AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Assessments & Approvals

December 22, 2010 AEC 09-289

J.H. Cohoon Engineering Limited
440 Hardy Road, Unit #1,
Brantford, ON

Attention: Mr. J. Cohoon, P.Eng.

Re: Response to Review Comments Provided by Genivar on "Hydrogeological Review of Sustainability of the Paris Water Supply" (Azimuth, March 2010)

Dear Sir:

This letter is provided in response to the review completed by Genivar of our March 2010 report on availability of alternate water supplies for Paris. The review provides sixteen comments and each of the comments are addressed below. I have maintained the same numbering so that the responses can be matched directly to the comments provided.

In preparing this response, I communicated with Gary Stevenson at Genivar. The author of the review, Stan Holden, was not available during this period. Mr. Stevenson indicated that the objective of the peer review focused primarily on the technical evaluation and methodology, and does not specifically consider the interpretation or conclusions of the report, but that the absence of criticism of the main findings can be taken to indicate general agreement with the results. Thus, we find it encouraging that the County's peer reviewers do not disagree with the general conclusions.

Comment 1) As Genivar notes, the estimated population of the proposed development is shown as 1,400 in Section 1 and as 1,300 in Section 5. The proposed development will have 406 to 461 residential units, which corresponds to a population of 1,218 to 1,383 people. The water use values shown in Section 5 are derived from the average number of units, a density of 3 people per unit and 386 Lpcd (433 * 3* 386 * 365 days = 183,157m^3/year)

Comment 2) Genivar notes that the new County design criteria is 400 L/day/person. In preparing our report, we considered a range of values from 270 to 450 L/d/person based on the MOE province-wide ranges. Most of the values in our report were determined

using the value of 386 L/d/person (from the "Water Servicing Review for Paris (KMK, 2005).

Revision to the water demand of 400 L/d/person is an increase of 4% from the WSRP value of 386 L/d/person. This is considered to be well within the precision of the estimates used in our assessment. We stated that the "water demand of approximately 540 to 630m^3/day" reflects the proposed development. Using 400L/d/person, this range would change to 611 to 653m^3/day.

Genivar also requested that the maximum day demand be provided. Based on the number of new units, a peaking factor of approximately 4 is reasonable. Because the new development will be serviced by the municipal system, the peaking factor should reflect peaking within the overall system such that a factor of approximately 3 is more appropriate. Thus, the maximum day demand is 1,959 m^3/day.

Comment 3) Genivar indicates that the Gilbert well field includes eight production wells whereas our report made mention of only four. Noted. This information does not change the assessment regarding supply and demand.

Comment 4) Genivar indicates that, in 2008, Paris was supplied by two well fields as opposed to three as noted in our report. Our information was based on the Part III Form 2 (O.Reg. 170/03) information provided by the County to the MOE, which indicates that Gilbert, Telfer and Scott well fields were in use, and that Telfer was used as a backup for periods of high demand and maintenance. This information does not change the assessment regarding supply and demand.

Comment 5) Genivar notes that the Airport well and water system serves the airport and the community to the south. The Airport well and its capacity are included within Section 4 as it represents an additional proven supply available to the community. During teleconferences and meetings with County staff, the opportunity to connect the Airport system to the larger overall system was one of the alternatives that was discussed. The aquifer serving the Airport system is one alternative that is currently underutilized and could be expanded to satisfy future demand.

Comment 6) Genivar provided additional information regarding values from Table 1 of our report. The main difference relates to the approved and potential use of the Gilbert Upper Aquifer, which Genivar indicates should reflect 35 L/s and our report shows 50 L/s. The permitted amount should indicate 35 L/s, however, the Lotowater reference document indicates that the supply has the potential to be increased to 50 L/s.

Comment 7) Genivar has indicated that the demand calculations should be based on the new County criteria of 400 L/d/person. We considered a range of values from 386 L/d/person to 450 L/d/person, so the revised values are within the ranges presented.

We agree with Genivar's approach that the water infrastructure be designed for maximum day demand and maximum hour demand be met from storage.

Using 400 L/d/person, the existing average day demand is 5,610m^3/day.

Maximum day demand is 16,830m^3/day, based on a 3x peaking factor.

Maximum hour demand is a function of infrastructure design and capability, and we are not privy to this information. For example, this demand will also include allowance for fire protection and ancillary uses such as lawn watering. However, it is expected to be approximately 520L/s, based on a peak factor of 8.

