EB-2011-0242 EGDI
EB-2011-0283 Union

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998*, S.O. 1998, c.15, Schedule B; and in particular section 36 (2) thereof;

AND IN THE MATTER OF an application by Enbridge Gas Distribution Inc. for an Order or Orders approving and setting the cost consequences associated with the purchase of Ontario biomethane by Enbridge Gas Distribution Inc.;

AND IN THE MATTER OF an application by Union Gas Limited for an Order or Orders approving and setting the cost consequences associated with the purchase of Ontario biomethane by Union Gas Limited.

POLLUTION PROBE

CROSS-EXAMINATION REFERENCE BOOK
(Biomethane Proceedings)

April 27, 2012

KLIPPENSTEINS
Barristers & Solicitors
160 John Street, Suite 300
Toronto, Ontario M5V 2E5

Murray Klippenstein
Kent Elson
Tel: (416) 598-0288
Fax: (416) 598-9520

Lawyers for Pollution Probe

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[1] http://www.northlandpower.com/WhatWeDo/PrerevenueProjects/Project.aspx?projectID=280
[2] http://occs.business.athabascau.ca/storage/energyandenvironment/energyandenvironment.pdf
[3] http://www.toronto.ca/legdocs/1998/agendas/council/cc/cc980416/wu3rpt/cl009.htm

Filed: 2012-03-09
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I-12-1
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UPDATED

ENBRIDGE GAS DISTRIBUTION INC.
UNION GAS LIMITED
RESPONSE TO POLLUTION PROBE INTERROGATORY #1

Issues 2.1 & 2.2: Are the proposed costs from landfill and anaerobic digester sources reasonable and appropriate?

Reference: Exhibit B, Tab 1, page 21

Preamble:

One of the potential benefits of purchasing biomethane is a net reduction in Ontario's and Canada's greenhouse gas emissions. Pollution Probe wishes to know the incremental cost of achieving these greenhouse gas reductions ($ per tonne of net greenhouse gas emission reduction).

The incremental cost will be a function of numerous factors including the price paid for biomethane, the price of the alternative supply option (natural gas) and the incremental greenhouse gas emission reductions (net of free-riders) if Enbridge and Union purchase biomethane instead of natural gas.

Interrogatory:

Please provide your best estimates of the incremental greenhouse gas emission reduction costs ($ per tonne) of your proposed procurement programs for biomethane from:

a) landfill gas; and
b) anaerobic digestion.

Please show your calculations and state and justify all of your input assumptions.

Please provide a sensitivity analysis using high and low estimates of the cost of natural gas.

Response:

Please see responses to GEC Interrogatory #1 to #4 (Exhibit I-9-1 to I-9-4) and CME Interrogatory #5 (Exhibit I-6-5).

"Implied GHG Reduction Values" are provided in the table and chart below. A number of assumptions were required to make these calculations, including:

- A range of conventional natural gas market prices, per GJ, of $4, $8, $12. Please see CME #5 d and e for NYMEX future prices (to 2024) and historical WACOG prices (1999 – 2011).
- CO_2 "emission values" have been included for "substitution" and "substitution and emission reduction" impacts based on the conversion factors included at Exhibit B, Tab 1, Appendix 1, page 48. This approach is consistent with the approach used in response to GEC #1 to calculate the requested range of "Relative Values of Carbon". Please refer to GEC #1 for an explanation of the upper and lower ranges of GHG emissions which also apply to this response.

The requested "Implied GHG Reduction Values" have been calculated at each of the proposed upper and lower tiers for RNG prices as proposed in this application. As can be seen in the chart below, 24 different "Implied Values" are presented which are dependent on the following three sets of variables:

- The proposed price of RNG in the program (four different prices, based on high and low for AD and Landfill, $17 - $11, $13 - $6)
- A range of three different conventional natural gas market prices as stated above ($4, $8, $12)
- GHG reduction (t CO_2/GJ) for "substitution only" and GHG reduction (t CO_2/GJ) for "substitution and emission reduction"

These calculations assume that all of the benefits of acquiring RNG as part of system supply are attributable to GHG reductions however, as noted in Pollution Probe's Interrogatory #1, the reduction of greenhouse gas emissions is but one of the potential benefits of purchasing biomethane. The other benefits are outlined at Exhibit B, Tab 1, pages 8 to 10. The actual value of the GHG reductions resulting from the proposed Program would be some fraction of the values shown in the table and chart below.

Table 1

Line No.	RNG Price ($/GJ) (a)	Natural Gas Price ($/GJ) (b)	Premium/ (Discount) ($/GJ) (c) = (a) - (b)	GHG Reduction: Substitution Only[1] (t CO_2/GJ) (d)	GHG Reduction: Substitution and Emission Reduction[2] (t CO_2/GJ) (e)	Implied GHG Reduction Value: Substitution Only ($/t CO_2) (f) = (c) / (d)	Implied GHG Reduction Value: Substitution and Emission Reduction ($/t CO_2) (g) = (c) / (e)
1	$ 17.00	$ 12.00	$ 5.00	0.051	0.428	**$ 98.04**	**$ 11.68**
2	$ 13.00	$ 12.00	$ 1.00	0.051	0.428	**$ 19.61**	**$ 2.34**
3	$ 11.00	$ 12.00	$ (1.00)	0.051	0.428	**$ (19.61)**	**$ (2.34)**
4	$ 6.00	$ 12.00	$ (6.00)	0.051	0.428	**$ (117.65)**	**$ (14.02)**
5	$ 17.00	$ 8.00	$ 9.00	0.051	0.428	**$ 176.47**	**$ 21.03**
6	$ 13.00	$ 8.00	$ 5.00	0.051	0.428	**$ 98.04**	**$ 11.68**
7	$ 11.00	$ 8.00	$ 3.00	0.051	0.428	**$ 58.82**	**$ 7.01**
8	$ 6.00	$ 8.00	$ (2.00)	0.051	0.428	**$ (39.22)**	**$ (4.67)**
9	$ 17.00	$ 4.00	$ 13.00	0.051	0.428	**$ 254.90**	**$ 30.37**
10	$ 13.00	$ 4.00	$ 9.00	0.051	0.428	**$ 176.47**	**$ 21.03**
11	$ 11.00	$ 4.00	$ 7.00	0.051	0.428	**$ 137.25**	**$ 16.36**
12	$ 6.00	$ 4.00	$ 2.00	0.051	0.428	**$ 39.22**	**$ 4.67**

