HALIFAX
REGIONAL MUNICIPALITY

P.O. Box 1749
Halifax, Nova Scotia
B3J 3A5 Canada

**Item No. 11.1.2 (ii)**
**Halifax Regional Council**
**August 16, 2011**

**TO:** Mayor Kelly and Members of Halifax Regional Council **October 18, 2011**

Original signed by

**SUBMITTED BY:** Richard Butts, Chief Administrative Officer

Original Signed by

Mike Labrecque, Deputy Chief Administrative Officer, Operations

**DATE:** July 25, 2011

**SUBJECT:** Project 00953: Wind Energy Facilities in HRM

## SUPPLEMENTARY REPORT

## ORIGIN

July 5, 2011 - Regional Council passed the following motion requesting a Supplementary Staff report on Project 00953:

> MOVED by Councillor Rankin, seconded by Councillor Lund that Halifax Regional Council defer decision pending completion of a supplementary staff report to address issues raised by speakers and Members of Council at the public hearing, and; that the supplementary report be presented to Council no later than August 16, 2011. MOTION TO DEFER PUT AND PASSED.

## RECOMMENDATION

It is recommended that Halifax Regional Council:

1. Adopt the amendments to the Regional Municipal Planning Strategy as set out in Attachment A of the staff report dated April 11, 2011; and

2. Adopt the amendments to the Land Use By-laws as set out in Attachment B of the staff report dated April 11, 2011, as amended by the proposed Land Use By-law amendments presented in Attachment A of this Supplementary report dated July 25, 2011.

**EXECUTIVE SUMMARY**

At its July 5th meeting, Regional Council directed staff to defer decision on the staff recommendation for the siting of wind turbines in HRM. The deferral was initiated so that staff could provide Council with some clarifications and options concerning various subject matters contained in the proposed by-law for the siting of wind turbines in HRM. Staff was requested to provide this information for Council's August 16th meeting.

This report has been created in two separate sections: **(A) Categories with Staff Recommendations and (B) Categories with No Staff Recommendations.** Under each section a list of categories and requested clarifications have been included, which were identified by members Council and the public at the public hearing. In the first section, this is followed by the Staff Recommendations and Options. In the second section, recommendations and options have not been included as these items are primarily for information only.

Under "(A) Categories with Staff Recommendations" the recommendations are intended as proposed revisions to the Land Use By-law (LUB) amendment package presented in Attachment B of the April 11, 2011 report entitled Project 00953: Wind Energy Facilities in HRM. The proposed revisions are based on information received at the July 5th public hearing. Attachment E of this report: *Brief of Revised Setback and Separation Distance Regulations for Wind Turbines (Proposed)* contains a list of these new proposed LUB amendments.

As stated, the format of the report is as follows:

1. Requested Clarifications/Questions
2. Staff Explanations.
3. Staff Recommendations (if required)
4. Options for Council to consider (if required)

It should be noted there was a significant overlap in many of the requested clarifications. As many of the questions are similar, some of the questions/clarifications have been abbreviated. The full list of clarification/discussion items appear in Attachment D – Requested Clarifications.

The following is a synopsis of the discussion section of the staff report.

## (A) Categories with Staff Recommendations

### 1. Urban Setbacks and Separation Distances

a. *Requested Clarifications*

*1. Re-examine the property line setbacks and separation distances in Urban Area business parks (particularly in Burnside).*

***b. Staff Recommendation***

***1. Maintain setback to property boundary (1.0 times the height) to prevent any possibility of turbine failure on an adjacent property.***

***2. Maintain separation distances to sensitive (habitable) buildings such as hotels, residences and hospitals in order to ensure adequate mitigation of impacts.***

***3. Remove separation distances to neighbouring industrial and commercial (non- sensitive) buildings to allow for increased opportunities for turbine development in business parks, particularly Burnside.***

*c. Options*

*1. Council could consider removing the setback to property boundary, however, this is not recommended as staff advise that the precautionary principle should be maintained, at least in the short term.*

**2. Rural Setbacks and Separation Distances**

*a. Requested Clarifications*

*1. Consider amendments to increase the proposed separation distance for large scale wind turbines. This might include consideration for the cumulative effects of multiple turbines on a sliding scale as multiple large turbines should have different separation distances.*

*2. Discuss the following:*

- *the staff proposal (550 metres) and the Ontario REA process for setback.*
- *what the impacts will be of establishing separation distances of 750m, 1000m, 1.5 km and 2km setbacks on wind turbine development in the Rural Area of HRM; and*
- *discuss why there are different setbacks for urban and rural areas.*

***b. Staff Recommendation***

***1. A setback to property line of 1.0 times the height of a wind turbine (for all categories of wind turbine) in the Rural Area.***

***2. A distance separation requirement from a large wind turbine to a habitable building on an adjacent lot of 750 metres.***

*c. Options*

*1. Council may consider a different distance separation requirement from a large turbine to a habitable building on an adjacent lot of greater than 750 metres. However, staff do not recommend this approach as it is felt the 750 metre distance adequately mitigates impacts, and that greater distances will significantly limit opportunities for wind turbine development in Rural HRM.*

**3. Classification of Turbines**

*a. Requested Clarifications*

*1. Ranges of small and medium turbines may be too restrictive to be practical. Staff should amend the ranges to be supportive of the Nova Scotia wind turbine production industry. In addition, COMFIT requirements need to be recognized as well as net metering.*

***b. Staff Recommendation***

***1. Adopt a kilowatt range of greater than 10 kw to 30 Kilowatts for small wind turbines.***

***2. Adopt a kilowatt range of 30 kw to 300 Kilowatts for medium wind turbines.***

***3. Change the definition of small scale wind turbines to reflect direct-to-distribution requirements as well "net- metering" opportunities.***

*a. Options*

*1. Council may consider combining the small and medium categories of wind turbines, however, this is not recommended as it would be difficult to apply a suitable separation distance (the range would be too broad).*

**4. Wright's Cove**

*a. Requested Clarifications*

*1. Consider restricting as-of-right wind turbines from lands adjacent to Wright's Cove to eliminate impacts to residential uses there.*

***b. Staff Recommendation***

***1. Remove as-of-right areas for wind turbine development from properties adjacent to Wright's Cove.***

*c. Options*

*1. Council may consider leaving the lands adjacent to Wright's Cove as- of-right for wind turbine development, however, this is not recommended as these lands would be left unprotected until residential development takes place.*

**5. Development Agreement Provision**

*a. Requested Clarifications*

*1. Consider a development agreement method for large/ medium wind turbines for site specific applications in order to enable community consultation and deal with issues identified such as water sources, noise, height, aesthetics, public safety and groundwater.*

***b. Staff Recommendation***

***1. In accordance with the April 11, 2011 staff report, staff maintains its recommendation that no development agreement provision be adopted for wind turbine development in HRM.***

*c. Options*

*1. Council could consider adopting a development agreement provision for all Large Scale wind turbines that fall below the threshold for a Provincial Environmental Assessment. Staff do not recommend this approach due to the appropriateness of the DA tool, costs and time involved for approvals, and the new proposed increased separation distance for large scale turbines of 750 metres.*

***6.*** **Buffers Around Protected Areas**

*a. Requested Clarifications*

*1. Create buffers around Protected Areas. Consider a range of distances up to 2000 metres.*

***b. Staff Recommendation***

***1. In accordance with the April 11, 2011 staff report, staff maintains its recommendation that no buffers be established around Protected Areas***

*c. Options*

*1. Council may choose to add additional buffers around Protected Areas in Rural HRM in accordance with the separation distance from Large Scale Wind Turbines to adjacent habitable buildings (now proposed to be 750 metres). Staff do not recommend this approach as it will further limit opportunities for wind energy development in HRM.*

**7. Boundary Revisions Issue**

*a. Requested Clarifications*

*1. Given that no development will occur on Urban Reserve designated lands for a considerable length of time, shouldn't Urban Reserve lands be considered for wind turbine development? These lands are outside the urban service boundary.*

***b. Staff Recommendation***

***1. In accordance with the April 11, 2011 staff report, staff maintains its recommendation is that Urban Reserve lands be restricted from wind turbine development.***

*c. Options*

*1. Council may choose to enable wind turbine development within areas designated Urban Reserve. Staff do not recommend this approach as these lands are intended for longer term residential development in accordance with Regional Plan policy.*

## (B) Categories with No Staff Recommendations

**8. Provincial Environmental Assessment**

*a. Requested Clarifications*

*1. Discuss the role of the Provincial Environmental Assessment and what it entails including the following:*

*(a) the time frame of the process; and*

*(b) public consultation in contrast to the municipal DA process.*

*b. Options*

*1. N/A -- Request for information.*

**9. Property Values**

*a. Requested Clarifications*

*1. Are there negative impacts to Property Values in proximity to wind turbine development?*

*b. Options*

*1. N/A -- Request for information.*

**10. The Denmark Experience**

*a. Requested Clarifications*

*1. Why have countries such as Denmark stopped placing wind turbines on land?*

*b. Options*

*1. N/A -- Request for information.*

**11. Transmission and Easement Corridors**

*a. Requested Clarifications*

*1. What rules and regulations would be in place for a transmission corridor?*

*2. What are the infrastructure requirements?*

*3. Is Nova Scotia Power to under Public Utilities Act able to expropriate lands?*

*b. Options*

*1. N/A -- Request for information.*

**12. Effects, Infrasound and Low Frequency Vibration**

a. *Requested Clarifications*

*1. Include information on the health effects including shadow flicker of wind turbines and the experiences of the family from Pubnico.*

*b. Options*

*1. N/A -- Request for information.*

# DISCUSSION

## (A) Categories with Staff Recommendations

In this section, staff reviews the issues brought forward by members of Council and the public during the Public Hearing held on July 5, 2011. Explanations are provided for staff's original proposed amendments as well as options for Council's consideration. In addition, this section of the report presents staff's new recommendations to amend the wind energy Land Use By-law amendments that were contained in Attachment B of the April 11, 2011 staff report titled Project 00953: Wind Energy Facilities in HRM.

