

Appendix C:

Disposition Tables of Responses to Comments Received from Federal Reviewers on Provincial Technical Reports

Agency	Comment Received	Action
<p>Environment Canada. Environmental Protection Operations Division – Ontario. (Received March 9, 2009) Comments on the Air Quality Impact Assessment TEPA Report. <i>Air Quality and Climate Change Issues</i> And Environment Canada. Environmental Protection Operations Division – Ontario. (Received May 25, 2009)</p>	<p>General EC is generally supportive of the detailed and comprehensive approach taken to the assessment of air quality impacts for the Technically and Environmentally Preferred Alternative (TEPA) for the Detroit River International Crossing project. EC agrees with the important conclusion that the Windsor-Essex Parkway will mitigate future transportation related impacts within the study area relative to the future “No-Build” alternative. However EC has some outstanding concerns:</p> <ol style="list-style-type: none"> 1. The design of stormwater management for the project should include consideration of the potential increase in extreme precipitation intensity and frequency over the lifetime of the project. 2. Options to reduce vehicle idling and associated emissions on the plaza such as block queuing should be considered. 3. The potential cumulative air impacts of Brighton Beach Power Plant, a major local source of air pollutants has not been incorporated into the assessment. 	<ol style="list-style-type: none"> 1. In consultation with ERCA, it was established that the regional storm for the study area is equivalent to the 100-year storm event. This represents the most significant foreseeable storm event. All storm sewer systems for freeway and all culvert crossings of the freeway are designed in accordance with the requirements of the Ministry of Transportation Drainage Manual and will be sized to convey the 100-year storm with no impacts. The watercourse crossings have all been designed to convey the 100-year storm without negatively impacting The Windsor-Essex Parkway, and will convey the Regional storm without increasing existing upstream floodlines. As details to the effects of climate change have not been finalized, the drainage features have been designed considering the most conservative rainfall events. However, in lieu of a formal design to account for potential climate change, designs for the major watercourse crossings and the stormwater management facilities with approximately 0.3m of freeboard account for storms in excess of the 100-year design storm. In addition, the crossing designs have been checked against the Hurricane Hazel storm, and berms provided where the access road may be susceptible to overtopping, particularly along the Wolfe/Cahill channel re-alignment. 2. Refer to response below (on page 6) for <i>Section 9.2.1 Layout of Plaza Facilities and Operations</i>, which relates to anti-idling options such as block queuing, Intelligent Transportation Systems and an off-site marshalling yard for the future plaza design phase. 3. They have been included as part of the 90th percentile background, see separate section below for more information on Brighton Beach.
	<p>Section 2.1.6 Mixing Height Data - The approach taken to develop mixing heights for application within the dispersion model is described in this section.</p> <ul style="list-style-type: none"> • EC requests access to the mean monthly minimum (morning) and maximum (afternoon) mixing heights that were used to create the hourly mixing heights used within CAL3QHCR. If this information is contained in one of the reports available on-line, then a link and page reference would be sufficient. 	<p>Mixing heights were calculated on a daily basis and provided as input to PCRAMMET. When mixing heights on a daily basis were unavailable, the monthly means were used in place of the daily mixing heights. The attached file includes the daily morning and afternoon mixing heights for the full year.</p>
	<p>Section 2.3.1.1 Existing Air Pollutant Concentrations in the Huron Church Rd / Highway 3 Corridor - Large differences were noted between the benzene observations from the DRIC stations versus the MOE stations for maximum, 90th percentile and average values.</p> <ul style="list-style-type: none"> • EC requests that the project team clarify these differences. 	<p>Both the MOE and the DRIC stations used SUMA canisters for collection and analysis. Different laboratories were used for the analysis and there may be differences in the laboratory equipment that could lead to some of the differences. A conversation with Tom Dann from Environment Canada on March 31, 2009 indicates that the difference could be attributable to local industrial sources.</p> <p>There are no industries within the Windsor area that report emissions of benzene according to NPRI, however, the usage threshold is 10 tonnes and a 1% concentration and it is possible that most benzene usage is at less than 1% concentration quantities. There are four facilities in the Detroit area that report benzene emissions to the Toxics Release Inventory. The largest is Marathon Petroleum, which located approximately 5 km from the MOE monitoring station that releases approximately 2 tonnes of benzene per year. One facility on Zug Island also reports emissions but total emissions are less than 200 kg per year from that facility. The same criteria apply for both the US and Canadian reporting requirements and it is possible that there are industries that are not reporting benzene emissions due to the low concentrations of benzene within the process.</p> <p>It is not clear why the differences exist, however, the incremental change due to traffic as indicated in the TEPA report is very low and the background conditions are the major contributor to benzene concentrations even at very close distances to the roadway.</p>
	<p>Section 3.1.2 Meteorological Data - Table 2.2 in the AQIA – TEPA (as well as table 7.2 from the Environmental Assessment Report indicates that stability classes E (stable) and F (very stable) occurred 13% and 15% of the time respectively at Windsor airport during the 5 year period selected for meteorological inputs to the dispersion modelling. Stability classes E & F are adjusted under certain conditions for application in CAL3QHCR.</p> <ul style="list-style-type: none"> • EC requests clarification of how stability classes E & F were handled for use within CAL3QHCR. 	<p>Stability classes are calculated through the U.S. EPA meteorological preprocessor PCRAMMET (PCRAMMET USER'S GUIDE, EPA-454/B-96-001, U.S.EPA June 1999). No adjustments were made to the stability classes beyond this guidance.</p>

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	<p>It was noted in section 2.1.5 of the AQIA – TEPA that calm winds occurred about 4% of the time at the Windsor airport from 2000-2004.</p> <ul style="list-style-type: none"> EC requests that the proponent clarify how the calm winds were handled for application within CAL3QHCR. 	<p>Calm wind conditions (<1m/s) are processed according to EPA guidance (Calms Processor (CALMPRO) User's Guide, EPA-901/9-84-001, U.S. EPA, 1984). When a calm wind condition exists, a calm wind flag is set, the hourly concentrations are set to 0.0, and the hourly ambient background concentration is not used in any calculations for that hour. The annual; or period average is calculated by summing each valid (non-calm) 1-hour average concentration and dividing by the total number of non-calm hours or 75 percent of the total number of hours in the period, whichever is greater.</p>
	<p>Section 3.3.2 Receptors - Sensitive receptors including schools, churches, parks and residential areas have been identified for the air quality modelling. However it is not clear whether all of the candidate facilities were identified and included as receptors. In addition, it is unclear how receptors in "residential areas" have been identified for inclusion. If a sensitive receptor was chosen from the middle of a residential area, the modelling would miss the larger impacts at the houses closer to the Parkway or Plaza.</p> <ul style="list-style-type: none"> EC requests that an explanation be provided of the criteria used to identify and select sensitive receptors for the dispersion modelling. It is not clear also whether all of the candidate facilities within 250m of the crossing, plaza and Parkway included in the analysis. It is not clear to EC how the locations of residential area receptors were determined. Presumably representative residences were chosen from within residential areas. EC recommends that the closest residence to the Parkway or Plaza in each residential area be included as a sensitive receptor. It is also not clear to EC whether all of the residences within 50m of the Parkway right-of-way were included as sensitive receptors. EC requests that the above be clarified. 	<p>Due to the large amount of potential information that could be provided a list of sensitive receptors was chosen from the 2484 receptors modelled based on feedback from public meetings and community input. Parks, schools, and specific residential neighbourhoods were included in the tabular listings and were meant to be indicative of air quality within identified neighbourhoods. Due to the number of receptors, horizon years and contaminants it was not feasible to include all of this data in one report.</p> <p>However, results are available for all 2484 receptors. A large amount of modeling results were generated in the analysis as there are over 2400 receptors modelled for three horizon years, 12 contaminants, for both No Build and the TEPA. The DRIC study team provided this data to Environment Canada on December 5th, 2008. of all receptors modelled including within the ROW to allow for Environment Canada to examine the data of the full modelling exercise.</p> <p>Results at receptors within the ROW the roadway are presented in the Air Quality Impact Assessment Supplementary Documentation Section 5.</p>
	<p>Section 3.2.3.2 Vehicle Emission Estimates - Particulate emissions come not only from tailpipes but also from other sources including road abrasion / degradation, tire and break wear, as well as soil, mud and debris deposited on the surface of the roadway. Highway maintenance and cleaning routines will have an impact on particulate emissions from along the roadway. If highway cleaning efforts are less effective than assumed by the emissions factor module, then actual particulate emissions could exceed levels estimated for the project.</p> <ul style="list-style-type: none"> It is not clear to EC whether roadway maintenance and cleaning activities were assumed to support the particulate emission factors used for this project. It is also not clear to EC whether protocols would be in place to ensure that the assumed maintenance and cleaning standards will be met or exceeded. EC requests that any the foregoing be clarified and that any proposed protocols should be described. 	<p>No credit for mitigation was taken in the development of the emission factors for road dust and non tail-pipe emissions and emission factors were not reduced from those generated by the Mobile6 for tailpipe, brakes and tire wear. The road dust emission factors follow the USEPA AP 42 emission factor guidance. The inclusion of the 90th percentile background concentration is very conservative in calculating exceedance days and could be considered to encompass differences in roadway mitigation.</p>
	<p>Section 3.2.3.3 Customs / Inspections Plaza - During periods where capacity of the plaza is exceeded, EC expects that longer queues are likely to form back towards the plaza entrance.</p> <ul style="list-style-type: none"> EC requests that the proponent indicate how many total hours with these longer queues are expected by the year 2035. 	<p>The Canadian international customs plaza has been designed to accommodate projected border traffic to beyond the 2035 horizon year, and is much larger than the existing plazas at either the Ambassador Bridge or the Detroit-Windsor Tunnel. The design of the plaza has been completed through consultation with the Canada Border Services Agency (CBSA), with consideration to anticipated processing times, border processing improvements such as the NEXUS and FAST systems, anticipated staffing levels of the plaza, and the need for both primary and secondary inspection areas. U.S. authorities are equally committed to building the new border crossing and U.S. plaza to meet future travel demands. While it is recognized that rare delays at the plaza could occur as a result of significant unpredictable events, it is not possible to speculate on the magnitude and frequency of the potential effects of such events.</p>
	<p>Section 4.0 Overview of Model Results - In figure 4.1 the scale for PM_{2.5} concentrations does not appear to be correct.</p>	<p>The contaminant listed in Figure 4.1 is PM, not PM_{2.5}. Scale is appropriate.</p>
	<p>Section 4.4.8 PM₁₀ - Large numbers of PM₁₀ exceedance days are projected for numerous grid and sensitive receptors. Twenty of the 64 sensitive receptors in Table 4.19 were projected to have PM₁₀ exceedances on more than 50 days per year.</p> <ul style="list-style-type: none"> EC requests that the study team evaluate mitigation options to reduce the projected PM₁₀ exceedances. We note that some reduction in exceedances will result from the modifications outlined in the Recommended Plan Analysis. 	<p>Elevated exceedances are due to the assumption of the 90th percentile background concentrations occurring for 365 days of the year. See Air Quality Impact Assessment Supplementary Documentation Section 4 for a detailed discussion on elevated exceedances. When a more representative background choice is used, exceedances are primarily driven by background conditions. Mitigation options will consider EC recommendations MTO has approved</p>