(1) GHG reduction from fuel substitution calculated from pre-filed evidence Exhibit B, Tab 1, Appendix 1, Page 48
= 2,677.7 kt CO2 / (1,373 M m3 * 0.0379 GJ/m3)

(2) GHG reduction from fuel substitution and emission reduction calculated from pre-filed evidence Exhibit B, Tab 1, Appendix 1, Page 48
= 2,677.7 kt CO2 / (1,373 M m3 * 0.0379 GJ/m3) + 10,327.8 kt CO2 / (723 M m3 * 0.0379 GJ/m3)

Figure 1

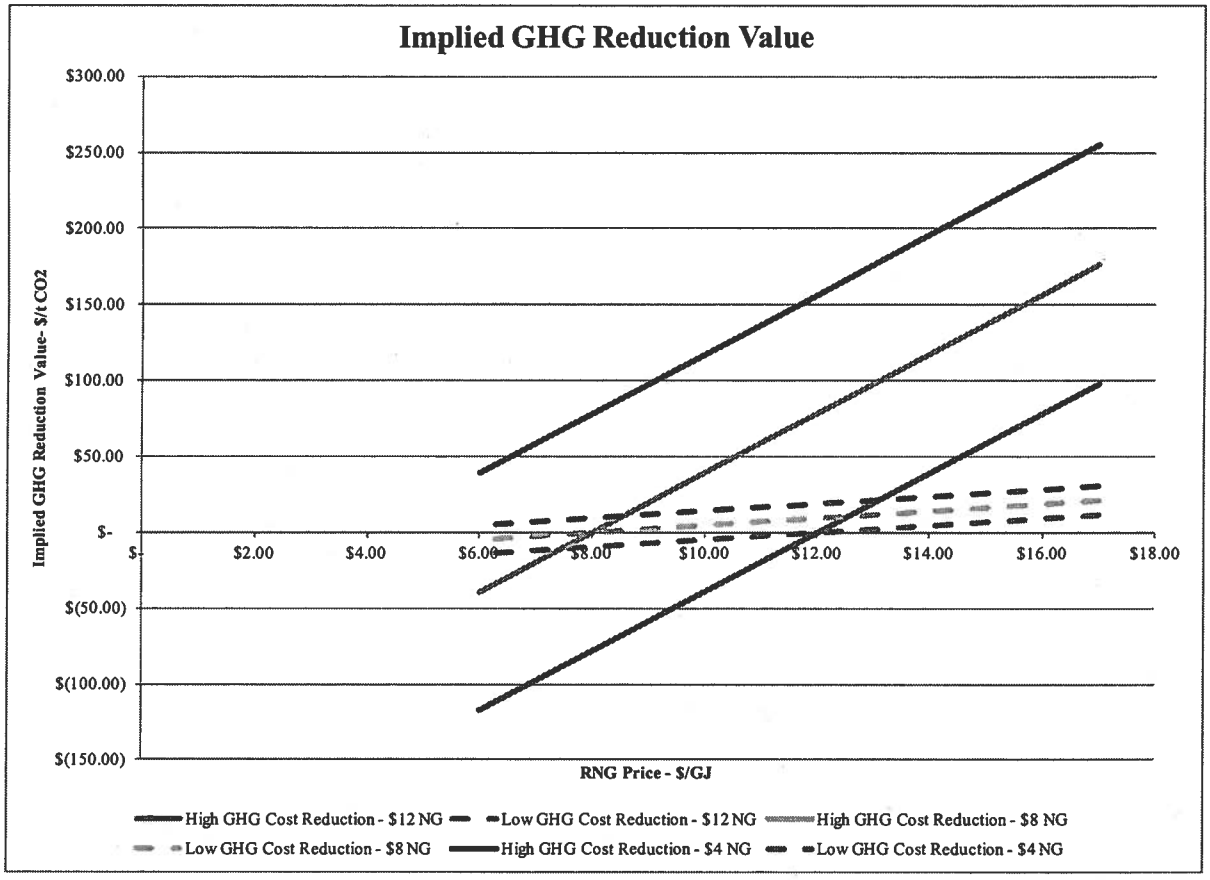
Implied GHG Reduction Value
$300.00
$250.00
$200.00
$150.00
$100.00
$50.00
$-
$(50.00)
$(100.00)
$(150.00)
Implied GHG Reduction Value- $/t CO2
$-
$2.00
$4.00
$6.00
$8.00
$10.00
$12.00
$14.00
$16.00
$18.00
RNG Price - $/GJ
High GHG Cost Reduction - $12 NG
Low GHG Cost Reduction - $12 NG
High GHG Cost Reduction - $8 NG
Low GHG Cost Reduction - $8 NG
High GHG Cost Reduction - $4 NG
Low GHG Cost Reduction - $4 NG

