-6 of the EPA exposure factors handbook. This is the per capita intake of the general population and should not have been used.** **More correct would have been to have selected the mean concentration out of Table 13-44 of the consumer only home produced game. This would have been 1.0 g/kg-d or 71 g/d of wild game. Canada's Food Guide suggests a single serving size of 75 g for lean meat.** **Therefore, this would represent a wild game serving would be eaten once a day. This will be updated in the final HHRA. This is essentially equivalent to the farm scenario where one would be ingesting all of their dietary intake of meat from the farm (75.2 g/day meat) and would be then similar to hunting wild game in the area. Given that there was no undue risk to farmers consuming meat then there would not likely be a risk to the hunters at this increased rate of ingestion. Therefore, this is not anticipated to affect the overall conclusions of the risk assessment. But will be updated in the final HHERA.**
6	Acute Concentration Ratios Based on Annual Average Concentrations	Some tables (e.g., Table 7-15) entitled Acute Concentration Ratios but risk estimates are provided for annual average concentrations. Are these really acute Concentration Ratios?
		Disposition **This is in fact a typo; the titles of Tables 7-15 and 7-16 will be corrected as they should not reference any particular exposure duration. The exposure times reflect those of 1 hr, 24hr and annual average.**
7	Soil and Other Environmental Concentrations	Do the estimated environmental concentrations of chemicals in soil represent the concentrations that will occur after 30 years of operation of the facility?
		Disposition **Yes**
8	Health Canada (2004): Estimated Number of Excess	Health Canada has typically required that mortality estimates should be provided as part of the risk assessment approach for PM2.5, SO2, NO2, etc. (i.e., they typically do not consider it appropriate to just compare estimated air concentrations to the Canada-wide standard). Is there a rationale for why this was not done in the current HHRA?

Reviewer's Name & Organization: Lesbia Smith, MD, Ross Wilson, MSc, DABT; Environmental & Occupational Health Plus Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
	Deaths in Canada Due to Air Pollution	Disposition **In our experience Health Canada has not required this type of assessment in an Environmental Assessment in Canada. That being said we recognize the fact that on a regional airshed basis the preference for planning is to use either the ICAP or the AQBAT risk modelling approach. Given the fact that the HHRA looks at specific receptor locations in isolation and that these aforementioned models are best used on regional airshed planning it was not deemed an appropriate approach for this EA.** **That being said if the AQBAT or the ICAP models were to be used they would look at the annual average concentration of the CACs over the entire airshed, not at single or point source locations. The impact over the entire airshed on an annual basis was predicted to be minimal and therefore the use of these models would not have changed the conclusions of the report.** **A discussion in the uncertainty section will be added to the final HHRA.**
9	Camping Scenario	For the camping scenario, where people are present only 14 days per year, what type of exposure amortization was used for evaluation of non-carcinogens?
		Disposition **They were amortized for the life stage evaluated (i.e., 1643 days for Toddler). We understand that in some jurisdictions in Canada this type of amortization is falling out of favour but still endorsed for use in Ontario.** **Overall, the soil and water concentrations at the camp grounds are not expected to increase much over baseline conditions and therefore, regardless of amortization period are not expected to pose a potential risk to receptors, even on an acute exposure.**
10	Chromium Speciation	What was the rationale for the assumed ratio of trivalent to hexavalent?
		Disposition **Separate emissions factors were used by the Air Quality Assessment Team for Total Chromium and Chromium VI, based on different sources of information. Chromium VI was not speciated from Total Chromium or assumed to represent a portion of the Total Chromium emission factor.** **Emission factors for Chromium III were not provided or obtained by the Air Quality Assessment Team and as a result, Chromium III concentrations were not considered specifically in the risk assessment. However, it is Total Chromium includes the contribution of both Chromium VI and Chromium III.**
11	Exposure Point Concentrations	In some cases, a chemical has a higher exposure point concentration when it is designated "c" (carcinogen) while in other cases the concentration is lower when it gets this designation. How does this aspect of the assessment work?

