



**association to protect  
AMHERST ISLAND**

Post Box 4, 5695, Front Road,  
Stella, ON K0H 2S0

Mr. Sean Fairfield,  
Algonquin Power Corp.,  
2845, Bristol Circle,  
Oakville, ON L6H 7H7

Feb. 27<sup>th</sup>, 2011

Dear Mr. Fairfield,

On behalf of the Association for the Protection of Amherst Island, I am writing concerning the proposed Windlectric 75MW wind energy project for Amherst Island for which OPA has made a contractual offer under the renewable energy FIT program. I understand that you are predicting the generation of 247 GWh per year. This is a wild exaggeration, presumably made to excite the public, OPA and potential investors. I will make sure that every bank in Canada sees this inflated number for what it is. Of course, you may have deluded yourself as well and will realize after you have read this letter that it would be best to get out of the contract before it is too late.

You must surely realize that the awarding of the contract was nothing more than pure politics. The McGuinty government, worried about some important marginal Liberal seats, put a moratorium on off-shore wind farms. Then, taking heat from the wind industry and environmental lobbyists, told everyone that he was going to be aggressive in promoting on-shore wind energy. The result was the awarding of four contracts, all in safe Tory seats where he has nothing to lose. The collateral damage is to the well-being and health of rural residents in those areas and additionally in the case of Amherst Island the future profits of your company and the birds in an Important Bird Area (IBA).

I would like to explain why a project on Amherst Island is a very bad idea. As you will see, any project on Amherst Island would be marginal with a capacity factor (efficiency) at or below 20%; the area available is too small to support a viable project; there is considerable resistance from a large number of islanders; it is quite irresponsible to develop a project in an important bird area, particularly when considering the presence of a development on Wolfe Island and announced developments in Prince Edward County and off-shore in Eastern Lake Ontario.

Marginal Wind Resource

According to the Ministry of Natural Resources, Amherst Island has only acceptable wind speed at 80 metres (6.5 m/s on average). 80 metres is a typical turbine hub height. The very small regions on the MNR Wind Speed Atlas map of Amherst Island (see Figure 1) that correspond to 7.5 m/s wind speed will be excluded as either zoned *shoreline residential* or isolated by land that is zoned *environmentally protected*.

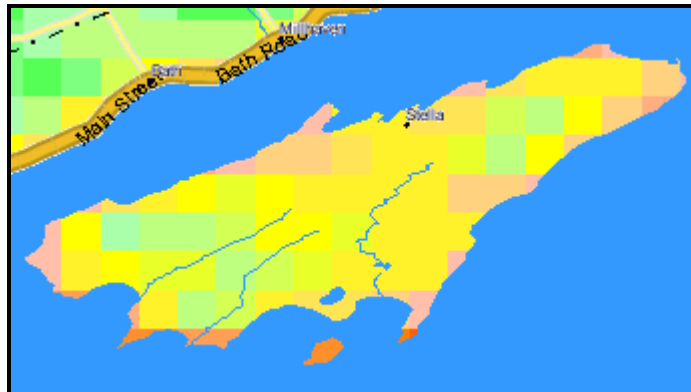
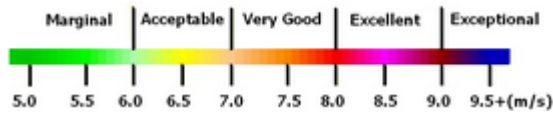


Figure 1. MNR Wind Speed Map (80 metres) for Amherst Island

Contrast this wind speed map with that for Wolfe Island. The dramatic difference is demonstrated in figure 2. The Wolfe Island wind energy generating facility occupies the western portion of Wolfe Island where the MNR wind atlas shows an average wind speed at 80 metres of about 7.5 metres/sec. As you will know, the power derived from a turbine varies as the third power of the wind speed. The third power of the ratio of 7.5 m/s to 6.5 m/s is 1.5 or a 50% premium. Put another way, a wind project on Amherst Island will have an annual average capacity factor of about 2/3 that of the Wolfe Island project.

