Planning and Development
Services Department

December 5, 2008

Jo-Anne Butler
Vice President Electric Resources
Ontario Power Authority
120 Adelaide Street West
Suite 1600
Toronto, On. M5H 1T1

Agatha Garcia-Wright
Director of Environmental Assessments and Approvals Branch
Ministry of the Environment
2 St. Clair West, 14th Floor
Toronto, On. M4V1L5

Dear Ms Butler and Ms Garcia-Wright:

Re: Environmental Review Reports, Environmental Assessments submitted in response to the RFP from the Ontario Power Authority for a proposed 350MW Peaking Plant for Northern York Region and Southern Simcoe County
Proponents: Northland Power, Pristine Power, Sithe Global

This letter provides comments from York Region staff in response to the Environmental Review Reports (ERR) completed by Northland Power, Pristine Power and Sithe Global for each of their Environmental Screening Process Assessments submitted in response to the RFP by the Ontario Power Authority for a 350MW peaking plant. Comments are provided on the OPA process in general, and for individual projects for specific sites. Our comments deal with the following three areas:

- conformity to the infrastructure requirements of Policy 4.2.1.2 of the Greenbelt Plan provided by Regional Planning staff;
- impacts on groundwater provided by the Regional Environmental Services Department; and,
- Impacts on human health and the environment obtained from a Peer Review of the proponents Human Health and Environmental Risk Assessments.

On November 7, 2008, the Ontario Power Authority released the names of the proponents and submissions received in response to their RFP. Five of the six proposals are located within York Region. Proponents in York Region have completed an Environmental Review Report (ERR) for each of their site(s) and filed the related Notice of Completion. Each Environmental Review Report exceeds 500 pages and requires comments be submitted within a 30-day timeframe. The

30-day timeframe ends during the first week in December 2008. It is noted that Northland Power has advised that they are agreeable to an extension of the commenting timeframe to January 2, 2009.

On November 20, 2008, Regional Council adopted Clause 4 of Report No. 10 of the Planning and Economic Development Committee, which recommended among other things, that "the Ontario Power Authority extend the commenting period for the Environmental Screening Process Assessments until after OPA has made a decision on the preferred site which is expected in early January 2009" (see copy of report attached).

Regional staff reiterate this request and again recommend that the commenting timeframe be extended till after OPA makes its decision. This enables staff to focus a review on the selected site and not have all proponents undertake additional work if their site is not selected.

Since the time of Regional Council's resolution, Regional staff have completed a review of the ERR and engaged a consultant to peer review the Human Health and Environmental Risk Assessment.

Comments in respect to the Greenbelt Plan

The proponents for the 4 sites located within the Greenbelt Plan area have provided an assessment of how each proposal addresses process of the Greenbelt Plan. *Attachment No. 2* to this letter provides Regional Planning comments on the Environmental Review Reports for each site in terms of the policies set out in Section 4.2.1.2 of the Greenbelt Plan. Section 4.2.1.2 of the Greenbelt Plan provides a series of policies, criteria, and technical parameters which the proponents are required to meet. Section 4.2.1.2 requires infrastructure to:

- be designed and constructed to minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System;
- minimize, wherever possible, the negative impacts and disturbance of the existing landscape;
- avoid key natural heritage features or key hydrologic features;
- where reasonable, maintain or improve connectivity; and,
- where practicable, support and reinforce the rural and existing character of the Protected Countryside.

As policy 4.2.1.2 deals primarily with minimizing negative impacts to the Greenbelt landscape, and minimizing ecological and hydrogeological impacts, the comments from the Lake Simcoe Region Conservation Authority are instrumental in determining if Section 4.2.1.2 has been addressed. Comments from the Lake Simcoe Conservation Authority are appended to this letter.

From a Regional Planning perspective, the proponents must fully indicate how their proposal addresses Section 4.2.1.2. Regional Planning staff recommend that the proponent chosen by the Ontario Power Authority provide the additional information to address Section 4.2.1.2 to the satisfaction of York Region and the Lake Simcoe Conservation Authority prior to award of the power contract.

Groundwater
Regional Environmental Services staff have reviewed the EA documents for each site and verified the site location in respect to wellhead protection areas and significant recharge areas, as per the *Clean Water Act*. Staff have also verified the location of private wells and potential interference. Environmental Services staff have indicated that none of the sites generate issues from a Regional water resources perspective. The Sithe Global site is located in a significant recharge area; however it is located in a municipal water service area and the proponent has provided a spill response plan.

Human Health and Environmental Risk
York Regional Council requested that each proponent provide a Human Health and Environmental Risk Assessment for each site. Regional staff have engaged the firm of Jacques Whitford, Environmental Engineers and Scientific Management Consultants, to peer review the Human Health and Environmental Risk Assessments submitted by the proponents in conjunction with their ERR's. The firm of Jacques Whitford has advised that although methodology and approach varied amongst the three different consultants, all arrived at the same conclusion that the construction and operation of natural gas-fired electrical generating facilities would not pose an undue risk to either human or ecological receptors. These findings are supported by their peer review. While the peer reviewers agreed with the overall conclusion in the Human Health and Environmental Risk Assessment conducted by each of the consultants, they did note specific areas in each report that require clarification or potential improvement.

Conclusions from Jacques Whitford for each specific site are noted below. A copy of the Jacques Whitford peer review is attached to this letter.

Northland Power – 1170 Miller Road, King Township Site, Northland Power – 18156 Dufferin Street, King Township Site, and Northland Power – 1160 Holborn Road, East Gwillimbury Site

Staff from Jacques Whitford have advised that the assessment of the Northland Power air modeling, risk assessment and supporting information concludes that measurable adverse effects on human health or agricultural crops are not expected. Despite noted differences in scientific opinions and approaches identified within the reports, the reviewers concluded that overall the conclusions are supported by the assessment performed.

Sithe Global – 48 Sluse Road, East Gwillimbury Site

Staff from Jacques Whitford have advised that the air modelling, risk assessment report and supporting documentation of the Sithe Sluse Road Peaking Station concludes that emissions from the proposed facility will not result in a health risk to human or ecological receptors. Although there are several comments for clarification or potential improvement, the peer review concluded that the assessment adequately supports the conclusion that the project will not result in measurable undue risks to health or the environment.

Pristine Power – 18781 Dufferin Street, King Township Site

Staff from Jacques Whitford have advised that the assessment of the York Energy Centre LP air modelling, risk assessment and supporting documentation concludes that measurable adverse

effects on human health and ecological receptors are not expected. A number of areas for potential improvement were noted by the reviewers; however, the conclusions of no elevated risk are supported by the assessment. It is agreed that the reported potential elevated health risks associated with exposure to NO_x, SO_2 and PM_{10} most likely correspond to extreme air quality events, would occur only on a very infrequent basis, and the proposed facility would not be expected to measurably impact air quality related to such extreme events.

With respect to the Human Health and Environmental Risk Assessment, and based on the peer review and discussion with the peer reviewer, the Public Health Branch staff recommend that, once the Ontario Power Authority has selected a submission/site, the proponent be requested to: 1) address the areas identified by the peer reviewer as needing clarification, and; 2) include an analysis of any frequency of exceedances of health based standards by air contaminants. MOE staff should review and assess this information through the Provincial EA process to ensure the proposed facility meets the highest standards set by the MOE.

The proponent should ensure that the issues identified by Public Health staff and those identified in the Greenbelt section of this letter, are addressed, and if for any reason they are not, then this letter is a formal request to elevate their Environmental Assessment to an Individual Environmental Assessment in accordance with section 16 of the *Environmental Assessment Act.*

If you require clarification or further information please contact Paul Belton, Manager of Development Review (905 830-4444 ext. 1507) or Heather Konefat, Director of Community Planning (905 830-4444 ext. 1502).

Sincerely,

Bryan Tuckey M.C.I.P., RPP
Commissioner of Planning and Development Services
pb

Attachments – Planning Report
Greenbelt Policy 4.2.1.2
Conservation Authority Comments
Peer Review

Copy to: Jim Mulvale, Northland Power
Julia Ciccaglione, Pristine Power
Mario Buszynski, Dillon Consulting
Shailesh Monteiro, Sithe Global

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York Region

Minute No. 169 as recorded in the Minutes of the meeting of the Council of The Regional Municipality of York held on November 20, 2008.

DEPUTATIONS

Council then heard the following deputations:

169 Proposed Sites for Private Electric Power Generation
(Clause No. 4 of Planning and Economic Development Committee Report No. 10)

Susan Walmer, STORM Coalition, MegaWhat? Citizens' Collective

Harvey Tenenbaum, Harten Consulting Group on behalf of Accu-Metrics

Brad Rogers, Stantec, accompanied by Dr. Douglas Bryant, and Sam Mantenuto, on behalf of Northland Power Inc., and

Jim Masin, Resident, Bradford.

It was moved by Mayor Morris, seconded by Mayor Emmerson that Council receive the deputations and refer them to consideration of Clause 4 of Planning and Economic Development Committee Report No. 10.

Carried

York Region

Clause No. 4 in Report No. 10 of the Planning and Economic Development Committee was adopted, without amendment, by the Council of The Regional Municipality of York at its meeting on November 20, 2008.

4
PROPOSED SITES FOR PRIVATE ELECTRIC POWER GENERATION

The Planning and Economic Development Committee recommends the following:

1. **The deputation by Don Sinclair, General Manger, Development and Legal Services, Town of East Gwillimbury, November 4, 2008, regarding Ontario Power Authority procurement for Northern York Region, be received;**

2. **The following communications be received and referred to staff:**

   (a) **A. Garcia-Wright, Director, Environmental Assessment and Approvals Branch, Ministry of the Environment, October 9, 2008, regarding the electricity generating project for the Northern York Region area.**

   (b) **B. Panizza, Director of Corporate Services/Town Clerk, Town of Aurora, October 16, 2008, regarding Information Report on Proposed Sites for Private Electric Power Generation.**

   (c) **M. Francis, Deputy Clerk, Town of Bradford West Gwillimbury, October 22, 2008, regarding 'Natural Gas Fired Power Generating Facility'; and**

3. **The recommendations contained in the following report dated October 1, 2008, from the Commissioner of Planning and Development Services be adopted subject to recommendation 1 being amended to read as follows:**

   1. **All proponents responding to Ontario Power Authority's RFP for a "350 MW peaking plant" *must* conduct a human health and environmental risk assessment *for each site*, in accordance with accepted practices in the professional field of risk assessment, to be provided for public review and comment, as part of the Environmental Assessment process; as recommended by the Medical Officer of Health.**

1. RECOMMENDATIONS

It is recommended that:

1. All proponents responding to Ontario Power Authority's RFP for a "350 MW peaking plant" conduct a human health and environmental risk assessment, in accordance with accepted practices in the professional field of risk assessment, to be provided for public review and comment, as part of the Environmental Assessment process; as recommended by the Medical Officer of Health.

2. The Ontario Power Authority extend the commenting period for the Environmental Assessments to after it has made its decision on the preferred site which is expected in early January 2009.

3. Staff report back to Committee on the status of any comments provided to the Ministry of the Environment on the Environmental Assessments for the proposed peaking plant.

4. The Regional Clerk forward a copy of this report to the local area municipalities, Ontario Power Authority, Ministry of Municipal Affairs and Housing, Minister of Energy, Minister of the Environment, Northland Power, Pristine Power Inc, and Sithe Global Canadian Power.

2. PURPOSE

This report:

- Provides a response back to Committee and Council on the potential environmental and health issue raised at the September 3, 2008 Planning Committee, and the issue of exporting of power to United States, raised by the Committee at the same meeting.
- Summarizes the other issues identified by the deputants at the September 3, 2008 Regional Planning Committee meeting.
- Updates the number of proponents & sites submitted in response to Ontario Power Authority's RFP, as of October 1, 2008, identifies applications submitted to amend the York Region Official Plan to facilitate the approval of a 350 MW peaking plant, and highlights applicable Provincial and Regional policies that may need to be addressed by the proponents.
- Provides an overview of the Environmental Assessment process for the proposed peaking plant.
- Describes Ontario Power Authority's evaluation process to select a preferred site.

3. BACKGROUND

The initial information report prepared by Planning staff on the proposed 350MW peaking plant recommended staff report back with a further report on the status of the applications received from the proponents. At the September 3, 2008 Planning Committee meeting, this recommendation was modified by adding the following:

"and that:

i. The report also address the issue of exporting power to the United States; and,
ii. The Medical Officer of Health be requested to report on the health and environmental risks relating to air emissions from electric power generation."

These two specific issues are dealt with in the analysis section of this report along with other issues identified by deputants which are noted below.

Issues presented by Deputants at the September 3, 2008 Planning Committee

At the September 3, 2008 Planning Committee there were 5 deputations by members of the public. Some of the issues presented by the public include the following:

- Whether the peaking plant is the most cost effective solution.
- Are other alternative forms of electric power more suitable to serve York Region?
- Upgrading the transmissions lines and having them buried.
- Satisfying the Provincial Plan policies and Lake Simcoe Act.
- Is it appropriate for more senior levels of government to override decisions of lower levels of government?
- Should the OPA working group of 2005 be reactivated to assess all options to the proposed peaking plant?

Current status of responses to the Ontario Power Authority's RFP includes one additional new site proposed by Pristine Power

As of October 1, 2008 there are a total of eight sites being proposed in response to Ontario Power Authority's (OPA) RFP, compared to the seven identified in the September 3, 2008 report presented to Regional Planning Committee. Since September 3, 2008, Pristine Power has advised that they are proposing a new site in the Township of King and their initial site in the Town of Georgina is now considered a secondary priority for them. The known sites are shown on *Attachment 1* and briefly described in *Attachment No. 2.*

As of October 1, 2008 the Regional Planning Department has received three applications for amendment to the Regional Official Plan to facilitate the approval and construction of the peaking plant. All of the applications are from Northland Power.

OPA's Evaluation Process will take place in November and December of 2008 and a preferred site is expected in January 2009

Ontario Power Authority's RFP indicates that all proposals must be submitted by October 30, 2008 after which the OPA will begin its evaluation of the proposals. A decision is anticipated by the end of December 2008 or early January 2009.

Evaluation is conducted by OPA in four distinct stages, as follows:

- Stage 1 – Proposal Completeness Requirements
- Stage 2 – Mandatory Requirements
- Stage 3 – Rated Criteria – proponents are awarded up to a total of 100 points based on their responses to rated criteria that include among other things: Environmental Assessment, Municipal and Regional Approvals, Community Outreach.
- Stage 4 – Economic Bid Evaluation and Selection – each proponent will have its evaluated cost discounted by a factor that is proportional to the total points received in Stage 3. The proponent with the lowest adjusted evaluated cost will be selected and required to enter into a contract with OPA for the development, construction and operation of the facility.

4. ANALYSIS AND OPTIONS

The decision to move forward with a peaking plant to provide additional electric power supply to York Region and southern Simcoe County rests with the Ontario Power Authority (OPA) and the Ontario Energy Board. The Ontario Power Authority has established submission requirements, an evaluation process, and a decision timeline to assess proposals submitted in response to their RFP. York Region supports the provision of additional electric power to serve both existing residents and businesses and the expected future growth within York Region.

Responses to the two specific issues raised by Planning Committee are provided below.

The Regional Medical Officer of Health has provided a report recommending the proponents undertake a human health and environmental risk assessment

The response from the Regional Medical Officer of Health to the request from the September 3, 2008 Planning Committee is set out in *Attachment No. 3*. The Medical Officer of Health has provided comments in respect to the emissions from peaking plants, and a recommendation for the proponent to carry out a human health and environmental risk assessment. The human health and environmental risk assessment would

appropriately form part of the proponent's submission in connection with the Environmental Assessment process.

Ontario Power Authority has indicated that exporting power to the United States generally occurs only when there is low demand locally

In respect to the issue raised at Planning Committee regarding the exporting of power to the United States, Regional staff are not qualified in this area to provide a response and have therefore contacted staff from the Ontario Power Authority who have indicated that:

"Ontario exports power to the U.S. and other neighbouring jurisdictions only when Ontario electricity needs are met and surplus power is available – usually during periods of lower demand. The proposed plant in northern York Region is needed to meet demand during peak periods – during these times, exports are not likely to occur because all resources are required to meet Ontario demands. In fact, it is usually during peak periods when Ontario has to import power to meet needs, often from coal-fired resources in the United States.

Northern York Region has experienced robust growth in the past few years and this has resulted in the area's demand exceeding the capability of the electrical infrastructure serving the area. The addition of gas-fired generation in northern York Region is needed to address two Regional needs: inadequate capacity of the transmission line from Vaughan and a lack of supply diversity (reliance on a sole transmission line in this area to serve a large load). A major supply reinforcement – either transmission or generation – is required in northern York Region to address these needs. Changing export patterns on the system will not address northern York Region's needs. A local solution is still required.

The OPA's Integrated Power System Plan evaluates the need for additional resources on a system-wide basis, and has determined that new supply is required to meet reliability requirements and replace coal with cleaner sources in the earliest practical timeframe. The OPA plans to meet Ontario's requirements for the next 20 years. Given that there is a need for a major supply reinforcement in northern York Region and that there is a need for additional system resources, placing generation in northern York Region can effectively address both system and local needs. This can defer or avoid transmission reinforcements that would otherwise be required to solve northern York Region local reliability needs."

Discussion on other issues raised by deputants at the September Planning Committee

Other issues raised by deputants, including cost, alternate technologies or forms of electricity, and burying transmissions lines are part of the process and responsibilities of the Ontario Power Authority or the Ontario Energy Board and they will be assessing them. Regional staff do not have the expertise in these areas to provide expert technical responses.

In respect to the issue of whether a more senior level of government can override decisions of lower levels of government, the Ontario Power Authority has established a process that takes into consideration municipal comments; however, OPA has the ability to make a decision that deviates from a municipal recommendation.

In respect to the issue of reactivating the OPA 2005 Working Group, the Mayor of Georgina provided an invitation to Mayors of the other municipalities and informal discussions have taken place.