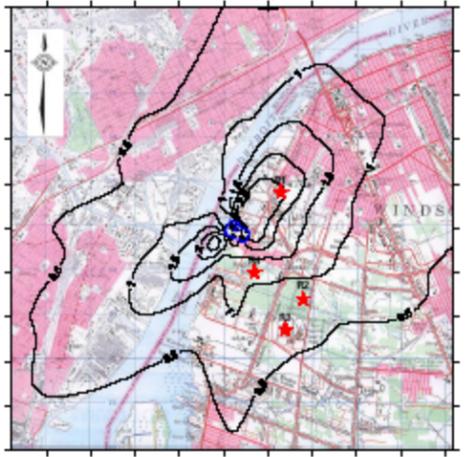
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		<p>standards and guidelines that consider Best Management Practices for air emissions for new roadways. These guidelines will be applied to the design of The Windsor-Essex Parkway, the inspection plaza, and the crossing. Such construction-related mitigation measures include:</p> <ul style="list-style-type: none"> ▪ Periodic watering of unpaved (unvegetated) areas. ▪ Periodic watering of stockpiles. ▪ Limiting speed of vehicular travel. ▪ Use of water sprays during the loading, unloading of materials. ▪ Sweeping and/or water flushing of the entrances to the construction zones. ▪ Use of calcium chloride. <p>In addition, during construction, the Contractor is required to implement dust suppression measures to reduce the potential for airborne particulate matter resulting from construction activities. These suppression measures are commonly in the form of water as a first choice on exposed soils to prevent dust from becoming airborne, or chemical applications if required where water is ineffectual. The Contractor is required to take steps as necessary to control dust resulting from the Contractor's operations, or by public traffic where temporary roads are maintained by the Contractor through work zones, such that dust does not affect traffic, enter surface waters or escape beyond the right-of-way to create a nuisance to residents, businesses or utilities. Standard dust suppression requirements dictated by the construction contract will comply with local Municipal By-Laws for such activities. Examples of other best practices for dust control, which are sometimes required during construction include:</p> <ul style="list-style-type: none"> ▪ Avoiding site preparation, excavation and construction during windy and prolonged dry periods. ▪ Minimizing vehicle traffic on exposed soils. ▪ Stabilizing soil and other material storage piles against wind erosion. ▪ Covering and containing fine particulate materials during transportation to and from the site. Install a tarpaulin on material stockpiles and haulage trucks, as appropriate. ▪ Use of new or well-maintained heavy equipment and machinery, fitted with fully functional emission control systems/ muffler/ exhaust system baffles and engine covers
	<p>Section 4.4.9 PM_{2.5} - Some important results from the MOE Windsor Traffic Study (2004) were not included in the discussion in this section. The MOE Study examined the impact of highway emissions on PM_{2.5} concentrations over 10 days. Downwind concentration increases of 5-15 µg/m³ within 25m of the edge of the highway and 2-10 µg/m³ from 25-100m from the highway (page 25) were reported. The authors point out that the results reflect a limited number of meteorological and traffic conditions. Presumably instances of even higher PM_{2.5} downwind increases would have been observed had the sample size been extended to a full year.</p>	<p>The MOE Windsor Traffic Study (2004) states that the impacts are negligible during free-flow conditions and that conditions where these elevated concentrations are expected to occur are during congestion. The results presented in the report focus on events where significant queuing of traffic occurred throughout the day. The maps in question are indicative of concentrations that could occur under congested traffic conditions. PM_{2.5} increments predicted by the modelling for the TEPA project are consistent with the PM_{2.5} concentrations shown in the Air Quality Impact Assessment Supplementary Documentation Section 5.3 and show increments of up to 10 µg/m³.</p>
	<p>The data discussion in this section, including Table 4-20 is somewhat cryptic.</p> <p>It is not clear to EC whether Table 4.20 presents the maximum PM_{2.5} concentration (dispersion model output plus background concentration) from all project grid and sensitive receptors. EC requests that this be clarified. It is somewhat surprising that there are no modelled exceedances of the Canada-wide Standard for PM_{2.5} at any project receptor.</p>	<p>SENES has confirmed that there are no exceedances of PM_{2.5} predicted for sensitive receptors beyond the Right of Way using a 90th percentile background of 21 µg/m³. While there are instances of elevated concentrations that are currently occurring using the MOE monitoring information, these are not driven by the road impacts and would be driven by background and transboundary conditions. See the Air Quality Impact Assessment Supplementary Documentation Section 5.3 for a more detailed discussion of PM_{2.5} exceedances within the ROW.</p> <p>The difference between the TEPA and Practical Alternatives report PM_{2.5} methodology for modelling is discussed in the Air Quality Impact Assessment Supplementary Documentation Section 2 and Appendix A.</p>
	<p>Section 4.5.2 Concentrations at Tunnel Portals - Modelled concentrations at tunnel portals are reported for NO_x and PM_{2.5} in Table 4.2.3.</p> <ul style="list-style-type: none"> • EC requests that the separation distance used from the tunnel portals to the portal receptors be provided. 	<p>See the Air Quality Impact Assessment Supplementary Documentation Section 5 for a more detailed discussion of contaminant concentrations within the ROW. Distances are provided below:</p>

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		<p>64 South Portal Bethlehem Labelle Tunnel 7 m</p> <p>72 Centre of Pulford Tunnel 50 m</p> <p>82 South Portal Reddock Tunnel 8 m</p> <p>395 North Portal Spring Garden Tunnel 50 m</p> <p>675 Centre of Huron Church Tunnel 75 m</p> <p>676 South Portal Huron Church Tunnel located on road, 25 m from tunnel portal, overly conservative choice and should probably not have been used as indicator</p>
	<p>Section 5.1 Mitigation - Towards the end of this section it is noted that “road sweeping practices in accordance with maintenance standards will be employed to reduce silt loading on the Windsor-Essex Parkway”. This point is somewhat confusing as it appears to apply to the operations phase but has been presented in the context of construction mitigation measures.</p> <p>EC requests that the project team verify whether the “road sweeping practices...” mitigation measure applies to the operational phase of the project. The team is requested to be more specific about the maintenance standards that would apply. This comment also ties into the issue of emission factors and roadway maintenance identified in TEPA section 3.2.3.2.</p>	<p>The mitigation measures for “road sweeping” are for identified for the operations phase. Road sweeping practices in accordance with maintenance standards will be employed to reduce silt loading on The Windsor-Essex Parkway.</p> <p>Also, MTO has approved standards and guidelines that consider Best Management Practices for air emissions for new roadways. These guidelines will be applied to the design of The Windsor-Essex Parkway, the inspection plaza, and the crossing and are noted in the previous response above.</p>
<p><u>TSD: Air Quality Impact Assessment – Recommended Plan Analysis</u> (Air Quality Report RPA)</p> <p>The proposed changes and additional analysis in this report are acceptable.</p> <p>And</p> <p>Environment Canada. Environmental Protection Operations Division – Ontario. (Received May 25, 2009)</p>	<p>N/A</p>	<p>N/A</p>
<p><u>Consideration of Air Quality Issues in the Environmental Assessment Report, Individual Environmental Assessment</u> (EA Report)</p> <p>And</p> <p>Environment Canada. Environmental Protection Operations Division – Ontario. (Received May 25, 2009)</p>	<p>Section 4.1 Air Quality - Much of the data in this section is several years out of date, making reference to observations from 2003 as the most-recent available. This is disconnected from the Air Quality Report which includes ambient monitoring data from the MOE stations through 2006 (see section 2.3.1).</p>	<p>The information provided in Chapter 4.0 of the Detroit River International Crossing Environmental Assessment Report (December 2008) is intended to document the existing conditions within the Preliminary Analysis Area (PAA). The obtained existing conditions information was utilized in the generation, assessment and evaluation of the illustrative access road, plaza, and crossing alternatives within the PAA.</p> <p>Subsequent to the evaluation of the illustrative plaza, crossing and access road alternatives, the study team identified an Area of Continued Analysis (ACA), and a more detailed review of existing environmental conditions within this more focused area was undertaken. Specifically, practical alternatives for the access road, plaza and crossing were developed within the ACA and the impacts were assessed in the Practical Alternatives Evaluation Working Paper, Air Quality Impact Assessment, May 2008.</p> <p>Subsequent to the evaluation of the practical plaza, crossing and access road alternatives, the Technically and Environmentally Preferred Alternative (TEPA) emerged. The air quality impact assessment of the TEPA is documented in the Air Quality Impact Assessment – Technically and Environmentally Preferred Alternative Report (December 2008), as well, it follows the assessment protocol established in the Air Quality Work Plan, February 2006. The assessment is</p>

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		<p>a comparative assessment and considers the air quality impacts of existing conditions projected into the future (No Build) and of the TEPA. Thus, some information provided in the Air Quality Impact Assessment – Technically and Environmentally Preferred Alternative Report (December 2008) may be more current as the findings documented in the report correspond to the TEPA, which was developed and presented to stakeholders in June 2008.</p> <p>In summary, as the DRIC study progressed, additional information was gathered for further assessment of the TEPA, however, the intent of Chapters 4 and 7 of the Detroit River International Crossing Environmental Assessment Report (December 2008) is to provide an overview of the existing conditions within the PAA and ACA.</p>
	<p>Section 7.1 Description of the Area of Continued Analysis, Air Quality - The meteorological and climatological data used as input to the dispersion model are presented in this section. EC's comments about the meteorological data and its application to the project dispersion modelling may be found under sections 2 & 3 of the Air Quality Report.</p> <p>There is a discrepancy between the PM_{2.5} background concentration proposed in section 7.1 and the data presented in the Air Quality Report (see Tables 2.6 and 2.16). <u>EC recommends</u> that the background PM_{2.5} concentration for use in the dispersion modelling be based on the 90th percentile concentrations from the most representative background observations, which in this case are the two MOE stations. The appropriate value is 21 µg/m³</p>	<p>The PM_{2.5} data presented in Section 7.1 of the <i>Detroit River International Crossing Environmental Assessment Report</i> (December 2008) outlines the information collected from the detailed review of existing environmental conditions that was conducted within the Area of Continued Analysis. Specifically, practical alternatives for the access road, plaza and crossing were developed within the ACA and the impacts were assessed in the <i>Practical Alternatives Evaluation Working Paper, Air Quality Impact Assessment</i> (May 2008).</p> <p>Subsequent to the evaluation of the practical plaza, crossing and access road alternatives, the Technically and Environmentally Preferred Alternative (TEPA) emerged. The air quality impact assessment of the TEPA is documented in the Air Quality Impact Assessment – Technically and Environmentally Preferred Alternative Report (December 2008), as well, it follows the assessment protocol established in the Air Quality Work Plan, February 2006. The assessment is a comparative assessment and considers the air quality impacts of existing conditions projected into the future (No Build) and of the TEPA. Thus, some information provided in the Air Quality Impact Assessment – Technically and Environmentally Preferred Alternative Report (December 2008) may be more current as the findings documented in the report correspond to the TEPA, which was developed and presented to stakeholders in June 2008.</p> <p>In summary, as the DRIC study progressed, additional information was gathered for further assessment of the TEPA, however, the intent of Chapters 4 and 7 of the Detroit River International Crossing Environmental Assessment Report (December 2008) is to provide an overview of the existing conditions within the PAA and ACA.</p>
	<p>Section 8.0 Practical Alternatives for Crossings, Plazas and Access Roads - EC provided comments on the Practical Alternatives Evaluation – Air Quality Impact Assessment in July 2008 along with follow-up responses in February 2009. As such, we will not provide further comments on the alternatives analysis within the environmental assessment.</p>	<p>N/A</p>
	<p>Section 9.1.5 Stormwater Management (also sections 9.2.6, 9.3.7 and 10.4.9) - Stormwater management is addressed in separate sections for the bridge (9.1.5) for the plaza (9.2.6) and for the Windsor-Essex Parkway (9.3.7). Stormwater environmental effects and mitigation are addressed in section 10.4.9 and in the table in section 10.7, ID# 16.0 on page 10-40). The bridge has a design lifetime of 75 years and the plaza and Parkway are expected to have corresponding operational time horizons. Substantial change in several climate parameters such as extreme rainfall could occur over the operational lifetime of the project.</p> <p>Climate modelling experiments point to a potential increase in the frequency and intensity of extreme precipitation events under a changed climate (Kharin <i>et al.</i> Changes in Temperature and Precipitation Extremes in the IPCC Ensemble of Global Coupled Model Simulations, <i>Journal of Climate</i>, vol 20, 2007 pp. 1419-1444). This study, found that 20-year return period rainfalls (24-hour) would increase in intensity by 10-20% by 2081-2100. For North America, extreme precipitation events now occurring every 20 years are projected to occur once every 8-9 years near the end of this century. Applying these specific adjustments directly to longer (e.g. 50-100 year) return period events is less reliable because the short sampling periods greatly increase the uncertainty associated with rare events.</p> <ul style="list-style-type: none"> • <u>EC recommends</u> that the design of the stormwater management for the bridge, plaza and Windsor-Essex Parkway include consideration of the potential increases in extreme precipitation from peer-reviewed climate modelling experiments. Since there is still considerable uncertainty associated with the modelling of extreme events, it may be more cost effective to adaptively manage (i.e. iterative adjustments as additional data becomes available) project elements that may be modified relatively inexpensively. However, for stormwater management features that are 	<p>In consultation with ERCA, it was established that the regional storm for the study area is equivalent to the 100-year storm event. This represents the most significant foreseeable storm event. All storm sewer systems for freeway and all culvert crossings of the freeway are designed in accordance with the requirements of the Ministry of Transportation Drainage Manual and will be sized to convey the 100-year storm with no impacts. The watercourse crossings have all been designed to convey the 100-year storm without negatively impacting The Windsor-Essex Parkway, and will convey the Regional storm without increasing existing upstream floodlines.</p> <p>As details to the effects of climate change have not been finalized, the drainage features have been designed considering the most conservative rainfall events. However, in lieu of a formal design to account for potential climate change, designs for the major watercourse crossings and the stormwater management facilities with approximately 0.3m of freeboard account for storms in excess of the 100-year design storm. In addition, the crossing designs have been checked against the Hurricane Hazel storm, and berms provided where the access road may be susceptible to overtopping, particularly along the Wolfe/Cahill channel re-alignment.</p> <p>Overall, the designs of all crossing structures and channels related to the Windsor-Essex Parkway have been conducted to convey the 100-year storm and include a freeboard following the MTO design parameters. This freeboard will provide protection for peak flows greater than</p>

