



November 2, 2010

John Friberg
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Ministry of Natural Resources
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Peterborough, Ontario K9J 8M5

Re.: Offshore Windpower: Consideration of Additional Areas to be Removed from Future Development (EBR #011-0907)

Dear Mr. Friberg,

Thank you for the opportunity to provide comments regarding where, when and how the Province should make Crown land available for offshore wind projects. Conservation Ontario supports renewable energy in Ontario and looks forward to providing input to the development of appropriate studies and policies for offshore wind development to determine the feasibility of such development and to gain a better understanding of potential impacts. It is recognized that these new policies must balance the Province's priority to expand Ontario's use of clean and renewable energy while protecting the environment and ensuring public safety from natural hazards. To ensure these objectives are met, as outlined in the comments below, significant research and studies are required in advance of considering the installation of offshore wind turbines.

The following comments are submitted for your consideration in response to EBR #011-0907 (Offshore Windpower: Consideration of Additional Areas to be Removed from Future Development) and should be considered in conjunction with the comments submitted to the Ministry of the Environment (MOE) on September 7, 2010 in response to EBR #011-0089 (Renewable Energy Approval Requirements for Off-shore Wind Facilities - An Overview of the Proposed Approach), which are attached for your reference. These comments are not intended to limit your consideration of comments that may be submitted by individual conservation authorities (CAs). CAs have intimate knowledge of the natural heritage and natural hazard issues within and along the lakes and rivers in their jurisdiction and can provide a greater level of detail regarding the specific constraints that should be considered. The comments below provide broad level recommendations regarding the constraints the Ministry of Natural Resources (MNR) should consider when determining areas of Crown land that may be appropriate for offshore wind development subject to the results of studies required under the Renewable Energy Approval (REA) Regulation (O.Reg 359/09) and MNR's Approval and Permitting Requirements Document

for Renewable Energy Projects. These considerations are not limited to only the Great Lakes system, but include large inland lakes, river estuaries and other Crown land areas covered by freshwater.

Provincial Studies and Analyses Required

MNR is commended for focusing resources on identifying the risks and benefits of offshore windpower to inform its policies because the impacts associated with locating wind turbines in the water as opposed to on land are substantial and not properly understood. Ontario's lakes and rivers are the lifeblood of the province; the health of our ecosystems, people and economy are dependent on them. Prior to approving any offshore wind development, the Province is urged to complete a thorough analysis of the potential impacts, including cumulative impacts, of such development using peer reviewed science and modeling. MNR is also strongly encouraged to consult with all other approval agencies with jurisdiction over offshore areas of Ontario on the completion of these studies with respect to the terms of reference, data needs, and assessing the results. The Ministry is cautioned that this type of development may prove to be inappropriate for many offshore areas.

The Province must include climate change as a factor to be addressed in the studies and modeling, as climate change may exacerbate the potential impacts of offshore wind development.

Relationship to Permits under the Conservation Authorities Act

Pursuant to regulations made under Section 28 of the *Conservation Authorities Act (CA Act)*, which were approved by the Minister of Natural Resources in 2006, CAs regulate development and other activities in or adjacent to river or stream valleys, Great Lakes and large inland lakes shorelines, watercourses, hazardous lands and wetlands. According to MNR's Land Management Section, CA regulations apply to activities taking place in regulated areas of Crown land as far as the CA's jurisdictional boundary extends. It is noted that many CA boundaries extend out into the Great Lakes' international boundary and that the beds of the Great Lakes are Crown land. The Provincial Crown itself is not subject to Section 28 regulations, however, when activities are undertaken by a third party or an entity removed from the Crown through lease of Crown land or divested interest then those activities referred to above are considered by MNR's Land Management Section to be subject to these regulations. Conservation Ontario looks forward to ongoing discussions with MNR regarding coordination of service delivery for renewable energy project approvals with regard to Crown land disposition and with regard to the technical considerations for ensuring offshore projects do not create new or exacerbate existing natural hazards.