Reviewer's Name & Organization: Lesbia Smith, MD, Ross Wilson, MSc, DABT; Environmental & Occupational Health Plus Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition **This occurs because of the physical/chemical properties of a given COPC in a given media, and the duration of exposure considered. Based on guidance from the US EPA HHRAP (2005), COPC concentrations are averaged over the exposure duration for carcinogenic compounds because carcinogenic risk is averaged over the lifetime of an individual. However, because hazard quotients associated with noncarcinogenic COPC are based on threshold doses rather than lifetime exposures, the highest annual average COPC soil concentration occurring during the exposure duration period is calculated, which typically occurs at the end of the operating period.** **Based on this rationale, and following the guidance of the HHRAP document in all cases, the carcinogenic risk estimate should be slightly lower, which is the case in this risk assessment. In all cases, the difference in EPC estimates is marginal if not negligible.** **Regardless, we will rerun the model for carcinogenic risk at the total deposition over 30 years using the noncarcinogenic fate and transport output. Given that this is expected to be only a minor increase in concentrations it is not expected to change the carcinogenic conclusions of the report.**
12	Mercury TRV	In Table 7-3, the acute 1 hour TRV for mercury is more stringent than the chronic value. Does this seem reasonable? Also, US EPA provides a separate and more stringent TRV for mercury vapours – should this be considered?
		Disposition **The 1-hour mercury value is 0.6 µg/m3 from CalEPA and the annual is 1 µg/m3 from WHO. WE could have also also considered the CalEPA chronic value of 0.3 µg/m3, which is the same as the US EPA elemental mercury TRV of 0.3 ug/m^3. This will be updated in the final HHERA, however would not result in an unacceptable CR of >1.0 at any location.**
13	Hierarchy for TRVs	For some chemicals it seems that the US EPA has been a preferred source of information while for others, Health Canada is used. Was there a preferred hierarchy? Also, have Health Canada spreadsheet tools been considered as a source of TRVs?

Reviewer's Name & Organization: Lesbia Smith, MD, Ross Wilson, MSc, DABT; Environmental & Occupational Health Plus Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition **There is no hierarchy used in the selection of TRVs, as stated in Section 7.5 "When TRVs or inhalation benchmarks for a particular COPC were available from multiple regulatory agencies, all of the TRVs were reviewed and professional judgment of an experienced toxicologist was used to select the most appropriate TRV. The most critical considerations in selecting TRVs were the source (it must be derived by a reputable agency), the data used to derive the limit, the date the TRV was derived (it must be as up to date as possible) and its relevance in terms of duration and route of exposure"** **The updated Health Canada PQRA spreadsheet tool was not used as a source of TRVs as the TRV supporting document is still in draft.**
14	TRV for Benzene	The unit risk for benzene in Table 7-3 is provided as 7.8×10^{-8} $(ug/m^3)^{-1}$ but US EPA provides a value of 7.8×10^{-6} $(ug/m^3)^{-1}$ (100 times greater) (see Appendix H). Is this a typo?
		Disposition **This was a typo in Table 7-3 of the Report. The value of 7.8×10^{-6} $(ug/m^3)^{-1}$ was used in the assessment and throughout in the modelling exercise.**
15	Lead	Baseline risks from lead (i.e., HQ of 0.020) (see Table 7-19) seems quite low. Typical background concentrations of lead often result in HQs that are much greater in the Canadian environment. Is there a reason why lead exposure is so low
		Disposition **The levels of lead in the background are generally low throughout this area and averaged only 15 mg/kg. Therefore, would not be anticipated to present an unacceptable risk. Using the Health Canada PQRA model as a check, the value of 15 mg/kg lead in soil results in an HQ of 0.02 similar to that found in this risk assessment in Table 7-19.**
16	Nickel	What is the form of nickel that would be emitted from the facility? Has this been considered in the TRV used?

Reviewer's Name & Organization: Lesbia Smith, MD, Ross Wilson, MSc, DABT; Environmental & Occupational Health Plus Inc.		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition **Nickel has been assessed in this risk assessment as Ni^{2+}, as it is the most likely form of nickel emitted from incinerators is as Ni^{2+} . This was taken into consideration in the TRV selection.**
17	Short-term TRVs for PAHs	In some cases, no short-term TRVs are provided for prominent PAHs (e.g., benzo[a]pyrene). Is the absence likely to affect conclusions?
		Disposition **The absence of a 1 hr benz(a)pyrene value is based on the fact that there were no regulatory health based standards for these chemicals. It is unlikely to affect the overall conclusions given the low CR values returned for other reporting periods.**
18	Exposure Point Concentrations	Appendix E provides the exposure point concentrations for a limited list of the chemicals of potential concern. For example, only 6 of the PAHs. Is there a rationale for why exposure point concentrations are provided for certain chemicals but not others?
		Disposition **The 'Benzo(a)pyrene-c' entry is in fact the cumulative TEQ of all carcinogenic PAHs. Appendix E has been adjusted to break down and include concentrations for all PAHs which cumulatively form the TEQ. EPCs for all other chemicals are currently present in the Appendix. An updated version of the Appendix is attached for your viewing.**