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Exhibit B
Tab 1
Appendix 1

5. GREENHOUSE GAS IMPACT OF METHANE CAPTURE FROM ONTARIO WASTES

The production and capture of RNG from Ontario wastes contributes to GHG reduction through two processes: emission reduction and fuel substitution. Emission reduction can be achieved through the capture of the emitted methane from landfills and the anaerobic digestion of animal manures, in particular hog manures. Figure 8 and Table 17 (Appendix 1) shows the results of our estimates where we assigned a value of 21 times CO_2 for the methane emission reductions. These estimates are based on best case scenario of all landfill gas and 20% of animal manures captured with methane no longer emitted into the atmosphere. Although we are using all landfill emissions to calculate GHG emission avoidance, we recognize that under Ontario regulations, some large landfills will not be permitted to claim carbon credits for the emission avoidance scenario. The manures that are likely to emit methane during storage are those associated with dairy cows and hogs, as these manures are often liquid and thus, stored under anaerobic conditions. Other manures that are stored dry and manures that are applied to land are unlikely to emit significant amounts of methane as these conditions tend to be predominantly aerobic. As shown in Table 7 earlier, only 27% of the methane from the largest landfills is currently captured. However, under government regulations the capture rate at these large landfills will be increasing over the next couple of years.

Fuel substitution applies to the use of RNG to replace any NG produced from fossil fuels. Table 17 and Figure 8 shows the results of our estimates where we assigned a value of 2.87 (NG GHG intensity, t CO_2 eq/t) for fuel substitution (Abboud et al. 2010). The value of 2.87 that we used is similar to the value of 2.79 used in a recent BC report (Electrigaz Technologies, 2008).

Total GHG reductions for Ontario were estimated as 18,984 kt CO_2 eq/yr. Emission reductions contribute slightly more GHG reductions than fuel substitutions in Ontario with 54% of the GHG reductions arising from emission reductions, while the remaining 46% arise from fuel substitution.

5.1 NEAR-TERM GHG IMPACTS FROM ONTARIO WASTES

Of the total GHG reductions, approximately 69% can be realized in the near-term through AD processing of Ontario wastes. This represents 13006 kt CO_2 eq/yr, where

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EB-2011-0283 Union
I-1-8
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ENBRIDGE GAS DISTRIBUTION INC.
UNION GAS LIMITED
RESPONSE TO BOARD STAFF INTERROGATORY #8

1.0 Role of the Utilities

Issue 1.2 - Is the proposed role of both Enbridge and Union in developing and implementing a biomethane program reasonable and appropriate?

Reference: Prefiled Evidence / Exhibit B/Tab 1/Appendix 1/pages v-vi

a) Please list existing biomethane suppliers, both landfill and anaerobic, in Ontario.

b) Please indicate existing suppliers that have infrastructure that can enable connection to the gas distribution systems in the near future without major capital investments.

c) Please provide an estimate of the amount of capital investment (pipeline and infrastructure) required by producers to connect to the distribution system, that would be economically supported under the proposed pricing structure and contractual arrangements?

Response:

a) Only one biomethane supplier exists in Union's franchise area. A WWTP operated by the City of Hamilton is commissioning a project for injection of biomethane into Union's nearby distribution service.

b) In Ontario, there are a number of anaerobic digester and landfill projects either in commercial operation or under development to utilize untreated biogas to generate electricity or for direct use of biogas as a low-heating value fuel supplement. There are no existing suppliers that have infrastructure in place to enable connection to the gas distribution system. Biogas projects in Ontario that the Utilities are aware of include:

- 8 anaerobic digester projects in commercial operation generating electricity under OPA FIT contracts
- 33 additional digester projects awaiting Notice to Proceed under OPA FIT contracts
- 1 landfill gas project in commercial operation generating electricity under OPA FIT contract
- 3 additional landfill projects awaiting Notice to Proceed under OPA FIT contracts
- Biogas projects operating under the OPA Renewable Energy Standard Offer Program (RESOP):
    - Waterloo Landfill, Waterloo, ON

- Seacliff Energy, Leamington, ON
- Woodward Ave. WWTP, Hamilton, ON

- Landfill projects partnering with nearby industry for direct use of biogas as a low-heating value fuel supplement:
  - Cambridge Landfill, Cambridge, ON
  - Walker Environmental Group Landfill, Thorold, ON

c) Please see Exhibit B, Tab 1, Appendix 4, page 60.

NORTHLAND POWER

OUR BUSINESS TECHNOLOGIES FACILITIES PROJECTS JV PARTNERSHIPS

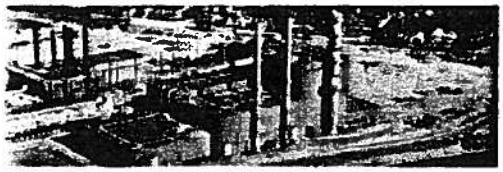
THERMAL

WIND

HYDRO

SOLAR

VIEW ALL



Thorold

Location	Thorold, ON
Overview	Northland's thermal energy plant at Thorold, Ontario, opened on budget and ahead of schedule in 2010. The highly efficient cogeneration facility generates 265 MW of electricity, enough to power to about 100,000 Ontario homes. Steam extracted from the steam turbine combines with steam from two natural-gas- and landfill-gas-fired auxiliary boilers to supply up to 350,000 pounds per hour of process steam per hour to the adjacent AbitibiBowater paper mill. The facility has enabled AbitibiBowater to retire its aging, inefficient steam plant, improving steam supply reliability and the plant's competitiveness while protecting the jobs of its 400 employees. The Thorold cogeneration facility will also help AbitibiBowater reduce pollutant emissions since its parts per million of nitric oxide emissions are significantly lower than those produced by the paper mill's retired steam generator.
	CONTACT: Thorold Cogeneration Station 90 Allanburg Road Thorold, ON L2V 0A8 905.680.5426
Technology	Cogeneration
Main Equipment	One 170 MW General Electric 7FA industrial gas turbine; one 95 MW steam turbine
Fuel	Natural gas, landfill gas
Capacity	265 MW
Opened/Acquired	2010
Agreements	OPA power purchase agreement to 2030; steam supply agreement with AbitibiBowater to 2030
Northland roles	Developer, owner, operations management
Documents	NOTICE OF APPLICATION AND WRITTEN HEARING Thorold CoGen L.P. Application for Electricity Retailer Licence AVIS DE REQUÊTE ET D'AUDIENCE ÉCRITE de Thorold CoGen L.P. en vue d'obtenir un permis de détaillant d'électricité

Energy Conservation:
The Interim Solution?

