

THE FOLLOWING ARE THE LATE ITEMS FOR THE MEETING OF CITY COUNCIL HELD ON OCTOBER 11, 2011:

HEARINGS

**3a - i) Proposed Official Community Plan Amendment
and Zoning Bylaw Amendments
City Park Local Area Plan Implementation**

- Tom Wolf, dated October 10, 2011, requesting to speak to Council regarding the above; and
- Joanne Franko, dated October 11, 2011, submitting comments and requesting to speak to Council regarding the above.

**c) Proposed Official Community Plan Amendment
To Amend a Portion of the City Park Land Use Policy Map
Light Industrial to Mixed Use
City Park Local Area Plan Implementation
300 to 800 Blocks of Duchess Street
Proposed Bylaw No. 8966
(File No. CK. 4351-011-8)**

- John Kearley, Executive Vice-President, Peel Properties Limited, requesting to speak to Council regarding the above.

**3d) Proposed Zoning Bylaw Map Amendment
To Rezone Properties in the City Park Neighbourhood
IL1 District to MX1 District
City Park Local Area Plan Implementation
300 to 800 Blocks of Duchess Street
Proposed Bylaw No. 8967
(File No. CK. 4351-011-8)**

- John Kearley, Executive Vice-President, Peel Properties Limited, dated October 11, 2011, submitting comments regarding the above.

ADMINISTRATIVE REPORT NO. 18-2011

Section B - Corporate Services

**B1) Seasonal Taxi Licenses
(Files CK. 307-4 and CS. 307-1)**

- Troy Larmer, General Manager, The United Group, dated October 10, 2011, requesting to speak to Council; and
- Krisan Macas, dated October 11, 2011, requesting to speak to Council.

Section F - Utility Services

F1) Request for Proposal for Development of Tall Wind Turbine Project Saskatoon Light & Power: Capital Project 2306: Electrical Supply Options – Wind Turbine (File No.: CK. 2000-5 and WT. 2000-10-2)

The following letters are submitting comments regarding the above matter:

- Bonnie Clark, dated October 6, 2011;
- Larry Rempel, dated October 6, 2011;
- Tonya Kaye, dated October 6, 2011;
- Valancy Bowering, dated October 6, 2011;
- Gerard Schmidt, dated October 6, 2011;
- Bryan Silzer, dated October 6, 2011;
- Melissa Silzer, dated October 6, 2011;
- Leslee Newman, dated October 6, 2011;
- Susan Peters, dated October 6, 2011;
- Jack Lapsiuk, dated October 6, 2011;
- Denis Grimard, dated October 6, 2011;
- Janinne Collins, dated October 6, 2011;
- Rob Collins, dated October 6, 2011;
- Robert Hnatuk, dated October 6, 2011;
- Jacqueline Prefontaine, dated October 6, 2011;
- Jason Prokopchuk, dated October 6, 2011;
- Barb Biddle, dated October 6, 2011;
- Mark Beblow, dated October 7, 2011;
- Anthony Hnatiuk, dated October 7, 2011;
- Keith Martin, dated October 7, 2011;
- Jeff Edmonstone, dated October 7, 2011;
- Chris Anderson, dated October 7, 2011;
- Trista Edmonstone, dated October 7, 2011;
- Christine Harwood; dated October 7, 2011;
- Kristina Anderson, dated October 7, 2011;
- Ralph Schaan, dated October 7, 2011;
- Lowell Schaan, dated October 7, 2011;
- Jennifer Kryworuchko, dated October 7, 2011;
- Wes and Delores McCurdy, dated October 7, 2011;
- Gordon Myers, dated October 8, 2011;
- Randall Renneberg, dated October 8, 2011;
- Eric Ashworth, dated October 8, 2011;
- Jo Ann Wisminity, dated October 9, 2011;
- Bernice Rinas, dated October 10, 2011;
- Pete Cockburn, dated October 10, 2011;
- Rosalyn Kirkham, dated October 10, 2011;

- George Swerhone, dated October 10, 2011;
- Dave and Judith Bereza, dated October 10, 2011;
- Helen and John Meredith (two letters), dated October 10, 2011;
- Wanda Waldner, dated October 10, 2011;
- Karen Bosker, dated October 10, 2011;
- Edward Fairbrother, dated October 11, 2011;
- Grace Varga, dated October 11, 2011;
- Jim Earle, President, Montgomery Place Community Association, dated October 9, 2011;
- Dr. John Meredith, Nautilus – Operational Research Consulting, dated October 11, 2011;
- Wally Penner, dated October 11, 2011;
- Meredith Wild, dated October 11, 2011;
- Melanie Downing, dated October 11, 2011;
- Sherri Buckle, dated October 11, 2011; and
- Denis Grimard, dated October 11, 2011, attaching further documents he will be referencing in his presentation (Due to the size of the documents, there will be a limited distribution to members of City Council and the General Manager, Utility Services only. A copy can be viewed in the City Clerk’s Office and on the website under “Late Items” for this meeting).

The following has requested to speak to Council regarding the above matter:

- Mark Bigland-Pritchard, dated October 10, 2011.

REPORT NO. 14-2011 OF THE PLANNING AND OPERATIONS COMMITTEE

1. Communications to Council

From: Carola Brotzel
Date: May 2, 2007
Subject: Traffic Issues on Avenue C North
 from 33rd Street to Circle Drive

AND

Enquiry – Councillor D. Hill (June 22, 2009)
Traffic Calming Measures – Avenue C North of 33rd Street
(File No. CK. 6320-1)

- Keith Moen, North Saskatchewan Business Association, dated October 6, 2011, requesting to speak to Council regarding the above; and
- Kelly Harrington, dated October 11, 2011, submitting comments.

SPEAKERS LIST

**(NOT including Presentations, Hearings or Matters Requiring Public Notice
(* represents late letter)**

ADMINISTRATIVE REPORT NO. 18-2011

Section B - Corporate Services

B1) Seasonal Taxi Licenses
(Files CK. 307-4 and CS. 307-1)

***1. Troy Larmer**

***2. Krisan Macas**

Section F - Utility Services

F1) Request for Proposal for Development of Tall Wind Turbine Project
Saskatoon Light & Power: Capital Project 2306:
Electrical Supply Options – Wind Turbine
(File No.: CK. 2000-5 and WT. 2000-10-2)

3. Louis Denis Grimard

***4. Rosalyn Kirkham**

***5. Mark Bigland-Pritchard**

REPORT NO. 14-2011 OF THE PLANNING AND OPERATIONS COMMITTEE

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***6. Keith Moen**

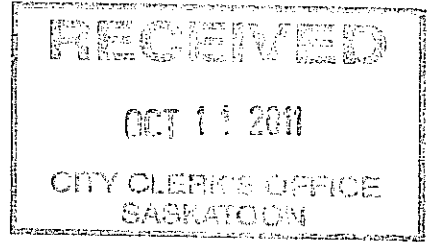
MISCELLANEOUS MATTERS

7. Ashley and Brad Berrns – zoning process

8. J.L. Grover – smoke detector maintenance

4351-011-8
3a-i)

From: CityCouncilWebForm
Sent: October 10, 2011 10:58 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Tom Wolf
838 8th Ave. N.
Saskatoon
Saskatchewan
S7K 2X2

EMAIL ADDRESS:

tom.wolf@sasktel.net

COMMENTS:

His Worship and City Council,

I would like to speak to City Council on Oct 11, 2011 to comment on the City Proposed Official Community Plan Bylaw No. 8769 Amendments and Rezonings

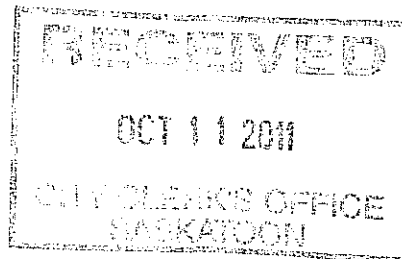
Sincerely,

Tom Wolf

4351-011-8

Joanne Franko
812 4th Avenue North
Saskatoon SK S7K 2N4
(306) 244-9841 – frankoj@sasktel.net

October 11, 2011
His Worship and City Council
c/o City Clerk's Office
222 3rd Avenue North
Saskatoon SK S7K 0J5



To: Your Worship Mayor Don Atchison and City Council,

Re: City Park Local Area Plan Proposed Amendments to Zoning Bylaw No. 8770 and Official Community Plan Bylaw No. 8769
File No. PL4115-OC/10; PL 4350-Z39/10

Date of City Council Meeting – October 11, 2011

I wish to address the changes to zoning and land use changes being proposed for City Park. As an active member of the City Park LAP process and a former President of City Park Community Association, I am both pleased by the proposed changes and disappointed in what I see as a glaring omission of one required zoning change.

I am pleased to see that the majority of the zoning and land use changes proposed in the LAP are moving ahead. I support all of the zoning and land use changes that were outlined in the notice that I received. Particular areas of concern for the LAP committee were the rezoning of Hygrade Mill from Heavy to Light Industrial, rezoning Duchess Courts from Heavy Density Residential to Light Density Residential and rezoning City Park Collegiate Land from Low Density Residential to Community Facility. As a committee, we also agreed that the zoning and land use in City Park needed to reflect current use and protect future use. However, I am dismayed by the one glaring omission from these proposed bylaws; that is to change the zoning for the residential area west of 7th between Queen and Duchess Street to RM1. During the LAP process, there were a few overwhelmingly unanimous issues and this was one of them. To see this zoning change not going ahead at this time is a significant disappointment to me.

In my discussions with two Planners from the City, I was given different feedback as to why this zoning change is not moving ahead at this time. From what I was told, this residential zoning change is now subject to delay because of the infill strategy currently being prepared by City Administration. During our LAP process, there were significant delays in getting to a final report. I was quite disheartened to hear that that one of the most significant zoning issues that we requested is being delayed (again) because of yet another strategy. I completely support tasteful infill development that fits into the character and feel of a neighborhood. However I also feel that the neighborhood should have some say as to their position on infill development. I appreciate that without knowing the content of the infill strategy, I have no idea yet how this will impact City Park. However given that City Park is already recognized as having one of the highest density neighborhoods in Saskatoon, I'm curious how much more density we want to add. From where I live within City Park, there are ~ 14, 3 floor walk-up apartments within a 2 – 3 block radius of our house (depending on how you count blocks and

apartments). I think we have enough density. And yet one of our more significant zoning issues, is not being considered at this time because of a yet unknown infill strategy?

It must be clear to you by now that I am frustrated by what has been a long and protracted process. I am pleased to see that the majority of the zoning and land use requests that have been proposed by the City Park LAP committee are moving ahead however I can't hide my disappointment that one of the most significant zoning issue for us is not being addressed at this time. I am also concerned that this zoning change will be further delayed by 'consultation' that City Administration and City Council will require, to support the implementation of the infill strategy. Rather, I prefer to see this issue addressed now; failing that, I hope to see this issue quickly resolved upon the adoption of the infill strategy by City Council.

During the City Park LAP process, we spent many hours talking about zoning and residential density. Its time for City Council to put some action into fully supporting the recommendations of the City Park LAP Committee.

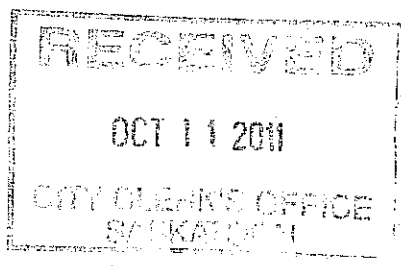
Respectfully submitted,

Joanne Franko

4351-011-8
3c)

Peel Properties Limited

A Member of the Millennium III Group of Companies



October 11, 2011

His Worship and City Council
c/o City Clerk's Office
222 3rd Avenue North
Saskatoon SK S7K 0J5

Dear Sirs and Mesdames:

**Re: City Proposed Official Community Plan Bylaw No. 8769
Amendments and Rezoning**

I hereby request to speak to the members of City Council regarding the proposed changes to the zoning designation of 420 Duchess St., Bylaw No. 8769 at the meeting of City Council on October 11th, 2011.

Yours truly,

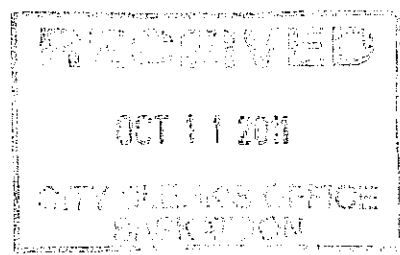
A handwritten signature in black ink, appearing to be "John A. W. Kearley".

John A. W. Kearley
Executive Vice-President

4351-011-8
3d)

Peel Properties Limited

A Member of the Millennium III Group of Companies



October 11, 2011

His Worship and City Council
c/o City Clerk's Office
222 3rd Avenue North
Saskatoon SK S7K 0J5

Dear Sirs and Mesdames:

**Re: City Proposed Official Community Plan Bylaw No. 8769
Amendments and Rezoning**

The purpose of this letter is to confirm that the owners of Peel Properties Limited are completely opposed to the proposed rezoning of the 300-800 Block of Duchess Street from the existing IL1 designation to the proposed MX1 designation. The limitations imposed by this new zoning designation will severely diminish the functionality and flexibility of our property from a leasing standpoint. These changes would then directly impact upon the income of the property, thus decreasing its value as an investment.

I hereby request that 420 Duchess St. be exempted from this rezoning, and strongly urge the City of Saskatoon to consider the affects of rezoning upon a tax base which utilizes the income approach to assessments as a revenue generator.

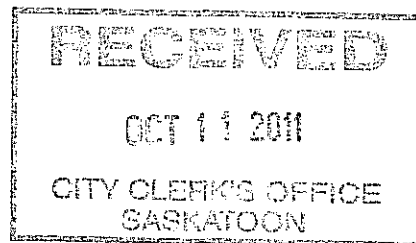
Yours truly,

John A. W. Kearley
Executive Vice-President

2612 Koyl Avenue Saskatoon SK S7L 5X9 Telephone (306) 955-4174 Fax (306) 955-4175

BI
307-4

From: CityCouncilWebForm
Sent: October 10, 2011 2:11 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Troy Larmer
225 Avenue B North
Saskatoon
Saskatchewan
S7L 1E1

EMAIL ADDRESS:

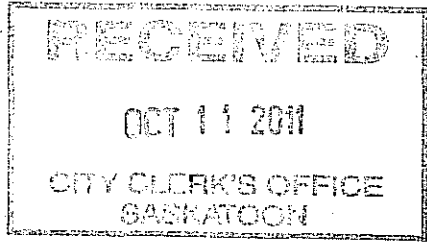
troy1@unitedgroup.ca

COMMENTS:

I am requesting to be placed on the speakers list and speak to the issue on seasonal taxi plates.

Thank you.
Sincerely,
Troy Larmer, General Manager
The United Group

From: CityCouncilWebForm
Sent: October 11, 2011 5:01 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:
Krisan macas
#1-103 Berini Drive

SASKATOON
Saskatchewan
S7N 4N2

EMAIL ADDRESS:

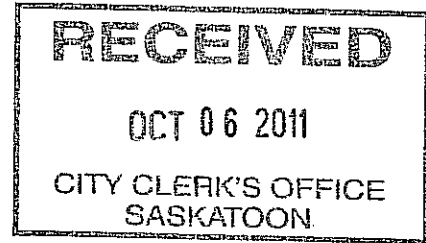
kmacas@shaw.ca

COMMENTS:

I wish to speak to Council in regards to the Temporary Taxi License issue ,at the Council meeting Scheduled for the 11th of October 2011.

2000-5
F1)

From: CityCouncilWebForm
Sent: October 06, 2011 12:03 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Bonnie Clark
3327 Merritt St.
Saskatoon
Saskatchewan
S7M 3P7

EMAIL ADDRESS:

bclark@cfactorworks.com

COMMENTS:

Re: Proposed Wind Turbine Project

Members of Council,

With many alternatives for green energy out there, I wonder why the Wind Turbine Proposal is still under consideration? Weighing the pros and the cons it simply does not add up. The project forecasts an unremarkable return on investment but holds significant negative impact in question for Montgomery Place residents.

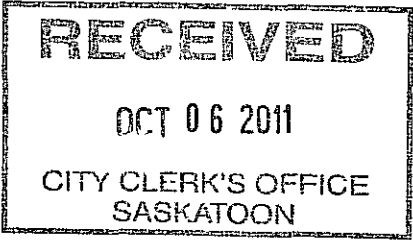
I have a request of each councilor. As residents in your own wards - perhaps far away from Montgomery - ask yourself how you would feel about possibly never going into your backyard again and hearing the chirping of birds and squirrels, but in its place, an annoying whining noise? Will your children choose to play outside or will they be more comfortable inside, where there are no annoying noises but rather their favourite video game? And how will the vibration affect grandma who is already dealing with imbalance and is at risk of another fall? In addition to these daily impacts on your life, how do you explain to your children the violent end for the massive number of birds who flock there?

I ask you to consider these as though you are a resident of Montgomery Place. Look at your children, your family, your neighbours, your pets and consider the implications on them. Once you have done that, I ask you to be accountable to the residents of Montgomery Place as you would be to everyone who you know and care for.

There is undoubtedly far too much at risk to proceed with this project. I urge you to explore other alternatives that would not present such risks that could affect residents' daily lives and ultimately diminish their property values. Montgomery Place was founded on being a neighbourhood that was safe, quiet and provided boundless green space for families to enjoy outdoor fun. If this project were to proceed, it would rock its very foundation.

Sincerely,
Bonnie Clark

From: CityCouncilWebForm
Sent: October 06, 2011 11:08 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Larry Rempel
1508 Crenar Drive
Saskatoon
Saskatchewan
S7M 5B5

EMAIL ADDRESS:

leo@sasktel.net

COMMENTS:

I'm sending this email to address the construction of the wind turbine at the landfill.

Residents of Montgomery Place responded very clearly at a community meeting which Kevin Hudson and Rod Neufeld attended. Concerns about property values and other effects of the turbine on our area were raised. We seem to have been completely ignored.

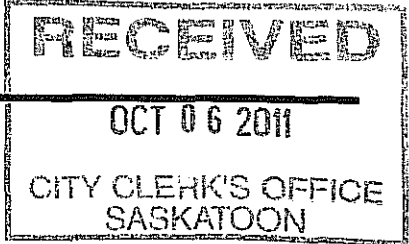
Mr. Atchinson and city council, you need to consider the impact of the turbine on our community.

The turbine needs to be moved out of the city. To my knowledge no real effort has been made to find a better location. This needs to be done. I would like to ask the council to direct Mr. Hudson and Mr. Neufeld to contact SaskPower and arrange for an alternate location.

This is not a letter against alternate energy. It is a letter supporting it, but not advocating harming a community because it's easier than doing the work of finding a more appropriate location.

Thank you.

2000 - 5.