### 1. Urban Setbacks and Separation Distances

***a. Requested Clarifications***

1. Re-examine the property line setbacks and separation distances in Urban Area business parks (particularly in Burnside).

***b. Explanation***

Staff had recommended three setback and separation distance measures *for Micro, Small and Medium Turbines:*

i. Setback to Property Line;
ii. Separation distance from turbine to adjacent Non–Sensitive building (i.e. manufacturing, office, etc.); and
iii. Separation distance from turbine to adjacent Sensitive building (places where people sleep i.e. hotels, motels etc.).

***Setback to Property Line and Separation Distance to an adjacent Non-Sensitive building (i.e. manufacturing, office, etc.)***

Requiring a setback to the property line and a separation distance from adjacent Non-Sensitive (manufacturing, office etc.) buildings are limiting factors for wind energy development in Burnside Business Park. The wind industry suggests that employing a setback to the property boundary hinders the ability to locate the towers in locations where lot areas are small. In response to these concerns, staff has undertaken a series of analyses including all permitted categories of turbines and applied these categories to randomly selected areas in Burnside (as well as areas in Bayer's Lake and selected Industrial Waterfront locations). This analysis has shown that some sites in Burnside do fail the setback to property boundary test and therefore would be restricted from the placement of wind turbines there. Unlike Bayer's Lake and some of the Marine Industrial locations where lot sizes are much larger and building placement less numerous, in Burnside, lot and building densities are more intense. The setback requirement

to the property boundary and separation distance requirement to an adjacent non-sensitive building (manufacturing and office) had been recommended for safety reasons.

It should be noted as a point of caution that while it is unlikely that a turbine tower will fail given the substantial investment of these structures (often costing more than $20,000 for a small scale machine), it cannot categorically be stated that a turbine tower will never fail simply because the tower does not fail very often. Currently, no industry standardization for turbine base inspection exists to establish turbine stability at either the Municipal or Provincial levels in Nova Scotia (except for requirements as set out as part of the Provincial Environmental Assessment process which does not apply to towers in Burnside Business Park or elsewhere in the urban area).

By maintaining a setback from the property line for wind turbine development, this is consistent with Council's advice to Industry Canada with respect to the siting of communication towers, ie., should the tower fail, its collapse should not impact abutting properties.

***Separation distance from Turbine to Adjacent Sensitive building (places where people sleep i.e. hotels, motels etc.)***

The separation distances to adjacent sensitive (habitable) buildings had been recommended based on impact mitigation to those buildings where persons might sleep. The distances were established based on the following principles:

i. Research
ii. The precautionary principle

The distances were considered based on established sound criteria and rationale that is consistent with the HRM Wind Energy Master Plan, the UNSM Best Practices Guidelines and other contexts. Mitigation impacts were considered for factors such as ice and blade throw from wind turbines, and were based on recommendations from the World Health Organization and well other known researchers in the field of wind energy.

The approach of establishing absolute measures for separation distance is not unlike other processes (the Provincial EA process for example). These processes have established distances based upon the principle that known distances will sufficiently mitigate impact. Research indicates the proposed distance separation distance requirements originally recommended are conservative (generous) and therefore should be sufficient to reduce sound.

***c. Staff Recommendation***

1. ***Maintain setback to property boundary of 1.0 times the height of the turbine to prevent any possibility of turbine failure on an adjacent property.***
2. ***Maintain separation distances to sensitive (habitable) buildings such as hotels, residences and hospitals in order to ensure adequate sound protection.***

***3. <u>Remove</u> the separation distance requirement to neighbouring industrial and commercial (non- sensitive) buildings to allow for greater flexibility in placing turbines in the Urban Area business parks.***

*d. Options*

*1. Council could consider removing the setback to property boundary but this is not recommended as staff advise that the precautionary principle should be maintained, at least in the short term.*

## 1. <u>Rural Area Setbacks and Separation Distances</u>

### *a. Requested Clarifications*

*1. Consider amendments to increase the proposed separation distance for large scale wind turbines. This might include consideration for the cumulative effects of multiple turbines on a sliding scale, as multiple large turbines should have different separation distances.*

*2. Discuss the following:*
   *1. the staff proposal (550 metres) and the Ontario REA process for setback;*
   *2. what the impacts will be of establishing separation distances of 750m, 1000m, 1.5 km and 2km setbacks on wind turbine development in HRM; and*
   *3. discuss why there are different setbacks for Urban and Rural areas.*

### *b. Explanation*

In Rural HRM, the setbacks and separation distance requirements are treated differently than in Urban HRM. For example, no wind turbines are proposed for residential neighbourhoods within Urban HRM because lot areas are small. Larger lots in Rural HRM provide greater opportunity to site wind turbines farther way from lot lines and more centrally to lots. The two measures included in the original staff proposal were as follows:

a. Setback to property line, and
b. Separation from all adjacent habitable buildings.

The principle reason for larger setbacks to property lines in the Rural area had been to try and locate the wind turbine more centrally to the lot. The proposed increased setbacks in particular, and also the separation distances proposed, had been based upon the precautionary principle, the basis of which is to mitigate impacts. However, applying these measures would have a limiting factor on the number of wind turbines constructed in rural residential neighbourhoods and would have had the effect of reducing heights of turbines in these neighbourhoods.

Therefore, in order to standardize the setback requirements for wind turbine development between the Urban and Rural Areas, and in order to create additional opportunities for small

wind turbine development in the Rural Area, staff is recommending a property boundary setback of 1.0 times the height of the turbine.

**Analysis of Enhanced Distance Separation Requirements for Large Scale Wind Turbines**

Though HRM is approximately 5577 square kilometers (1,378,106.7 acres), very little of the Municipality is suitable for wind turbine development as only a relatively small area of lands contain enough wind (6.5 metres per second and above) for wind farm development. (approx. 686.4 sq. km or 169,622 acres). However, as most of this land is located near existing settlement patterns close to the coast, establishing adequate distance separation from habitable buildings is important to mitigate impact. Staff had proposed a separation distance of 550 metres from a turbine to the nearest habitable building. When accounting for the 550 metres separation distance, approximately 61% of the 686 sq. km was removed from the lands most suitable for wind energy development at the large scale, leaving approximately 268 sq. km. When applying even greater distances, the amount of total remaining lands for wind turbine development in HRM drops dramatically.

Table 1.0 - *Available Developable Area for Wind Turbines with Enhanced Separation Distances* demonstrates that as the distance separation increases, the total available land decreases substantially. Given that there are further limiting factors such as proximity to grid infrastructure, power load limitations, land configurations (contiguity), and accounting for the proximity to sensitive environmental features, the opportunities for wind farm development at 1000 metres distance separation or greater, is very limited.

**Graduated Distance Separations**

With regard to the larger wind turbine developments, graduated separation distances are enhanced preset distances that set each subsequent turbine farther away from a habitable building. It has been noted that there is a scarcity of available land area for wind turbine development in HRM. Applying graduated separation distances in advance, and particularly at the municipal level, prior to knowing whether a sound study would establish the need for such distances, is considered overly restrictive. It has always been and continues to be staff's contention that the Provincial Environmental Assessment process (for developments of 2.0 MW or more) should establish such distance separation requirements.

It should be noted that graduated separations distances are particularly conservative. Should these distances be adopted by the NS Provincial EA process, it is likely that an applicant would have the option of carrying out a sound study in lieu of meeting the graduated separation distances, in order to reduce the distances. This is currently the case in Ontario where study is done on a case by case basis.