Anne Papmehl

ABSTRACT

Renewable energy technologies are the solutions of the future. However, climate change, global warming, rising energy prices and demand are urgent problems of the present. Without dependable, cost-effective and widely-available GHG-free technologies, how are we to solve these energy issues in the near term?

Energy conservation is being heralded a viable transitional energy solution, a bridge between the carbon and renewable age. The benefits are many: it can be done immediately with existing technologies, it buys time and it works. Efficiency efficient technologies, coupled with wise management practices, can help to preserve the existing fossil fuel resource for future generations, enable a company meet its Kyoto targets and save it money, until full scale adoption of renewable energy becomes feasible.

This paper examines what is being done to increase energy efficiency and conservation in Canadian organizations of varying sizes in the industrial, institutional and commercial (IC&I) sectors. What technological innovations are they using and what management practices are they applying? How are measures like energy retrofits, equipment upgrades, waste management practices, on site co-generation, process integration and re-design, fleet and logistics management, energy measurement and energy awareness initiatives helping these organizations to reduce emissions, save money and increase productivity? How are these projects funded and what ancillary co-benefits are these organizations gaining from their conservation efforts? Finally, what can they teach other organizations?

Key words: conservation, incentives, management, innovation, integration and efficiency

Energy conservation is the first thing that comes to mind when all other variables are fixed and there is pressure to lower energy costs. As often said, a units of energy saved, is a unit of energy generated.

Yet conservation does not get as much attention as other solutions that are long-term measures and require a significant amount of investment. Conservation can be applied immediately and its benefits can be felt right away.

This chapter discusses some cases of Canadian organizations that have adopted energy conservation and outlines their financial and environmental successes.

The author argues, with the help of these case studies, that conservation helps reduce emissions and has a cost advantage over construction of new power generation units to meet increasing demand. The author suggests that without addressing demand side consumption, there is little hope of solving energy challenges in the future.

Anshuman Khare

Gerdau Ameristeel Corporation[12]

Another way in which waste management can influence energy conservation is by converting waste into fuel, known as energy from waste (EFW). One EFW technology that has gained prominence in recent years is the capture and flaring of methane gas from landfill sites to offset natural gas use. The landfill gas (LFG) represents a readily available source of fuel that would otherwise lie dormant, and the act of turning that LFG into fuel alleviates some of the adverse environmental and social impacts associated with the landfill itself such as gas migration, foul odours, potential for explosion and toxins seeping into groundwater.

In 1995, the Regional Municipality of Waterloo installed a system to extract and flare off methane gas produced by the decomposing waste at a landfill site in nearby Cambridge, Ontario. One year later, the Region formed a partnership with Gerdau Ameristeel Corporation, a recycler of post-consumer and industrial scrap metal (then operating under the name Gerdau Courtice Steel) to use previously flared landfill gas to offset natural gas consumption at its adjacent mill site.

In 1996, the Region drilled 44 vertical gas-collection wells into the landfill and installed a system to extract, remove moisture and flare off the methane gas that was being produced by the decomposing waste, primarily from the landfill's perimeter. The Region also increased the amount of material used to cover the landfill to ensure efficient capture of the LFG.

Gerdau expanded the collection facility to 62 wells in 1998, and installed a comprehensive system to extract and pressurize the LFG, then deliver it via a 200-millimeter (8-inch) diameter pipeline directly from the landfill site to the reheating furnace at the steel plant. The furnace was modified to run entirely on landfill gas, supplemented by natural gas when higher energy inputs are needed.

In terms of costs, the Region installed and funded the well field and collection/flare system and owns 95 per cent of the collection facility. Gerdau funded the utilization system, which the Region operates, without any government assistance. The original capital cost to Gerdau was $900,000.

With modifications completed by September 1999, Gerdau started using the methane gas as energy for its reheat furnace facility. The original installation was commissioned to deliver approximately 1,000 cubic feet per minute. However, when subsequent studies showed that there was more gas in the landfill than previously expected, Gerdau invested another $1 million in 2004 to increase the flow rates. The system can now deliver more than 1,800 cubic feet per minute (CFM) with a target average of 1,400 to 1,450 CFM. On a yearly basis this amounts to approximately 374 million cubic feet (or 10.41 million cubic metres) of LFG flowing from the landfill to the steel plant.

Today, between 30 to 35% of Gerdau's energy input for the reheat furnace comes from LFG, and the plant avoids approximately 118,000 tons of CO_2e emissions per year.[13] The company reports significant cost savings as well, but does not disclose the amounts as they are proprietary.

Gerdau's agreement with the Regional Municipality will extend for twenty years from the time it first started utilizing the LFG in 1999. Although the Cambridge landfill officially closed at the end of 2003, the waste deposited there will continue to generate methane through anaerobic (where oxygen and moisture are

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[12] The information and data cited in this section are based on information supplied to the author by the organization.

[13] CO_2e stands for CO_2 equivalent. Other GHG emissions are weighted by a factor that represents their global warming potential expressed in equivalent CO_2 units and included in the CO_2 total.

absent) decomposition until about 2019. After that time, the methane production is expected to drop to the point where it will no longer be economically feasible to pipe it to the mill. Gerdau will go off line and the Region will flare off the remaining gas.

