November 30, 2006

F O R C E
Friends of Rural Communities and the Environment

Permit to Take Water Coordinator
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Sent by Fax and Email on November 30, 2006

Re: EBR # IA06E1293 – Permit to Take Water Application by Gartner Lee Limited on behalf of St Marys Cement Group (CBM)

Dear Ms. Sheppard, MOE Permit to Take Water Coordinator

Thank you for the opportunity for FORCE, on behalf of our communities, hereafter referred to as the community, to input to the public record and to contribute constructive input as your Ministry and Regional Office evaluate a Permit to Take Water application (PTTW) by Gartner Lee Limited (GLL) on behalf of St. Marys Cement Group (CBM). As you are aware, St Marys are requesting permission to do some further information gathering and to test the theoretical Groundwater Recirculation System (GRS) planned to try to reduce the unacceptable negative impacts of their proposed quarry development on our communities.

This letter forms the basis of our submission and provides a framework presentation to the two enclosed reports from the community's technical experts which are integral to and detail our position:

1. INTERA Engineering Hydrogeologic Review of GRS Workplan (26/11/2006), as completed by Kenneth G. Raven P.Eng, P.Geo, Principal and Senior Hydrogeologist and
2. North-South Environmental Comments on St Marys PTTW (21/11/2006), as completed by Brent Tegler, PhD, Applied Ecologist.

FORCE

Friends of Rural Communities and the Environment (FORCE) is a federally registered not for profit corporation. It is a citizen-based advocacy group with hundreds of supporters in

Campbellville (rural Milton), Kilbride (rural Burlington), Mountsberg, Freelton, and Carlisle (parts of rural Flamborough).
FORCE was formed in June 2004 to protect our natural and built environments in the face of a proposed large-scale, below the established groundwater table, aggregate development in the Northeast Flamborough portion of the amalgamated City of Hamilton.

We note upfront that our organization is neither anti-aggregate nor anti-road. Indeed, our area is home to some of Ontario and Canada's largest aggregate operations. We do, however, have significant issues with the pending application in its proposed location for substantive reasons; reasons that relate to active and productive agricultural operations, acknowledged fragile natural systems within the Natural Heritage System of the Greenbelt, and existing rural communities. One of the most significant areas of concern we have in regards to the proposed aggregate development is its impact on groundwater. For over two years now, we have worked to substantively and professionally prepare and document the community case, including the use of expert technical reports.

We also believe that our organization has a responsibility to promote good government in the municipal and provincial arenas and therefore, we have a responsibility to input into the broader planning reform processes which bear upon the application processes for development proposals such as the one before our communities. As such, we have been active contributors to consultations on initiatives such as planning reform, the Greenbelt Plan, Places to Grow, and source water protection planning.

Community Case Summary regarding the Protection of Groundwater and the St Marys PTTW Application

In our area, groundwater is the only source of potable water. The Carlisle municipal system and private wells for homes, schools, farms and businesses all use groundwater as the source for drinking water and other uses. Adequate and quality supplies of groundwater are essential. We have experienced quantity and quality challenges for many years. The test that is planned would use significant volumes of water and would intrude into our groundwater aquifer. As such, we believe it is critical that the Ministry of the Environment (MOE) afford our groundwater the highest level of protection possible.

While we are opposed to the proposed quarry development in this location and its OPA and zoning by-law application, we recognize that as part of the current land use planning and future *Aggregate Resource Act* (ARA) decision making processes, further hydrogeologic and related information gathering, including testing of the proposed mitigation system(s) would be required. In fact, appropriately designed pilot test(s) and proven successful representative results would be expected by the community in order to contemplate the application's next steps.