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	<p>challenging or expensive to revamp or retrofit, <u>EC recommends</u> that current margins of safety be evaluated to determine whether they are robust enough to accommodate an increase in 24-hour extreme rainfall intensity of 10-20% by the end of this century without resulting in adverse impacts on the environment.</p>	<p>the 100-year storm. This information will be documented as part of the design process.</p> <p>The checks against the Hurricane Hazel storm were to confirm that there were no negative impacts to either the existing floodlines or for the proposed Windsor-Essex Parkway. The level of safety considered with the analysis shows that the proposed design will convey storms without negatively impacting the upstream area, including storms greater than the 100-year storm.</p>
	<p>Section 9.2.1 Layout of Plaza Facilities and Operations - Vehicles approaching the inspection area will spend some time in queues, creeping forward, alternating between stop-and-go and idling modes. The queue lengths and associated emissions will depend on a number of factors including crossing traffic volume and the numbers of operating inspection stations and toll booths. Limited NO_x exceedances are expected near the plaza associated with the significant amount of idling expected to occur with trucks at the Plaza (AQIA – TEPA, section 4.4.6).</p> <p>There are options to manage vehicle movements so that a substantial portion of queued vehicles can wait in signal-controlled lanes or areas with their engines off, reducing the stop-and-go and idling emissions from border queues. These include Intelligent Transportation Systems technologies, marshalling yards and block queuing (which divides waiting vehicles into active and engine-stopped queues). These approaches were examined in a report submitted to EC in July 2008: <i>Phase II feasibility Study for Anti-idling Options</i>.</p> <ul style="list-style-type: none"> • <u>EC recommends</u> that the project team evaluate anti-idling options such as block queuing and Intelligent Transportation Systems and an off-site marshalling yard as part of the future plaza design phase, as a means to reduce air pollution emissions from plaza operations. 	<p>The analysis completed for both the Level 2 and Level 3 traffic operations analysis was based on a free-flow condition from the access road into the plaza, with no queues extending out of the plaza to the access road. The Canadian international customs plaza has been designed to accommodate projected border traffic to beyond the 2035 horizon year, and is much larger than the existing plazas at either the Ambassador Bridge or the Detroit-Windsor Tunnel. The design of the plaza has been completed through consultation with the Canada Border Services Agency (CBSA), with consideration to anticipated processing times, border processing improvements such as the NEXUS and FAST systems, anticipated staffing levels of the plaza, and the need for both primary and secondary inspection areas.</p> <p>The following information has been provided by Transport Canada on April 15th, 2009.</p> <p>An operations analysis of the plaza was completed by the CBSA using the CAN-SIM software program, revealing acceptable plaza operations. Both the Canadian and U.S. governments are committed to building the new plazas and border crossing to meet future travel demands, along with providing the necessary staffing to meet processing demands. While it is recognized that rare delays at the plaza could occur as a result of significant unpredictable events, it is not possible to speculate on the magnitude and frequency of the potential effects of such events.</p> <p>The entire corridor from London to Windsor, including the new border crossing will have Intelligent Transportation Systems (ITS) in place (portions have already been installed and are operating) to monitor traffic flow along Highway 401 as well as to provide information to travellers as to the state of the various border crossings. For example, at the Highway 401/402 split in London there is a large overhead ATMS sign that intends to provide real-time border wait times at the various crossings in Sarnia and Windsor. It allows traffic to be directed to crossings which are not experiencing major delays. In addition, there will be ATMS along the entire corridor at the major decision route points for international traffic. Such notifications could help to mitigate idling vehicles at the border as it would provide the traveller information to plan their trip accordingly.</p> <p>With regard to an off-site marshalling yard, it would have to be located outside of the City limits (a minimum of 8 km from the border), which would be impractical as international and local traffic could not be distinguished between. Furthermore, the use an off-site marshalling yard would require alterations to the design of the access road in order facilitate a system that is enforceable. For example, the flow of traffic would have to be diverted to the queuing site while impeding direct flow of traffic to the border. This would require a physical barrier as drivers may not be inclined to use the off-site marshalling area.</p>
	<p>Section 9.3.8 Traffic Operations (also section 3.2.3 of the Air Quality Report) - EC acknowledges that an apparently thorough job has been done on the traffic simulations for 2015, 2025 and 2035 using the powerful VISSIM model. However our department lacks the expertise to evaluate these simulations. The validity of the highway emissions projections rests, in large part, on the reliability of the traffic projections.</p> <ul style="list-style-type: none"> • EC requests that the proponent clarify whether any agency or expert outside the project team has reviewed the traffic projections and simulations. If not, then our confidence in the magnitude of the projected air quality impacts is reduced. 	<p>Regarding the traffic projections that have been developed by the DRIC study team, the team acknowledges Environment Canada's concerns, but would note that the traffic projections have been developed and reviewed by traffic specialists from two industry leading consulting firms, each of which has implemented a stringent quality control process involving internal third party review of the findings. In addition an expert review team from the appropriate transportation authorities, including FHWA, MDOT, and MTO, performed a comprehensive review of the methodology, and found it acceptable. As such, the DRIC study team is confident that the traffic projections have been developed correctly, using appropriate methodologies.</p>
	<p>Section 10.1 Air Quality - EC is generally supportive of the air quality assessment approach that combines worst-case project modelled impacts of project emissions with a suitably conservative background concentration. However, this approach may be deficient if there is a major, independent source of one of the project pollutants in the immediate vicinity of the project. This is the case for the Brighton Beach Power Plant (BBPP) which emits substantial amounts of</p>	<p>It is important to note that modelled worst case air quality impacts of the Brighton Beach Power Plant (BBPP) in the vicinities of the Plazas are worst case predictions that occur once over the modelling period (5 years) and are not indicative of typical concentrations. As per a letter issued</p>

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	<p>NO_x and PM_{2.5}. Omitting this source will likely lead to an underestimate of the cumulative air quality impact on the receptors in the vicinity of Plaza B.</p> <p>The BBPP Environmental Review Report (2001) projected the maximum incremental annual average NO_x concentrations to occur within one kilometre both northeast and southwest of the BBPP. The two MOE ambient monitoring stations are located 2 km (College) and 4.5 km (University) from the BBPP. The incremental annual average modelled concentration near the MOE University Avenue station was roughly 1/3 of the concentrations within 1 km of the BBPP. EC has no comparable information on file for PM_{2.5}.</p> <ul style="list-style-type: none"> • EC recommends the emissions from the Brighton Beach Power Plant be evaluated to determine if they could have a cumulative air quality impact in the vicinity of the project. One approach would be to secure the worst-case dispersion modelling results for the Brighton Beach facility. A second approach would be use BBPP emissions in combination with the meteorological data set for this project to model the BBPP impact at the receptors in the vicinity of Brighton Beach and Plaza B. The BBPP impacts would then be treated as one more component within the “model combinations” approach described in section 3.2.4 of the AQIA – TEPA. Any marked additional impact from the BBPP could increase the frequency of air quality exceedances for the receptors in the vicinity of Plaza B. 	<p>by Environment Canada to the Citizen's Alliance on August 7, 2002 in regard to the Brighton Beach Power Plant environmental review report, air impacts relating to the Brighton Beach Power project are expected to be low.</p> <p>As SENES conducted work on the Air Quality Impacts relating to the Brighton Beach project, we were able to review the concentrations presented in the publicly available Environmental Review Report December 2001. The concentrations presented are the maximums that occur once in five years. Table 4.3 of this assessment (shown below) indicates that the maximum increment relating to SO₂, CO, and the particulate matter fractions is very low relative to the applicable criteria, with maximum concentrations of 0.9 µg/m³ for SO₂ on a 24 hour basis and 94 µg/m³ for CO and 2 µg/m³ of the particulate matter fractions. These contaminant maximum concentrations are also low relative to ambient conditions.</p> <p>It should be noted that the NO_x concentrations predicted for Brighton Beach Power Plant assessment were conservative by a factor of two at double the manufacturer's guarantee to determine the impacts of equipment degradation (source testing undertaken since the plant was fully operational has shown the emissions to be below the manufacturer's' guarantee). In addition, the one hour maximum concentrations presented in the assessment were based on assuming a cold start condition was occurring every hour, in the day, 365 days per year for five years. As a cold start would only occur if the facility were completely shut down for a period of several days, it is unrealistic to expect that the hourly maximum concentration would occur concurrently with the maximum concentration at the plaza. For the 24 hour averages the assessment performed for BB assumed that the facility was operating for 24 hours per day. The BB facility is to be used as an intermittent facility and does not operate on the full 24 hours. Therefore the results presented in the BB assessment are very conservative.</p> <p>Predicted NO_x 24 hour averages for BB have a maximum increment of 20 µg/m³ Maximum NO_x 24 hr concentrations at the Plaza are 138 µg/m³ in 2025 assessed in the TEPA report (other concentrations away from the plaza would be lower). Even if the worst case once in five year day of Brighton Beach were to coincide with the worst case day of the TEPA, there would be no exceedance of the NO_x criteria.</p> <p>Up to 10 hours of exceedances per year are predicted for NO_x 1 hr near the Plaza with the TEPA. The maximum concentration for one hour in five years for Brighton Beach is 200 µg/m³. It is extremely unlikely that the one hour maximum that would occur with the Brighton Beach project would coincide with the few hours of exceedances that are predicted to occur with the TEPA, particularly as the maximum concentrations for Brighton Beach are more than a factor of two conservative. The Air Quality Impact Assessment Supplementary Documentation provides more information on hourly concentrations near the Plaza and it can be seen that 99% of the time the impacts will be well below criteria for the TEPA and thus highlighting that exceedances would occur for NO_x 1 hr criteria only under extreme circumstances. NO_x concentration curves typically show extreme maximums and then decrease precipitously with 90th percentile values often lower than maximums by factors of 2 - 5 (one example is Figure 4.1 in the TEPA report). This is also highlighted in Table 4.9 of the TEPA report which shows that for receptors located near the plaza, the maximum values are in the order of 300 µg/m³ for NO_x on a 24 hour basis for locations south of the plaza but by the 90th percentile (i.e., values are lower 90% of the time), the concentrations are approaching the background concentrations of 64 µg/m³ with values in the 70 µg/m³ range. Data from the BB facility was examined for 90th percentile concentrations and showed a similar trend. Maximum 1 hour BB increments under steady state conditions are between 40-80 µg/m³ (does not include background) while 90th percentile BB increments are approximately 5-10 µg/m³. Adding 10 µg/m³ (the 90th percentile predicted from BB) along with the 90th percentile background to the maximum incremental concentrations predicted by the TEPA for north of the plaza area will not impact compliance status. In reality, since the emissions were doubled for the BB project for NO_x, this increment of 10 µg/m³ would be lower and would be closer to 5 µg/m³.</p> <p>The maximum 24 hour increment for PM_{2.5} and PM₁₀ is 2 µg/m³ according to the Brighton Beach report Table 4.3. Compared to a background increment of 21 µg/m³ for a 90th percentile concentration the additional 2 µg/m³ that only occur once in a five year period are unlikely to change the compliance status of the predicted concentrations. In addition, the day to day variability for both PM_{2.5} and PM₁₀ from ambient conditions often can be greater than 10 µg/m³</p>