Maple Leaf Foods[14]

Maple Leaf Foods is a Canadian food processing company, operating over 100 plants across Canada, the U.S. and Europe. Being in an energy-intensive industry, the company's energy costs have been running high, at over $100 million per year. Faced with the prospect that these costs will go even higher, the company established an energy council in 2001 and began a company-wide energy management strategy.

In the same year, the company set an annual energy reduction goal of 3%. Over a five-year period (2001-2006), Maple Leaf has met this target consistently, while saving more than $15 million. No data is available on emissions reductions since the company is not currently tracking this.

The company attributes much of its energy-saving success to its efforts in developing awareness and culture-building initiatives around energy conservation. Maple Leaf is a study in how to engage employees, leverage, capture and share their knowledge on energy conservation in a company where employees are spread over a large geographical area.

Some words about the company's corporate structure will help to explain how Maple Leaf accomplishes this. The company is divided into six independent operating companies (IOCs), each of which contains a number of individual plants. Each IOC has its own energy champion who reports to the corporate energy champion.[15] At the plant level, the energy champion is typically the plant manager, although he or she may delegate that function to the maintenance manager of chief engineer.

Energy teams, consisting of employees from different areas of the plant, are a key resource to developing and implementing energy saving ideas. The teams work closely with the engineers, so that ideas may be evaluated and implemented quickly. Each energy champion is involved in creating, implementing and managing energy savings projects that take place under his or her IOC and reporting them to the corporate energy champion. The energy coordinator, who also reports to the corporate energy champion, collects all project data, new information, ideas and suggestions from the plants and tailors that information to the needs of a broader company audience by putting this information on a shared drive, so that one plant can learn from another.

With many energy projects taking place across the company, Maple Leaf has a formidable challenge in managing the new energy saving information that comes from the plants and sharing it with other plants. A dedicated Intranet portal disseminates energy knowledge and ideas across the company. The portal can be accessed by all employees and contains a range of information and topics: data on every single energy project undertaken (including how it was done, the challenges it faced and whether it succeeded), what is expected of an energy champion, incentives, initiatives and training programs. The portal also contains a comprehensive technical library, from which employees can access information on matters such as boilers, cogeneration, compressors, pumps, steam systems and lighting systems. With information in one place, the need for time-consuming 'google' searches is eliminated.

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[14] The information and data cited in this section was collected through an interview with the Energy Coordinator, Corporate at Maple Leaf Foods.

[15] Fairly new terms in the corporate lexicon, energy champions and energy leaders are individuals within the organization who can rally both executives and staff in achieving company wide awareness and implementation.

- Accessing City Hall
- Mayor
- Councillors
- Meeting Schedules

City of Toronto Council and Committees

All Council and Committee documents are available from the City of Toronto Clerk's office. Please e-mail clerk@city.toronto.on.ca.

Keele Valley Landfill Mining and Gas Collection

The Works and Utilities Committee recommends the adoption of the report dated March 10, 1998, from the Interim Functional Lead for Solid Waste Management.

The Works and Utilities Committee reports, for the information of Council, having requested the Commissioner of Works and Emergency Services to:

(1)review the proposal for the mining of the Keele Valley Landfill Site in five years= time; and

(2)investigate whether there are any other landfill sites within City boundaries that might be suitable for consideration.

The Works and Utilities Committee submits the following report (March 10, 1998) from the Interim Functional Lead for Solid Waste Management:

Purpose:

To provide information on the potential for landfill mining at the Keele Valley Landfill Site.

Funding Sources, Financial Implications and Impact Statement:

There are no funding implications from our recommendations.

Recommendation:

It is recommended that landfill gas (LFG) collection and utilization continue at the Keele Valley Landfill Site, and that landfill mining not be considered.

Council Reference/Background/History:

On February 11, 1998, the Works and Utilities Committee requested the Interim Functional Lead for Solid Waste Management to prepare a report on the feasibility and impact of mining the Keele Valley Landfill Site.

Discussion:

Landfill mining is the process of recovering usable materials from a landfill. Landfill mining can be an effective method to reclaim valuable landfill space, and may provide revenue from the recovery and sale of recyclable materials. However, a landfill mining program will interfere with the LFG collection system at the Keele Valley Landfill Site. It would create additional truck traffic and noise impacts in a community which is adamantly opposed to any extension of landfill operations. A landfill mining project would also be subject to an Environmental Assessment. Due to the development within the community and the potential environmental impacts associated with landfill mining, it would be difficult to obtain approval for the project. Therefore, the collection of LFG must take precedence.

Landfill gas is produced by the biological decomposition of wastes placed in the landfill and is comprised of methane, carbon dioxide, nitrogen, oxygen and trace quantities of other gases. The Keele Valley Landfill Site has an LFG collection system comprised of approximately 30,000 metres of horizontal collection trenches and 1,500 metres of vertical wells within the solid waste mass, dual LFG headers, and a network of gas migration monitoring probes.

If LFG is not collected and burned under controlled conditions, LFG may have an impact on the environment and the surrounding community. The main components of LFG, methane and carbon dioxide, are primary greenhouse gases. Landfill gas also contains trace quantities of other gases such as hydrogen sulphide, and mercaptans which, if released to the atmosphere, may cause off-site odours. A landfill mining program would require the removal of interim and final cover which could cause

excessive LFG to be released to the atmosphere. A mining project would also interfere with the existing network of LFG collection systems and the continual construction of new collection systems.

