



Harden Environmental Services Ltd.  
4622 Nassagaweya-Puslinch Townline Road  
R.R. 1, Moffat, Ontario, L0P 1J0  
Phone: (519) 826-0099 Fax: (519) 826-9099

- Groundwater Studies
- Geochemistry
- Phase I / II
- Regional Flow Studies
- Contaminant Investigations
- OMB Hearings
- Water Quality Sampling
- Monitoring
- Groundwater Protection Studies
- Groundwater Modeling
- Groundwater Mapping

Our File: 1006

December 12, 2013

Township of Puslinch  
7404 Wellington Road 34  
Guelph, Ontario, N1H 6H9

Attention: Karen Landry, CAO

Dear Ms. Landry;

Re: Pinebush/ County Road 32 and Townline Road Drainage

As requested, here is a summary of the meeting held on December 3, 2013 at the MTE office in Kitchener.

This meeting was a precursor to the upcoming PLCA board meeting on January 8. The meeting was one hour long and attended by Jeff Molenhuis from MTE, Roger Ward from MTO and Jessica Linton from Natural Resources (consulting company doing biological assessment).

Jeff wanted to discuss issues raised by the PLCA and how we got where we are (for the benefit of Roger Ward). Roger was there because the RMOW and MTO are cost sharing the intersection improvements.

Jeff briefly explained the various options and restated that Option 6 is the preferred option because it removes the water from the intersection with no further maintenance required. Other options were limited by not having enough elevation difference to adequately lower the water level at the intersection.

I restated that Option 8 was the Townships preferred option but we deferred to MTE's analysis saying that Option 8 would not work. Roger Ward was curious why Option 8 would not work and Jeff explained that there was still a possibility of flooding if the infiltration basin did not operate correctly. Roger suggested that at least a portion of Option 8 should be considered to further offset water flowing into the Puslinch Lake basin. Jeff said he would look into this.

Jeff also explained that the additional storm water pond proposed for the southwest corner originally was designed to capture storms larger than the 5 year storm, but due to constraints from City of Cambridge arborist, the size needed to be reduced. Jeff said there was a possibility of enlarging this SWM area.

Jessica said that there would be plant uptake of chloride in the wetland but also confirmed that the wetland and the lake were contiguous (there is no physical barrier between the lake and the wetland). Jessica provided a subsequent email that corrected her position and that the wetland and the lake are not connected. We agreed that the additional mass of chloride added from the intersection was unlikely to greatly affect chloride concentrations in the lake.

I suggested that Jeff be prepared to defend not using Option 8 and if it was mainly because of financing the residents will not be satisfied as they are spending a lot of private money on improving the quality of the lake.


I agreed to send water quality sampling taken from the intersection and my water balance for Puslinch Lake to Jeff and Jessica. ( I did so the next day).

I mentioned that I had been talking to consultants working in the industrial area nearby and there were issues with storm water. Jessica confirmed that there is some environmental concern with flooding in the area. I then stated that the Township is concerned about additional storm water being diverted into lake from the problem areas. There must be some mechanism to prevent additional storm water from being diverted into the lake should Option 6 go forward.

We will be pleased to address questions from council on this matter.

Sincerely,

Harden Environmental Services Ltd.

A handwritten signature in blue ink, appearing to read 'S. Denhoed', is written over a light blue rectangular background.

Stan Denhoed, M.Sc., P.Eng.  
President

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Township of Puslinch

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Council Agenda	Nov 6/13
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Our File: 1006

November 1, 2013

Township of Puslinch  
7404 Wellington Road 34  
Guelph, Ontario, N1H 6H9

Attention: Karen Landry, CAO

Dear Ms. Landry;

Re: Pinebush/ County Road 32 and Townline Road Drainage

I am pleased to provide a summary of the meetings and discussions that have been held between the Township of Puslinch, represented by Stan Denhoed (Harden Environmental) and councillor Wayne Stokley, and the Regional Municipality of Waterloo (RMOW) represented by Gary MacDonald and MTE Consultants Inc.

Briefly, the Township was approached by the RMOW in 2010. The RMOW was interested in the Township's input in regards to engineering solutions to eliminate periodic flooding of the intersection at Townline Road and Pinebush Road. Despite efforts by the Township to dissuade the RMOW from including options that resulted in discharging storm water into the Puslinch Lake basin, the final solution preferred by the RMOW includes discharging water into the basin adjacent to the lake. On behalf of the Township, Harden Environmental participated in the discussions and ultimately assisted in the final design that minimizes, but does not eliminate drainage into the lake basin.

The summary of events leading to this final design goes as follows;

In late 2010, the Township was presented with an engineering report titled "County Road 32/Townline Road/Pine Bush Road Intersection Drainage Improvements Environmental Impact Study" (Natural Resource Solutions Inc. and MTE Consultants, September 2010), and "Scoped Hydrogeological Assessment" (MTE Consultants, September 2010).

The Environmental Impact Study presented seven solutions to address

the issue of periodic flooding of the intersection. The preferred solution (Option 6) included overland conveyance of storm water from the intersection into the Puslinch Lake basin. The storm water would be discharged into a wetland located west of the lake.

Stan Denhoed prepared a review of the report and included the following statements in an email send to Gary Macdonald on November 26, 2010.