As a community, we believe, however, that permission for this PTTW should be deferred - not denied outright for opposition's sake - and that the pilot test(s) and companion PTTW should be refined before a PTTW application is further considered. We advance this position on the basis of:

1. Giving permission to a pilot test of this scale now is premature. There is substantial outstanding work required to understand this watershed, its vulnerabilities and risks, and implications for source water protection. Equally, there is work required on the overall proposed quarry application. This body of work should be substantially advanced, if not completed, before a test evaluating a proposed mitigation system for the proposed development in the watershed should be considered.
2. Permitting the PTTW as it stands and in light of outstanding work in this watershed would not respect the duty to protect groundwater and evaluate risks first – duties spelled out as Director's considerations in O. Reg. 387/04 pertaining to permits to take water and in the new *Ontario Clean Water Act.*
3. The GRS being proposed for the Flamborough Quarry is still unproven technology without any precedent in the world. Permitting a pilot test of this scale under these circumstances, and in the absence of more complete understanding of the watershed, would be using our community as a laboratory experiment.
4. There are a range of technical content and process issues which are not addressed in the PTTW application and the companion pilot test material. They require consideration for improvement of the proposed testing framework and may result in terms and conditions that may be attached to the approval of a PTTW permit.

The body of this letter/submission develops the rational for the argument advanced. We will specifically outline:

- grounds for the MOE and companion agency duty to protect groundwater,
- representative examples of the outstanding work required to be done with respect to this watershed and with respect to the proposed quarry's land use planning application,
- concerns about the lack of proven long term precedent and use of our community for a laboratory experiment, as well as
- issues and considerations for evaluation of the PTTW application and the establishment of terms and conditions.

MOE and Companion Agency Duty to Protect Source Water

The paragraphs following outline the clear duties and obligations of the Ministry of the Environment and its municipal government and conservation authority partners to protect source water.

Permit to Take Water (PTTW) under the *Ontario Water Resources Act (OWRA)*

In 2004, the Provincial Cabinet approved regulation O. Reg. 387/04 to explicitly expand the considerations relevant to a PTTW application to include the following mandatory considerations, where relevant, when a Director is considering an application to cancel, amend or issue a permit to take water. Given the groundwater challenges in this area and the extent of work still required to complete watershed characterization, water budgets, surface and groundwater vulnerability assessments, and define long term municipal water

supply, among other analyses, we believe that these enumerated considerations have direct bearing on this PTTW application and companion test work plan.

From the regulations:

"(2) The Director shall consider the following matters, to the extent that information is available to the Director, and to the extent that the matters are relevant to the water taking or the proposed taking in the particular case:

1. Issues relating to the need to protect the natural functions of the ecosystem, including:

    i. the impact or potential impact of the water taking on:
        a. the natural variability of water flow or water levels,
        b. minimum stream flow, and
        c. habitat that depends on water flow or water levels, and

    ii. groundwater and surface water and their interrelationships that affect or are affected by, the water taking or proposed water taking, including its impact or potential impact on water quantity and quality.

2. Issues relating to water availability, including:

    i the impact or potential impact of the water taking or proposed water taking on:
        a. water balance and sustainable aquifer yield and
        b. existing uses of water for large municipal residential systems and small municipal residential systems, both as defined in subsection 1(1) of Drinking Water Systems, for sewage disposal, livestock and other agricultural purposes, for private domestic purposes, and for other purposes,

    ii low water conditions, if any

    iii whether the water taking or proposed water taking is in a high use watershed or a medium use watershed,
        a. as shown on the Average Annual Flow Map or
        b. as shown on the Summer Low Flow Map

    iv any planned municipal use of water that has been approved,
        a. under a municipal official plan in accordance with Part III of the *Planning Act* or
        b. under the *Environmental Assessment Act*

3. Issues relating to the use of water, including:

    i whether water conservation is being implemented or is proposed to be implemented in the use of the water, in accordance with best water

management standards and practices for the relevant sector if these are available,

ii the purpose for which the water is being used or is proposed to be used and

iii if the water is not currently being used, whether there is a reasonable prospect that the person will actually use the water in the near future.

4. Other issues, including:

i the interests of other persons who have an interest in the water taking or proposed water taking to the extent that the Director is made aware of those interests and

ii any other matters that the Director considers relevant.

The regulation also makes provision to distinguish between high-use and other watersheds.