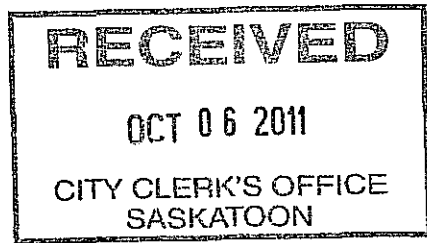
Subject: FW: Wind Turbine

From: Tonya Kaye [tinydog2002@yahoo.com]
Sent: October 6, 2011 10:26 AM
To: Lorje, Pat (City Councillor)
Subject: Re: Wind Turbine

Dear Pat Lorje (and all Council Members),
I live in Holiday Park - and, sorry, I don't have a printer. I am in total agreement with your stand on these wind turbines. First in my mind is the thousands of birds that will be butchered by the turbine blades. The stability of the turbines on the mass of garbage is of great concern as we don't want accidents. Also 700 meters is not that far away for residential areas. I agree that Saskatoon can find other means of turning green, ie. get recycling program in place and expand this to all sorts of wastes. Putting out millions of dollars for turbines with all sorts of attached potential problems is not a bright idea.

I hope you can add my brief comments to the Clerk's Office.
Thank you. I will be watching the development of this question with great interest.
Tonya Kaye
1414 Avenue N South
Saskatoon, SK S7M 2R3
652-3855
tinydog2002@yahoo.com

From: CityCouncilWebForm
Sent: October 06, 2011 10:15 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

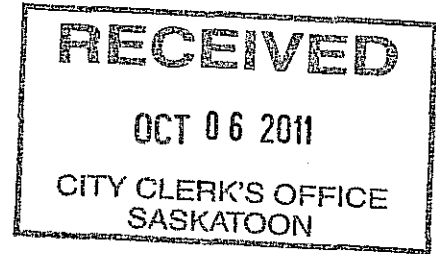
FROM:
Valancy Bowering
1056 McCormack Road
Saskatoon
Saskatchewan
S7M 5K2

EMAIL ADDRESS:
valancy@shaw.ca

COMMENTS :

As a concerned citizen of Saskatoon and a resident in the Parkridge area, I am against the installation of the proposed wind turbine tower at the landfill site in Saskatoon.

From: CityCouncilWebForm
Sent: October 06, 2011 10:34 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Gerard Schmidt
647 Fairbrother Pl

Saskatoon
Saskatchewan
s7s 1j2

EMAIL ADDRESS:

gschmidt1@rogers.blackberry.net

COMMENTS:

I am AGAINST the erection of the 80 metre wind turbine at the landfill location in Saskatoon Sk.

From: CityCouncilWebForm
Sent: October 06, 2011 10:03 AM
To: City Council
Subject: Write a Letter to City Council

TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Bryan Silzer
3410 Caen St.

Saskatoon
Saskatchewan
S7M 3P4

EMAIL ADDRESS:

brymel@sasktel.net

COMMENTS:

I am sending this letter to voice my opinion of the Wind Tower Proposal at the Land Fill. NO,NO,NO. I cannot believe some are willing to put the area residents through this for .6 MW of power. First the possible health risks. This is a joke, spend your money on a water park and power generation station on the river. The power you will generate out of this turbine will not even cover the impact on the housing market in the area. You are already put a freeway through our area and affect housing prices and now this!! After the disaster taking place on 11th st with a freeway on our door steps and now a wind turbine, I believe I will move out of the neighbourhood and out of the city!!

From: CityCouncilWebForm
Sent: October 06, 2011 10:06 AM
To: City Council
Subject: Write a Letter to City Council

TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Melissa Silzer
3410 Caen St.
Saskatoon
Saskatchewan
S7M 3P4

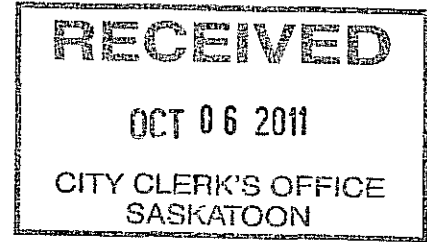
EMAIL ADDRESS:

brymel@sasktel.net

COMMENTS:

I am AGAINST the wind tubine at the land fill

From: CityCouncilWebForm
Sent: October 06, 2011 8:51 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

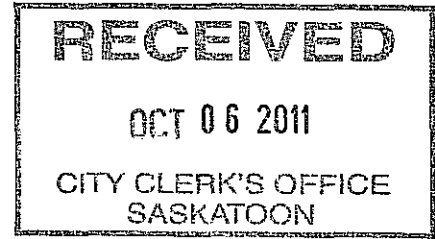
Leslee Newman
3303 Caen Street
Saskatoon
Saskatchewan
S7M 3P3

EMAIL ADDRESS:

COMMENTS:

Vote NO on the wind turbine proposal. There is not one good reason to erect such a structure. Financial arguments in favour of the turbine are laughable. There is a host of good reasons against the erection of the proposed wind turbine, foremost of which is the legion of potential health risks. Please research for yourselves. Please listen to concerned citizens. Hear us. Show us with your NO vote that we have been heard.

From: CityCouncilWebForm
Sent: October 06, 2011 8:06 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

susan peters
3203 11th street west
saskatoon
Saskatchewan
s7m 1k2

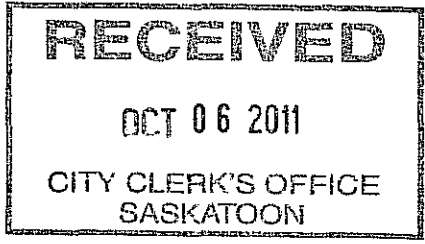
EMAIL ADDRESS:

speters9999@hotmail.com

COMMENTS:

I have just recently been informed of the proposal to put a wind turbine on the land fill southeast of my home. I am EXTREMELY OPPOSED to this venture. I don't feel that the money saved is enough to warrant the noise and health effects it will probably have on the residents of Montgomery & Holiday Park. I have seen television shows on communities/homes in other provinces with these wind turbines & people have had to move away from the homes due to the headaches they obtain from the turbines. Those same residents were unable to sell there homes because no one else wanted to live there either. Surely there are other ways to save energy/money then to use turbines which have proven to be problems after they have been installed. I VOTE NO TO WIND TURBINES!

From: CityCouncilWebForm
Sent: October 06, 2011 8:25 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

jack lapsiuk
3114 Mountbatten street
saskatoon
Saskatchewan
s7m 3t1

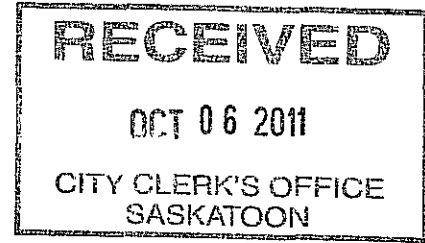
EMAIL ADDRESS:

lapsiuk@sasktel.net

COMMENTS:

I am opposed to the erection of this wind turbine at our landfill. We can't afford any more tax increases to pay for it, as this Mayor and Council sell off valuable land (parcel Y) for over 50% less than what it was valued at. Terrible.
Jack Lapsiuk

From: CityCouncilWebForm
Sent: October 05, 2011 7:11 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Denis Grimard
3123 Mountbatten Street
Saskatoon
Saskatchewan
S7M 3T3

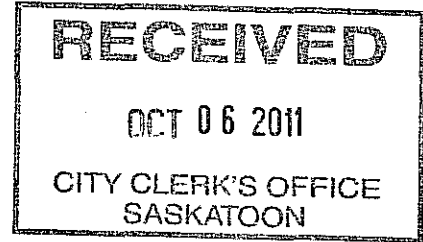
EMAIL ADDRESS:

dvgrimard@gmail.com

COMMENTS:

I am against the erection of the 80 metre wind turbine at the landfill location in Saskatoon, Sk.

From: CityCouncilWebForm
Sent: October 06, 2011 7:57 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Janinne Collins
1505 Lancaster Blvd.
Saskatoon
Saskatchewan
S7M5M3

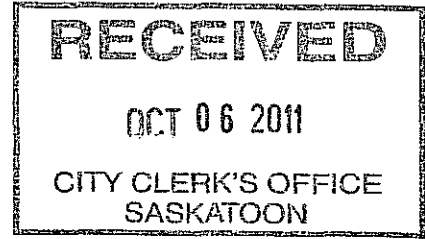
EMAIL ADDRESS:

janinne@shaw.ca

COMMENTS:

I am against the proposed wind turbine at the landfill in Saskatoon. I urge you to oppose this.

From: CityCouncilWebForm
Sent: October 06, 2011 1:29 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Rob Collins
1505 Lancaster Blvd
Saskatoon
Saskatchewan
S7M-5M3

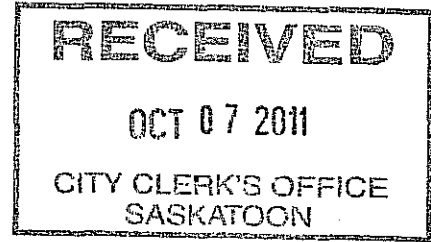
EMAIL ADDRESS:

rcollins@credential.com

COMMENTS:

Enough with the experiments in our neighbourhood. The financial cost to our city(much like the thought of hydro will be far greater than projected to the point that it's laughable - green is fun, but at what cost!), impact to local housing prices, the "lack of recognition over health issues", the eyesore of a turbine in Montgomery (already turned into dump, city yards, snow dump, etc - enough commercial stuff). I'm just terribly disappointed that we pursue ideas like this for the sake of "doing something". So not a fan - please do not put our city or neighbourhood through this.

From: CityCouncilWebForm
Sent: October 06, 2011 5:08 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Robert Hnatuk
3333 Mountbatten Street
Saskatoon
Saskatchewan
S7M 3T8

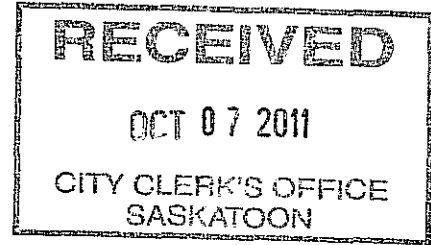
EMAIL ADDRESS:

robhnatuk@shaw.ca

COMMENTS:

I oppose any and all 50-100 meter tall structures near or close to residential areas, in particular I oppose the proposed construction of a power generating wind turbine at the Saskatoon Landfill.

From: CityCouncilWebForm
Sent: October 06, 2011 5:29 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Jacqueline Prefontaine
1105 11th Street West

Saskatoon
Saskatchewan
S7M 1G7

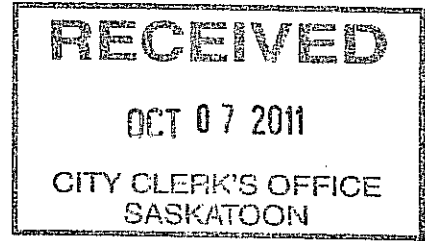
EMAIL ADDRESS:

Prefontj@shaw.ca

COMMENTS:

"I am against the erection of the 80 metre wind turbine at the landfill location in Saskatoon, Sk." My sleep is already disturbed by the noise from the train and the power station. I believe that the wind turbine should be placed well out of the city limits.

From: CityCouncilWebForm
Sent: October 06, 2011 10:08 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

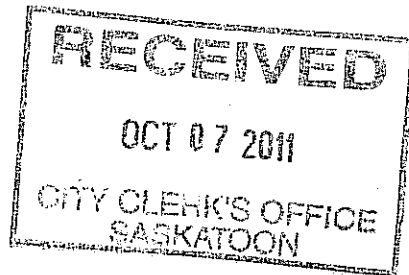
Jason Prokopchuk
3413 Ortona Street
Saskatoon
Saskatchewan
S7M3R9

EMAIL ADDRESS:

jiprokopchuk@sasktel.net

COMMENTS:

Our family is against the City of Saskatoon erecting any type of wind turbine, especially one that is 80m tall and in Montgomery Places backyard. The City's proposal to council does not mention the failed attempt to erect this same wind turbine on Diefenbaker hill and now as Government funding and time is running out we will not accept this project either. Thank you for your time.



October 6, 2011

To City Council,

OPPOSITION TO WIND TURBINE PROJECT

As many other residents of Montgomery Place, I am opposed to the Wind Turbine Project proposed by the city administration. Although several meetings were held in our community, there were not adequate explanations or details provided and none of our concerns were addressed. Instead, Kevin Hudson and his team tried only to justify this project, which appears to have their own vested interest in having this project go forward. Some of my concerns are as follows:

1. Health & Safety

Some studies conducted have raised concerns of the impact of low frequency noise LFN (20-200HZ) audible in residential areas close to the turbines. Even if there are a small number of people affected, it is not worth the risk.

2. Inadequate data provided on performance and cost

- The study completed by Civil & Geological Engineering at the University of Sask. Indicated the landfill where they plan to erect the turbine is unstable.
- A case has been made that evaluation should be made for each specific case based on noise data from the turbines involved not on general trends as there are many different makes & models which have different noise emissions
- We were first told the turbine would be 60 meters high and in the administration report to city council it is 80metres high. What is the true cost of construction and of maintenance?
- The safe distance from residential areas chosen by the different jurisdictions around the world are arbitrary and the city's choice is an average. The setbacks as regulated in Europe vary from 400m to 1500m and often are ignored when the turbines are installed sometimes with setbacks as low as 150m. There is no evidence of factual data to back up choices.

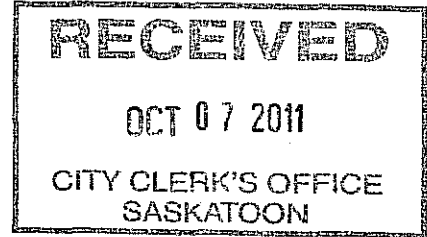
3. Property value reduction

In other jurisdictions, there are many cases where courts have ruled in favor of compensation to homeowners for loss in property value due to the noise pollution & flicker caused by wind turbines even at a distance of 550m. Does the city really want this issue to arise?

In conclusion, economics do not justify any risk to health and safety. I would ask all city councilors "how confident would you be if the decision was to install a wind turbine close to your residence"?

Barb Biddle
3101 Ortona Street
Saskatoon, Sk S7M 3R3

From: CityCouncilWebForm
Sent: October 07, 2011 7:32 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Mark Beblow
3367 Cassino Avenue
Saskatoon
Saskatchewan
S7M 5E8

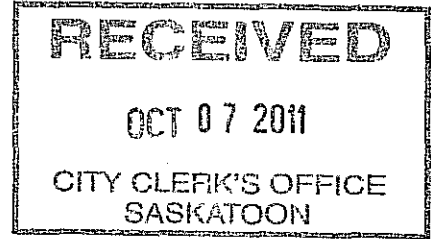
EMAIL ADDRESS:

mark.bebelow@gmail.com

COMMENTS:

I am against the erection of the 80 metre wind turbine at the landfill location in Saskatoon, Sk.

From: CityCouncilWebForm
Sent: October 07, 2011 9:57 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Anthony Hnatiuk
3118 Ortona Street
Saskatoon
Saskatchewan
S7M 3R4

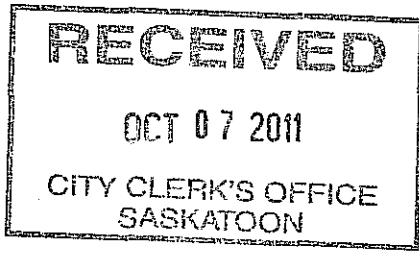
EMAIL ADDRESS:

thnatiuk@sasktel.net

COMMENTS:

With regard to the proposed erection of an 80 metre wind mill at the land fill, as a resident of Montgomery, I am totally opposed to the idea. I have read the only report to date and have attended the latest open house, so I do understand what is happening, but in my opinion, this is not a viable or favorable project for our area, or for any area in Saskatoon for that matter.

From: CityCouncilWebForm
Sent: October 07, 2011 11:34 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

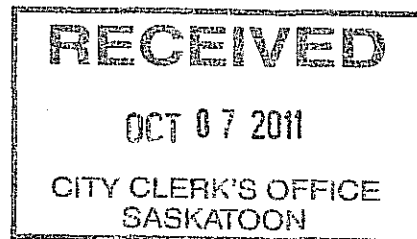
FROM:
keith martin
3240 Dieppe st.
saskatoon
Saskatchewan
s7m-3s5

EMAIL ADDRESS:
komartin@sasktel.net

COMMENTS:

The wind turbine , great Idea Councillor Lorje is out to lunch with her flicker thoughts and vibrations!!!Forget the idea of a special tax for roads , curb your out landish spending on river landing and you should never have got involved with the art gallery !!!!That project will come to haunt you Mayor Don. The new slogan for the upcoming civil election in 2012 will be "ABA' remember the band of a few years ago , we will borrow the ABA from them in the campagne "Anybody But Atch."

From: CityCouncilWebForm
Sent: October 07, 2011 12:14 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Jeff Edmonstone
3141 Mountbatten St

Saskatoon
Saskatchewan
S7M 3T4

EMAIL ADDRESS:

Jeff.Edmonstone@mcgfin.ca

COMMENTS:

Thanks for the chance to be heard.

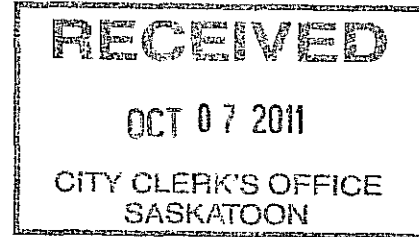
I oppose the erection of a wind turbine so close to our most unique area of the city, Montgomery Place. It is not worth the decreased property values, health, environment issues that go along with a project like this.

If all the properties dropped 20% in value, would the city be prepared to decrease taxes by 20%. Do the math this is not worth the negatives that come with this project.

My 6 and 4 year old boys live here with many other children, who wants the health risks on their hands if this does cause problems.

No, no, no.

From: CityCouncilWebForm
Sent: October 07, 2011 12:24 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Chris Anderson
3313 Mountbatten Street

Saskatoon
Saskatchewan
S7M 3T8

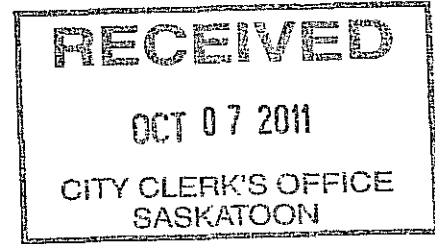
EMAIL ADDRESS:

christopheranderson@sasktelnet

COMMENTS:

I totoally opposed to this wind turbine antwhere near Montgomery

From: CityCouncilWebForm
Sent: October 07, 2011 1:30 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Trista Edmonstone
3141 Mountbatten St
Saskatoon
Saskatchewan
S7M 3T4

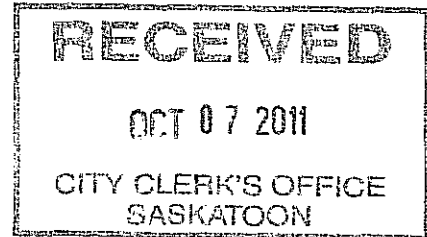
EMAIL ADDRESS:

tedmonstone@hotmail.com

COMMENTS:

I am opposed to the wind turbine by the bump. not worth the output. property values will decrease, health and noise concerns, environmental concerns, and they kill birds.

