APPLICATION FOR REVIEW
Filed pursuant to Section 61 of the *Environmental Bill of Rights*
RE: Section 27 of the *Environmental Protection Act*

APPLICANT NUMBER ONE

NAME: Concerned Citizens' Committee/Tyendinaga & Environs

ADDRESS: 1035 Marysville Road

CITY: Marysville

PROVINCE: Ontario

POSTAL CODE: K0H 2N0

TELEPHONE: 613-396-6784

I hereby declare that the Concerned Citizens Committee/Tyendinaga & Environs is an Ontario non-profit corporation, carrying on business with its head office in Ontario, established by articles of incorporation in June 2000 (Ontario Corp. No. 1422188).

_____ _____

DATE MICHAEL BOSSIO, CHAIRMAN

APPLICANT NUMBER TWO

NAME: Canadian Environmental Law Association

ADDRESS: 130 Spadina Avenue, Suite 301

CITY: Toronto

PROVINCE: Ontario

POSTAL CODE: M5V 2L4

TELEPHONE: 416-960-2284

I hereby declare that the Canadian Environmental Law Association is a federal non-profit corporation, carrying on business with its head office in Ontario, established by articles of incorporation in September 1981 (Business No. 125071274 RC001).

_____ _____

DATE RICHARD D. LINDGREN, COUNSEL

APPLICANT NUMBER THREE

NAME: Mohawks of the Bay of Quinte

ADDRESS: RR #1, 13 Old York Road

CITY: Tyendinaga Mohawk Territory

PROVINCE: Ontario

POSTAL CODE: K0K 1X0

TELEPHONE: 613-396-3424

I hereby declare that the Mohawks of the Bay of Quinte is a First Nation that is resident within Ontario.

_____ _____

DATE CHIEF R. DONALD MARACLE

SUBJECT-MATTER OF REQUESTED REVIEW

The Applicants hereby request a review of an **existing** provincial statute, namely:

- *Environmental Protection Act,* R.S.O. 1990, c.E.19, as amended ("EPA")

In particular, the Applicants request a review of section 27 of the EPA in order to impose further and more stringent prohibitions on the establishment, use, operation, alteration or expansion of waste disposal sites at locations which are hydrogeologically unsuitable (i.e. fractured bedrock).

For the reasons set out below, the Applicants submit that it is in the public interest to review and revise section 27 of the EPA because, as currently drafted, the section is incomplete, outdated and inadequate to protect the environment and public health and safety.

Subsection 61(1) of the *Environmental Bill of Rights* ("EBR") provides that an Application for Review may be filed where the Applicants believe that an existing Act "should be amended, repealed or revoked in order to protect the environment". The EPA is prescribed for the purposes of Applications for Review under the EBR: see O.Reg. 73/94, section 6(1).

In this case, the Applicants submit that section 27 of the EPA should be reviewed and amended by adding new provisions which:

1. Prohibit the establishment, use, operation, enlargement, alteration or expansion of a waste disposal site at locations which are hydrogeologically unsuitable.

2. Prohibit proponents from re-applying for approval of a new or expanded waste disposal site under Part V of the EPA where the facility, or a substantially similar facility, has been previously proposed at the same (or adjoining) location and has been refused approval under the *Environmental Assessment Act* ("EAA") or the EPA due to hydrogeological unsuitability.

The Applicants' suggested legislative drafting for these two new provisions is set out below.

REASONS FOR REQUESTED REVIEW

1. Background: Description of the Applicants

The **Concerned Citizens' Committee/Tyendinaga & Environs** ("CCCTE") is an incorporated non-profit organization that includes residents living beside or near the Richmond Landfill Site. This organization and its members are concerned about the environmental and health risks posed by the now-closed Richmond Landfill, and they

were actively involved in the environmental assessment ("EA") for the proposed expansion of the landfill site. This EA was rejected by the Minister of the Environment under the EAA in 2006 for environmental reasons, but the site owner has recently commenced a second EA process for the so-called "BREC Landfill" that has been proposed immediately beside the Richmond Landfill. At the present time, the CCCTE is currently involved in the BREC Landfill EA process as well as an appeal hearing under the EPA before the Environmental Review Tribunal ("ERT") regarding the closed Richmond Landfill.

The **Canadian Environmental Law Association** ("CELA") is a public interest law group established in 1970 for the purposes of using and improving laws to protect the environment and human health. CELA lawyers represent individuals and groups (including the CCCTE) in the courts and before administrative tribunals in environmental matters. In particular, CELA has had a lengthy history of casework and law reform activities in relation to in landfill disputes, waste management matters, and groundwater protection.

The **Mohawks of the Bay of Quinte** ("MBQ") is a First Nation, and the Tyendinaga Mohawk Territory is located 3.5 kilometres from the Richmond Landfill. Marysville Creek, whose headwaters are near the Richmond Landfill Site, flows downstream into the MBQ territory and provides habitat for fish and wildlife species utilized as food by MBQ members. In addition, most domestic wells in the MBQ territory are supplied by groundwater under the influence of surface water. Over the years, the Chief and council of the MBQ have taken various steps to safeguard MBQ interests that may be affected by transboundary impacts arising from the operation or expansion of the Richmond Landfill. The MBQ was extensively involved in the EA for the Richmond Landfill expansion, and is currently involved in the proponent's new EA process for the BREC Landfill that has been proposed immediately beside the Richmond Landfill. The MBQ is also a party in the above-noted ERT appeal hearing.

2. Overview: The Rationale for Reform of the EPA

The Applicants' overall position is that the Ministry of the Environment ("MOE") should undertake the requested review and revision of section 27 of the EPA in order to better protect the environment and safeguard public health and safety.

(i) The Legal Context

Subsection 27(1) of the EPA currently contains a general prohibition against constructing or operating or expanding a waste disposal site, unless the proponent has applied for, obtained, and complied with an environmental compliance approval ("ECA").[1]

[1] This general prohibition does not apply where a person is undertaking an on-site activity that has been prescribed for the purposes of Part II.2 of the EPA, and where the person has duly registered the activity in the MOE's Environmental Activity and Sector Registry: see subsection 20.21 of the EPA.

The general prohibition in subsection 27(1) has existed in the EPA since its inception, and it has remained essentially unchanged since the 1970s. However, the Ontario Legislature subsequently augmented this general prohibition by adding some location-specific prohibitions in the EPA in order to protect particularly sensitive or vulnerable areas from adverse effects caused by waste disposal sites.

In 1994, for example, section 27 of the EPA was amended to specifically prohibit new or expanded waste disposal sites in the Niagara Escarpment Plan Area: see subsections 27(2) and (3) of the EPA. Similarly, section 27 of the EPA was further amended in 2004 to prohibit new or expanded waste disposal sites involving the deposit of waste into natural or artificial "lakes": see subsections 27(3.1) and (3.2) of the EPA. This latter amendment was a direct legislative response to the ill-conceived Adams Mine Landfill proposal in a former iron ore mine (featuring faults and fractured bedrock) near Kirkland Lake. The Applicant CELA made submissions to the Ontario government in support of the above-noted amendments to section 27 of the EPA.

For the reasons described below, the Applicants submit that it is now time to again amend section 27 of the EPA to create a specific prohibition against new or expanded waste disposal sites at hydrogeologically unsuitable locations across the province. In addition, having regard for the controversial Richmond Landfill case near Napanee, the Applicants further submit that it is appropriate to amend section 27 of the EPA to prohibit proponents from re-submitting waste disposal site proposals which have been previously refused or rejected by MOE officials, or the Environmental Review Tribunal ("ERT"), due to the hydrogeological unsuitability of the proposed location.