Source Water Protection Planning under the *Ontario Clean Water Act*

The *Ontario Clean Water Act* was recently passed by the Ontario Legislature and received Royal Assent on October 19, 2006. MOE presentation materials being actively used in the *Clean Water Act, 2006 – The Road Map for Implementation* presentations throughout the province and in our area on November 27, 2006 clearly state that "its purpose is to protect existing and future sources of drinking water" and that it "*sets above all else, the concept of prevention as the first principle "*– the pre-cautionary principle – "*in the safeguarding of our drinking water for our communities and for our health".*

Implementation of the legislation requires municipalities and conservation authorities to map the sources of drinking water supply, and especially the vulnerable areas that need protection, such as the *areas around wellheads*, water intakes, *recharge areas*, and sensitive aquifers in order to *prevent the supply from being depleted or contaminated*. They are directed to *identify and monitor any existing or future activity* that could potentially threaten water quality or quantity and take action to reduce or remove that threat. They are empowered to *take preventative measures* before a threat to water can cause harm. Communities are directed to work together across watersheds in full and public consultation to develop and execute plans to protect their drinking water sources. This new approach is based on local development and implementation, collaboration, good science, increased vigilance and the necessary foresight to avoid potential problems, not just deal with immediate ones or problems from the past.

What we do know is that the proposed quarry development, its stated expansion lands, and the site of the pilot GRS test fall within and beside the Carlisle Wellhead Protection Areas and the local recharge area (see Appendix A – Figure 5.6 Carlisle Wellhead Protection Zones from the City of Hamilton Groundwater Resources Characterization and Wellhead Protection Study) – two defined areas that are supposed to be protected by this

new law. As the proposed quarry's rehabilitation plan includes allowing it to flood following aggregate extraction, the resulting surface water potentially poses a bacteriological threat to the Carlisle wells since it would be in the 2 year TOT. A quarry development in these vulnerable areas could very well be identified as a *significant threat* to our drinking water.

We note that the Minister's Source Water Technical Experts' Committee report – *Watershed-based Source Protection Planning, Science-based Decision-making for Protecting Ontario's Drinking Water Resources: A Threats Assessment Framework* (November 2004) provides contextual guidance specific to aggregate development:

- Quarries are identified as a land use activity which threatens drinking water sources and are sufficiently serious to be of provincial concern (Table 3.1).
- The primary issue with quarries is one of aquifer vulnerability in that they provide a direct pathway to drinking water supplies. Any quarry found within a 25 year TOT WHPA must be assessed for risk of contamination of the drinking water supply (Table 5.1).
- The risk of new quarries and final quarry land use should be assessed according to new standards of municipal wells and/or quarries should be restricted within the 5 year TOT capture zone (Table 6.2).
- The 2 year TOT is defined as the Pathogen Concern Zone where pathogens should be minimized to protect the drinking water supply (Table 6.3).

<u>Greenbelt Plan Considerations</u>

The duty to protect groundwater carries a greater burden here in the Greenbelt. We note the Greenbelt Plan limitations on lake based water extensions and expansions. The Greenbelt Plan states clearly in section 4.2.2.2 that where settlements do not currently have Great Lake or Lake Simcoe based water and sewage services, *extensions to, or expansions of existing Great Lake or Lake Simcoe based services to such settlements are not permitted*. There is a public health caveat provided – unless such servicing is required to address failed individual on-site sewage or water services, or to ensure the protection of public health where it has been determined by a medical officer of health (or health authority) that there is a public health concern associated with existing services within the settlement.

This suggests that local water supplies must have "failed" or become a "public health risk" - and have been "determined" to have become so by an authority - before a decision to extend the lake based system from Waterdown could even be made. Given the time required for the municipality to undertake a Class EA for the water/sewer project and to conform to the Greenbelt Plan Infrastructure Policies, it would be years before service could be restored in a meaningful way. Witness the recent challenges in securing a Certificate of Approval for the new Carlisle wellhead during a period of regulatory evolution. In the interim, residents might face the prospect of even more truck traffic volume to fill the Carlisle water tower and/or to fill individual cisterns. Needless to say, the cost of the infrastructure replacement would also be significant and likely born by the municipal taxpayer.