From: CityCouncilWebForm
Sent: October 07, 2011 1:44 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Christine Harwood
3120 Mountbatten Street

Saskatoon
Saskatchewan
S7M 3T1

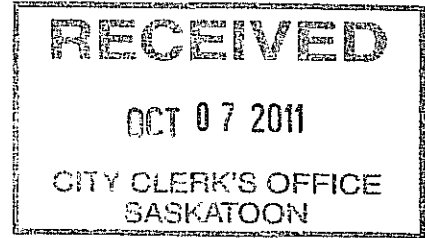
EMAIL ADDRESS:

COMMENTS:

We are opposed to the turbine and wonder why it has to be built within city limits and on top of the landfill? Aren't there enough issues currently going on for nearby residents of the rotting, stinking dump (whose life has been extended another 40 years.... lovely). Just last Friday, Sept 30th, our daughter had a birthday party and the kids ended up playing hide and go seek outside in our yard at 8:30 pm. Well they might as well have been playing inside the fence of the dump and not our backyard, because the air blowing in our direction was filled with the rotting stench you find at the dump. We have noticed this stink at least 6 times this summer and then again this past Friday. I have lived at this address since 1979 and have never smelled garbage rot until this summer. Now, to add a noisy 80 metre tall, flickering, fluttering, vibrating, structure to the already long list of 'crappy things' being added next door to our once quiet, garbage stink-free neighbourhood is frustrating to say the least. It sometimes feels like council has an agenda that leans towards all bad ideas belong in the southwest corner of the city.

Thank you,
Christine Harwood

From: CityCouncilWebForm
Sent: October 07, 2011 1:47 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

kristina anderson
3313 mountbatten street
saskatoon
Saskatchewan
s7m3t8

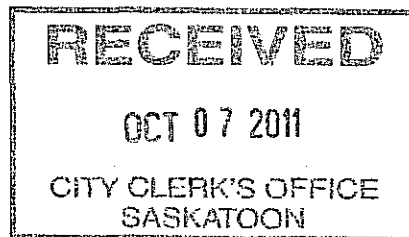
EMAIL ADDRESS:

kr.anderson@sasktel.net

COMMENTS:

i do not want these windmills to be put up as i am concerned about the noise and property value.i have chosen to live in montgomery for the country like setting.

From: CityCouncilWebForm
Sent: October 07, 2011 1:54 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Ralph Schaan
1640 Lancaster Cres.
Saskatoon
Saskatchewan
S7M3V9

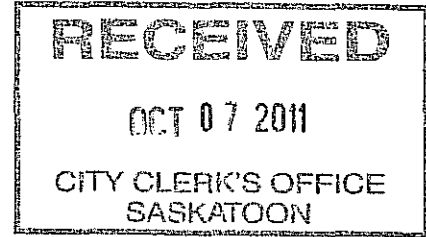
EMAIL ADDRESS:

ralphnhwp@sasktel.net

COMMENTS:

I belive this wind turbine will be determental to our health as well as creating a drop in property value.Why would city council approve this project near residential ares when information such as CBC reported in Ont. to be a serious problem for Home Owners health and well being.We do not want nor need this project in our area. Please make the choice to keep the Montgomery area a beautiful place to live in as it has been in the past.

From: CityCouncilWebForm
Sent: October 07, 2011 2:04 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Lowell Schaan
1207 Lancaster Blvd

Saslatoon
Saskatchewan
S7M-3V6

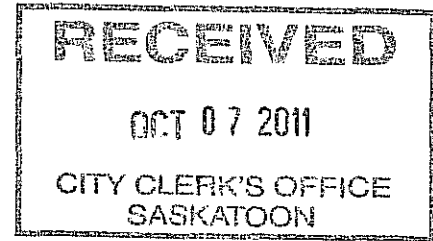
EMAIL ADDRESS:

lowellschaan@hotmail.com

COMMENTS:

I understand that the city is considering putting up a windmill at the land site. I wish city counsel would reconsider placing it somewhere else. I have learned that a city in Ontario had them put in close to a neighbourhood and it cause nothing but problems for it residents. Like Flicking a constant noise from it and I also understand the city in Ontario had to buy those citizens houses effected by it. I don't want the same thing to happen to our great area Montgomery. Thankyou for your consideration in this matter.
Sincerely L Schaan

From: CityCouncilWebForm
Sent: October 07, 2011 3:36 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Jennifer Kryworuchko
3124 Mountbatten St
Saskatoon
Saskatchewan
S7M3T1

EMAIL ADDRESS:

jennifer.kryworuchko@usask.ca

COMMENTS:

Dear Mayor and Members of City council,

I would like to express my dismay about the proposed tall wind turbine project being considered for location at the Saskatoon landfill adjacent to the community of Montgomery Place. I believe that the location of the wind turbine will present additional noise, albeit it not very loud and "white", that will adversely affect quality of life in this neighbourhood. This will then affect property value as new buyers elect to live elsewhere even due to suspicions about noise or other effects from the wind turbine.

The West side of Saskatoon is already impacted by socioeconomic challenges encountered by its residents - making it less "desirable" a place to live. Since moving here we have learned of the "east - west" divide in Saskatoon. This is unfortunate, as it seems that the west side is being condemned as an inner city neighbourhood with no way out. It is my feeling that council should carefully consider the impact of the wind turbine among other issues when considering development on the west side of the city. The priority should be to create conditions where neighbourhoods are enhanced and thus desirable. Ultimately, facilitating a mix of neighbourhoods in a geographic area (with low, middle upper class residents/neighbourhoods co-located) can have a tremendous impact on education and socialization. This may open possibilities for children, youth and families to see their life as a path that can go otherwise...versus an inevitable path. The alternative is to see neighbourhoods abandoned by middle and upper class families who can do so, leaving neighbourhoods that become inner city or abandoned for families facing financial and related challenges.

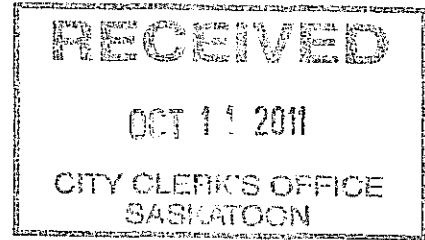
Anyway, please think this through. Do we need to add this feature here? Can it be added to another highly desired neighbourhood? If not, why not?

Some careful reflection is needed because I think Montgomery is a neighbourhood "at risk" like many on the west side.

Thank you for your careful consideration.

Sincerely, Jennifer Kryworuchko

From: CityCouncilWebForm
Sent: October 07, 2011 5:18 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Wes & Dolores McCurdy
1520 Haida Avenue
Saskatoon
Saskatchewan
S7M 5K3

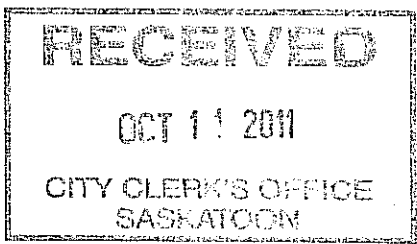
EMAIL ADDRESS:

w.dmc@sasktel.net

COMMENTS:

As long term residents of Montgomery Place, we are strongly opposed to the erection of the wind turbine at the landfill location in Saskatoon.

From: CityCouncilWebForm
Sent: October 08, 2011 9:46 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Gordon Myers
3374 Cassino Ave
Saskatoon
Saskatchewan
S7M 5E6

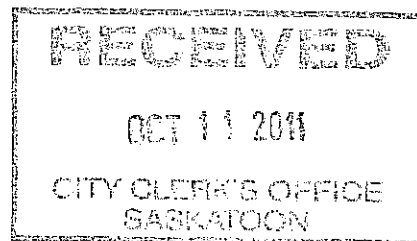
EMAIL ADDRESS:

mgmyers@sasktel.net

COMMENTS:

I am against the erection of the 80 metre wind turbine at the landfill location in Saskatoon, Sk!!
First we get the south Circle Drive boondoggle Project, then the proposed bus barn project and now this council sees fit to put up an 80 meter wind tower on a mountain of garbage. Try putting this tower up on the east side and see the reaction you get. It will be the same as the south Circle Dr. bridge project going past Riverside Estates. Money talks and the project gets moved. This area does not have that luxury!
I Challenge this council to put our tax dollars to use in more important projects like road repair which this city so desperately needs and quite spending money on projects of this nature and similar ones such as sound walls.

From: CityCouncilWebForm
Sent: October 08, 2011 4:42 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Randall Renneberg
1615 Bader Cres.
Saskatoon
Saskatchewan
s7m3v2

EMAIL ADDRESS:

randallrenneberg@hotmail.com.

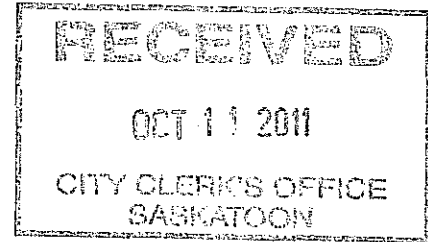
COMMENTS:

It seems this end of town gets a lot of things not wanted any other place. Example bus barns, concrete recyle south of Valley Road, now a wind turbine at the landfill. Just having the landfill and CNR rail next door to Montgomery should be enough, without having something new like a wind turbine.

Yours Truly

Randall Renneberg

From: CityCouncilWebForm
Sent: October 08, 2011 8:10 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Eric Ashworth
1225 Avenue K.S.
Saskatoon
Saskatchewan
S7M 2G7

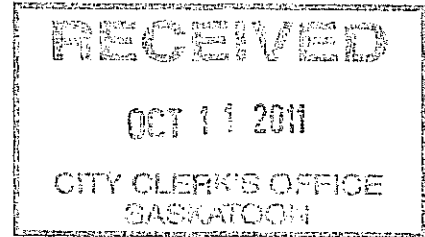
EMAIL ADDRESS:

triteck@saktel.net

COMMENTS:

With regards the proposed tall wind turbine at the local landfill I am against the project entirely as I feel it will serve no useful purpose with regards a required decrease in greenhouse gasses or put Saskatoon on the map as a contender towards the promotion of green technology. I am sure money can be far better spent than the promotion of a quirky gimmick

From: CityCouncilWebForm
Sent: October 09, 2011 2:24 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Jo Ann Wisminity
3152 Caen Street
Saskatoon
Saskatchewan
S7M 3N5

EMAIL ADDRESS:

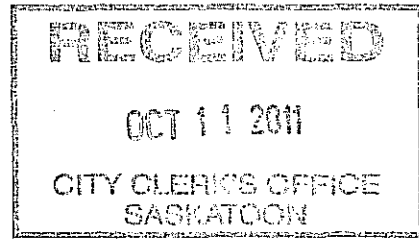
tjwis@shaw.ca

COMMENTS:

I am writing in response to a decision to have a wind turbine located on the landfill near the Montgomery neighborhood. A wind turbine at this location will not only cause vibration and noise to the residents of this neighborhood but also cause harm to birds that are located nearby. I am against having this wind turbine so close to my home for these reasons. We have the land fill now and to put up a wind turbine on this site has not been thoroughly thought out. Please send my concerns to the council who will be deciding on this. I am against this- please find another location.
Thank you, Jo Ann Wisminity

2000-5

From: CityCouncilWebForm
Sent: October 10, 2011 10:14 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

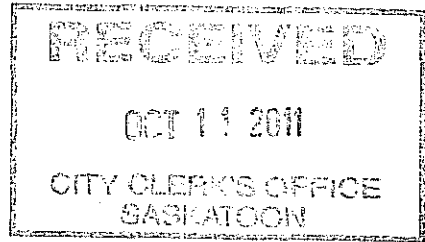
Bernice Rinas
207 Wrigley Cres.
Saskatoon
Saskatchewan
S7M4Y3

EMAIL ADDRESS:

COMMENTS:

Although my husband and I are in favor of wind turbines after reading the literature about them we are concerned about the health of our family living near enough to be affected by them. We are opposed at having one placed where you have proposed.

From: CityCouncilWebForm
Sent: October 10, 2011 8:04 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Pete Cockburn
1401 Haida Avenue
Saskatoon
Saskatchewan
s7m3w8

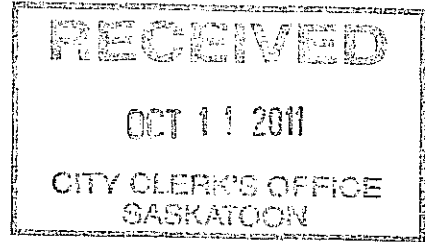
EMAIL ADDRESS:

superiorinspections@sasktel.net

COMMENTS:

Hi as a concerned resident of Montgomery Place i would like to comment on the proposed wind turbine project. I would beg all of you to please vote NO to the proposal it is very unfair to saddle our area with this project due to several factors, real estate values will drop, health concerns, furthermore have we the residents of Montgomery not faced enough recently, newly designed drainage ditches (certain areas) that to this day cannot be cut by some residents, mowers literally tip over if cutting complete ditch, new bridge and highway construction, moving of the transit barns and the City Engineering yards being re located near our area, and lets not forget we already have had to endure the LANDFILL for as many years as any of us can remember. I would ask all of you to take a look deep into your souls and ask yourselves if the wind turbine were going into your area of residence would YOU vote yes, would it be alright for your children or grand children to live and grow up near such a project i would hope not. I realize we need to explore other energy alternatives but lets move them out in the country in a secluded area away from any residential areas which would include yours as well as mine. As far as the impact on areas i believe that real estate values will be impacted and that is simply WRONG that we or any resident of Saskatoon should be exposed to such misfortune and that anyone including Kevin Hudson shouldnt comment on real estate values unless you are a professional in either real estate appraisals and or real estate values. Please re consider folks lets dig deep and im sure our creativity will find other means and or locations which may benefit us all in the future. THANK YOU

From: CityCouncilWebForm
Sent: October 10, 2011 9:08 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Rosalyn Kirkham
3326 Caen Street
Saskatoon
Saskatchewan
S7M 3P2

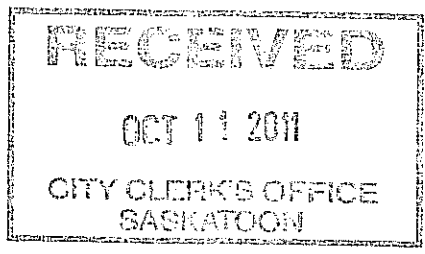
EMAIL ADDRESS:

rosalyn.kirkham@shaw.ca

COMMENTS:

I am opposed to the recommendation to proceed with tender for the wind turbine project. I have submitted letters to the Mayor and each City Councillor. I would like the opportunity to speak to City Council at the meeting on Tuesday October 11.

From: CityCouncilWebForm
Sent: October 10, 2011 9:22 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:
George Swerhone
1120 Avenue M south
Saskatoon
Saskatchewan
S7M 2M2

EMAIL ADDRESS:
George.Swerhone@sasktel.net

COMMENTS:

My comments are about the proposed wind generator at the landfill:

I noticed in the reports that their cost recovery and profit estimates are based on Sask Power currently charging 35 cents per kwh for wind generated power rather than about 10 cents that is charged for conventionally generated power making everything sound 3-1/2 times better than it really is. Most utilities have a dual rate where they charge environmentalists a higher rate for wind and solar generated power. This inflated rate is used to encourage and justify the installation of wind and solar power farms and to get private investors to invest in them. In a lot of places, especially with the world economy on the verge of collapse the rates are being rolled back substantially and new contracts are being written with fewer guarantees for the higher rate.

I didn't notice any routine maintenance estimates added in to the projected profits or estimates of the lifetime of the wind turbine. Usually for solar systems it is 25 years for the solar panels and they don't have any mechanical components at all. We installed a solar system at our farm to power our cabin. It is like paying for the electricity up front because it will almost never generate enough electricity to pay itself back at 10 cents per kwh in its useful lifetime.

If there was enough consistent wind in this area to economically justify the installation of wind generators there would be wind power farms all over the Strawberry Hills and all along the South Saskatchewan River valley. The only place you see wind power farms is near Lethbridge and Swift Current where there is really a lot of wind that is above the power generating threshold. Most wind turbines need a wind speed of above 30 km/hr, some even higher before they start generating useful amounts of power, or any power at all.

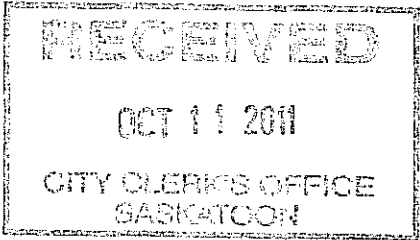
There is a group of people near Pike Lake that built a "green" housing development and every house had a bunch of solar panels and a wind turbine. They were disappointed with the wind power because they said there were very few days when there was sufficient wind to

generate electricity. It will seem like a really windy day, especially in the winter but it won't be enough to start the turbine.

The turbine will kill tons of birds no matter what anyone says. There are thousands of gulls, crows, ravens and other scavenger birds flying back and forth to the river directly in line with where the turbine will be. If the agenda of a group is to build something they will say anything to get it done.

2000-5.