Proponents are required to demonstrate that the application conforms to Provincial and Regional planning policy

Attachment No. 4 to this report provides a general comparison of the eight sites in terms of the applicable Provincial and Regional designations and key policies that the proponent may be required to address. Six of the eight sites are located within the Provincial Greenbelt. Regional Official Plan Amendment applications have been received for only 3 sites and information for the other sites has been obtained from notices of public meetings in connection with the related Environmental Assessment process. As Regional staff have no formal submissions for 5 of the sites, and no formal response from the Province regarding compliance to the Greenbelt Plan, the information provided in *Attachment No. 3* should be considered as a general guide that may change if new information is received.

As noted in staff's initial report, only 18 of the 100 points awarded by the Ontario Power Authority for a proponent's response to their rated criteria are allotted to the Municipal and Regional Approvals category. The Environmental Assessment, and Community Outreach are two other rated criteria that have a large percentage of points awarded by the OPA in response to submissions.

The Environmental Assessment Process

Regional Council has recommended that the Ministry of the Environment ensure a proper environmental assessment(s) is carried out that meets the highest standards set by the Ministry of the Environment for such facilities, and takes into consideration, among other things:

- Environmental, social and economic impacts on existing and future residential communities.
- Detailed analysis in respect to the Provincial Greenbelt Plan and Oak Ridges Moraine Plan, if applicable.
- Visual impact, including an assessment of the potential economic impact on affected homeowners.

The Ministry of the Environment's Guide to Environmental Assessment Requirements for Electricity Projects may allow proponents to follow a Category B process

The Ministry of the Environment's "Guide to Environmental Assessment Requirements for Electricity Projects" provides an overview of the EA requirements for electricity projects in conjunction with Ontario Regulation 116/01. In accordance with this guide and the regulation, a new electricity project utilizing natural gas and producing less than 5MW could procede as a Category A project, and projects producing greater than 5MW could proceed as a Category B project. Category B projects are projects which have potential environmental effects that can likely be mitigated. Proponents of these projects are able to complete the Environmental Screening Process instead of completing an Individual or "full" EA, subject to requests at the end of the project to elevate the project to a higher category or to an Individual EA. The Environmental Screening Process sets out public and agency consultation opportunities, and opportunities to review any of the reports and request that the project be elevated to a higher category or to an Individual EA.

As part of the Environmental Screening Process, proponents are responsible for identifying any potential negative environmental effects and developing mitigation and impact management. Negative environmental effects may include, but are not limited to, the harmful alteration, disruption, destruction, or loss of natural features, flora or fauna and their habitat, ecological functions, natural resources, air or water quality, and cultural or heritage resources.

Next steps

Next steps include the completion of the Environmental Assessment process that includes receiving comments from the public and agencies and having the Ministry of the Environment provide a response to any requests to elevate the EA to the next category or to an Individual EA. As the Environmental Assessment process allows the proponents to proceed using a Category B, comments from the Region will be required for each EA that is being carried out to ensure Regional Council's request that the highest standards for such facilities are implemented.

To reduce the amount of staff time required to review all of the Environmental Study Reports when eventually only one site will be chosen by the Ontario Power Authority, the Ontario Power Authority should extend the commenting timeframe to after it has made a decision and selected the preferred site which is expected in January 2009. This will enable staff to direct their review to the one preferred site and not all of the other sites for which EA's are being filed.

The peaking plant project involves unique and specialized technical consideration that is beyond the expertise of Regional staff. Regional staff will monitor the Environmental Study Reports during the 30 day commenting timeframe to ensure any issues will be identified and appropriately addressed by the MOE and/or the proponent. Following established practise, staff will comment on the EA's, where appropriate, and confirm our comments to Committee and Council in a future report as soon as possible. Comments forwarded to the MOE are likely to be cursory in detail if the commenting timeframe is not extended to after the OPA makes its decision and due to the short 30 day period available to review the documents.

Northland Power has indicated it expects to file Environmental Study Reports (ESR) for its four sites on October 30, 2008 and Sithe Global has also indicated it expects to file its ESR by the end of October 2008.

A formal decision on the preferred site from the Ontario Power Authority is expected in January 2009 and, subsequent to this decision, it may be necessary to process an amendment to the Regional Official Plan and also amendments to the local Official Plan and the Zoning By-law(s). If applicable, statutory Public Meetings will be held and decision reports on the ROPA and LOPA will be presented to Regional Committee and Council. Noted below are estimates of key dates in the Environmental Assessment, Planning and OPA process.

Initiation of Environmental Assessment by proponents. Public Information Centres held.	August to October 2008
Filing of Environmental Study Report (ESR) by proponents	October 30, 2008 for the 4 Northland sites. Filing dates for the other ESR's are not known but will be after October 30, 2008.
Proposal Submission Deadline by OPA	October 30, 2008
30 Day Review Period of ESR by public and agencies	November/December 2008 depending on filing date.
Evaluation of submissions by Ontario Power Authority	November/December 2008
Decision on preferred site by Ontario Power Authority	January 2009
Review of application to amend Regional Official Plan, if required	January – March 2009
Statutory Public Meeting for Regional Official Plan Amendment, if required	March 2009
Decision report on ROPA and LOPA to Regional Planning Committee and Council, if required	May 2009
Decision by MOE on any requests to elevate the Environmental Assessment(s) to a higher category	30 to 45 days from the end of the 30 day commenting period.

5. FINANCIAL IMPLICATIONS

There are no financial implications associated with this report.

Once a preferred site and proponent has been selected by the Ontario Power Authority, and if it is determined that a Regional Official Plan amendment is required, the proponent will be required to provide fees for the cost to review the background studies submitted in support of the Regional Official Plan amendment.

6. LOCAL MUNICIPAL IMPACT

Northland Power has also submitted applications to amend the Official Plans of the affected local municipalities. Regional staff will be consulting with local planning staff on the processing of both the local and Regional Official Plan amendment applications.

7. CONCLUSION

As of October 1, 2008 proponents have initiated 8 potential sites within York Region for the proposed peaking plant. Applications for an amendment to the Regional Official Plan have been submitted for 3 sites. Certain proponents have also verbally indicated that it is their opinion that the proposed peaking plant facility is a permitted use and does not require an amendment to the Regional Official Plan.

All proposals are subject to the Environmental Assessment process. Previous Regional Council positions for electricity projects have recommended that the Ministry of the Environment ensure a proper environmental assessment(s) is carried out that meets the highest standards set by the Ministry of the Environment for such facilities, and takes into consideration, among other things:

- Environmental, social and economic impacts on existing and future residential communities.
- Detailed analysis in respect to the Provincial Greenbelt Plan and Oak Ridges Moraine Plan, if applicable.
- Visual impact, including an assessment of the potential economic impact on affected homeowners.

Regional staff will monitor the Environmental Study Reports and if necessary provide comments to the MOE during the 30 day commenting timeframe to ensure any issues will be identified and appropriately addressed by the MOE and/or the proponent.

In keeping with the recommendation of the Region's Medical Officer of Health, the proponent shall complete a human health and environmental risk assessment, in accordance with accepted practices in the professional field of risk assessment that is provided for public review and comment.

For more information on this report, please contact Paul Belton, Manager of Development Review, Ext.1507, or Heather Konefat, Director of Community Planning at extension 1507.

The Senior Management Group has reviewed this report.

(The four attachments referred to in this clause are attached to this report.)

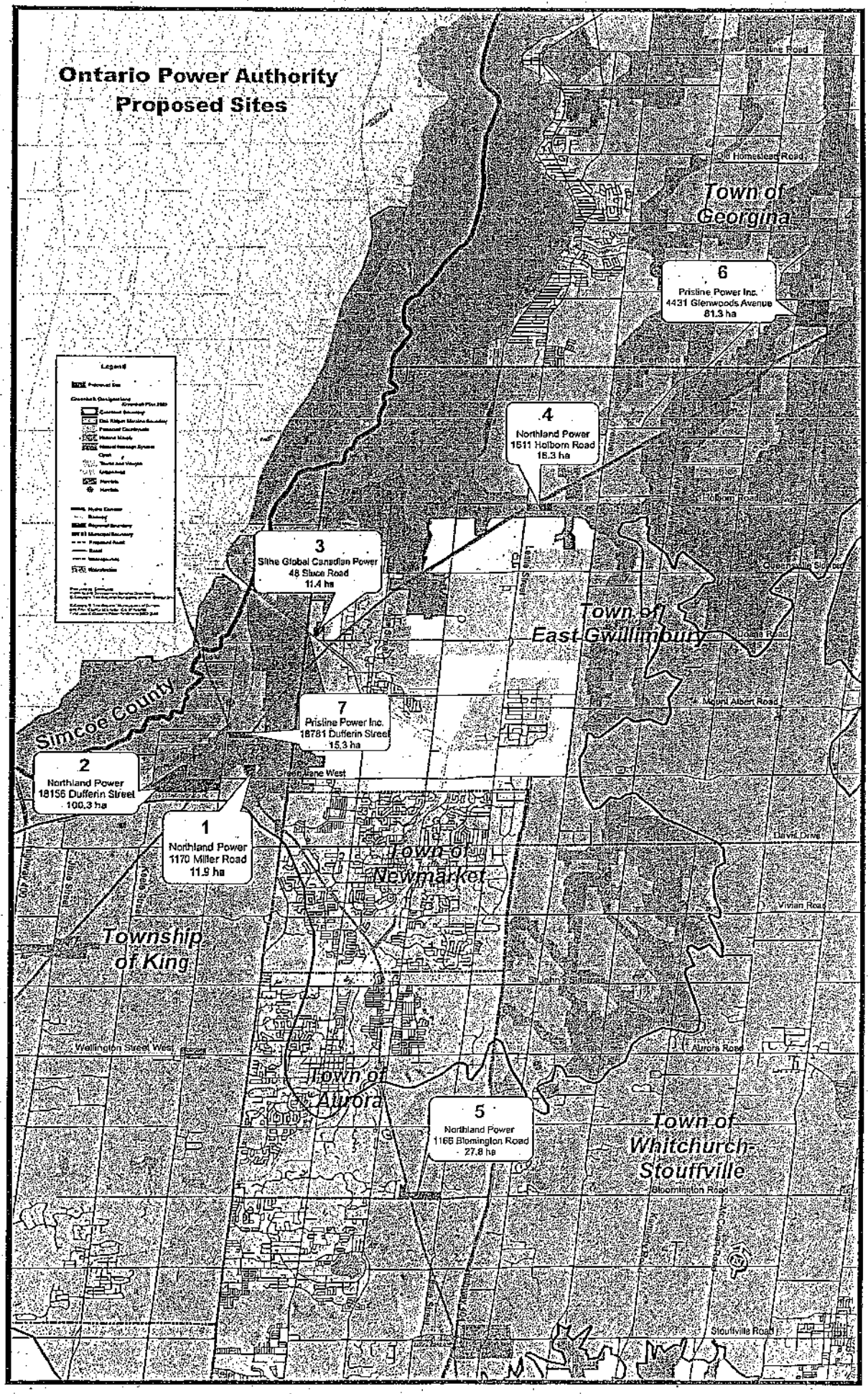
Ontario Power Authority
Proposed Sites
Town of Georgina
6
Pristine Power Inc.
4431 Glenwoods Avenue
81.3 ha
4
Northland Power
1511 Holborn Road
16.3 ha
3
Silfab Global Canadian Power
48 Sluce Road
11.4 ha
Town of East Gwillimbury
7
Pristine Power Inc.
18781 Dufferin Street
15.3 ha
Simcoe County
2
Northland Power
18156 Dufferin Street
100.3 ha
1
Northland Power
1170 Miller Road
11.9 ha
Town of Newmarket
Township of King
Town of Aurora
5
Northland Power
1166 Bloomington Road
27.8 ha
Town of Whitchurch-Stouffville
Bloomington Road
Stouffville Road
Holborn Road
Mount Albert Road
Vivian Road
Aurora Road
Wellington Street West
Green Lane West
Davis Drive
Keele Street
Yonge Street
Legend

Table 1
Proposed Sites for Ontario Power Authority's "Peaking Plant"

Municipality	Proponent	Location and Size of Site [1]
1. King Township	Northland Power	1170 Miller Side road, east of Dufferin St. North of Hwy 9, adjacent to Holland Junction Transformer Station. (11.7 ha)
2. King Township	Northland Power	18156 Dufferin St., south of Miller Sideroad, north of Hwy 9. (100 ha)
3. East Gwillimbury	Sithe Global Canadian Power	48 Sluse Rd., in Holland Landing, (11.1 ha)
4. East Gwillimbury	Northland Power	1160 Holborn Rd., east side of Leslie Street, (10.6 ha)
5. Aurora	Northland Power	North side of Bloomington Road, west of Leslie Street, (15.86 ha)
6. Georgina	Pristine Power	South side of Glenwoods Avenue, west side of McCowan Road, (80.1 ha)
7. King Township	Pristine Power	East side of Dufferin Street, north of Miller Sideroad (15.3 ha)
8. Aurora		Confidential – not provided at this time

Footnotes:
1. This table revises the property sizes noted in the September 3, 2007 Planning Committee report.

York Region

Council Attachment 3

Canada's Top 100 Employers 2008

Community and Health Services Department
Public Health Branch

MEMORANDUM

TO: Bryan Tuckey, Commissioner, Planning and Development Services

FROM: Dr. Karim Kurji, Medical Officer of Health

DATE: October 3, 2008

RE: **Public Health Impacts of Emissions from Natural Gas Fired Peaker Plant**

I am writing in response to a recommendation approved by York Region Council on September 18, 2008 that the 'Medical Officer of Health be requested to report on the health and environmental risks relating to air emissions from electric power generation', regarding the proposed sites for private electric power generation in York Region.

According to Natural Resources Canada, natural gas burns more cleanly than either coal, gasoline or diesel fuel. The Energy Information Administration under the United States Department of Energy states that natural gas, when burned, emits lower quantities of greenhouse gases and criteria pollutants per unit of energy produced than do other fossil fuels.

Environment Canada indicates that where natural gas is of particular concern is in its contribution to climate change, citing that methane, carbon dioxide and water vapour are all important greenhouse gases. The pollutants emitted by natural gas peaker plants are the same pollutants that would occur from burning of any natural gas such as home heating, which Environment Canada lists as primarily nitrogen oxides, which play a key role in the formation of smog. In addition, particulate matter, sulphur oxides and reactive hydrocarbons are also produced from the burning of natural gas, but in very small amounts compared to the combustion of other fossil fuels.

Although there is limited research which examines the health effects of living near a natural gas power plant, local assessment from nearby natural gas power plants in both Peel and Halton Regions can be examined for comparison. Both Regions' plants are combined cycle plants, as opposed to the proposed single cycle plant for York Region. According to the overall summary of Halton Region's *Human Health and Ecological Effects Assessment for the Halton Hills Generating Station*, there would be no measurable adverse effects, from short- or long-term exposure, on humans as a result of air emissions from the generating station.

It is important to note that assessing the public health impacts of air emissions from any source requires facility-specific, detailed information about the technology being proposed, the contaminants of concern and the location of the source of air emissions. For example, when the design team assessed the human health and ecological effects assessments for the proposed Halton Hills Generating Station, they also found carbon monoxide and polycyclic aromatic hydrocarbons as contaminants of concern.

Since the Ontario Power Authority is in the process of reviewing the industry submissions for the proposed single cycle natural gas plant for Northern York Region, specifics on the plant (e.g. technology and contaminants of concern) and location have not been finalized. As the peaker plant technology and location are the most important factors affecting the level of health impacts, it will be pertinent to determine impacts after a site has been chosen and details provided. Therefore, a human health and environmental risk assessment, similar to the study that was conducted in Halton Region would provide further information about public health and environmental impacts of emissions from the proposed natural gas plant. This assessment should include health impacts on the days when general poor air quality is experienced (e.g. smog alert days) as these are potentially the days when the plant will be operating and when air quality may already be poor.

To conclude, it is recommended that the proponent for the Natural Gas Fired Peaker Plant in York Region conduct a human health and environmental risk assessment, in accordance with accepted practices in the professional field of risk assessment that is provided for public review and comment.

Please do not hesitate to call me if you have any questions.

Thank you.

Copy to: Joann Simmons, Commissioner, Community and Health Services

Site No. 1 – Northland Power - King Township

Location	1170 Miller Road, between Bathurst Street and Dufferin Street.
Provincial Plans, Designation(s), & Salient Policies	Located within Greenbelt and designated "Protected Countryside" – (Rural Area) which permits resource based industrial uses, and industrial uses serving the rural resource and agricultural sectors. Also permits other uses subject to Sections 4.1 to 4.6. Non agricultural uses must demonstrate that the location and water & sewer servicing are appropriate, there are no negative impacts on key natural heritage features, key hydrological features or functions, and there are no negative impacts on the biodiversity or connectivity of the Natural Heritage System. Not located within the Natural Heritage System of the Greenbelt Plan. Subject to Section 4.2.1- General Infrastructure Policies of Greenbelt Plan. May comply with Policy 4.2.1.1 if proposal "serves the significant growth and economic development expected in southern Ontario beyond the Greenbelt by providing for the appropriate infrastructure connections among urban growth centres and between these centres and Ontario's borders."
Comment on Provincial Plan(s)	Must comply with General Infrastructure Policies of Greenbelt Plan. Proponent should demonstrate compliance to Sections 4.1 to 4.6 of Greenbelt Plan.
Regional OP Designation & Salient Policies	Designated "Rural Policy Area" which permits limited industrial uses subject to criteria that includes: • Need and demand, • Why the location is required and appropriate; • Impact on surrounding farmland, and environmental features and functions; • Why the use cannot be located in a settlement area; provision of adequate servicing, and compatibility with surrounding uses.
Compliance to Regional OP	An amendment to the Regional Official Plan may be required depending on the application's compliance to the Greenbelt Plan.
Status of Application to Amend the Regional Official Plan	An application to amend the Regional OP has been submitted which includes applicable application fees and background studies.