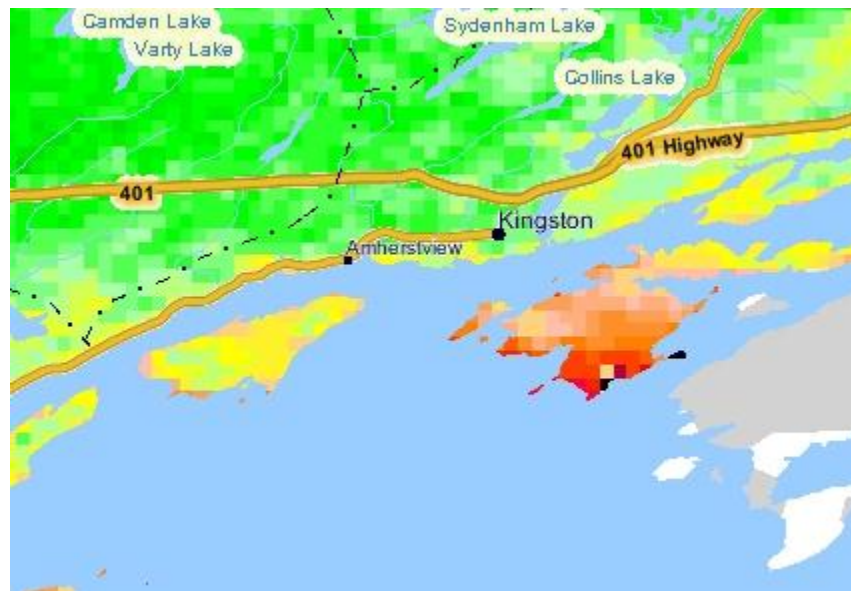


Figure 2. MNR Wind Speed Map (80 metres) for Amherst Island and Wolfe Island

The attached report, based upon hourly measurements provided by IESO, shows that for its first year of operation the Wolfe Island project had a capacity factor (efficiency) of 24%. For the calendar year January to December 2010 the efficiency was 27% as a result of a very windy Fall. On this basis, a development on Amherst Island would have had a capacity factor of less than 20%.

The attached report shows the capacity factors for the eight wind energy generating facilities that were in operation for the full year July 2009 to June 2010 as well as those brought on-line in 2010. You will see that Wolfe Island was not particularly far out of line. It is well known that the highest winds are within the Great Plains of North America and that SW Ontario is on the fringe of the Great Plains and has higher wind speeds than Eastern Ontario.

I would also like to point out that, in a report commissioned by the OPA from Helimax to investigate potential sites for wind energy, Amherst Island did not make the list of 60 sites. That is, it did not even rate "least favoured". The ranking factors used by Helimax were: a) wind speed; b) megawatt capacity density; c) road access; d) social factors.

Windlectric does have its own wind speed map based upon measurement from 3 test towers and upper atmosphere modeling. It shows somewhat higher wind speeds than does the Ontario Wind Atlas. Nevertheless the Ontario Wind Atlas will give a better picture of comparative wind speeds across Ontario and hence comparative capacity factors.

Assuming a capacity factor in the range 20 to a generous 25%, then the calculation of power generated is trivial:

$75\text{MW} \times 24\text{h} \times 365\text{d} \times (20 \text{ to } 25)\% = 130 \text{ to } 160 \text{ GWh}$ , less than two-thirds of your figure!

#### Project Area

Amherst Island does not have the land area for a large project. The total area of Amherst Island is 16,500 acres. Of this, I estimate that 3000 acres is zoned either environmentally protected or environmentally sensitive and 2500 acres is zoned either hamlet or shoreline residential. All of this was "off-limits" under the Official Plan Amendment of Loyalist Township. This will remain so under the REA process defined by the Green Energy Act. These numbers do not include the area of buffer zones around these four zone classifications. This leaves less than 11,000 acres. Of course, only part of these 11,000 acres will have been leased to Windlectric.

Algonquin Power has one operating wind energy project, at St. Leon in Manitoba. For that project the nameplate power is 99 MW and the area occupied is 23,000 acres. A similar density on Amherst Island would limit the project to considerably less than 50 MW, surely not viable given the expected low capacity factor and the expense of an underwater cable of 3 km or more, depending upon where Windlectric plans to locate the transformer sub-station.