From: CityCouncilWebForm
Sent: October 10, 2011 9:15 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Dave & Judith Bereza
3219-11th St West
Saskatoon
Saskatchewan
S7M1K2

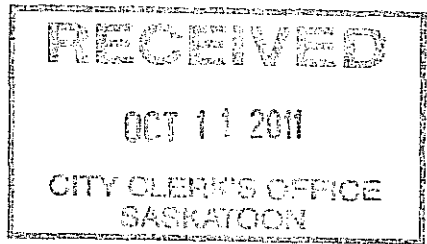
EMAIL ADDRESS:

Contact@rivercitystatuary.com

COMMENTS:

We are against the erection of the 80 metre wind turbine.
House prices will likely drop minimum of 20% as has been seen in Ontario and other areas- CBC News-Oct 1,2011.
Health risks are also something that will also be a concern.
We do not believe that the city should be spending more taxpayer dollars on this project. We have sufficient power sources now without spending more money.
Further meetings and input should be heard from Montgomery residences.
Thank You

From: CityCouncilWebForm
Sent: October 10, 2011 9:35 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

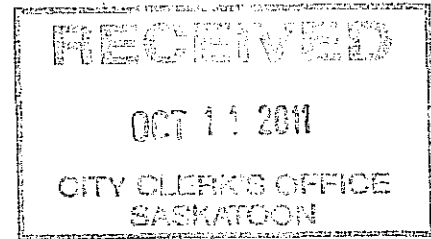
FROM:
Helen Meredith
3337 Dieppe St
Saskatoon
Saskatchewan
S7M 3S6

EMAIL ADDRESS:
jmeredith@sasktel.net

COMMENTS:

I am pro green energy. However, I oppose the placement of a 80 metre tall turbine at the landfill.
I oppose for the following reason :
1] The foundation is unstable due to decomposing shifting garbage.
2] The turbine poses a danger to our migrating bird population.
3] A distance of 700 meters is too close to a residential area. This is supported by the news from Ontario where residents who lived further than 700 meters experienced health problems.
I believe that the ecological and health costs are too high to proceed with this project.
It appears that this project makes a public " Show" that Saskatoon is on the side of green energy.
Please let us avoid this error and proceed with other ways of "Being Green."
Helen Meredith
Montgomery resident

From: CityCouncilWebForm
Sent: October 11, 2011 12:04 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Helen Meredith
3337 Dieppe St
Saskatoon
Saskatchewan
S7M 3S6

EMAIL ADDRESS:

hmeredith@sasktel.net

COMMENTS:

I am pro green energy. However, I oppose the placement of a 80 metre tall turbine pylon, plus another 40 metre height for blade length, at the landfill.

I oppose for the following reasons :

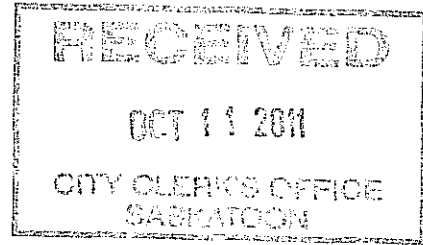
- 1] The foundation is likely to be highly unstable due to decomposing shifting garbage. There would likely be huge design and construction costs to overcome this.
- 2] The turbine poses a danger to our migrating bird population.
- 3] A distance of 700 meters is too close to a residential area. This is supported by the news from Ontario where residents who lived further than 700 meters experienced health problems. History has shown over and over again that once accepted safety standards in many areas need to become stricter and stricter as more knowledge accumulates. Over time larger populations are exposed for longer periods, and health problems finally appear. The standards for shadow flicker and for infra-sonic noise frequencies need much more empirical, and in fact, epidemiological study before wind turbines should be located near any populated area.
- 4] It appears that this project is intended to make a public "Show" that Saskatoon is on the side of green energy. Surely we don't need such an eye-sore and health hazard simply to make a "me too" statement.

I believe that the ecological, structural and health cost risks are too high to proceed with this project.

Please let us avoid this error and proceed with other ways of "Being Green." The city already has much more sensible and less dangerous and intrusive options for green energy.

John Meredith
Montgomery Place Resident

From: CityCouncilWebForm
Sent: October 10, 2011 9:53 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

wanda waldner
3415 Dieppe Street

Saskatoon
Saskatchewan
S7M 3S8

EMAIL ADDRESS:

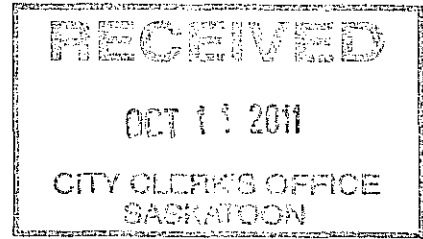
wandawaldner@saskatel.net

COMMENTS:

Dear Sir/Madame,

I am writing to provide my comments regarding the proposed wind turbine. There are benefits to constructing a wind turbine for obvious reasons, however, I completely oppose the idea of constructing one in the area behind Montgomery near the existing land fill. It is much too close to the residential neighborhood and would negatively affect the residents of the area. It is a fact that this neighborhood should be cherished for what it once was and now is. A unique and beautiful location on the outskirts of Saskatoon. Do not sandwich the residents of this area with any additional "projects" that should be located much further away from a residential neighborhood. We have enough to deal with surrounded by the elevator, trains and dump!!!! The city should be supporting this historical neighborhood and preserving its heritage not destroying it. Thank you.

From: CityCouncilWebForm
Sent: October 10, 2011 9:59 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

karen Bosker
1254 Cres.Blvd
Saskatoon
Saskatchewan
S7M 3W6

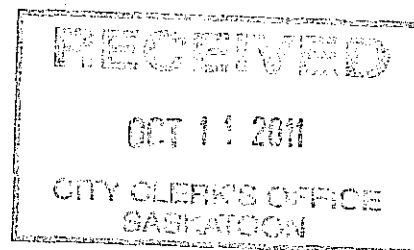
EMAIL ADDRESS:

jkbosker@sasktel.net

COMMENTS:

My husband John and I are not in favour of the wind turbine near the Montgomery Area. Near the dump could possibly kill a lot of birds and we are concerned about the affects of this turbine to our health. We also feel that a lot of things are being put around Montgomery place that are ruining our quiet community for eg. putting the equipment yards outside our area as well. Put the wind turbine far from us. If you do put in a wind turbine and save thousands of dollars does that mean you will cut the city boulevards more often? Right now John and I are really not happy with the service we receive right now. We face the boulevard and we have to complain about it each year to get it cut. Let's use our savings to keep Saskatoon beautiful! John & karen Bosker

From: CityCouncilWebForm
Sent: October 11, 2011 1:31 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Edward Fairbrother
3232 Dieppe Street
Saskatoon
Saskatchewan
S7M3S5

EMAIL ADDRESS:

efairbrother@gmail.com

COMMENTS:

I am against the erection of the 80 metre wind turbine at the landfill location in Saskatoon. While it is not politically correct to oppose "green energy", there are several valid concerns that make me opposed to this project. This project will emit constant noise, vibration and flicker, as well as decrease property values in Montgomery Place and Holiday Park. Wind turbines of this scale are not suitable for any urban environment. City council should unanimously reject this "green-washed" proposal.

2000-5.

From: CityCouncilWebForm
Sent: October 11, 2011 8:01 AM
To: City Council
Subject: Write a Letter to City Council

TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

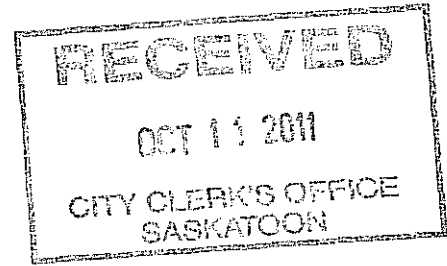
Grace Varga
3227 Mountbatten st
saskatoon
Saskatchewan
s7m 3t8

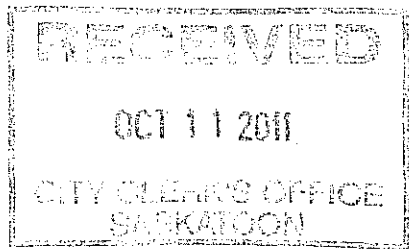
EMAIL ADDRESS:

gracevarga@saskatel.net

COMMENTS:

I am against the erection of the windturbine at the landfill site





October 9, 2011

To the Mayor and City Council,

OPPOSITION TO WIND TURBINE PROJECT

As members of the Montgomery Place Community Association, we are opposed to the Wind Turbine proposed by the city administration.

Several meetings were held by the city in our community over this last year. However, many residents have expressed to us their concerns about this project. They are concerned about noise pollution (audible and low frequency), flicker, vibration, and impact on property values. They felt their questions expressed about all these issues were not addressed at any of these forums.

Also of great concern were the huge costs to taxpayers. Spending almost 5 million on **one wind turbine** do not justify the benefit of providing services to some 500 homes.

The explanations and data provided were inadequate. None of the concerns of residents were addressed and therefore we must state categorically our opposition to this proposed project.

Montgomery Place Community Association

Jim Earle , PRESIDENT
c/o 3101 ORTONA STREET
SASKATOON S7M 3R3



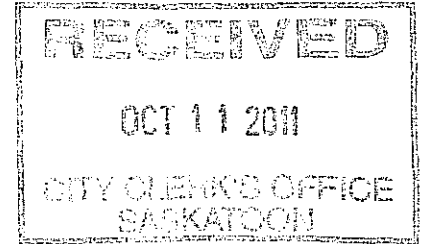
jmeredith@sasktel.net

3337 Dieppe Street
Saskatoon, Saskatchewan
S7M 3S6
Canada
Telephone 306-382-6661
306-241-7628

October 11, 2011

City Council
... via City Clerk
City of Saskatoon

Mayor and City Council

**Re: Proposed Tall Wind Turbine**

This Proposal, and the suggested subsequent RFP should be reviewed and evaluated on a number of different, and perhaps competing, dimensions. To mention a few : economic viability vs alternative uses for available resources, environmental and human health and safety, political and community desire, and esthetics. Some of these are amenable to quantitative analysis and others are much more subjective in nature. This makes them no less important in the political/democratic process.

1. Economics - The economics are marginal and the benefits, at best, are small. It appears that the IRR as reported is based on the participation of the Federal Government covering half of the capital cost. This makes the IRR quite acceptable, but it is misleading. It may be acceptable to the city administration, but in one way or another, taxpayers are paying the full cost.

Further to the capital cost and potential cash income – Have the numbers really been subjected to rigorous risk analysis? Many, many projects are a huge disappointment because of apparent cost over-runs. This is inevitable, due to the common belief that the total cost is simply the sum of all the most likely costs of the components. All the items are subject to some degree of uncertainty. This is usually recognised by using low, most likely, and high estimates on components, or by selected overall scenarios. It is now recognized that this type of analysis is incomplete and misleading. I draw your attention to the attached article "The Flaw of Averages" by Dr. Sam Savage at

The effect in this particular project is easily demonstrated. The work in the attached spread-sheet is for illustrative purposes only. I am sure all the numbers are wrong, but the principle can be demonstrated. The capital cost has been broken into several components, each with a low, most likely, and high estimate. The 'most likely' add up to a round \$ 5 million. Labour costs are based on estimated hours multiplied by an estimated \$/hr rate. A technique called Monte Carlo simulation is used to randomly draw a value from each of the distributions of the many cost components, then calculate the resulting total cost. This is repeated many times (in this case 10,000 times) and the resulting 10,000 estimates of the total cost are collected and analyzed. The result is that the average total cost is \$ 5,361 thousand. There is only a 10% chance that the cost would be \$5 million or less. That leaves a 90% chance of being over the original estimate. In fact, there is a 30% chance that the cost will be more than \$ 5.5 million. That is, almost a 1 in 3 chance of being more than 10% over cost. Surely any decision makers should have this sort of information.

Still to be addressed are the impact of the uncertainty in the service factor and of the expected returns. As to the service factor, the whole distribution of wind speeds must be analyzed. The average is important, but that is made up of a few instances when the wind is too strong for safe operation or too low for any operation at all. Thus the actual production will likely be lower than based on the apparent average wind speed. The income stream is based on production and anticipated pricing over many years. Obviously, a major source of uncertainty!

2 Health, Safety and Environment - The report to council says that the calculations meet current, stringent, German standards for sound and shadow flicker. History has shown over and over again that once accepted safety standards in many areas need to become stricter and stricter as more knowledge accumulates. Over time larger populations are exposed for longer periods, and health problems finally appear. The current guidelines are under pressure for review. In many 'wind farm' locations there are collections of symptoms being

reported. Taken together, these may eventually be recognized as a 'syndrome', although not currently acknowledged.

The standards talk about hours per year of exposure at certain levels. These will certainly be revised as more data are available. However, this is experimentation on uniformed and often unwilling human populations. An additional concern, which is not addressed, is the potential for serious immediate consequences. Both shadow flicker and acoustic frequencies are related to the rotation speed of the windmill. This is in the range of a few cycles per second (Hz) down to a few seconds per cycle. This is in the frequency range where many jurisdictions are concerned about public exposure and risk of triggering epileptic seizures. What about momentary distraction or disorientation while driving? The proposed location is right at a soon to exist new high speed, high density freeway interchange. There is very little knowledge regarding human responses to infra-sonic assault in the 0.3 to 5 Hz range. There seems to be an assumption that because humans can't 'hear' it, it doesn't exist.

3 Political and Community – The purported benefits as communicated in the city "community engagements" are said to be "visible benefit ... to participate in this type of program" and "promotion of Saskatoon". Does this benefit extend beyond those in the city administration and council who are proponents of a highly visible "me-too" eye sore, health hazard and economic questionability?

The report to council seems to minimize opposition of the residents at an information meeting at Montgomery School. Yes, there was concern about health and environmental impacts, visual and noise pollution and impact on property values. In spite of the usual assurances, there were still underlying concerns about the general lack of in-depth knowledge of the effect of long term exposure of the general population. There were also several people who queried the economics and pointed out the error of using only half of the whole cost to present the project economics.

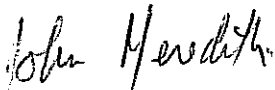
Recommendations

Please drop the Tall Wind Turbine project, and put resources into other "green energy" projects which are already being considered.

If there is indeed a decision to proceed to an RFP, please ensure that the resulting costs and benefits are subjected to rigorous probabilistic analysis before proceeding with a financial disaster and potential public health hazard. There are engineering firms in Saskatoon who are capable of carrying out an excellent probabilistic analysis at either the project definition or project evaluation/review phases.

Thank you for the opportunity to communicate with you.

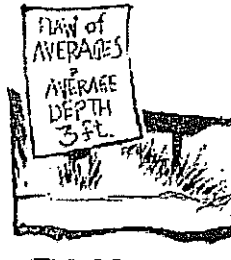
Sincerely,



John Meredith, PhD, M.Sc
Nautilus - Operational Research Consulting

The Flaw of Averages

IF YOU COUNT ON THE STOCK MARKET'S AVERAGE RETURN TO SUPPORT YOU IN RETIREMENT, YOU COULD WIND UP PENNILESS



DANZIGER

By Sam Savage

"The only certainty is that nothing is certain." So said the Roman scholar Pliny the Elder. And some 2000 years later, it's a safe bet he would still be right. The Information Age, despite its promise, also delivers a dizzying array of technological, economic and political uncertainties. This often results in an error I call the Flaw of Averages, a fallacy as fundamental as the belief that the earth is flat.

The Flaw of Averages states that: Plans based on the assumption that average conditions will occur are usually wrong.

A humorous example involves the statistician who drowned while fording a river that was, on average, only three feet deep.

But in real life, the flaw continually gums up investment management, production planning and other seemingly well-laid plans. The Flaw of Averages is one of the cornerstones of Murphy's Law (What can go wrong does go wrong).

Fortunately, superfast computers can overcome this problem by bombarding our plans with a whole range of inputs instead of single average values. Today, this technique, known as simulation, is at the center of such diverse activities as Wall Street investing and military defense planning.

But back to the flaw, and an area that's important to all of us: investing for the future.

Suppose you want your \$200,000 retirement fund invested in the Standard & Poor's 500 index to last 20 years. How much can you withdraw per year? The return of the S&P has varied over the years but has averaged about 14 percent per year since its inception in 1952. You use an annuity workbook in your spreadsheet that requires an initial amount (\$200,000) and a growth rate for the fund. "I need a number," you say to yourself, so you plug in 14 percent. Now you can play with the annual withdrawal amount until your money lasts exactly 20 years. If you do this you will be pleased to find that you can withdraw \$32,000 per year. (see Figure A).

Even if the return fluctuates in the future, as long as it averages 14 percent per year, the fund should last 20 years, right?

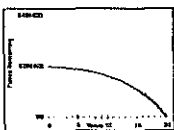
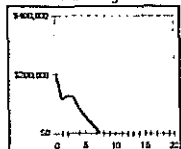
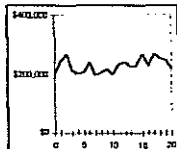


Figure A. Funds remaining with annual withdrawal of \$32,000, assuming 14% return every year.

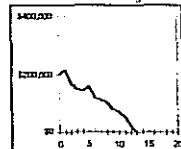
Start: 1973 Avg. Return 14% Tanks in 8 years.



Start: 1974 Avg. Return 15.4% Goes the distance.



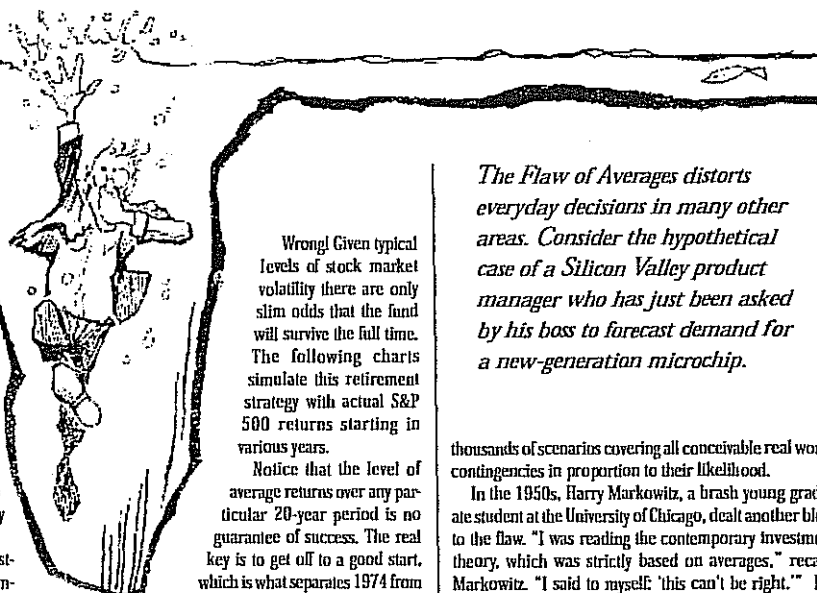
Start: 1975 Avg. Return 15.4% Tanks in 13 yrs.



Start: 1976 Avg. Return 15.3% Tanks in 10 yrs



Figure B. Simulated Fund performance: if started in various years.



Wrong! Given typical levels of stock market volatility there are only slim odds that the fund will survive the full time. The following charts simulate this retirement strategy with actual S&P 500 returns starting in various years.

Notice that the level of average returns over any particular 20-year period is no guarantee of success. The real key is to get off to a good start, which is what separates 1974 from its neighbors.

For this example the Flaw of Averages states that: If you assume each year's growth at least equals the average of 14 percent, there is no chance of running out of money. But if the growth fluctuates each year but averages 14 percent, you are likely to run out of money.

The results above are not the result of a rigorous scientific study, and should not be used for making investment decisions, but they should at least have you asking yourself: Why isn't someone doing something about this? People are. One of the first was William E. Sharpe, a Nobel laureate in Economics, who recently left Stanford to spend full time simulating retirement benefits. "I expected people to question the specifics of our simulation algorithms," reflects Sharpe about the launch of Palo Alto-based Financial Engines Inc., "but to my surprise, everyone else out there was just plugging in averages." (As in Figure A)

The Flaw of Averages distorts everyday decisions in many other areas. Consider the hypothetical case of a Silicon Valley product manager who has just been asked by his boss to forecast demand for a new-generation microchip.