Site No. 2 – Northland Power, King Township

Location	18156 Dufferin Street
Provincial Plans, Designation(s), & Salient Policies	Located within Greenbelt and designated "Protected Countryside" – (Rural Area) which permits resource based industrial uses, and industrial uses serving the rural resource and agricultural sectors. Also permits other uses subject to Section 4.2 to 4.6. Non agricultural uses must demonstrate that the location and water & sewer servicing are appropriate, there are no negative impacts on key natural heritage features, key hydrological features or functions, and there are no negative impacts on the biodiversity or connectivity of the Natural Heritage System. Subject to Section 4.2.1- General Infrastructure Policies, of Greenbelt Plan. May comply with Policy 4.2.1.1 if proposal "serves the significant growth and economic development expected in southern Ontario beyond the Greenbelt by providing for the appropriate infrastructure connections among urban growth centres and between these centres and Ontario's borders." Located within Natural Heritage System. Sections 3.2, 3.2.2, 3.2.3, 3.2.4, and 3.2.5 apply. There are a variety of policies that are intended to protect the natural environment, key natural heritage features or key hydrologic features and functions. Watershed plans are required and cross-watershed impacts need to be considered.
Comment on Provincial Plan(s)	Must comply with General Infrastructure Policies of Greenbelt Plan. Requires applicant to demonstrate compliance to Natural Heritage System policies of Greenbelt Plan.
Regional OP Designation & Salient Policies	Portions of site located within Regional Greenlands System - "Significant Forested Lands". Portions of site located within "Mineral Aggregate Resource Area". Rehabilitation of abandoned pits and quarries is required and is to be in accordance with other policies of the ROP. Designated "Rural Policy Area" which permits limited industrial uses subject to criteria that includes: • Need and demand, • Why the location is required and appropriate; • Impact on surrounding farmland, and environmental features and functions; • Why the use cannot be located in a settlement area; provision of adequate servicing, and compatibility with surrounding uses.
Compliance to ROP	An amendment to the Regional Official Plan may be required depending on the application's compliance to the Greenbelt Plan.
Status of Application to Amend the Regional Official Plan	An application to amend the Regional OP has been submitted which includes applicable application fees and background studies.

Site No. 3 Sithe - Global Canadian Power, East Gwillimbury

Location	48 Sluse Rd., in Holland Landing
Provincial Plans, Designation(s), & Salient Policies	Located within the "Whitebelt Area" of Provincial Growth Plan and within a settlement area.
Comment on Provincial Plan(s)	Consistent with Growth Plan.
Regional OP Designation & Salient Policies	Site is designated "Towns and Villages" by Regional OP and located within Holland Landing, which is considered a local centre. A full range of land uses, including industrial uses is permitted by the ROP in local centres and these uses are to be guided by local area municipal secondary plan policies and designations.
Compliance to ROP	Generally complies to Regional Official Plan. No ROPA required.
Status of Application to Amend the Regional Official Plan	Not Applicable

Site No. 4 - Northland Power, East Gwillimbury

Location	1160 Holborn Rd., east side of Leslie Street,
Provincial Plans, Designation(s), & Salient Policies	Located within Greenbelt and designated "Protected Countryside" (Prime Agricultural Area). Permits normal farm practises and full range of agricultural, agricultural-related, and secondary uses, and other uses subject to Sections 4.2 to 4.6. Non agricultural uses must demonstrate that the location and water & sewer servicing are appropriate, there are no negative impacts on key natural heritage features, key hydrological features or functions, and there are no negative impacts on the biodiversity or connectivity of the Natural Heritage System. Located within "Natural Heritage System". Sections 3.2, 3.2.2, 3.2.3, 3.2.4, and 3.2.5 apply. There are a variety of policies that are intended to protect the natural environment, key natural heritage features or key hydrologic features and functions. Watershed plans are required and cross-watershed impacts need to be considered. Proposal is subject to Section 4.2.1- General Infrastructure Policies of Greenbelt Plan. Proposal may comply with Policy 4.2.1.1 if proposal "serves the significant growth and economic development expected in southern Ontario beyond the Greenbelt by providing for the appropriate infrastructure connections among urban growth centres and between these centres and Ontario's borders."
Comment on Provincial Plan(s)	Must comply to General Infrastructure Policies of Greenbelt Plan. Proponent must demonstrate compliance to Sections 4.1 to 4.6 of Greenbelt Plan.
Regional OP Designation & Salient Policies	Designated "Agricultural Policy Area" which permits primarily farm and accessory uses. New industrial uses are directed to hamlets, villages, towns and urban areas. A proposed non farm use is subject to Policy 5.8.7and requires a ROPA which meets tests of Policy 5.8.7 .
Compliance to ROP	An amendment to the Regional Official Plan may be required depending on the application's compliance to the Greenbelt Plan. Application may be "grandfathered" if deemed to comply to local municipality's Official Plan or zoning by-law.
Status of Application to Amend the Regional Official Plan	No application submitted to date.

Site No. 5 – Northland Power, Aurora

Location	1166 Bloomington Road, north side of Bloomington Road, west of Leslie Street
Provincial Plans, Designation(s), & Salient Policies	Located on the Oak Ridges Moraine which forms part of the Greenbelt Plan. The Oak Ridges Moraine Plan designates the site "Countryside Area" and "Natural Linkage Area". Infrastructure is permitted in the "Countryside Area" of the Oak Ridges Moraine Plan and is also permitted in the "Natural Linkage Area" only if the need for the project has been demonstrated and there is no reasonable alternative. Other policies including Section 41 of the Oak Ridges Moraine Plan are also applicable.
Comment on Provincial Plan(s)	The proponent will need to demonstrate compliance to Section 41 of the Oak Ridges Moraine Plan, and other additional policies.
Regional OP Designation & Salient Policies	The site is also designated "Natural Linkage Area" and "Countryside Area" by the Regional Official Plan. The underlying designation is "Rural Policy Area". Infrastructure is permitted provided it complies with Section 41 of the Oak Ridges Moraine Plan. The "Rural Policy Area" designation permits limited industrial uses subject to criteria that includes: • Need and demand, • Why the location is required and appropriate; • Impact on surrounding farmland, and environmental features and functions; • Why the use cannot be located in a settlement area; provision of adequate servicing, and compatibility with surrounding uses.
Compliance to ROP	Demonstration of compliance to Section 41 of the Oak Ridges Moraine Plan may be made through the Environmental Assessment process. An amendment to the Regional Official Plan may be required depending on the application's compliance to the Greenbelt Plan.
Status of Application to Amend the Regional Official Plan	An application to amend the Regional Official Plan has been submitted.

Site No. 6 Pristine Power Inc., Georgina

Location	4431 Glenwoods Avenue, between Kennedy Road and McCowan Road
Provincial Plans, Designation(s), & Salient Policies	Located within Greenbelt and designated "Protected Countryside" (Prime Agricultural Area). Permits normal farm practises and full range of agricultural, agricultural-related, and secondary uses, and other uses subject to Sections 4.2 to 4.6. Non agricultural uses must demonstrate that the location and water & sewer servicing are appropriate, there are no negative impacts on key natural heritage features, key hydrological features or functions, and there are no negative impacts on the biodiversity or connectivity of the Natural Heritage System. Partially located within Natural Heritage System. Sections 3.2, 3.2.2, 3.2.3, 3.2.4, and 3.2.5 apply. There are a variety of policies that are intended to protect the natural environment, key natural heritage features or key hydrologic features and functions. Watershed plans are required and cross-watershed impacts need to be considered. Proposal is subject to Section 4.2.1 General Infrastructure Policies. Proposal may comply with Policy 4.2.1.1 if proposal "serves the significant growth and economic development expected in southern Ontario beyond the Greenbelt by providing for the appropriate infrastructure connections among urban growth centres and between these centres and Ontario's borders."
Comment on Provincial Plan(s)	Must comply to General Infrastructure Policies of Greenbelt Plan. Requires applicant to demonstrate compliance to Natural Heritage System policies of Greenbelt Plan.
Regional OP Designation & Salient Policies	Designated "Agricultural Policy Area". Located partially within the Regional Greenlands System. An amendment to the Regional Official Plan is typically required in accordance with policy 5.8.7 of the Regional OP.
Compliance to ROP	An amendment to the Regional Official Plan may be required depending on the application's compliance to the Greenbelt Plan.
Status of Application to Amend the Regional Official Plan	An application to amend the Regional Official Plan has not yet been received.

Site No. 7 Pristine Power Inc. King Township

Location	4431 Glenwoods Avenue, between Kennedy Road and McCowan Road
Provincial Plans, Designation(s), & Salient Policies	Located within Greenbelt and designated, in part, "Protected Countryside" – (Rural Area) which permits resource based industrial uses, and industrial uses serving the rural resource and agricultural sectors. Also permits other uses subject to Sections 4.1 to 4.6. Non agricultural uses must demonstrate that the location and water & sewer servicing are appropriate, there are no negative impacts on key natural heritage features, key hydrological features or functions, and there are no negative impacts on the biodiversity or connectivity of the Natural Heritage System. Designated, in part, "Protected Countryside" (Prime Agricultural Area). Permits normal farm practises and full range of agricultural, agricultural-related, and secondary uses, and other uses subject to Sections 4.2 to 4.6. Non agricultural uses must demonstrate that the location and water & sewer servicing are appropriate, there are no negative impacts on key natural heritage features, key hydrological features or functions, and there are no negative impacts on the biodiversity or connectivity of the Natural Heritage System. Proposal is subject to Section 4.2.1 General Infrastructure Policies. Proposal may comply with Policy 4.2.1.1 if proposal "serves the significant growth and economic development expected in southern Ontario beyond the Greenbelt by providing for the appropriate infrastructure connections among urban growth centres and between these centres and Ontario's borders."
Comment on Provincial Plan(s)	Must comply with General Infrastructure Policies of Greenbelt Plan.
Regional OP Designation & Salient Policies	Designated in part "Agricultural Policy Area" and in part "Rural Policy Area". An application for non farm uses in the Agricultural Policy Area typically requires an amendment to the Regional Official Plan in accordance with policy 5.8.7.
Compliance to ROP	An amendment to the Regional Official Plan may be required depending on the application's compliance to the Greenbelt Plan.
Status of Application to Amend the Regional Official Plan	No application to amend the Regional Official Plan has been received to-date.

Attachment No. 2

Site No 1 – Miller Sideroad Northland Power

Greenbelt Policy	Response in Environmental Review Report
The location and construction of *infrastructure* and expansions, extensions, operations and maintenance of *infrastructure* in the Protected Countryside, are subject to the following: a. Planning, design and construction practices shall minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System, traversed and/or occupied by such *infrastructure*;	Appendix 'B1' to the ERR is an Environmental Impact Study that contains a section on Greenbelt Conformity. Within this section, the proposal is evaluated against the Natural Heritage policies of the Greenbelt Plan. The proponent has submitted an application to amend the Regional Official Plan.
b. Planning, design and construction practices shall minimize, wherever possible, the *negative impacts* and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt;	The ERR does not specifically address design and construction practises.
c. Where practicable, existing capacity and coordination with different *infrastructure* services is optimized so that the rural and existing character of the Protected Countryside and the overall urban structure for southern Ontario established by Greenbelt and any provincial growth management initiatives are supported and reinforced;	The ERR does not deal with this specific policy.
d. New or expanding *infrastructure* shall avoid *key natural heritage features* or *key hydrologic features* unless need has been demonstrated and it has been established that there is no reasonable alternative; and	The ERR indicates that there will be no negative impact and no loss of Key Natural Heritage Features and Key Hydrogeological Features and Functions.
e. Where *infrastructure* does cross the Natural Heritage System or intrude into or result in the loss of a *key natural heritage feature* or *key hydrologic feature*, including related *landform features*, planning, design and construction practices shall minimize *negative impacts* and disturbance on the features or their related functions, and where reasonable, maintain or improve *connectivity*.	The ERR does not specifically address design and construction practises.

Site No 2 – Pitway Northland Power

Greenbelt Policy	Response in Environmental Review Report
The location and construction of *infrastructure* and expansions, extensions, operations and maintenance of *infrastructure* in the Protected Countryside, are subject to the following: a. Planning, design and construction practices shall minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System, traversed and/or occupied by such *infrastructure*;	Appendix 'B1' to the ERR is an Environmental Impact Study that contains a section on Greenbelt Conformity. Within this section, the proposal is evaluated against the Natural Heritage policies of the Greenbelt Plan. The proponent has submitted an application to amend the Regional Official Plan.
b. Planning, design and construction practices shall minimize, wherever possible, the *negative impacts* and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt;	The ERR does not specifically address design and construction practises.
c. Where practicable, existing capacity and coordination with different *infrastructure* services is optimized so that the rural and existing character of the Protected Countryside and the overall urban structure for southern Ontario established by Greenbelt and any provincial growth management initiatives are supported and reinforced;	The ERR does not deal with this specific policy.
d. New or expanding *infrastructure* shall avoid *key natural heritage features* or *key hydrologic features* unless need has been demonstrated and it has been established that there is no reasonable alternative; and	The ERR indicates that there will be no direct impact to key Natural Heritage Features or Key Hydrogeological Features and Functions
e. Where *infrastructure* does cross the Natural Heritage System or intrude into or result in the loss of a *key natural heritage feature* or *key hydrologic feature*, including related *landform features*, planning, design and construction practices shall minimize *negative impacts* and disturbance on the features or their related functions, and where reasonable, maintain or improve *connectivity*.	The ERR does not address construction practises.

Site No 3 – Sluse Road Sithe Global

Greenbelt Policy	Response in Environmental Review Report
The location and construction of *infrastructure* and expansions, extensions, operations and maintenance of *infrastructure* in the Protected Countryside, are subject to the following: a. Planning, design and construction practices shall minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System, traversed and/or occupied by such *infrastructure*;	This application is not located within the Greenbelt Plan area. The policies are not applicable.
b. Planning, design and construction practices shall minimize, wherever possible, the *negative impacts* and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt;	
c. Where practicable, existing capacity and coordination with different *infrastructure* services is optimized so that the rural and existing character of the Protected Countryside and the overall urban structure for southern Ontario established by Greenbelt and any provincial growth management initiatives are supported and reinforced;	
d. New or expanding *infrastructure* shall avoid *key natural heritage features* or *key hydrologic features* unless need has been demonstrated and it has been established that there is no reasonable alternative; and	
e. Where *infrastructure* does cross the Natural Heritage System or intrude into or result in the loss of a *key natural heritage feature* or *key hydrologic feature*, including related *landform features*, planning, design and construction practices shall minimize *negative impacts* and disturbance on the features or their related functions, and where reasonable, maintain or improve *connectivity*.	

Site No 4 – Leslie Street Northland Power

Greenbelt Policy	Response in Environmental Review Report
The location and construction of *infrastructure* and expansions, extensions, operations and maintenance of *infrastructure* in the Protected Countryside, are subject to the following: a. Planning, design and construction practices shall minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System, traversed and/or occupied by such *infrastructure*;	The ERR indicates that the Greenbelt Policies will be dealt with in a separate report entitled Planning Justification Report, Town of East Gwillimbury, 1611 Hoburn Road. Appendix 'B1' to the ERR is an Environmental Impact Study that contains a section on Greenbelt Conformity. Within this section, the proposal is evaluated against the Natural Heritage policies of the Greenbelt Plan.
b. Planning, design and construction practices shall minimize, wherever possible, the *negative impacts* and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt;	The ERR does not deal specifically with construction practises.
c. Where practicable, existing capacity and coordination with different *infrastructure* services is optimized so that the rural and existing character of the Protected Countryside and the overall urban structure for southern Ontario established by Greenbelt and any provincial growth management initiatives are supported and reinforced;	The ERR does not deal with this specific policy.
d. New or expanding *infrastructure* shall avoid *key natural heritage features* or *key hydrologic features* unless need has been demonstrated and it has been established that there is no reasonable alternative; and	Appendix B1 to the ERR indicates that key natural heritage and key hydrologic features will not be impacted.
e. Where *infrastructure* does cross the Natural Heritage System or intrude into or result in the loss of a *key natural heritage feature* or *key hydrologic feature*, including related *landform features*, planning, design and construction practices shall minimize *negative impacts* and disturbance on the features or their related functions, and where reasonable, maintain or improve *connectivity*.	The ERR does not deal with this specific policy.

Site No 5 – York Energy Centre, Pristine Power

Greenbelt Policy	Response in Environmental Review Report (ERR)
The location and construction of *infrastructure* and expansions, extensions, operations and maintenance of *infrastructure* in the Protected Countryside, are subject to the following: a. Planning, design and construction practices shall minimize, wherever possible, the amount of the Greenbelt, and particularly the Natural Heritage System, traversed and/or occupied by such *infrastructure*;	Section 3.3.7.2 of the ERR states: "Although not part of the site development, a small portion of the lands owned by YEC, but outside of the facility footprint is designated "Natural Heritage System." YECLP is committed to complying with the Greenbelt legislation and intends to work closely with MMAH. Development will be minimized in the natural system where possible."
b. Planning, design and construction practices shall minimize, wherever possible, the *negative impacts* and disturbance of the existing landscape, including, but not limited to, impacts caused by light intrusion, noise and road salt;	The ERR does not specifically deal with construction practises. Section 3 of the ERR provides a Noise Impact Assessment and concludes that the proposed facility will be in compliance during the worse case noise emission scenario.
c. Where practicable, existing capacity and coordination with different *infrastructure* services is optimized so that the rural and existing character of the Protected Countryside and the overall urban structure for southern Ontario established by Greenbelt and any provincial growth management initiatives are supported and reinforced;	This policy is not specifically dealt with in the ERR.
d. New or expanding *infrastructure* shall avoid *key natural heritage features* or *key hydrologic features* unless need has been demonstrated and it has been established that there is no reasonable alternative; and	This policy is not specifically dealt with in the ERR; however sections of the ERR indicate that the facility will have minimal impact on Natural Heritage Features.
e. Where *infrastructure* does cross the Natural Heritage System or intrude into or result in the loss of a *key natural heritage feature* or *key hydrologic feature*, including related *landform features*, planning, design and construction practices shall minimize *negative impacts* and	This policy is not specifically dealt with in the ERR

disturbance on the features or their related functions, and where reasonable, maintain or improve *connectivity*.	