APPENDIX P – PEER REVIEW COMMENTS

APPENDIX P-4

Ontario Ministry of the Environment
Peer Reviewer Comment Table

Ontario Ministry of the Environment

June 25 2009

TO: Gavin Battarino, Project Coordinator, EAAB

FROM: Barry Lubek, Supervisor, Human Toxicology, Standards Development Branch,
Aden Takar, Senior Scientist, Ecological Standards Section, Standards Development Branch

CC: Minnie de Jong, Manager, Human Toxicology and Air Standards,
Brendan Birmingham, Senior Research Toxicologist,
Samir Abdel-Ghafar, Regulatory Toxicologist
Craig Kinch, Manager, Ecological Standards Section, Standards Development Branch

SUBJECT: *Review of "Site Specific Human Health and Ecological Risk Assessment – Technical Study Report", Durham/York Residual Waste EA Study, prepared by Jacques Whitford, dated May, 2009 (Project No. 1009497),(Received May 20, 2009)*

Reviewer's Name & Organization Barry Lubek, Supervisor, Human Toxicology, Standards Development Branch, Minnie de Jong, Manager, Human Toxicology and Air Standards, Brendan Birmingham, Senior Research Toxicologist, Samir Abdel-Ghafar, Regulatory Toxicologist, Aden Takar, Senior Scientist, Ecological Standards Section, Standards Development Branch, Craig Kinch, Manager, Ecological Standards Section, Standards Development Branch		
Comment Number	**Section Number**	**Comment and Disposition**
1	Problem Formulation	The proponent assumed *"for the purpose of this risk assessment"* that the initial processing capacity of the facility would be 140,000 tonnes of waste/yr. All risks modelled (including traffic) in this report apply to a 140,000 tonne/ year. However, in Section 3.1.1 (page 11) the proponent informs that the proposed facility is expected to process up to 400,000 tonnes of waste/yr for 30 years. This HHRA will not suffice for a facility with increased production since the risk of adverse effect to human health from exposure to contaminants from the 140,000 tonnes/year capacity facility is unlikely to be the same as that for 400,000 tonnes/year capacity facility.
		Disposition: **Acknowledged. Potential risks associated with the 400,000 tonnes per year (tpy) operating scenario will be evaluated in the Final Report.**
2	Problem Formulation	The proponent has used the CALPUFF air dispersion model to predict ground level concentration (GLC) of Contaminants of Potential Concern (COPCs) and its dispersion prediction. SDB understands that the proponent is currently in discussion with EMRB about the use of this particular model. Any change to the information in this HHRA as a result of advice from EMRB may have a bearing on our comments provided in this memo.
		Disposition: **Acknowledged. Jacques Whitford recognizes that any potential changes to the air dispersion model will have direct ramifications on the results of the HHERA; therefore, changes that were made in the air quality model were updated accordingly in the HHERA.**
3	Statistical Analysis	SDB is concerned that the 95% Upper Confidence Limit of the Mean (95% UCLM) was used to determine contaminant concentration. Although statistically valid, the use of the 95% UCLM for small numbers of samples creates inconsistency and uncertainty. The proponent should use the maximum concentration in all cases to avoid inconsistencies and reduce uncertainty, or the Method of Detection Limit (MDL) for non-detectable samples.

