Ministry of the Environment
West Central Region

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Ontario

May 21, 2009

Ms D. Schwier
Ministry of Natural Resources
Guelph District
1 Stone Road
Guelph, ON N1G 4Y2

Dear Ms Schwier:

RE: Application for a Category 2 (Quarry Below Water), Class "A" Quarry License
St. Marys Cement Inc. (Canada)
Part of Lots 1, 2 and 3, Concession 11, City of Hamilton

Please be advised that staff of the ministry's West Central Region have reviewed the hydrogeological information circulated by St. Marys Cement Inc. in support of the above-noted license application, and offer the following comments for your consideration.

Surface Water Impacts

With respect to the potential for surface water impacts as a result of the proposed extraction, the following is based on a review of the documents submitted by St. Marys in support of the application and in accordance with the requirements of the Aggregate Resources Act (ARA):

- St Marys Flamborough Quarry Hydrogeological Level 2 Report, AECOM Canada Ltd., February 26, 2009.
- Hydrological Level 2 Technical Report St. Marys Flamborough Quarry, Stantec Consulting Ltd., January, 2009.
- Natural Environment Level 2 Technical Report: St. Marys Flamborough Quarry, Stantec Consulting Ltd. and Savanta Inc., February, 2009.

Anticipated impacts have been predicted using theoretical modeling. Although mathematical models are useful tools for simulating future conditions, they should be calibrated and verified using actual data. In this case, some impact studies have been conducted but on a relatively small test basis, using one centrally located well. AECOM suggests the model is also able to predict surface water impacts; however, surface water impact predictions using a groundwater model (in this case MODFLOW) are rarely done because of the differences in water characteristics, in terms of both quality and quantity. This approach does not provide enough evidence to conclude that there will not be unacceptable impacts and therefore we cannot support a quarry license.

AECOM has stated testing done to date was not for the purpose of collecting surface water data, but designed specifically to monitor the groundwater regime. AECOM's response to previously raised comments was that surface water impact testing would be done at a future date. Accordingly, surface water impacts can only be inferred based on the model's predicted groundwater impacts. Thus we cannot support a quarry license in the absence of field surface water impact test results.

Stantec and Savanta's studies have identified three types of surface water features in the vicinity of St. Marys property:

1. Creeks and tributaries of Bronte Creek;

   Stantec's report suggests that, unmitigated, the quarry would have an impact on all surrounding creeks to some degree by decreasing the drainage area which contributes to their streamflows. For those that are intermittent (B, C and D) it is likely that the dry period would start earlier and last longer. For Mountsberg Creek, tributary A and Flamboro Creek, the flows would likely be reduced and Stantec has estimated this using the normal area pro-rating.

   St. Marys' plan for some type of Groundwater Recirculation System (GRS) may counter the reduction in flow in these tributaries to some degree. In addition, the planned discharge of excess water to tributaries C and D may result in parts of these systems getting more water than they do at present; however, the predictions are just theoretical at this time. This theoretical approach, particularly for an undefined GRS, does not provide adequate evidence to conclude that there will not be unacceptable impacts and thus we cannot support a quarry license.

2. On-site ponds; and

   Impacts that may occur to on-site have little or no impact on the surface water regime.

3. Provincially significant wetlands.

   Provincially significant wetlands are managed specifically by the Ministry of Natural Resources (MNR), in conjunction with local conservation authorities. In light of MNR having jurisdiction over this feature, we have not commented on potential impact to these features.

<u>Groundwater Impacts</u>

Several potential receptors have been identified within the quarry study area including private and communal water wells for domestic water supply, the Mountsberg Creek Wetland Complex (a provincially significant wetland), and several cold water streams that are part of the Upper Bronte Creek watershed. The consultant has determined that if quarry dewatering is left unmitigated, impacts to these receptors would be unacceptable. As well, the City of Hamilton has identified that based on its modeling, the site is within the two year capture zone of a municipal drinking water supply.

Accordingly, to support the ARA application the consultant updated the numerical model for the study area including the quarry site. Through modeled simulations of the Groundwater Recirculating System (GRS), the consultant concluded that the GRS is a feasible mitigation measure for maintaining groundwater levels around the perimeter of the proposed quarry and for protecting surface water features.

The numerical model used is based on the assumption that the aquifer in the study area responds hydraulically as an equivalent porous media. This approach makes it difficult to predict impacts or the mitigation capability of a GRS without field verification particularly in a fractured rock setting. As well, the report contains no details on the design of the GRS. No field testing of the GRS has been completed to demonstrate conceptual feasibility. Given the absence of field

testing of the proposed GRS, and without even a conceptual design of a GRS (with respect to number of wells, location, spacing, depths, etc.) we cannot support the issuance of the license at this time. If a conceptual design had been provided, with no field testing, we could not support the issuance of a license.

In addition, since the GRS has not been field tested, the impact of the proposed recirculation on groundwater quality is not well understood, and cannot be accounted for in the current preliminary Adaptive Management Plan.

Concluding Comments

The proponent's response to predicted impacts as a result of the proposed extraction has been to suggest the use of a Groundwater Recirculating System (GRS) to return extracted water (from dewatering) back into the aquifer. The feasibility of this mitigation measure has only been modeled to date. The proponent also has proposed to implement monitoring, a trigger and contingency plan and an Adaptive Management Plan (AMP) to address surface water impacts. It would be premature to agree to a yet-to-be designed AMP or trigger and contingency plan where the basic viability of the only proposed mitigation measure (the GRS) has not been demonstrated. Accordingly, we object to the issuance of the license at this time.

By way of information, ministry staff are aware of community concerns related to noise and air quality (dust/PM2.5). Noise studies have been carried out for on-site activities (processing/ blasting) but to our knowledge there have not been any specific noise studies for increased truck traffic. We are also not aware of any specific studies to assess the potential quarry impacts of dust/PM2.5 on area residents. As you know, this ministry does not get involved in noise and air quality issues for quarries in either the land use planning or the ARA application review process. We understand that MNR is the lead ministry to respond to potential issues raised with respect to noise and air quality during the MNR permitting process.

Should you have any questions or wish to discuss these comments, please do not hesitate to contact Belinda Koblik, Water Resources Supervisor at (905) 521-7615 or at Belinda.Koblik@ontario.ca.

Yours truly,

B. Koblik

Carl Slater
Technical Support Manager
West Central Region

c: Melanie Horton, St. Marys Cement