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Sent by Facsimile 1-905-474-9889

November 18, 2008

IMS No.: PEAA269C2

Mr. David P. Wesenger, BES
Stantec Consulting Ltd.
361 Southgate Drive
Guelph, ON N1G 3M5

Dear Mr. Wesenger:

Re: 1611 Holborn Road, Town of East Gwillimbury
Proposed Natural-Gas-Fired Simple Cycle Peaking Facility
Part Lot 25, Concession 3
Township of East Gwillimbury, Regional Municipality of York

The Lake Simcoe Region Conservation Authority (LSRCA) has reviewed the subject study in accordance with the Greenbelt Plan 2005, provincial policy, the LSRCA's Watershed Development Policies and Ontario Regulation 179/06 under the *Conservation Authorities Act.* This property is one of four sites proposed by Northland Power for a potential peak power generation facility. These comments are provided in response to the Environmental Assessment Notice of Public Information Session received on September 19, 2008. We have not received any formal circulation of Official Plan Amendment or Zoning Bylaw Amendment from the Township to date.

The subject property is 16 hectares in size. It is partially regulated by the LSRCA for apparent valleyland, watercourse and erosion hazard. It appears that only the southwest corner of the property is within the regulated area. A permit under Ontario Regulation 179/06 will be required for any site grading/development proposed within the regulated areas of the property. We note that development is not (currently) proposed within any of the natural hazards on the site.

The property is located within the Protected Countryside designation of the Greenbelt Plan area within the Natural Heritage System. As such, the policies of the Plan relating to the Natural Heritage System apply. The subject property is not located within the Natural Heritage System for the Lake Simcoe Watershed - July 2007.

A

Watershed

for Life

The subject property contains three unevaluated marshes. Determination must be made as to whether or not these wetlands meet the requirements of a key natural heritage/key hydrologic feature in accordance with the draft Technical Definitions and Criteria for Key Natural Heritage Features in the Natural Heritage System of the Protected Countryside Area of the Greenbelt Plan (2005), recently released on the Environmental Bill Registry. Should it be determined that there are wetlands that meet the criteria, Section 4.2 of the Greenbelt Plan will apply.

Breeding bird surveys have not been undertaken at this time. Surveys will be required to determine the impact on the breeding bird community.

Mitigation for the impacts of noise and lighting is required, which for example could include coniferous plantings around the building, focused lighting and sound dampening techniques. Noise impacts should be quantified as far as existing sound and proposed sound (in decibels).

Given that the subject property is within the Natural Heritage System of the Greenbelt, a restoration plan for the remainder of the property to enhance existing natural heritage features is recommended.

If this site is selected, the following additional work shall be required:

- Breeding bird surveys
- Assessment of wetlands under the Greenbelt Technical Paper
- Noise quantification and mitigation
- Restoration plan

We would require that stormwater management, sediment and erosion control be addressed through the municipality's site plan process. We have not conducted a review of these studies to date.

Please call me if you have any questions. In order to facilitate our processing of this file, please reference the above-noted file numbers in future correspondence.

Yours truly,

Jackie Burkart
Senior Planner

JB/ph

c. Paul Belton - Regional Municipality of York, 905-895-3482 - Fax
Carolyn Kellington, Twp. of East Gwillimbury, 905-478-2808 - Fax
Shawn Cronkwright, Ontario Power Authority, 1-416-967-1947 - Fax
Mike Walters, Director, Watershed Management,
Lake Simcoe Region Conservation Authority

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Sent by Facsimile 1-403-444-6784

November 20, 2008

IMS No.: PEAA262C3

Ms. Julia Ciccaglione, B.A.Econ., B.Sc., M.Sc.
VP, Sustainable Development and Environment
Pristine Power Inc.
Suite 2250, First Canadian Centre
350-7th Avenue SW
Calgary, Alberta T2P 3N9

Dear Ms. Ciccaglione:

Re: York Energy Centre's Environmental Review Report
Proposed Pristine Power Generation Facility
18675 Dufferin Street
Township of King, Regional Municipality of York

The Lake Simcoe Region Conservation Authority (LSRCA) has reviewed the Environmental Review Report in accordance with the Greenbelt Plan, provincial policy, Ontario Regulation 179/06 under the Conservation Authorities Act and the LSRCA's Watershed Development Policies. The study is being carried out in support of a 350megawat natural gas-fired generation station to supply electrical power to northern York Region during peak power demand. We understand that the Ontario Power Authority (OPA) will award one site to a power company for peak power generating in the northern part York Region.

The study area is partially within the regulation limits of the LSRCA. The regulation components consist of watercourses and their associated meanderbelts and floodplain, and lands adjacent to the Ansnorveldt Wetland Complex which has been identified as a provincially significant wetland (PSW). Any development within the regulated portions of the property will require a permit under Ontario Regulation 179/06.

The property is located within the Protected Countryside designation of the Greenbelt Plan. The access road into the property is located within the Natural Heritage System of the Plan. As such, Section 4.2 of the Greenbelt Plan applies. The subject property is also partially located within the Natural Heritage System for the Lake Simcoe Watershed - July 2007 (here-in NHS). Policies under the Greenbelt Plan would meet the recommendations of the NHS.

Safe access to the site must be demonstrated in order for any development to occur on this property. A topographic survey, prepared by an Ontario Land Surveyor (OLS) will be required to precisely delineate the floodplain on this property and depths of flooding that can be expected under the Regional storm event.

A

Watershed

For Life

Development should ideally be located outside of the 120 metre adjacent lands to the PSW as well as outside of the PSW itself. A recent wetland staking exercise of the Ansnorveldt Wetland, by the Ministry of Natural Resources, included the forested lands to the immediate south of this property in the wetland boundary. The proposed development is within 120 metres of the PSW. Accordingly, a natural heritage evaluation, a hydrological evaluation and an Environmental Impact Study (EIS) are required to determine an appropriate setback and mitigation requirements for the protection of the wetland. The EIS must be scoped with staff of the LSRCA prior to its undertaking. We recognize that a crossing of the watercourse within the wetland near Dufferin Street will be required. It is our understanding that a spanned crossing is proposed. Any mitigation/compensation requirements for protection of the natural features will be addressed through the site plan and permit processes. It appears that all development (with the exception of works associated with the crossing) is to be located outside of the minimum 30 metre buffer to the watercourses.

Stormwater management has not been reviewed for this site. We will conduct that review should this property be selected by OPA. We note that the stormwater management pond is proposed within 120 metres of the PSW. The EIS must demonstrate that there will be no alteration to the hydrology (ground and surface water) of the wetland. Sediment and erosion controls will be required during construction and until the site has been stabilised.

If this site is chosen by the OPA, noise quantification and a mitigation plan for noise and lighting will be required. Detailed Noise impacts should be quantified as far as existing (background) sound (in decibels) and proposed sounds (in decibels). A tree removal and protection plan will be required for any tree removal in the Right-of-Way (ROW) and areas adjacent to or within the PSW. Compensation, restoration and enhancement plantings for grassland and shrubland habitat in the ROW as well as within the wetland and swm pond areas will be required at the detailed design stage.

I trust that this is satisfactory but should you have any questions or comments with regard to the above, please contact me at 905-895-1281 (ext. 286). Please reference the above file number in future correspondence.

Yours truly,

Jackie Burkart
Senior Planner

JB/ph

c. Mario Buszynski, Dillon Consulting Limited, 1-416-229-4692 - Fax
Shawn Cronkwright, Ontario Power Authority, 1-416-967-1947 - Fax
Paul Belton, Regional Municipality of York, 905-895-3482 - Fax
Sarah Armstrong, Township of King, 1-905-833-2300 - Fax
Mike Walters, Director, Watershed Management,
Lake Simcoe Region Conservation Authority

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Sent by Facsimile 1-905-895-3482

October 28, 2008

File No.: D05.64
IMS No.: POFC514C2

Mr. Paul Belton, M.C.I.P.
Manager of Development Review
Regional Municipality of York
17250 Yonge Street
Newmarket, ON L3Y 6Z1

Dear Mr. Belton:

Re: Official Plan Amendment Application D05.64
To Facilitate a Peaking Plant (Miller/Crang Site)
1170 Miller's Sideroad, Part Lot 6, Concession 2
Township of King, Regional Municipality of York

The Lake Simcoe Region Conservation Authority (LSRCA) has reviewed the proposed amendment to York Region's Official Plan in accordance with the Greenbelt Plan 2005, provincial policy and Ontario Regulation 179/06 under the *Conservation Authorities Act.* The proposed amendment would re-designate the subject lands from "Agricultural Policy Area" and "*Rural Policy Area*" to "*Rural Policy Area - Special Exception*" and establish in Section 5.9 of the Official Plan, policies regarding a non-renewable electricity generation (peaking) land use in addition to the existing designations. This would permit the use of these lands for a private power simple cycle "peaker" power generation facility on approximately 1.21 hectares of a 11.7 hectare parcel of land. This property is one of four sites proposed by Northland Power for a potential peak power generation facility.

The site is partially regulated by the LSRCA for apparent valleyland. A permit under Ontario Regulation 179/06 will be required for any site grading/development proposed within the regulated areas. We note that development is not proposed within any natural hazards.

A Watershed for Life

The property is located within the Protected Countryside designation of the Greenbelt Plan area but outside of the Natural Heritage System. As such, the policies of the Plan relating to the Natural Heritage System do not apply. The subject property is not located within the Natural Heritage System for the Lake Simcoe Watershed - July 2007. Accordingly, the LSRCA would have no objection to the proposed amendment.

October 28, 2008
File No.: D05.64
IMS No.: POFC514C2
Mr. Paul Belton, M.C.I.P.
Manager of Development Review
Regional Municipality of York

If this amendment is approved, noise quantification and a mitigation plan for noise and lighting will be required. This could include coniferous plantings around the buildings, focused lighting and sound dampening techniques. Noise impacts should be quantified as far as existing (background) sound (in decibels) and proposed sounds (in decibels).

We note that 'Appendix A - Bird Species Likely or Confirmed to be Breeding in the Area of the Proposed Facility' does not appear to be correct for this property. The applicant should confirm this.

Please provide us with your decision on this file. Please call me if you have any questions. In order to facilitate our processing of this file, please reference the above-noted file numbers in future correspondence.

Yours truly,

Jackie Burkart
Senior Planner
x 286

JB/ph

c. Sarah Armstrong, Township of King, 1-905-833-2300 - Fax
Brad Rogers, Stantec Consulting Limited, 1-905-474-9889 - Fax

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Web: www.lsrca.on.ca

120 Bayview Parkway
Box 282
Newmarket, Ontario
L3Y 4X1

Sent by Facsimile **1-905-833-2300**

October 28, 2008

File Nos.: OP-08-02, Z-08-09
IMS Nos.: POFC511C3, PZOC1070

Ms. Sarah Armstrong, BES
Township of King
Planning Department
2075 King Road
King City, ON L7B 1A1

Dear Ms. Armstrong:

Re: Official Plan and Zoning By-Law Amendment Applications
To Facilitate a Peaking Plant (Pitway Site), OP-08-02& Z-08-09
18156 Dufferin Street, Part Lots 5 and 6, Concession 3 Old Survey
Township of King, Regional Municipality of York

The Lake Simcoe Region Conservation Authority (LSRCA) has reviewed the proposed amendments to the Township of King Official Plan and Zoning Bylaw in accordance with the Greenbelt Plan 2005, provincial policy, and Ontario Regulation 179/06 under the *Conservation Authorities Act*. The proposed amendments would re-designate and re-zone the subject lands from "*Gravel Pit*" and "*Industrial Extractive (M3)*" respectively, to permit the use of these lands for a natural gas-fired power generation facility. It is unclear from the application if the entire site is subject to the amendment or just the eastern portion where the facility is proposed. This should be clarified. This property is one of four sites proposed by Northland Power for a potential peak power generation facility.

The property is located within an area partially regulated by the LSRCA. The regulation components consist of watercourses, meanderbelt, floodplain, apparent valleyland and wetland. A permit under Ontario Regulation 179/06 will be required for any site grading/development proposed within the regulated areas.

With respect to the natural hazards on the property we note that the facility is proposed within the floodplain. The LSRCA would not support siting the proposed facility within the floodplain. Should Northland Power pursue the proposed facility in this location, a topographic survey, prepared by an Ontario Land Surveyor (OLS) would be required to determine the exact extent of the floodplain on the property. It appears that there are areas that are outside of the floodplain, and in accordance with provincial policy and the LSRCA's Watershed Development Policies, development should be moved to a non-flood-prone area of the property. Consideration in this regard should also be given to any future expansions of the facility. We note that all development is proposed outside of the erosion hazards (meanderbelt) and appears to be located outside of the wetland {* subject to verification in the field, by the Ministry of Natural Resources (MNR)}.

A

Watershed

for Life

The property is located within the Protected Countryside designation of the Greenbelt and is part of the Greenbelt Natural Heritage System. The Ansnorveldt Wetland, which has been identified as a provincially significant wetland (PSW), and the 120 metre adjacent lands covers part of the site. The property has also been identified as supporting Level 1, Level 2 and Level 3 features of the Natural Heritage System for the Lake Simcoe Watershed - July 2007 (here in referred to as NHS). It is also identified as an area of significant woodlands in the York Region Official Plan. We note that the property is the site of an old gravel pit that has been rehabilitated and that the licence under the *Aggregate Resources Act* was surrendered in April 2007.

The following comments are provided with respect to the natural heritage features and values of the property and our review under the Greenbelt Plan 2005 and the PPS.

1. The subject property is within the Greenbelt's Natural Heritage System. In accordance with Section 3.2.2 3.d) of the Greenbelt Plan best efforts should be applied to minimize the disturbed areas to 25%, and impervious surfaces to 10% of the total developable area of the site. While the entire area of the site is 100 hectares, the total developable area should be calculated as the total area of the property minus all key natural heritage features (KNHF) and key hydrological features (KHF) and their minimum vegetation protection zones.

2. Part of the Ansnorveldt PSW exists on the subject property. The boundaries of the PSW must be staked and surveyed in the field with the MNR* to determine the exact limits of the wetland.

3. Section 5.0 Opportunity/Constraints indicates that there would be some encroachment, during construction, into the 30m buffer to the PSW. Section 7.1.3 Other Direct Effects notes there may be a need to establish a lay down area within the 30m buffer and this area would be fully restored upon completion of construction. We are generally not in favour of any encroachment into the buffer. Further discussion and detail would be required.

4. Section 7.2.1 Changes to Ground Water Quantity and Quality notes that a water budget has not been completed at this time. A water budget and analysis is required to demonstrate that the proposed development will not have any affect on the hydrology (both ground water and surface water) of the PSW and any other KNHF or KHF . Any negative impacts to these features would not be supported by the LSRCA.

5. The subject property contains Level 1, Level 2 and Level 3 features of the NHS. It appears that the proposed development footprint would not encroach into any of these features.

The following comments are provided with respect to the Environmental Impact Study undertaken by Stantec Consulting Limited (June 2008) in support of the proposed site:

6. Seasonal vegetation surveys have not been undertaken and are required as part of the EIS. The locations of any rare, threatened or endangered species must be identified in the mapping and addressed in the impacts analysis.

7. Breeding amphibian and bird surveys have not been undertaken. These surveys are required. Analysis of existing conditions and the impacts resulting from the proposed development must be provided. Complete lists of all species observed with their provincial status are required.

8. Given the wetlands and woodlands on the property, salamander surveys are warranted.

9. The proposed development area is currently a meadow. Analysis of the impact of the proposed development on the meadow function (e.g., breeding birds, flora, foraging for raptors, amphibians, etc.) is required.

10. The woodlands must be examined for meeting the criteria of significant woodlands according to the Greenbelt Plan technical paper as these woodlands are subject to the requirements of the Greenbelt Plan. Other woodlands should then be assessed for conformity with York Region's Significant Woodlands.

11. Mitigation for the impacts of noise and lighting is required, which for example could include coniferous plantings around the building, focused lighting and sound dampening techniques. Noise impacts should be quantified as far as existing (background) sound (in decibels) and proposed sound (in decibels).

Based on all of the above the LSRCA respectfully requests that the Township defer any decision on these proposed amendments until we have reviewed a topographic survey for the property. Should the survey indicate that the proposed site for the facility is not within the floodplain, we would require that items 1, 2, 3 and 4 be addressed as well as completion of the EIS.

The following additional work will be required as part of the EIS:

- Additional vegetation surveys May - August
- Description of soils is required for the ELC
- Breeding bird surveys (2 visits minimum)
- Breeding amphibian surveys (3 visits minimum)
- Salamander surveys (dip netting of vernal pools and log rolling)
- Staking and surveying of key natural heritage features with the MNR (for the PSW) and LSRCA (all other key natural heritage and key hydrological features)
- Figure depicting staked limits of features with minimum vegetation protection zone and proposed development footprint
- Water budget
- Noise quantification and impacts analysis, and mitigation

Any other requirements (i.e. stormwater management, erosion and sediment control, re-vegetation etc.) would be addressed through detailed review at the site plan stage.