"That's difficult for a new product," responds the product manager, "but I'm confident annual demand will be between 50,000 and 150,000 units."

"Give me a number to take to my production people," barks the boss. "I can't tell them to build a facility with a capacity of between 50,000 and 150,000 units!"

So the product manager dutifully replies: "If you need a single number, the average is 100,000."

The boss plugs the average demand and the cost of a 100k capacity fab into a spreadsheet. The bottom line is a healthy \$10 million, which he reports to his board as the average profit to expect. Assuming that demand is the only uncertainty, and that 100,000 is the correct average, then \$10 million must be the best guess for profit. Right? Wrong! The Flaw of Averages ensures that average profit will be less than the profit associated with the average demand. Why? Lower-than-average demand clearly leads to profit of less than \$10 million. That's the downside. But greater demand exceeds the capacity of the plant, leading to a maximum of \$10 million. There is no upside to balance the downside.

This leads to a problem of Dillbertian proportion: The product manager's correct forecast of average profit, so he gets blamed for giving the correct answer.

A computerized cure for the Flaw of Averages is Monte Carlo Simulation, first used for modeling uncertainty during development of the atomic bomb. It generates

The Flaw of Averages distorts everyday decisions in many other areas. Consider the hypothetical case of a Silicon Valley product manager who has just been asked by his boss to forecast demand for a new-generation microchip.

thousands of scenarios covering all conceivable real world contingencies in proportion to their likelihood.

In the 1950s, Harry Markowitz, a brash young graduate student at the University of Chicago, dealt another blow to the flaw. "I was reading the contemporary investment theory, which was strictly based on averages," recalls Markowitz. "I said to myself: 'this can't be right.'" His resulting portfolio theory, which was based on both risk and average outcomes, revolutionized Wall Street and won him a Nobel Prize. Markowitz also devoted much of his career to designing simulation systems.

Simulation-based acquisition is now used routinely in the military. Its instigator was William J. Perry, who in spite of a bachelor's degree, master's degree and doctorate in math, has had a remarkably well-rounded career as a Silicon Valley entrepreneur, U.S. Secretary of Defense and Stanford professor.

In 1996, while at the Pentagon, Perry issued a directive stating that models and simulations must be used to reduce the time, resources and risks of the acquisition process. Perry says in retrospect: "With tens of thousands of uncertainties, it was just a perfect application for simulation."

A dramatic example of the savings that resulted from Perry's directive is related by John D. Illgen of Santa Barbara-based Illgen Simulation Technologies Inc., who says: "In response to improvements in foreign weapon systems, the Navy was preparing to spend tens of millions of dollars to upgrade its shipboard defensive systems. With a \$250,000 simulation we were able to show that the present defensive system was adequate to meet the increased threat."

While many of today's managers still cling tenaciously to "flat earth" ideals, the innovators are abandoning averages and facing up to uncertainty. Those who dare discover a New World of managerial tools including simulation, decision trees, portfolio theory and real options.

And what happens when one of these innovators is confronted by someone cloaking themselves behind a single number? The story of the emperor's new clothes says it all.

Sam Savage is senior research associate at Stanford University, where he directs the Industrial Affiliates Program for the Management Science & Engineering Department. See www.stanford.edu/~savage/flaw for animations and downloadable simulations of the examples in this article.

Jeff Danziger is a widely syndicated cartoonist. See www.danzigercartoons.com for more of his work.



Sam Savage, senior research associate at Stanford University, says innovators who abandon averages and face up to uncertainty are free to discover a New World of managerial tools including simulation, decision trees, portfolio theory and real options.

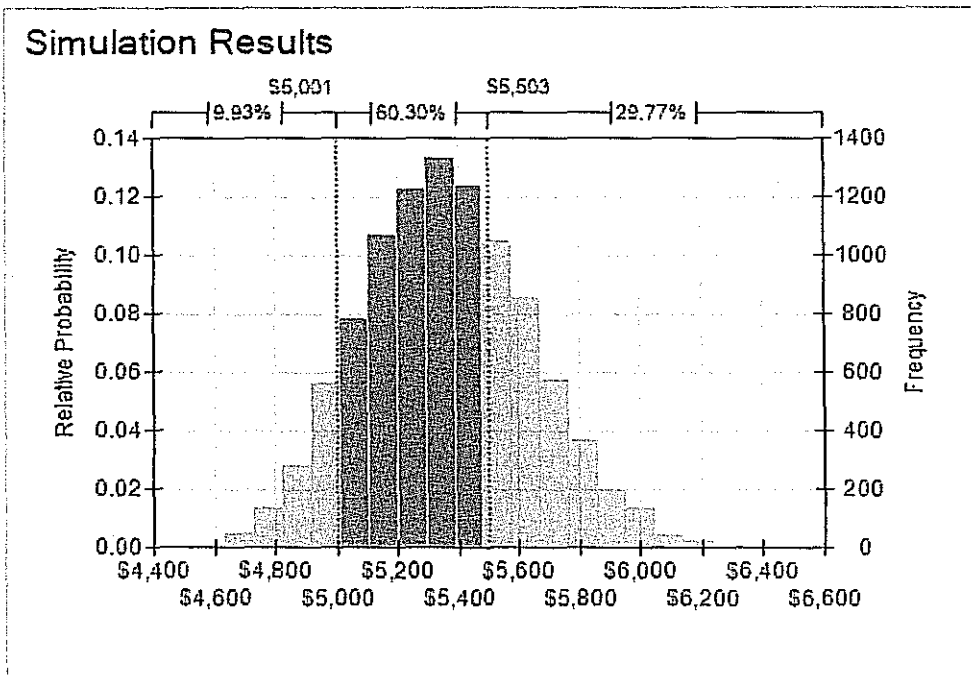
Example of Monte Carlo Simulation of Capital Costs - 2 MegaWatt

Basic Assumption : \$5,000,000 for 2 MegaWatt Hour

	\$,000	— Ranges —			One Sampled Calculation	Average of
		min	MAX			10,000 Samples
Materials						\$,000
Tower, Vanes, Generator, Control System	\$1,200	1100	1500		\$1,274	\$1,286
Erection	\$800	750	1100		\$948	\$909
Foundation						
Normal						
Design	\$100	90	120		\$109	\$104
Materials	\$360	300	480		\$424	\$386
Direct Labour Hours (,000)	20	18.0	24.0	17.0		
Labour Rate	50	45	60	66.0		
Labour Dollars ,000	\$1,000				\$1,124	\$1,088
Extra - based on LandFill						
Design	\$25				\$25	\$25
Materials	\$90	80	120		\$127	\$99
Direct Labour Hours (,000)	10	9.0	13.3	10.7		
Labour Rate	50	45	60	55.6		
Labour Dollars ,000	\$500				\$556	\$522
Electrical Grid Tie-ins	\$300	280	330		\$299	\$304
Duration Contingency - Add hours	11.36	10.8	15.1	12.6		
Labour Rate	55	48	65	59.8		
Labour Dollars ,000	\$625				\$680	\$639
TOTAL INSTALLED COST	\$5,000				\$5,565	\$5,361
Category Summary						
Engineering	\$125					\$129
Materials	\$1,650					\$1,771
Labour	\$2,925					\$3,157
Other	\$300					\$304

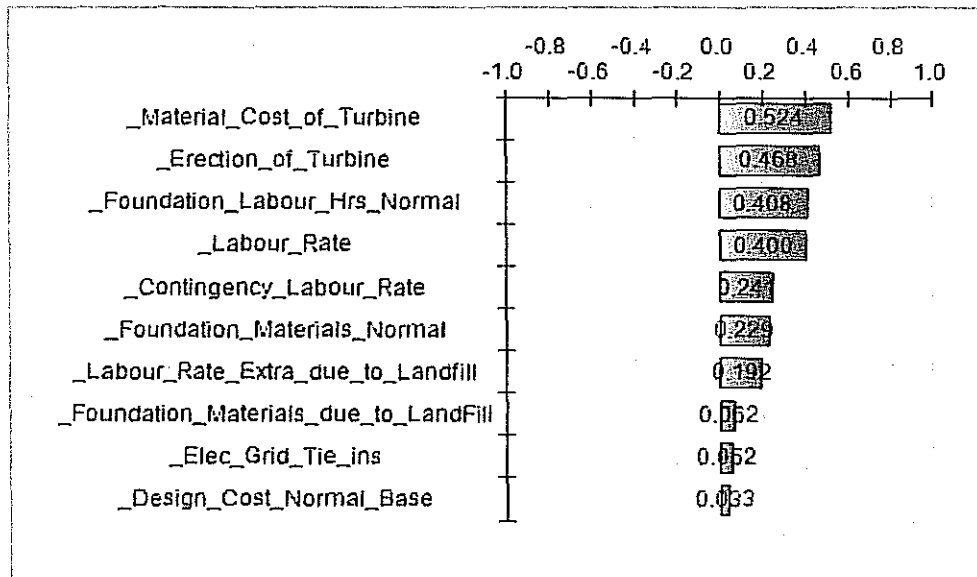
Note that the expected value of \$5,361,000 is significantly higher than that arrived at by simply summing up all the individual most likely values.

Example of Monte Carlo Simulation of Capital Costs - 2 MegaWatt



NOTES :

- 1 There is only a 10% chance that the project will be at, or below budge
- 2 There is a 30% chance that it will be 10% (\$500,000) or more above budge



Relative Impact (correlation) of each uncertain variable on the Total Cost.

From: CityCouncilWebForm
Sent: October 11, 2011 9:48 AM
To: City Council
Subject: Write a Letter to City Council

TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Wally Penner
3201 Mountbatten Street
Saskatoon
Saskatchewan
S7M 3T5

EMAIL ADDRESS:

wallyworksinwood@shaw.ca

COMMENTS:

We are against the erection of the 80 metre wind turbine at the landfill location in Saskatoon. Living in Montgomery and planning on retiring there, we have just invested tons of money into renovating our home. In other cities where turbines have been installed, property values have been reported to have dropped a minimum of 20%. Is the city prepared to reimburse the 20% loss? Also...what about the health repercussions? The city has passed bylaws restricting certain things because of ill effects on health but want to bring in a turbine...again with proven statistics that there will be health risks to families in the vicinity of the turbine. Again...where is the logic? Saskatoon is the "IT" city in Canada...we should be proud of what we have accomplished. I believe the taxpayers have had a lot to do with that and really hope that their voice is still considered important to the Council.

Thank you for your time.
Wally Penner

From: CityCouncilWebForm
Sent: October 11, 2011 9:58 AM
To: City Council
Subject: Write a Letter to City Council

TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

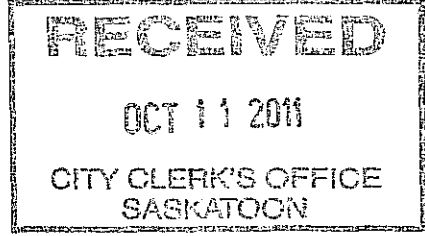
Meredith Wild
3332 Ortona Street
Saskatoon
Saskatchewan
S7M 3R8

EMAIL ADDRESS:

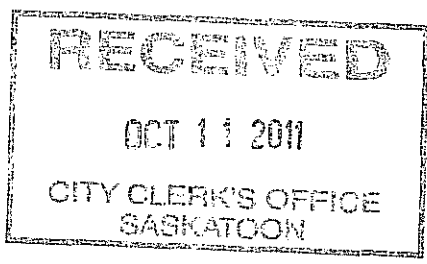
mwild@sasktel.net

COMMENTS:

I am opposed to the placement of a wind turbine at the landfill on the West side of the City of Saskatoon, Saskatchewan.



From: CityCouncilWebForm
Sent: October 11, 2011 10:01 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:
Melanie Downing
1207B Lancaster Blvd
Saskatoon
Saskatchewan
S7M 3V6

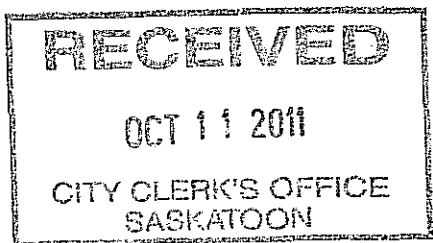
EMAIL ADDRESS:

pbe@shaw.ca

COMMENTS:

I and my family (my huhsband and my kids, mom and Dad, auntie and many more) greatly oppose this windturbine. What else is this city going to do to our area to decrease the value and appeal of my neighborhood? We don't want it. Funny how a pile of garbage is what this city come up with, think!

From: CityCouncilWebForm
Sent: October 11, 2011 10:12 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

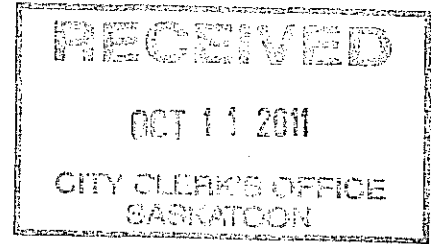
FROM:
Sherri Buckle
3359 Cassino Ave.
Saskatoon
Saskatchewan
S7M 5E8

EMAIL ADDRESS:
stoonbuckle@yahoo.com

COMMENTS:

I am writing to oppose the placement of a tall wind turbine at the landfill location in Saskatoon. A single tall turbine does not meet the economies of scale needed to make this a truly green installation. Also I can find no reference to the cost of decommissioning the turbine at the end of it's life span in the economics summaries provided so far. Outside of residential considerations, I have concerns regarding the effects of shadow flicker and ice throw on the major roadways and interchanges that will be well within the recommended setbacks for safety from manufacturers themselves. I have not seen any reports on consideration for lightning strike; even with proper grounding nacelles are easily damaged. Replacement and or repair of the same would make the cost of the turbine far exceed any economic return on a single turbine installation. As a Montgomery resident who may or may not be affected by sound effects and flicker in my home I am still disturbed by the seemingly casual dismissal of the concerns expressed by those who will be (File No.: CK. 2000-5 and WT. 2000-10-2). I also do not think that the hundreds of people (Not just Montgomery residents!) who will be using the new south bridge will be so admiring or supportive of an admittedly symbolic wind turbine if they knew of the visual effects and risks of thrown ice or blade parts as they drive by.

From: CityCouncilWebForm
Sent: October 10, 2011 10:24 PM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Mark Bigland-Pritchard
812 5th St E
Saskatoon
Saskatchewan
S7H 1G9

EMAIL ADDRESS:

mark@lowenergydesign.com

COMMENTS:

I wish to make a brief presentation to the Council meeting of 11th October regarding the proposed wind turbine (section F1 of meeting agenda). Please let me know if this is possible

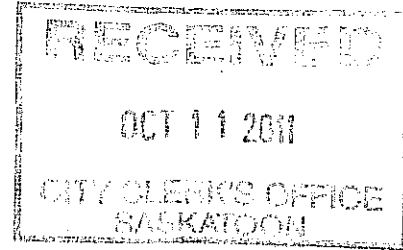
From: Denis Grimard [dvgrimard@gmail.com]
Sent: October 11, 2011 9:41 AM
To: Web E-mail - City Clerks
Subject: Attention of City Clerks Office - documents I will be referring to in my speech tonight on the Wind Turbine project
Attachments: Orleans Part Two Sept 2009.pdf, Orleans Part One Aug 13 2009.pdf

Hello, can you please provide copies of these two documents for tonight's meeting as I will be referencing them in my speech tonight,

Printed in black and white is fine.

Thanks

Denis Grimard



2000-5

RECEIVED

OCT 11 2011

CITY CLERK'S OFFICE
SASKATOON

**Findings and Recommendations
Orleans Citizens Wind Committee**



Part One

- A. Shadow Flicker/Safety Setbacks***
- B. Noise/Sleep Interference***

August 13, 2009

Initial Report Wind Committee Findings And Recommendations

After thoroughly studying the Scientific Facts this document represents the Consensus Findings and Recommendations of the Orleans of the Wind Committee concerning the Health and Safety aspects of Wind Farms concerning Shadow Flicker, Safety Setbacks, Noise and Sleep Disturbance.

The remaining Consensus Findings and Recommendations relating to ***Stray Voltage, Construction Disruption, Earthquake Seismic Effects, Fire Risks & Fire Department Needs, Ground Water Impacts & Protection of Aquifers, Lightening Protection, Lighting Turbine Towers, Storm Water and Runoff Erosion, Road Upkeep & Repair, Security (Vandalism/Terrorism) and Radon*** are under preparation and will be added later to this initial document.

The Orleans Wind Committee strongly recommends that ***the principal Health and Safety considerations of Shadow Flicker, Safety Setbacks, Noise and Sleep Disturbance*** be given priority in updating the current Orleans Wind Law.

The Committee fully realizes that the Town Board may want to discuss and understand the Wind Committee's Recommendations and Findings with the Committee and encourages the Board to meet with them to discuss the Findings or Recommendations.

J. Stephen Bingham Chair

Judy Tubolino, Vice Chair

Patricia Booras-Miller

Rosemary Forbes

William Di Trinco

Darryl Hyde

Initial Report Wind Committee Findings And Recommendations

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Initial Report Wind Committee Findings And Recommendations

I. Orleans Citizens Wind Committee Members 2009

Committee Background: The Orleans Wind Committee was established by the Town of Orleans two years after the town established a local wind ordinance in 2007. The Town of Orleans does not have a present wind developer application however; they do have a portion of the town in the Horse Creek Wind Project under the lead agent Town of Clayton. This committee is charged with taking a serious review of the present Health and Safety Standards for protection in the town's local law and review these Standards to see if, in their present form, still adequately protect the residents in the Town of Orleans for the future. This committee is charged to make recommendations to the town council if these Standards do not protect Town of Orleans residents adjacent to the wind turbines.

Mr. J. Stephen Bingeman (Chair): A resident of Orleans for thirty five years and resides in LaFargeville. Steve served in the U.S. Army and is a semi-retired tractor trailer driver. Steve is married and has four children and fifteen grandchildren and two great-grandchildren. Steve has served the Orleans community for 21 years on LaFargeville Volunteer Fire Department and served as a Lieutenant of the rescue ambulance squad.

Mrs. Judy Tubolino (Co-Chair): A resident of the Town of Orleans for thirty nine years. She is a family member of a third generation of land owners in Orleans. She is a Real Estate Broker and currently manages a real estate office. She is a wife, mother and grandmother. Judy has served previously for over nine years as an Assessor for the Town of Orleans.

Mrs. Patty Booras-Miller: A resident of the Town of Orleans for nine years. She moved to Orleans after retiring as a healthcare administrator for over 32 years of service in general, vascular and thoracic surgery in a practice in Watertown, NY. She recently retired as teacher in healthcare management. Before moving to Orleans, she was involved in many civic community affairs in Watertown and Jefferson County. She has been active in the Girl Scout movement serving as advisor and leader for 30 years.