Agency	Comment Received	Action
		<p>and the maximum concentrations of PM_{2.5} are not likely to be detectable from the daily background variability using conventional monitoring equipment.</p> <ul style="list-style-type: none"> As stated in the BBPP report, <i>the predicted incremental concentrations of SO₂, CO, SPM, and PM₁₀ are only a small fraction of the ambient concentrations measured in Windsor. For these constituents, no measurable increase in ambient concentrations should be experienced.</i> <p>No additional modelling is required to determine the impacts.</p> <p>Figure 4.1 and Table 4.3 from Environmental Review Report for the Brighton Beach Power Station, December 2001.</p> <p>Information on Brighton Beach Power Plant has been added into Table 7.1 Identification of Other Projects and Activities in the CEA of the CEAA</p> <p style="text-align: center;">FIGURE 4.1 PREDICTED INCREMENTAL ANNUAL AVERAGE NO_x CONCENTRATIONS</p>  <p>Report.</p>

Agency	Comment Received	Action																																																																																																																																																																			
		<p style="text-align: center;">TABLE 4.3 MODELLED CONVENTIONAL POLLUTANT MAXIMUM INCREMENTAL CONCENTRATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Contaminant</th> <th rowspan="2">Averaging Time</th> <th rowspan="2">MOE POI¹ and AAQC² (µg/m³)</th> <th rowspan="2">Federal AQ Objectives MAL (µg/m³)</th> <th colspan="4">Calculated Maximum Incremental Concentration at Receptors (µg/m³)</th> <th rowspan="2">Existing Annual Conditions³</th> </tr> <tr> <th>R1 Residence</th> <th>R2 Ojibway Prairie</th> <th>R3 Raceway</th> <th>R4 Black Oak</th> </tr> </thead> <tbody> <tr> <td rowspan="4">NO_x {as NO₂}</td> <td>½h (POI)</td> <td>500</td> <td>-</td> <td>162</td> <td>220</td> <td>239</td> <td>103</td> <td>n/a</td> </tr> <tr> <td>1 h</td> <td>400</td> <td>-</td> <td>135</td> <td>184</td> <td>200</td> <td>86</td> <td>74 (NO_x)</td> </tr> <tr> <td>24 h</td> <td>200</td> <td>-</td> <td>20</td> <td>11</td> <td>11</td> <td>18</td> <td></td> </tr> <tr> <td>annual</td> <td>-</td> <td>100⁴</td> <td>2.6</td> <td>0.7</td> <td>0.6</td> <td>1.1</td> <td>48 (NO₂)</td> </tr> <tr> <td rowspan="4">SO₂</td> <td>½h (POI)</td> <td>830</td> <td>-</td> <td>3</td> <td>5</td> <td>5</td> <td>3</td> <td>n/a</td> </tr> <tr> <td>1 h</td> <td>690</td> <td>900</td> <td>3</td> <td>4</td> <td>4</td> <td>2</td> <td></td> </tr> <tr> <td>24 h</td> <td>275</td> <td>300</td> <td>0.9</td> <td>0.5</td> <td>0.5</td> <td>0.8</td> <td>22</td> </tr> <tr> <td>annual</td> <td>55</td> <td>60</td> <td>0.1</td> <td><0.1</td> <td><0.1</td> <td><0.1</td> <td></td> </tr> <tr> <td rowspan="5">CO</td> <td>½h (POI)</td> <td>6000</td> <td>-</td> <td>112</td> <td>153</td> <td>167</td> <td>72</td> <td>n/a</td> </tr> <tr> <td>1 h</td> <td>-</td> <td>35000</td> <td>94</td> <td>128</td> <td>139</td> <td>60</td> <td></td> </tr> <tr> <td>8 h</td> <td>36200</td> <td>15000</td> <td>12</td> <td>10</td> <td>11</td> <td>9</td> <td></td> </tr> <tr> <td>24 h</td> <td>15700</td> <td>-</td> <td>7</td> <td>4</td> <td>4</td> <td>6</td> <td>916</td> </tr> <tr> <td>annual</td> <td>-</td> <td>-</td> <td>0.9</td> <td>0.3</td> <td>0.2</td> <td>0.4</td> <td></td> </tr> <tr> <td rowspan="3">SPM</td> <td>½h (POI)</td> <td>100</td> <td>-</td> <td>7</td> <td>6</td> <td>2</td> <td>0.2</td> <td>n/a</td> </tr> <tr> <td>24 h</td> <td>120</td> <td>120</td> <td>2</td> <td>0.9</td> <td>0.9</td> <td>1</td> <td></td> </tr> <tr> <td>annual</td> <td>60</td> <td>60</td> <td>0.2</td> <td><0.1</td> <td><0.1</td> <td><0.1</td> <td>62/53⁵</td> </tr> <tr> <td>PM₁₀</td> <td>24 h</td> <td>50 (interim)</td> <td>-</td> <td>2</td> <td>0.9</td> <td>0.9</td> <td>1</td> <td>27</td> </tr> <tr> <td>PM_{2.5}</td> <td>24 h</td> <td>-</td> <td>30 (by 2010)</td> <td>2</td> <td>0.9</td> <td>0.9</td> <td>1</td> <td>-</td> </tr> </tbody> </table> <p><small>Note: ¹ ½h (POI) are O.Reg 3468 criteria for facility by itself (independent of background). ² AAQC are applicable for ambient conditions (facility plus background). ³ annual average ambient concentrations (average of data presented in Section 3.2). ⁴ MAL (Maximum Acceptable Level) is for NO₂ – modelled results are for NO_x (NO_x plus NO). ⁵ annual Windsor / site measurements.</small></p>	Contaminant	Averaging Time	MOE POI ¹ and AAQC ² (µg/m ³)	Federal AQ Objectives MAL (µg/m ³)	Calculated Maximum Incremental Concentration at Receptors (µg/m ³)				Existing Annual Conditions ³	R1 Residence	R2 Ojibway Prairie	R3 Raceway	R4 Black Oak	NO _x {as NO ₂ }	½h (POI)	500	-	162	220	239	103	n/a	1 h	400	-	135	184	200	86	74 (NO _x)	24 h	200	-	20	11	11	18		annual	-	100 ⁴	2.6	0.7	0.6	1.1	48 (NO ₂)	SO ₂	½h (POI)	830	-	3	5	5	3	n/a	1 h	690	900	3	4	4	2		24 h	275	300	0.9	0.5	0.5	0.8	22	annual	55	60	0.1	<0.1	<0.1	<0.1		CO	½h (POI)	6000	-	112	153	167	72	n/a	1 h	-	35000	94	128	139	60		8 h	36200	15000	12	10	11	9		24 h	15700	-	7	4	4	6	916	annual	-	-	0.9	0.3	0.2	0.4		SPM	½h (POI)	100	-	7	6	2	0.2	n/a	24 h	120	120	2	0.9	0.9	1		annual	60	60	0.2	<0.1	<0.1	<0.1	62/53 ⁵	PM ₁₀	24 h	50 (interim)	-	2	0.9	0.9	1	27	PM _{2.5}	24 h	-	30 (by 2010)	2	0.9	0.9	1	-
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	<p>The construction of the project has the potential to affect the air quality in the vicinity of the crossing, plaza and Parkway, largely due to fugitive dust emissions and exhaust emissions from construction vehicles and equipment. Several controls have been proposed on page 10-4 and under ID# 1.0 in the table in section 10.7 on page 10-31.</p> <ul style="list-style-type: none"> EC recommends that project construction air emissions be controlled through the implementation of an air emissions management plan based on references such as Cheminfo Services Inc. <i>Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities</i>. March 2005. The document identifies technologies and practices geared to reduce PM and VOC emissions across the full spectrum of construction activities. The document is available for download from EC's web site: <http://www.ec.gc.ca/cppic/En/refView.cfm?refId=1863> 	<p>Acknowledged. The mitigation measures outlined below have been discussed in subsequent documents (i.e., the CEAA Report).</p> <p>MTO has approved standards and guidelines that consider Best Management Practices for air emissions for new roadways. These guidelines will be applied to the design of The Windsor-Essex Parkway, the inspection plaza, and the crossing. Such construction-related mitigation measures include:</p> <ul style="list-style-type: none"> Periodic watering of unpaved (unvegetated) areas. Periodic watering of stockpiles. Limiting speed of vehicular travel. Use of water sprays during the loading, unloading of materials. Sweeping and/or water flushing of the entrances to the construction zones. Use of calcium chloride. <p>In addition, during construction, the Contractor is required to implement dust suppression measures to reduce the potential for airborne particulate matter resulting from construction activities. These suppression measures are commonly in the form of water as a first choice on exposed soils to prevent dust from becoming airborne, or chemical applications if required where water is ineffectual. The Contractor is required to take steps as necessary to control dust resulting from the Contractor's operations, or by public traffic where temporary roads are maintained by the Contractor through work zones, such that dust does not affect traffic, enter surface waters or escape beyond the right-of-way to create a nuisance to residents, businesses or utilities. Standard dust suppression requirements dictated by the construction contract will comply with local Municipal By-Laws for such activities. Examples of other best practices for dust control, which are sometimes required during construction include:</p>																																																																																																																																																																			

Agency	Comment Received	Action
		<ul style="list-style-type: none"> ▪ Avoiding site preparation, excavation and construction during windy and prolonged dry periods. ▪ Minimizing vehicle traffic on exposed soils. ▪ Stabilizing soil and other material storage piles against wind erosion. ▪ Covering and containing fine particulate materials during transportation to and from the site. Install a tarpaulin on material stockpiles and haulage trucks, as appropriate. ▪ Use of new or well-maintained heavy equipment and machinery, fitted with fully functional emission control systems/ muffler/ exhaust system baffles and engine covers. <p>Mitigation measures for the predicted effects largely comprise of standard best management practices, and will be based on relevant standards and specifications, industry standards and protocols. Overall, with the implementation of these best management practices and mitigation measures, some residual effects from the project remain possible, however they are not expected to be significant. In some instances, elements of the project design will result in improvements to environmental quality relative to existing conditions.</p> <p>MTO will be responsible for implementing the mitigation measures required in relation to The Windsor-Essex Parkway. Transport Canada will be responsible for implementing mitigation measures required in the relation to the border inspection plaza and the international bridge crossing.</p>