Outstanding Requirements and Issues for Understanding this Watershed and for the Overall Proposed Quarry Application

Given the clearly established duty to protect groundwater and to do so with as fulsome a knowledge base as possible, we table the following representative examples of work required to understand this watershed, to lay an appropriate framework for source water protection and for evaluation of the risk profile associated with the proposed test and overall development:

- The City of Hamilton and its consultants (SNC Lavalin along with Charlesworth & Associates) completed the draft City of Hamilton Groundwater Resources Characterization and Wellhead Protection Study (Carlisle Wellhead Protection Study) in 2004. It still needs to be approved by the Ministry of the Environment and companion action plans to protect our groundwater need to be put in place.

- Conservation Halton (CH) and the Hamilton Conservation Authority are the designated Source Protection Authority for our area. They have established an internal Source Protection Team and have been the recipients of MOE funding to begin pre-Assessment Report and Source Protection Plan work. They are fine organizations and we appreciate the working relationship and open dialogue we have been able to establish on this file, especially with Conservation Halton. The work in this watershed is, however, not as advanced as some within the City of Hamilton, such as that done by the Grand River Conservation Authority.

  In October 2006, CH officials indicated that the agencies were still in the early stages of work on mapping and GIS work to characterize the watershed and a water budget. An independent study, involving Waterloo Hydrogeologic, had been commissioned to begin preliminary work on threats identification and subsequent assessment. Completion of this work, assessments related to surface and groundwater vulnerability, quality and quantity risk assessments, municipal long term water supply, and issues and threats identification are required to complete the Assessment Report as per the October 2006 draft guidance modules for same. No formal steps have been taken yet with respect to establishment of the local Source Protection Committee and its involvement in the Terms of Reference, Assessment Report, and subsequent Source Protection Plan.

  The early stage of work is re-enforced by the fact that the City of Hamilton chose to hold back detailed inclusion of source water protection planning in its most recent Rural Official Plan revisions (approved by the City in September 2006 and now before the Province for consideration) until the detailed background data to support the policy and performance measures were more defined.

- The substantive content and process issues identified in the INTERA Engineering November 11, 2005 analysis of the Draft Level 2 Hydrogeology Report by GLL still stand (see www.StopTheQuarry.ca under Community Case – Hydrogeology menu selection, scroll through the text towards the bottom of the page to FORCE Review of Draft Level 2 Hydrogeology Report). These include the adequacy of the hydrogeologic characterization of the site, forecast water table drawdown, methodologies, and the extent of adverse impacts on the existing groundwater

users and adverse ecological impacts on the Provincially Significant Wetlands, Environmentally Sensitive Areas, and local streams.

- Reviews of the hydrogeology reports for the proposed quarry by the Combined Aggregate Review Team (CART), provincial ministries (including MOE and Natural Resources (MNR)) and Peer Review Team (Jagger Himms) similarly found serious gaps, errors and omissions (see the reports at www.StopTheQuarry.ca under the respective jurisdictions at the Government & Agencies menu selection). Some of the most critical agency comments were from your own Ministry.

- A complete Hydrogeology Terms of Reference and work plan has been requested by CART. We understand that it has still not been submitted to the City of Hamilton in complete form for review and circulation to CART nor has it been evaluated by these governments and agencies. Work that documents baseline conditions, potential impacts and their precise degree of severity should be completed first *before* any test to reduce those impacts is considered and conducted.

- An example of emerging learnings about the watershed include the July 2006 discovery of high lead levels – presence of the toxic metal at levels well above the Ontario Drinking Water Standard - in wells in Northwest Flamborough. Lead deposits can occur randomly in dolomite bedrock and there is no way to predict where nor is it possible to predict the impact, if any, on the deposits of procedures such as hydraulic fracturing and blasting. An estimated 8,000 rural Hamilton households, including those in our community, have received notices to have their private well water tested for lead as a result of the sampling results in NW Flamborough.

- There is institutional knowledge and memory regarding the way water flows and past experiences with area developments to be gleaned from residents adjacent to the proposed development and test site which can inform the PTTW application, the test design, and any terms and conditions. Examples include recent flooding in Stonebrook Estates, the impacts on water quality of blasting related to the development of Stonebrook Estates, and the historic diversion of Mountsberg Creek and the paths of spring run-off and heavy rain water flow.