Ontario's basic regulatory requirements for waste disposal sites are set out in Regulation 347, but new or expanding landfills are now generally subject to standards contained in O.Reg.232/98.[2] These standards are intended to confer some degree of groundwater protection (i.e., the design specifications outlined in section 10 of the regulation). However, the Applicants note that these landfill standards are now 15 years old, and that they only apply to certain landfills (i.e., > 40,000 cubic metres of total waste disposal volume for municipal waste). Moreover, section 8 of the regulation merely requires proponents to "assess" site suitability on the basis of certain generic topics, but does not impose any express prohibitions regarding the types of site locations which may not be considered for landfilling purposes. In short, Ontario's current landfill standards tend to focus on <u>how</u> landfills are to be built, rather than <u>where</u> they should (or should not) be located.

Accordingly, the existing statutory framework and current regulatory standards do not necessarily prevent proponents from proposing landfills at hydrogeologically unsuitable sites across Ontario. Indeed, it has been the Applicants' experience that the current provincial regime has allowed (if not emboldened) proponents to continue proposing new

[2] See also MOE, *Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites* (rev. January 2012).

or expanded landfills at fractured bedrock locations[3] or other hydrogeologically questionable sites.[4] The Applicants submit that this situation is contrary to the public interest and clearly inconsistent with MOE's own guidance documents. Since landfill location constraints have not been expressly incorporated into the EAA (or regulations or policy guidelines thereunder), the Applicants conclude that it is now time to insert appropriate statutory prohibitions into section 27 of the EPA.

(ii) The Environmental Context

Noting that millions of Canadians rely upon wellwater, a groundwater workshop held in Toronto in 2002 by the Canadian Council of Ministers of the Environment ("CCME") identified fractured bedrock settings as being vulnerable to contamination for various reasons:

> Fractured rock is used as a source of groundwater where there is little overburden or the overburden has little capacity for an adequate supply of groundwater. Groundwater may be obtained from a single fracture or multiple fractures if the density of fractures is large. Fractured bedrock aquifers contain both horizontal and vertical fractures…
>
> Because fractured bedrock aquifers are complex, it is very difficult to characterize groundwater flow and hydrologeological properties of even a single fracture, let alone an entire site or fractured bedrock aquifer…
>
> Fracture networks provide the groundwater pathways in most bedrock aquifers and are often complex, highly heterogeneous, and, in most cases, unpredictable. Horizontal fractures may quickly spread a contaminant, and vertical fractures provide conduits from the surface to depth. By following these pathways, the extent of groundwater contamination may be much larger than would occur in porous media…
>
> Many fractured rock aquifers (both sedimentary and crystalline rock) have little overburden to protect them from surface water or runoff. Hence, these aquifers are very vulnerable to surface sources of anthropogenic contamination…

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[3] For example, the proposed West Carleton Environmental Centre landfill near Carp is underlain by fractured bedrock: see Waste Management, *Geology and Hydrogeology Existing Conditions Report* (September 2011) at pages 4, 13, 15 and 26. It should be noted that the existing landfill at this location has already established Contaminant Attenuation Zones to address off-site migration of leachate. Other recent examples of proposed Ontario landfills at fractured bedrock locations include: Waste Management's proposed Beechwood Road Environmental Centre Landfill near Napanee; and the Walker Environmental Group's proposed Southwestern Landfill in a limestone quarry near Ingersoll.

[4] For example, the Capital Region Resource Recovery Centre (Taggart-Miller Environmental Services) initially proposed landfilling upon lands containing a shale quarry (and partially underlain by limestone) in Russell Township near Ottawa. However, it should be noted that the proponent's EA process has recently rejected the Russell site for hydrogeological and other reasons, and has now focused upon a second "preferred" site that had been acquired by the proponent for comparative purposes: see Taggart-Miller, *Comparative Evaluation of Alternative Sites: EA of the Proposed Capital Region Resource Recovery Centre* (February 2013).

> Within the scientific community, it is well known that fractured bedrock aquifers are very different than porous media aquifers, and hence must be treated differently (emphasis added).[5]

More recently, an Environment Canada study summarized groundwater contamination concerns in the landfill context as follows:

> The main threat to water quality due to the disposal of wastes focuses on the groundwater environment. Surface water contamination also occurs as a result of direct runoff from waste sites to streams, lakes and wetlands, and indirectly as contaminated groundwater discharges to surface waters. The contamination of groundwater has many factors which makes it very different from surface water contamination. Because we cannot observe groundwater, we typically discover that the groundwater is contaminated once a well or surface water body becomes contaminated. Surface water contamination occurs quickly and can be stopped at the source. However, groundwater contamination may commence years after the waste source is in place. The slow release rate causes it to take years to thousands of years to move through the groundwater flow regime, and groundwater can be difficult, if not impossible to remediate, and prohibitively costly to remediate. Ultimately all contaminated groundwater will discharge to surface water. Thus, should serious groundwater contamination occur, the destruction of drinking water supplies and aquatic ecosystems occurs for decades to hundreds of years (emphasis added).[6]

Similar concerns were expressed by the MOE in a major study of seven Ontario landfills across southern Ontario:

> The remaining two landfills – Bayview Park and Upper Ottawa Street – are situated upon sedimentary bedrock. Unlike the consolidated materials, these are extensively fractured, and the fractures, where open, provide the major conduits for groundwater flow. Rather than moving through the mass of interconnected pores as in sands, groundwater flows along interconnected features, often bypassing cubic metre volumes of rock. It is much more difficult to anticipate the fracture pathways that contaminants will take…
>
> The distribution of contaminants at the landfill sites on fractured sedimentary rocks – Bayview Park and the Upper Ottawa Street sites – is much more complex and consequently more difficult to interpret in terms of organic solute migration and persistence.[7]

In light of such studies and other site-specific landfill investigations, it is increasingly understood that fractured bedrock (i.e., dolomite, limestone and other soluble rock) is

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[5] CCME, *Linking Water Science to Policy Workshop Series: Groundwater Quality* (2002), pages 3-5.

[6] Allan S. Crowe et al., *Threats to Sources of Drinking Water and Aquatic Ecosystem Health in Canada: Landfills and Waste Disposal* (2008).

[7] J.F. Barker et al., *Final Report: The Occurrence and Mobility of Hazardous Organic Chemicals in Groundwater at Several Ontario Landfills* (June 1989) at pages 3, 90, 92.

highly vulnerable to contamination from landfills since the fracture networks may provide rapid and direct pathways for leachate to enter aquifers. This is particularly true if karst features (i.e. solutionally enlarged fractures, sinkholes, etc.) are present. It is also generally recognized that groundwater protection is also dependent upon the type and depth of the overburden soils and sediments overlying the bedrock.

These basic siting principles were recognized by the MOE over 20 years ago:

> When selecting new landfill locations, there is a preference for sites in environments that provide natural protection, or in other words, sites where landfill generated contaminants are naturally reduced to acceptable concentrations or naturally contained…
>
> In general, fine grained soils (e.g., silty clay) are good contaminant attenuators, and coarse grained soils (e.g. sand, gravel) and areas of fractured rock are poor attenuators. Mixes of grain sizes, as occur in glacial tills in Ontario, are generally good leachate attenuators (emphasis added).[8]

At this time, the MOE provided similar directions to MOE staff involved in reviewing hydrogeological assessments of proposed landfills:

> In view of the uncertainties involved in landfill design, it is the general policy of the Ministry to select sites that are naturally protective, where failure will have a minimum impact on the water resources of the province (emphasis added).[9]

In the Applicants' view, entrenching these siting principles and preferences directly within section 27 of the EPA would not only help safeguard the environment, but it would also create greater certainty, efficiency and predictability in the landfills approval process. For example, by declaring certain types of areas as unacceptable (or "off-limits") for landfilling purposes *ab initio*, amended section 27 of the EPA would force proponents to focus site selection searches on safer or more preferable types of locations (i.e. those with natural protection characteristics, such as clay deposits or thick overburden). In turn, this would allow MOE regulators to make earlier upfront determinations of whether a proposed site appears to be approvable (or not). Similarly, interested parties and other stakeholders would not have to waste their time and limited resources on reviewing unmeritorious landfilling proposals at hydrogeologically unsuitable locations.