Agency	Comment Received	Action
<p>Environment Canada. Environmental Protection Operations Division – Ontario. (Received March 9, 2009)</p> <p>And</p> <p>Environment Canada. Environmental Protection Operations Division – Ontario. (Received May 25, 2009)</p>	<p>Radar Surveys</p> <p>The Natural Heritage Report notes that, “The investigations <i>should</i> include mobile radar studies in association with acoustical recordings and point count surveys during peak spring and fall migration periods” (EA Report Sec. 10.4.5, p. 10-22, para. 6; Natural Heritage Report, Ex. Sum. p. xiv, para. 7; Natural Heritage Report, Sec. 6.8.4.3, p. 73, para. 2; Natural Heritage Report, Sec. 6.11, Table 13, ID # 6.8), however the EA Report states that these “... surveys <i>may</i> be carried out to provide input to bridge design” (EA Report Sec. 10.5.3, p. 10-29). The EA Report should be consistent with the Natural Heritage Report since EC agrees that radar <i>should</i> be conducted.</p> <p>Since migration occurs in sporadic pulses, these surveys would have to occur during the peak migration periods, at least 30 days in the spring and at least 45 days in the fall, to get a proper index of the number of birds passing by. <u>EC also recommends</u> that the surveys be conducted daily from sunset to sunrise to ensure the “big nights” for migration were not missed. The survey design should allow for a full description of flight patterns including flight heights, average flight height, the proportion of individual flights within the various risk zones (i.e. the DRIC proposed suspension bridge design, the DRIC cable-stayed bridge design, and the existing Ambassador Bridge), flight directions, and the number of birds (i.e. flight volume/ passage rates). These flight patterns should be correlated with weather conditions (e.g. wind speed, wind direction, visibility). Radar monitoring should be supplemented with acoustical monitoring to differentiate birds from bats.</p> <p>Point Count Surveys</p> <p>EC does not believe point count surveys are required during peak spring and fall migration periods. Nor are point count surveys required in the area of the bridge approach during the breeding season. The Southwestern Sales Corporation Limited property (immediately adjacent to the river) is highly disturbed (fill piles, etc) and the Ontario Power Generation property (immediately to the east is highly fragmented (EA Report, App. 1, Canadian Plaza B1). Neither of these properties is likely to support avian species of conservation concern.</p> <p>Pursuant to Section 79(1) of SARA, if any listed wildlife species, its critical habitat or the residences of individuals of that species may be adversely impacted by the project, the Responsible Authorities for the CEAA assessment must notify the competent Minister responsible for the listed species in writing. Fisheries and Ocean Canada (DFO) is responsible for aquatic species at risk and can provide advice regarding potential impacts on these species covered under the <i>Fisheries Act</i>. Notifications in relation to listed terrestrial species are to be sent to EC, and for this project may be sent to my attention.</p> <p>Snakes</p> <p>It should be noted that CWS coordinated the writing of the draft strategy for Butler's Gartersnake, but there is not a Recovery Team (RT) in place for this species at this time. CWS is a member of the RT for Eastern Foxsnake. While these species have not been detected to date in the Plaza B1 or bridge approach footprint, impacts are likely elsewhere during the implementation of the Recommended Plan.</p> <p>EC agrees that radio-telemetry monitoring should continue on the Butler's Gartersnake (NHIA Sec. 6.9.2.3, p. 76, para. 8), and Eastern Foxsnake (NHIA Sec. 6.9.3.3, p. 78, para. 8; NHIA Sec. 6.11, Table 13, p. 102, ID # 6.9) populations. We strongly recommend that those involved in the monitoring contact the Eastern Foxsnake Recovery Team (RT) for advice and recommendations with respect to the planned radio-telemetry work. We would like to know the technical background of the telemetry staff, since they may benefit from some training by the RT. In addition, the RT may be able to provide the survey veterinarian with some useful information regarding the surgeries required for telemetry work (if they have not already spoken with experts). Such training and information transfer helps to reduce snake mortality due to the surgery. We agree as well that it may be possible to reduce the impact on the summer activities of the species by relocating individuals off site to areas of suitable habitat (whether restored or currently suitable habitat).</p>	<p>Radar studies and acoustic studies will be carried out by Transport Canada in consultation with Environment Canada to provide input to bridge design. A Terms of Reference document has been prepared by Transport Canada, in consultation with EC, which outlines how further work is to be carried out.</p> <p>Given the availability of known techniques such as alterations to lighting to mitigate impacts to migratory birds residual effects are not expected to be significant.</p> <p>The Responsible Authorities have determined that a follow-up program pursuant to CEAA will be required for Migratory Birds and will continue to discuss with EC where formal CEAA follow-up programs may be warranted. In some cases, monitoring and/or regulatory follow-up programs may be more appropriate (i.e. species at risk on federal land). The Responsible Authorities will continue to engage Environment Canada in the development of monitoring and CEAA follow-up programs.</p> <p>The United States Fish and Wildlife Service has also reviewed the Terms of Reference including EC's comments, and is generally satisfied and are not proposing any additional changes further to those that EC recommended.</p> <p>Refer to the above noted comment.</p> <p>In accordance with the requirements of ss. 79(1) of the <i>Species at Risk Act</i> (SARA), Transport Canada provided written notification (on behalf of the RAs/PA) to EC on March 24, 2009, of the project's potential to affect these listed wildlife and plant species or their critical habitat.</p> <p>Comment noted. The 2009 field program for Eastern Foxsnake intends to confirm the presence/absence of this species within the plaza/crossing footprint. Mitigation requirements for potential impacts to Eastern Foxsnake associated with The Winsor-Essex Parkway are outlined in the application for a permit under the Ontario <i>Endangered Species Act, 2007</i>.</p> <p>The radio-telemetry studies and the surgical implants will be carried out by trained specialists who have been identified and approved by regulatory agencies through issuance of a <i>Scientific Collectors Permit</i> and an <i>Endangered Species Act</i> permit. All surveys will be carried out in accordance with these Permits and strict adherence to the Animal Care Protocol approved for the snake studies. The MNR Species at Risk Biologist has served as the point of contact for the snake specialists and the Recovery Team.</p>

NATURAL HERITAGE IMPACT ASSESSMENT – KEY ISSUES TABLE

Agency	Comment Received	Action
	<p>EC is very concerned, however, about the potential for destruction of hibernacula, as this may be catastrophic to the populations (NHIA Sec. 6.9.2.1, p. 76, para. 1). The telemetry work should assist in determining if/where the hibernacula are located within the project footprint. Eastern Foxsnake (NHIA Sec. 6.9.3.1, p. 78, para. 1), and Butler's Gartersnake (NHIA Sec. 6.9.2.1, p. 75, para. 4), both tend to have strong site fidelity for hibernaculum sites, so individuals using a hibernaculum, which is destroyed, will likely die. This can cause significant declines in the local population. Eastern Foxsnake is known to hibernate communally with other Foxsnakes and other snake species including Butler's Gartersnake. Every attempt should be made to protect hibernacula and corridors which connect them with other areas the species uses (i.e. for foraging, basking, etc.). <u>EC recommends</u> a continuation of the monitoring/telemetry work to determine how the species are using the site and where hibernacula are located. Detailed recommendations for threat mitigation and habitat protection should be made after this work is complete.</p>	<p>The 2009 field program for Butler's Gartersnake and Eastern Foxsnake, which includes radio-telemetry studies, is expected to provide the study team with important information related to population and distribution, behaviour and critical habitat areas.</p> <p>Threat mitigation and habitat protection recommendations will be developed during future design stages using the information collected from the 2009 field program.</p>
	<p>While Butler's Gartersnake has not been found in the area of the proposed Plaza B1, or bridge approach, this species does occur within the Parkway footprint. Approximately 40% of the population is expected to be impacted by the Recommended Plan, so without a comprehensive mitigative effort, the population will be dramatically impacted, or eliminated. Hibernacula are not suspected to occur on the Plaza B1 site, however, EC recommends that the mark-and-recapture study initiated in 2008 be continued along with a radio-telemetry study, to better determine snake locations, movement and other important biological information. Since a Butler's Gartersnake RT is not yet in place, <u>EC recommends</u> that the Eastern Foxsnake RT be contacted for advice on the telemetry study. It should be noted that telemetry work will require SARA permits and these should be in place well before the field season (contact: Andrew Taylor of CWS 905-336-4464).</p>	<p>The 2009 field program for Butler's Gartersnake and Eastern Foxsnake, which includes radio-telemetry studies, is expected to provide the study team with important information related to population and distribution, behaviour and critical habitat areas. Permits have been secured under the <i>Fish and Wildlife Conservation Act</i> and the <i>Endangered Species Act, 2007</i> to conduct scientific studies. The requirements related to the <i>Species at Risk Act</i> are to be determined.</p>
	<p>The creation of habitat for Butler's Gartersnake to replace lost habitat is recommended, and EC certainly supports this approach. It should be noted, however, that significant thatch layer is vital for the survival of the species in the tallgrass habitats it inhabits. Several years of plant growth and senescence are typically necessary to establish a sufficient thatch layer, so habitat creation has to be well under way in advance of impacts. Provision of the appropriate plant assemblages/associates important to Butler's Gartersnake should also be given thorough consideration. Aside from vegetation cover, consideration should also be given to the incorporation of structure such as rock and wood, to enhance the habitat that is created. Restoration site selection criteria should place a strong emphasis on sites that may be seasonally wet.</p>	<p>Comment noted. The restoration area for Butler's Gartersnake is immediately adjacent to the existing habitat for Butler's Gartersnake and displays/displayed similar characteristics. The study team has recommended that the restoration area be prepared well in advance of translocation.</p>
	<p>The need for connectivity to a larger Butler's Gartersnake population is noted (NHIA Sec. 6.9.2.2, p. 76, para. 3), but further detail should be provided. The relocation of snakes is likely to be more successful if the animals are moved to a safe location, a minimum distance from where they were found. It is noted that habitat will be restored near the construction site, but it is essential that a planned release area be restored well in advance (as above).</p>	<p>A translocation of the Butler's Gartersnake is planned, as opposed to relocation. The chances of success with a translocation are considered much greater than with relocation.</p>
	<p>It is noted that, "Snakes will be captured and relocated prior to construction to avoid mortality" (EAR Sec. 10.4.5, p. 10-22, para. 1; EAR Sec. 10.6.1, Table 10.7, p. 10-38, ID # 12.0; NHIA Ex. Sum. p. xiv, para. 2; NHIA Sec. 6.11, Table 13, p. 101, ID # 6.9), and that Butler's Gartersnake is slow moving (Sec. 6.9.2.1, p. 75, para. 4;); even when disturbed (Sec. 4.4.4, p. 15, para. 4). Butler's Gartersnake is a 'side winder' species, which moves relatively slowly on bare ground. While they have difficulty moving on hard bare ground or paved surfaces, they move quite quickly through the dense grass of their preferred habitat. Various capture methods may have to be considered, with the assistance of the Eastern Foxsnake RT, for the different species encountered in the construction zone.</p>	<p>Comment noted.</p>
	<p>Temporary snake exclusion fence (EAR Sec. 10.4.5, p. 10-22, para. 1; EAR Sec. 10.6.1, Table 10.7, p. 10-37, ID # 12.0) is recommended for Butler's Gartersnake (Sec. 6.9.2.2, p. 76, para. 4), and Eastern Foxsnake (Sec. 9.9.3.2, p. 78, para. 6), and a caution is included that, "Heavy-duty sediment fencing should not be used, so as to avoid snake mortality caused by snakes becoming tangled in such fencing" (Sec. 6.9.3.2, p. 78, para. 4). This is a very important point since the "heavy duty" silt fencing has mono-filament mesh (like a fish net) attached to the back of the silt fencing to strengthen it, and this material traps snakes. Regular silt fencing can be an effective short term solution to keep non-climbing snakes such as Butler's Gartersnake, as well as turtles, away from the construction zone. The fencing material should be buried about 15 cm in the ground, or in areas where it cannot be buried, 15 cm of soil can be placed on the bottom of the fence. It should be noted that silt fence is a less effective barrier for climbing snakes, such as Eastern Foxsnake, and Eastern Milk Snake. We therefore agree that it will be very important to ensure the barriers are well maintained (NHIA Sec. 6.9.3.3, p. 79, para. 1).</p>	<p>Comment noted. Permanent barriers will also be required to prevent snake access to the travel surface of The Windsor-Essex Parkway, where mortality might occur.</p>