In 1995, the City of Toronto (formerly Metropolitan Toronto) committed to a 20-year contract to provide LFG from the Keele Valley Landfill Site to a private power generator. The LFG is used as a fuel to generate electricity which is sold to Ontario Hydro. Toronto has received $2.78 million in net royalties from the sale of landfill gas which has been extracted and converted to electricity at the Keele Valley Landfill Site since May 1995. In 1998, net royalties from the sale of Keele Valley landfill gas are expected to be $1.17 million. The Keele Valley Landfill Site will continue to generate landfill gas well beyond the year 2015 for which Toronto, under contract with Eastern Power Limited, will receive royalties in excess of $20 million from electricity sales.

In 1997, a $600 million class action lawsuit was commenced against the former Municipality of Metropolitan Toronto alleging that the Keele Valley Landfill Site is a source of odours and a nuisance for the community. The certification motion was argued on February 25 and 26, 1998. The decision of the judge is under reserve. Given the class action, the City should not undertake any project which may be perceived to adversely affect the gas collection system or to generate odours and increase the nuisance potential of the landfill. Any action that may prejudice the gas collection system may increase Toronto=s potential exposure to liability.

The Region of York has expressed its opposition to a landfill mining project occurring at the Keele Valley Landfill Site. On January 15, 1996, the former Municipality of Metropolitan Toronto received a communication from the Regional Municipality of York, forwarding a copy of Clause No. 7 of Report No. 1 of the Regional Transportation and Works Committee, entitled ALandfill Mining, Keele Valley Landfill Site@. Regional Council, by adoption of the foregoing clause, advised Metropolitan Toronto that the Region opposed any consideration of landfill mining at the Keele Valley Landfill Site.

Any proposal regarding landfill mining would require environmental assessment compliance and approvals.

Conclusions:

A landfill mining program would negatively impact revenue from the LFG utilization project and could affect the environment and the local community, and therefore is not a feasible option at this time.

Contact Name:

D. Angove, P. Eng., Engineer - Operations

Solid Waste Management Division

Phone: (416) 392-3701; Fax: (416) 392-4754

E-mail: Derek_Angove@metrodesk.metrotor.on.ca

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Plus Attachment

ENBRIDGE GAS DISTRIBUTION INC.
UNION GAS LIMITED
RESPONSE TO VECC INTERROGATORY #3

1.0: Role of the Utilities

References: Exhibits B Tab 1Page 7 of 28: Exhibit B Tab 1 Appendix 1 Table 8 page 18

Preamble:

In June 2008, amendments to Ontario Regulation 232/98 and Revised Regulations of Ontario 1990, Regulation 347 under the *Environmental Protection Act* resulted in requirements for all landfills emitting in excess of 1.5 million m3 to collect landfill gas and flare it or use it in a manner that achieves a similar end. These requirements had previously applied only to landfills emitting in excess of 3 million m3, and to those landfills that were new and expanding.

a. What is the target for the landfill gas RNG program-Landfills falling under Reg 347 or those that are under the threshold?

b. How many of the former (>1.5 MMm3) and how many of the latter (<1.5MMm3)?

c. Provide Lists and locations and legal ownership.

d. Indicate which are in each Utilities franchise area and which are already capturing emissions and or utilizing the energy (or will do so in the near future)

e. Map the sites based on proximity to the Union and EGD transmission and distribution systems including compression and storage facilities.

f. Do EGD and Union plan to procure RNG from landfills other than those listed in this response? If yes provide additional details.

Response:

a. The Utilities do not have a "target" for any landfill gas projects whether under Reg 347 or under the Reg. 347 threshold.

b. As per part a), there are no "targets".

c. A list large landfill sites (defined as having capacities greater than 1.5 MM m^3) is presented in the filed evidence, Exhibit B, Tab 1, Appendix 1, pages 18-19. A list of small landfills

with capacities less than 1.5 MM m³ can be obtained from Landfill Inventory Management Ontario (LIMO) at:
http://www.ene.gov.on.ca/environment/en/monitoring_and_reporting/limo/index.htm.

The complete dataset, as of January 12, 2011, contains over 2,400 sites. Information regarding site location relative to the Utilities franchise areas is presented in the filed evidence, Exhibit B, Tab 1, Appendix 1, pages 17-18.

d. The following table is compiled from information publicly available from Landfill Inventory Management Ontario ("LIMO").

http://www.ene.gov.on.ca/environment/en/monitoring_and_reporting/limo/STD01_078377.html

Details regarding emissions capture are not available from LIMO for small landfills.

Name	Required to Collect Landfill Gas	Landfill Gas Collected
Bensforth Rd - Peterborough	Yes	Yes
City of Thunder Bay Solid Waste and Recycling Facility	Yes	Yes
Cornwall Landfill - Cornwall	Yes	Yes
Deloro Landfill	No	No
EWSWA Regional Landfill - Essex Windsor	Yes	Yes
Glanbrook - Hamilton	Yes	Yes
Green Lane - St. Thomas	Yes	Yes
Halton Regional Landfill - Milton	Yes	Yes
Humberstone - Niagara Region	Yes	No
Lafleche - Stormont	Yes	Yes
Lindsay-Ops - Kawartha Lakes	Yes	Yes
Line 5 Landfill - Sault Ste. Marie	Yes	Yes
Merrick Landfill - North Bay	Yes	Yes
Mohawk Street - Brantford	Yes	No
Newalta Stoney Creek Landfill	Yes	Yes
Niagara Regional Road 12 - Niagara Region	No	No
Petrolia - Lambton	Yes	Yes
Richmond - Napanee	Yes	Yes
Ridge Landfill - Blenheim	Yes	Yes
Salford - Oxford County	Yes	No
Sandy Hollow - Barrie	No	No
Springhill - Ottawa	No	No
Stratford - Stratford	Yes	No
Sudbury Regional Landfill	Yes	Yes
Tom Howe - Haldimand	Yes	Yes

Trail Road - Ottawa	Yes	Yes
W12A - London	Yes	Yes
Walker Bros Landfill	Yes	Yes
Warwick - Lambton	No	No
Waterloo Landfill	Yes	Yes
West Carlton - Ottawa Carp Rd	Yes	Yes
WSI - Ottawa - Navan Rd	Yes	No

e. See maps attached as Attachment 1.

f. Per a. and b. above, the Utilities have no targets.