It is a reality that there are many other major issues – outside of hydrogeology - still on the table that could see the proposed quarry application turned down and where the applicant's work remains very preliminary. Again, we feel this work should be more advanced before such an invasive series of tests to pilot the GRS is granted. Examples of issues include:

- IBI, authors for the transportation peer review, found that "…no definitive conclusions or recommendations are provided" regarding the proposed haul routes, impact of truck traffic, and/or if mitigation is required. (See the December 2005 Peer Review Reports under the City of Hamilton at the Government & Agencies menu selection at www.StopTheQuarry.ca.) As a result of this review, agency and community comments, the City of Hamilton has issued a Transportation Terms of reference, reviewed by CART, which requires a more fulsome transportation study by the applicant. That work has not yet entered the public domain.

- The Peer Review report done by Dougan & Associates (June 2006) of the Draft Environmental Impact Statement (EIS) and Level 2 Natural Environment Report (Stantec, February 2006) contains a clear themes that the application is preliminary and incomplete; there remain methodological issues; and attempts to refine criteria are unjustified and serve to benefit mineral aggregate extraction and maximize its size. (See www.StopTheQuarry.ca, select the City of Hamilton under the Government & Agencies menu, and select the Peer Review report.) Most importantly, we note that in their conclusion, the independent experts state "It is our opinion that it is premature and inappropriate for the EIS to discuss impacts or to make conclusions regarding the ability to mitigate impacts until the technical studies required to support the impact assessment are completed...We strongly encourage the report authors to refrain from commenting or making assertions regarding impacts and the ability to mitigate them until the required technical studies are complete."

Lack of Precedent

Of significant concern to our community is the fact that the GRS system proposed is still unproven and there is no example of a successful precedent, with long term operational experience and supporting data, anywhere in the world. Neither has the applicant tabled mitigation system alternatives with this PTTW application nor as part of the overall development application. This means that our community aquifer, and the drinking water it provides to the Carlisle municipal system, the communal well for Stonebrook Estates, and hundreds of private wells for individual residences, farms, businesses and schools, would be the laboratory setting for this test. Extending the metaphor, our families, livestock, and crops, among other things, would be the proverbial guinea pigs or lab rats.

GLL states on page 4 of the Revised Work Plan (p4) with respect to the GRS that: "*This mitigation approach employs methods that are commonly applied to induce filtration for purposes of recharge, maintenance of water levels and for establishing hydraulic barriers to alter groundwater flow patterns (Huxley et al., 2004).*"

Anyone who reads the references will find that the citation made is not supported by them.

Both Tegler and Raven in the reports submitted by FORCE find that the Huxley et al. reference concludes that these recharge methods are not commonly applied and remain unproven. We note that Huxley et al. (page 13) specifically states "*No examples of recharge wells as a mitigation measure for quarry dewatering were found within the published literature*".

This is especially true for the system's application to reducing the impacts of quarry dewatering in a deep fractured dolomite bedrock setting. The case studies that St Marys has included – evaluation of short-term hydraulic responses for shallow overburden (soil) using recharge trenches - do not relate directly to the geology found in this area and will be of little utility in ascertaining the likely success of the proposed GRS system for the site at issue.

Further, the references (Huxley et al, 2004 and Corcoran et al., 2005) clearly make a distinction between short term initial hydraulic response and longer term performance. They point to the need for more research and problems with the systems over the longer term from factors such as well/aquifer plugging and dissolution.

The unproven technology without any demonstrated successful precedent speaks directly to our earlier points about understanding this watershed and its risks and vulnerabilities before proceeding with the pilot test work. Surely, this is a case where the precautionary principle should be exercised to protect the Carlisle municipal water system as well as private wells.

We also note the opinion of Tegler in North-South Environmental Comments on St Marys PTTW (21/11/2006). The firm feels that the proponent should not be granted a PTTW to conduct hydrologic tests related to a GRS *prior to* conducting a full Environmental Cost Accounting (ECA) of the proposed GRS. An ECA would determine hidden environmental costs; a cost-benefit evaluation; and appropriate environmental metrics associated with operating a GRS for a fully operational quarry. He suggests that the ECA should also consider the need to maintain continuous operation of the GRS after aggregate extraction is completed. Worst case scenarios involving failure of the GRS and potential resulting social and ecological impacts require documentation as does the cumulative impact of recirculation on the efficacy of the GRS as well as community wells and natural features.