(iii) Conclusions on the Legal and Environmental Rationale for Reform

In summary, the Applicants submit that there is a sound legal, technical and scientific basis for disallowing landfills in fractured bedrock settings. This has been recognized in MOE guidance documents and landfill siting criteria used in other jurisdictions, as discussed below. Moreover, there are a number of Ontario cases where MOE officials or

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[8] MOE, *Guidance Manual for Landfill Sites Receiving Municipal Waste* (1993) at pages 3-2 and 3-7.

[9] MOE, *Guideline for the Hydrogeologic Assessment of Proposed Landfills under the Environmental Protection Act, Part V* (1993) at page 2.

adjudicative bodies have refused to approve proposed landfills at fractured bedrock locations due to concerns about groundwater protection, as discussed below. Even if proponents promise to take care in designing and operating waste disposal facilities at such locations, there remains considerable uncertainty about whether leachate contaminants can be satisfactorily monitored, contained or remediated at fractured bedrock sites.

Accordingly, the Applicants' proposed amendments to section 27 of the EPA are fully justified on technical and policy grounds, and represent an appropriate (and long overdue) legal constraint on landfill site selection processes. Rather than continuing to spawn intractable, case-by-case disputes over hydrological suitability, the EPA should adopt a province-wide prohibition that simply precludes the siting of landfills on fractured bedrock and other undesirable locations.

3. MOE's Policies, Guidelines and Procedures

The Applicants submit that the continuing failure of section 27 of the EPA to specifically prohibit landfilling at hydrogeologically unsuitable locations is at odds with the MOE's own policies, guidelines and procedures (past and present) regarding groundwater protection and landfill siting.

For example, the MOE's current "Reasonable Use" guideline specifies that proponents must employ "appropriate technology" and select "a suitable location" in order to exercise "good groundwater management practices."[10] In terms of site suitability, this guideline goes on to indicate that the MOE "may not support proposals for facilities for the disposal of waste" in certain "environments unsuitable for waste disposal", such as the following locations:

> **No appreciable attenuation can be provided**
>
> A disposal facility may not be supported in a location where no appreciable attenuation can be provided in the subsurface and an excessive amount of the attenuation required for acceptable discharge must be provided by dilution in surface waters. The impact on surface by contaminants carried from a disposal site by the groundwater will almost always be undetectable. However, unacceptable circumstances might exist where the subsurface travel time for contaminants is very short and the time for the degradation of the easily biodegradable organic contaminants is inadequate to substantially reduce their concentrations.
>
> **Natural attenuation capacity is weak**
>
> A disposal facility may not be supported in a location where the ability of the natural environment to attenuate contaminants is weak, as in fractured rocks, and as compensation, a very large area is required for the attenuation of contaminants.

[10] MOE Guideline B-7, section 4.1.

> For technical reasons, environments where this is necessary are generally quite expensive to evaluate and contingency plans in such environments are seldom practical…
>
> **The consequences of failure are unacceptable**
>
> A disposal facility may not be supported in a location where the consequences of failure are unacceptable. For example, waste disposal may not be supported where failure and a resulting contaminant discharge might affect the sole source of a community water supply to an unacceptable degree (emphasis added).[11]

In addition, the MOE's "position statement" in its "Engineered Facilities" procedure recognizes the inherent limitations of engineered facilities, and states a clear preference for siting such facilities at locations with a "high degree" of natural protection:

> It is the Ministry's position that there are limitations to engineered facilities. Preferred sites for engineered facilities are those in environments with characteristics that provide a high degree of natural protection, or where there is no useful or potentially useful groundwater resource.
>
> This procedure may restrict the use of engineered facilities as a means of landfilling in sensitive hydrogeologic environments. However, the level of control required is necessary to protect Ontario's clean environment and valuable ground and surface water resources. Where some reasonable level of natural protection is present or where practical contingency measures are possible, engineered facilities will be considered on a case-by-case basis (emphasis added).[12]

The "Engineered Facilities" procedure justifies MOE's preference for naturally protective sites on the following grounds:

> (a) A landfill will produce leachate that, depending on the particular environment, has the potential, for a very long time, to cause contamination… Thus, if there is a groundwater resource that must be "protected", some natural attenuation will be required at all sites after the service lives of the engineered contaminant control facilities have expired.
>
> (b) There is, for the most part, less than thirty years of experience on the performance of engineered leachate control facilities and in particular flexible membrane liners in landfills and leachate collection systems. Although short-term field and laboratory data can be extrapolated to predict the long term performance and service lives of engineered leachate

[11] *Ibid*., section 5.0.

[12] MOE Procedure C-13-1. Interestingly, this Procedure and MOE Guideline C-1 no longer appear to be web-posted on the MOE website, although this guidance documentation would still be relevant to smaller or older waste disposal sites which are not subject to O.Reg.232/98.

> control facilities, in the absence of long term field data some uncertainty remains.
>
> Guideline C-13 does not preclude landfills that rely upon engineered leachate control facilities for environmental protection. However, such sites should be located where monitoring and contingency measures are workable so that if the engineered leachate control facilities fail prematurely, environmental damage will be limited (emphasis added).[13]

Moreover, the MOE's "Engineered Facilities" procedure offers several important caveats about relying upon liners as the primary line of defence against groundwater contamination:

1. Synthetic membrane liners cannot be replaced when their service lives expire.

2. Improvement in the quality of leachate with time is not well defined.

3. There is limited field experience with synthetic membrane liners in landfills in terms of their service lives.

4. Synthetic membrane liners may impede monitoring of landfills to provide early warning of impending failure.[14]

Accordingly, the mere fact that liners and/or leachate collection systems may be deployed at an engineered facility does not necessarily ensure long-term protection of fractured bedrock aquifers, and does not adequately compensate for the fundamental unsuitability of sites containing: little or no overburden; fractured or karstic bedrock; fast-moving or complex groundwater flow systems; negligible natural attenuation capacity; and hydraulic connections to nearby watercourses or wells. In the Applicants' view, it is this type of vulnerable site location that the EPA should expressly prohibit for landfilling purposes.

Put another way, failing or refusing to enact such a prohibition in the EPA (and simply attempting to address hydrogeological considerations in non-binding MOE guidance documents) leaves it open to proponents to propose landfilling at inherently unsuitable locations. Even if such proposals are eventually rejected under the EAA or EPA, they should not have been considered in the first place, and it is a profound waste of MOE and stakeholders' time, money and effort to respond to landfilling proposals at locations which are wholly unsuitable and potentially harmful.

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[13] *Ibid.,* Appendix B.
[14] *Ibid.*

4. Case Study: The Richmond Landfill Saga

The Applicants submit that the Richmond Landfill case provides an illustrative example of the need to review and revise section 27 of the EPA. Similar cases (involving landfilling at fractured bedrock locations) are described below.

(i) Description of the Richmond Landfill

The Richmond Landfill Site is located at Part of Lots 1, 2 and 3, Concession 4, in the Town of Greater Napanee, in the County of Lennox & Addington. The landfill site is located approximately 1 kilometre north of Highway 401, and is northeast of the intersection of County Road 10 and Beechwood Road. This rural area is not serviced by a municipal water system, and local residents, farms and businesses are dependent upon groundwater as a source of drinking water.

The general area is characterized by thin overburden soils, negligible natural attenuation capability and highly fractured bedrock, thereby rendering local aquifers highly vulnerable to contamination. For example, the Government Review prepared in 2006 by the MOE in relation to the landfill expansion EA (see below) concluded that the site is located within an area that is highly susceptible to groundwater contamination. In particular, the Government Review found that:

> The entire region, including the Richmond landfill site, has been identified as being underlain by fractured limestone bedrock with minimal soil protection and having aquifers that are highly vulnerable to contamination. The site has no natural attenuation protection and groundwater flows through the subsurface at a fast rate. The existing site is near capacity, with approximately one year of site life remaining. The site has one unlined cell. It is reasonable to assume that this cell is a potential source of groundwater contamination. The unlined cell and its potential for off-site contamination have caused a great deal of public concern (page 5, emphasis added).