Reviewer's Name & Organization Barry Lubek, Supervisor, Human Toxicology, Standards Development Branch, Minnie de Jong, Manager, Human Toxicology and Air Standards, Brendan Birmingham, Senior Research Toxicologist, Samir Abdel-Ghafar, Regulatory Toxicologist, Aden Takar, Senior Scientist, Ecological Standards Section, Standards Development Branch, Craig Kinch, Manager, Ecological Standards Section, Standards Development Branch		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **Acknowledged. The Final HHERA has been updated and will use the maximum concentration for most detected samples, the MDL will continue to be used for non-detected chemical concentrations. In media where there was sufficient sample sizes to conduct statistical analysis, the 95th UCLM was used (soil and small mammals). A full outline of changes to baseline chemical concentrations as a result of this comment is provided in Appendix B-2. Additionally, the complete Environmental Baseline Technical Study has been provided in Appendix B-1**
4	COPC Selection	The proponent determined airborne COPCs from available lists of chemicals emitted by thermal treatment facilities incinerating municipal waste. The list of COPCs was then screened against the criteria of $t_{1/2} < 182$ days and $K_{ow} > 5$. It is not clear that these criteria are valid for a continuously emitting source such as a thermal treatment facility. Using these criteria may eliminate VOCs from the multi-pathway analysis, specifically the uptake from air to vegetation contribution. Further, it would appear that USEPA recommends $K_{ow} = 4$ as a transition between volatile and persistent COPCs (page 5-35). As noted in section 5.3.2 (USEPA HHRAP document), a more detailed approach to removing COPCs from consideration in the multi-pathway analysis is preferred. It is suggested that the procedures in section 5.3.2 be followed. The consultant also should consider the use of the Hazard Ranking System (HRS), (USEPA, 2006).
		Disposition: **The substances carried forward into the multi-pathway assessment qualified with the criteria presented in "Persistence and Bioaccumulation Regulations of CEPA 1999" (Government of Canada, 2000). The study team feels that these are appropriate criteria for evaluating persistent and bioaccumulative COPC.** **Using the HRS system, a considerable number of the chemicals would have been omitted as COPCs based on the combination of toxicity and concentration of release.** **The approach used in the HHERA has been adopted in numerous provincial EAs and accepted by Health Canada and Environment Canada in the past.**

Reviewer's Name & Organization Barry Lubek, Supervisor, Human Toxicology, Standards Development Branch, Minnie de Jong, Manager, Human Toxicology and Air Standards, Brendan Birmingham, Senior Research Toxicologist, Samir Abdel-Ghafar, Regulatory Toxicologist, Aden Takar, Senior Scientist, Ecological Standards Section, Standards Development Branch, Craig Kinch, Manager, Ecological Standards Section, Standards Development Branch		
Comment Number	**Section Number**	**Comment and Disposition**
5	COPC Selection	Exposure through consumption of locally grown produce is a concern. The consultant should use Canadian data to validate the model.
		Disposition: **Acknowledged. At this time there is no Canadian-specific guidance for produce ingestions rates for this grouping of garden produce. Therefore garden produce ingestion rates for all four categories were taken from the US EPA HHRAP Guidance (2005). US EPA (2005) presents resident and farmer produce ingestions rates. Note, ingestion rates are only specific to children and adult receptors; therefore child ingestion rates were used as a proxy for toddlers and adult ingestion rates were used as a proxy for teens.**
6	COPC Selection	The Conceptual Site Model (CSM) is incomplete because it does not include possible pathways such as soil build-up resulting from uptake by vegetation with subsequent leaf fall, and accumulation or airborne organics being directly absorbed by crops and produce. The CSM should be revised appropriately.
		Disposition: **Acknowledged. Accumulation of airborne organics directly absorbed by crops and produce is present in the HHERA Conceptual Site Model. After review of soil build-up resulting from uptake by vegetation with subsequent leaf fall, it was concluded that this exposure pathway was not directly relevant to the HHERA. Additionally, US EPA HHRAP (2005) does not consider this pathway in the guidance document. It should be noted that if this pathway were included it would not significantly alter the results of the HHERA. Also at this point we are unaware of any validated calculations to make this estimation.**

Reviewer's Name & Organization Barry Lubek, Supervisor, Human Toxicology, Standards Development Branch, Minnie de Jong, Manager, Human Toxicology and Air Standards, Brendan Birmingham, Senior Research Toxicologist, Samir Abdel-Ghafar, Regulatory Toxicologist, Aden Takar, Senior Scientist, Ecological Standards Section, Standards Development Branch, Craig Kinch, Manager, Ecological Standards Section, Standards Development Branch		
Comment Number	**Section Number**	**Comment and Disposition**
7	COPC Selection	The report states that Ozone (O_3) was not assessed because it was considered a regional Air Quality issue (page 45). The consultant based this decision on its analysis of background (baseline) monitoring at the Courtice Rd. monitoring station (section 2.4, Air Quality Assessment). However, emissions from the facility that are the subject of this risk assessment may affect local O_3 concentrations and therefore the magnitude of this effect (risk characterization) should be discussed.
		Disposition: **The incremental contribution of Facility emissions to regional ozone levels was assessed by comparing Facility emissions of ozone precursors (NOx and VOCs) to existing regional precursor emissions (including commercial, residential, and industrial NOx and VOCs emissions). This discussion is provided in Section 7.5 of the Air Quality Assessment Technical Study Report. The analysis shows that the Facility is not expected to contribute substantially to ozone precursors (NOx and VOCs) on a regional basis.**
8	COPC Selection	The report should include background air data for inorganic mercury (Hg^0) (Table 7-11). If the proponent does not have this data, EMRB should be contacted for recent air monitoring data. Federal air monitoring data from the CAMNet sites (Point Petre and Egbert) is also extensive and available. This information should be incorporated into the report.
		Disposition: **The Canadian Atmospheric Mercury Measurement Network (CAMNet) website has no data or reports available for download (and has not been updated since 2002), but a request has been made to EMRB for any available data pertaining to inorganic mercury. At this time, no data has been received and the risk assessment will proceed with the current air data for inorganic mercury. Should any new data arise it will be implemented into the risk assessment as appropriate.**