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	<p>Plants</p> <p>Five vascular plant species at risk will be impacted by the Plaza B1 construction. None are known on the crossing site. Dense-blazing star, Kentucky coffee-tree and willowleaf aster are Threatened (THR) and will require SARA permitting. Climbing Prairie Rose and Riddell's Goldenrod, both Special Concern (SC), are also found within the Plaza footprint.</p>	Comment noted.
	<p>Proposed mitigation recommends more seed collection than plant and sod transfer, however, only sod transfer will bring with it SAR associates and overlooked species. EC recommends sod transfer, especially within the high quality areas displaced by the plaza footprint. It is stated that, "Sod should be rolled out onto a new bare site leaving an equal amount of fresh bare ground between sods so that plants can spread to these" (NHIA Sec. 6.5.2.2, p. 40, para. 1). It should be noted that prairie sod will not roll as easily as 'lawn sod' from a sod farm. Specialized implements have been designed for standard construction equipment, which allow 'native' sod to be cut in blocks, and palletized, for transfer on flatbed trucks. The US Society of Ecological Restoration (John Munro) should be contacted for information on the latest developments in this restoration technology.</p>	The detailed landscape plan will be prepared during future design phases in consultation with EC, MNR and ERCA. The state-of-the-art methods for ecological restoration of prairie communities will be included in the landscape plan. Recognized experts in the field, such as John Munro of the U.S. Society of Ecological Restoration, will be consulted at that time.
	<p>Transplanting is recommended for the three Threatened Species-At-Risk (SAR). Both dense-blazing star and willow-leaf aster are easily transplanted. Willow-leaf aster requires small portions of the rhizome (10 cm) along with a short length of aerial root attached. It should be noted that willow-leaf aster is a semi-obligate out-breeding species; so regardless of the transplant method, genetically different individuals are needed for successful pollination. Kentucky Coffeetree is a fairly tough plant that is resistant to drought, heat, and salt, when well established, however, it prefers wet to average soils, and it is somewhat sensitive to soil compaction. The root pattern consists of deep coarse laterals; transplanting efforts will be most successful when small balled and burlaped specimens are moved to optimal recipient sites in early spring.</p>	The detailed landscape plan will be prepared during future design phases in consultation with EC, MNR and ERCA. The state-of-the-art methods for transplanting species at risk will be included in the landscape plan. Transplanting methods will also be described in the application for a permit under the <i>Species at Risk Act/Endangered Species Act, 2007</i> .
	<p>Although Colic-root has not been found in the Plaza B1 footprint it should be noted that this species is difficult to propagate from seed <u>and</u> transplants, and neither method has been successful in Ontario. The most suitable option for this species is likely sod transfer, and consideration should be made for including other SAR such as Climbing Prairie Rose (SC), and Riddell's Goldenrod SC), when identifying 'donor' sites.</p>	Comment noted. The study team recognizes the challenges involved with transplanting colic-root and other prairie plants can benefit through sod transfer.
	<p>Ecological Restoration for Recommended Plan</p> <p>It is noted that disturbed areas will be restored "... using a landscape plan based on ecological restoration principles" (Sec. 6.8.1.1, p. 64, para. 2). There are also references to "restoration and enhancement approaches", "restoration and enhancement methods", "restoration and enhancement techniques" (EAR Sec. 10.4.2, p. 10-18, para. 3; Natural Heritage Report, Sec. 6.11, Table 13, p. 96, ID # 6.5), and "ecological restoration principles" (Natural Heritage Report, Sec. 6.8.1.1, p. 64, para. 1), but this is not consistent with the traditional landscaping approach proposed for trees and shrubs.</p> <p>Citing the Canadian Nursery Landscape Association it is stated, "Successful establishment of transplanted and new potted stock is partly dependent on size. As a result, larger nursery stock and existing trees should be planted and transplanted. This will allow trees to compete effectively with other vegetation and encourage their successful establishment" (Natural Heritage Report, Sec. 6.5.2.2, p. 40, para. 3). This approach is inappropriate since larger woody material does not transplant well, and large-caliper nursery stock has poor root/shoot ratios, reducing the chance of survival.</p>	Agreed. Whips and/or direct seeding should be primarily used for restoration and transplantation. Larger woody material will only be used for transplantation when a rare tree or shrub is being displaced or for landscaping, as opposed to ecological restoration areas.
	<p>The traditional landscaping approach was a dismal (and very costly) failure on the Highway 407 Central Section, which supported an ecological restoration approach on the Highway 407 East and West Sections. It was found that an ecological restoration approach was highly successful at a significantly lower cost. A traditional landscape approach usually focuses on a contractor warranty on large woody plant materials (Natural Heritage Report, Sec. 6.5.2.2, p. 41, para. 4). If the plant dies, the contractor replaces it (often with substandard stock), at which time they have normally met their obligation. But if the dead plant was healthy when it was installed, and it was properly cared for, it was probably unsuited for the site. Replanting with the same species satisfies warranty requirements, but it will not solve the problem.</p>	Agreed, a results-based warranty with adaptive management techniques should be considered instead of the traditional landscaping approach that focuses on a contractor warranty. Adaptive management techniques will be better at ensuring successful establishment of all vascular plant species. A results-based approach allows for adjusting ecological restoration techniques that do not work.

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	<p>An ecological restoration approach follows a planting plan prepared by a qualified restoration ecologist, which focuses on the planting of large numbers of a relatively large number of species to meet specific restoration goals for defined restoration units (e.g. minimum number of successful species, minimum number of viable stems/ha, minimum percent ground cover). With this approach it does not matter whether a particular plant, or for that matter, species, survives, as long as the overall restoration objectives are met.</p>	<p>Agreed, a detailed planting plan will be prepared during future design phases.</p>
	<p>There is occasionally stakeholder resistance to an ecological restoration approach, since planting small stock and direct seeding (e.g. oak) does not provide the ‘instant results’ of a traditional landscape approach using large-caliper ‘balled-and-burlap’ stock. This reaction, however does not seem to be an issue with this project. For example, it is stated that, “Public reaction was strongly in favour of ‘Carolinian, the theme that reflected the least ornate, most ecologically sensitive, and maintenance conscious design,...’” (EA Report, 10.4.7, p. 10-24, para. 4). It is further stated that the landscape design should “... respect local heritage ...” (EA Report, 10.4.7, p. 10-24, para. 5), and, “... that the most ecologically sensitive solutions should be pursued” (EA Report, 10.4.7, p. 10-24, para. 8). “It was clear from the workshops that stakeholders remained focused on ecological principles and a green facility” (EA Report, 10.4.7, p. 10-24, para. 8). It seems a minimum amount of public education would be required to gain full stakeholder support for an ecological restoration approach.</p>	<p>Agreed, the public will be educated during future design stages about the benefits of an ecological restoration approach.</p>
	<p>It is noted that, “Post-construction monitoring should occur to ensure successful plant establishment and reproduction” (EAS Sec. 10.4.2, p. 10-18, para. 5; EAS Sec. 10.6.1, Table 10.7, p. 10-34, ID # 9.0; Natural Heritage Report, Ex. Sum. p. vi, para. 1), and that this should occur for at least five years (Natural Heritage Report, Sec. 6.5.2.3, p. 45, para. 6). EC agrees, but post-construction monitoring should not be limited to a quantitative photo-monitoring technique (Natural Heritage Report, Sec. 6.11, p. 97, ID # 6.5). In addition to photo-monitoring, woody species plots (i.e. species type, number, height and general condition) and ground cover quadrats (i.e. species, percent cover) should be quantitatively monitored, and ‘restoration cruise surveys’ should be conducted as part of a monitoring, maintenance and supplementary planting program to ensure vegetation meets ‘free-to-grow’ objectives.</p>	<p>The techniques that will be used for post-construction monitoring will be worked out and expanded during future design stages in consultation with regulatory agencies, such as EC, MNR and ERCA. The experience gained from the Highway 407 East and West Extension will be taken into consideration in developing monitoring approaches.</p>
	<p>Restoration cruise surveys are general site surveys conducted by a qualified restoration ecologist in late spring and fall of each year. The entire site is walked to ensure all restoration units are covered. The purpose of these surveys is to:</p> <ol style="list-style-type: none"> Identify any obvious problem areas (e.g. erosion and erosion prone areas, areas with inadequate vegetation cover, signs of vandalism, evidence of rodent problems) so that the need for supplementary planting can be determined; Determine the level of weedy competition, and appropriate tending (e.g. weed control actions, irrigation during the first year of establishment); Make general qualitative and/or semi-quantitative observations pertaining to restoration units areas (e.g. general observations on relative growth, variability among plots, evidence of ecological gradients); and, Provide photographic documentation of all restoration units (as above). 	<p>Comments noted. The techniques that will be used for post-construction monitoring will be developed further during future design stages in consultation with regulatory agencies, such as EC, MNR and ERCA. The experience gained from the Highway 407 East and West Extension will be taken into consideration in developing monitoring approaches.</p>
	<p>Prescribed Burning</p> <p>EC’s guidance document “PLANTING THE SEED – A Guide to Establishing Prairie and Meadow Communities in Southern Ontario” is referenced in the “Fire” section (Natural Heritage Report, Sec. 6.5.2.2, p. 42, para. 2) when correctly describing fire frequency in the context of prairie maintenance. There are, however, several references to plans to burn the prairie areas “as frequently as possible” (EA Report, 10.4.2, p. 10-18, para. 5; Natural Heritage Report, Ex. Sum. p. vi, para. 1; Natural Heritage Report, Sec. 6.5.2.3, p. 45, para. 6; Natural Heritage Report, Sec. 6.11, Table 13, p. 97, ID # 6.5; Natural Heritage Report, Sec. 6.11, p. 102, ID # 6.9). This is incorrect as prescribed burns should be conducted ‘as is ecologically appropriate’.</p>	<p>Agreed, prescribed burns will be conducted as is ecologically appropriate. The reference to burn “as frequently as possible” referred to prairie areas that are in close proximity to residential or commercial areas, where there is the potential for public protest towards ecologically appropriate burn regimes. A public education program related to the requirement for prescribed burns will be promoted.</p>
	<p>Use of Native Species</p> <p>It is noted that, “Landscape plantings should be limited to native, non-invasive species typical of the tallgrass prairies/Carolinian forest” (Natural Heritage Report, Ex. Sum. p. v, para. 1), and that, “Only local genetic stock (locally grown and locally collected) should be allowed for restoration use” (Natural Heritage Report, Sec. 6.5.2.2, p. 39, para. 3; Natural Heritage Report, Sec. 6.9.4.2, p. 84, para. 2). EC fully supports this approach, and there are many opportunities. For example, if the restoration plan prescribes the planting of oak, seed could be collected from Black Oak Woods, and sown directly into the planting. This economical approach has been extremely successful on a variety of soil types, and was a major component of the restoration plans for the Highway 407 East and West Extensions.</p>	<p>Comment noted.</p>

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	<p>It should be noted that there are local organizations involved with prairie establishment (e.g. The Rural Lambton Stewardship Network) that have invested in the specialized equipment needed for seed collection and planting. It is possible that these organizations may be interested in designing and implementing a prairie restoration plan.</p>	<p>Opportunities to collaborate and form partnerships with local organizations involved with prairie establishment will be explored during future design phases.</p>
	<p>Plant Salvage</p> <p>There is mention of “Opportunities to forge partnerships with parties to relocate plant material to lands in public ownership, ...” (Natural Heritage Report, Ex. Sum. p. v, para. 5), but details as to how this might be done were not provided. Local naturalist clubs are occasionally interested in this type of activity, but they usually have very limited capacity. In any case, community volunteers should not be responsible for the well being of SAR. EC expects to see a comprehensive plant salvage plan that focuses not only on SAR, but also their vegetation associates, and this plan should not rely on efforts of volunteers.</p>	<p>Comments noted. A comprehensive plant salvage plan that focuses on SAR and their associates will be created in future design phases in consultation with EC and MNR. Partnerships will be forged with conservation organizations such as the Essex Region Conservation Authority, the Ojibway Nature Centre and the Walpole Island First Nations. Extensive use of volunteers is not anticipated.</p>
	<p>Herbicide Control of Invasive Species</p> <p>It is stated that, “Transported materials and equipment need to be screened for exotic and invasive invertebrate species” (Natural Heritage Report, Sec. 6.5.2.1, p. 37, para. 5). This mitigation measure is impractical because it is impossible to ensure all equipment is thoroughly washed down before entering the site, and that transported materials are free of propagules of invasive species. It is further stated that, “Soils disturbed as a result of construction activities need to be stockpiled and treated with herbicides prior to being re-used and planted upon” (Natural Heritage Report, Sec. 6.5.2.3, p. 44, para. 2). Again, this mitigation is impractical since a pile of material can not be treated with herbicides, and in many cases there would not be a reason to do so. If invasive species are an issue during site preparation, EC’s guidance document “PLANTING THE SEED – A Guide to Establishing Prairie and Meadow Communities in Southern Ontario” (referenced in the Natural Heritage Report,, p. 104), provides advice on controlling weed problems, including the use of herbicides.</p>	<p>Comments noted. Invasive species management and control techniques will be further expanded in future design stages.</p>
	<p>Soils Management</p> <p>There are several references to “soil management plans” (Natural Heritage Report, Ex. Sum. p. v, para. 3; Natural Heritage Report, Sec. 6.11, Table 13, p. 97, ID # 6.5; EA Report, Sec. 10.6.1, Table 10.7, p. 10-34, ID # 9.0), and we agree that this will be a very important to the success of the ecological restoration initiatives. Care must be taken to reduce the possibility that soil containing high concentrations of invasive plant propagules will be spread in the areas identified for restoration. Areas containing a high proportion of aggressive invasives should be clearly mapped before beginning ‘cut and fill’ activities on the site. By planning ahead, soils containing an invasive seed bank can be buried deeply to prevent germination. The Garlic Mustard invasion of scores of woodlots along Highway 402 is a prime example of what happens when soils containing an invasive species seedbank are not handled appropriately.</p>	<p>Agreed, areas containing a high proportion of aggressive invasives will be clearly mapped. There is a problem with burying soils that contain an invasive seed bank. That problem is common reed (<i>Phragmites australis</i>), which is abundant in a majority of the unmanaged tallgrass prairie communities. These tallgrass prairie vegetation communities also contain an assemblage of rare prairie species propagules. An adaptive soil management plan will be further expanded to deal with soils in a site specific manner.</p>