Evaluation of the PTTW Application and Establishment of Terms and Conditions

In order for the overall application to move through the review process, we have recognized that it will be necessary to pilot the proposed mitigation system(s) – at this point, the proposed GRS – and that the pilot should be of suitable scope, physical scale, content and duration to address the issues of providing a reliable demonstration of how the GRS may function at full scale. When you evaluate this specific PTTW application and test plan, we believe that there are a number of considerations that should be taken into account for final decision making and the establishment of appropriate terms and conditions:

1. The test plans to pump significant volumes of water. Almost four (4) times the volume permitted to be taken by the Carlisle Municipal system. There is no meaningful assessment of the impact on existing approved water users. The complaint and follow-up/replacement policy included is very basic considering that some people and businesses could lose their water supply permanently and that publicly funded facilities such as schools and child care facilities have a legal requirement for an on-site potable water supply.

2. The volume of water to be discharged into Mountsberg Creek and/or one of its tributaries is also significant. We are concerned about the potential environmental impact on the creek and its species because of changes in flow rate, chemical composition, and temperature. Raven has documented that the calculation of water quality impacts by Stantec are not realistic and underestimate the concentration impacts that are likely to occur – meaning they will exceed the Provincial Water Quality Objectives (PWQO) for selected parameters such as iron, aluminium and

zinc. We are also concerned about the potential risk to the Provincially Significant Wetlands. The test is not supposed to be testing the wetlands' ability to sustain negative impact and the test should be limited and halted if negative impact begins to occur. We note as well that flooding impacts, particularly for residential properties, from the creek overflow are not anticipated and planned for in any material way either.

3. If groundwater recirculation does occur, the test does not indicate how the quality of water in the aquifer will be protected from potential surface contaminants and/or changes in temperature which could lead to bacteriological impacts. Concerns about "thermal plumes" and how they would be addressed have been raised during review of the overall proposed quarry application by both MOE and MNR with respect to drinking water, the Provincially Significant Wetlands, and other watercourses. Raven is clear that the risk with respect to impacts from contamination and temperature change is real. It may not be as significant for the proposed tests given that groundwater is being injected and pumped around but it is a significant issue for the longer term system. He calls for the definition of water quality standards for temperature, microbiological, physical and chemical parameters in injected water for both the GRS pilot and any future full-scale GRS. Raven also notes the very real potential for escape of injected water and the need to identify, quantify and qualitatively assess this water.

4. The tests include some procedures such as aquifer fracturing that would be irreversible and could possibly impact existing groundwater flows. We do not know how existing approved water users and natural features will be protected from potential changes in water quantity and quality. Again, the complaint and follow-up procedures seem inappropriate given the possible impacts.

5. It is not clear what these short term tests will mean or what value they will provide. Raven directly questions the temporal scale of the pilot test in this regard. The tests will do nothing to generate meaningful data on the long term performance of the GRS and to help assess the known long term failure scenarios in this setting. Raven documents that based on GLL's own supporting documentation, a critical engineering feasibility and performance issue is its long term performance in deep fractured bedrock settings. Huxley et al. clearly warn against performance deterioration due to particulate plugging (even at suspended solids levels as low as 1 to 3 mg/L), chemical precipitation, bio-fouling and air bubble entrainment. The GLL work plan does not discuss these important long term performance issues. Longer term evaluation of plugging and bedrock dissolution is challenging and cannot be evaluated with pumping and re-injection of groundwater as planned in the pilot test. These conditions are not the same as collecting groundwater that infiltrates to the floor of the proposed quarry, oxidizes, picks up atmospheric gases and particulates and then is pumped into the GRS as surface water. It is not clear how the long term performance issues will be addressed and evaluated for a full scale GRS.