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Comment Number	**Section Number**	**Comment and Disposition**
9	Exposure Assessment – Dietary Exposure	The consultant applied US child-specific exposure parameters to the toddler. Health Canada /CEPA has toddler specific values that should be incorporated into the report as appropriate. It should be noted that when using the CEPA 1994 food consumption data for all foods (toddler = 1,493 g /day and 5-11 year = 1,833 g/day) the child appears to consume about 23% more food than the toddler. However, correcting for BW (toddler = 1492.5 g/day/13 kg = 114g/kg/d; child = 1833 g/day/ 27 kg = 68 g/kg/d), the use of the child food consumption factor underestimates the toddler intake. This issue should be discussed in the uncertainty section of the report.
		Disposition: **The food ingestion rates were adjusted on a g/day based on adjustment between child and toddler body weight.**
10	Exposure Assessment – MDL issues	As noted above, over 60% of COPCs were Non-Detect (<MDL, Method of Detection Limit) in background monitoring.. In the absence of detectable concentrations, the risk assessor has to default to MDLs, which results in uncertainty for Hazard Quotient (HQ) and Lifetime Cancer Risk (LCR). The implication of defaulting to the MDL to the calculated risk should be discussed in the uncertainty section.
		Disposition: **Acknowledged. This will be updated in the Final Report**
11	Exposure Assessment – MDL issues	The report refers to models of exposure to contaminants via breast and dairy milk. All modeled results need validation / ground-truthing against published Canadian or other North American data.

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Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **These estimates were derived using models adopted for North America by the US EPA and accepted for use by Health Canada. It is these agencies that have attempted to ground-truth such models prior to their publishing and use in guidance documents.**
12	Exposure Assessment – MDL issues	In the text (page 159), it is noted that predicted exceedences for the resident infant / farmer infant are related to the use of MDL in the breast milk model. Similarly, exceedences for the farm toddler may be related to the use of MDL in the dairy model. The consultant should discuss this in the uncertainty section.
		Disposition: **Acknowledged. As per Comment #10, the impact of using MDL has been discussed in the uncertainties table. Additionally, discussion of exceedances based on the use of MDL's has also been added.**
13	Exposure Assessment – Soil exposure	In Section 6.2 (page 57) the proponent indicated that the US EPA (2005) model was used to predict the deposited contaminants in the soil mixing zone. A rational as to the appropriateness of this model should be provided as well as a complete citation included in the reference section.

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Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **Acknowledged. The US EPA (2005) reference was referring to the HHRAP Guidance Document (not a model). It will be updated to read:** ***"The US EPA (2005) HHRAP Guidance allows for variation of the soil mixing zone through which the contaminants would be deposited and then distributed. For all agricultural lands and garden scenarios the US EPA recommends a 20 cm mixing zone. For other land uses (e.g. residential soil exposure) and ecosystems the US EPA recommends a 2cm mixing zone. For this risk assessment the more conservative 2cm mixing zone was employed to estimate soil concentrations and subsequent fate and transport of chemicals in the environment for all land uses."***
14	Exposure Assessment – Soil Exposure	The proposed MOE standard for the toddler Soil Ingestion Rate (SIR) is 200 mg soil/day (MOE, 2008) for soil and dust. The proponent adopted the Health Canada (2004) SIR of 80 mg soil/day and calculated the dust ingestion rates based on the rational document of MOE (1996). The proposed MOE toddler SIR should be used for this risk assessment.
		Disposition: **Acknowledged. The Soil Ingestion Rates have been updated to meet the proposed MOE (2008) levels.**
15	Exposure Assessment – Soil Exposure	The MOE proposed soil standard for arsenic is 11 ug/g and should be used in the report. The arsenic value of 14 ug/g used in this report (Table 2) is outdated.

