Darlene Conway, P. Eng.
Ottawa, Ontario

January 24th, 2010

By e-mail:
The Honourable John Gerretsen, Minister of the Environment
Charles Goulet, P. Eng., District Engineer, Ottawa District Office, MOE
Mansoor Mahmood, P. Eng., Supervisor, Water and Wastewater, MOE
Doris Dumais, Director, Approvals Program, MOE
Les Pataky, P. Eng., Regional Engineer, Southern Region, MNR
Dan Marinigh, Director, Lands and Waters Branch, MNR
David Lindensmith, P. Eng., Senior Project Engineer, Eastern Region, MTO
Hani Farghaly, P. Eng., Senior Engineer, Design Standards Section, MTO
John Price, P. Eng., MVC

Dear Sirs and Madam:

**Re: Follow-up to Serious Concerns with Third Party Review Model of Record for the Carp River Restoration**

Further to my submission of January 18th, 2010, this is to provide some additional comments for your consideration as agencies that have had or will have a review and/or approval role in this project. I also wish to pose some specific questions for which I am seeking responses from the Ministries circulated.

**Concerns re: Use of the Carp River corridor as an on-line SWM facility**:
This relates to my previous submission wherein I documented the assignment of much lower (compared to existing) roughness values to almost 50% of the restoration reach, apparently in the vicinity of the future SWM ponds and numerous fish habitat ponds.

Notwithstanding that, in my opinion, this is not a defensible assignment of roughness values, for argument's sake, I would ask you to consider the implications of accepting these low values. Depending on such low roughness values to reduce flood levels throughout the corridor (rather than relying on conventional off-line flood control facilities) is effectively depending on the river corridor to serve as an on-line flood control facility. Rather than providing the necessary storage volumes in off-line SWM facilities that would mitigate the impacts of increased peak flows on existing condition flood levels – long a standard requirement of development – there appears to be an assumption that this function can be achieved by maintaining almost 50 % of the river corridor almost as "smooth" (0.04) as the low flow channel (0.035).

There are many implications to this presumed design assumption:

Just as storage volume is the essential design element of a conventional off-line flood control facility, maintaining the very low roughness values assumed for almost 50% of the corridor would likewise become a perpetual requirement. Failure to maintain that low roughness value over the long term could result in increases in 100 year flood levels in the order of 0.30m to almost 0.40m for a significant portion of the restoration reach, as I documented in my previous submission.

This approach presumably represents a commitment by the City to ensure this low roughness condition in perpetuity with the maintenance burden that comes with that assumption: regular inspections and, if necessary, corrective actions to ensure the numerous habitat ponds' connecting channels to the Carp River are not filling in with sediments or vegetation (which could lead to the eventual lowering of the water level, filling in with vegetation, etc.) along with regular mowing of all other areas beyond the water surface area to keep natural succession at bay (to prevent increased roughness) and possibly the regular harvesting of emergent vegetation.

However, such a scenario would obviously be contrary to a key objective of the restoration plan which is to naturalize the corridor and provide increased riparian cover for at least 70% of the reach. I provide this scenario, however, to demonstrate that beyond what may be characterized by some as differing opinions of professional engineers regarding appropriate overbank roughness values, there is the very practical matter of the dependence on long-term human intervention – in a supposedly naturalized river corridor - to maintain this presumed condition in perpetuity - or knowingly increase flood levels and flood risk that could be avoided with conventional measures such as off-line flood control facilities.

This apparent approach of depending on a very low roughness value to mask the full impacts of development on existing flood levels is, in my opinion, contrary to a prudent and precautionary approach that is warranted given the admitted uncertainty associated with an uncalibrated/unvalidated model; will result in avoidable increased maintenance costs for the City; and significantly undermines the (ostensible) objective of the project: to naturalize the corridor and improve the health of the river.