Much is known by CAs with regard to nearshore areas of the Great Lakes system, however, no significant studies and/or development has typically occurred in offshore and/or deepwater areas. Without a greater understanding of the impacts of aquatic-based installations of turbines through studies addressing impacts on the coastal environment, CAs could be faced with a colossal task of trying to issue a permit under the *CA Act* based on limited knowledge and a lack of comparable projects to reference. CAs will require provincial guidelines and resources in order to have a level of comfort that would enable them to confirm that these offshore projects will not affect the control of flooding, erosion, pollution or dynamic beaches. In terms of technical guidance to inform permit application decisions, CAs are currently using provincial guidelines that are over 15 years old and few CAs have the financial resources to have coastal engineers on staff.

Therefore, CAs typically rely on consultants through a peer review format to inform their permit decisions. However, these opinions are based on a site by site basis and the level of detail is typically pertinent to only one location on the shoreline. MNR is requested to develop the technical guidance and resources that CAs can use to determine whether to permit offshore development, including an update to the 1996 natural hazards technical guidelines (Hazardous Sites Technical Guide; Technical Guide for Great-Lakes-St. Lawrence River System; Technical Guide for Large Inland Lakes). In this respect, Conservation Ontario looks forward to ongoing discussions with the Ministry of Natural Resources regarding technical requirements for coastal engineering studies and coordination of approvals.

Definition of Shoreline

In order to develop policies for offshore wind development, the Province must first provide a clear definition of the defining point along the shore, referred to by MOE as the “shoreline”. Various policy and legislative processes refer to different points in the coastal environment as shoreline: Fisheries and Oceans Canada policies refer to the 80th percentile, which is an elevation driven point; other legislative processes such as the *Public Lands Act* refer to the vegetation line, the foredune and other points as defining the shoreline. A specific definition for shoreline is required for this and other developments in the coastal environment.

Considerations for the Siting Of Offshore Wind Development

The littoral zone and affects on sediment transport

It is our understanding that offshore lake water depths will be a major constraint to the construction of offshore turbines as present technologies allow for a maximum lakebed construction depth of 46 metres. In addition, such considerations as shoreline type, lake sediment composition and depth, structural features of bedrock and existing man-placed appurtenances will also require consideration. Some offshore areas within the Great Lakes system are particularly shallow which render them more reactive to disturbances in the nearshore littoral zone, specifically to the lakebed configuration. This disturbance in a shallow lake environment is not readily dispersed thereby increasing turbidity and negatively impacting natural sediment transport in both the short term and into the future (though it is difficult to estimate how long into the future). Long term impacts relating to sediment supply and starvation may include erosion and impacts on water quality, which is typically related to lakebed sediment characteristics and specifically to the nearshore areas.

There is a concern that offshore development may affect changes to sediment budgets or longshore littoral drift. This, in turn, may result in negative impacts to those areas which exhibit the characteristics of a dynamic beach. A dynamic beach is generally described as an unstable accumulation of shoreline sediments that are found along the Great Lakes - St. Lawrence River System and large inland lakes. The coastal processes, which enable the dynamic equilibrium for these beach areas, only exists in the natural environment. Dynamic beach areas are often identified as significant natural heritage areas.

These areas can be quite sensitive to anthropogenic activities. Impacts to a coastal process can significantly and negatively impact the form and function of a dynamic beach. Such impacts may result in a significant increase in erosion, and loss of beach deposits from the system and may subsequently represent a further hazard to pre-existing inland development.

It is a concern that such disturbances could not only result from offshore development, but also from any required onshore infrastructure. The limits of the dynamic beach hazards should be identified and development should be directed away from either directly within a dynamic beach area or from those areas where impacts to the coastal processes could result in an impact to the form and function of a dynamic beach system.

Aquatic habitat; areas heavily utilized by recreational boaters and for sport fishing

Many lakes in Ontario are important for tourism and recreation due to the recreational boating and sport fishing (including summer and ice fishing) opportunities they provide. The introduction of wind turbines in the lake could pose a significant potential impediment to navigation and unsubstantiated impacts to the aquatic environment that could affect the supply of fish.

Navigation channels must be protected and maintained.