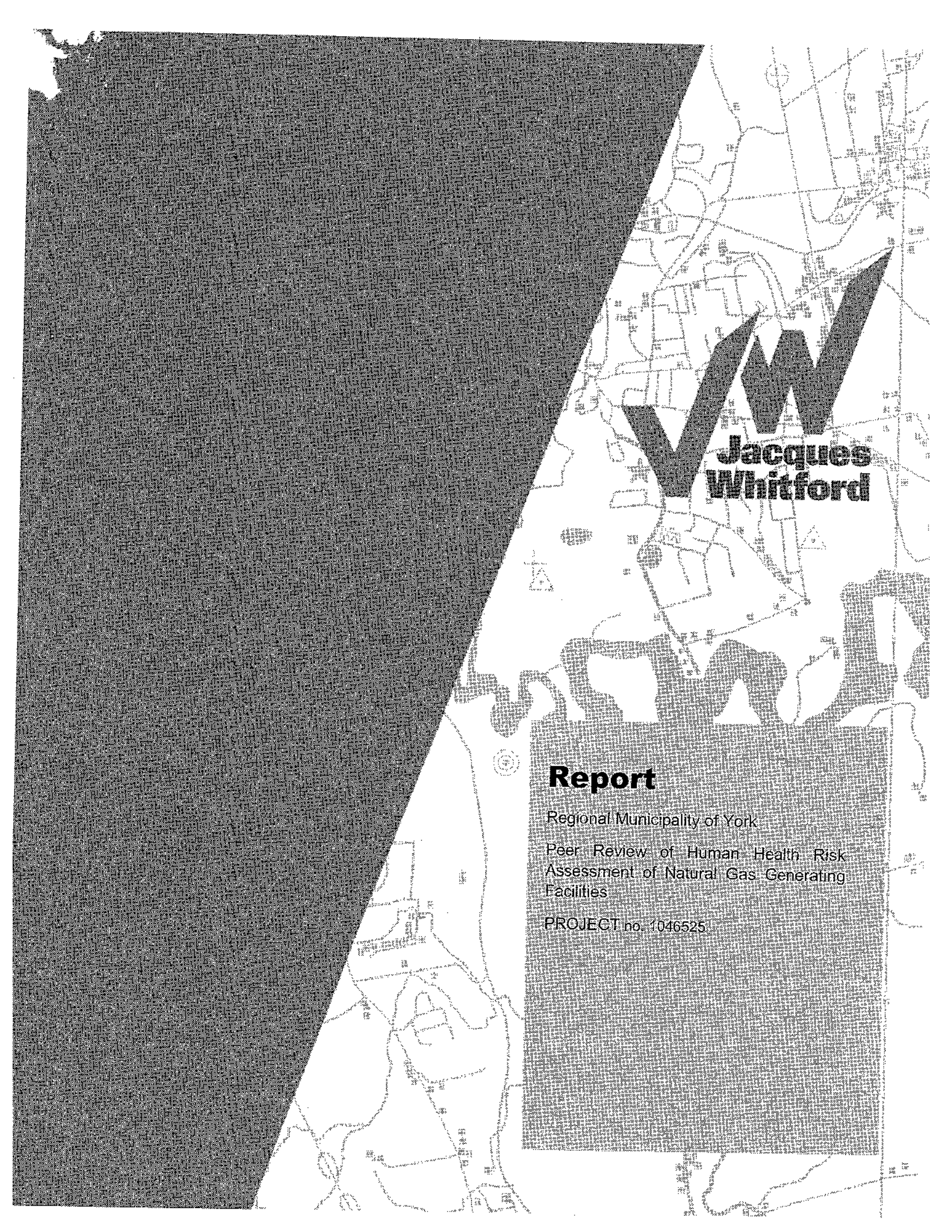
I trust that this is satisfactory. Please call me if you have any questions. In order to facilitate our processing of this file, please reference the above-noted file numbers in future correspondence.

Yours truly,

Jackie Burkart
Senior Planner

JB/ph

c. Paul Belton - Regional Municipality of York - 905-895-3482 - Fax
Brad Rogers, Stantec Consulting Limited, 1-905-474-9889 - Fax



Jacques Whitford

Report

Regional Municipality of York

Peer Review of Human Health Risk Assessment of Natural Gas Generating Facilities

PROJECT no. 1046525

PROJECT NO. 1046525

REPORT TO	**The Regional Municipality of York** **17250 Yonge Street** **P.O. Box 147** **Newmarket, ON** **L3Y 6Z1**
FOR	Peer Review
ON	Human Health Risk Assessment of Natural Gas Generating Facilities

November 28, 2008

Jacques Whitford
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Jacques Whitford

EXECUTIVE SUMMARY

Jacques Whitford Limited (Jacques Whitford) was retained by the Regional Municipality of York to conduct a peer review of human health and environmental risk studies undertaken by three consultants for five proposed natural gas-fired electrical generating facilities submitted by Northland Power, Sithe Global, and Pristine Power in response to the RFP from the Ontario Power Authority.

The primary objective of the peer review was to provide detailed comment on approach and methodology used in the conduct of the risk assessment and to evaluate whether or not the conclusions reached were based on sound and accepted scientific practice in Ontario. The secondary objective of the peer review of the human health and environmental risk analyses was to assess the completeness of the reports, including whether the assessments have considered all appropriate and potentially significant contaminants, emissions, exposure pathways and receptors (potentially exposed people or ecological resources). The review considered whether exposure limits applicable in Ontario and those used by Health Canada and other international agencies (e.g., World Health Organization [WHO]) have been appropriately used to benchmark acceptable exposure levels (e.g. air standards) or risk estimates.

The peer review also considered whether evidence supports that emissions will be below provincial criteria (current and proposed) and federal maximum acceptable levels, whether appropriate current and proposed, provincial and federal air quality standards, or other international health-based standards have been considered for all relevant media, whether methodologies incorporate current literature and published methodologies that estimate health impacts associated with natural gas-fired electricity generation (e.g., RWDI 2005), as well as health impacts of various pollutants associated with emissions from natural gas-fired electricity generation (e.g., CARB 2008).

The assessment of the Northland Power Inc. air modeling, risk assessment and supporting information concludes that measurable adverse effects on human health or agricultural crops are not expected. Despite some differences in scientific opinions and approaches identified within the reports, the reviewers concluded that overall the conclusions are supported by the assessment performed.

The assessment of the York Energy Centre LP air modelling, risk assessment and supporting documentation concludes that measurable adverse effects on human health and ecological receptors are not expected. A number of areas for potential improvement were noted by the reviewers; however, the conclusions of no undue elevated risk to human or ecological health are supported by the assessment. It is agreed that the reported potential elevated health risks associated with exposure to NO_x, SO_2 and PM_{10} most likely correspond to extreme air quality events, would occur only on a very infrequent basis, and the proposed facility would not be expected to measurably impact air quality related to such extreme events.

The air modelling, risk assessment report and supporting documentation of the Sithe Sluse Road Peaking Station concludes that emissions from the proposed facility will not result in a health risk to human or ecological receptors. Although there are several peer review comments for clarification or potential improvement to the report were noted, and the peer review concluded that the assessment adequately supports the conclusion that the project will not result in measurable undue risks to health or the environment.

Although the methodology and approach varied amongst the three different consultants, all arrived at the same conclusion that the construction and operation of the proposed peaking natural gas-fired electrical generating facilities near residences would not pose an undue risk to either human or ecological receptors. These findings are supported by the peer review.

Table of Contents

1.0 INTRODUCTION

1.1 Background

The Ontario Power Authority issued a Request for Proposals (RFP) for the construction and operation of gas-fired 'peaking' generation in the Northern York Region. Three proponents prepared environmental impact assessment studies to support their proposal for design, installation and operation of the future facility.

Jacques Whitford Limited (Jacques Whitford) was retained by the Regional Municipality of York to conduct a peer review of human health and environmental risk studies undertaken by three consultants that address the potential health risks associated with gas-fired generation stations that could be located in York Region.

1.2 Objective

This primary objective of the peer review was to provide detailed comments on the three consultants reports and provide an assessment of the whether the risk assessments performed adequately support the conclusions reached.

The secondary objectives of the peer review of the human health and environmental risk studies were to assess the completeness of the reports including whether the assessments have considered all appropriate and potentially significant contaminants, emissions, exposure pathways and receptors (potentially exposed people or ecological resources). The review considered whether exposure limits applicable in Ontario and those used by Health Canada and other international agencies (e.g., World Health Organization [WHO]) have been appropriately used to benchmark acceptable exposure levels (e.g. air standards) or risk estimates.

The peer review also considered whether evidence supports that emissions will be below provincial criteria (current and proposed) and federal maximum acceptable levels, whether appropriate current and proposed, provincial and federal air quality standards, or other international health-based standards have been considered for all relevant media, whether methodologies incorporate current literature and published methodologies that estimate health impacts associated with natural gas-fired electricity generation (e.g. RWDI 2005) as well as health impacts of various pollutants associated with emissions from natural gas-fired electricity generation (e.g. CARB 2008).

The consultant's report to the Ministry of Energy (RWDI 2005) was intended as a comparative analysis that assessed the hypothetical health costs of different types of power generation facilities in Ontario. The study included inherent simplifications and assumptions that make it useful to only compare the results between scenarios and not in an absolute sense. Therefore, it would not be appropriate to benchmark or compare results of the human health risk assessment undertaken for the environmental assessment process to the Ministry of Energy Report.

Although ground-level ozone (O_3) is an important health parameter, none of the proposed facilities will directly emit ozone to the atmosphere. Ozone may form downwind from the facilities (on the order of several kilometres) under certain atmospheric conditions (hot, low wind days) due to the emissions of

nitrogen oxides (NO_X) and photo-chemically reactive volatile organic compounds (VOC). As a result, effects on ground-level ozone were not evaluated as a direct requirement of this peer review.

1.3 Scope of Work

A scope of work for this project includes a review of the Human Health and Environmental Risk studies and the Environmental Air Dispersion Data for five proposed natural gas-fired electrical generating facilities submitted by Northland Power, Sithe Global, and Pristine Power in response to the RFP from the Ontario Power Authority.

The reviewed studies are as follows:

- *A Review of Environmental Air Dispersion Data for Four Proposed Natural-Gas Fired Electrical Generating Facilities*, Intrinsik, October, 2008, for Northland Power Inc.;
- *York Energy Centre, Screening Level Risk Assessment*, Dillon Consulting Limited (2008a); and,
- *Appendix G, Risk Assessment* in *Sluse Road Peaking Station Environmental Review Report, Town of East Gwillimbury, Ontario*, November, 2008, Golder Associates for Sithe Global.

Further details pertinent to each of the above risk assessment reports are contained in the respective environmental review reports including three Stantec Consulting Ltd. (Stantec) reports on which the Intrinsik assessment is based:

- Northland Power Inc. – Proposed East Gwillimbury Peaking Generation Station, October, 2008;
- Northland Power Inc. – Proposed King township (Pitway Site) Peaking Generation Station, October, 2008; and
- Northland Power Inc. – Proposed King Township (Miller Site) Peaking Generation Station, October, 2008.

The detailed review comments on these assessments are presented in the sections that follow.

1.4 Reviewers

The review was conducted by senior Jacques Whitford staff, specializing in air emissions from natural gas-fired generating stations, air modelling, human health risk assessment and ecological risk assessment including crops (Table 1).

Table 1 Jacques Whitford Senior Reviewers

Team Member	Specialization
Cecile Willert, P.Eng.	Human health risk assessor
Dr. Tereza Dan	Ecological risk assessor
Ben Coulson, P.Eng.	Air quality specialist
Dr. Christopher Ollson	Human Toxicology and Risk Assessment

2.0 NORTHLAND POWER INC

The Northland Power Inc. report by Intrinsik (2008) titled, "A Review of Environmental Air Dispersion Data for Four Proposed Natural-Gas Fired Electrical Generating Facilities" is presented as Appendix F to each of the Stantec Consulting Ltd. Environmental Assessment reports for the three Northland Power Inc. sites, namely East Gwillimbury (Stantec 2008a), King Township Pitway Site (Stantec 2008b) and King Township Miller Site (Stantec 2008c). Further supporting information for each site is included in Appendix E of each of the three Environmental Assessment reports which details the air quality assessment undertaken by Envirometrex Corporation for each site (Envirometrex 2008a, b, c).

The reviewers understand that a fourth site in Aurora evaluated in the Intrinsik (2008) report is no longer under consideration. Information specific to the Aurora site was thus not considered further by the peer reviewers.

Specific comments on the Northland Power Inc. risk assessment and supporting information are outlined below. The assessment concludes that measurable adverse effects on human health or agricultural crops are not expected. Despite some differences in scientific opinions and approaches outlined in the sections that follow, the reviewers concluded that the conclusions reached in the report are supported by the assessment performed.

2.1 Air Quality Assessment

The air quality assessments prepared by Envirometrex for Northland Power's three sites under consideration all follow a similar format and methodology, with only the internal site configuration generally affecting the offsite results. In general, the assessments appear to follow an acceptable approach based on the available information reviewed. However, as these assessments are being conducted under Ontario regulations, and to demonstrate compliance under *Ontario Regulation 419/05* (O.Reg. 419), it would have been preferable if the reports followed the Ontario Ministry of the Environment's (MOE) guidance contained in their publication "Procedure for Preparing an Emission Summary and Dispersion Modelling (ESDM) Report" (MOE, 2005). This guidance format outlines a standardised presentation and level of detail to include in reports that demonstrate compliance against O.Reg. 419 that would have facilitated these technical reviews. Additional drawings including site plans, process flow diagrams, and elevation views as required by the ESDM guide would have further facilitated the peer review.

The peer review focussed on six main areas that should be included in an air quality assessment of this type: facility design, baseline conditions, facility emissions, dispersion modelling, compliance assessment, and cumulative effects.

The Environmetrex assessments discuss the criteria that have been used to evaluate the projects' air quality contributions. These include MOE standards and ambient air quality criteria (AAQC), and federal ambient air criteria. The MOE AAQC are referenced to Ontario Regulation 337, however this regulation was retired in August 2008. However, these criteria are still published by the MOE in a guidance document (MOE, 2008a). The assessments reference the Canadian Council of Ministers of the Environment (CCME) Canada-wide Standard (CWS) for respirable particulate ($PM_{2.5}$) of 30 ug/m^3, which is a target set to evaluate an airshed's acceptability, and not particularly as a local ambient air

quality indicator. In this light, the MOE suggests that the contribution of primary $PM_{2.5}$ to ambient levels should be less than approximately 25 ug/m^3 for an individual facility to ensure that the CWS can be achieved (MOE, 2008a). The assessments also notably omit the 30-minute carbon monoxide (CO) standard of 6,000 ug/m^3 contained in O.Reg. 419 and only evaluate CO against the retired AAQCs.

Each of the three proposed Northland Power projects reviewed were of similar design. They included two 200 MW Siemens 5000F combustion turbines using Dry Low NOx (DLN) technology to generate electricity. A 300 hp diesel-fired emergency fire pump is also included in the plant design. The fire pump is dismissed early in each report as having minor emissions and is not evaluated further. Diesel fire pumps are expected to be tested on a regular basis (e.g., once per month for one hour) and emissions from such sources can create short-term levels of some contaminants, such as nitrogen oxides, that are very close to the prescribed MOE limits. As such, it would be prudent to include this source in the air quality assessments to ensure compliance with MOE limits can be achieved.

The procedures used to evaluate the emissions from the combustion turbines appear appropriate. Data quality ratings as required by the ESDM guide were not provided; hence an estimate of the uncertainty in the emissions data cannot be determined. A higher natural gas sulphur content than the value used to determine turbine sulphur dioxide (SO_2) emissions has been known to occur in Ontario in some cases (although SO_2 emissions appear to be arbitrarily increased as a conservatism after the fact in the assessments). However, SO_2 levels are still expected to be small such that predicted concentrations will still comply with applicable limits.

The Environmetrex assessments appropriately considered all particulate matter emitted from the facility to be less than 2.5 microns in diameter (i.e., $PM_{2.5}$). Combustion turbine particulate is typically less than 1 micron. Particulate matter emissions were based on in-stack concentration levels from the manufacturer. A common issue with turbine manufacturer data is the reporting of only filterable particulate matter and not total particulate matter, which includes the condensable fraction. The filterable and condensable fractions are typically about equal. The air quality assessments do not appear to explicitly make this clarification; hence particulate emissions could be under-estimated by a factor of 2. However, based on the Pristine Power data, it is likely that the given values are for total particulate emissions.

Emissions from combustion turbines vary during start-up and shut-down compared to steady-state conditions, with CO emissions often being much higher. The Environmetrex air quality assessments do address this variability and do appear to follow the correct emission trends for NO_X, CO, and PM. However, the exact methodology could not be verified as insufficient supporting information was provided in the report.

The turbine emissions are compared to the MOE Guideline A-5 limits for combustion turbines (MOE, 1994) and the Environment Canada (EC) guidance "New Source Emission Guidelines for Thermal Electricity Generation" (EC, 1999). This latter guidance does not appear to apply, as it is specifically for electricity units that are steam-driven. The SO_2 limit for Guideline A-5 appears to have been incorrectly calculated using the power output allowance for NO_X rather than SO_2. However, this correction would result in a higher limit for SO_2 and thus would not affect the overall conclusions.

The dispersion modelling methodology appears to be generally appropriate, but does not always follow the recommended MOE guidance. An MOE-approved model was used and the model setup followed standard practices outlined in the "Air Dispersion Modelling Guideline for Ontario" (MOE, 2005b). These practices included the use of building downwash algorithms, MOE-approved meteorological data,

terrain data, and appropriate receptor density and spacing. In the case of the Miller site, an additional receptor grid was placed on nearby elevated terrain which is a positive modelling approach. However, overall the receptor grid spacing used does not have the density required by the MOE guidance, particularly close to the sources. This lack of receptor density may cause the maximum offsite point of impingement concentration to be under-estimated, as the worst-case may fall between points in the receptor grid. Considering that the Sithe Sluse Road air quality assessment predicted much higher ground-level concentrations for the same turbine class (about 1.5 to 2 times for 1-hour NO_X), the influence of these receptors may be important and should likely be addressed.

The source parameters used in the modelling appear to be appropriate with the exception of stack exit diameter which seems large for a facility of this size. A larger diameter will serve to decrease the stack exit momentum resulting in higher ground-level concentrations; hence it is not expected to be a concern.

The Environmetrex air quality assessments evaluate three emissions scenarios: continuous operation, worst-case start-up/shutdown operation, and peaking operation. The approach as described appears to be acceptable and should result in prediction of the worst-case offsite concentrations. However, it is difficult to understand from the report which scenario values are actually reported as the worst-case. For some contaminants, start-up/shutdown operation would produce the worst-case results. Clarification of the results would be useful as it is difficult to otherwise comment on the predicted concentrations and their apparent validity.

The 8-hour CO concentrations appear to be scaled from the 1-hour CO results using a factor of 0.56. The use of this factor and where it derives from is not described hence no comment can be made on its appropriateness. Half-hour CO concentrations should also be assessed against the O.Reg. 419 limit (omitted as described above).

A comparison is made between the predicted incremental concentrations and the existing ambient levels. However, a formal cumulative effects assessment is not conducted with the report indicating that MOE requirements only necessitate the evaluation of incremental concentrations. Although not usual, this interpretation is not strictly correct as the MOE has the ability to require the assessment of ambient levels along with facility incremental concentrations. In some instances of more controversial projects, the MOE has been moving more regularly to this approach. However, given the predicted concentrations, such an assessment is unlikely to add much value for most contaminants, with the possible exception of short-term NO_X and $PM_{2.5}$ levels.