The widening of the corridor (or if you consider the loss of storage from filling in the floodplain, this is rather a narrowing of the filling) that I understand is currently being incorporated in the restoration plan is further indication of the presumed use of the corridor as an on-line flood control facility. If the corridor is being widened to address concerns re: flood level increases, it begs the question as to why the conventional alternative of providing sufficient off-line flood control storage (SWM ponds) that will maintain existing 100 year flood levels has never been considered. The long-repeated conclusion that 100 year controls will result in increased flood levels ignores the fact that the currently proposed 10 year controls result in the same problem! The solution is not to provide more on-line storage for SWM purposes or mask impacts with low roughness values but to implement appropriate SWM criteria that achieve the basic

objective of mitigating the impacts of increased peak flows such that adjacent riparian landowners are not impacted by increased flood levels. Frankly, letting peak flows discharge uncontrolled (beyond the 10 year event) and constructing an efficient ("smooth") floodway to facilitate this is a dated approach to floodplain management that has long been proven to cause more problems than it solves.

That being said, I would appreciate a response to the following Ministry-specific questions:

**MOE:**

1. In the City staff report that was prepared for the Third Party Review (available here: http://ottawa.ca/calendar/ottawa/citycouncil/occ/2009/05-27/pec/1-ACS2009-ICS-CSS-0005-Carp%20River.htm), the future permit requirements listed did not include a Certificate of Approval under the *Ontario Water Resources Act* (OWRA) for the restoration (given the apparent proposed use of the restoration reach as an on-line quantity control facility). Has MOE advised the City that if the corridor is intended to be used as an on-line flood control facility, that it is considered a sewage works and hence a C of A will be required for the restoration plan?
2. Given the Third Party Review forms part of the City's response to the Minister's July 21st, 2008 order, and that the apparent selective revision of roughness values was not clearly documented, is MOE satisfied that the TPR report endorsed by all agencies and the City was sufficiently transparent on this matter?
3. In terms of MOE's regulatory role (the statute authority derived from approving works under Section 53 of the OWRA), do the increases in flood levels (0.15m to almost 0.40m) and peak flows (30 to 40% in many locations) exceed thresholds that MOE applies when approving Cs of A? If yes, what are those thresholds (for flood level and peak flow increases)?
4. The Fernbank plan, now under appeal to the OMB, made use of the Third Party Review model of record and recommendations in its supporting technical studies. If there is now uncertainty with respect to the validity of the TPR model of record, could you please outline the process MOE foresees will be required to correct and update the Fernbank Class EA studies?
5. What is MOE's position with respect to OWRA approvals that have been issued to date on the basis of various versions of the Carp River hydrologic/hydraulic modeling?

**MNR:**

1. Does MNR have any concerns with the assignment of roughness values at the bridges and in the overbank areas that underlies the post-development flood levels documented in the TPR?

2. Given that the restoration will require a permit under the *Public Lands Act*, does MNR have any concerns with the flood level increases that result when the roughness values are revised to match existing condition roughness values? Will the City be required by MNR to obtain permission from affected riparian landowners?
3. With flood level increases in some locations in the order of 0.40m, does MNR consider the objectives of provincial natural hazards policies to have been met?
4. Does MNR have any concerns with respect to the use of routed flows downstream of road crossings that provide considerable flow attenuation, i.e., Richardson Side Road (refer to Table A4 in Appendix in January 18th submission), the use of which reduces the impacts of peak flows downstream while the structure is in place but could result in increased peak flows and flood levels downstream if/when that structure is ultimately replaced?

**MTO:**

1. Does MTO have any concerns with the assignment of roughness values at the bridges and in the overbank areas that underlies the post-development flood levels documented in the TPR? or, conversely, does MTO have any concerns with the flood level increases that result when the roughness values are revised to match existing condition roughness values?

Thank you in advance for your consideration of these comments and questions. I look forward to your responses.

Regards,

Darlene Conway, P. Eng.

cc:
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