Reviewer's Name & Organization Barry Lubek, Supervisor, Human Toxicology, Standards Development Branch, Minnie de Jong, Manager, Human Toxicology and Air Standards, Brendan Birmingham, Senior Research Toxicologist, Samir Abdel-Ghafar, Regulatory Toxicologist, Aden Takar, Senior Scientist, Ecological Standards Section, Standards Development Branch, Craig Kinch, Manager, Ecological Standards Section, Standards Development Branch		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **Acknowledged. This will be updated in the Final Report**
16	Toxicity Assessment – TRV Selection	SDB's preferred TRVs are the WHO value of 0.02 ug/kg/day for PCBs and the MOE (1994) value of 1.85 ug/kg/day for lead. These values should be incorporated into the report and calculations revised where appropriate.
		Disposition: **Acknowledged. These values will be used in the Final Report.**
17	Toxicity Assessment – TRV Selection	SDB does not recommend the automatic use of air standards or AAQC to screen or characterize inhalation risks (Table 7-2). By definition, HQ are based on comparison of estimated exposure with TRVs (RfCs, REL,etc). AAQC or air standards are not necessarily TRVs and on an individual basis may not be health protective – for example, new science may have emerged since they were set. Appropriate TRVs should be used. If no inhalation TRV is available, the proponent could explore extrapolation from a RfD, use of a surrogate TRV from a chemical with a similar structure, or derivation of a TRV based on current science, or in the absence of any such information, assess the chemical qualitatively.
		Disposition: **Acknowledged. As stated in Section 7.5, under Benchmark (Inhalation), "for this assessment only health-based benchmarks were used". However, we acknowledge for benchmarks related to particulate matter, values are often derived based on policy and not only health. The study team believes that using these health based benchmarks does not compromise the integrity of the HHERA results. Where possible RfCs or RELs were used. A comparison to the WHO values was also conducted to add another level of conservatism and transparency to the HHERA.** **In addition, it was very clear in the report where toxicity values were benchmarks vs. TRVs.**

Reviewer's Name & Organization Barry Lubek, Supervisor, Human Toxicology, Standards Development Branch, Minnie de Jong, Manager, Human Toxicology and Air Standards, Brendan Birmingham, Senior Research Toxicologist, Samir Abdel-Ghafar, Regulatory Toxicologist, Aden Takar, Senior Scientist, Ecological Standards Section, Standards Development Branch, Craig Kinch, Manager, Ecological Standards Section, Standards Development Branch		
Comment Number	**Section Number**	**Comment and Disposition**
18	Toxicity Assessment – TRV Selection	SDB noted the following: 1. The proponent referred to the Cadmium TRV proposed for the AAQC in 2006. It is unclear why a proposal was relied on, when a decision document for cadmium was posted in 2007. 2. The Arsenic inhalation TRV citation is incorrect. The reported value by the CalEPA REL is 0.03 µg/m^3, not 0.015 as shown in the Table. 3. The US EPA IRIS RfC values were all cited as US EPA 2009, not by the year the individual RfC was derived. This should be corrected and other references used in the TRV Tables confirmed.
		Disposition: **1. Acknowledged. The reference for Cadmium will be updated in the Final Report.** **2. According to Cal EPA (2008) the Chronic REL for Arsenic is 0.015 µg/m^3** **3. Referencing regarding US EPA IRIS TRVs have been updated for the Final Report**
19	Risk Characterization	The risk assessment for such a proposed facility is associated with many uncertainties. Further, whereas some parameters may be 'conservative', others may not be. Statements used in the report such as: 1. the MOE uses a very conservative benchmark of 10^{-6} ; 2. That conservative means that the risk is overestimated; and 3. That 'conservative overestimates' of the risk have been followed, is subjective and also may be misleading. The proponent is requested to remove such statements.
		Disposition: **Acknowledged. While the study team will retain the term "conservative" the text will be updated in the Final Report to reflect its meaning.**