Initial Report Wind Committee Findings And Recommendations

Mrs. Rosemary Forbes: A resident of the Town of Orleans for forty years. She is married with three children and has grandchildren. She is a fourth generation member of landowners in the Town of Orleans. She is active with the Stone Mills Agricultural Museum, Orleans Library and is a Cub Scout Pack leader. She provides children's day care in her home for over twenty years. She is a past member of the Evans Mills Improvement League, Evans Mills Library board of trustees, and helped run the Evans Mills preschool program.

Mr. William DiTrinco: A resident of Orleans for three years after having moved from our neighboring town of Hammond where he and his family had lived for 30 years. He is a land owner and a previous dairy farmer. Bill owns and operates St. Lawrence Home Building Corporation on Wellesley Island. He is a father of two children and has grandchildren.

Mr. Darryl Hyde: A resident of the Town of Orleans all his life. Darryl and his wife of 45 years, Sue have raised four children in this community. He is strong advocate to see that our town continues to strive for the next generation of residents. "Resident must make things better for our town, for our residents, for our next generation to thrive and grow here." Darryl and Sue have nine grandchildren. Darryl was a member of LaFargeville Rescue Squad for 27 years Darryl has worked in sales for over forty years traveling to all areas of New York State.

Initial Report Wind Committee Findings And Recommendations

Subjects shown in Purple will be part of a later submission to the Board

II. Environmental / Health & Safety Considerations

A. Shadow Flicker & Safety Setbacks

B. Noise/Sleep Interference

C. Electronic & Electromagnetic Interference

D. Stray Voltage AKA Ground Current

E. Construction Disruption

F. Earthquake Seismic Effects

G. Fire Risks & Fire Department Needs

H. Ground Water Impacts & Protection of Aquifers

I. Lightning Protection

J. Lighting Turbine Towers

K. Storm Water, Runoff Erosion

L. Road Upkeep & Repair

M. Security (Vandalism/Terrorism)

O. Radon

Numerous documents were reviewed by the committee to substantiate the committee's conclusion for the recommendation. (See Chapter IX) The committee offers the council two formats for referencing the documents; hardcopy and a CD.

Hardcopies are provided in a *separate catalog* of documents listed under each category of discussion. Each *URL* is referenced in dark blue and underlined. Each document referenced in light blue indicates the document is a pdf and on a CD disk.

III. Introduction and Scope

This report represents the consensus of the Orleans Wind Turbine Study Committee.

This committee submits to the Town Board the *First Part* of our Findings and Recommendations for revisions to Local Law No 1 2007 **covering Noise, Safety Setbacks , Shadow Flicker and Compliance.**

This *First Part* of our Findings and Recommendations document is submitted to the Town Board for your review and action.

The *Second Submission* will consist of Findings and Recommendations that this committee thinks could better serve both the Town and residents in protection from Health and Safety impacts. These recommendations will be listed in these categories:, Electronic & Electromagnetic Interference, Stray Voltage AKA Ground Current, Construction Disruption, Earthquake Seismic Effects, Fire Risk & Fire Department Needs, Ground Water Impacts & Protection of Aquifers, Lightening Protection, Lighting Turbine Towers, Storm Water, Runoff Erosion, Road Upkeep & Repair, Security (Vandalism/Terrorism) and Radon.

You, the elected officials of the Town are charged with the protection of the Health, Safety and Welfare of the Orleans Community.

The Wind Committee's charge was to examine the Health and Safety considerations in the present Local Law No 1 2007 for Wind Facilities. This committee is charged with making recommendation to the town board for revisions and/or adoption to this law if the present recommendations do not adequately protect residents in Orleans who reside adjacent to industrial wind turbines.

This committee is charged to review such recommendations with substantiated facts and references that demonstrate to this board the committee's recommendations do warrant change.

And we struggled to look at the big picture rather than just the little picture.

Initial Report Wind Committee Findings And Recommendations

It appears to the Wind Committee that while Health and Safety are paramount considerations, the issues of Citizens' Welfare appear to us to have overriding considerations you should also consider.

The committee thinks that the ordinance should follow the spirit of:

If you break it...you must fix it

If you can't fix ityou must provide just compensation

The Wind Companies should respond and be accountable to the town, not the other way around.

Members of this committee would encourage the Boards to Act not just React by considering also that **Annual Operating Renewal Permits** should be dependent on satisfactory compliance to the Town Board Ordinances.

Orleans should seriously consider establishing a Complaint Committee reporting to the Town Board to effectively and fairly deal with Citizens complaints.

Our understanding is that currently Wind Companies are provided the legal rights of real people in most Local Wind Ordinance.

Our understanding is that if you don't designate the Wind Companies as People, then you make the rules.

If you evoke the proper NYS Environmental Laws, **Home Rule** will provide the necessary legal protection. It is suggested that you have your revisions reviewed by a Lawyer proficient in Environmental Law and the Jefferson County Planning Department. This can be accomplished if you pay strict attention to Current NYS Environmental Law in your revision of the current Orleans Wind Law.

And that can minimize legal threats from most of your considerations.

While many of the suggested modifications to the local law may make the proposed Horse Creek wind facility impossible to implement fully, this committee believe the changes are necessary to protect the residents of our town.

Initial Report Wind Committee Findings And Recommendations

Members of this committee all agree the overlay district selected was not the best location due to the number of homes and residents in such a small area. To correct this there may be two solutions:

- Establish a new overlay district or
- Have no overlay district at all, allowing the entire township for consideration

Regardless, as long as the modifications we are suggesting are incorporated into our local law, residents will be protected regardless of what area of the town a wind facility is proposed.

This committee strongly suggests the town board invite others like Keith Pittman <http://www.empirestatewindenergy.com/> Empire State Wind Energy LLC and Ms. Hester Chase, a Town of Cape Vincent resident who recommends local owned wind development programs, to give a presentation of a different approach to wind development. They may give the town another option in which the town has more control over the placement of the facility and at the same time the town and the residents of the town would share in the profits and benefits.

Much of this report has been derived from other reports that the committee found very helpful to our own understanding of the facts and scientific basis for the Health and Safety recommendations regarding Wind Energy Conversion Systems (WECS) in their Towns.

Within this report are the findings of the Committee to date, outlining the consensus recommendations for dealing with the potential impact Health and Safety issues in regard to possible future wind farm development in the Town of Orleans area.

To facilitate the gathering, compilation, review and understanding of available information on WECS, the Town selected a citizens committee comprised of six (6) land owners, to represent the diverse interests, occupations and viewpoints within the Town.

Consensus Committee recommendations, written in layman's terms, can be found at the end of each discussion. A summary of the committee's final recommendations, written in more formal language, can be found in the last part

Initial Report Wind Committee Findings And Recommendations

of this document. ***Suggested Wording for a Revised Orleans Wind Ordinance That Follows the Spirit of the Wind Committee***

Members of this committee have invited in depth talks by professionals versed in Wind Farm Planning, Forensic Engineering, Turbine Safety and Low and High Frequency Noise which included question and answer sessions

Members of this committee studied other town ordinances including Towns like Bethany, NY and the Town of Union, WI which are similar to the Town of Orleans which is rural in nature.

Members of this committee think that the conclusions of these reports are also for the most part, applicable for the Town of Orleans, and perhaps for towns with similar configurations, but are not universal truths.

This report is not intended as a memorandum on the suitability of wind energy as an industry. While many members of the committee have studied the usefulness of wind energy in general, that research has not been included here, except where it directly impacts the Town. The suitability of wind energy in general and/or in theory is left for others to evaluate.

This committee does however encourage the Town not to just react to the current Wind Farm Issue but to act in a way that is a win-win for the whole community.

This committee has not directly addressed non-commercial turbines, believing those to be adequately handled by the Town in the past. That topic is addressed indirectly, however, by simply extrapolating data downward to the lower end of the spectrum.

The Town should also note the prevailing nature of ongoing discussions in Albany for placing wind development in rural communities. New York State officials may choose to draft legislation, including zoning rights and limits, of their own. However, it is the belief of this committee that the ***Town should enact legislation to protect its residents now before any pending State Legislation is passed;*** and let Albany take legal liability for any actions they may override in the future.

Initial Report Wind Committee Findings And Recommendations

IV. Work to Date

This committee was formed in December 2008, and had started meeting biweekly during the months of Jan to March 2009. Since April 14, 2009 we have been meeting on a weekly basis to critically examine the available information surrounding the issues of health and safety and to report our findings back to the Orleans's Town board.

To accomplish this we began by scheduling and publically advertising information presentations where everyone was welcome to participate. .

Altogether, committee members have reviewed countless documents, newspaper articles, and web pages, local, state, federal and international reports.

Committee members have served as a sounding board for each other, examining all evidence critically. We have invited and spoken with many experts with experience in industrial wind turbines safety and noise issues, including Rick James, Dr. Paul Carr, Cliff Schneider, Keith Pittman and Chuck Ebbing.

Committee members Patty Booras-Miller, Judy Tubolino, Darryl Hyde and Cindy Grant participated in many trips to Maple Ridge Wind Farm facility. During these trips committee members viewed many working turbines observing the sounds, the sights and shadow flicker. They also interviewed local residents. Darryl Hyde has made many trips to view the Cohoctan Wind Project.

Committee members Steve Bingeman, Darryl Hyde, Patty Booras-Miller, Judy Tubolino and Cindy Grant have spoken with town officials from other townships that are in different stages of industrial wind development gaining their experiences and knowledge for wind development in their communities. These committee members have also attended industrial wind informational meeting/presentations -both pro and con

This committee has identified a list of significant issues/concerns that are not adequately addressed in Orleans current wind law/ordinance. These issues/concerns are listed in this document to be considered by this board in revising Orleans Local Law No 1 2007 for Wind Facilities.

V. Information on Committee Research:

During our investigations and research in acoustics we requested the advice of many professionals and documents.

This committee is fortunate to have the help of our own retired Acoustical Engineer Chuck Ebbing. Chuck wears two hats in assisting us:

One, as our Facilitator keeping us focused on our agenda and secondly, as a Practicing Acoustical Engineer and Educator at RPI and Syracuse University. He helps this committee with interpretations and other engineering noise issues.

This committee did not only rely entirely on Chuck's interpretations and analogies of the Tocci & Cavanaugh and the Horse Creek noise reports, we also turned to other acoustic professionals. We resourced factual documents by many Federal, State and International Agencies. We viewed reports by other wind committees such as the Bethany Report [bethany-windturbinesstudycommitteereport.pdf](#) and Union, WI for Large Wind Facilities [Town of Union Wind Energy Licesensing Ordinance 2008-06-1.pdf](#). We accumulated and researched other local wind laws across NYS as well as other states.

We reviewed at length our own New York State DEC's report Assessing and Mitigating Sound Impacts DEC guidelines noise2000 .pdf and the extensive report by Kamperman & James October 28, 2008 Version 2.1 "The How To Guide to Criteria For Siting Wind Turbines to Prevent Health Risks From Sound" 08-11-02 Kamperman-James Ver. 2 1 (Orleans) Noise Criteria for Siting Wind Turbines 2.1 .pdf. The committee viewed the document "Public Health Impacts of Wind Turbines" by the State of Minnesota's own Department of Public Health, Environmental Health Division dated May 22, 2009 Public Health Impacts of Wind Turbines pdf.

Rick James of E-Coustic Solutions answered questions over the phone from both the Wind Committee and a large audience.

This committee consulted with and heard presentations on acoustic impacts related to industrial turbines directly from:

Dr. Paul Carr, of Bernier & Carr
Rick James of E-Coustic Solutions
Chuck Ebbing, Ebbing Acoustics

Initial Report Wind Committee Findings And Recommendations

Cliff Schneider, NYS DEC Retired

We also have read about, listened, and talked to residents living near wind facilities who face the intrusion and sleep deprivations caused by excessive noise intruding into a very quiet rural community.

Unfortunately wind turbines when placed in populated areas don't co-exist easily with the people. :

VI. Summary Findings

The committee finds that WECS facilities have both positive and negative impacts on any Town. Our recommendation is that the Town work to accentuate the positive impacts while trying to eliminate significant negative impacts in consideration of any WECS project.

A preferred approach would include both the consideration of the best ways in which to locate any proposed wind farms to minimize complaints, and secondly develop ordinances that result in a win-win outcome so that the entire community and Town really benefit, not just a few.

These efforts should include examination of the applicable areas in Orleans that might be suitable for development, remembering that Industrial Sized Wind Farms and People do not coexist easily in populated areas.

Based on the information gathered, the Committee recommends that the Town of Orleans immediately work to enact zoning legislation designed to protect the Health, Safety and Quality of Life for Town of Orleans residents prior to seriously considering any WECS project(s).

This legislation should not draw a conclusion on the presence of WECS within the Town of Orleans, but rather guide any such presence along safe, secure lines. The goal should be to answer the question: In what ways can Orleans intelligently utilize wind energy rather than just reacting to permit applications?

To accomplish this goal, the committee has completed this report providing, in the committee's opinion, findings, undisputed facts and reasonable estimates around which successful zoning legislation can be drawn.

Initial Report Wind Committee Findings And Recommendations

In addition, the committee offers its continued assistance to assist the Planning Board and/or Town Board in creating such zoning legislation.

A. General Findings:

Wind energy is a potential renewable and nonpolluting energy resource of the Town of Orleans and its conversion to electricity, if judiciously implemented may reduce dependence on nonrenewable, conventional energy sources and decrease the pollution that results there from. However, wind energy facilities should be sited in a way that protects the health and safety needs of the Town of Orleans residents residing near the large wind turbines, as well as the general public. Populated areas and wind farms have not co-existed well together. It is wise to carefully examine the parts of Orleans that would minimize these problems.

The regulation of the siting and installation of large wind turbines is necessary to protect the health, safety and welfare of the residents of the Town of Orleans and the general public adverse health and safety issues are likely to arise if appropriate standards, guidelines and setbacks are not followed in the siting and installation of large wind turbines.

It is appropriate to consider as relevant, recommended best practices for large wind turbines from international organizations that have more experience with the use, siting and installation of large wind turbines than the U.S.

Wind turbine accidents have occurred involving ice throws, blade disintegration, fire and tower failure. According to the Caithness Windfarm Information Forum, from 1999 through June 2008pdf there were over 500 accidents around the world, including North America, involving ice throws, blade disintegration, and fire and tower failure from large wind turbines.

There should be strict meaningful penalties for the developer should they violate these requirements and standards.

The setback distances that will be required to meet the noise provisions will significantly exceed the setback distances required by Safety and Flicker.

Initial Report Wind Committee Findings And Recommendations

This has been true in all the unbiased assessments of community noise we have uncovered.

B. Findings Regarding Wind Turbine Noise Impacts:

This committee concludes that the sound pressure level ("SPL") of 50 dBA set forth in the Orleans Wind Ordinance No 1 2007 does not adequately protect town residents from the adverse health effects associated with large wind turbine noise. It also finds that in all cases that it investigated, the required setback distances required to meet the satisfactory noise safety standards was always significantly larger than those required to meet the required safety setbacks to avoid potential harm to people from ice throw or parts of failed turbine blades impacting on homes or people.

Large wind turbines are significant sources of noise, which, if improperly sited, can negatively impact the health of residents, particularly in rural areas of low ambient noise levels such as the Town of Orleans.

Large wind turbines emit two types of noise -- 1) Aerodynamic noise from the blades passing through the air, which can generate broadband noise, tonal noise and low frequency noise; and 2) Mechanical noise from the interaction of the turbine components. A dBA scale is commonly used to measure audible wind turbine noise. Low frequency noise from large wind turbines is not adequately measured with a dBA weighting. In order to evaluate the low frequency noise it will be necessary to use a dBC scale. For a better assessment of the health effects from low frequency noise, the World Health Organization ("WHO") suggests using a dBC weighting. (See Rogers 1/2006; Alberts 11/20/2005; WHO 1999 pdf)

Noise is an annoyance that can negatively impact health, producing negative effects such as sleep disturbance and deprivation, stress, anxiety and fatigue. WHO defined annoyance as a feeling of displeasure associated with any agent or condition believed by an individual to adversely affect him or her. According to

WHO, health should be regarded as a state of complete physical, mental and social wellbeing, and not merely the absence of disease or infirmity. Under this definition, noise has a significant impact on the quality of life and noise annoyance is an adverse health effect. (See WHO 1999, Ch. 3.7; Dr. Harry 2/2007; Pedersen & Waye 2/27/08 pdf)

Initial Report Wind Committee Findings And Recommendations

Large wind turbines create a noise annoyance that can hinder physical and mental healing and can cause adverse health effects associated with sleep disturbance and deprivation, psychological distress, stress, anxiety, depression, headaches, fatigue, tinnitus and hypertension. Wind turbine noise can affect each person differently. Some people are unaffected by wind turbine noise, while others may develop adverse health effects from the same noise. At very low frequencies, wind turbine noise may not always be heard but rather felt as a vibration of the chest cavity. Medical research reported complaints from people who felt the noise from large wind turbines to be similar to symptoms associated with vibroacoustic disease. (See Pedersen et al 3/1/2007, 8/2003, 1/11/2008 and 6/3/2008; Pedersen 2007; Mariana Alves-Pereira and Nuno Castelo Branco 9/20/2007; WHO 1999; Kamperman & James; reports by Dr. Pierpont, Dr. Harry and Dr. Leventhal, State of Minnesota Department of Public Health "Public Health Impact of Turbines" pdf)

The risk of adverse health effects resulting from 24/7 annoying noise and the lack of adequate recuperative sleep results in symptoms. These include headaches, stress, anxiety, fatigue, depression, pain and stiffness, and decreased cognitive ability associated with sleep deprivation from wind turbine noise. These risks increases with increasing A-weighted sound pressure levels. According to wind turbine noise studies, few respondents were disturbed in their sleep by wind turbine noise at Sound Pressure Levels less than 35 dBA; however, at SPL greater than 35 dBA respondents were increasingly disturbed in their sleep by wind turbine noise. (See Pedersen et al 6/3/2008 and 8/2003 pdf)

Wind turbine noise greater than 5db over the residual ambient increases the risk for adverse health effects because an increase of 5 dB is clearly noticeable. (See Kamperman and James pdf)

Studies show that prolonged exposure to wind turbine noise resulted in adverse health effects at SPLs below those from other sources of community noise, such as road traffic noise. Noise generated 24/7 by wind turbines has characteristics that creates **disproportionate annoyance impacts** which result in health impacts **far greater** than that compared to urban, industrial or commercial noise. (See Pedersen et al 6/3/2008 and 8/2003; Soysal 2007) also Bajdek Noise-Con 2007 pdf)

Living in a rural environment, in comparison with a suburban area, increases the risk of residents being impacted by noise from nearby large wind turbines because of the low ambient SPL in rural environments. Data taken in the North

Initial Report Wind Committee Findings And Recommendations

Country points to nighttime ambients typically in the range of 20-30 dBA. (See Schomer and Schneider and Pedersen and Waye, 3/1/2007, p. 485 pdf)

In 1971, the International Standards Organization was recommending community noise limits for rural areas be set at a SPL of 35 dBA during the day, 30 dBA during the evening and 25 dBA at night. (See Table 9: ISO 1996-1971 Recommendations for Community Noise Limits as cited by Acoustic Ecology Institute and Daniel Alberts of Lawrence Technological University pdf)

The Wind Industry Publication pdf points to typical rural ambients being 25 dBA with little or no wind at ground level. Schneider has shown that this occurs very frequently in the North Country on clear starry nights when the earth cools and the wind at ground level is minimal. Calm nights have little background noise to mask the 24/7 noise from turbines that are still operating because the wind at turbine height is still turning the turbines. Balloonists exploit these Stable Environmental Conditions by taking off in calm conditions on the ground and travel with the wind above treetop levels.