Incremental Cost of Greenhouse Gas (GHG) Reductions from Wind Power

(i.e. Implied GHG Reduction Value of Wind Power)

Wind Power Feed-in-Tariff [1]	Wind Power GHG Emission Rate[2]	Natural Gas Commodity Cost	Cost of Electricity from Combined-Cycle Gas Turbine[3]	Combined-Cycle Gas Turbine GHG Emission Rate[4]	Implied GHG Reduction Value
11.5 cents per kWh	12 grams per kWh	$8 per GJ	9.1 cents per kWh	290 grams per kWh	$86 per tonne[5]
11.5 cents per kWh	12 grams per kWh	$4 per GJ	6.2 cents per kWh	290 grams per kWh	$191 per tonne[6]
11.5 cents per kWh	12 grams per kWh	$2 per GJ	4.7 cents per kWh	290 grams per kWh	$245 per tonne[7]

[1] *Ontario's Feed-in Tariff Program: Two-Year Review Report*, (March 2012), Appendix 4.

[2] Ontario Power Authority, *Supply Mix Analysis Report,* Volume 2, (December 2005), p. 199.

[3] Assuming an annual capacity factor of 50%. See Ontario Power Authority, *Integrated Power System Plan*, Exhibit I, Tab 31, Schedule 86, p. 1.

[4] Ontario Power Authority, *Supply Mix Analysis Report,* Volume 2, (December 2005), p. 213.

[5] [(11.5 – 9.1 cents)/(290 – 12 grams) x 1,000,000] = $86 per tonne.

[6] [(11.5 - 6.2 cents)/(290 – 12 grams) x 1,000,000] = $191 per tonne.

[7] [(11.5 – 4.7 cents)/(290 – 12 grams) x 1,000,000] = $245 per tonne.

EB-2011-0242 EGDI
EB-2011-0283 Union

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act*, 1998, S.O. 1998, c. 15, (Schedule B); and in particular 36 (2) thereof;

AND IN THE MATTER OF an application by Enbridge Gas Distribution Inc. for an Order or Orders approving and setting the cost consequences associated with the purchase of Ontario biomethane by Enbridge Gas Distribution Inc.;

AND IN THE MATTER OF an application by Union Gas Limited for an Order or Orders approving and setting the cost consequences associated with the purchase of Ontario biomethane by Union Gas Limited.

RESPONDING ARGUMENT OF UNION GAS
(Pollution Probe Motion for Full and Adequate Interrogatory Response)

A. OVERVIEW

1. Pollution Probe brings this motion to compel the Utilities to provide an estimate of the amount of biomethane that is already being captured and used for energy use that would be purchased by the Utilities under the biomethane program at issue in this application (the "Diverted Amount"). While it does not have particulars, Union believes that the Diverted Amount would be a very small amount of the biomethane purchased under the program and Union does not currently purchase any biomethane. Pollution Probe seeks an estimate of the Diverted Amount because Pollution Probe wishes to know the extent to which the program will cause a net reduction in greenhouse gas emissions, or, as Pollution Probe has termed it, a reduction in greenhouse gas emissions "net of free-riders".

2. Union has answered Pollution Probe's interrogatory. Union agrees that causing a net reduction in greenhouse gas emissions is an important benefit of the program, but, as Union has informed Pollution Probe, at this time Union does not have sufficient information to make and justify an assumption about the Diverted Amount, though Union believes it to be very small, if not zero. Union is aware of only one biomethane supplier--a waste water treatment plant

operated by the City of Hamilton--that exists in Union's franchise area and has expressed an interest in selling biomethane to Union under the program.[1] That supplier's potential contribution would be *de minimis* with respect to the project as a whole. As a result, Union has not included the Diverted Amount as an input assumption in its joint response with Enbridge to Pollution Probe's interrogatory, nor was Union required to do so by virtue of the fact that Pollution Probe made reference to a free-rider amount in the preamble to its interrogatory. On this motion Pollution Probe seeks to compel Union, in effect, to guess the quantum of the Diverted Amount, notwithstanding that Union has not included the Diverted Amount as an input assumption in its joint answer with Enbridge and notwithstanding that it does not have sufficient information to address the issue beyond stating that it is Union's belief that the Diverted Amount is *de minimis*.

3. The Utilities have answered the interrogatory and should not be compelled to hazard guesses that will be of no assistance to the Board on this application. The Board's process does not and cannot accommodate such a multi-staged interrogatory process. The motion should be dismissed.

B. FACTS

4. In its interrogatory at Tab 2 of Pollution Probe's motion record, Pollution Probe requested the Utilities' best estimates of the incremental greenhouse gas emission reduction costs, in dollars per tonne, of the Utilities' proposed procurement programs for biomethane from landfill gas and anaerobic digestion. Pollution Probe further asked that the Utilities show their calculations and state and justify all input assumptions.

5. In their updated common response to Pollution Probe's interrogatory at Tab 3 of Pollution Probe's motion record, the Utilities show their calculations and state and justify all input assumptions.

6. In an email to Pollution Probe's counsel dated March 25, 2012, attached at Tab A of this record, counsel for the Utilities advised that the Utilities had insufficient information to address the topic of the Diverted Amount.

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[1] See Board Staff IR#8 and LPMA IR#3.