6. The test plan includes a series of tests. Each one becomes more invasive to the groundwater aquifer. As a community, we believe that moving to the next step should not be decided by St Marys and its consultants alone. At a minimum, the

steps should be monitored by the agencies, or independent experts on their behalf, and gated. Unless certain criteria are achieved during the early steps, or if certain negative impacts occur, the later steps which have the potential to have irreversible (negative and/or unknown) impact should be restricted. Raven too has noted that given the unproven application of the GRS at this site, there is strong potential for unforeseen and unanticipated results and for modification of the test. He calls for stakeholders, other than the proponent, to be allowed to monitor field implementation. He notes that even for assessment of initial hydraulic behaviour, implementation of the pilot may not be straightforward and should be monitored for its insights into how easily (or not) a full scale system would operate, including whether the proposed pumps are able and allowed (by PTTW restrictions) to pump at high enough rates to actually create 30 m of drawdown. He also calls for careful documentation of the methods and results of the GRS pilot test to permit independent assessment.

The INTERA report provides more detailed analysis of the above noted issues and concerns as well as others. Further, Raven comments that since the GRS pilot test remains conceptual at this time and may be revised following hydrogeologic characterization of the Amabel Formation, that it would be appropriate for GLL to refine its work and prepare a more detailed and focused field test plan prior to conducting the GRS pumping tests. This should include more specifics on exact locations for water quality and quantity monitoring. GLL has historically not created monitoring intervals in the most permeable sections of the bedrock that are expected to create the greatest drawdowns.

Tegler's material builds on Raven's report in some select areas and comments on a number of other factors. These include no assessment of the sensitivity or resilience of natural features located within close proximity of the test site in relation to the magnitude or duration of groundwater and/or surface water fluctuations or water quality changes to which they may be exposed; lack of assessment of long term impacts that may occur as a result of the GRS test; and lack of discussion with respect to decommissioning of the pilot GRS system.

Conclusion

In summary, we recognize that as part of the current land use planning and future *Aggregate Resource Act* (ARA) decision making processes, further hydrogeologic and related information gathering, including testing of the proposed mitigation system(s) would be required. In fact, the community would expect appropriately designed pilot test(s), independent monitoring and documentation for assessment, and proven successful representative results in order to contemplate the application's next steps.

FORCE requests that a full and thorough review of this PTTW application and the proposed test series be completed in light of all of the relevant factors outlined in the duties to protect source water, and specifically, groundwater. We are requesting that MOE defer the PTTW application at this time, pending completion of other work required to better understand the watershed and the overall proposed development. We believe that work

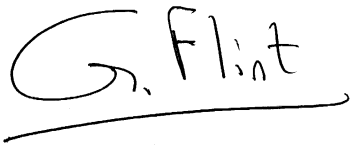
can inform the PTTW application, the test design for proposed mitigation system(s), and appropriate terms and conditions.

Adequate supplies of quality groundwater are essential to all forms of life. It is critical therefore, that groundwater is afforded the highest level of protection possible, through the most thorough evaluation of all the risks and relevant factors. It is also important that the new legislative framework, the *Ontario Clean Water Act*, be reinforced rather than undermined from the start.

Thank You

Thank you again for the opportunity to input and for your Ministry and Office's thorough consideration of our community's concerns. We have appreciated your personal responsiveness, and that of your Office, to the community during this public comment period and we look forward to working with you on this file as the PTTW application and the overall application move through the review process.

Respectfully submitted,



Graham Flint, B.A.Sc., P.Eng.
FORCE Chair & Spokesperson

Enclosures

Cc: Minister Broten
Paavo Kivisto, Deputy
Ted McMeekin, MPP
Margaret McCarthy, Councillor
Stan Holiday, City of Hamilton
Helma Geerts, Region of Halton
Bob Edmondson, Conservation Halton

Appendix A

Figure 5.6 Carlisle Wellhead Protection Zones from the City of Hamilton Groundwater Resources Characterization and Wellhead Protection Study