It seems that not many are aware that wind turbines generate a considerable wake behind them. This means that there is the wind deficit as well as turbulence downwind of a turbine. The wind deficit takes away from the capacity factor of the downwind turbines and the excess turbulence contributes to extra low frequency noise and wear and tear on those turbines. These things are well known as a result of government-sponsored work in Europe, notably in Denmark. This deficit is perhaps one of the reasons why the 24% first-year capacity factor of the Wolfe Island facility was so much lower than the 40% claimed by Mr. Ian Baines during the development stage and the 34% that was being

claimed by the developer even up to the six month mark of operation. It is clear that any project developed on Amherst Island would have to be high density and will suffer from wind deficit. I note here that the recent research from John Hopkins University recommends a spacing of 15 blade diameters to avoid wake deficit. This corresponds to about 0.5 turbines per square km. St Leon does indeed satisfy that criterion. Wolfe Island, at 1 turbine per square km does not; the wake deficit is clear: the downwind turbines turn more slowly.

I have attended two talks by John Foster, a public relations representative for Transalta, on the design and construction of the Wolfe Island wind energy generating facility (One to the Probus Society of Kingston and one to the Kingston chapter of the IEEE). In both talks he mentioned that it was four times more difficult to build on an island. Granting some exaggeration, the point is well taken that the logistics are challenging when putting any infrastructure on an island. It would be worse for Amherst Island: the ferry is smaller and side-loading rather than end-loading for Wolfe Island; the roads are of a lower standard; there is a spine down the island and I cannot imagine how turbine parts would be moved without major earth-moving; there are not the facilities for hosting work crews; there are many large lots that have not been optioned so that those that are form a haphazard patchwork.

### Opposition to the Project.

There is on Amherst Island a large and organized opposition to a large wind energy project. The incorporated Association for the Protection of Amherst Island (APAI) has about 150 members and 175 people signed a petition to Loyalist Township to oppose a large project. This from a population of 450 year-round and perhaps up to 800 with summer cottagers. There are many others who do not want to declare themselves for business or family reasons or just so as not to upset neighbours. The opposition is not against wind energy as such; the reasons are the noise, flicker and safety problems associated with close proximity to wind turbines, the ensuing health problems, concern with ground-water problems, environmental concerns (Amherst Island is one of Canada's "Important Bird Areas") and destruction of a beautiful island. This association will oppose a large-scale wind energy project by every possible means.

Until recently, the options to lease land were held by Gaia Power and Canadian Hydro Developers (CHD) which had bought out the interest of Vector Power several years ago. CHD had stated in a letter to CPAI, the precursor to APAI, that if they were not wanted by the community they would develop elsewhere where they were welcome. CHD abandoned development on Amherst Island, presumably because of insufficient wind, because of a significant number of islanders who did not want them and because they realized that a proposal for Amherst Island would trigger a federal Cumulative Environmental Impact Assessment (CEIA) which could well sink the project. As I hope you are aware, CHD stated categorically that there would be "no development on Amherst Island in the foreseeable future" in order to forestall a CEIA for the Wolfe Island wind energy project. The quote is from the Wolfe Island Environmental Review Report.

### Impact on Birds and Bats

As noted above, Amherst Island is an “Important Bird Area” (IBA). Rather than make my own remarks, I will quote from respected wildlife organizations; the two full letters and full motion from Ontario Nature are available by sending me an e-mail.

From **Nature Canada** (Mara Kerry, Director of Conservation) in a letter to the Ontario Power Authority, dated Oct. 15<sup>th</sup>, 2008:

*“Amherst Island is one such IBA. The entire island is internationally recognized as an IBA due to the high numbers of migrating Brant that are found there in the Spring. The variety of habitats on the island also make it a renowned site for a wide variety of other birds including shorebirds (such as Spring-migrating Dunlin), raptors (particularly significant are the island’s wintering concentrations of hawks and owls), and land-birds (such as large concentrations of migrating swallows).”*

And later:

*“Wind energy must not be produced at the expense of bird populations. These species contribute enormously to our well-being through ecological services they provide such as depredation (e.g. eating defoliating insects or small rodents) or seed distribution, as well as social values and opportunities such as hunting and bird watching that they offer us. Many of the species migrating through Amherst Island are already declining or threatened in response to many other stresses throughout their ranges. Adding to the cumulative impact is exactly what this type of proposal would do.*