Habitat for aquatic species at risk listed under the *Species At Risk Act* and the *Endangered Species Act, 2007* must be protected from development, as should fish spawning and rearing areas, which are sensitive to changes in water quality and turbidity. To ensure Ontario's aquatic species at risk and fish supply are adequately protected, fish species presence and significant fish habitat must be identified. Further research is required on the affects of offshore turbines and their construction on fish movement and life processes as well as the potential impact development may have on these species and their habitat. Fisheries and Oceans Canada could be helpful in this regard.

Avian and bat habitat and migration corridors

Wind turbines can increase the risk of avian and bat mortality. It is recommended that areas designated as habitat for sensitive bird, waterfowl, bat and butterfly species, as well as migration corridors for these species, be excluded from offshore wind development.

Bird Life International, which is a science-based initiative to identify, conserve, and monitor a network of sites that provide essential habitat for Canada's bird populations, has designated many areas of Ontario's lakes as Important Bird Areas (IBAs). IBAs are defined as areas that support specific groups of birds: threatened birds, large groups of birds, and birds restricted by range or by habitat. IBAs range in size from very tiny patches of habitat to large tracts of land or water. IBAs are also indicators of biodiversity richness and are therefore also important for a wide range of species. It is recommended that wind facilities not be placed within IBAs or the avian migratory corridors between them.

It is also noted that Provincial policies should ensure that turbines are operated at speeds that will have the least impact on avian and bat mortality. It will be impossible to collect and count the species killed by offshore turbines, so operations and location must be optimized to minimize mortality.

Areas of significant ice formation/impact

The Province is encouraged to consider critical areas of ice formation and historic locations of ice fields that may require further study to understand the impacts of turbines that may be constructed within these areas. The normal lake currents and predominant wind directions that cause the

movement of ice should be evaluated and considered when assessing whether an area may be suitable for offshore development.

Ice cover on lakes may provide a sheltering effect for natural shoreline areas and insufficiently protected inhabited areas of the shoreline. This sheltering effect from ice cover provides protection from wave energy that would be created from winter storm wind events. The placement of structures in the lake may have the potential to negatively impact the natural field ice formation which may result in ice scour in the nearshore environment. Ice scour could increase shoreline recession, erosion, and ice piling which could potentially affect shoreline protective structures such as breakwalls and dykes, thereby damaging existing nearshore development (e.g. existing small homes, cottages and storage buildings).

Many offshore areas are impacted by significant numbers of freeze-thaw cycles in the winter. Large areas of field and pan ice freeze to significant thicknesses then rupture during thawing cycles and move depending upon the availability of open water and their proximity to the locations of ice rupture and break-up. Ice movement, build-up, and the potential formation of frazil ice have the possibility to negatively impact water intake locations and pumping. In addition, ice jamming creates the potential for flooding at mouths of rivers, streams, municipal drains and pump station locations especially during spring freshette run-off events, and could impact operation and maintenance of the dredged navigation channel. Should turbines be constructed in or near areas where historically ice has bridged and accumulated, it is expected that additional break-up could occur changing the historic movement of ice and result in impacts on the shoreline. It is also expected that the design of offshore wind turbines would include the installation of ice cones or other mechanisms to encourage ice break-up to prevent impacts on the turbine structures. This encouragement of ice break-up in or near the proposed location of wind turbines could potentially pose a threat to the navigation channels and developed areas along the shoreline.

Added to these concerns are the implications of climate change and predictions of reduced ice cover during winter storm events that would increase the extent of anticipated hazards along the Great Lakes shorelines. Overall, ice and the management of existing ice cover and climate change considerations should be a significant concern for any and all offshore wind structures.

Intake protection zones

Given that MOE's proposed 5 km exclusion zone for offshore wind development has not yet been approved, it is recommended that MNR ensure that intake protection zones are constrained from development. In determining where development (including the placement of related infrastructure) may be allowed, consideration must be given to water quality issues that could impact intake protection zones as mandated through source protection planning under the *Clean Water Act*. Offshore development must not aggravate levels of turbidity, which could pose a threat to drinking water.