***Table 1.0 - Available Developable Area for Wind Turbines with Enhanced Separation Distances***

| Distance Separation (winds 6.5m/s and higher) | Total Remaining Lands for Wind Turbine Development | Total Remaining Lands for Wind Turbine Development (%) | Total Restricted Areas (acres) | Total Restricted Areas (%) |
|---|---|---|---|---|
| **550m** | 66,273 acres **268.1 sq. km.** | 39% | 103,349 | 61% |
| **750m** | 51,829 acres **209.7 sq. km.** | 31% | 117,793 | 69% |
| **1000m** | 38,486 acres **155.7 sq. km.** | 23% | 131,136 | 77% |
| **1500m** | 22,394 acres **90.6 sq. km.** | 13% | 147,228 | 87% |
| **2000m** | 14,963 acres **60.5 sq. km.** | 9% | 154,659 | 91% |

Notwithstanding the aforementioned, staff acknowledges that there is a notable level of community concern regarding the proposed 550 metre separation distance from large scale wind turbine development to adjacent habitable buildings, and that there is a desire for this distance to be increased. While staff can offer no solid scientific basis for changing its recommendation, nonetheless, based on feedback received, staff do recommend an enhancement to the earlier recommended distance separation requirement for Large Wind Turbines from **550 metres to 750 metres**.

***c. Staff Recommendation***

1. ***That Regional Council requires a setback to property line of 1.0 times the height of a wind turbine (for all categories of wind turbine) in the Rural area.***
2. ***That Regional Council requires a distance separation requirement from a large wind turbine to a habitable building on an adjacent lot of 750 metres.***

***d. Options***

1. *Council may consider a different distance separation requirement from a large turbine to a habitable building on an adjacent lot of greater than 750 metres. However, staff do not recommend this approach it is felt that this separation distance requirement will adequately mitigate potential impacts. In addition, increasing the separation distance beyond 750 m will further reduce the opportunities for wind energy development within HRM.*

## 3. Classification of Turbines

### *a. Requested Clarifications*

1. *Ranges of small and medium turbines may be too restrictive to be practical. Staff should amend the ranges to be supportive of the Nova Scotia wind turbine production industry. In addition COMFIT requirements need to be recognized as well as net metering.*

### *b. Explanation*

It was stated at the public hearing that there are constraints created by the limits of the wind turbine categories. Council could consider creating a single category for both small and medium wind turbines. However, with this expanded category, selecting an appropriate single distance separation would be excessive for the smaller turbines. In staff's opinion it is better to maintain the categories as recommended with the distance separation requirements as recommended.

There is, however, rational for reducing the kilowatt ranges at the upper limit of the small turbine range and the lower limit of the medium turbine category. This is supported by the argument that the categories have inherent technological limitations to the local wind producers. Staff acknowledges that by reducing the kilowatt limits of medium turbines from 50 kilowatts to 30 kilowatts, and reducing the setback to property boundary to 1.0 times the total height of the turbine as recommended in a previous section of this report), the technical limitations are resolved and adequate distance separation to adjacent habitable buildings is achieved. Staff acknowledges that 250 metres distance separation for the medium turbine is a significant (conservative) measure, but advises it is appropriate given that there is no recommendation to establish an artificial sound limit.

Community Feed in Tariff (COMFIT)
The Comfit is direct-to-distribution power production, meaning it feeds directly into the power grid. Net metering, on the other hand, is turbine-produced power which is connected to the household power meter. Staff acknowledges that the definition in the "small" turbine category was created prior to the Comfit regulations being adopted. The definition for small wind turbines needs flexibility to reflect both that power can be produced and directly fed into the distribution network and also produced for net metering.

### c. *Staff Recommendation*

1. ***Adopt a kilowatt range of 10 kw to 30 Kilowatts for small wind turbines.***
2. ***Adopt a kilowatt range of 30 kw to 300 Kilowatts for medium wind turbines.***
3. ***Change the definition of small scale wind turbines to reflect direct-to-distribution requirements as well as for "net- metering" opportunities.***

***d. Options***

1. *Council may consider combining the small and medium categories of wind turbines however this is not recommended as it would be challenging to establish an appropriate separation distance given the wider range of power being produced.*

**4. <u>Wright's Cove</u>**

***a. Requested Clarifications***

*1. Consider restricting as-of-right wind turbines from lands adjacent to Wright's Cove to eliminate impacts to residential uses there.*

***b. Explanation***

Lands in Wright's Cove are the subject of a development agreement to permit residential development. It has been staff's intention to mitigate impact from wind turbines to residential development. Should the staff recommendation regarding setback and separation distances for wind turbines be approved and the lands are developed residentially, adequate separation should be achieved from wind turbines. To achieve this, staff advises that wind turbine development be restricted on lands adjacent Wright's Cove which have residential development capability.

***c. Staff Recommendation***

***1. That Regional Council restrict wind turbine development on properties adjacent to Wright's Cove that have residential development capability (LUB Map amendment).***

***d. Options***

*1. Council may consider leaving the lands adjacent to Wright's Cove as of right for wind turbine development however this is not recommended as these lands would be left unprotected until residential development could occur.*

**5. <u>Potential Development Agreement Provisions for Wind Turbines in HRM</u>**

***a. Requested Clarifications***

*1. Consider a development agreement method for large/medium wind turbines for site specific applications that would enable community consultation and deal with issues identified such water sources, noise, height, aesthetics and public safety and groundwater.*

***b. Explanation***

Staff maintains its position that the Development Agreement (DA) approval process is not an effective tool for dealing with wind turbine proposals (refer to the April 11, 2011 staff report for additional rationale). Under the HRM Charter legislation, DAs are intended to be used for development projects where matters such as building design and location, density, architectural elements, landscaping, buffering, parking and related site design matters are being considered. Many of these matters are not germane to wind turbine development proposals.

However, the HRM Charter provides Council with the right to request studies as part of a discretionary (DA) approval process. For example, Council could request that the proponent submit studies to address matters such as shadow flicker, sound, tower collapse, blade and ice throw, and effects on surface water. However, HRM must also reasonably be able to evaluate these studies in order to make informed staff recommendations to Council when undertaking a decision. Currently, HRM has no expert capacity on these matters and would have to seek out expertise for the purpose of providing evaluation to staff to inform Council. The implications of this mean that HRM would be reliant on outside expertise to inform every DA process utilized for wind turbines if the aforementioned studies were requested.

Staff has ascertained that the cost to proponents to prepare these studies could range from $2,000 for smaller scale projects to upwards of $100,000 for larger scale projects, depending upon complexity and scope of the development. The costs for third party reviews of these studies are not known at this time.

The DA process would result in increased costs for the proponent, increased approval processing times and associated staff resource impacts, and the potential for an appeal process from the decision of Council.

The issue of groundwater in wind turbine development has tended to be raised more frequently of late though there is little concern about the effect of wind turbine siting on ground water resources. Like any construction related project, wind turbines sit on the land. Site preparation for large wind turbines require that lands must be cleared and a relatively small foundation created on the land to support the tower. In the event that blasting is necessary for the foundation, compliance with HRM's Blasting By-law would be required, including potential impacts on any nearby potable water supply.

Evaluating potential health impacts associated with wind turbine development is beyond the authority of a DA process, and is only dealt with through the Provincial Environmental Assessment process, which in turn utilize Health Canada as their primary resource.

***Large Scale and Medium Scale Wind Turbine Development and Development Agreements***

Every project above 2 megawatts of power must undergo study through the Provincial Environmental Assessment process. This process currently requires a mandatory thirty day period for public/stakeholder input, and it is reported that in virtually all cases, proponents conduct public sessions/open houses to present the project.

By introducing a DA process where a Provincial EA is required, this would mean a duplication of effort and a two-tier decision making process – one at the Municipal level and one at the Provincial level. Staff does not advise this approach.

While staff does not advocate the use of a DA for medium and large scale wind turbine proposals, it is acknowledged that a gap of environmental review exists below 2 megawatts of power generation (the threshold for the Provincial EA process). However, given that staff is now recommending that the separation distance to habitable buildings be increased from 550 metres to 750 metres for any large scale proposals, this will significantly improve the level of mitigation of potential impacts of such developments on nearby properties. This, in turn, should help allay the concerns of citizens and Council and perhaps resolve the desire to introduce a DA approval process.

Nevertheless, should Council wish to institute a DA approval process for medium and large scale wind turbine proposals, staff has provided a draft DA policy as Attachment C of this report. Again, it is staff's recommendation to limit this only to developments that would not be required to undergo the Provincial Environmental Assessment process.

***c. Staff recommendation***

***1. In accordance with the April 11, 2011 staff report, staff maintains its recommendation that no development agreement provision be adopted for wind turbine development in HRM.***

***d. Options***

*1. Council may consider adopting a development agreement provision for all Large scale wind turbines that does not require a Provincial Environmental Assessment. Staff do not recommend this approach due to the appropriateness of the DA as an effective tool for this purpose, the increased costs and time involved for the approval process, and because staff is proposing to increase the separation distance to habitable buildings from large scale turbines from 550 metres to 750 metres.*

**6. Buffers Around Protected Areas**

***a. Requested Clarifications***

*1. Create buffers around protected areas. Consider a range of distances up to 2000 metres.*

***b. Explanation***

The Restricted (R) Zone in the rural area prohibits wind turbine development, and is comprised of the following areas:

1. Regional Parks: as identified through the Regional Municipal Planning Strategy
2. Protected Areas: identified as designated wilderness reserves
3. Conservation Areas: that have been designated as incompatible for ground site disturbance

Some rationale for the creation of buffers around environmentally sensitive lands may include the preservation of views, the potential saving of flora and fauna from site preparation, and/or wild life protection outside of the protected boundary of areas. Staff acknowledges that the potential exists for smaller scale turbine development which in some cases would be located within relative proximity to Restricted Zone boundaries. However staff feels, given that these would be smaller scale turbine developments and less impactful than large wind farms to Restricted areas, that additional buffers are not warranted.