*Individual turbines and wind farms must not be located in areas with particular significance to congregating, migrating or breeding birds, including Important Bird Areas such as the Amherst Island IBA. Our position to oppose locating wind turbines within IBAs is consistent with that of Bird Life International. It is also supported by the 2006 Environment Canada document prepared by Bird Studies Canada entitled Wind Turbines and Birds: A Guidance Document for Environment Assessment, which stipulates that IBAs be considered areas of “very high” potential site sensitivity in terms of the risk of adverse effects on birds.*

*Given the above, I urge you to reject the current proposal by Algonquin Power and Gaia Power Inc. to develop a wind project at the Amherst Island Important Bird Area. In your consideration of this matter, I would welcome the opportunity to provide you with additional information on Nature Canada, our Important Bird Area program and our BirdLife partnership, or on the potential wildlife and habitat impacts of wind energy developments including their incompatibility with IBAs. Please do not hesitate to contact me in this regard.”*

Letter from **Cataraqui Region Conservation Area** (Mara Shaw, Watershed Management Coordinator) to Mr. John Friberg, Ontario Ministry of Natural Resources, as a response to EBR 011-0907 (Offshore Wind Power: Consideration of Additional Areas to be Removed from Future Development); dated October 13<sup>th</sup>, 2010:

*“Exclusion Specific to Eastern Lake Ontario*

*On the basis of the recommended exclusion zones above, CRCA staff recommend that the shoals of Eastern Lake Ontario be excluded from offshore wind turbine installation*

*until further studies are conducted and only then if the results indicate that no negative impact would be incurred on the region's natural heritage.*

*Staff notes that the proposed location of the Wolfe Island Shoals Wind Project is in the midst of three IBAs: Pigeon Island (ON041) which is globally significant for congregatory species and nationally significant for its colonial water-bird and sea-bird concentrations; Wolfe Island (ON037), which is globally significant for congregatory species and continentally significant for both congregatory species and waterfowl concentrations; and Amherst Island (ON062) which is globally and continentally significant for congregatory species. The impact of off-shore wind turbines on the significant populations of waterfowl and shorebirds, migrating and congregating birds has not been studied in inland waters. Initial results from the terrestrially-based Wolfe Island wind turbines indicate increased bird and bat mortality which has currently only reported results from its first year of monitoring.”*

At its 2010 Annual General Meeting, **Ontario Nature** passed the following motion:  
*“Be it resolved that Ontario Nature – Federation of Ontario Naturalists 1) calls upon the government of Ontario to place a moratorium on wind farm development within 5 km of known significance to migrating birds and National Parks, Provincial Parks, and Important Bird Areas, until multi-year radar studies of bird migration are conducted at proposed development sites; and 2) urges the government to protect these sites from wind farm development if studies determine that they have significant bird migration concentrations, for example of over 100,000 birds in a season or are found to be situated within major migratory pathways.”*

The motion was moved by Myrna Wood (Prince Edward County Field Naturalists) and seconded by Erwin Batalla (Kingston Field Naturalists).

You are probably aware of the very negative publicity attracted by the wind energy industry over the initial and final reports on the bird and bat kill on Wolfe Island.

I urge you not to sign the contract for a wind farm on Amherst Island while you have the time and opportunity. In my opinion, your figure for the power output is wildly exaggerated, the project is environmentally distressing to people and wildlife, and the very strong opposition will at the least cause a long delay in the approval process and at best put a stop to it. The decision to award the contract was so clearly political and, as seen in Europe, economic reality eventually catches up with political decisions.

Yours sincerely,

John Harrison PhD,  
Director, Research

[harrisjp@physics.queensu.ca](mailto:harrisjp@physics.queensu.ca), [protectai@kos.net](mailto:protectai@kos.net)

Enclosures: Capacity Factor of Ontario Wind Energy Generating Facilities; Response to Senate Committee on Energy, the Environment and Natural Resources.

Cc: Mr. Murray Beckel, Mayor Bill Lowry, Mr. Colin Anderson (OPA), Minister of Energy and Infrastructure, Minister of the Environment, Mr. Randy Hillier MPP.