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Comment Number	**Section Number**	**Comment and Disposition**
20	Risk Characterization	The Procedures Document (2004) and Rationale Document November 2008 specify HQ = 0.2 or 10^{-6} risk per medium and associated pathways (also called "components"). The calculated risk for all media should be summed for each contaminant
		Disposition: **Acknowledged. The HHERA presents the overall summed HQ for all pathways (i.e. "components") relevant to the receptor in question. A detailed breakdown of all HQs in the HHRA is available in Appendix I.**
21	Risk Characterization	The consultant proposes comparing Lifetime Cancer Risk (LCR) with typical observed cancer incidence (*for all cancers combined, reviewer's italics*) in Canada (0.38 (F); 0.44 (M)), which is highly inappropriate since "all cancers" were not assessed. This position ignores the specific endpoint cancer incidence/mortality associated with each TRV. Each cancer slope factor or inhalation risk factor is associated with a specific cancer endpoint (lung, liver, skin, etc). Further, prevailing cancer rates reflect a multitude of causal factors (e.g. smoking, second hand smoke, lifestyle (diet, lack of exercise), and occupational and environmental pollution). To do an accurate comparison, one would need to compare to the cancer incidence of the specific cancer endpoint associated with exposure to that environmental pollutant.
		Disposition: **The cancer statistics are provided simply for illustration purposes. They were not used as a benchmark of for interpretation of the LCR in the HHRA.**
22	Risk Characterization	It would be useful to provide a chart comparing the health based limit (TRVs) to a) the background concentrations, b) the concentrations from the facility, and c) the total of the background plus the facility.

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Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **This statement is not understood by the authors. Does the MOE wish to see bar-charts of such information? This information is provide in table format within the report.**
23	Editorial	The proponent has used terms or abbreviations without explaining the meaning at first use. For example, the abbreviations RFP, Addendum # 21 (November 20, 2008), CACs, "Upset Case" and "Upset Project Case" were not identified when first mentioned. This is also true with the terms Bioaccumulation and Persistence.
		Disposition: **Acknowledged. All abbreviations and acronyms have been reviewed for the Final Report.**
24	Editorial	The proponent relied on a generic risk assessment report by Jacques Whitford, 2007 to determine the COPCs. This report should be provided by the proponent.
		Disposition: **This report is available on the proponent's website. http://www.durhamyorkwaste.ca/healthrisk_assessment.php**
25	Editorial	In appendix A "COPC Screening" in Table 2, some cells are included but do not appear to serve a purpose – e.g. the cell titled "Carried forward irrespective ?"

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Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **Acknowledged. Redundant columns will be removed in the Final Report.**
26	Editorial	In Table 2, Log and days are missing from the K_{ow} and $t_{½}$ cells. Also, the proponent used references such as Mackay et al (2000) and EpiSuite without providing complete citations in the references.
		Disposition: **Acknowledged. Units will be added and references will be updated within the Final Report.**
27	Editorial	The calculation and the parameters (body weight and inhalation rate) used to derive the inhalation TRV from RfD (route-to-route extrapolation) should be included as footnote to Table 7-3 and appropriate citations should be provided.
		Disposition: **Acknowledged. The calculation method will be added as a footnote in the Final Report.**
28	Editorial	In Appendix B "Baseline Soil and Biota", the proponent should confirm that the Garden produce samples from local markets are indeed locally grown to enhance the respective evaluation.

Reviewer's Name & Organization Barry Lubek, Supervisor, Human Toxicology, Standards Development Branch, Minnie de Jong, Manager, Human Toxicology and Air Standards, Brendan Birmingham, Senior Research Toxicologist, Samir Abdel-Ghafar, Regulatory Toxicologist, Aden Takar, Senior Scientist, Ecological Standards Section, Standards Development Branch, Craig Kinch, Manager, Ecological Standards Section, Standards Development Branch		
Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **Acknowledged. As stated in the Environmental Baseline Report (2009):** ***"in the case of agricultural products and local produce samples were collected from farms and markets located outside a 1 km radius of the proposed site due to limited availability. Every effort was made to ensure that the farms were as close as possible to the proposed facility site. Sampling garden produce from the backyards of residents within the area surrounding the proposed facility site was limited to one location; however, garden produce was obtained from local farmers' fields and markets. General inquiries were made to confirm that the produce acquired had been grown locally. The produce collected is considered to be sufficient to represent baseline conditions of the area surrounding the proposed facility site." (p.10)***
29	Editorial	In page (109), the equation shown to derive the Secondary Particulate Matter (SPM) is not comprehensible. It should be reformatted. Also, an explanation of the parameters used for the conversion (1.376 & 1.291) of the sulphate and nitrate should be provided.
		Disposition: **Acknowledged. The equation has been updated in the Final Report.** **The calculation of SPM is based on model-predicted sulphate and nitrate concentrations and is discussed in Appendix D (Section 3.4.1) of the Air Quality Assessment Technical Study Report (2009). The leading constants are the respective ratios of the molecular mass of ammonium to those of sulphate/nitrate.**
30	ERA: Section 5.1 Baseline Soil and Biota Data	The statistical analysis protocol followed for estimating baseline chemical concentrations for different media is highly questionable especially when calculating 95% upper confidence limit of the mean (UCLM) for few data points. It is not acceptable to fit a distribution to a very small sample size (five data points in this case) and calculate 95% UCLM based on this distribution.