In staff's view most large scale wind turbine development will occur in areas where the winds blow at 6.5 metres per second or higher. Most areas of the Restricted Zone (Regional Parks, Protected Areas and Conservation Areas) are outside of these locations. That means that most developments of substantial scale would occur at some distance from Restricted areas as currently proposed.

*Table 2.0 - Separation Distances Plus Corresponding Buffers Around Protected Areas*, shows that land availability is substantially reduced when buffers that correspond to the separation distances are applied around Protected areas. When considering other limitations including EA requirements, proximity to grid infrastructure and others such conditions, these enhanced buffers would place additional constraints on future wind energy development in HRM. Accordingly staff do not recommend establishing buffers around Restricted Areas as proposed.

***Table 2.0 - Separation Distances Plus Corresponding Buffers Around Protected Areas***

| **Distance Separation (winds 6.5m/s and higher) plus Buffer Around Protected Areas (PAs)** | **Total Remaining Lands for Wind Turbine Development** | **Total Remaining Lands for Wind Turbine Development (%)** | **Total Restricted Areas (acres)** | **Total Restricted Areas (%)** |
|---|---|---|---|---|
| **<u>550m</u> separation distance + <u>550m</u> Buffer** | 55,730 acres **225.5 sq. km** | 33% | 113,892 | 67% |
| **<u>750m</u> separation distance + <u>750m</u> Buffer** | 42,051 acres **170.1 sq. km** | 25% | 127,570 | 75% |
| **<u>1000m</u> separation distance + <u>1000m</u> Buffer** | 29,808 acres **120.6 sq. km** | 18% | 139,814 | 82% |
| **<u>1500m</u> separation distance + <u>1500m</u> Buffer** | 15,358 acres **62.1 sq. km** | 9% | 154,264 | 91% |
| **<u>2000m</u> separation distance + <u>2000m</u> Buffer** | 9,365 acres **37.9 sq. km** | 6% | 160,257 | 94% |

***c. Staff Recommendation***

***1. In accordance with the April 11, 2011 staff report, staff maintains its recommendation that no buffers be established around Protected Areas.***

***d. Options***

*1. Council may choose to add additional buffers around Protected areas in Rural HRM in accordance with the separation distance from Large Scale Wind Turbines to Adjacent Habitable Building (now proposed at 750 metres). Staff do not recommend this approach as it may further limit the opportunities for wind energy development in HRM.*

**7. <u>Boundary Revision Issues (Urban Reserve Lands)</u>**

***a. Requested Clarifications***

*1. Given that no development will occur on Urban Reserve designated areas for a considerable period of time, shouldn't urban reserve lands be considered for wind turbine development? These lands are outside the urban service boundary.*

***b. Explanation***

In the Regional Plan, Urban Reserve lands are lands that have been set aside for the foreseeable future for the purpose of permitting enabling fully serviced urban residential development. By opening these lands to wind turbine development, this could place encumbrances on lands intended for this future use. Strategically it is important to ensure that these lands remain unencumbered so that their intended future use can be realized.

***c. Staff Recommendation***

***1. In accordance with the April 11, 2011 staff report, staff maintains its recommendation that no wind turbine development be permitted in areas designated Urban Reserve.***

***d. Options***

*1. Council could include Urban Reserve Lands in the Rural Wind -2 Zone for the purpose of constructing wind turbine development. Staff does not recommend this approach as these lands are intended to be utilized for longer term residential development in accordance with the Regional Plan.*

## (B) Categories with No Staff Recommendations

In this section staff reviews categories and the requested clarifications, provides explanation and potential options where applicable to Regional Council. It should be noted that some of the clarifications were primarily for additional information and thus no options are provided. None of the categories in this section provide a recommendation to amend staff's proposed wind energy land use by-law amendments as contained in Attachment B of the April 11, 2011 staff report.

### 8. Provincial Environmental Assessment

#### *a. Requested Clarifications*

*1. Discuss the role of the Provincial Environmental Assessment and what it entails including the following:*
   *a. the time frame of the process*
   *b. public consultation in contrast to the municipal DA process*

#### *b. Explanation*

Every wind project proposing to produce 2 megawatts of power or more must go through a Provincial Environmental Assessment (EA) for the siting of wind turbines in Nova Scotia. A Provincial EA is completed on a case by case basis and includes an initial scoping meeting to determine which studies are required as part of the process. For example, if a project is located on a mountain top in a remote area a sound study may not be requested. This is true of all aspects of an EA process where the components of the Assessment are determined based on the conditions of the wind proposal. This also includes matters such as groundwater and hazards to development such as misting, contingency plans in the event of fire, and other impacts to the environment.

The Provincial EA process currently requires a mandatory thirty day period for public/stakeholder input, and provincial staff indicate that in virtually all cases, proponents conduct public sessions/open houses to present the project. In some cases, the Minister can choose to forward the proposal to the Environmental Assessment Board for review, whereby a formal public hearing is mandated.

Under the HRM Charter there is no opportunity to introduce a compulsory public consultation program for developments that are proceeding by way of an as-of-right approval process. Only through processes such as re-zonings or DAs can public consultation be legislated.

A previous section of this report presents an option for Council to introduce a DA approval process for large scale wind turbine development, including staff's analysis and recommendation in this regard.

***c. Options***

*1. N/A – Request for information.*

## 9. Property Values

***a. Requested Clarifications***

*1. Have you considered the effect on Property Values?*

***b. Explanation***

A comprehensive study on the subject of property values and wind turbine was funded by the U.S. Department of Energy and was published in December of 2009. The Lawrence Berkeley National Laboratory conducted the analysis, which was based on site visits and data collected from nearly 7,500 single-family home sales located near one of 24 existing wind facilities across nine U.S. states. Aspects of the study included the following:

1. The homes were between 244 metres and 16 kilometres away from the nearest turbine; and
2. The home-sales data was collected from a period spanning 1996 to 2007.

The result was no evidence of widespread impacts. The study acknowledges that individual home values may have been affected but that the sample size or occurrence was too small or infrequent to measure.

The study did measure what it called "Nuisance Stigma," which takes into account prices of homes within 1.6 kilometres of a wind turbine, but found no statistical evidence that property values were affected. However the Ontario EA process considered the study in establishing their 550 metre separation distance (which was also staff's initial proposal).

***c. Options***

*1. N/A -- Request for information*

## 10. The Denmark Experience

***a. Requested Clarifications***

*1. Why have countries such as Denmark stopped placing wind turbines on land?*

***b. Explanation***

At the public Hearing there was reference to Denmark's move to develop offshore wind in lieu of expanding onshore wind production. Staff acknowledges that there is conflict between human populations and onshore wind turbines. In large part, this is explained by the density of wind turbines in the country.

- Canada: Approximately 9.9 million square kilometers and produces roughly 4,008 megawatts of wind generated electricity (population estimated – 34,278,400 for 2011)
- Nova Scotia: Approximately 55,491 square kilometers and produces roughly 280 megawatts of wind generated electricity (population estimated – 945,900 for 2011)
- Denmark: Approximately 43,094 square kilometers and produces roughly 3734 megawatts of wind generated electricity (population estimated – 5,529,888 for 2011)

Denmark's wind generated electricity is created by offshore and onshore production. Approximately 23 % (868 MW) is produced offshore, while 77% or 2866 MW is produced onshore. In the Denmark context, 71% of Canada's entire wind energy production is produced on a land area less than the size of Nova Scotia. It should be noted that the population in Denmark is more than 5 times greater than Nova Scotia. Accordingly, it is not surprising that conflict with that magnitude of wind turbine density is inherent. No such magnitude of turbine to population ratio is foreseeable in Nova Scotia's future.

***c. Options***

*1. N/A -- Request for information*

## 11. Transmission and Easement Corridors

***a. Requested Clarifications***

*1. Supporting infrastructure - clarification requested on transmission and easements. What rules and regulations would be in place for a transmission corridor?*
*2. What are the infrastructure requirements?*
*3. Is Nova Scotia Power, under the Public Utilities Act, able to expropriate lands?*

***b. Explanation***

Pursuant to the Public Utilities Act, the Nova Scotia Utility and Review Board ("NSUARB" or "Board") exercises general supervision over all electric utilities including wind turbines operating as public utilities within the Province.