Eye-witnesses living near newly-constructed large wind turbines in the Town of Byron, Fond du Lac County, WI testified under oath in DeKalb Hearing that they currently experience adverse health effects from the wind turbine noise such as sleep deprivation and disturbance, headaches, nausea and dizziness. The SPL from the wind turbines in the Town of Byron is greater than 45 dBA at their residences and can be heard inside of their houses and outside in their yards.

In order to reduce the risk of negative health impacts from large wind turbine noise, Acoustical Engineers George Kamperman and Richard James recommend (a) audible sound limits based on pre-existing background sound levels plus a 5dB allowance for wind turbine noise or (b) SPL not to exceed 35 dBA L_{eq} within 100 feet of any occupied structure, whichever is lower; and (c) a dBC limit not to exceed 20 dB above nighttime ambient background levels. These sound levels are in line with numerous published guidelines such as the sound limits proposed by the United Kingdom Business Enterprise and Regulatory Reform Department, which suggest for quiet, rural areas and low noise environments, the outside levels of the L A90, 10 min. of wind farm noise should be limited to an absolute level of 35 – 40 dBA. (See Kamperman & James; United Kingdom Business Enterprise & Regulatory Reform Department document "Onshore Wind: Noise" 7/17/2008 pdf)

C. Findings Regarding Setback Distances from Wind Turbines:

The Town of Orleans Wind Committee concludes that (a) the Safety setbacks of 1250 feet set forth in the present Orleans Wind Ordinance are not based on empirical evidence relating to safety considerations. Adequate Setbacks from large wind turbines to the property line of nearest residence or other inhabited structure are necessary to protect the health and safety of Town of Orleans residents, based on the following findings.

Minimum setbacks from dwellings are necessary to mitigate noise impacts not predicted with sound models. Pre-construction sound models fail to accurately predict wind turbine noise impacts due to factors such as atmospheric conditions, temperature inversions, wind layers, geography and low frequency noise which travels further with less loss of intensity than higher frequency noise. In addition, at night when air stabilizes, wind turbine noise can travel further than expected and can be 5-15 dB(A) louder than predicted. (See Kamperman & James; Acoustic Ecology Institute Special Report: Wind Energy Noise Impacts 2008)pdf

A dBC requirement is needed to minimize adverse health effects from low frequency noise. A dBC requirement will likely result in setbacks between large wind turbines and nearby dwellings of 1km (.62 miles) or greater for 1.5 to 3 MW wind turbines if wind turbines are located in rural areas where L90A background levels are 30 dBA or lower. Such is the case for all rural townships where the preponderance of evidence is that nighttime ambient when people sleep is typical 20-30dBA. (See Kamperman & James; WHO 1999; Bajdek Noise-Con 2007; Pedersen and Waye 1/11/2008, ARI Guidelines, Measurements by Cliff Schneider, Charles Ebbing, Paul Carr, and even a wind power publication).

Noise diminishes with distance. According to a sound propagation formula in the Wind Turbine Acoustic Noise White Paper by the University of Massachusetts Renewable Energy Research Lab pdf, a SPL of 35 dBA is reached at approximately ½ mile from a wind turbine based on a sound power at 102 dBA at hub height as applied to a 1.5 – 3 MW wind turbine. Therefore, at a distance of less than ½ mile, a wind turbine will create a SPL that exceeds safe levels. (See Rogers pg. 18 Figure 11; Burton 2001).

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Wind Turbine Sound Propagation from the theoretical center of the noise source. This example is for a turbine of 102 dBA sound power	
Distance in Ft.	dBA reduction -6 per doubling of distance
1	102 dBA
2	96 dBA
4	90 dBA
8	84 dBA
16	78 dBA
32	72 dBA
64	66 dBA
128	60 dBA
256	54 dBA
512	48 dBA
1024	42 dBA
2048	36 dBA
4096	30 dBA
8192	24 dBA
16384	18 dBA
32768	12 dBA
65536	6 dBA
131072	0 dBA

The turbines considered for Orleans are more likely to have sound power ratings from 106 to 108 dBA.

While this model of sound propagation is descriptive of the noise generated by the machinery at the hub, the noise produced by the turbine blades is not accounted for in this model and the noise has been found to travel further. Therefore, this ordinance requires siting based not only on set-backs, but also on sound studies.

The closer people live to wind turbines the more likely they will experience noise annoyance or develop adverse health effects from wind turbines' noise. Further, the degree of difficulties resulting from the sound of wind turbines seems clearly related to the distance from the turbines, though the literature has studied a

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variety of turbine sizes in a variety of locations. George Kamperman and Richard James reviewed several studies to determine the impact of wind turbine noise on nearby residents. Their review showed that some residents living as far as 2 miles complained of sleep disturbance from wind turbine noise and many residents living 1000 feet from wind turbines experienced major sleep disruption and other health problems from nighttime wind turbine noise.

G.P. Van den Berg studied a wind farm in northwestern Germany and discovered that residents living 500 m (1640 feet) from the wind turbines reacted strongly to wind turbine noise and residents up to 1900 m (1.18 miles) distance expressed annoyance. A survey conducted by Pedersen and Waye revealed that less than 10% of the respondents experienced sleep disturbance at distances of 1,984 feet to 3,325 feet **and found that the sound from wind turbines was of greater concern in rural environments because of the lower ambient noise.** (Bajdek, Noise-Con 2007 ; Van den Berg 2004 ; Pedersen & Waye 2/27/08; Kamperman & James) pdf

Adverse health effects from wind turbine noise can be exacerbated by the rotating blades and shadows from the wind turbines. As wind turbine blades rotate in sunny conditions, they cast strobe-like shadows on the windows of nearby homes and buildings causing shadow flicker that cannot be avoided by occupants. Shadow flicker can cause some people to become dizzy, nauseated or lose their balance when they see the movement of the shadow. Shadow flicker from wind turbines at greater than 3Hz poses a potential risk of inducing photosensitive seizures. Therefore, wind turbines should be sited such that shadows from wind turbine blades do not fall upon the windows of nearby dwellings or within 100 feet of dwellings for any considerable period. The Wind Energy Handbook recommends a setback of at least 10 rotor diameters to avoid shadow flicker on occupied structures. (See Acoustic Ecology Institute special report 2008; Burton 2001; UK Noise Association 6/2006, Graham Harding 2008 and Dr. Nina Pierpont 3/2/2006 and 8/1/2006)pdf

If placed too close to a road, the movement of the wind turbine blades and resulting shadow flicker can distract drivers and lead to accidents. (See NRC May 2007 report, pg. 263)pdf

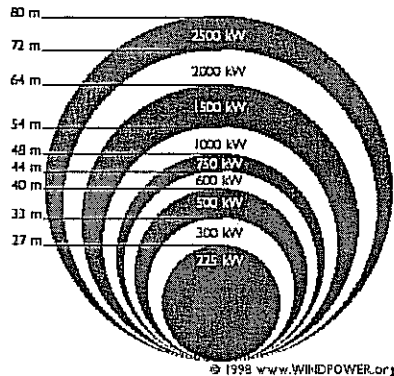
Wind turbines have been known to throw ice and debris from the turbine blades. According to Professor Terry Matilsky from the Department of Physics and Astronomy at Rutgers University, ice throws from large wind turbines can reach

up to a distance of 1750 feet and blade throws can reach 2500 feet. (See Matilsky, Terry, <http://xray.rutgers.edu/~matilsky/windmills/throw.html> 6/20/2008)

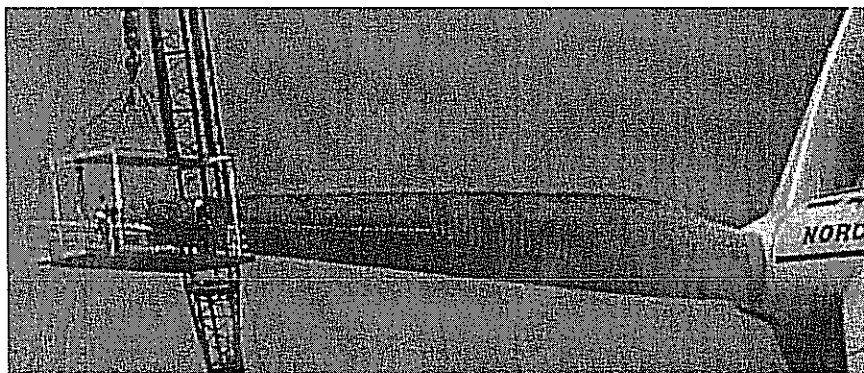
VII. Overview of Safety Setback Recommendations

A. Shadow Flicker

Shadow Flicker consultants generally agree that *flicker is not noticeable beyond about 10 Turbine Rotor Diameters* from a wind turbine, or 2634 ft for an 80m diameter rotor.



"A minimum spacing from the nearest turbines to a dwelling of 10 rotor blades diameters is recommended to reduce the duration of any nuisance due to light flicker (Taylor and Rand,1991) pdf. However, a spacing of this magnitude is likely to be required in any event by noise constraints and to avoid visual domination." This is cited verbatim in Wind Energy Handbook, , Wiley & Sons Ltd, New York, 2001 pdf pg. 527



One of the largest turbines to date in 2004 was 390 ft in diameter which would require a setback of 3900 ft, if the 10 times the rotor diameter rule were used.

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"May 12, 2004 - The new LM Glasfiber wind **turbine rotor** blade is being launched today at the WindEnergy 2004 trade fair in Hamburg, Germany. With a **rotor** diameter of 126 metres (390 feet), the blade set of three generates sufficient power from the wind to cover the annual power consumption of about 5,000 households. Today at the WindEnergy 2004 trade fair in Hamburg, LM Glasfiber launches the world's largest blade to date - measuring 61.5 meters in length. The composition of materials, a new design and new manufacturing processes have enabled LM to reduce the weight to less than 18 tonnes (40K lbs) for one blade." <http://www.highbeam.com/doc/1G1-119158764.html>

Recommendation:

The consensus of the Orleans Wind Committee is that the Turbines be set back at least 3000 ft or 10 Turbine Rotor Diameters (whichever is greater) from the property lines and from nearby affected roads/intersections to avoid significant Flicker Problems.

B. Turbine Ice and Debris Throw Distances

1. Ice Throw



As in the design of all structures like bridges and buildings, we recommend that the Board plans *for the worst, hoping for the best.*

Ice throws results in falling lumps of ice – usually described as about the size of tennis balls. Ice may be thrown as far as 1,800 feet, possibly into roads and highways in the area as well as causing potential harm to individuals.

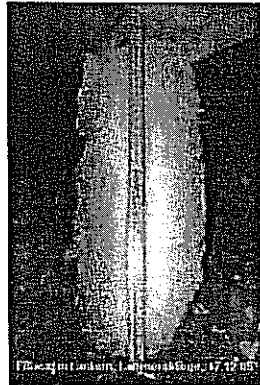
bethany-windturbinestudycommittteereport.pdf

There is of course a big difference between how far debris from a failed turbine blade can fly in the case of a turbine operating under control at normal speed,

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and one that is out of control and spins at increasing speed until it shatters the blades or one of the blades hits the lower part of the tower causing it to topple.

You all have seen the reports of such out of control failures recently in the newspaper.



2. Debris Throw

Vestas the largest and oldest wind turbine manufacturer's safety manual, "Mechanical Operating and Maintenance Manual" s, (written to limit their liability) states;

"For a 500' tall Turbine do not stay within a radius of **1,640 feet** (about a ¼ mile) or **1300 ft for a 400 ft turbine** from the turbine unless it is necessary".

Their text from the: Vestas_complete_manual 400 ft tall.pdf

"Do not stay within a radius of 400m (1300ft) from the turbine unless it is necessary. If you have to inspect an operating turbine from the ground, do not stay under the rotor plane but observe the rotor from the front.

Make sure that children do not stay by or play nearby the turbine. If necessary, fence the foundation. The access door to the turbine must be locked in order to prevent unauthorized persons from stopping or damaging the turbine due to mal-operation of the controller"

3. High Wind Failure



High Wind Failure occurs when the braking system fails. The braking system in a turbine is designed to stop the rotors in the event the wind is too strong. When the brakes fail, the turbine spins out of control.

Turbine Structural failure in Western Germany

This is the most dangerous failure by far. In Germany in multiple years including 1999, 2000 and 2003, the brakes on wind turbines failed in high wind, causing a turbine blade to hit the tower at high speed. This resulted in anything from parts of the blade to the entire nacelle (rotors attached) flying off the tower.

A well documented Turbine failure is discussed in the Bethany Report *Page 20*. [bethany-windturbinestudycommittteereport.pdf](#)

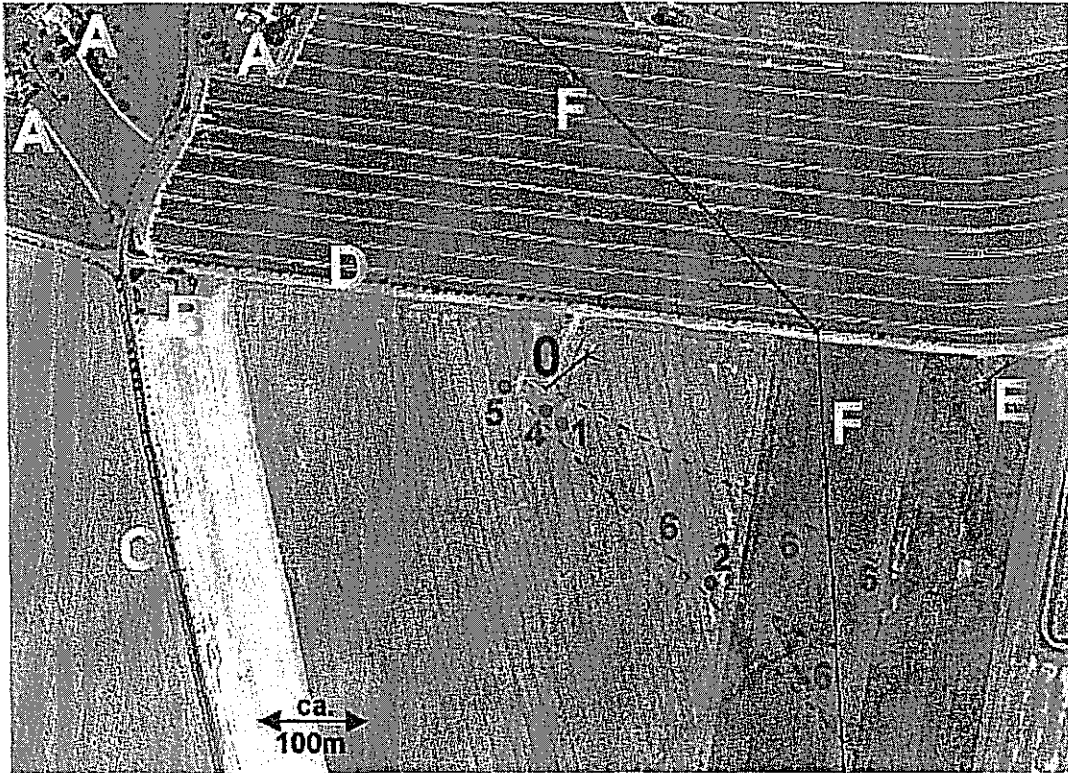


Figure E.9.1: aerial view of a turbine which suffered high wind failure. Significantly-sized debris is plotted in numerals

Notice how far the debris field extends from the turbine at O and what could have happened if the wind was blowing the debris toward the road D or at the house at B. One piece 3 did travel over the adjunct road.

Also a recent Vestas Over speed Turbine Failure was documented by the Danish Government Body, the Energy Agency of Failure Investigation. Danish Report *Endelig redegørelse for haveriforløb ved Halling og Sidinge2.pdf*

A windmill in Denmark collapsed during a storm in Denmark on Feb 22, 2008. The mill was commissioned on 12/23/1996. The wind turbine was a Vestas (North Tank NKT600-180/43) 600 kW the braking system failed while two technicians worked in the turret at the top. The technicians were able to get out before the collapse. Pieces of the shattered turbine were thrown more than 500 meters away. Results of the accident was that the 3 blades literally exploded when the tower was hit and wing pieces from all three wings and the other debris was widely spaced almost 180 degrees.

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The Turbine and the top half of the tower crashed to the ground and the generator fell out so that it lied alongside the tower. Larger pieces of wings landed 2-300 meters (**6.58-984 ft**) away, while the smaller pieces landed up to 500 meters (**1640 ft**) away. Even smaller pieces landed in a courtyard over 700 meters (**2297 ft**) away. These could have been both thrown and blown to this location because of the extreme wind.

For the same rpm of the turbine, taller turbines result in throw distance proportional to the height. If this were a modern 400'-500'-600' turbine the throws would be significantly larger.

Recommendation:

For these reasons the Wind Committee recommends a 3000 ft Setback or 10 Turbine Rotor Blade Diameters (whichever is greater) from the property lines for the Turbines.

C. Noise Setback Implications

If you review the previous studies of turbine setbacks required to successfully operate in very quiet rural settings in North Country, and meet the NYS DEC recommendations, the required Noise Setbacks exceed those of Flicker or Ice/Debris Throw Setbacks.

Our finding is that the controlling setback requirements will be due to **Noise**.

Setbacks required to meet the **noise requirements** recommended in this ordinance **will exceed the required setback distances required by Safety and Flicker typically by two or more times** depending on the specific turbine Sound Power Level and the Rural Night Time Ambient.