*1) The northwest corner of Pine Bush and Townline Road may be developed as a SUNCOR truck stop. There was a pre-hearing for the development on Tuesday this week. I have not reviewed drainage details of this site but several figures for Options 1 through 4 suggest that drainage from the NW corner passes under Pine Bush into the existing storm water management system for this area. Options 5, 6 and 7 do not show this conveyance or conveyance of water under Townline Road. It should be made clear whether or not the existing culvert beneath Townline Road will remain and if so, what is the total catchment area for water to be conveyed to wetland WL-1. What are the water quality ramifications if the NW corner is developed as a truck stop?*

*2) I have attached water quality results from water ponded at the intersection taken in March. The two main parameters of concern will be chloride and phosphorous although several metals also exceed PWQOs. Puslinch Lake already qualifies as a Policy 2 water way according to Water Management Guidelines, Policies, Objectives Provincial Water Quality Objectives (MOE, 1999). The addition of storm water to this kettle lake that is essentially a closed system will not be welcome. I understand that public safety should take precedence over environmental degradation, however, if there is a possibility of diverting the storm water to an infiltration gallery (natural or manmade) this would reduce potential impact to Puslinch Lake. Even if this option is made available, it may be problematic according to Source Water Protection legislation. I have not reviewed the capture zones for Townline wells or Pine Bush wells developed for or being developed by the RMOW.*

*3) The potential mass loading of salt should also be detailed in order to gain an appreciation of the mass of salt to be introduced to the lake environment.*

*4) Any additional separation between the outfall and Puslinch Lake is beneficial. Is Option 7 not better by providing additional contact time and retention prior to discharge to WL1 and then the lake?*

On January 14, 2011 MTE prepared a response to Stan's comments and stated that the wetland into which the drainage will be discharged is not directly connected to Puslinch Lake and therefore contaminants (other than chloride) will likely be attenuated in the wetland. MTE also states that shallow groundwater flow is towards Puslinch Lake and

whether the chloride enters the groundwater system beneath the intersection or at the wetland, it will ultimately end up in Puslinch Lake. Option 6 remained the preferred solution.

On February 23, 2011 there was a meeting with the RMOW, the Township of Puslinch and the County of Wellington. The Township expressed continued concern with Option 6 and requested that the RMOW consider developing an infiltration basin at the intersection.

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On April 20, 2011 the RMOW's consultants presented Option 8 that did not include an outlet to Puslinch Lake as requested by the Township. Option 8 was constructing a large infiltration gallery in the land between County Road 32 and Townline Road. MTE did not recommend this option as it did not provide a permanent drainage route away from the intersection.

Harden Environmental provided the following comments regarding Option 8.

*Thank you for the addendum. I have had a chance now to review Option 8 and am surprised at how large the undertaking is. When I observe the flooded condition at the intersection, the total volume of water appears to be significantly smaller than the total volume capable of being detained in the proposed infiltration pond. Is Option 8 designed to accommodate water from the west side of Townline Road also?*

*As we discussed in the meeting, we are trying to avoid the transfer of stormwater from the intersection directly into the Puslinch Lake basin. The kettle lake basin is essentially a closed system and any chemical additions to the basin remain in the basin. The Puslinch Lake Conservation Association is working diligently to improve lake water quality and the addition of storm water from the intersection is not beneficial. To this end, Option 8 is the favoured option. Chloride is not the only contaminant of concern. Nutrients such as nitrogen, phosphorous and sulphur can also impact on the lake quality. The discharge of the water into a wetland adjacent to the lake does not mean that nutrients will not be remobilized during the spring freshet and carried into the lake. The MOE and GRCA have given the Township considerable resistance to discharging water near the PSW at the south end of Puslinch Lake. Any option but 5,6 or 7 may be required in order to eliminate impacts to wetlands in this same complex.*

*Options 5,6,7 and 8 allow for the transfer of stormwater from the west side of Townline Road into the Puslinch Lake basin. With the water drawn down to 312.3 m amsl in Option 6, how much water from DP-1, WL-5 and Stormwater Pond #2 will be diverted into the Puslinch Lake basin? Can this be avoided?*



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*Thank you again for considering this alternative. I will discuss with Wayne Stokley and other members of council. Council will be looking for assurances that storm water from other basins is not allowed to discharge into the Lake basin.*

On May 1, 2012, MTE Consultants provided a response to our comments and on May 17<sup>th</sup>, 2012 a meeting was held in the Township of Puslinch lunchroom. Option 8 was presented as not being favourable leading to discussions of how to minimize flow getting into the Puslinch Lake basin. A storm water management area developed in the southwest corner of the intersection was discussed as an area to accommodate the first flush of water for the majority of storms and only the larger storms would then contribute water to the lake basin.

In July of 2012 Harden Environmental established the elevation of the water table in the southwest corner of the intersection to verify that a pond could be excavated. Subsequently we expressed satisfaction to the RMOW that the addition of the storm water pond improved Option 6.

That was the last of the Township's involvement until October 2013 where the RMOW presented this amended Option 6 as the final solution to the Puslinch Lake Conservation Association. We understand that the RMOW presented this solution to the Grand River Conservation Authority for their approval and it was granted.

We will be pleased to address questions from council on this matter.

Sincerely,

Harden Environmental Services Ltd.

A handwritten signature in black ink, appearing to read 'S. Denhoed', followed by a horizontal line extending to the right.

Stan Denhoed, M.Sc., P.Eng.  
President