Typically large scale wind projects connect to the transmission service while smaller scale projects (less than 5 MW) would connect to the distribution service. The best analogy to explain this is highways (Transmission) and local streets (Distribution). In either case, new power poles would be required but not new transmission scale towers. This would be new NSPI infrastructure and subject to existing regulations. The cost of this infrastructure would be borne by the wind developer.

New power poles would be similar in size to that of a street lighting pole. Though there might be upgrades to existing systems such as changes to existing power lines (increasing the gauge

of the wire), rarely would this result in changing the physical height or size of a distribution system. In some cases a substation may be needed but it would rarely exceed the size of a small residential house.

In terms of location to infrastructure, in some cases large scale wind farms are as far as 20-30 kms to a transmission line. This represents a substantial cost and is a major consideration for potential wind farm location.

In terms of easements, NSPI does have the power to expropriate lands, however, it is unlikely that they would do so given the cost. Typically, the costs to secure any lands or easements would be borne by the developer. For this reason the Utility to the extent possible, tends to follow existing easements.

**c**. ***Options***

*1. N/A -- Request for information*

## 12. Health Effects, Infrasound and Low frequency vibration

### *a) Requested Clarifications*

*1. include information on the health effects including shadow flicker of wind turbines and the experiences of the family from Pubnico.*

### *b) Explanation*

The issue of human health impacts and wind turbines is contentious. There is little evidence to show a direct link to human health. It has been widely claimed that a family in Pubnico vacated the property due to impacts from low frequency vibration. It was understood that the nearest turbine to their home was approximately 400 metres away from the nearest wind turbine. The particular array of the turbine placements may have also been a contributing factor. Low frequency vibration which is inaudible to the human ear occurs in the environment naturally (waves crashing on the shore) and artificially (cars on roads). To date, no peer-reviewed scientific literature substantiates the claim of impact to human health from low frequency vibration.

However, where proposed wind turbine development are the subject of the Provincial EA process, Health Canada is often consulted, which treats the subject of "annoyance" as a human health impact. The reasoning is this. Annoyance causes stress. Stress may impact human health, the extent of which is variable. It is further known that those who are negatively predisposed to wind turbines tend to view these machines as a greater annoyance than those who are not negatively predisposed to wind turbines. This in turn may cause greater levels of stress to those persons.

### *c) Options*

*1. N/A -- Request for information*

**Conclusion**

Staff have reviewed all information presented at the July 5th Public Hearing, and have provided advice or information as appropriate. Based on the analysis, staff has presented a number of recommendations for amending the proposed LUB provisions that were before Council at the Hearing. As such, staff recommends that Council approve the amendments to the LUBs as set out in Attachment B of the staff report dated April 11, 2011, as amended by Attachment A of this Supplementary Report dated July 25, 2011.

## BUDGET IMPLICATIONS

There are no budget implications associated with this report. However if Council introduces a Development Agreement requirement for the siting of wind turbines in HRM this may have impact on staff resources.

## FINANCIAL MANAGEMENT POLICIES/BUSINESS PLAN

This report complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Project and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Project and Operating reserves, as well as any relevant legislation.

## COMMUNITY ENGAGEMENT

For the community engagement program undertaken for the wind turbine process, and the synopsis of input received from the numerous public information session held, please refer to the February 2, 2011 staff report.

## ATTACHMENTS

| | |
|---|---|
| Attachment A | Proposed Amendments of By-laws to Amend the Land Use By-laws of HRM |
| Attachment B | Typical Example (Dartmouth) of Wind LUB Amendments with Suggested Changes - For Information Only (revisions as shaded) |
| Attachment C | Potential Development Agreement Criteria for Wind Turbine Siting in HRM |
| Attachment D | Requested Clarifications |

Attachment E Brief of Revised Setback and Separation Distance Regulations for Wind Turbines (Proposed)

---

A copy of this report can be obtained online at http://www.halifax.ca/council/agendasc/cagenda.html then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Shayne Vipond, Senior Planner, 490- 4335

Report Approved by: Original Signed

Austin French, Manager, Planning Services, 490- 6717

---

**ATTACHMENT A**

**Proposed Amendments of by-laws to Amend the Amend the Land Use By-laws of HRM**

**Amendments of By-laws to Amend the Land Use By-laws for Bedford, Cole Harbour/Westphal, Dartmouth, Eastern Passage/ Cow Bay, Eastern Shore (East) Eastern Shore (West), Halifax Mainland, Halifax Peninsula, Lawrencetown, Musquodoboit Valley - Dutch Settlement, North Preston Cherry Brook Lake Major Lake Loon and East Preston, Planning Districts 1&3 (St. Margaret's Bay), Planning District 4 (Prospect Road), Planning District 5 (Chebucto Peninsula), Planning Districts 14 &17 (Shubenacadie Lakes), Planning Districts 8&9 (Lake Echo/Porter's Lake), Planning Districts 15, 18 & 19 (Beaver Bank, Hammonds Plains and Upper Sackville), Sackville, and Timberlea/Lakeside/Beechville of the Halifax Regional Municipality.**

The by-laws to amend the land use by-laws of the Halifax Regional Municipality as set out above are hereby amended as follows:

1) In Part I section g), delete subsection ii) and replace it with the following:

   **"ii Small Facility" means a wind energy facility which has a total rated capacity of more than 10 kW but not greater than 30 kW. A Small Facility has a stand alone design, on its own foundation, or may be supported by guy wires, is not roof mounted, and the tower of which is not more than 35 metres (115 feet) in height."**

2) In Part I, section g) subsection iii), delete reference to **50 kW** and replace it with **30kW**.

3) In Part II section a) delete subsection ii) and replace it with the following:

   **"ii All turbine towers in the UW-1 Zone shall have a minimum distance between turbines equal to the height of the tallest tower."**

5) In Part II section b), delete reference subsection ii) 1.

6) In Part II, section b) subsection iii),(2) delete reference to the words **2.0 times** and replace with **1.0 times**.

7) In Part II, section b) subsection iv), (2) delete reference to the words **2.0 times** and replace with the words **1.0 times**.

8) In Part II, section b) subsection v),(2) delete reference to the words **1.5 times** and replace with **1.0 times**.

9) In Part II, section b) subsection vi),(1) delete reference to the words **550 metres (1805 feet)** and replace with **750 metres (2460 feet).**

10) In Part II, section b) subsection vi),(2) delete reference to the words **1.5 times** and replace with **1.0 times**.

11) In Part VIIII delete reference to **VIIII** and replaced it with **IX.**

In addition the by-law to amend the land use by-law for Dartmouth of the Halifax Regional Municipality is hereby amended as follows:

12) In Part IX SCHEDULES delete **a) Schedule - Map A-1 – Wind Energy Zoning Map** and replace with the following:

**a) Schedule - Map A-1.1 – Wind Energy Zoning Map**

**Dartmouth**
**Land Use By-Law**

## Schedule A-1.1 - Wind Energy Map

(UW-1) Urban Wind Zone

(RW-2) Rural Wind Zone

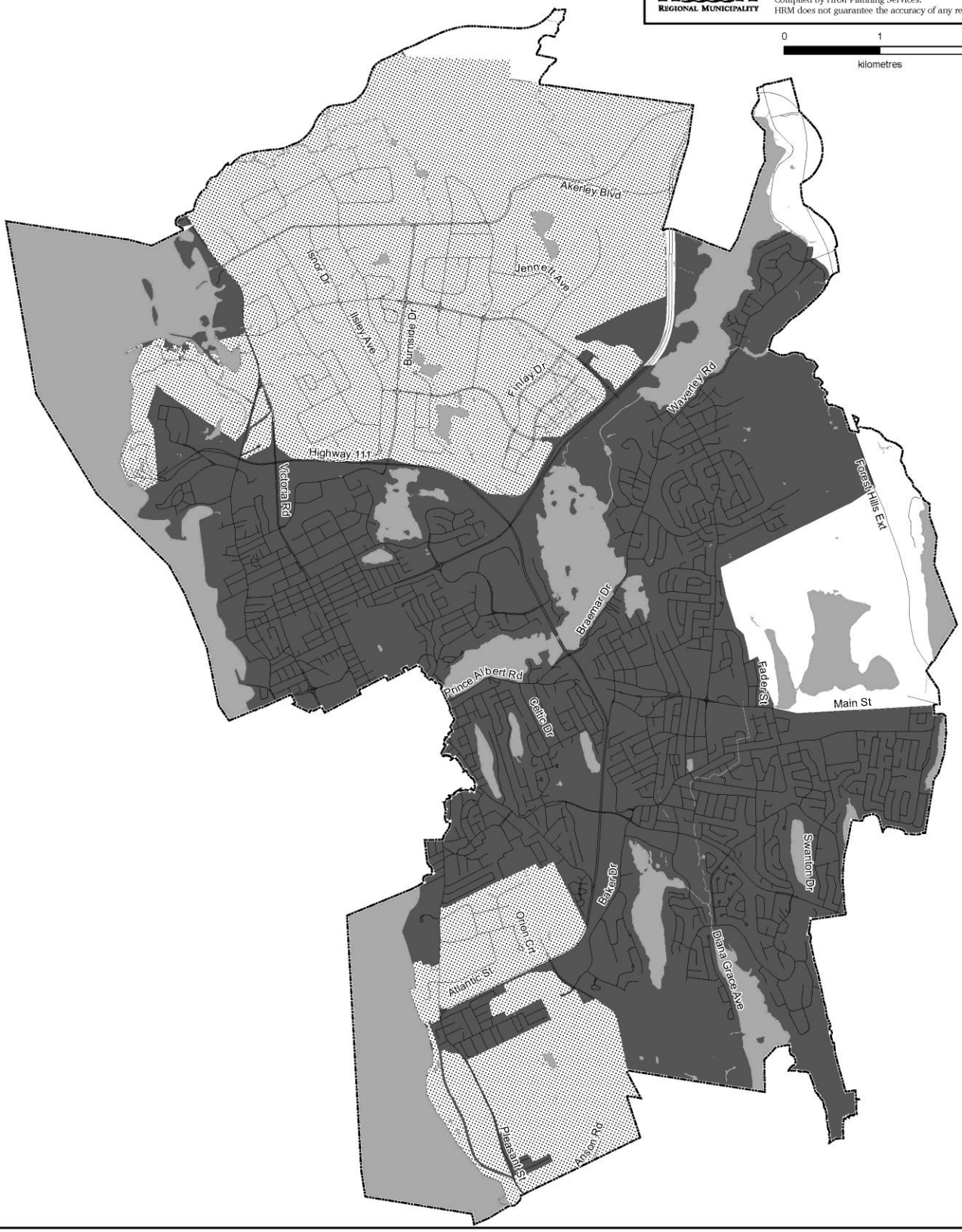
(R) Restricted Zone

HALIFAX
REGIONAL MUNICIPALITY

Effective:

Compiled by HRM Planning Services.
HRM does not guarantee the accuracy of any representation on this plan.

0 1 2
kilometres




T:\work\planning\Scott\Wind Study\Draft of Regulations\Maps\Schedules\BW version\Dartmouth rev1.mxd (SML)

**ATTACHMENT B**

# Typical Example (Dartmouth) of Wind LUB Amendments with Suggested Changes - For Information Only

**(revisions as shaded)**

1. Inserting in "Section 2 General Provisions", a new subsection "32 G WIND ENERGY FACILITIES" as follows:

"32G WIND ENERGY FACILITIES

The use of windmills or wind turbines to produce electricity or for any other purpose shall be regulated in accordance with the provisions of this Section.

## I DEFINITIONS

For the purposes of this Section, certain terms are defined as follows:

a) "Habitable Building" means a dwelling unit, hospital, hotel, motel, nursing home or other building where a person lives or which contains overnight accommodations.

b) "Nacelle" means the frame and housing at the top of the tower that encloses the gearbox and generator.

c) "Nameplate Capacity" means the manufacturer's maximum rated output of the electrical generator found in the nacelle of the wind turbine;

d) "Total Rated Capacity" means the maximum rated output of all the electrical generators found in the nacelles of the wind turbines used to form a wind energy facility;

e) "Tower Height" means the distance measured from grade at the established grade of the tower to the highest point of the turbine rotor or tip of the turbine blade when it reaches its highest elevation, or in the case of a roof mounted wind turbine the distance measured from the lowest point of established grade at the building's foundation to the highest point of the turbine rotor or tip of the turbine blade when it reaches its highest elevation;

f) "Turbine" means a wind energy conversion system, the purpose of which is to produce electricity, consisting of rotor blades, associated control or conversion electronics, and other accessory structures.

g) "Wind Energy Facility" means a wind energy conversion system, the purpose of which is to produce electricity, consisting of one or more roof mounted turbines or turbine towers, with rotor blades, associated control or conversion electronics, and other accessory structures including substations, meteorological towers, electrical infrastructure and transmission lines;

i) "Micro Facility" means a wind energy facility consisting of a single turbine designed to supplement other electricity sources as an accessory use to existing buildings or facilities and has a total rated capacity of 10 kW or less, and is not more than 23 metres (75 feet) in height.

(to be deleted)

ii) "Small Facility" means a wind energy facility ~~consisting of a single turbine designed to supplement other electricity sources as an accessory use to existing buildings or facilities and has~~ a total rated capacity of more than ~~10 kW but not greater than 50 kW~~. A Small Facility has a stand alone design, on its own foundation, or may be supported by guy wires, is not roof mounted, and the tower of which is not more than 35 metres (115 feet) in height.

(to be added)

ii) "Small Facility" means a wind energy facility which has a total rated capacity of more than 10 kW but not greater than 30 kW. A Small Facility has a stand alone design, on its own foundation, or may be supported by guy wires, is not roof mounted, and the tower of which is not more than 35 metres (115 feet) in height.

iii) "Medium Facility" means a wind energy facility which has a total rated capacity of more than ~~50kW~~ 30 kW but not greater than 300 kW. A Medium Facility has a stand alone design, on its own foundation, or may be supported by guy wires, is not roof mounted, and the towers of which are not more than 60 metres (197 feet) in height.

iv) "Large Facility" means a wind energy facility which has a total rated capacity of more than 300 kW. A Large Facility has a stand alone design, on its own foundation, or may be supported by guy wires, is not roof mounted, and the towers of which are greater than 60 metres (197 feet) in height.

## II ZONES

For the purpose of this section the following zones apply as shown on the attached Schedule A-1 - Wind Energy Zoning Map. Such zones are:

(UW-1) Urban Wind Zone
(RW-2) Rural Wind Zone
(R) Restricted Zone

### a) URBAN WIND ZONE (UW-1)

i) All Wind Energy Facilities, except Large Facilities, are permitted in the Urban Wind Zone (UW-1).

(to be deleted)

~~ii) All turbine towers in the UW-1 Zone shall be set back a minimum distance of 1.5 times the tower height from any building on an adjacent property, and shall have a minimum distance between turbines equal to the height of the tallest tower~~

~~1. However the minimum setback shall not apply from the turbine tower to an accessory building on an adjacent property,~~

(to be added)

ii) All turbine towers in the UW-1 Zone shall have a minimum distance between towers equal to the height of the tallest tower

iii) All turbine towers in the UW-1 Zone shall be set back a minimum distance of 1.0 times the tower height from any adjacent property boundary.

iv) Turbine towers of Micro Facilities in the UW-1 Zone shall be set back a minimum distance of 3.0 times the tower height from any habitable building on an adjacent property.

v) Turbine towers of Small Facilities in the UW-1 Zone shall be set back a minimum distance of 180 metres (590 feet) from any habitable building on an adjacent property.

vi) Turbine towers of Medium Facilities in the UW-1 Zone shall be set back a minimum distance of 250 metres (820 feet) from any habitable building on an adjacent property.

b) **RURAL WIND ZONE (RW-2)**

i) All Wind Energy Facilities are permitted in the Rural Wind Zone (RW-2).

ii) All turbine towers shall have a minimum distance between turbines equal to the height of the tallest tower.

(to be deleted)

~~1. However the minimum setback shall not apply from the turbine tower to an accessory building on an adjacent property.~~

iii) Turbines towers of Micro Facilities in the RW-2 Zone shall have the following set back requirements:

(1) A minimum distance of 3.0 times the tower height from any habitable building on an adjacent property;

(2) A minimum distance of ~~2.0 times~~ 1.0 times the tower height from any adjacent property boundary.

iv) Turbines towers of Small Facilities in the RW-2 Zone shall have the following set back requirements:

(1) A minimum distance of 180 metres (590 feet) from any habitable building on an adjacent property;

(2) A minimum distance of ~~2.0 times~~ 1.0 times the tower height from any adjacent property boundary.

v) Turbines towers of Medium Facilities in the RW-2 Zone shall have the following set back requirements:

(1) A minimum distance of 250 metres (820 feet) from any habitable building on an adjacent property;

(2) A minimum distance of ~~1.5 times~~ 1.0 times the tower height from any adjacent property boundary.

vi) Turbines towers of Large Facilities in the RW-2 zone shall have the following set back requirements:

(1) A minimum distance of ~~550 metres (1805 feet)~~ 750 metres (2460 feet) from any habitable building on an adjacent property;

(2) A minimum distance of ~~1.5 times~~ 1.0 times the tower height from any adjacent property boundary.

c) **RESTRICTED ZONE (R)**

ii) Wind Energy Facilities shall not be permitted in the Restricted Zone.