(ii) MOE Refusal to Approve Richmond Landfill Expansion

In the late 1990s, the site owner applied under the EAA to significantly expand the footprint, capacity and lifespan of the Richmond Landfill. In particular, the proponent applied for a 25-year approval to dispose of an additional 750,000 tonnes/year of various non-hazardous wastes from an all-Ontario service area.

The Terms of Reference for the EA of the proposed expansion were approved by MOE in 1999. The EA itself was submitted by the site owner in 2005, and the MOE Government Review of the EA was published in June 2006. Significantly, the Government Review recommended against EA approval for various environmental reasons:

> The ministry's Review identified that the EA does not adequately describe existing baseline conditions, meet regulatory requirements for satisfying RULs

> [Reasonable Use Limits] at the property boundary, or provide for a viable leachate control option. Given that the landfill is a potential source of groundwater contamination in a susceptible subsurface environment, the Review has also concluded that there are significant environmental risks associated with expanding the landfill (page 27, emphasis added).

Accordingly, the Government Review recommended "that the proposed undertaking not be approved due to the concerns identified by the ministry, members of the Government Review Team, the MBQ, and the public" (page 27).

On November 3, 2006, the Minister of the Environment accepted this recommendation, and she refused to approve the proposed expansion. In particular, the Minister's decision agreed that:

> The entire region, including the Richmond landfill site, has been identified as being underlain by fractured limestone bedrock with minimal soil protection and having aquifers that are highly vulnerable to contamination. The site's fractured bedrock aquifer has no proven natural attenuation capabilities and groundwater flows through the subsurface at a fast rate.[15]

Accordingly, the Minister's decision letter concluded as follows:

> From my review of the information on hydrogeology/geology, groundwater reasonable use limits, and air quality impacts I have concluded that approving this EA would be inconsistent with the purpose of the EAA as outlined above.
>
> I conclude that the undertaking would not meet the regulatory requirements for protecting groundwater. In addition, the EA does not provide a viable leachate control plan.
>
> I also find that the impacts of the existing landfill operation on the environment are not adequately described in the EA. This information is necessary to predict the environmental effects of the proposed expanded landfill site. Without this information a reliable and traceable impact assessment cannot be conducted.
>
> Based on the foregoing, with the approval of the Lieutenant Governor in Council, I refuse to give approval to proceed with the undertaking (pages 7-8, emphasis added).[16]

During this acrimonious seven-year EA battle (1999-2006), the Applicants CCCTE and MBQ collectively raised and spent hundreds of thousands of dollars to retain experts and lawyers to oppose the proposed – and ultimately unsuccessful - expansion.

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[15] Letter to Kevin Bechard from Environment Minister Broten dated November 3, 2006 at page 3.
[16] *Ibid.*, pages 7-8.

(iii) The MOE requires Site Closure

Shortly after the Minister rejected the proposed Richmond Landfill expansion, the Applicants, nearby residents, and local municipalities called upon the MOE to ensure the prompt, proper and permanent closure of the Richmond Landfill Site. For example, the Applicants wrote to the MOE to request immediate site closure and the imposition of appropriate post-closure requirements, such as monitoring, reporting, remedial work, and contingency measures.

In March 2007, the MOE amended Condition 34 of Provisional Certificate of Approval A371203 to require the site owner to prepare an updated Closure Plan for the Richmond Landfill. The site owner subsequently submitted a proposed Closure Plan dated June 2007. During the 30 day public comment period on the proposed Closure Plan, the Applicants submitted written comments which detailed the various legal and technical deficiencies within the Plan.

In July 2008, the MOE prepared its overall response to the Closure Plan proposed by the site owner. Among other things, this MOE response summarized the numerous agency/public concerns and questions about the Closure Plan (including the significant shortfall in financial assurance provided to date), and further indicated that the MOE expected the site owner to respond to such concerns "in detail." In the meantime, the landfill continued to accept waste despite being very close to its approved capacity.

In November 2008, the Applicants jointly filed an EBR Application for Review of the 20 year-old Provisional Certificate of Approval No. A371203 for the Richmond Landfill. Among other things, this EBR Application for Review requested site closure, comprehensive post-closure requirements, and appropriate groundwater/surface monitoring. However, this EBR Application was denied by the MOE, and the requested review was not undertaken.

In his 2008-09 Annual Report, the Environmental Commissioner of Ontario reviewed this matter, and recommended that "the MOE require the immediate closure of the Richmond Landfill" (Recommendation 11). Among other things, the Environmental Commissioner concluded in his supplementary report that:

> The ECO believes that the continued operation of the site poses an unjustified risk to the environment and urges the MOE to require the orderly closure of the site immediately. The geology of the site is inherently unsuitable for waste disposal... Contamination of the groundwater appears to be inevitable. Closure of the site would lessen the amount of leachate entering the groundwater and therefore the risk.
>
> The ECO is concerned that even a robust monitoring program will not reliably detect groundwater contamination and will not provide sufficient lead time to implement protective measures...

> In conclusion, the ECO believes that there are compelling environmental reasons for MOE to require the immediate, orderly closure of the site, and no compelling social or economic reasons for continuing to keep it open (emphasis added).[17]

In February 2009, the MOE's hydrogeologist reviewed various groundwater reports submitted by the site owner, and concluded, *inter alia*, that: (i) "the status of the site with respect to Guideline B-7 compliance has not been determined" (ii) "the EMP [environmental monitoring program] can only be developed once issues related to the physical hydrogeology of the site are resolved; (iii) "complex hydrogeological conditions at this site make it difficult to identify and monitor potential leachate impacts"; and (iv) "the physical hydrogeological conceptual model proposed by WM / WESA is not acceptable."[18]

In May 2009, the MOE utilized EBR Registry No.010-1381 to solicit public input on over 100 proposed amendments to Provisional Certificate of Approval No. A371203. Among other things, these amendments proposed to require the site owner to prepare an environmental monitoring plan ("EMP"), various contingency plans, and certain reports. The Applicants filed detailed comments with the MOE in relation to these proposals, and expressed concern about the lack of detail in the amendments regarding the content of various plans and reports to be submitted under the proposed amendments.

In April 2010, the MOE posted its Decision Notice in relation to EBR Registry No.010-1381. Among other things, the Director decided to amend Provisional Certificate of Approval No.A371203 to prohibit the receipt of waste for disposal at the Richmond Landfill after June 30, 2011, and to specify that the five cells of the site shall be capped with final cover material by September 30, 2011.

These closure steps have since been implemented by the site owner, although there was some minor delay in the placement of final cover material. The MOE's amendments further required the site owner to prepare and file various documents with the MOE by June 30, 2010, including an updated EMP, contingency plans, and other reports.

(v) The CCCTE's EBR Appeal to the ERT

Upon receipt of the required documents, the MOE then posted EBR Registry Notice No. 011-0671 in July 2010, and public comments were solicited by the MOE on these documents. The Applicants filed detailed comments which outlined various legal and technical concerns about the inadequate content of the proposed EMP, contingency plans, and other documents filed by the site owner under the EPA.

In January 2012, the MOE posted its Decision Notice on the EBR Registry in relation to Amended ECA No.A371203. In essence, the MOE decided to impose conditions which

[17] ECO 2008-09 Annual Report, Recommendation 11; and Annual Report Supplement, page 176.

[18] Memorandum from K. Stephenson to C. Dobiech dated February 25, 2009; Memorandum from K. Stephenson to C. Dobiech dated April 28, 2010.

essentially adopted the various documents submitted by the site owner. The Applicant CCCTE, represented by the Applicant CELA, then sought leave under section 38 of the EBR to appeal seven of these conditions related to the impugned documents.

In March 2012, the ERT granted the CCCTE leave to appeal under the EBR,[19] and various preliminary hearings have been held to date. While some issues in dispute have since been settled by the parties (i.e., annual reporting, odour monitoring and public notification), the main hearing is scheduled to commence in October 2013, and will largely focus upon the EMP and contingency planning for leachate, groundwater and surface water. The Applicant MBQ has been granted party status in these public hearings before the ERT.

