Golder Associates

TECHNICAL MEMORANDUM

DATE October 31, 2011 **PROJECT No.** 08-1122-0078

TO Frank Cairo

FROM Stephen Wilson, P.Geo. **EMAIL** srwilson@golder.com

GROUNDWATER IMPACT ASSESSMENT AND WELLHEAD PROTECTION PLAN APPLICATIONS D07-16-11-0014 AND D02-11-0066 VILLAGE OF RICHMOND, ONTARIO

Golder Associates Ltd. (Golder) was asked to address the requirements of the City of Ottawa (City) for two reports relating to the above captioned application. The two reporting requirements are a Wellhead Protection Study and a Groundwater Impact Study. Terms of Reference for these studies were not available from the City.

Section 4.7.5 of Official Plan Amendment 76 includes the following policies:

4.7.5 – Protection of Groundwater Resources

Policies

1. When reviewing development applications, the City will consider the potential for impact on groundwater resources.

    a. A groundwater impact assessment may be required where the City has identified that the lands play a role in the management of the groundwater resource or the need is indicated in other available information such as subwatershed plans or local knowledge, and

    b. A groundwater impact assessment may be required where the proposed use has the potential to negatively impact the groundwater resource. [Amendment #76, August 04, 2010

4. Where wellhead protection areas have been identified, the policies in Section 4.8.2 will apply.

4.8.2 – Wellhead Protection

Policies

1. Planning applications for uses within wellhead protection areas will be reviewed to assess the level of risk to a municipal water supply. [Amendment #76, August 04, 2010]

2. The zoning by-law will restrict land uses that have the potential to cause contamination of the groundwater resource in areas identified on Schedule K as Wellhead Protection Areas. [Amendment #76, August 04, 2010]

Golder Associates Ltd.
32 Steacie Drive, Kanata, Ontario, Canada K2K 2A9
Tel: +1 (613) 592 9600 Fax: +1 (613) 592 9601 www.golder.com
Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Based on this information, the following two assessments are presented.

Groundwater Impact Assessment

The recently completed Master Servicing Study, which was prepared in compliance with the requirements of the Environmental Assessment Act, included a technical memorandum prepared by Golder summarizing the results of an aquifer assessment study. The memorandum was updated in March 2011 to include additional data collected during the on-going aquifer testing program. The results of the studies indicated that the two production wells constructed on the development property could together provide over 7 megalitres per day (ML/day) without causing unacceptable impacts. The development under consideration will contain approximately 1,000 units. Using a conservative assumption of a maximum day water demand of 2,320 L/day/unit (single family homes), a maximum day requirement of about 2.3 ML/day is calculated.

Golder is in the process of updating the memorandum to include the results of a 72-hour pumping test conducted on one of the two wells. The data collected during the test have confirmed the yield of the aquifer.

Water quality was also addressed in the March 2011 technical memo. Results of testing on samples collected from the pumping test show that water quality is excellent, meeting all health and aesthetic related criteria. Additional sampling has been undertaken on the recent 72-hour test, and the results are consistent with previous samples.

Wellhead Protection Study

The proposed development is located in a Wellhead Protection Area as per Schedule K of the official Plan. Golder completed the Wellhead Protection Studies for a number of City wells, including the two King's Park wells whose capture zones extend underneath the development lands. The report determined that the deep bedrock aquifer has a low aquifer vulnerability throughout the capture zone (The King's Park shallow bedrock aquifer capture zones do not intersect the development lands). The lands are located within Zone B (two-year time of travel) from the King's Park Wells, and based on the accepted Ministry of the Environment (MOE) methodology, the vulnerability score for the area is 6. This vulnerability score is combined with a score for potential chemical and biological threats to determine if a threat is significant. No land uses are considered significant threats in an area with a vulnerability score of 6, with the exception of dense non-aqueous phase liquids (DNAPL's) which pose a significant threat in all capture zones.

The only land uses proposed for the development is residential/parkland, which do not constitute a significant threat to the aquifer. Capture zone delineation and aquifer vulnerability studies will be undertaken for the development lands as required under the Clean Water Act. Based on the data acquired from the aquifer testing program, it is anticipated that the capture zones and vulnerability scoring for existing and proposed deep bedrock wells in the area will be similar to the King's Park results, and no specific land use restrictions are anticipated.

Closure

Based on our understanding of the requirements of the Official Plan, it is Golder's opinion that the Groundwater Impact Assessment and Wellhead Protection Study have been addressed through this memorandum.

We note that Groundwater Vulnerability and Threats Assessment studies in compliance with the Clean Water Act will be required for the wells constructed to supply the development of these lands. These studies are comprehensive and the studies for existing water systems have taken a year or more to complete. There is

currently no guidance established from the MOE regarding including a new water system in a Source Protection Plan. For a new system, a resolution from Council to request an amendment of the Terms of Reference for the Mississippi-Rideau Source Protection Area to include the water system will be required. Once the Terms of Reference our modified, the studies are completed and then must be included in the Source Protection Plan, which must be approved by the Province.

The Groundwater Vulnerability Studies are used to develop planning policies and measures to ensure that significant threats to municipal groundwater systems are prevented or mitigated. The results of the studies will not affect the viability of a development, particularly one that is exclusively residential. Considering the length of time required to complete these studies and the current lack of guidance from the Province on how to implement the Source Protection Planning process with new water systems, it is suggested that this process would best be conducted concurrently with the draft approval process.

Yours truly,

GOLDER ASSOCIATES LTD.

PROFESSIONAL GEOSCIENTISTS ONTARIO
Oct 31, 2011
STEPHEN R. WILSON
PRACTISING MEMBER
0122

Stephen Wilson, P.Geo.
Senior Hydrogeologist/Associate

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