## III PERMIT APPLICATION REQUIREMENTS

All Wind Energy Facilities require a development permit. The permit application shall contain the following:

a) a description of the proposed Wind Energy Facility, including an overview of the project; the proposed total rated capacity of the Wind Energy Facility;

b) the proposed number, representative types, and height or range of heights of wind turbines towers to be constructed, including their generating capacity, dimensions, respective manufacturers, and a description of accessory facilities;

c) identification and location of the properties on which the proposed Wind Energy Facility will be located;

d) at the discretion of the Development Officer, a survey prepared by a Nova Scotia Land Surveyor, a surveyor's certificate, or a site plan showing the planned location of all wind turbines towers, property lines, setback lines, access roads, turnout locations, substation(s), electrical cabling from the Wind Energy Facility to the substation(s), ancillary equipment, building(s), transmission and distribution lines. The site plan

must also include the location of all structures and land parcels, demonstrating compliance with the setbacks and separation distance where applicable;

e) at the discretion of the Development Officer, proof of notification to the Department of National Defense, NAV Canada, Natural Resources Canada and other applicable agencies regarding potential radio, telecommunications, radar and seismoacoustic interference, if applicable, to Transport Canada and the *Aviation Act;* and,

f) any other relevant information as may be requested by the Halifax Regional Municipality to ensure compliance with the requirements of this By-law.

## IV ADDITIONAL PERMIT REQUIREMENTS

a) The Development Permit application shall be reviewed by a Municipal Building Official to determine if design submissions are required from a Professional Engineer to ensure that the wind turbine base, foundation, or guy wired anchors required to maintain the structural stability of the wind turbine tower(s)are sufficient where a wind turbine is:

   a. not attached to a building and is not connected to the power grid and,

   b. attached to an accessory building in excess of 215 square feet and is not connected to the power grid.

## V EXCEPTIONS

Notwithstanding Section II a) and II b) the setback requirements from any Wind Energy Facility to a property boundary may be waived where the adjoining property is part of and forms the same Wind Energy Facility. All other setback provisions shall apply.

a) Wind Energy Facilities shall not be permitted in the following zones of the Dartmouth Land Use By-law:

   a. RPK (Regional Park) Zone.

## VII INSTALLATION AND DESIGN

a) The installation and design of a Wind Energy Facility shall conform to applicable industry standards.

b) All structural, electrical and mechanical components of the Wind Energy Facility shall conform to relevant and applicable local, provincial and national codes.

c) All electrical wires shall, to the maximum extent possible, be placed underground.

d) The visual appearance of the Wind Energy Facility shall at a minimum:

   i) be a non-obtrusive colour such as white, off-white or gray;

ii) not be artificially lit, except to the extent required by the *Federal Aviation Act* or other applicable authority that regulates air safety; and,

iii) not display advertising (including flags, streamers or decorative items), except for identification of the turbine manufacturer, facility owner and operator.

## VIII MISCELLANEOUS

a) Micro Wind Facilities shall be permitted on buildings subject the requirements in Section II a) Urban Wind Requirements and Section II b) Rural Wind Requirements.

b) The siting of Wind Energy Facilities is subject to the requirements for Watercourse Setbacks and Buffers as set out in the Land Use By-law.

c) The siting of all accessory buildings are subject to the general set back provisions for buildings under this By-law

**to be deleted**

~~**VIIII**~~

**To be added**

## IX SCHEDULES

a) Schedule - Map A-1 – Wind Energy Zoning Map

**Dartmouth**
**Land Use By-Law**

## Schedule A-1.1 - Wind Energy Map

(UW-1) Urban Wind Zone

(RW-2) Rural Wind Zone

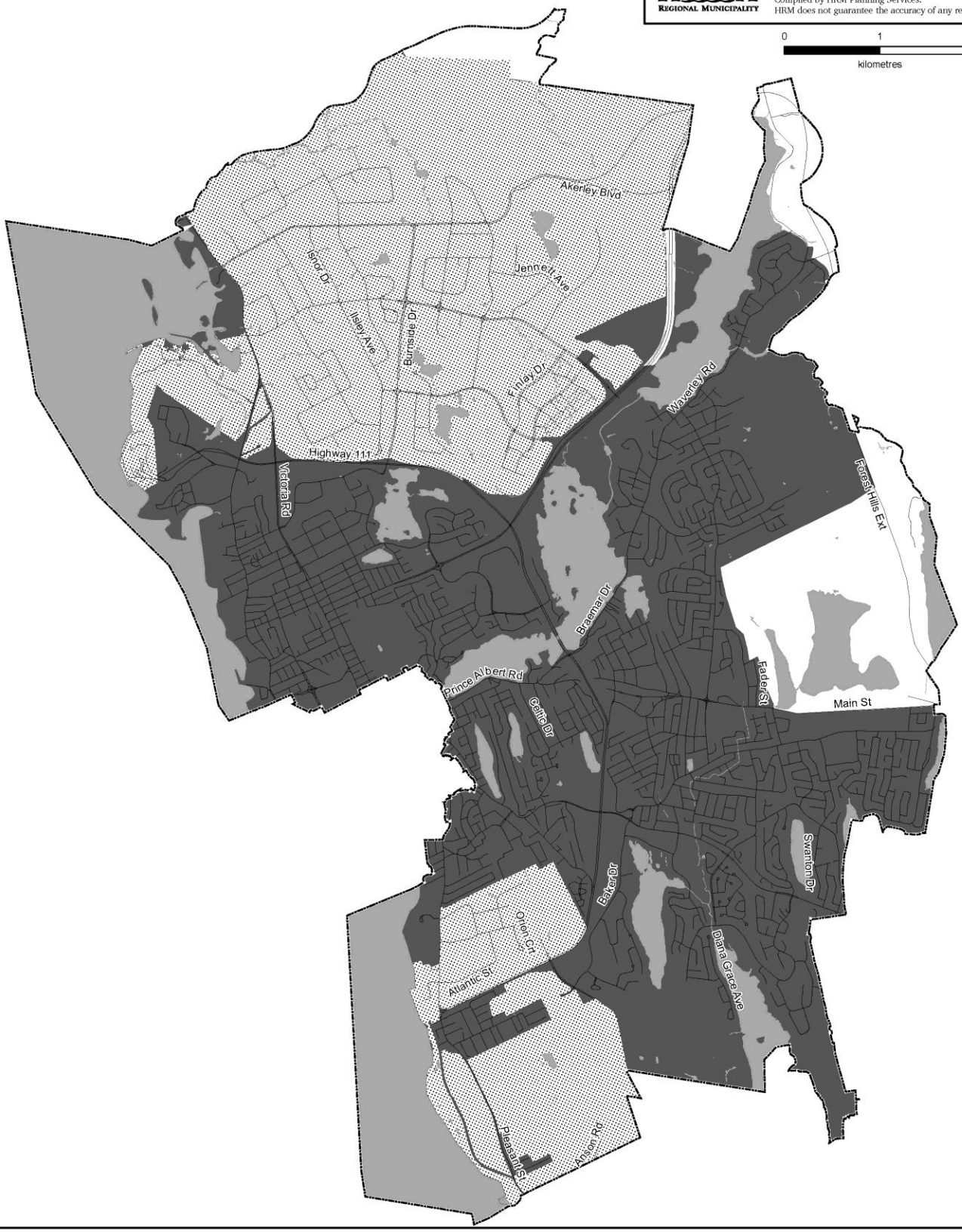
(R) Restricted Zone

HALIFAX
REGIONAL MUNICIPALITY

Effective:

Compiled by HRM Planning Services.
HRM does not guarantee the accuracy of any representation on this plan.

0 1 2
kilometres




T:\work\planning\Scott\Wind Study\Draft of Regulations\Maps\Schedules\BW version\Dartmouth rev1.mxd (SML)

ATTACHMENT C

**Potential Development Agreement Criteria for Wind Turbine Siting in HRM**

Rural HRM

These machines can be highly visible and are considered controversial, generating conflicting opinion and strong points of view. The Municipality recognizes that a large portion of the public are predisposed to considering wind energy facilities in a negative light given the obtrusive nature of the technology. However in order to appropriately mitigate impacts to the public HRM will utilize a Development Agreement to review studies that will establish that adequate protections are in place to address visual and sound impact mitigation. Accordingly Large wind energy facilities in excess of 300 Kilowatts of power production that do not undergo a Provincial Environmental Assessment shall be processed by Development Agreement.