(vi) The Proposed BREC Landfill

Despite the MOE's correct rejection of the proposed Richmond Landfill expansion, despite the ongoing ERT appeal, and despite public and agency concerns about leachate migration from the closed Richmond Landfill Site, the proponent has proposed to establish and operate a substantially similar mega-landfill immediately beside the Richmond Landfill.

This new landfill – now euphemistically called the Beechwood Road Environmental Centre ("BREC") – is being proposed on essentially the same fractured bedrock location as the unapproved expansion of the Richmond Landfill Site. In summary, the proponent proposes to dispose of approximately 8 million tonnes of waste over 20 years at the BREC landfill. Alarmingly, the proposed BREC landfill footprint, if approved, would be more than three times larger than the existing Richmond Landfill footprint, and would receive three times more waste per annum than received by the Richmond Landfill while in operation.

In any event, the proponent has now commenced another EA process for the BREC Landfill, and the Applicants and other stakeholders have been reluctantly dragged into yet another protracted, costly and multi-year EA process.

In the Applicants' view, it is an abuse of process to allow a proponent to re-apply for approval of a landfilling proposal on (or beside) the same lands which have been previously rejected for hydrogeological reasons. Accordingly, the Applicants submit that a "no means no" amendment to the EPA (i.e., to prohibit repeated applications for a previously rejected waste disposal site) is both reasonable and necessary. This is particularly true in this case where the proponent is proposing a new adjacent landfill on fractured bedrock when, at the same time, it is attempting to develop satisfactory contingency measures for a closed landfill that is leaking leachate off-site, as discussed below.

[19] *CCCTE v. Director* (2012), 67 C.E.L.R. (3d) 94 (ERT).

(vii) Leachate Impairment of Groundwater

For a number of years, there was an ongoing debate among the various parties as to whether the groundwater at the Richmond Landfill Site has been impaired by leachate, or whether leachate contaminants have moved off-site past the landfill boundaries. Much of the disagreement centred on whether the proponent's evolving site conceptual model had satisfactorily described the complex groundwater flow system at the Richmond Landfill setting. While this debate dragged on, the MOE's hydrogeologist recommended in 2010 that alternative water supplies should be provided to six private residences located south of the Richmond Landfill:

> On a precautionary basis and until the plume has been fully delineated, I recommend that bottled water should be offered / supplied to the owners of the following residences where elevated concentrations of some leachate indicator parameters have been observed…
>
> Prior to full delineation of leachate impacts, WM should also conduct an ongoing domestic water sampling program around, and hydraulically downgradient of, the Richmond Landfill.[20]

At the present time, however, this technical debate has now been resolved, as there is a preponderance of expert hydrogeological opinion which suggests that the Richmond Landfill Site has impacted groundwater quality.

In November 2012, for example, the MOE's hydrogeologist reviewed recent groundwater sampling data collected by the proponent, and concluded that:

> It is my opinion that the landfill has impacted groundwater at, and beyond, the southern property boundary (essentially Beechwood Road). These impacts exceed allowable limits according to Guideline B-7… As such, the site is in non-compliance with Guideline B-7 and its Environmental Compliance Approval...
>
> Based on experience with other large landfill sites in a fractured bedrock setting, it is common to see impacted groundwater plumes extend several hundred metres…The presence of impacts extending from the [Richmond Landfill] waste area to Beechwood Road fits with experience from other similar sites.[21]

This opinion is shared by hydrogeologists retained by the Applicants CCCTE and MBQ.

Accordingly, in the context of the above-noted CCCTE appeal to the ERT, all hearing parties – including the proponent – have now agreed that "there is evidence that leachate is migrating off-site from the Richmond Landfill Site and causing off-site groundwater

[20] Memorandum from K. Stephenson to C. Dobiech dated March 1, 2010.
[21] Memorandum from K. Stephenson to D. Arnott dated November 27, 2012 at pages 18-19.

impacts in excess of Reasonable Use limits under the MOE's Guideline B-7", contrary to the site's environmental compliance approval.[22]

(viii) Conclusions regarding the Richmond Landfill Saga

In the Applicants' view, the Richmond Landfill saga amply demonstrates why even engineered landfills should not be permitted at fractured bedrock locations. Despite the installation of various liners and a perimeter leachate collection system at the Richmond Landfill Site, leachate has migrated beyond the property boundaries at levels in excess of Guideline B-7 levels. Thus far, the proponent's response has been to propose a Contamination Attenuation Zone ("CAZ"), rather than install engineered works (i.e., purge wells) to intercept and contain the migrating leachate at source. It remains to be seen whether a satisfactory CAZ can be developed, approved and effectively implemented in this case. In any event, to prevent this unfortunate and unacceptable scenario from recurring elsewhere in Ontario, the Applicants submit that section 27 of the EPA should be amended to specifically prohibit new or expanded landfills at fractured bedrock locations.

The Applicants further submit that the above-noted chronology regarding the proposed expansion of the Richmond Landfill (and the proposed BREC Landfill on the same fractured bedrock setting) justifies additional amendments to section 27 of the EPA. In particular, section 27 should be amended to ensure that where a proposed waste disposal site has been reviewed and rejected by MOE (or the ERT) for hydrogeological reasons, the proponent should not be able to subsequently seek approval for essentially the same undertaking on (or beside) the same lands. In the Applicants' view, there should be "zero tolerance" under the EPA for repetitive applications by the same proponent for the same (or substantially similar) undertaking at, or immediately beside, the same unsuitable location.

5. Joint Board Decisions on Fractured Bedrock Landfill Sites

Aside from the Richmond Landfill saga, there have been other notable instances in Ontario where landfilling at hydrogeogically unsuitable locations has been properly rejected by adjudicative bodies.

For example, the Applicant CELA served as counsel for a residents' group involved in the first environmental assessment of a new landfill under Ontario's EAA. This case involved a proposal by the Region of Halton to establish a large landfill at its preferred site, which was a fractured bedrock location in West Burlington.[23] However, after an extensive public hearing (which focused mainly on hydrogeological matters), the Joint Board rejected the preferred site for environmental reasons, and promulgated evaluation criteria to assess the suitability of proposed landfill locations:

[22] *CCCTE v. Director,* 2013 CarswellOnt 6509 (ERT) at para.10.
[23] Joint Board File No.CH-86-02.

> Amongst the many factors to be considered in assessing the hydrogeological suitability of a landfill site, this Board considered the following matters to be of considerable significance:
>
> 1. The hydrogeology of the area must be comprehensible to the Board.
>
> 2. The loss of contaminants should be minimal (and preferably zero), as a result of either natural containment or engineered works.
>
> 3. Natural containment and attentuation of contaminants is preferred to engineered containment and attenuation.
>
> 4. If it is predicted that contaminants may move away from a landfill site, then the postulated contamination migration pathways should be predictable.
>
> 5. It should be demonstrated that predicted leachate migration from the site will have no significant adverse impact on surface waters.
>
> 6. Monitoring to identify contaminant escape and migration pathways should be straightforward.
>
> 7. There should be the highest possible confidence in the effectiveness of contingency measures to intercept and capture lost contaminants.

The Board's articulation of these hydrogeological criteria was upheld by the Ontario Divisional Court,[24] and the "Halton criteria" were subsequently adopted and applied in another landfilling case in which a private proponent proposed to establish a large-scale engineered facility in the Steetley Quarry in Flamborough Township.[25] After another lengthy public hearing (which again focused primarily on hydrogeology), the Joint Board refused to grant EAA approval of the proposed landfill in the Steetley Quarry for environmental reasons, particularly in relation to groundwater protection.

Taken together, these two leading Joint Board decisions provide a clarion call against approving landfills at fractured bedrock locations. In short, it is unlikely that landfilling in a fractured bedrock setting can ever satisfy the common sense "Halton criteria" described above, even where careful engineering commitments are made by proponents. Accordingly, the EPA should be amended to simply rule out such locations at the earliest possible stage in the proponents' preliminary planning.