Plume visibility and the associated potential fogging and icing issues are discussed but are dismissed as being of no concern due to the thermal buoyancy of the plume and high exit velocity. While the reviewers generally agree that these issues are unlikely to be significant, further discussion and explanation would be helpful considering the peaking facility is designed for regular start-ups and shut-downs when thermal buoyancy and exit velocity may not be as beneficial.

Generally, the methodology used, emissions, and predicted concentration levels seem to give valid results, subject to the issues noted above.

2.2 Human Health Risk Assessment

The Northland Power Inc. report contains a review of potential health risks which is qualitative in nature or what might be considered a screening level assessment. Such assessments typically are based on conservative assumptions designed not to underestimate risks.

The basic steps that should be involved in the conduct of any risk assessment, whether in a detailed or a screening level assessment, include identification of applicable emissions, selection of chemicals of concern, evaluation of transport pathways and subsequent human exposure, a dose-response assessment, characterization of potential risks and discussion of uncertainties and the likelihood of those uncertainties to impact the results and conclusions of the assessment.

In the Intrinsik (2008) report, the section identified as the human health risk assessment spans just over one page. A rigorous screening to identify pollutants that may have health impacts and thus should be assessed for human health could not be found, and instead several generally unreferenced statements were made, the basis of which was not provided in the report or supporting documentation. In order to determine whether the screening and subsequent conclusions were justified, the reviewers were required to conduct further research to fill in some of the gaps from the Intrinsik (2008) report. No uncertainty analysis was provided in the report.

The Intrinsik (2008) report does not contain a discussion or screening out of additional human exposure pathways that may be present. Instead, only airborne exposures are examined with no consideration for whether aerial deposition or washout and subsequent exposure pathways associated with soil, surface water, groundwater or produce uptake may or may not be pertinent to the assessment of human health. For the criteria air contaminants and volatile compounds, these pathways are considered of relatively minor importance, but for semi volatile compounds identified in the assessment, such as PAHs, these pathways may be more important. PAHs are identified as pollutants in the assessment, a list of PAH compounds typically assessed for this type of facility is provided, and point of impingement concentrations are provided for PAHs as a group; however, except for naphthalene, no further discussion or analysis of potential health risks associated with PAHs is provided. That being said the reviewers acknowledge that the dominant pathway of exposure and potential risk to human health from these types of facilities is through direct inhalation of chemicals and that all other exposure pathways would unlikely result in a potential undue risk to health.

The Intrinsik (2008) review identifies pollutants for evaluation of human health as nitrogen oxides (NO_x, conservatively assumed to be in the form of nitrogen dioxide, NO_2), particulate matter (specifically $PM_{2.5}$) and carbon monoxide (CO).

Background concentrations in the Intrinsik (2008) report are based on the 90th percentile of concentrations from 2002 to 2004 at the MOE Newmarket monitoring station. Although the percentile is low compared to that used in the Sithe Global report (Golders 2008), a discussion is also provided of 99th percentiles and the data are thus considered by the reviewers to be adequately supported.

Much of the discussion of CO, VOCs, particulate, and NO_x found in Chapter 2 of the Intrinsik (2008) report has been adapted from Section 3.1 of the United States Environmental Protection Agency (US EPA 2000) AP 42 guidance on emission factors from stationary gas turbines, with some parts of the text repeating the US EPA document verbatim, with little discussion specific to the intended facilities. The US EPA reference provides emission rates for PAHs which appear to have been taken into account in the projected PAH point of impingement concentrations estimated by Intrinsik (2008), even

though the PAHs are not evaluated further. If the PAH point of impingement concentrations were compared to the MOE air quality standard for benzo(a)pyrene (considered conservative since benzo(a)pyrene is one of the most potent PAHs with respect to carcinogenicity), the maximum projected benzo(a)pyrene concentrations can be seen to be less than the applicable standards. The deficiency is thus considered to be fairly minor, although secondary exposure pathways have also not been taken into account.

The assumption that all of the NO_x compounds are in the form of NO_2 is stated to be conservative, and this assumption is considered by the reviewers to be appropriate for a screening level assessment. The Intrinsik (2008) review did not consider the WHO health based guidelines for NO_2 (200 µg/m^3 for 1 hour NO_2 concentrations) or the WHO (2005) review of these guidelines. The lower WHO guidelines supported by the 2005 update are well above the base load point of impingement concentrations for all three sites and omission of these guidelines from consideration is thus not considered a significant deficiency. It should be noted that the reviewers do not necessarily endorse the use of the WHO guidelines for criteria air contaminants in Ontario, but have been asked to comment on other jurisdiction standards.

The Intrinsik (2008) and Envirometrex (2008a, b, c) reports site the Ontario standards for carbon monoxide based on multiple sources. The single source standard of 6,000 µg/m^3 should have been compared to incremental point of impingement concentrations. Since estimated base load point of impingement concentrations are between two and three orders of magnitude less than this standard, the conclusions of their report are not affected.

For particulate matter in air, only $PM_{2.5}$ is considered by Intrinsik (2008). The larger size fraction PM_{10} was evaluated by Envirometrex (2008a, b, c). This size fraction is considered representative of all dust that reaches the lungs during inhalation while the $PM_{2.5}$ fraction contains the dust particles of a size most likely to reach the alveoli (tiny air sacs in the lungs). Although $PM_{2.5}$ has a greater propensity for health impacts, PM_{10} concentrations are by definition the same as or higher than $PM_{2.5}$ concentrations in emissions, since the smaller size fraction is contained within the larger PM_{10} fraction, and thus PM_{10} is generally evaluated in addition to $PM_{2.5}$. Earlier studies (e.g. RWDI 2005) evaluated PM_{10} and Envirometrex (2008a, b, c) also evaluated PM_{10} in terms of air emissions for the three sites. Table 18 in each of the Envirometrex reports indicates that worst case PM_{10} and $PM_{2.5}$ concentrations are indistinguishable. The evaluation of only $PM_{2.5}$ was thus concluded to be justified for this assessment.

The potential for health effects associated with $PM_{2.5}$ was evaluated by Intrinsik (2008) based on CCME (2000) target of 30 µg/m^3 by 2010. A more recent study by the California Environmental Protection Agency's Air Resources Board (CARB 2008) develops a relationship of 10% increase in health impacts compared to a 10 µg/m^3 increase in long term $PM_{2.5}$ air concentrations. This is higher than that reported in the Intrinsik (2008) assessment as a 4 to 7% increase in mortality. Envirometrex reports subchronic (24-hour) maximum $PM_{2.5}$ concentrations ranging from 0.50 to 0.75 µg/m^3 for the three sites. Based on the CARB (2008) dose-response model, an increase of up to 0.75% in potential health effects associated with $PM_{2.5}$ would be expected for individuals with long term exposures at the point of impingement. RWDI (2005) provides baseline data on health impacts in Ontario associated with 2005 power generation. Based on a 0.75% increase in these base rates, approximately 1 in 5,000 people with long term exposures at the point of impingement for the maximum location (Pitway site) might be expected to experience minor illness while about 1 in 1.6 million people at this exposure might visit an emergency room. There are several highly conservative assumptions in these estimates that would be expected to significantly overstate the potential actual risks to individuals residing or working in the

vicinity of the plant. Intrinsik's conclusion of "no measurable health effects in humans living in the surrounding communities" is thus considered by the reviewers to be supported by the analysis and the most recent literature.

The Intrinsik (2008) report neglects to evaluate a number of other pollutants typically associated with emissions from natural gas-fired generating stations. These include sulphur dioxide (SO_2), volatile organic compounds (VOCs) and Polycyclic Aromatic Hydrocarbons (PAHs). VOCs and PAHs are discussed in the Intrinsik report as Hazardous Air Pollutants (HAPs). The reason given in the Intrinsik report for exclusion of these compounds from consideration is that information is not available on "ambient ground level concentrations". Table 1 of the Intrinsik report however provides point of impingement concentrations for the HAPs. Point of Impingement concentrations are the appropriate concentrations with which to evaluate potential health risks to these compounds. The basis for their exclusion is therefore not justified.

The air quality assessments undertaken for each of the three proposed sites (Envirometrex 2008a, b, c, Table 19 in all three documents) compares maximum estimated concentrations of the PAH compound naphthalene and the VOCs other than 1,3-butadiene and benzene to applicable ambient air quality standards or criteria which are considered to be protective of health impacts. The maximum concentration ratio occurs at East Gwillimbury and Miller are 0.0075 for acrolein. For the Pitway site, the corresponding ratio for acrolein is slightly higher at 0.011. Because the assessments are based on conservative characterization of emissions and air concentrations, a ratio less than one can be concluded to indicate that elevated risks to human health are not expected. The fact that the highest ratios are two orders of magnitude below the comparative benchmark of 1 provides for a high degree of certainty in this conclusion. The exclusion from the evaluation of the HAPs that have standards is thus not considered a significant deficiency.

The remaining VOCs that have not been addressed in either the Instrinsik or Envirometrex reports are 1,3-butadiene and benzene. The estimated 24-hour maximum concentrations are reported by Envirometrex to be <0.00004 to <0.00006 $\mu g/m^3$ for 1,3-butadiene and 0.001 to 0.002 $\mu g/m^3$ for benzene. Although these concentrations are not considered representative of potential long term exposures, a comparison of these concentrations to United States Environmental Protection Agency (US EPA 2002 and 2008) reference concentrations or risk specific concentrations based on US EPA (2002 and 2008) or Health Canada (2004) cancer unit risks and an acceptable cancer risk defined by the MOE as one in one million would be considered highly conservative. Since projected maximum 24-hour concentrations for these chemicals are well below those benchmarks, the data support the conclusion that there is no unacceptable risk to human health. The exclusion of these compounds was thus concluded to not be a significant deficiency.

Sulphur compounds including sulphur dioxide are discussed in Section 2.0 of the Intrinsik (2008) report in terms of air emissions. Potential emissions are quantified in this section and a conclusion is provided that, "this emission rate results in trace emissions of SO_2 that have negligible effect on either health or vegetation." The basis for this conclusion is not provided in the Intrinsik (2008) report. The supporting air quality assessments (Envirometrex 2008a, b, c) provide estimates of 24-hour maximum incremental ambient air concentrations of SO_2 for each of the three proposed sites ranging from 0.08 to 0.11 $\mu g/m^3$. The current worst case background concentrations are reported as 46 $\mu g/m^3$. The World Health Organization (WHO 2006) recently updated their health based air quality guideline for SO_2 to 20 $\mu g/m^3$. Interim targets of 50 and 125 $\mu g/m^3$ were also recommended in the WHO review. Since the estimated incremental concentrations are orders of magnitude below both the WHO guideline and the current

maximum concentration, and since the maximum background air concentration meets the interim targets, the reviewers concluded that Intrinsik's conclusion that health effects due to SO_2 would be negligible is reasonable.

Based on the discussion above, the conclusion of the human health risk assessment that no measurable adverse affects would result from the facility operations is adequately supported by the assessment and supporting information provided.

2.3 Ecological Assessment

The Northland Power Inc. report contains a review of agricultural effects of oxides of nitrogen which is qualitative in nature or what might be considered a screening level assessment. Such assessments typically are based on conservative assumptions designed not to underestimate risks.

The basic steps that should be involved in the conduct of any risk assessment, whether in a detailed or a screening level assessment, include identification of applicable emissions, selection of chemicals of concern, evaluation of the transport pathways and subsequent exposure, characterization of potential risks and discussion of uncertainties and the likelihood of those uncertainties to impact the results and conclusions of the assessment.

The Intrinsik (2008) report did not include an ecological risk assessment. Rather the report was focused on the agricultural effects of oxides of nitrogen. A description of the study area and the evaluation of other types of possible receptors that appear to present (such forested ecosystems) should have been provided. A screening of the potential chemicals of concern that may pose risk to ecological receptors was not included in the report, nor was a selection of the specific receptors that might be present within the local study area included. Furthermore, no other pathways of exposure were assessed, and a rationale was not provided for why these were excluded. No discussion of uncertainties was found in the report, and the reviewers thus again were required to fill in some of the gaps in order to provide an interpretation of the findings.

Sulphur compounds including sulphur dioxide are discussed in Section 2.0 of the Intrinsik (2008) report in terms of air emissions. Potential emissions are quantified in this section and a conclusion is provided that, "this emission rate results in trace emissions of SO_2 that have negligible effect on either health or vegetation." The basis for this conclusion was found in the air quality assessments (Envirometrex 2008a, b, c) which provides an estimate of 24-hour maximum incremental ambient air concentrations of SO_2 for each of the three proposed sites ranging from 0.08 to 0.11 $\mu g/m^3$. The current worst case background concentrations are reported as 46 $\mu g/m^3$. These values are well below the World Health Organization (WHO 2000a) effects of sulphur dioxide on vegetation for 24-hours (100 $\mu g/m^3$). The conclusion that the emission rate will result in trace emissions of SO_2 that will have a negligible effect on vegetation is supported, but should be presented in a specific screening for ecological receptors against the AAQC and WHO standards.

The assumption that all of the NO_x compounds are in the form of NO_2 is stated to be conservative, and this assumption is considered by the reviewers to be appropriate for a screening level assessment. The Intrinsik (2008) review did not consider the WHO (2000b) vegetation based guidelines for NO_2 (200 $\mu g/m^3$ for 24 hour or annual 30 $\mu g/m^3$ NO_2 concentrations). The WHO guidelines are well above the base load point of impingement concentrations for all three sites and omission of these guidelines from consideration is thus not considered a significant deficiency.

In summary, the risk assessment combined with other supporting documentation identified in the documents reviewed was found to be adequate to support the conclusion that measurable effects to agricultural crops would not be expected. No analysis was provided on which to base conclusions regarding other potential ecological risks.

2.4 Summary

For the air quality assessment, the methodology used, emissions, and predicted concentration levels seem to generally give valid results, subject to the issues noted in this review. The reviewers concluded that the information provided in the screening review, combined with that presented in the supporting documentation was adequate to conclude that measurable effects to human health or agricultural crops are not expected for any of the proposed Northland Power Inc. sites. No conclusions could be drawn regarding other potential ecological receptors.

3.0 YORK ENERGY CENTRE

The York Energy Centre LP is owned by Pristine Power Inc. and Harbert Power LLC, as a limited partnership. "York Energy Centre, Screening Level Risk Assessment" undertaken by Dillon Consulting Limited (Dillon 2008a) as a supporting document the York Energy Centre Environmental Assessment. Further supporting information documenting the air quality assessment is included in the report "York Energy Centre, Air Quality Assessment", also undertaken by Dillon (2008b) as part of the environmental assessment. The site evaluated in the York Energy Centre reports is located at 18781 Dufferin Street in King Township.

Specific comments on the York Energy Centre LP risk assessment and supporting information are outlined below. The assessment concludes that inhalation effects may occur due to high short-term background air concentrations, not related to the proposed facility. No other human health or ecological effects are expected based on the study findings. A number of areas for potential improvement were noted by the reviewers; however, the conclusions of no elevated risk are supported by the assessment. It is agreed that the reported potential elevated health risks associated with exposure to NO_x, SO_2 and PM_{10} most likely correspond to extreme air quality events, would occur only on a very infrequent basis, and the proposed facility would not be expected to measurably impact air quality related to such extreme events.

3.1 Air Quality Assessment

The Dillon air quality assessment of the proposed Pristine Power/Harbert York Energy Centre (YEC) generally follows evaluation and modelling practices mandated by the Ontario Ministry of the Environment (MOE). Similar to the other proposed projects, the technical report does not strictly follow the level of detail required by the MOE in their ESDM guide as would be desirable for a modelling assessment that is compared to MOE compliance limits under *Ontario Regulation 419/05* (O.Reg. 419).

The peer review focussed on six main areas that should be included in an air quality assessment of this type: facility design, baseline conditions, facility emissions, dispersion modelling, compliance assessment, and cumulative effects.

The Dillon assessment also discusses the criteria that have been used to evaluate the projects' air quality contributions. These include MOE standards and ambient air quality criteria (AAQC), and federal ambient air criteria including reference to the Canadian Council of Ministers of the Environment (CCME) Canada-wide Standard (CWS) for respirable particulate ($PM_{2.5}$) of 30 ug/m^3. As noted above, this target is set to evaluate an airshed's acceptability, and not particularly as a local ambient air quality indicator. The MOE suggestion to compare primary $PM_{2.5}$ and ambient levels to a target of approximately 25 ug/m^3 for an individual facility would be more appropriate to ensure that the CWS can be achieved (MOE, 2008a). The assessment also notably omits the 30-minute carbon monoxide (CO) standard of 6,000 ug/m^3 contained in O.Reg. 419 and only evaluates CO against the MOE AAQCs.

The proposed YEC includes the use of two 200 MW Siemens 5000F combustion turbines using Ultra Low NOx (ULN) technology to generate electricity. A 100 hp diesel-fired emergency fire pump and 800 ekW back-up diesel generator is also included in the plant design. The fire pump and diesel generator are not evaluated as part of the air quality assessment. Both of these sources are expected to be

tested on a regular basis (e.g., once per month for one hour) and emissions from such sources can create short-term levels of some contaminants, such as nitrogen oxides, that are very close to the prescribed MOE limits. As such, it would be prudent to include this source in the air quality assessments to ensure compliance with MOE limits can be achieved.

The procedures used to evaluate the emissions from the combustion turbines appear appropriate. Data quality ratings as required by the ESDM guide were not provided; hence an estimate of the uncertainty in the emissions data cannot be determined. The natural gas sulphur content used in the assessment is based on information contained in the U.S. EPA document AP-42, which is acceptable. However, higher sulphur levels have been known to occur in Ontario in some cases. Albeit, SO_2 levels are still expected to be small such that predicted concentrations will still comply with applicable limits.