Policy SU-

**HRM shall consider, under the development agreement, any wind turbine facility proposed to produce in excess of 300 Kilowatts that does not undergo a Provincial Environmental Assessment.**

**In reviewing applications to enter into a Development Agreement for the development of a wind turbine facility it shall be the policy of Council to have consideration for the following:**

**(a) that the proposed development does not create an unacceptable impact on surrounding habitable uses in terms of noise, shadow flicker/ strobing and public safety. In the evaluation of this criterion Council shall have regard to the following:**

**(i) noise level information supplied by the manufacturers of the wind turbines;**
**(ii) the duration of expected noise exposure by adjacent properties;**
**(iii) the extent to which shadow flicker and strobing is a factor on residential uses;**
**(iv) the turbines are located such that collapse, blade throw or ice throw does not affect adjacent properties.**

**(b) the impact of the proposed development on surface water, storm water, streams, lakes or wetlands and other environmental matters.**

**(c) the impact of the proposed development with respect to soil stability and retention and potential for erosion.**

**(d) a project decommissioning and site reclamation plan.**

**Attachment D**

**Requested Clarifications**

## 1. Urban Setbacks and Separation Distances

*(1) Re-examination of distances in urban areas particularly in business parks*
*(2) Remove setbacks to property lines (particularly in Burnside);*
*(3) Consider the Burnside proper area as there are only two areas that could have turbines;*
*(4) The businesses in Burnside are only interested in small scale wind turbines;*
*(5) Reconsider the boundaries around small scale turbines as the separation distance may be able to be changed.*

## 2. Rural Setbacks and Separation Distances

*(1) consider an amendment to increase the separation for large scale wind farms and consideration for the cumulative effects of multiple turbines on a sliding scale;*
*(2) seriously reconsider the setback distance and offer options other than the 550m proposed setback;*
*(3) multiple large turbines should be separate from and have different separation distances from single large turbines;*
*(4) clarification requested on the 250m setback for medium sized turbines and how it relates to noise effects when Ontario decided that 40 decibels was considered for 550m setback;*
*(5) Clarification was requested in regard to the maps as to what impact would a change in setback distance of 750m or 1000m or 1.5 km and 2km setbacks have on wind turbine development in HRM. Justification of difference between distances for urban and rural as all Councilors are compelled to be balanced in regard to the rural/urban portions of their districts*
*(6) Divisive impacts to Community - Institute controls to remove impact*
*(7) Rural vs Urban – areas treated differently, why?*
*(8) If there are any changes in regard to large scale farms/distances/development agreement process for rural areas, then the urban areas should not be treated any different as some of these areas are abutting residential areas.*
*(9) Consistency between urban and rural regulations*

## 3. Classification of Turbines

*(1) issue of Nova Scotia wind turbine industry product - there appears to be a marginal difference between product referenced in the presentation as they are outside the category of medium turbine size of 35m.*
*(2) consider making smaller turbines a little "larger" so as not to eliminate the local industry*
*(3) try to meet manufacturer's requirement in order to help support the Nova Scotia wind turbine production industry (made in Nova Scotia, made in Halifax plan)*

(4) *Ranges of small and medium turbines too restrictive to be practical*
(5) *local producer of wind turbine that are 50 m - how to accommodate this size - increase max height of small turbine to 50 m - what are implications?*
(6) *COMFIT requirements need to be recognized as it is direct to distribution*

**4. <u>Wright's Cove</u>**

(1) *Are turbines permitted in Wright's Cove area as of right independent of existing development agreement on adjacent lands?*
(2) *Lands not covered under DA subject to as of right wind turbine development?*

**5. <u>Potential Development Agreement Provisions for Wind Turbines in HRM</u>**

(1) *a method to consider a site specific application process such as a development agreement that would deal with issues identified such as water sources, noise, height, aesthetics and public safety;*
(2) *that no application be entertained until Council completion approves a new by-law.*
(3) *protect groundwater - institute mandatory dye testing*
(4) *consider a development agreement process for medium turbines as well as they could provide power for up to 20 or 30 homes.*
(5) *information on the possible effects on wells.*
(6) *clarify the scope of the DA process once the policy is passed - it seems to be that the separation distances could not be negotiated through the DA process so if separation is a key issue for communities then separation distances need to be set very large so that they deal with all concerns.*
(7) *what the as-of-right does is that it prevents some measure of responding to local concerns?*
(8) *is there any other proposal through site based planning or DA that would allow for some community negotiation?*
(9) *would this have to be that all wind turbines would need to be by DA with a minimum setback standard? or at least wind turbines that are medium and large?*

**6. <u>Buffers Around Protected Areas</u>**

(1) *have buffers around protected areas,*
(2) *create buffer in accordance with the height of turbine rather than just separation distance,*
(3) *enhance buffers around protected areas -- 2000 metres requested*
(4) *protected areas should be considered the same as a habitable building*

**7. <u>Boundary Revision Issues</u>**

(1) *re-examine the Urban Reserve designated areas under the Regional Plan as they should not be excluded totally when there is a moratorium on development of those lands for 25 years. The urban reserve areas are outside the municipal service boundaries so why not allow wind farms in the interim.*

(2) *the seven urban reserve areas are not treated equally as some are zoned Urban Wind 1 and other areas are restricted areas such as Governors Lake North although it is near a business park.*
(3) *clarification was requested on the return on investment as it may take 10 to 20 years but there is a moratorium on those lands for 25 years.*
(4) *the urban reserve area in District 4 is going through a master plan process and therefore Councillor Nicoll does not consider that area urban reserve*

**8. <u>Provincial Environmental Assessment</u>**

(1) *clarification on the process surrounding large windmill proposals to ensure understanding that if more than 2 megawatts of power is to be produced the application would automatically require that a provincial Environmental Assessment be done;*
(2) *clearly outline what an Environmental Assessment entails.*
(3) *Information to be included in regard to the time frame for a provincial Environmental Assessment*
(4) *effects of misting and other hazards: what is effect of coolants and risk of that and of fires*
(5) *what specifically is the role of public consultation in the Provincial EA process - is it mandatory?*
(6) *how does the consultation take place?*
(7) *can the public comment on all aspects of the wind turbine proposal?*
(8) *is there more opportunity for public to influence the siting of wind turbines under the EA process?*
(9) *what specifically is the role of public consultation in the Provincial EA process - is it mandatory? how does the consultation take place?*
(10) *can the public comment on all aspects of the wind turbine proposal? is there more opportunity for public to influence the siting of wind turbines under the EA process or a municipal DA process?*

***9. Property Values***

(1) *Are there negative impacts to Property Values in proximity to wind turbine development?*

***10. The Denmark Experience***

(1) *refer to countries involved in windmill industry who have retreated on in land turbines such as Denmark*
(2) *information on why other countries, such as Denmark, have stopped placing wind turbines on land.*

**9. <u>Transmission and easement corridors</u>**

(1) *Supporting infrastructure - clarification requested on transmission and easement corridors?*

*(2) What rules and regulations would be in place as you cannot have a turbine without a transmission corridor?*
*(3) What are the infrastructure requirements?*
*(4) Power of Nova Scotia Power to under Public Utilities Act to expropriate lands*
*(5) How prominent will poles and towers be?*

**10. <u>Health Effects, Infrasound and Low frequency vibration</u>**

*(1) include information on the health effects of wind turbines such as the experiences of the family from Pubnico.*
*(2) shadow flicker and human health*

Attachment E

Brief of Revised Setback and Separation Distance
Regulations for Wind Turbines
(Proposed)

# General

**Categories of Wind Turbines -- Maximum Heights and Power Generation Ranges**

| Categories | Max. Height | Power Generation |
|---|---|---|
| Micro | 25 metres (75 ft) | 0-10 kW |
| Small | 35 metres (115 ft) | 10- **30kW (revised)** |
| Medium | 60 metres (197 ft) | **30 (revised)** – 300 kW |
| Large | 60 metres plus | 300 kW + |

**Small Turbine Category** -- Revised definition to recognize Comfit and Net metering applications.

# Urban Area

**Permitted Location of Wind Turbines:** (Business Parks and Select Marine Industrial locations)

**Categories of Wind Turbines Permitted Urban Area:** Micro, Small and Medium

**Micro Wind Turbines**

1. Setback to Property line -- 1.0 times height
2. Separation Distance -- 3 times height to habitable building on adjacent lot
3. ~~Separation Distance – 1.5 times height to non-sensitive building on adjacent lot~~ (removed )

**Small Wind Turbines**

1. Setback to Property line -- 1.0 times height
2. Separation Distance – 180 metres (590 ft) to habitable building on adjacent lot
3. ~~Separation Distance – 1.5 times height to non-sensitive building on adjacent lot~~ (removed )

**Medium Wind Turbines**

1. Setback to Property line -- 1.0 times height
2. Separation Distance – 250 metres (820 ft) to habitable building on adjacent lot
3. ~~Separation Distance – 1.5 times height to non-sensitive building on adjacent lot~~ (removed)

# Rural Area

**Location of Wind Turbines:** Permitted outside of Restricted Zone **(**Regional Parks, Protected Areas, Conservation Areas, Western Commons, and Urban Area)

**Categories of Wind Turbines Permitted**: Micro, Small, Medium and Large

**Micro Wind Turbines**

1. Setback to Property line -- **1.0 (revised)** times height
2. Separation Distance -- 3 times height to habitable building on adjacent lot

**Small Wind Turbines**

1. Setback to Property line -- **1.0 (revised)**times height
2. Separation Distance – 180 metres (590 ft) to habitable building on adjacent lot

**Medium Wind Turbines**

1. Setback to Property line -- **1.0 (revised)**times height
2. Separation Distance – 250 metres (820 ft) to habitable building on adjacent lot

**Large Wind Turbines**

1. Setback to Property line -- 1.0 times height
2. Separation Distance – **750 metres (2460 ft) (revised)** to habitable building on adjacent lot