Additional general siting constraints

In addition to the constraints described above, the constraints identified below would be relevant to any location in the Great Lakes system and pertain to turbines and/or cable routing:

- Lake sediment composition and depth (e.g. sediment sampling to analyze chemistry for potential pollutants and disturbance of same; geotechnical investigations to confirm the

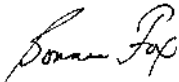
- appropriateness of areas in which significant foundation features are proposed to be constructed);
- Structural features of the bedrock including geologic topography and consideration of faults and seismic activity in the Great Lakes system;
 - Location and proximity to existing mines (i.e., concerns about subsidence);
 - Oil and gas reservoirs;
 - Oil/gas pipelines and other utilities;
 - Documented and undocumented shipwrecks throughout the Great Lake system; and
 - Air navigation and radar.

Conclusion

The Province is urged to take a precautionary approach to identifying areas that can be released for offshore wind development, based on peer reviewed science and modeling. While CAs support renewable energy, they have regulatory responsibilities to ensure that any green energy offshore development within their jurisdiction is sited, operated, maintained and decommissioned in a way that will not affect the control of flooding, erosion, dynamic beaches, and pollution. Therefore, the Province is requested to continue to consult with Conservation Ontario on the development of policies for offshore wind activities, and to provide technical guidance to assist CAs in the application of Section 28 of the *CA Act* for projects that are proceeding through the REA approval process. Additionally, it is noted that completion of a Memorandum of Understanding on Coordinating Service Delivery for Renewable Energy Project Approvals would facilitate the efficient and timely review of applications.

Thank you again for the opportunity to provide comments on EBR #011-0907 (Offshore Windpower: Consideration of Additional Areas to be Removed from Future Development). If you have any questions regarding these comments please contact myself at (905) 895-0716 ext. 223, or Natasha Leahy at ext. 228.

Sincerely,



Bonnie Fox
Manager, Policy and Planning

c.c. CA GMs/CAOs
CA Section 28 Regulations Contacts
Barry Duffey, Manager, Program Planning and Implementation Branch, MOE
Liz Mikel, Policy and Program Advisor, Biodiversity Branch, MNR



September 7, 2010

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Toronto, Ontario M4V 1P5

Re.: Renewable Energy Approval Requirements for Off-shore Wind Facilities - An Overview of the Proposed Approach (EBR #011-0089)

Dear Mr. Duffey,

Thank you for the opportunity to provide comments to the “Off-Shore Wind Facilities Renewable Energy Approval Requirements” discussion paper that was posted on the Environmental Registry (EBR #011-0089) for public comment. The following comments are submitted for your consideration by Conservation Ontario, which is the network of Ontario’s 36 Conservation Authorities (CAs). These comments are not intended to limit your consideration of comments submitted individually by CAs.

Conservation Ontario acknowledges the importance of renewable energy for sustainable growth, to combat climate change and to protect, maintain and restore the health of our watersheds and supports the Province’s intent to develop legislation, regulations and other policies that facilitate renewable energy projects and streamline the application process for these projects. The Province is commended for its intention to develop policies that address the need for greater renewable energy capacity in Ontario while protecting human health and the environment. It is understood that the off-shore wind policies the Province is developing will reflect the research currently underway in government ministries including the Ministry of Natural Resources (MNR), the Ministry of the Environment (MOE) and the Ministry of Tourism and Culture (MTC). The Province’s aim to develop policies based on sound science is supported fully. The Province is requested to consult with Conservation Ontario and CAs throughout the development of these policies, as the jurisdiction of many CAs extends into the Great Lakes and large inland lakes.