The Dillon assessment appropriately considered all particulate matter to be less than 2.5 microns in diameter (i.e., $PM_{2.5}$). Combustion turbine particulate is typically less than 1 micron. Particulate matter emissions were based on in-stack concentration levels from the manufacturer. A common issue with turbine manufacturer data is the reporting of only filterable particulate matter and not total particulate matter, which includes the condensable fraction. The filterable and condensable fractions are typically about equal. Although not explicitly stated, the supporting information in the appendices appears to confirm that the values used are for total particulate.

Emissions from combustion turbines vary during start-up and shut-down compared to steady-state conditions, with CO emissions often being much higher. The Dillon air quality assessment does address this variability and does appear to follow the correct emission trends for NO_X, CO, and PM. However, it was unclear how these values were used in the modelling assessment, which assumes the turbines operate continuously 24-hours per day and 365 days per year. It does appear that worst-case emissions (from start-up, shutdown and steady state) for each contaminant were used in the assessment, but this should be confirmed to ensure the analysis is appropriately conservative (e.g., some higher emission rates, for CO, were reported than modelled).

The turbine emissions are not compared to the required MOE Guideline A-5 limits for combustion turbines (MOE, 1994). This information is important to ensure the facility will comply with the required limits. Based on the information contained in the other submissions, it is expected that this same turbine technology (i.e., Siemens 5000F) will be able to meet the necessary A-5 limits.

The dispersion modelling methodology appears to be generally appropriate. An MOE-approved model was used and the model setup followed standard practices outlined in the "Air Dispersion Modelling Guideline for Ontario" (MOE, 2005b). These practices included the use of building downwash algorithms, MOE-approved meteorological data, terrain data, and appropriate receptor density and spacing. The receptor grid spacing used in the assessment appears to be of a higher density than that required by the MOE guidance, particularly close to the sources. This approach is a positive modelling feature that will enable capture of the worst-case concentrations.

The source parameters used in the modelling appear to be appropriate based on the drawings and figures provided. It is notable that the parameters differ somewhat from the values reported in the Environmetrex reports for Northland Power, particularly for geometries (e.g., stack height and diameter). Considering that these are packaged turbines, it would be expected that design parameters would be somewhat consistent.

Half-hour CO concentrations could have also been assessed against the O.Reg. 419 limit, however as they were omitted as described above, this is not possible.

A comparison is made between the predicted incremental concentrations and the existing ambient levels. However a formal cumulative effects assessment is not conducted with the report indicating that MOE requirements only necessitate the evaluation of incremental concentrations. Although not usual, this interpretation is not strictly correct as the MOE has the ability to require the assessment of ambient levels along with facility incremental concentrations. In some instances of more controversial projects, the MOE has been moving more regularly to this approach. However, given the predicted concentrations, such an assessment is unlikely to add much value for most contaminants, with the possible exception of short-term NO_X and $PM_{2.5}$ levels. The reviewers noted that for $PM_{2.5}$, the 99th percentile is referred to in the text as the background concentration; however the table (i.e., Table 6.1) appears to report the 90th percentile. Considering the CWS is based on a 98th percentile value, a higher concentration may be more appropriate for comparison purposes.

Plume visibility and the associated potential fogging and icing issues are discussed but are dismissed as being of no concern due to the thermal buoyancy of the plume and high exit velocity. While the reviewers generally agree that these issues are unlikely to be significant, further discussion and explanation would be helpful considering the peaking facility is designed for regular start-ups and shut-downs when thermal buoyancy and exit velocity may not be as beneficial.

Generally, the methodology used, emissions, and predicted concentration levels seem to give valid results, subject to the issues noted above.

3.2 Human Health Risk Assessment

The Dillon (2008a) human health risk assessment documents the appropriate steps in the risk assessment process.

Tables 2-5 through 2-8 analyze background concentrations of specific pollutants in ambient air at 4 MOE sampling locations, of which only Newmarket is located within York Region. The data from the four sampling locations are averaged. The text of the report also indicates that if only data were available for only two locations, the lower of the two values was selected. Both methods provide non-conservative estimates of background concentrations. For NO_x and SO_2 the average is less than the Newmarket concentration tabulated; however, for CO and $PM_{2.5}$ the Newmarket concentration exceeds the average for one or more averaging periods. The selection of the lower averages thus is not justified. Because many pollutants have a threshold below which no adverse impacts are expected to occur, selection of a maximum concentration would have been reasonably conservative, particularly given the scarcity of data specific to York Region.

The Dillon (2008a) report does not indicate what statistic has been selected for each background concentration as shown in Tables 2-5 through 2-8. Comparing detailed data provided in the Sithe Global report (Golders 2008a) to that of Dillon (2008a), the background concentrations reported by Dillon can be seen to be a fairly extreme statistic. Reviewing further detail on these provided in the air quality assessment (Table 3.2, Dillon 2008b) did not provide any insight into what the tabulated values represent since no match to the concentrations in Table 3.2 could be found. The result of what appears to be use of some extreme statistic is apparent exceedances of applicable 1-hour NO_2 standards, even though these exceedances most likely occurred at the Newmarket monitoring station only a handful of

times for short periods over the three year monitoring period and could potentially result in a conservative assessment of background or baseline risk.

The risk assessment report appears to inter-mix $PM_{2.5}$ and PM_{10} data without explanation or a discussion of why one was evaluated rather than the other. Since the air quality report (Dillon 2008b) analyzes $PM_{2.5}$ and since $PM_{2.5}$ is known to be a greater concern for health effects than equal concentrations of PM_{10}, further discussion or rationale for not evaluating $PM_{2.5}$ further would be appropriate.

Table 2-8 (Dillon 2008a) is reported as containing background concentrations for $PM_{2.5}$. Tables 2-1, 2-2 and 2-4 report the selected values from Table 2-8 as being background concentrations of PM_{10}. The text of the report discusses $PM_{2.5}$ on page ii of the executive summary as being a potential human health concern. Section 2.2.1 (page 10) identifies only PM_{10} as being evaluated in the assessment. PM_{10} is also discussed elsewhere throughout the risk assessment report. Based on the content of the report, page ii was concluded by the reviewers to be a typographic error. The risk assessment report does not contain sufficient further information to ascertain whether background concentrations used are actually PM_{10} or $PM_{2.5}$. Since no match could be found to background concentrations tabulated in the air quality assessment (Dillon 2008b), the reviewers could not ascertain whether PM_{10} or $PM_{2.5}$ values have been used in the risk analysis. The use of the latter could lead to an underestimation of total concentrations, but since the projected concentrations are above long term risk thresholds for $PM_{2.5}$ (CARB 2008), the potential underestimation was concluded to not significantly impact the assessment.

Although $PM_{2.5}$ was not evaluated in the assessment of risk, the incremental concentration of PM_{10} concentration projected at the maximum point of impingement is less than that estimated by Intrinsik (2008) and thus the same conclusions regarding negligible health risks associated with $PM_{2.5}$ can be inferred.

The single source ambient air quality standard of 6,000 $\mu g/m^3$ for CO should have been compared to incremental concentrations of carbon monoxide. Since the estimated concentrations are orders of magnitude less than this standard, the conclusions are not affected.

The methodology used for selecting background concentrations for VOCs differs from that for other compounds. Data from Egbert and Stouffville were selected with preference given to Egbert data due to the closer proximity of this station. The rationale is considered reasonable; however, the scarcity of data should have again led to a more conservative approach. The statistic used is not documented, nor is the averaging period. Based on review of Table 2-16 these concentrations were concluded to likely be maximum annual averages; however, without further information on the sampling frequency and duration, the interpretation and impact on the assessment are unclear. The VOC and PAH background concentrations are noted to be orders of magnitude above the incremental concentrations and all are below applicable ambient air standards, so the lack of clarity was concluded to not pose a significant uncertainty.

For carcinogenic PAHs, benzo(a)pyrene has been evaluated as a surrogate for total PAHs. Due to the relative toxicity of various carcinogenic PAHs, this approach is considered by the reviewers to be reasonable for this assessment. The evaluation of background PAH concentrations in ambient air is based on a median of benzo(a)pyrene concentrations. The selection of a median value is not considered justified as it introduces statistical bias into the evaluation. Since benzo(a)pyrene is a carcinogen and as such incremental rather than total exposures are generally assessed for health risks

(i.e. there is assumed to be no threshold of effects), the impact of this statistical bias does not significantly affect the results of the assessment.

Table 2-15 provides benchmarks for screening annual average air concentrations of VOC and PAHs. Some of these values are adopted from US EPA Region III. No discussion is provided as to whether these Region III values provide the same level of protection as is MOE ambient air quality standards provide. For propylene oxide and toluene, 1 and 24-hour MOE ambient air quality standards are selected for screening annual average exposures. The annual screening value selected for benzene is based on indoor air "no-action levels for residential exposure to benzene in indoor air". Benzene in indoor air may be impacted by sources specific to materials in homes and may not be relevant for this type of assessment. In fact, recent discussions on how to address benzene concentrations in air in Ontario with the MOE suggest that they may no longer accept the use of "typical background" levels in indoor air. Regardless the greatest potential risk from exposure to benzene is on an annual basis and predicted values in air were below the concentration that would pose a 1-in-1,000,000 cancer risk in the exposed population. Therefore, this does not affect the overall conclusions of the assessment. Values provided in Table 3-1 are generally considered more appropriate and are used in the more detailed evaluation. The values selected in Table 2-15 were thus concluded to not significantly impact the results of the assessment.

The preliminary conclusion provided in Section 2.3.2.2 that states "emissions from the YEC facility do not represent a potential concern for human health" was concluded to be appropriate. The conclusion in Section 2.3.2 regarding PAH, and only PAH potential to accumulate in soil, sediment and water was also concluded to be appropriate. This sections indicates that sediment and surface water pathways are carried forward only for ecological receptors and not human health. Justification for the exclusion of these pathways from the evaluation has not been provided; however, the reviewers consider the potential underestimation of exposures to be of minor significance.

The dermal exposure route is missing from Figure 3.1; however, the pathway is indicated in this section of the report as having been evaluated.

Table 3-1 gives a risk specific concentration (corresponding to a one in one million risk) for benzene of 0.455 $\mu g/m^3$ from the US EPA Integrated Risk Information System (IRIS) database. The actual value provided in the IRIS database is a range of 0.13 to 0.45 $\mu g/m^3$. The midpoint or lower end of the range are considered appropriate for use in this type of assessment rather than the selected value. Given that predicted concentrations in the air quality assessment were also less than 0.13 $\mu g/m^3$ it does not materially impact the conclusions of the assessment.

Table 3-1 also lists an occupational exposure time weighted average for SO_2. Occupational exposure limits are not considered appropriate for evaluation of environmental exposures. Regardless, SO_2 has not actually been evaluated in the assessment so the tabulated value does not affect the conclusions.

Table 3-3 lists the source of intake rates assumed for garden produce only as "Ivy Avenue". A proper reference could not be located in the report and the source of these data is thus unclear.

Table 3-6 indicates that exposure to pollutants in indoor air is not considered a complete exposure pathway. This assumption is not considered by the reviewers to be valid as concentrations of contaminants in outdoor air could potentially migrate to the indoor environment, especially seasonally in the summer time. However, the inhalation assessment was conservative in nature and does not appear to be affected by this oversight.

Appendix A provides an annual deposition rate for PAHs on surface soil. No discussion is given on accumulation over time of these chemicals in soils. Given an annual average incremental benzo(a)pyrene concentration from Table 2-16 of 4.2×10^{-6} at the maximum point of impingement, a soil deposition and mixing rate of 4.3×10^{-4} µg/g per year can be estimated. This is more than an order of magnitude higher than the reported value (Table 3-7) of 2.9×10^{-5}. Combined with the lower assumed soil ingestion rates, direct exposures to soil appear to have been underestimated by a factor of 40. As can be seen in Table 3-19, estimated risks are very small and the inconsistencies and lower soil ingestion rates thus do not impact the conclusion of the assessment that an unacceptable risk to human health is not expected. Similarly, the non-cancer hazard indices estimated for naphthalene are orders of magnitude below the comparative benchmark of 0.2 and the issues with the soil ingestion rate and estimation of soil concentrations do not affect the conclusions.

The results of the peer review that the methodology and approach were appropriate in reaching the conclusion that no measurable impact to human health is expected for the proposed facility. If anything the peer reviewers believe that the analysis of background ambient air concentrations was found to have a significant potential to overstate potential health risks from air pollution unrelated to the proposed facility.

3.3 Ecological Assessment

The ecological risk assessment focused on the potential for primary and secondary combustion products to be deposited onto soil, sediment and surface water and thus potentially affecting the media quality and resulting in concentrations that might be deleterious to indigenous wildlife. The proposed site for the York Energy Center and the surrounding area are considered to contain "potentially sensitive" habitat such as a natural stream that traverses the property and the fact the site is adjacent to the Holland Marsh and a nature reserve.

The ecological risk assessment followed a standard format that included a Problem Formulation, Exposure Assessment, Toxicity Assessment and Hazard Assessment/ Risk Characterization.

Screening of the Contaminants of Concern is presented in Section 2.3 of the report. Although NO_x emissions for 1-hour and 24-hours are identified to be above the AAQC in the case of the background concentrations, NO_x was not evaluated further. Given the presence of potentially sensitive habitats and that large parts of the land adjacent to the site are primarily agricultural; the effect of NO_x on vegetation should have been considered and evaluated. The exclusion of NO_x evaluation was concluded to be a potentially significant deficiency. Further discussion of SO_x emissions and screening with respect to the effect on vegetation/agricultural ecosystem should be considered.

The exposure point concentrations for PAHs associated with the stack emissions appear to be marginal when compared to the background concentrations in all environmental media.

In the exposure pathway evaluation the inhalation pathway has been considered incomplete (Figure 4-1); however inhalation of dusts originating from the surface soil is being considered with the incidental ingestion of soil. Given the fact that the identified chemicals of concern consist mainly in gaseous air pollutants, volatile chemicals and PAHs, the primary route of exposure is via inhalation. Justification for not considering the inhalation pathway should be provided. This aspect not considered to be a major deficiency of the report as it is acknowledged that human health toxicity reference values typically afford a greater level of protection than those for ecological receptors. In addition, for many of the

chemicals evaluated it would be difficult to find useful population based ecologically relevant toxicity reference values specific to the inhalation pathway.

The ecological hazard assessment included a section on the discussion of the Toxicity Benchmarks. In the selection of the avian and mammalian toxicity benchmarks it is reported that in the case of benzo(a)pyrene the reported Lowest Observed Effects Level (LOEL) was chosen to represent the benchmark endpoint, although the No Observed Effects Level (NOEL) was also available. Adequate referencing should be provided for this statement; as well as for all the toxicity benchmarks provided in Tables 4-3 to Table 4-4.

In the interpretation of the ecological risk no Hazard Quotients (HQs) greater than 1 were reported. Given the conservative assumptions included in the evaluation such as the use of the maximum exposure point concentrations; the pairing of the maximum ingestion rates with the smallest body weight (in the case of birds and mammals), and the assumption that mobile receptors spend 100 % of their time within the site, the findings that no risk from PAHs is to be expected to occur to terrestrial receptors appears to be an adequate conclusion. In the case of the aquatic environment the highest value calculated of HQ=1 was found for sediment borne wildlife. The conclusion that PAH emissions deposited to soil, sediment and surface will not be of concern to ecological health are supported by the assessment.

3.4 Summary

The results of the risk assessment for the proposed facility indicate that no elevated health or ecological risks are anticipated other than those related to high background concentrations of PM_{10}, NO_x and SO_2. The analysis is sufficient to conclude that the facility will not measurably impact the background concentrations of these chemicals. Of note, the reviewers determined that the high background concentrations used in the assessment are most likely related to extreme events (i.e. maximum measured short term concentrations) and conclusions related to these high background concentrations may significantly overstate potential risks.

4.0 SLUSE ROAD PEAKING STATION

The Sithe Global report by Golder Associates Ltd. (Golder 2008a) titled, "Human Health Risk Assessment and Ecological Risk Assessment" is presented as Appendix G to the Golder (2008b) environmental assessment report titled, *Sithe Global Sluse Road Peaking Station Environmental Review Report* (Golder 2008b). Further supporting information for the Sluse Road site is included in Appendix F and title "Air Methods" (Golder 2008c).

The risk assessment report concludes that emissions from the proposed facility will not result in a health risk to human or ecological receptors. Although some points of disagreement with the approach taken, screening values or other information are noted in the sections that follow, the review concluded that the assessment adequately supports the conclusion that the project would not result in measurable risks to human health or the environment.

4.1 Air Quality Assessment

The Golder air quality assessment for the proposed Sithe Sluse Road Peaking Station is contained in the main Environmental Review Report (ERR) with supplemental information in Appendix F. The peer review of this assessment focussed on six main areas that should be included in an air quality assessment of this type: facility design, baseline conditions, facility emissions, dispersion modelling, compliance assessment, and cumulative effects.

Generally, the Golder assessment follows evaluation and modelling practices mandated by the Ontario Ministry of the Environment (MOE). Similar to the other proposed projects, it does not strictly follow the level of detail required by the MOE in their ESDM guide as would be desirable for a modelling assessment that is compared to MOE compliance limits under *Ontario Regulation 419/05* (O.Reg. 419). For instance, no estimation is provided for the data quality of the emission estimates.

The Golder assessment also discusses the criteria that have been used to evaluate the projects' air quality contributions. These include MOE standards and ambient air quality criteria (AAQC), and federal ambient air criteria including reference to the Canadian Council of Ministers of the Environment (CCME) Canada-wide Standard (CWS) for respirable particulate ($PM_{2.5}$) of 30 ug/m^3. As noted above, this target is set to evaluate an airshed's acceptability, and not particularly as a local ambient air quality indicator. The MOE suggestion to compare primary $PM_{2.5}$ and ambient levels to a target of approximately 25 ug/m^3 for an individual facility would be more appropriate to ensure that the CWS can be achieved (MOE, 2008a). The assessment also notably omits the 30-minute carbon monoxide (CO) standard of 6,000 ug/m^3 contained in O.Reg. 419 and only evaluates CO against the MOE AAQCs.