Comment 8) The calculations of infiltration from the proposed development property were included as a general indication of the surplus or deficit of ground water that is provided on-site. This concept was discussed in meetings / teleconferences with County staff. The values are not intended to quantify ground water on-site specifically as a source, but are only intended to provide a ballpark comparison.

Comment 9) The water budget approach is also intended to provide a general comparison and follows the approach described in Lotowater (2004 and 2005) to allow comparison to the earlier reference. As Genivar notes, a more detailed water budget could reflect differences in soil type, and this was not incorporated here. A more detailed budget would also have regard for detailed geological mapping and the vertical extent of units, areas of recharge and discharge, change in vegetation, land use, lateral inflow from adjacent hydrostratigraphic units, recharge / discharge from area streams and the Grand River and possibly transient climate conditions. However, it is felt that the current level of assessment provides a reasonable indication that the demand reflects about 10% of the annual infiltration, and that this reasonably indicates that the scale of use is unlikely to represent a significant consumption of ground water.

We do note in Section 6 that the more permeable deposits should be the primary target for well development, as is fully described in Lotowater (2004).

Comment 10) Noted.

Comment 11) As described under Comment 7 above, the maximum day demand is approximately 16,830m^3/day.

Comment 12) Using 400 L/d/person, the existing average day demand is 5,610m^3/day.

Maximum day demand is 16,830m^3/day, based on a 3x peaking factor.

Maximum hour demand is a function of infrastructure design and capability, and we are not privy to this information. For example, this demand will also include allowance for fire protection and ancillary uses such as lawn watering. However, it is expected to be approximately 520L/s, based on a peak factor of 8.

Comment 13) The potential for connecting the Airport system to the municipal system was included in our report as it was an option that was discussed with County staff. We recognize that this connection provides logistics issues due to the distances involved, but also note that the aquifer system in the vicinity of the airport is highly underutilized and is not subject to the agricultural quality impacts that are observed elsewhere. We also recognize that this option is unlikely to be utilized except in the longer planning timeframe, but feel that it is a viable solution.

Genivar does note that connection to the Bethel Road supply is underway, which can add up to 50 L/s to the system capacity (Aecom, 2009).

Comment 14) We agree with Genivar that water quality issues do have the ability to impact well yield as well as well viability. The use of the Fairview Heights well reflects a potential supply of approximately 250,000m^3/year which may not be realized without significant treatment capacity. For this reason, we have included Fairview Heights within the overall capacity reserve but have not included it within the Potential New Supplies shown in Table 2. The sources shown in Table 2 reflect the better solutions in the shorter timeframe to supplement the available supply. This information was primarily drawn from Lotowater (2004).

Comments 15 and 16) The ability to supplement the existing supply without major upgrades is intended to reflect changes to the system that can be incorporated relatively easily. We note that this is a continuum to changes that do require significant upgrades. Specific recommendations have not been made as a detailed evaluation of water supply infrastructure is beyond the scope of work that was requested by the County, which is to focus on the overall availability of supply to meet demand.

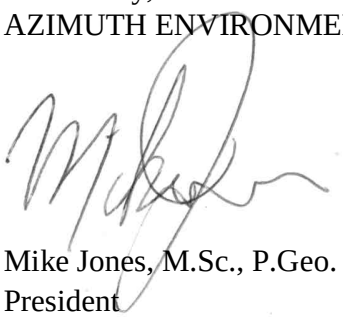
However, the reader is referred to Lotowater (2004) who identified the relative scope of work that would be required. Table 2 in our report summarizes the less intensive expansion, identifying 80 to 180 L/s of supply that could be realized. Of this volume, Lotowater (2004) identified capacity of 30-40 L/s that could be utilized mainly by increasing the size of pumps in existing wells.

Medium intensity upgrades would include tasks such as increased storage capacity or new wells constructed within the existing systems.

Capacity increases that require significant upgrades are those such as the incorporation of the Airport system that would require the construction of distribution mains, new pump stations, reservoirs and wells.

We appreciate the opportunity to respond to Genivar's comments and believe that the original conclusions of our report are valid – that the conclusion is reached that the existing supplies can readily accommodate future demand with modest upgrades to the infrastructure.

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING, INC.



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