It may be argued that it is unnecessary for the EPA to contain such a blanket prohibition because, as demonstrated by these two Joint Board decisions, the EA process can eventually screen out and reject hydrogeologically unsuitable sites. In response, the Applicants note that not all proposals to establish or change landfills have to undergo an individual EA at the present time: see O.Reg.101/07. In addition, even those proposals

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[24] *NSP Investments Ltd. v.Ontario* (1990), 4 C.E.L.R. (N.S.) 279 (Div.Ct.).
[25] *Re Steetley Quarry Products Inc.*(1995), 16 C.E.L.R. (N.S.) 161 (Jt.Bd.) at paras.221-224, 438-443.

that are large or significant enough to trigger an individual EA are automatically exempted from a public hearing under the EPA: see O.Reg.206/97.

More fundamentally, the Applicants submit that it is not in the public interest to force residents, municipalities, First Nations and other interested persons to spend countless years and vast sums of money in EA processes in orders to defeat sites which are objectively unsuitable and ultimately unapprovable. This is particularly true under Ontario's current EA regime, where intervenor funding is no longer available by law to help defray the costs of public participation in the EA hearing process. Indeed, the last EA hearings on landfills occurred in the late 1990s in Ontario, and no public hearings have been held by the ERT under the EAA for the past two decades. For these reasons, the Applicants submit that Ontario's current EA process cannot be relied upon as an adequate substitute for a clear and unequivocal prohibition in the EPA against landfilling at hydrogeologically unsuitable locations.

6. MOE Statement of Environmental Values

In determining whether the public interest warrants the requested review of section 27 of the EPA, subsection 67(2)(a) of the EBR directs the Minister to consider the relevant Statement of Environmental Values ("SEV").

In this case, the MOE's SEV indicates that the Ministry's "vision" is "clean and safe air, land and water" in order to ensure healthy communities, ecological protection and environmentally sustainable development for present and future generations. To achieve this vision, the SEV commits the MOE to a number of important principles, such as:

- adopting an "ecosystem approach" to environmental protection and resource management;

- using a "precautionary, science-based approach" in MOE decision-making in order to protect human health and the environment;

- developing legislation, regulations, standards and policies to protect the environment and human health;

These and other SEV commitments represent a provincial promise to Ontarians that the MOE will take all necessary steps to safeguard the environment and public health and safety.

The Applicants submit that their requested review of section 27 of the EPA is consistent with (if not mandated by) the policies and principles reflected in the MOE's SEV. In short, if the EPA is to be fully protective of groundwater and public health, then section 27 should be amended to include the long overdue prohibition against landfilling at fractured bedrock locations and other hydrogeologically unsuitable sites.

7. Absence of Periodic Review

In determining whether the public interest warrants the requested review, subsection 67(2)(c) of the EBR directs the Minister to consider whether "the matters sought to be reviewed are otherwise subject to periodic review".

At the present time, aside from using Part IV of the EBR, there is no statutory mechanism for the formal public review of section 27 of the EPA.

Accordingly, the Applicants submit that the requested review of section 27 of the EPA should be undertaken because there is no other formal, open or consultative process in place that periodically reviews or revises this provision.

8. Resources Required for the Requested Review

Subsection 67(2)(f) of the EBR lists "resources required to conduct the review" as another factor to be considered by the Minister when determining if the public interest warrants a Review.

To the Applicants' knowledge, the requested review can be carried out by relevant MOE personnel without the allocation of any new resources or staff.

9. Other Relevant Considerations

In determining whether the public interest warrants the requested review, subsection 67(2)(g) of the EBR permits the Minister to take into account "any other matter that the Minister considers relevant."

The Applicants submit that there are four additional considerations which should be taken into account regarding the need to review and revise section 27 of the EPA: (i) Ontario's proposed *Waste Reduction Act, 2013*; (ii) Ontario's source protection legislation; (iii) landfill siting criteria in other Canadian provinces; and (iv) landfill siting criteria in the United States.

(i) Waste Reduction Act, 2013

The Ontario government has recently introduced the *Waste Reduction Act, 2013* (Bill 91), and the proposed Waste Reduction Strategy, in order to greatly enhance waste reduction/reuse/recycling rates in all sectors, to conserve natural resources and energy, and to create socio-economic benefits.[26] The Applicants submit that their proposed amendment to section 27 of the EPA is entirely complementary to Ontario's new direction in provincial waste management policy.

[26] See EBR Registry No. 011-9260.

For example, if the various waste diversion initiatives under the *Waste Reduction Act, 2013* (i.e. product stewardship programs) are successful, then the overall volume of waste requiring disposal should significantly decrease, particularly within the MSW and ICI sectors. This decrease, in turn, means that there will be no public interest justification for proponents to build or expand landfills on fractured bedrock to handle the dwindling waste stream. Instead, any post-diversion residual waste requiring disposal can be directed to safer locations or facilities.

(ii) Clean Water Act, 2005

The Ontario government has accepted all of the recommendations arising from the Walkerton Inquiry, including those related to groundwater protection. In the Applicants' view, if the Ontario government intends to fully operationalize Commissioner O'Connor's recommendations regarding drinking water safety (including source protection), then, at the very least, section 27 of the EPA must be reviewed and revised forthwith in order to ensure that it effectively safeguards sources of drinking water.

Moreover, it should be noted that the MOE, source protection committees, municipalities and other stakeholders have spent several years (and millions of public dollars) developing watershed-based source protection plans across many areas of Ontario pursuant to the *Clean Water Act, 2005* ("CWA"). The public interest rationale for source water protection is that the first – and arguably most important – step in the "multi-barrier approach to drinking water safety is to prevent contaminants from getting into raw water supplies in the first place.

The Applicants therefore submit that the requested review is entirely consistent with MOE programs aimed at protecting drinking water sources from known or suspected sources of contamination, such as landfill sites. Indeed, waste disposal activities are specifically listed as a provincial drinking water threat under CWA regulations.[27]

To the Applicants' knowledge, almost all proposed source protection plans submitted to date under the CWA are currently awaiting approval by the MOE. Thus, at the present time, it is impossible to predict whether – or to what extent – the approved plans will effectively ban waste disposal sites in all known "vulnerable areas" in watersheds across Ontario. However, it seems reasonable to anticipate that a number of source protection plans (if approved by the MOE) will contain mandatory policies prohibiting new or expanded waste disposal sites on certain lands delineated as "intake protection zones" or "wellhead protection areas" in order to protect sources of municipal drinking water against these kinds of significant drinking water threats.

However, it is less clear whether – or how many – source protection plans approved under the CWA will suggest similar (but non-binding) constraints on sensitive lands which are identified as "highly vulnerable aquifers" or "significant groundwater recharge areas". Such areas often contain aquifers relied upon by private domestic well owners,

[27] O.Reg. 287/07, section 1.1(1), para.1.

but the lands may not be sufficiently close enough to a municipal well or water intake to trigger mandatory and enforceable prohibitions under the CWA.

For example, the proposed source protection plan for the Quinte Source Protection Region (which includes the Richmond Landfill and proposed BREC Landfill) recommends that "the Ministry of the Environment should consider the location of vulnerable areas for the protection of drinking water when issuing Environmental Compliance Approvals for new or expanding waste disposal sites."[28] This proposed policy notes that the MOE should "have regard" for this recommendation, and gives the MOE up to five more years to implement this policy. Since the MOE already presumably considers site vulnerability, it is unclear whether the proposed policy will result in any material changes in the *status quo*.

More fundamentally, the Applicants submit that groundwater protection should not be left to be determined in a piecemeal (or possibly inconsistent) manner in different source protection plans crafted by different committees in different areas of the province. To the contrary, a single, consistent and overarching statutory prohibition should be incorporated within section 27 of the EPA in order to prohibit landfilling at all hydrogeologically unsuitable locations.

The Applicants further note that the current round of source protection planning under the CWA has been largely limited to watersheds for which Conservation Authorities have been established. In effect, this means that there are large swaths of land in central and northern Ontario where there will be no approved source protection plans safeguarding local aquifers, or well owners who depend upon such aquifers. In the Applicants' view, the lack of province-wide coverage under the CWA provides an additional reason why the EPA itself should be amended to include a province-wide prohibition on landfilling in hydrogeologically unsuitable locations.