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Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **In the revised ERA in cases where five or fewer data points were available, the maximum concentration (or the maximum detection limit) was used to calculate the exposure point concentration for each medium.**
31	ERA: Section 5.1 Baseline Soil and Biota Data	The descriptive statistics of environmental media samples such as soil, sediment, surface water and biota should be included in the main report.
		Disposition: **This information is contained in the Environmental Baseline Study (Jacques Whitford 2009) and has been attached to this report (in Appendix B).**
32	ERA: Section 8.4.3 Derivation of Exposure Point Concentrations	The 95% UCLM of sample distribution of chemicals of potential concern (COPC) was used to calculate risk to all ecological receptors. This exposure estimate may be appropriate for mobile organisms with extensive home ranges but not for organisms with limited mobility such as plants and soil invertebrates. Therefore, the maximum concentrations of COPC should be used to calculate risk to immobile ecological receptors.

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Comment Number	**Section Number**	**Comment and Disposition**
		Disposition: **Acknowledged and this has been updated in the revised report.**
33	ERA: Section 8.5.1 Derivation of Wildlife TRVs	When deriving wildlife TRVs, studies reporting IC20s should be considered first if available before choosing LOAEAL and NOAEL data. Only bounded LOAEAL and NOAEL data should be used.
		Disposition: **We disagree with the statement that inhibition concentrations be used as a first choice over NOAELs and LOAELs for TRV derivation for wildlife. While the intent behind using IC20 (and EC20 for that matter) is valid, there is simply not enough data available to do this. In this ERA bounded NOAELs and LOAELs were selected when appropriate (a discussion of this can be found in Appendix J).**
34	ERA: Section 8.5.1 Derivation of Wildlife	Allometric dose scaling should not be applied to chronic toxicity data as this approach is not appropriate and was originally developed for acute toxicity data.

Reviewer's Name & Organization Barry Lubek, Supervisor, Human Toxicology, Standards Development Branch, Minnie de Jong, Manager, Human Toxicology and Air Standards, Brendan Birmingham, Senior Research Toxicologist, Samir Abdel-Ghafar, Regulatory Toxicologist, Aden Takar, Senior Scientist, Ecological Standards Section, Standards Development Branch, Craig Kinch, Manager, Ecological Standards Section, Standards Development Branch		
Comment Number	**Section Number**	**Comment and Disposition**
	TRVs	**Disposition:** **While Jacques Whitford agrees that the use of allometric dose scaling draws from acute data, this is not by itself enough to discount the approach, and indeed, studies have validated the allometric exponent (roughly 0.75) with chronic toxicity data. Moreover, the allometric scaling approach is used by Environment Canada and Health Canada for the derivation of mammalian TRVs (or critical toxicity values; CTVs) for chemical substances assessed under the Chemicals Management Plan and is suggested as an approach by Ohio EPA in their ERA guidance (2008). A number of other methods have been used to extrapolate toxicity data between species with different body masses but the MOE has not yet suggested an appropriate alternative. However, in the revised report a comparison of HQs calculated with and without body mass scaling is presented in the Uncertainty Section (8.9).**
35	ERA: 9.2 Ecological Risk Assessment Conclusions	Higher hazard quotients (HQs) were reported for several parameters such as PAHs, PCBs, phosphorous, zinc and others in surface water and sediment due to higher MDLs for these parameters. Other lines of evidence such as benthic assessment surveys and bioassays should be explored to justify that the higher HQs found are merely the result of the higher MDLs.
		Disposition: **Biological surveys were conducted as part of the baseline study (Jacques Whitford 2009) and results of these surveys have been summarized in the revised report. Furthermore biological water quality monitoring in Tooley Creek have been conducted (and are currently being conducted) by the Central Lake Ontario Conservation (CLOCA) for a number of years. The CLOCA findings are similar to Jacques Whitford findings which is that water quality is affected by agricultural activities, however this habitat was found to support a healthy and abundant population of cool water species.**

APPENDIX P – PEER REVIEW COMMENTS