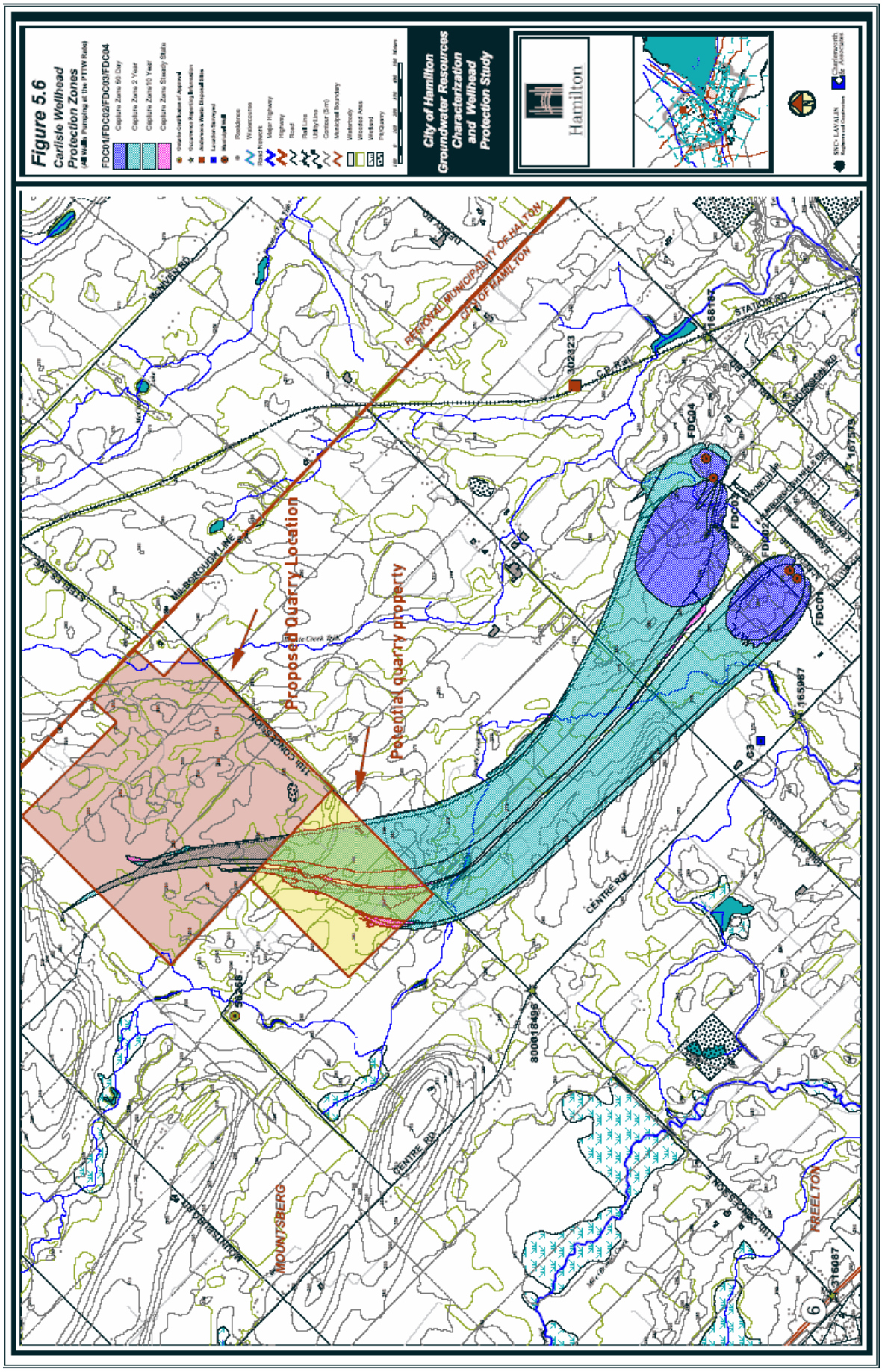


Figure 5.6
Carlisle Wellhead Protection Zones
City of Hamilton Groundwater Resources Characterization and Wellhead Protection Study
Hamilton
Proposed Quarry Location
Potential quarry property
REGIONAL MUNICIPALITY OF HALTON
CITY OF HAMILTON
MILBORO LINE
CENTRE RD
MOUNTSBERG
FREELTON
STATION RD
LAIDLAW RD
FDC01
FDC02
FDC03
FDC04