(iii) Landfill Siting Criteria in other Canadian Provinces

The Applicants' proposed prohibition against landfilling at hydrogeologically unsuitable locations (i.e. fractured bedrock) has been adopted and applied in various forms in other Canadian jurisdictions.

In Alberta, for example, provincial standards specifically prohibit new or expanded landfills at locations containing one or more of the following conditions:

- the area is situated within a ravine, coulee or gully;

- there is less than 30 metres of geologic materials with an equivalent hydraulic conductivity of greater than 1×10^{-8} metres/second; or

[28] *Quinte Region Proposed Source Protection Plan* (August 2012), Policy 1-6-E & F.

- the geologic materials within 10 metres below the liner include fractured non-porous bedrock or karst features (emphasis added).[29]

Interestingly, these Alberta standards not only stipulate where landfills shall not be located, but they also specify where landfills shall be situated:

> 2.1(d) A new landfill, or the new waste footprint of a laterally expanding landfill, shall only be situated at a location where:
>
> (i) there is a a 5 metre thick layer of clayey deposit having an equivalent hydraulic conductivity less than 1×10^{-8} metres/second…; and
>
> (ii) the geologic materials immediately beneath the clayey deposit…consist of at least 3 metres of material providing equivalent or better protection to the requirements in 2.1(d)(i).[30]

Less prescriptive siting criteria have been promulgated in Newfoundland and Labrador, but the provincial standards clearly reflect a preference to avoiding areas where there are "any bedrock or other rock outcroppings" within 300 mm of the bottom of the liner.[31] These standards also state that "areas where there is a reasonable depth of native soils and no useful groundwater resources are preferred locations."[32]

(iv) Landfill Siting Criteria used in the United States

Administered by the U.S. Environmental Protection Agency, there are regulations under the federal *Resource Conservation and Recovery Act* which set out location restrictions for siting waste landfills receiving municipal solid waste.[33] While several of these restrictions pertain to natural and man-made hazards (i.e., wetlands, floodplains and airports), there are also restrictions on landfilling in "unstable areas", which is defined as including karst terrain (i.e., areas where ground-level and subsurface karst features exist).[34]

Similar landfill siting criteria have been promulgated at the state level. In 1976, for example, Ohio developed various location prohibitions and separation distances, which have been periodically updated from time to time. Ohio's current siting criteria may be summarized as follows:

- solid waste landfills cannot be located within sand and gravel pits or limestone or sandstone quarries, or over sole source aquifers or sand and gravel aquifers that yield more than 100 gallons-per-minute;

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[29] *Standards for Landfills in Alberta* (February 2010) at page 8.
[30] *Ibid.*, page 9.
[31] *Environmental Standards for Municipal Solid Waste Landfill Sites* (May 2010), Table 1.
[32] *Ibid.*
[33] 40 CFR Part 258.10 to 258.16.
[34] *Ibid.*, Part 258.15.

- ground water resources used for public drinking water are specifically protected by prohibiting the location of solid waste landfills within a 5-year time-of-travel for ground water flow to a public water supply well or within a designated drinking water source protection area for a public water system using ground water;

- solid waste landfills must be located at least 1,000 feet from residential water supply wells and developed springs;

- solid waste landfills must be located outside of areas where collapse of underground mines may potentially cause ground subsidence; and

- solid waste landfills must be located and constructed so that the base of the landfill (the base of the bottom liner) is isolated from the underlying uppermost aquifer system (UAS) by at least 15 feet of soil or other geologic material.[35]

Similarly, Maine's waste management law expressly prohibits the issuance of a landfill approval at locations where the proposed facility overlies a significant sand or gravel aquifer, or the proposed facility poses an unreasonable threat to an underlying fractured bedrock aquifer.[36] This general prohibition is supplemented by more detailed landfill Rules which contain the following "prohibitive" and "restrictive" siting criteria":

> (2) **Prohibitive Siting Criteria**. To protect public health, safety, and the environment, the locations listed below are not suitable for siting new landfills or expansions of existing landfills. Variances from these siting prohibitions will not be granted.
>
> (a) The waste handling area must not be located within 1000 feet of Class AA or Class SA waters, as defined in 38 MRSA §465 and 465-B.
>
> (b) The area within the solid waste boundary must not lie over or be within 300 feet of a significant sand and gravel aquifer.
>
> (c) The area within the solid waste boundary must not be located within 200 feet of a fault that has had displacement in Holocene time.
>
> (d) The facility site must not be located in, on, or over a coastal sand dune system, coastal wetland, or fragile mountain area, as these terms are defined in 38 MRSA §480-B.
>
> (3) **Restrictive Siting Criteria**. The siting criteria listed below apply to siting new landfills or expansions of existing landfills unless the applicant or licensee receives a variance in accordance with Chapter 400, Section 13.

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[35] Ohio EPA, *Solid Waste Landfill Siting, Permitting and Hydrogeologic Investigations* (June 23, 2004).
[36] Maine Revised Statutes, Title 38, Part 1310-N: Solid Waste Facility Licences, Section 2-A.

(a) The following set-backs must be maintained…

(b) The area within the solid waste boundary must be located on soils that contain sufficient fines and clay-size particles to minimize infiltration of leachate. The in-situ soils must have an undisturbed hydraulic conductivity less than or equal to 1×10^{-5} cm/sec.

(c) The landfill and leachate storage ponds must be located so that site characterization monitoring, detection monitoring, and assessment monitoring can be conducted…[37]

Interestingly, landfill licencing occurs in two stages in Maine: (i) the upfront submission of a Preliminary Information Report by the proponent (i.e., to demonstrate compliance with the above-noted siting criteria); and (ii) the actual application for approval of the proposed landfill.

In New York State, a detailed set of landfill siting regulations have been developed under the *Environmental Conservation Law* in order to keep landfills out of environmentally sensitive areas. Where a proponent proposes a site that does not comply with the regulatory criteria, a "comprehensive" site selection process must be undertaken, and the proponent must justify choosing the non-compliant site and demonstrate its safety:

§360-2.12 Landfill siting.

(a) **Applicability**. New landfills and lateral or vertical expansions of existing active landfills must be located on a site that exhibits the following characteristics unless the requirements of subdivision (b) of this section are met. A site selection study will be required only if the applicant proposes a site that does not exhibit all of the characteristics identified in either paragraph (1) or (2) of this subdivision.

(1) In the case of new landfills and lateral or vertical expansions of existing landfills:

(i) the site is not located in an area identified in section 360-1.7(a)(2) of this Part;[38]

(ii) the site complies with the siting restrictions identified in subdivision (c) of this section;

(iii) bedrock subject to rapid or unpredictable groundwater flow must be avoided, unless it can be demonstrated that a containment failure of the facility would not result in contamination entering the bedrock system;

[37] *Maine Solid Waste Management Rules: Chapter 401 – Landfill Siting, Design and Operation*.

[38] These prohibited areas include certain agricultural lands, floodplains, wetlands, endangered species habitat, and lands near surface water bodies.

(iv) the site must not be in proximity of any mines, caves or other anomalous features that may alter groundwater flow;

(v) unconsolidated deposits underlying the proposed landfill must either exist or be constructed to be 20 feet or greater in thickness as measured from the base of the constructed liner system; and

(vi) the upper 20 feet of the unconsolidated deposits on the site must consist predominantly (greater than 50 percent) of soils throughout the vertical section, with a maximum in situ coefficient of permeability of 5 x 10-6 centimeters per second, with no appreciable continuous deposits having a maximum coefficient of permeability of 5 x 10-4 centimeters per second…

(b) **Exceptions**. New landfills and lateral or vertical expansions of existing landfills may be located on sites that do not exhibit the characteristics identified in subdivision (a) of this section provided that the requirements of paragraphs (1) and (2) of this subdivision are met. The department may impose additional requirements to assure that the permitted activity will have no significant adverse impact on the public health, safety or welfare, the environment or natural resources for any site selected pursuant to this subdivision.