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Date	Commenter	Comment Received	Response
1 June-09	<p>DFO Joe de Laronde for Draft Compensation Strategy for Fish Habitat Alterations – DRIC – May 2009</p>	<p>pp.1, paragraph 5 (2nd under Wolfe Drain) <i>"...also 'daylight' approximately 180 m (360 m²) of fish habitat."</i> Clarify if this is the direct ecological footprint from the combined culvert crossings being removed or is it the footprints plus the lengths between.</p> <p>pp.2, Paragraph 1 (Lennon and Cahill) <i>"...habitat contained in these drains is (are?) marginally suitable to NP for spawning and their spawning success is not known."</i> Please remove this sentence from the analysis because it is our understanding that YOY northern pike were captured in several locations which indicates that there has been some degree of successful spawning in these areas in the past.</p> <p>This section needs to include an analysis of the loss and impacts to Lennon, Cahill and tributaries associated with disconnecting them from the downstream habitat. The impacts to these channels extend beyond just the impact associated with their function as northern pike spawning and nursery habitat they also currently support self sustaining fish populations.</p> <p>As discussed at our April 6 meeting a minimum length of channel above the submerged culverts is required to allow the systems to remain self sustaining. Particularly in the case of Lennon Drain this minimum does not appear to be met so it's likely that the fish populations will not continue to exist independently; this loss needs to be accounted for in the section on losses and impacts and appropriate compensation will need to be provided.</p> <p>pp.2, paragraph 3, Grand Marais Drain (Turkey Creek) Acknowledged that much of the habitat here is as described, a concrete lined channel with little habitat diversity, however, fish were observed and because of the past perturbations this site offers opportunities for restoration that could be included as compensation.</p> <p>pp.2, paragraph 4, Youngstown Drain <i>"This branch does not contain fish habitat..."</i> Please change this comment to reflect input provided by DFO throughout this process – "Although fish don't inhabit this reach of Youngstown Drain it provides indirect fish habitat in the form of water and/or energy contribution to downstream systems."</p> <p><i>"Approximately 130 m² will be destroyed...(includes 80 m of channel...and approximately 50 m downstream...)"</i> Clarify if the loss is 130 linear meters i.e. 80+50=130 or 130 m² as indicated.</p> <p>p.3, paragraph 1 <i>"...EC. Row Expressway, which is technically considered a storm sewer..."</i> Please remove this statement from the report, its misleading in the context of this analysis because it suggests that the primary function of Basin Drain is to act as a storm sewer which is not correct. Basin Drain is a watercourse which is also receives some storm runoff from the roadways.</p> <p><i>"...is not expected to act as a barrier to fish passage."</i> Why not a barrier to fish passage? Because there are fish upstream as described in the beginning of this paragraph? That population may be relic from pre-road construction...or could be colonies from the less tangible means of colonization. I don't know but I suspect without passage data, neither does LGL so it makes this comment inaccurate and leading.</p>	<p>It is the direct ecological footprint of the combined culverts only. Wording was added to the sentence clarifying this point.</p> <p>We are not aware of this data and did not capture or observe YOY Pike in either Lennon Drain or the Cahill Drain system. Please provide us with this data and we will remove the sentence.</p> <p>The fact that there are self-sustaining fish populations upstream is mentioned in this section. Clarification stating that the compensation design will accommodate these species as well as Northern Pike was added.</p> <p>It is acknowledged that the Lennon Drain habitat remaining upstream of the submerged culverts may not be enough to sustain a population of resident fish. The Cahill system will provide enough channel length to sustain fish populations and the habitat will be enhanced to facilitate the life history functions of resident species. In addition, habitat will be added in the form of wetland pockets to enhance the diversity of habitats in the upstream portions of the Cahill system. The wetland proposed downstream in Lennon will accommodate other fish species as well as Northern Pike. It is, however, acknowledged that the wetland habitat differs from the linear habitat provided by the watercourse. As such, additional compensation is proposed along Grand Marais Drain (Turkey Creek) to enhance the linear habitat found there. Although it is not a direct benefit to Lennon Drain, it is part of the same system and will provide offsetting enhancements to the habitat loss in Lennon Drain. These points were made clearer and/or were added to the text.</p> <p>Agreed. We are proposing removal of concrete from the channel both upstream and downstream of the crossing based on DFO's suggestion/recommendation.</p> <p>Agreed. The paragraph was changed to include this sentence such that it states that indirect fish habitat is present.</p> <p>It's both as it's based on a 1 m wide channel. This point was clarified in the text.</p> <p>Agreed. This portion of the sentence was removed.</p> <p>It is likely not possible that the fish observed upstream are a relic of pre-highway construction as there is only about 90 m of remnant channel there that dries up for a large portion of the year. We do not know when the highway was constructed, but it has likely been longer than the life span of the small baitfish observed which means that, if they were remnants from pre-</p>

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		<p>Additional losses and impacts The construction of the Plaza will result in impacts to an unnamed tributary of the Detroit River near the Brighton Beach Power Plant and will need to be included as part of this assessment. This location was initially a candidate site for compensation but was determined to be unacceptable because the upper reach will be impacted by the Plaza.</p> <p>Compensation</p> <p>pp.3, paragraph 3 <i>Compensation</i> DFO appreciates the focus on northern pike as a species of concern but we would suggest rewriting this section to say that while northern pike is one of the target species to compensate for losses upstream on Lennon and Cahill drains, impacts and restoration of fish habitats that will benefit all or most species present in specific reaches/stream/drains will be developed. This message will link better to the information provided in the Natural Heritage Study which demonstrated that the systems support a wide range of species.</p> <p>For the losses in the upstream area of Cahill drain and tributaries we are prepared to consider compensation that will enhance the existing condition with the goal that this area will be self sustaining however sufficient information needs to be provided to demonstrate that this is a realistic alternative. For example if the proposal is to maintain an upstream fish population by creating refuge areas for fish during dry periods then information needs to be provided to demonstrate that there will be sufficient flow to ensure that the refuge areas/wetland pockets etc will be wet at all times. Its also important to demonstrate that that they can be designed to ensure that conditions within the refuge areas will be appropriate to support fish for extended periods of time, e.g. water depth, temperature.</p> <p>pp 4, paragraph 2 <i>Youngstown Drain</i> “...130m² of YD will be lost...” As discussed above, please clarify if this 130 square or linear meters?</p> <p>pp. 7, paragraph 1 “...will have a net benefit to the entire system and can be applied to compensate for other drains/watercourses.” As was discussed between Judson and Joe at the compensation options meeting in April, works on Grand Marais Drain ‘could’ account for some of the shortcomings in other drains that will be impacted. However, this is not the same as saying that if compensation is needed, focus can be placed just on the Grand Marais Drain. As was also discussed, under another program, the Detroit River Canadian Clean Up Implementation Committee, Grand Marais Drain and Turkey Creek are slated for restoration works already; a section of Turkey Creek was restored this season.</p> <p>Overall Comments on the Compensation section:</p> <p>DFO appreciates the overall concepts being presented in the report; they represent a step in the right direction. Moving forward we would like solidify the commitments about the compensation being proposed and to do that we need additional information about certain elements to assure ourselves that the compensation is possible and realistic.</p> <p>Within the compensation options there were a couple of areas where it was suggested that</p>	<p>highway times, they would have had to become self-sustaining. The habitat area is likely not large enough to support all life history functions. Although there is no passage data, we came to the conclusion that fish passed through the culvert as it was the most feasible explanation for their presence. Fish were seen upstream of E.C. Row Expressway during two site visits separated in time by two years (2006 and 2008).</p> <p>This drain, named Healy Drain, was not discussed in the text and this was an oversight. Its loss is in Table 1 at the end of the document and compensation is discussed on page 7 (Other Areas). Text was added to the document describing this drain.</p> <p>Agreed. This paragraph was re-worded.</p> <p>Agreed, that these points need to be made and details regarding constructability, function and maintenance of function need to be developed. However, at this early stage in the EA process, it is difficult to develop those details. Our overall commitment is to ensure the function of these additional habitats in such a way as they will provide a benefit to resident fish populations and will add to existing habitat diversity such that all life history functions of resident species can be realized. In addition, the habitat will be designed and constructed such that they do not negatively affect the watercourses of which they will be a part.</p> <p>See response above.</p> <p>Understood. It was not meant to be implied as a “catch-all” for all watercourses within the study area, but as a “fill-in” for those watercourses that could not be fully compensated for within the current compensation plan. However, it is felt that, due to the large populations of fish observed within Grand Marais Drain and the fact that the majority of watercourses within the study area drain into it, works within this watercourse could provide the largest net benefit to the system as a whole, when compared with the limited opportunities in those watercourses with much smaller fish populations.</p> <p>Agreed. The compensation planning process is ongoing and information is being updated frequently.</p> <p>Agreed. Use of the word “could” has ceased for all future documents to firm up our commitment to the compensation strategy. Please note that the area of</p>