7. In a further email to Pollution Probe's counsel dated April 4, 2012, attached at Tab B of this record, counsel for the Utilities advised that the Utilities currently do not purchase any RNG and the Diverted Amount is likely very small, if it is above zero.

8. Union is not aware of evidence that suggests that the Diverted Amount would be greater than a *de minimis* amount, nor has Pollution Probe adduced such evidence. Union does not see how guessing the quantum of the Diverted Amount, which Union has no means of calculating but believes to be *de minimis*, will be of assistance to the Board in deciding this application.

C. ISSUES

9. Should the Utilities be required to guess the Diverted Amount and provide information to justify the reasonableness of that guess?

D. SUBMISSIONS

10. The Utilities should not be required to guess the Diverted Amount and provide information to justify the reasonableness of that guess because:

(a) the Utilities have answered Pollution Probe's interrogatory,

(b) in any event, the Utilities should not be required to guess the Diverted Amount as that guess will be of no assistance to the Board in deciding this application; and

(c) the Board's process does not and cannot accommodate a multi-staged interrogatory process of the kind that this is becoming.

The Utilities have answered Pollution Probe's interrogatory

11. The Utilities have answered Pollution Probe's interrogatory in their updated common response at Tab 3 of Pollution Probe's motion record. In their answer the Utilities show their calculations and state and justify all input assumptions. The Utilities answer is full and adequate, as required by Rule 29(a) of the Board's *Rules of Practice and Procedure*.

12. Union has not included the Diverted Amount as an input assumption in its joint response to Pollution Probe's interrogatory because while Union believes the Diverted Amount to be *de*

minimis, Union has insufficient information to provide an estimate of the Diverted Amount that can be justified with reference to any evidence.

13. The fact that Pollution Probe made reference to a free-rider amount in the preamble to its interrogatory does not oblige Union to make up a number for the Diverted Amount and treat it as an input assumption for the purposes of the calculation provided in answer to Pollution Probe's interrogatory when, in fact, Union has insufficient information to provide an estimate of the Diverted Amount, beyond Union's stated belief that the Diverted Amount is *de minimis*.

The Utilities should not be required to guess the Diverted Amount

14. The purpose of all evidence adduced in a hearing before the Board is to assist the Board in making a decision. Only evidence that is relevant to an issue in the application that must be decided by the Board can be of assistance to the Board in its decision making. The Board will only direct a party to provide a response to an interrogatory if the Board is persuaded that the interrogatory relates to an issue in the application before it, and the response to the interrogatory is likely to adduce evidence that is relevant and helpful to the decision it must make.

Toronto Hydro-Electric System Ltd. (Re), EB-2009-0139, para. 9

15. Union should not be required to guess the Diverted Amount, beyond stating its belief that the Diverted Amount is *de minimis*, as that guess will be of no assistance to the Board in deciding any issue before it on this application.

The Board's process does not and cannot accommodate a multi-staged interrogatory process

16. No further responses from the Utilities are warranted or necessary for the effective conduct of the proceeding. The Board's process does not and cannot accommodate a multi-staged interrogatory process.

Union Gas Ltd. (Re), EB-2005-0520, paras. 10, 14

17. The Utilities' communications with Pollution Probe about its interrogatory are becoming a multi-staged interrogatory process. Pollution Probe will have an opportunity to cross-examine on this issue at the hearing. This multi-staged interrogatory process should end.

E. CONCLUSIONS

18. This motion should be dismissed.

April 5, 2011

Torys LLP
Suite 3000
79 Wellington St. W.
Box 270, TD Centre
Toronto, Ontario
M5K 1N2 Canada

Alexander C.W. Smith (LSUC#: 57578L)
Tel: 416-865-8142
Fax: 416-865-7380
asmith@torys.com

Lawyers for Union Gas Limited

TO: Klippensteins
Barristers & Solicitors
160 John Street, Suite 300
Toronto, Ontario M5V 2E5

Murray Klippenstein (LSUC# 26950G)
Kent Elson (LSUC#: 57091IH)
Tel: 416-598-0288
Fax: 416-598-9520

Subject: Renewable Natural Gas Proceeding
From: Fred Cass <fcass@airdberlis.com>
Date: 4/11/2012 8:02 PM
To: "'kent.elson@klippensteins.ca'" <kent.elson@klippensteins.ca>
CC: "'Edith Chin'" <Edith.Chin@enbridge.com>, "'trevor.maclean@enbridge.com'" <trevor.maclean@enbridge.com>, Norm Ryckman <Norm.Ryckman@enbridge.com>, "'Smith, Alexander'" <asmith@torys.com>

Kent

It appears from your letter dated April 10, 2012 to the Ontario Energy Board with regard to Pollution Probe's motion in the Renewable Natural Gas proceeding that you are seeking separate confirmation that "Enbridge's estimate of the free rider rate is the same as Union's". It is indeed the case that Enbridge's estimate of the free rider rate is the same as that of Union. I apologize for not explicitly stating this to you, but I assumed that it was understood because the response to Pollution Probe's interrogatory that has given rise to this issue about free rider rates is a joint response of both Enbridge and Union. In your April 10th letter, you have also asked about information in the possession of Enbridge that might justify the Enbridge and Union estimate of the free rider rate. You will find Enbridge's information in this regard in the responses to Interrogatories 2 and 3 from Canadian Manufacturers & Exporters (Exhibits I-6-2 and I-6-3).

I trust that you now have the information from Enbridge sought by Pollution Probe.

Fred

Frederick D. Cass

T 416.865.7742
F 416.863.1515
E fcass@airdberlis.com

Brookfield Place • 181 Bay Street
Suite 1800 • Box 754
Toronto ON • M5J 2T9 • Canada
www.airdberlis.com

http://www.airdbe