(1) The proposed landfill must be identified in the local solid waste management plan approved by the department under Subpart 360-15 of this Part as a component of the integrated solid waste management system for the planning unit in which the facility is located, and the proposed landfill must be consistent with the goals and objectives of such plan.

(2) The applicant must perform a site selection study and submit a site selection report as part of a complete application. This report must describe the factors that prevent the applicant from using a site exhibiting the characteristics identified in subdivision (a) of this section… The site selection report must also demonstrate that the chosen site will have no significant adverse impact on public health, safety, or welfare, the environment or natural resources, and will be consistent with the provisions of the ECL.

(i) The site selection process must be comprehensive and must identify and evaluate a reasonable range of alternative sites which are feasible considering the capabilities and objectives of the applicant. All of the criteria used to eliminate and evaluate the suitability of the potential sites must be clearly defined and consistently applied. A phased approach must be used, in which a more detailed evaluation of sites occurs as the number of potential sites is reduced.

(a) The applicant must exclude inappropriate siting areas by avoiding the prohibited siting areas identified in section 360-1.7(a)(2) of this Part and applying the landfill siting restrictions identified in subdivision (c) of this section.

(b) The applicant must evaluate potential siting areas to identify alternative sites that are suitable for landfill development. When applying the siting criteria, the evaluation must include the use of the type of data listed in section 360-2.11(a)(2)

of this Subpart. Field reconnaissance to confirm the published information and a morphologic evaluation of landforms must be performed to identify the areas which are likely to have thick low permeable soils available within the study area. The applicant must use the following criteria in the landfill site selection study:

(1) Unconsolidated deposits on the site must be those most likely to minimize the migration of contaminants from the landfill. In evaluating the sites, preferred sites should have the greatest possible thickness of these materials to provide a barrier to contaminant migration into bedrock;

(2) bedrock subject to rapid or unpredictable groundwater flow must be avoided unless it can be demonstrated that a containment failure of the facility would not result in contamination entering the bedrock system resulting in a contravention of groundwater standards;

(3) probable groundwater flow patterns and water quality must be considered in finding areas where containment failure would do the least environmental damage and would be easiest to correct;

(4) proximity and hydrogeologic relationship to water supply sources;

(5) natural topography and its impacts upon the proposed facility; and

(6) relationship to mines, caves, or other anomalous hydrogeologic features that might alter groundwater flow.

(c) Preliminary field investigations must be conducted at the highest ranking available site or sites, to identify any major obstacles to site development, and to provide sufficient data to differentiate among the preferred sites and support a siting decision.

(ii) The report must describe the process used to select the proposed site, including evaluation criteria, deferral (elimination) criteria, assumptions, data sources, decision-making means (such as numerical ranking systems) and other factors used to make the siting decisions. The report must demonstrate that, considering the capabilities and objectives of the applicant, a reasonable range of alternative sites available throughout the planning unit in which the project is proposed were evaluated and that the selected site is the most appropriate alternative. The decision-making process must be described to provide a clear understanding of how and why the siting decisions were made, and at a level of detail sufficient to provide for a comparative assessment of the alternatives discussed. The report must also include maps of sites and describe the results of the field investigations, the comparative advantages and disadvantages of the highest ranked sites, and the basis for selecting the proposed sites.

(c) **Landfill siting restrictions**. In addition to the provisions of section 360-1.7(a)(2) of this Part, the following landfill siting restrictions apply.

(1) Primary water supply, and principal aquifers:

> (i) Except in Nassau and Suffolk Counties, and except as provided in subparagraph (ii) of this paragraph, no new landfill and no lateral or vertical expansion of an existing landfill may be constructed over primary water supply aquifers, principal aquifers, within a public water supply stabilized cone of depression area, or within a minimum distance of 100 feet to surface waters that are actively used as sources of municipal supply. Greater separation distances may be required in accordance with subparagraph (iii) of this paragraph…
>
> (iii) The required horizontal separation between deposited solid waste, and primary water supply aquifers, principal aquifers, public water supply stabilized cone of depression areas, or surface waters that are actively used as sources of municipal supply must be sufficient (based on the rate and direction of groundwater and surface water flow, landfill design and requirements for corrective action in the event of failure of the landfill's containment system) to preclude contravention of groundwater standards in the aquifer and surface water standards in waters that are currently used as a source of municipal drinking water supply…
>
> (5) **Unmonitorable or unremediable areas**. New landfills must not be located in areas where environmental monitoring and site remediation cannot be conducted. Identification of these areas must be based upon ability to sufficiently characterize groundwater and surface water flow to locate upgradient and downgradient directions; ability to place environmental monitoring points which will detect releases from the landfill; ability to characterize and define a release from the landfill and determine what corrective actions may be necessary; and the ability to carry out those corrective actions (emphasis added)[39]

New York's siting criteria also prohibit landfills at "unstable" locations, such as "karst terrain".[40]

10. Applicants' Proposed Wording of Section 27 Amendments

For the foregoing reasons, the Applicants submit that section 27 of the EPA should be reviewed forthwith by the MOE in order to protect the environment and safeguard public health and safety.

If the MOE undertakes the requested review, the Applicants submit that consideration should be given to the following wording for potential amendments to section 27 in order to implement the policies and priorities reflected in the MOE's Guideline B-7 (Reasonable Use).

In particular, the Applicants submit that the EPA should prohibit landfilling in hydrogeologically unsuitable locations, as defined by the Act (or as may be prescribed by

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[39] *Chapter IV: Quality Services. SubchapterB. Solid Wastes. Subpart 360-2: Landfills.*

[40] *Ibid., Subpart 360-2.12(4)(c).* "Karst terrain" is defined as "areas where karst topography, with its characteristic surface and subterranean features, is developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terrains include, but are not limited to sinkholes, sinking streams, caves, large springs and blind valleys."

regulation). As an illustrative example, the Applicants suggest that the following new subsections should be added to section 27 of the EPA in order to more effectively address the issues and problems identified in this EBR Application for Review:

27. (5) No person shall use, operate, establish, alter, enlarge, or extend a waste disposal site in a hydrogeologically unsuitable location.

(6) In subsection (5), "hydrogeologically unsuitable location" means,

(a) an area of land containing fractured bedrock within XX metres of the ground surface, or containing karst topography and features;

(b) an area of land where,

(i) natural attenuation capacity is weak or non-existent; or

(ii) the consequences of failure of the waste disposal site design or operation may cause unacceptable impacts upon communal or private water supplies;

(c) an area of land designated as an Intake Protection Zone, Wellhead Protection Area, Highly Vulnerable Aquifer, or Significant Groundwater Recharge Area in source protection plans approved under the *Clean Water Act, 2005*; or

(d) an area of land prescribed by regulations under this Act as an hydrogeologically unsuitable location.

(7) No person shall apply or re-apply for an environmental compliance approval for a new or expanded waste disposal site if the proposal, or a substantially similar proposal, at the same, or an immediately adjacent, location has already been refused approval under this Act or the *Environmental Assessment Act* for hydrogeological reasons.

If the requested review is undertaken by the MOE, the Applicants hereby request an opportunity to provide further and more detailed input to MOE reviewers on the nature and wording of the potential revisions to section 27 of the EPA.

EVIDENCE SUPPORTING THE REQUESTED REVIEW

The documentary evidence supporting the requested Review is attached hereto as follows:

1. Excerpts from the relevant sections of the EPA and regulations thereunder;

2. Scientific and technical articles re landfill impacts on groundwater;

3. Excerpts from relevant MOE policies, guidelines, and procedures;

4. Relevant documentation from the Richmond Landfill case;

5. Excerpts from the Joint Board decisions re the Halton Landfill and Steetley Quarry Landfill;

6. The MOE SEV under the EBR;

7. Excerpts from landfill siting laws, regulations, standards and rules from other Canadian and U.S. jurisdictions;

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