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		<p>compensation “could” occur which we are concerned is not a firm enough commitment to implement, for example the culvert replacement on McKee Drain. At this point in the process we would like confirmation that any compensation proposed in this report represents a real commitment from the team to implement and that details that satisfy DFO’s regulatory responsibilities will be provided in the detailed design stage.</p> <p>Having said that we still have concerns about the extent of impact on Lennon and Cahill drains and the ability of the proposed compensation to mitigate impacts. As we indicated above the impacts to these channels extends beyond just the impact associated with their function as northern pike spawning and nursery habitat and includes the loss of their ability to support self sustaining fish populations.</p> <p>As discussed at our April 6 meeting a minimum length of channel above the submerged culverts is required to allow the systems to remain self sustaining; particularly in the case of Lennon Drain this minimum does not appear to be met so it’s likely that the existing fish population will not continue to be self sustaining, resulting in a complete loss of direct fish habitat in these areas; as stated above this loss needs to be accounted for in the previous section on losses and impacts and appropriate compensation will need to be provided.</p> <p>For Cahill drain and tributaries we may be prepared to consider compensation that will enhance the existing condition with the goal that this area will be self sustaining however sufficient information needs to be provided to demonstrate that this is a realistic alternative. For example if the proposal is to maintain an upstream fish population by creating refuge areas for fish during dry periods then additional information needs to be provided to demonstrate that there will be sufficient flow to ensure that the refuge areas/wetland pockets etc will be wet at all times. It’s also important to demonstrate that they can be designed to ensure that conditions within the refuge areas will be appropriate to support fish for extended periods of time, e.g. water depth, temperature. Information on the flow and water availability will also need to be provided for the downstream wetland proposed on the Lennon Drain.</p> <p>As proposed, the wetland pockets represent a significant component of the compensation plan and additional information needs to be provided to demonstrate that sufficient water will be available at the appropriate times of the year to achieve the fish habitat goals for which they are being created. If there isn’t going to be enough water to maintain the function of the new wetland areas during critical times then additional compensation alternatives will need to be developed.</p>	<p>McKee Drain within the study area does not constitute direct fish habitat. It was mistakenly categorized as such, but we realized that the large entombment downstream likely forms a barrier to fish passage. During field investigations by fisheries biologists in McKee Drain upstream of this barrier, no fish were observed or captured.</p> <p>Agreed. The Cahill system will have channel enhancements in the realigned sections and additional habitat to support resident fish populations will be constructed. Lennon Drain upstream of the Windsor-Essex Parkway may not provide enough stream length to support a self-sustaining population of fish. Therefore, compensation is focussed on downstream areas and additionally, in Grand Marais Drain.</p> <p>Agreed. The loss of the upstream portion of Lennon Drain is accounted for and direct fish habitat will be created or enhanced within the Lennon Drain system or Grand Marais Drain to compensate.</p> <p>Agreed. More information will be forthcoming when available.</p> <p>Agreed. During future design phases, the functioning of the wetland pockets as designed for self-sustaining fish populations or Northern Pike spawning will be ensured.</p>
<p>1 June-09</p>	<p>DFO Joe de Laronde for Summary of Existing Conditions – Fisheries - April 2009</p>	<p>It is unclear if this document is intended to be a stand alone document or if it is intended to replace some section of a larger document. If it is stand alone, then it will require more preface information for clarification.</p> <p>Comments pp. 1, Results <i>“No critical fish habitat or fish species at risk...”</i> This statement is counter to DFO’s position throughout this process that because northern pike, including YOY pike, have been found in some of the inland waterways, and considering that pike spawning habitat is likely limiting along these highly altered waterways, this represents critical habitat for this species and because of the scarcity of this type of habitat we would consider it rare.</p> <p>pp. 2, Fish and Fish Habitat</p>	<p>It is a summary document pulled together from existing information from other reports, an assimilation of information collected over the course of the study created for review purposes only.</p> <p>The inclusion of this statement was an oversight. It was meant to state that no critical habitat FOR fish species at risk was present within the inland watercourses. As mentioned above, we are unaware that YOY Pike were captured in any of the inland watercourses within our study area. During our investigations, only adult Pike were observed. However, we do agree that Pike spawning habitat for this species exists within the study area, but are reluctant to call it critical or rare. Pike spawning habitat is fairly specialized, but can occur over submerged (or emergent) vegetation anywhere that is connected to waters where Pike are found. Such habitat exists downstream of the study area in abundance, especially in the Turkey Creek marshes, and thus it is not rare. The small watercourses in the study area likely represent the upper limits of spawning habitat for these fish which contained, at least during our site visits, small adult fish. It is likely that the larger, more dominant fish spawn in better habitats downstream. An argument can be made that because such habitat is available and abundant in adjacent areas within the same watercourses and/or system (watershed), the marginal habitats in which the small Pike were observed within the watercourses in the study area should not be considered critical or rare.</p>

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		<p>General Comment: The use of the phrase “<i>present/absent</i>” is not accurate unless we are talking about a species of fish that could not be found in the area. The correct use should be... “<i>presence/not observed</i>” which implies that while ‘we’ (the study) did not catch any of species X, it is not to say that it is not present.</p> <p>pp. 8, Fish Habitat General Comments on this section: It is a persistent issue in the reviewing of any DRIC documents where fish and fish habitat are discussed. This pertains to any variation of the term ‘not fish habitat’. Fish habitat as described under the Federal Fisheries Act describes direct and indirect fish habitats. As is common place in the documents, degraded habitats in an open channel, for example, will be described as not being fish habitat when in fact, if they are connected to fish habitat downstream, they are, at the least, a water and energy contributor to downstream systems. As such, these types of systems are definitely fish habitat albeit indirect. This can also be applied to piped upstream watercourses that discharge into open downstream sources; they still support the downstream fishery and are considered indirect fish habitat. Its important to keep this in mind during future design stages for the SWM systems for example because there could be a negative impact on direct fish habitat if these types of systems are lost via rerouting into SWM’s or similar systems. Please consider this comment when reading any passages in any DRIC document describing fish and fish habitat.</p> <p>It is my understanding that LGL consulted with the Essex Region Conservation Authority (ERCA) in obtaining the drains classification maps. As DFO has discussed in past technical review documents, the wording describing each of the classes in DRIC documents does not reflect the drain class description that has been in effect since 2004. The DRIC documents still tend to use the class descriptions from the Class Authorization Process Guidance Document Draft Jan 2002. For consideration:</p> <ul style="list-style-type: none"> - Class A: Permanent Flowing, Cool/cold water, No sensitive fish species or communities present (originally, no trout salmon present). - Class B: Permanent Flowing Warm water, Sensitive fish or fish communities present < 10 years since last full maintenance. - Class C: Permanent Flowing Warm water, No sensitive fish species or communities present (originally, “baitfish present” was in place). - Class D: Permanent Flowing, Cool/cold water, Sensitive fish species or communities present (originally, trout salmon present). This can include northern pike. It also does not have to include cool/cold sport-fish...but can include species like sculpin which are cold and sensitive. - Class E: Permanent Flowing Warm water, Sensitive fish or fish communities present > 10 years since last full maintenance. Again, not just sport fish are included here. This could now include species like redhorse ssp. - Class F: Intermittent flow, varied temperature, dry for 3 months of the year. May still support seasonal fish habitats. <p>As well, in the studies done by LGL, there has been new data produced that can affect the class of the drains. My understanding is that this data has not been shared back with ERCA so that the drains may be considered for reclassification. Please ensure that this is done.</p> <p>Specific Comments on the Fish pp. 9, Fish Habitat (top sentence of the page) “...several of the larger watercourses continue to sustain warmwater and coolwater sportfish and baitfish communities.” Consider rewording to simply stating.... “...several watercourses continue to sustain warm and coolwater fish communities.” ...acknowledging that not only do larger systems have fish...but smaller ones do as well. Also, by not identifying bait and/or sportfish specifically allows for the inclusion of ‘coarse’ fish as well (sucker spp., carp, catfish spp., etc.).</p> <p>pp. 9, Broadway Drain “Only the downstream reach...to be fish habitat as there was warm water entering the</p>	<p>Wording will be changed.</p> <p>Agreed. This wording will be omitted and the correct term “indirect fish habitat” will be used.</p> <p>The role of indirect fish habitat (contribution of water, nutrients, etc.) will be considered during future design stages. Agreed that its importance cannot be overlooked.</p> <p>Drain classifications will be reviewed and wording will be updated.</p> <p>Earlier in the project several attempts were made to re-classify the drains (meetings were requested). Our data will be shared with ERCA so that reclassifications can be done.</p> <p>Agreed. Text will be re-worded.</p>

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		<p><i>channel...thermal barrier to fish movement.</i> The upstream section of the drain is not direct fish habitat because it is a piped/entombed system. The downstream reach may not support great fish habitat because of this thermal impact however, with no data supporting this, this comment is unfounded. At a minimum, it is indirect fish habitat at the top downstream of the pipe...characteristically direct fish habitat in the lower reach likely representing seasonal fish habitat when the gravel/sand barrier breaches at Detroit River.</p> <p>pp. 10, Burke Drain <i>“Warmwater sportfish were captured in Sept 2006 land the...”</i> Spelling error that likely was meant to say... “...Sept 2006 AND the...”</p> <p>pp. 11, Dickson Drain <i>“Warmwater baitfish (central mudminnow) were captured...”</i> CM is not a baitfish...it is arguably a forage fish...definitely considered a coarse fish. It is representative of typical degraded systems with high sediment loads. Interesting enough though, CM is listed by ROM as being a cool water, sensitive species.</p> <p>pp. 11, Healy Drain <i>“Only...was determined to be fish habitat as the buried culvert at Sandwich Street...”</i> See the general comments above as well as those in Broadway Drain.</p> <p>pp. 12, McKee Drain <i>“...upstream of this pipe is not considered to constitute fish habitat.”</i> See the general comments above as well as those in Broadway Drain.</p> <p>pp. 13, McKee Creek <i>“...and walleye and perch were anecdotally reported...”</i> It was very good to include this recognition...and the potential for enhancement.</p> <p>pp. 14, Youngstown Drain <i>“...did <u>no</u> constitute fish habitat and likely conveys water during rain events.”</i> See the general comments above as well as those in Broadway Drain...ironically, the passage in my general comments talks specifically to water contribution. As well, the word “no” likely is to be “not”.</p> <p style="text-align: center;">Fish Habitat Assessment Summary Table</p> <p>Please see my General Comments under <i>Fish and Fish Habitat</i> above for Drains Class discussions. Specifically, please pay attention to the Not Fish Habitat passage as in this table, this comment is very rampant and not accurate relative to Direct/Indirect applicability.</p> <p>General Comments relative to the table</p> <p>Please correct the column Overall Sensitivity of Habitat (low, moderate, high) to better reflect the affects of changing habitat comments to reflect Indirect/Direct Fish Habitat issues. With this, rarely will the comment “NA” be applicable with “Low” replacing most.</p> <p>Under the column Flow Conditions, periodically, the term “ephemeral” is used. To be consistent with the Class Authorization System for Municipal Drains, if the system is a Drain, it is flow classed as Intermittent at the lowest flow regime rating. This implies that the system may convey water at some time of year...maybe only after rain events. Basically, if it is a drain, it is constructed to convey water....and that water has to go somewhere. Please make the necessary changes to those drains (Burke, Dickson, Howard Ave) for sure. Please in the above context regarding indirect fishery, flows, the Drain Classification system, please</p>	<p>Agreed. Wording will be changed.</p> <p>The spelling error will be corrected.</p> <p>We did not know that they were not considered baitfish. Is there a listing of what are to be considered coarse fish? If so, can it be provided to us?</p> <p>Upstream areas will be considered indirect fish habitat.</p> <p>All upstream areas previously categorized as not fish habitat are now considered to be indirect fish habitat.</p> <p>These culverts are located on private property, and, thus, out of MTO's jurisdiction.</p> <p>The southern branch of Youngstown Drain will be considered indirect fish habitat in the future. “No” will be changed to “not”.</p> <p>The table will be reviewed and “not fish habitat” categorizations will be changed to indirect fish habitat where appropriate.</p> <p>Agreed. Column will be changed to reflect indirect fish habitat classifications.</p> <p>Ephemeral will be replaced with intermittent.</p> <p>Necessary changes will be made.</p>

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		<p>also consider the applicability of this term for the tributaries that are not drains but included in the assessment (Tribes of Dickson, Susan, Wolfe).</p> <p>pp. 5, Unnamed Pond Is listed as Un-classed under the Drain Classification system. In actuality, that system does not apply to ponds. NA would be appropriate here.</p>	<p>Agreed. Will change to NA.</p>
<p>From May 29, 2009 E-mail</p>	<p>E-mail from DFO to TC</p>	<p>Overall the compensation plan is still lacking in detail and the level of firm commitment that we need to see. We need more analysis to demonstrate that the compensation options proposed are actually possible. For example a significant component of the compensation they are proposing is wetland cell creation but they haven't provided any details of the expected flows and obviously the compensation will only have value as habitat if there is sufficient flow to ensure that the wetland cells will be "wet". Its also going to be important for them to demonstrate that the conditions in the wetland cells will be acceptable for fish to survive for extended periods of time e.g. water depth, temperature, DO.</p>	<p>Additional detail including associated drawings was provided in June 24 meeting with DFO.</p>
		<p>The same lack of firm commitment is found in the mussel work. We would like to have a firmer commitment from them about who will be hired to do the work (there are a limited number of contractors with the appropriate expertise) what areas they will be focusing on and what level of assessment will be done and when the assessment work will be conducted.</p>	<p>A mussel survey is underway and results will be provided to DFO as soon as they are available.</p>