The proposed facility would use two 200 MW F-class combustion turbines (Siemens 5000F or GE PG7241FA) using Dry Low NOx (DLN) technology to generate electricity. Additional auxiliary air emission sources did not appear to be included in the assessment, which focussed solely on the predicted impacts from the combustion turbines. Emissions from auxiliary sources such as diesel fire pumps and generators can create short-term levels of some contaminants, such as nitrogen oxides, that are very close to the prescribed MOE limits. It would be prudent to include such sources in the air quality assessments to ensure compliance with MOE limits can be achieved.

The procedures used to evaluate the emissions from the combustion turbines appear appropriate. Data quality ratings as required by the ESDM guide were not provided; hence an estimate of the uncertainty in the emissions data cannot be determined. The natural gas sulphur content used in the assessment is based on a conservative fuel sulphur content that should bracket the expected conditions seen in Ontario. This approach is positive from an air quality assessment perspective.

The Golder assessment appropriately considered all particulate matter to be less than 2.5 microns in diameter (i.e., $PM_{2.5}$). Combustion turbine particulate is typically less than 1 micron. Particulate matter emissions were based on in-stack concentration levels from the manufacturer. A common issue with turbine manufacturer data is the reporting of only filterable particulate matter and not total particulate matter, which includes the condensable fraction. The filterable and condensable fractions are typically about equal. Although not explicitly stated, the values used appear to be for total particulate based on the available information from the other proposed project air quality studies.

Emissions from combustion turbines vary during start-up and shut-down compared to steady-state conditions, with CO emissions often being much higher. The Golder air quality assessment does address this variability and does appear to follow the correct emission trends for NO_X, CO, and PM. Modelling results are provided for each conceivable start-up and shutdown scenario which is positive. The units of the emissions quoted in Tables 5.1-21 and Table F-24 are not provided, but appear to be in g/s. The units should be confirmed.

The turbine emissions are compared to the required MOE Guideline A-5 limits for combustion turbines (MOE, 1994). The estimated turbine emissions are predicted to be well within the required limits.

The dispersion modelling methodology appears to be generally appropriate. An MOE-approved model was used (AERMOD) and the model setup followed standard practices outlined in the "Air Dispersion Modelling Guideline for Ontario" (MOE, 2005b) with the exception that Appendix F of the ERR appears to outline that non-default modelling options were selected which is not per MOE recommendations. It is not clear from the report why non-default options would be used; however the options selected do not appear to be of concern. The use of building downwash algorithms, terrain data, and appropriate receptor density and spacing, appears to have been used appropriately. The receptor grid spacing used in the assessment follows the density requirements in the MOE guidance. Additional individual receptors of interest were also evaluated in the modelling which is a positive modelling feature.

The specific meteorological data used in the assessment is not clear. Appendix F of the assessment refers to data from meteorological station 6158733, which is Toronto Pearson Airport. However, this appendix also makes comparisons to monthly wind norms (Tables F-15 and F-16) for Toronto Airport so it is unclear why they do not match exactly. In general, much of the meteorological assessment included in Appendix F does not define the location or time period that is being presented. This basic information is important to the interpretation of the data figures and is not overly useful without.

The source parameters used in the modelling appear to be appropriate based on the drawings and figures provided.

Half-hour CO concentrations should also be assessed against the O.Reg. 419 limit as they were omitted as described above.

A formal cumulative effects assessment is included in the assessment. The exact protocol used to combine the ambient air quality levels with the predicted facility concentrations is not detailed, but

appears to pair hourly concentrations in time. More details on the methodology of this assessment would be useful to ensure it was conducted appropriately.

Plume visibility and the associated potential fogging and icing issues are discussed but are dismissed as being of no concern due to the plume exhaust conditions (buoyancy and exit velocity). While the reviewers generally agree that these issues are unlikely to be significant, further discussion and explanation would be helpful considering the peaking facility is designed for regular start-ups and shut-downs when thermal buoyancy and exit velocity may not be as beneficial.

Generally, the methodology used, emissions, and predicted concentration levels seem to give valid results, subject to the issues noted above.

4.2 Human Health Risk Assessment

Section 1.4.4 of the Golder (2008a) report discusses a cancer risk level of one in one hundred thousand as generally being considered negligible by regulatory agencies. While this is true for Health Canada, as cited in this section, MOE does not accept this level of risk as being negligible. The MOE considers an incremental cancer risks of one in one million for each media to constitute an acceptable or negligible level of risk.

Background air concentrations used in the assessment of human health were obtained from the MOE Newmarket station. Seven years of data were reviewed and 98th percentile concentrations selected for use in the evaluation. Data summaries are provided in the report tables and the selection of the Newmarket data and representative statistics are considered appropriate for this assessment.

For particulate matter in air, only $PM_{2.5}$ is considered by Golder (2008a). PM_{10} was evaluated in the air quality section (Golder 2008c) as having the same emission rates and thus the same ambient air concentrations as $PM_{2.5}$. The evaluation of only $PM_{2.5}$ was thus concluded to be justified for this assessment.

Nitrous oxides were assumed by Golder (2008a) to be in the form of nitrogen dioxide (NO_2). This assumption is considered conservative and appropriate to the assessment performed.

The screening of exposure pathways conducted in Section 2.1.2 is considered by the reviewers to be adequately supported for this assessment. Although quantitative rationale is not provided in this section for excluding indirect pathways associated with the deposition of PAHs on soil or leaching into groundwater, data provided in Table G-12 confirm that the screening is reasonable.

Tables G-1 through G-12 include "screening standards" that are also summarized in Table G-13. One hour values are reported in Table G-13 to be converted from 24 hour values. Insufficient discussion is provided regarding the appropriateness of this conversion in terms of mode of action of acute versus sub-chronic effects or justification as to whether the conversions are appropriate to the chemicals or toxic effects that are the basis of the underlying toxicity values. The reviewers acknowledge that this was standard practice prior to the adoption of O.Reg 419/05 and does not likely affect the conclusions.

For acetaldehyde, the 1-hour screening value of 1200 µg/m^3 exceeds the applicable ½ hour standard of 500 µg/m^3 and is thus inappropriate. The reported annual screening value of 96 is significantly higher than cancer and non-cancer toxicity values for acetaldehyde and is also considered inappropriate for this use.

The selected 24-hour screening value of 30 µg/m^3 for benzene is based on a sub-chronic non-cancer endpoint, with an additional uncertainty factor of 3 to convert from sub-chronic to chronic. The corresponding adverse effect of decreased lymphocyte count is not directly applicable to a 24 hour exposure period in this manner. The value has also been inappropriately converted to a 1 hour concentration. However, it is acknowledged by the reviewers that appropriate air quality objectives for benzene in Ontario continues to be a matter of debate and has yet to be resolved by the MOE. The benzene air quality criteria are currently under consideration by the MOE under O.Reg. 419/05.

In a similar matter, a chronic non-cancer toxicity value for 1,3-butadiene based on ovarian atrophy has been cited as a 24-hour standard and also converted to a 1-hour standard. Use of this chronic toxicity value to screen acute exposures is considered inappropriate. It should also be noted that the US EPA considers 1,3-butadiene carcinogenic with a risk based annual air standard of 0.03 µg/m^3 equivalent to the 1-in-1,000,000 acceptable carcinogenic dose. However, all predicted concentrations are below this value and thus is not considered to change the overall conclusions of the assessment.

For carbon monoxide, the single source 1-hour standard of 6,000 µg/m^3 should be used rather than the multiple source standards for 1 and 8 hours that are applicable to the entire air shed and are intended to account primarily for automobile emissions, not facility emissions. The 24-hour and annual average values that appear to be derived from these are thus also inappropriate.

For formaldehyde, the applicable half hour standard is 45 µg/m^3, thus the 1-hour standard of 158 µg/m^3 listed in Table G-13 is inappropriate. The annual value of 12 µg/m^3 that appears to be derived from the 24-hour value does not taken into account the chronic health effects associated with the carcinogenicity of formaldehyde. Table G-16 identifies formaldehyde as a known or probable carcinogen but indicates that it is not assessed for carcinogenicity. This is inappropriate as it should have been evaluated for carcinogenic effects.

The projected ambient air concentrations are low enough that the selection of screening values for acetaldehyde, benzene, 1,3-butadiene, carbon monoxide and formaldehyde do not impact the conclusions, including consideration for the carcinogenicity of formaldehyde and 1,3-butadiene.

Although $PM_{2.5}$ was not evaluated based on the recent California Air Resources Board findings (CARB 2008), the projected incremental concentrations of $PM_{2.5}$ are of a similar order of magnitude to those estimated for the Northland Power assessment (Intrinsik 2008) and thus the same conclusions regarding negligible health risks associated with $PM_{2.5}$ can be made as discussed previously in Section 2.2.

Based on the preceding review, although some points of disagreement on appropriate health screening values are noted, the assessment performed is considered by the reviewers to be adequate to support the conclusion of no elevated health risk.

4.3 Ecological Assessment

The Local Study Area (LSA) is dominated by agricultural, industrial and residential land use. In addition it contains the Holland Marsh which is an Environmentally Significant Area (ESA) containing a wide variety of wetlands and the Holland Landing Life Science Area of Natural Scientific Interest (ANSI). A number of species of concern, endangered or rare species have been identified (Golder, 2008e) within the LSA.

The ecological risk assessment described in Section 3 of the report followed a standard format that included a Problem Formulation, Exposure Assessment, Hazard Assessment and Risk Characterization and Uncertainty assessment.

Selection of target contaminants is adequately presented for most of the contaminants in Section 3.1.1 of the report; however, given the presence of an environmentally significant area and several species of concern or endangered species (e.g. butternut), screening could have also involved a comparison against the WHO (2000a and b) guidelines, which could have been taken into consideration for agricultural and forest ecosystems. The lower WHO guidelines are well above the maximum background and maximum of operations and omission of these guidelines from consideration is thus not considered a significant deficiency.

In Section 3.3 Hazard Assessment, reference was made to Attachment A, indicating that the description of the toxicity studies for the mammalian and avian TRV's and for plant toxicity benchmarks is contained within. However the attachment could not be identified within the materials available at www.sluseroadpeakingstation.com/report_nov2008.html and this was therefore not reviewed. Specific references should be provided.

Given that predicted air concentrations for start up, shut down and general operation of the station are below the AAQSS, the conclusion that the emissions from the project will not pose a risk to ecological receptors appears adequate.

4.4 Summary

The risk assessment report concludes that emissions from the proposed facility will not result in a health risk to human or ecological receptors. Although some points of disagreement with the approach taken, screening values or other information are noted in the sections that follow, the review concluded that the assessment adequately supports the conclusion that the project will not result in measurable risks to health or the environment.

5.0 CONCLUSION AND RECOMMENDATION

Although methodology and approach varied amongst the three different consultants, all arrived at the same conclusion that the construction and operation of natural gas-fired electrical generating facilities nearby residences would not pose an undue risk to either human or ecological receptors. These findings are supported by the peer review.

The following summarises the conclusions and recommendations from our peer reviews of the three proponent's studies:

Northland Power

- The overall assessments generally follow the recommended approach and requirements of the MOE modelling and assessment guidance;
- The assessment should be revised to consider a guideline limit of 25 ug/m^3 for PM2.5 in accordance with MOE recommendations (as included in their AAQC publication);
- The assessment should be revised to assess ½-hour CO concentrations against the O.Reg. 419 Schedule 3 limit;
- Emissions from the testing of the emergency diesel fire pump should be addressed in the assessment on a short-term basis (i.e., 1-hour) to ensure predicted impacts are not under-represented;
- Proponent should confirm that PM emission estimates from the turbines include filterable and condensable particulate (i.e., total particulate);
- Additional information should be provided on how start-up and shutdown emission scenarios were derived and assessed in the modelling;
- The receptor spacing and density should be revised to follow MOE recommendations as included in O.Reg. 419/05 to ensure the maximum offsite concentrations are not under-represented;
- The factor used to convert 1-hour CO concentrations to 8-hour concentrations should be defined and explained;
- Some additional analysis of the predicted cumulative effect (i.e., ambient plus facility) should be included relative to the corresponding air quality criteria to ensure an appropriate assessment of risk;
- Additional explanation regarding fogging and icing conditions should be provided for start-up and shutdown conditions when plume buoyancy and exit velocity may be reduced relative to steady-state conditions;
- A rigorous screening to identify pollutants that may have health impacts should have been included and would have identified PAHs and VOCs as additional pollutants requiring further evaluation for human health;

- Consideration should have been given to the screening of indirect human exposure pathways, in particular PAHs;
- No basis is provided for the conclusion that trace emissions of SO_2 will have a negligible effect on health;
- The screening of background concentrations of pollutants in ambient air is appropriate to the nature of the health assessment;
- Conservative assumptions regarding the nature of particulate matter in air and the nature of NO_x compounds emitted are appropriately conservative for the assessment of human health;
- The projected incremental PM2.5 emissions are sufficiently low to conclude that measurable health effects are not expected;
- Concentrations of HAPs not specifically assessed by Intrinsik for human health (VOCs, PAHs, SO_2) are projected to be low compared to health based literature benchmarks for these compounds.
- An ecological risk assessment should have been included in the report;
- The agricultural effects of NO_2 emissions are not expected to cause a concern;
- WHO standards for protection of agricultural and forested ecosystem should be included when evaluating toxicity to vegetation from NO_2 and SO_2 emissions.

York Energy Centre

- The overall assessments generally follow the recommended approach and requirements of the MOE modelling and assessment guidance, and the results generally appear appropriate;
- The assessment should be revised to consider a guideline limit of 25 ug/m3 for PM2.5 in accordance with MOE recommendations (as included in their AAQC publication);
- The assessment should be revised to assess ½-hour CO concentrations against the O.Reg. 419 Schedule 3 limit;
- Emissions from the testing of the emergency diesel fire pump and diesel generator should be addressed in the assessment on a short-term basis (i.e., 1-hour) to ensure predicted impacts are not under-represented;
- Proponent should confirm that PM emission estimates from the turbines include filterable and condensable particulate (i.e., total particulate);
- Proponent should confirm how the worst-case emissions were derived for the assessment;
- Turbine emissions should be compared to the MOE Guideline A-5 emission limits for combustion turbines;
- Some additional analysis of the predicted cumulative effect (i.e., ambient plus facility) should be included relative to the corresponding air quality criteria to ensure an appropriate assessment of risk;

- Additional explanation regarding fogging and icing conditions should be provided for start-up and shutdown conditions when plume buoyancy and exit velocity may be reduced relative to steady-state conditions;
- Background concentrations selected for short term concentrations of pollutants are considered higher than would normally be considered for characterizing typical background in a health risk assessment and may significantly overstate threshold health effects;
- The human health evaluation should have assessed risks associated with inhalation of PM2.5;
- PM2.5 and PM10 are confused in the tabulation of background ambient air data whether the correct data has been used is unclear;
- If all of the projected incremental PM10 emissions were conservatively assumed to be PM2.5, they would be sufficiently low to conclude that measurable health effects are not expected;
- The single source ambient air quality standard of 6,000 $\mu g/m^3$ should have been compared to incremental concentrations of carbon monoxide in the human health assessment;
- For evaluation of carcinogenic PAHs as benzo(a)pyrene is conservative and is considered appropriate for the evaluation of human health;
- The preliminary conclusion provided in Section 2.3.2.2 that states "emissions from the YEC facility do not represent a potential concern for human health" was concluded to be appropriate;
- A number of non-conservative assumptions and calculation discrepancies lead to a potential underestimation of some health risks associated with indirect exposure to PAHs by over an order of magnitude. Because the estimated risks are multiple orders of magnitude below applicable benchmarks, the potential underestimation does not impact the conclusions.
- Given the presence of potentially sensitive habitats and that large parts of the land adjacent to the site are primarily agricultural; the effect of NOx on vegetation should have been considered and evaluated.
- Further discussion of SOx emissions and screening with respect to the effect on vegetation/agricultural ecosystem should be included.
- Given the fact that the identified chemicals of concern consist mainly in gaseous air pollutants, volatile chemicals and PAHs, the primary route of exposure is via inhalation. Justification for not considering the inhalation pathway should be provided.
- The conclusion that PAH emissions deposited to soil, sediment and surface will not be of concern to ecological health appears to be adequate.

Sluse Road Peaking Station

- The overall assessments generally follow the recommended approach and requirements of the MOE modelling and assessment guidance;
- The assessment should be revised to consider a guideline limit of 25 ug/m3 for PM2.5 in accordance with MOE recommendations (as included in their AAQC publication);

- The assessment should be revised to assess ½-hour CO concentrations against the O.Reg. 419 Schedule 3 limit;
- Emissions from the testing of the emergency diesel fire pump and diesel generator should be addressed in the assessment on a short-term basis (i.e., 1-hour) to ensure predicted impacts are not under-represented;
- Proponent should confirm that PM emission estimates from the turbines include filterable and condensable particulate (i.e., total particulate);
- Proponent should confirm why non-default modelling options were used in dispersion modelling (contrary to MOE recommendations);
- Proponent should clarify what meteorological data was used in the dispersion modelling;
- More detail should be provided to describe the methodology used to conduct the cumulative effects assessment to ensure an appropriate assessment of risk;
- Additional explanation regarding fogging and icing conditions should be provided for start-up and shutdown conditions when plume buoyancy and exit velocity may be reduced relative to steady-state conditions;
- Background ambient air concentrations adopted for the evaluation of human health are considered appropriately representative for this analysis;
- Conservative assumptions regarding the nature of particulate matter in air and the nature of NO_x compounds emitted are appropriately conservative for the assessment of human health;
- The screening out of indirect exposure pathways is considered by the reviewers to be adequately supported for this assessment;
- Several of the "screening standards" used for the evaluation of human health are inappropriately converted to different averaging periods and ignore more stringent values appropriate to some averaging periods. The differences in values did not affect the conclusions of the assessment;
- Carcinogenic effects associated with formaldehyde should have been evaluated; however, the exclusion of this evaluation did not affect the conclusions of the assessment;
- For carbon monoxide, the single source 1-hour standard of 6,000 $\mu g/m^3$ should have been used for the evaluation of human health in this assessment;
- The projected incremental PM2.5 emissions are sufficiently low to conclude that measurable health effects are not expected;
- WHO standards for protection of agricultural and forested ecosystem should be included when evaluating toxicity to vegetation from NO_2 and SO_2 emissions.

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