The Ministry is commended for proposing a minimum exclusion zone for off-shore wind facilities in combination with a requirement to undertake various studies to assess impacts and determine appropriate mitigation techniques. While the proposed five kilometre exclusion zone appears to be sufficient to ensure that littoral transport and coastal processes, habitat function and recreation opportunities are not negatively impacted, it is important that the exclusion zone be

science-based and a precautionary approach be applied due to the limited knowledge of off-shore wind turbines in fresh water areas and possible major negative impacts. For example, the depth of Lake Ontario at five kilometres can be over 60 metres which may minimize potential impacts to littoral drift or disruption to fish habitat but present challenges to the feasibility for wind facility development here. On the other hand, the shallowness of the water of Lake St. Clair renders this lake highly reactive to disturbances in the littoral zone. Disturbances in the lakebed due to the construction of wind turbines of the nature being proposed along the reaches of the shoreline of Lake St. Clair would increase turbidity in both the short term and into the future (though it is difficult to estimate how long into the future) and the shallow nature of the lake would inhibit dispersion of turbidity in and around its two intake protection zones.

Each of the Great Lakes and inland lakes in the system hosts a unique set of challenges and constraints, which should be considered through the Province's approach to allowing development of windpower facilities. These constraints will require a comprehensive review to provide a clear assessment of all resource management issues. It is recommended that, rather than a one-size-fits-all exclusion zone, the delineation of this area be based on a precautionary approach that respects intake protection zones, avian migration routes, navigation routes, etc., and is supported by site specific studies and modeling (e.g. hydrodynamic modeling; geotechnical investigations addressing concerns for soil chemistry and potential instability, including subsidence, soil characteristics, soil types, etc.).

The exclusion zone must also consider water quality issues that could impact intake protection zones as mandated through source protection planning under the *Clean Water Act*. The exclusion zone must ensure that levels of turbidity are not aggravated and pose a threat to drinking water. Similarly, direction should be developed regarding turbine design to ensure the turbine model used will not impact water quality (e.g. through oil spills from petroleum products for cooling and lubrication within the nacelle). In the case of protecting water quality, specifically sources of drinking water, we recommend the approach of preventing negative impacts rather than mitigating impacts.

It is recommended that an aquatic impact assessment should also be required for off-shore wind turbine projects as part of the studies required by the proponent in advance of submission of the Renewable Energy Approval (REA) application. It is recommended that the terms of reference for an aquatic impact assessment should be approved by MNR, Fisheries and Oceans Canada and local CAs where applicable, and address all appropriate guidelines. The terms of reference should stipulate that the impact assessment address things such as, but not limited to:

- the timing of all surveys and survey techniques;
- aquatic habitat classifications;
- fish community inventories; and,
- a determination of the potential impacts of proposed development activities on aquatic habitats and aquatic organisms (fish, mussels, amphibians, aquatic invertebrates).

Section 2.5 of the discussion paper states that "Applicants may also be required to provide financial assurance for the decommissioning of an off-shore wind facility." It is recommended that technical and financial planning for decommissioning be a requirement for approval of off-shore wind projects. The proponent should be required to provide securities in the amount required to cover the cost of decommissioning. As well, it is recommended that MOE have a

policy in place regarding the timing for decommissioning and removal of off-shore wind facilities, such as 12 months after the turbines have ceased to provide power.

The discussion paper identifies that MNR will be the responsible legislated body for developing a guidance document to address coastal engineering matters. CAs have a regulatory responsibility to issue permissions for off-shore wind turbine projects within their jurisdiction under their individual Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation, made under Section 28 of the *Conservation Authorities Act*. MNR is requested to consult with Conservation Ontario on the development of the guidelines.

There is limited knowledge of the impacts of off-shore wind facilities on sediment transport possibly further impacting water quality, coastal processes impacting shoreline erosion and lakebed bathymetry and many factors contributing to impacts on avian wildlife, and cumulative impacts. Therefore, the Province is urged to take a science-based and precautionary approach when developing policies for approving the construction of off-shore wind facilities. It is noted that many of the comments provided here relate to the exclusion zone that will be prescribed through the REA regulation for off-shore wind facilities; these comments will be reiterated in a response to MNR regarding EBR posting #011-0907 (Off-shore Windpower: Consideration of Additional Areas to be Removed from Future Development).

Thank you again for the opportunity to provide comments on MOE's Off-Shore Wind Facilities Renewable Energy Approval Requirements discussion paper. If you have any questions regarding these comments please contact myself at (905) 895-0716 ext. 223, or Natasha Leahy at ext. 228.

Sincerely,



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