VIII. Details of Overall Health & Safety Recommendations

A. Shadow Flicker/Safety Setback

Flicker takes two forms:

Shadow Flicker - aka the Disco Effect or Strobe Effect

Shadow flicker occurs under a combination of conditions at particular times of the day and year. It happens when the sun shines from behind a turbine rotor. This can cause the shadow of the turbine blades to be cast onto roadways, buildings and other objects; which appears to flick the sun on and off as the turbine rotates.



Reverse flicker, or Blade Glint, occurs likewise under certain conditions. It happens when the sun reflects off turning rotor blades, reflecting a bright light back to the sun ward side of the turbine. An excellent animated image is available at: <http://www.windpowerorg/en/tour/env/shadow/index.htm>.

The distance between a wind turbine and a potential shadow flicker receptor affects the intensity of the shadows cast by the blades, and therefore the intensity of flickering.

Shadows cast close to a turbine will be more intense, distinct and 'focused'. This is because a greater proportion of the sun's disc is intermittently blocked.

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Sources of Flicker, for comparison

- Fluorescent Lights: 120Hz
- Computer Screens: 75Hz
- Wind Turbine Shadow: 1.25-5Hz

1. Effects of Flicker

Shadow flicker is one of the 'annoyance' or 'nuisance' effects of wind turbines, similar to noise and view complaints, however it is unique among these. While all are somewhat subjective and tolerated by different percentages of nearby residents, shadow flicker is by far the least well tolerated. Residents impacted by flicker complained of headaches, migraines, nausea, flicker vertigo and disorientation after only 10 minutes of exposure. Health, Hazard and Quality of Life Near Wind Power Installations: How Close is Too Close? By Nina Pierpont, MD, PhD. An analysis of health risks near CWECS facilities. pdf

This is consistent with our interviews in Lowville and our observations of shadow flicker while there.

As with car or sea sickness, this is because the three organs of position perception (the inner ear, eyes, and stretch receptors in muscles and joints) are not agreeing with each other: the eyes say there is movement, while the ears and stretch receptors do not. People with a personal or family history of migraine or migraine-associated phenomena such as car sickness or vertigo are more susceptible to these effects.

Flicker vertigo, while not well referenced in medical literature, has been experimentally studied in the psychology laboratory. It is relatively well-known by experienced helicopter pilots. One definition is "A steady light flicker, at a frequency between approximately 4 to 20Hz can produce unpleasant and dangerous reactions in normal subjects, including nausea, vertigo, convulsions or unconsciousness.

While the annoyance factors are obvious, yet subjective, other medical factors are measurable. Photosensitive epilepsy is triggered when the visual disturbance is within certain frequency ranges. Older model turbines generate flicker at about 1.1Hz, which is outside the boundaries of photosensitive epilepsy (although it

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may still cause nausea and migraines). Newer six-bladed turbines, however, can generate disturbances of 2.5Hz, theoretically approaching the realm of neural dysfunction.

2. Reducing Flicker

Shadow Flicker consultants generally agree that *flicker is not noticeable beyond about 10 Turbine Rotor Diameters* from a wind turbine.

"A minimum spacing from the nearest turbines to a dwelling of 10 rotor blades diameters is recommended to reduce the duration of any nuisance due to light flicker (Taylor and Rand, 1991). However, a spacing of this magnitude is likely to be required in any event by noise constraints and to avoid visual domination." This is cited verbatim in Wind Energy Handbook, Wiley & Sons Ltd, New York, 2001 pg. 527

Wind turbines can be painted by the manufacturer so that they blend with the natural environment. In most cases turbines are painted gray so that they will blend well with the skyline, but some are also painted green or are two-toned. Other turbines are manufactured with a galvanized metal so that the metal will weather and turn gray naturally. Zoning can require the turbine to be painted with a blending color that is non-reflective in nature, removing Reverse Flicker effects altogether.

Installing special controllers on the turbine which automatically turn it off during peak times of flicker is a common and reasonably inexpensive solution. Moving the turbine is the most expensive option and one that is nearly impossible to effect without strict zoning laws. Proving the annoyance factor of flicker is difficult as it is often viewed as a subjective determination and property owners are typically asked to sign "hold harmless" clauses with the wind developer, preventing many suits from coming to court. An inexpensive solution is to request developers to survey residents for chronic health effects in order to ensure that turbine placement will not exacerbate people with pre-existing conditions.

The most effective way to reduce flicker effects is to zone them away from occupied buildings prior to construction, via materials requirements and setback requirements. Some communities also take care to prevent flicker from distracting drivers on the road. Irish guidelines state that turbines should be set back from the road by up to 300 m (990 feet) Land Use and Zoning Issues Related to Site Development for Utility Scale Wind Turbine Generators

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depending on circumstances. A report by the Michigan State University Extension, pdf; suggests that a shadow flicker study be commissioned and included with each turbine permit application:

<http://web1.msue.msu.edu/cdnr/otsegowindflicker.pdf>

It is possible to predict the effects of shadow flicker on sensitive locations, such as roads or residences around proposed developments. The potential for shadows to affect locations are site-specific, and depend on prevailing wind patterns among other factors. Developers can use software during the site planning process to avoid possible problems. One example is "Wind Farmer: The Wind Farm and Design and Optimization software" (www.garradhassan.com/windfarmer/flicker.htm).

Another is "WindFarm from ReSoft". The output from this software shows results for a specific window of a specific house from all turbines located nearby. (<http://members.aol.com/resoft/shadflik.htm>)

There is also a shadow calculator on the Danish wind power site. Information regarding the specifications of the turbines, site plan details, a wind rose, and other technical data are required to use this site (which is Copyright protected): www.windpower.dk/tour/env/shadow/shadowc.htm

Shadow Flicker/Safety Setback Recommendation:

Recommendation:

The consensus of the Orleans Wind Committee is that the Turbines be set back at least 3000 ft or 10 Turbine Rotor Blade Diameters (whichever is greater) from the property lines and from nearby affected roads/intersections to avoid significant Flicker Problems.

Our findings are that Visual Flicker from Turbine Blades casting shadows can cause significant problems. Experience has shown that a setback at least 10 turbine rotor diameters or greater in most cases alleviates this problem.

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Recommendation:

It is also recommended that the Town shall specify coating materials or effects in zoning.

The Town should also specify a setback distance from property lines and roadways to eliminate shadow flicker.

The Town should also require shutdown of the turbines during periods of peak flicker if that becomes a problem.

The Town should require the WECS developer to mitigate any unexpected shadow flicker effects promptly at its own expense.

It is possible to predict the effects of shadow flicker on sensitive locations, such as roads or residences around proposed developments.

B. Noise/Sleep Interference

The study of noise impacts from industrial wind machines has been a long process for this committee to analyze. This committee has had to learn about the methodology of the collection of sound data and the science of measuring sound.

One of the key assignments of this committee was to analyze existing Orleans Noise Ordinance in Local Law No 1 2007 for *Wind Facilities as to whether the current level of 50 dBA adequately protects the residents in the overlay district.* (Orleans Wind Ordinance.pdf)

In fact, the acoustic peer review of the Horse Creek Wind project performed at the request of the Town of Clayton by Tocci & Cavanaugh Acoustics indicates that Atlantic Wind/ Iberdola's CH2MHILL report is flawed and will not adequately

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protect residents adjacent to the turbines in the overlay district. (Clayton Tocci Report & Summary.pdf)

Review of the Tocci & Cavanaugh report led to the organization of this committee by the town council. (Ebbing Presentation to Orleans Board on Wind Farm Noise Final.pdf)

Through extensive research we have found:

- Large wind turbines emit two types of noise -- 1) Aerodynamic noise from the blades passing through the air, which can generate broadband noise, tonal noise and low frequency noise; and 2) Mechanical noise from the interaction of the turbine components. A dBA scale is commonly used to measure audible wind turbine noise. Low frequency noise from large wind turbines is not adequately measured with a dBA weighting. For a better assessment of the health effects from low frequency noise, the World Health Organization ("WHO") suggests using a dBC weighting. <http://www.who.int/docstore/peh/noise/guidelines2.html>
- Orleans, as well as rural areas throughout our north country with little industry and traffic, has ambient noise levels, particularly at night when people sleep, in the range of 20 - 30 dBA. This is documented in: Clif Schneider's recent Inter Noise 2009 paper "Measuring Background Noise with an Attended, Mobile Survey during Nights with Stable Atmospheric Conditions". (C Schneider Inter Noise 2009 Report.pdf)
- And "Background Sound Measurements And Analysis In The Vicinity Of Cape Vincent", New York May 11, 2009 by Schomer and Associates. Inc. (Paul Schomer Cape Vincent Measurement Report v5-2.pdf Resume Paul Schomer.pdf)
- Our own CH2MHILL report shows that even though Mark Bastasch did very limited testing he too shows Horse Creek nighttime "cut in low speed" ambient as a 28 dBA, page 14. http://www.iberdrolarenewables.us/horsecreek/AppendixI_Noise_05030/Noise_CH2MHILL_05030.pdf
- "Guideline L For Assessing The Impact Of Air-Conditioning Outdoor Sound Levels in the Residential Community" (ARI Guideline L-1997.pdf)
- National Estimate of Outdoor Background Noise Based on General Type of Community Area and Nearby Automotive Traffic Activity, Rick James. (Typical Land-Use Situations and Associated Sound dBA.pdf)

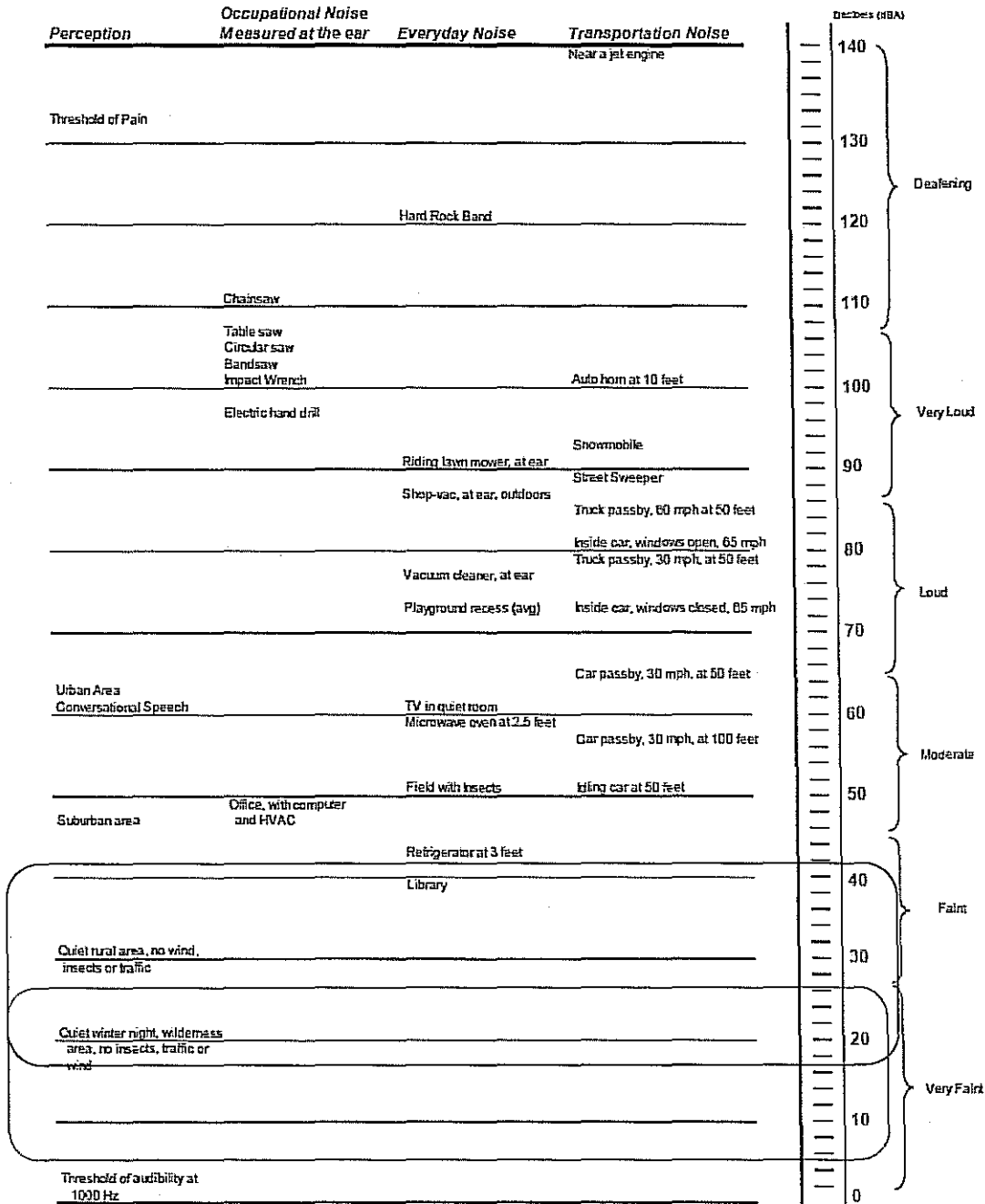
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- These facts have also been confirmed by measurements from Engineers and Professionals in Acoustics; Dr. Paul Carr, Charles Ebbing, John Earshen, Rick James and interestingly in the acoustic primer developed for use by the Wind Industry ("Noise Standards for Wind Turbines Background documents for New York" by RSG Inc Environment, Energy & Acoustics.)
- See Wind Industry Bulletin RSG INC. Noise Standards for Wind Turbines Background document for New York Feb 2009 Page 2 of (Noise_primer_for_wind_turbines.pdf).
 - This Publication lists typical ambients of:
 - Quiet rural area, no wind, insects or traffic as 30 dBA*
 - *Quiet Wilderness winter night no insects, traffic or wind 20 dBA*

The existing ambient noise levels of rural areas inside proposed Wind Farms *at night* are now *often 20-30 dBA* on clear nights with little or no wind. The wind industry will produce *45-55 dBA noise levels for 24/7 when the Turbines are working.* (Maple Ridge Clif Schneider study.pdf)

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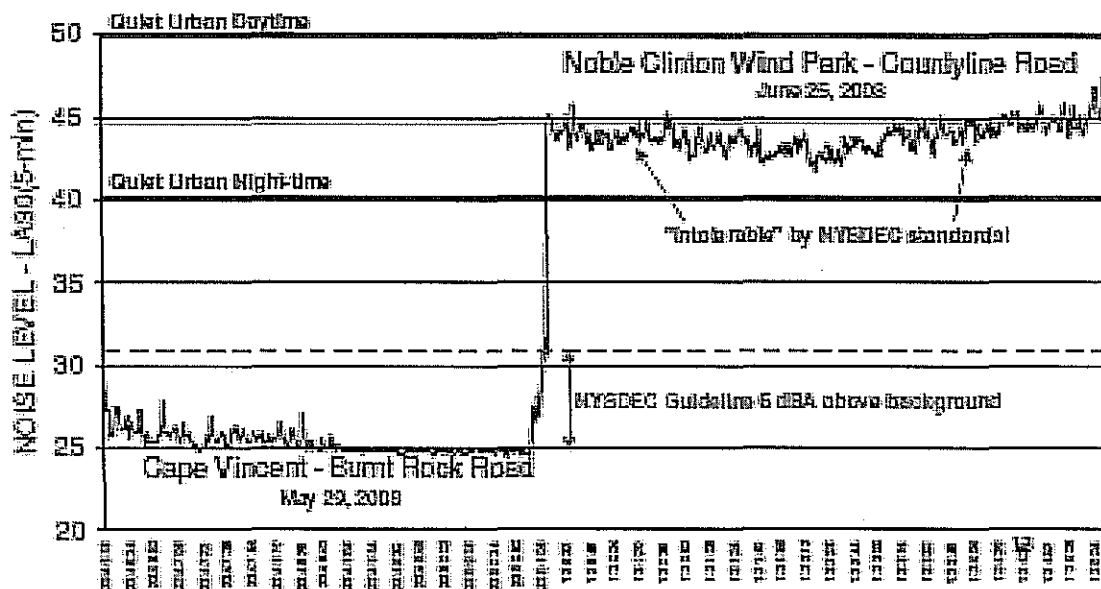
Figure 1: Basic Theory: Common Sounds in Decibels



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Typical Residual Noise Compared to Wind Farm Noise

Wind Park Impact on Rural Background Noise Calm Spring-Summer Nights at Towns of Cape Vincent and Clinton, New York



Large wind turbines create a noise annoyance that can hinder physical and mental healing and can cause adverse health effects associated with sleep disturbance and deprivation, psychological distress, stress, anxiety, depression, headaches, fatigue, tinnitus and hypertension. Wind turbine noise can affect each person differently. Some people are unaffected by wind turbine noise, while others may develop adverse health effects from the same noise. At very low frequencies, wind turbine noise may often not be heard but rather is felt as a vibration. Medical research reported complaints from people who felt the noise from large wind turbines, similar to symptoms that can be associated with vibroacoustic disease. (See Pedersen et al 3/1/2007, 8/2003, 1/11/2008 and 6/3/2008; Pedersen 2007; Mariana Alves-Pereira and Nuno Castelo Branco 9/20/2007; WHO 1999; Kamperman & James; reports by Dr. Pierpont, Dr. Harry and Dr. Leventhal, pdf)

The International Standards Organization (ISO pdf) recommends setting a base limit of 35– 40 dBA) for intruding noise and adjusting the limit by district type and

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time of day. Table 9 lists the adjusted limits from a base of 35 dBA. Notice that for Rural Districts they recommend night limit of 25 dBA.

World Health Organization Sleep Disturbance.pdf

Table 9. ISO 1996-1971 Recommendations for Community Noise Limits

District Type	Daytime Limit	Evening Limit (7 -11 PM)	Night limit (11 PM - 7 AM)
Rural	35 dB(A)	30 dB(A)	25 dB(A)
Suburban	40 dB(A)	35 dB(A)	30 dB(A)
Urban residential	45 dB(A)	40 dB(A)	35 dB(A)
Urban Mixed	50 dB(A)	45 dB(A)	40 dB(A)

NYS DEC Noise Guidelines

c. Thresholds for Significant Sound Pressure Level (SPL) Increase

The goal for any permitted operation should be to minimize increases in sound pressure level above ambient levels at the chosen point of sound reception. Increases ranging from 0-3 dB should have no appreciable effect on receptors. Increases from 3-6 dB may have potential for adverse noise impact only in cases where the most sensitive of receptors are present. Sound pressure increases of more than 6 dB may require a closer analysis of impact potential depending on existing SPLs and the character of surrounding land use and receptors. SPL increases approaching 10 dB result in a perceived doubling of SPL. The perceived doubling of the SPL results from the fact that SPLs are measured on a logarithmic scale. An increase of 10 dB(A) deserves consideration of avoidance and mitigation measures in most cases. The above thresholds as indicators of impact potential should be viewed as guidelines subject to adjustment as appropriate for the specific circumstances one encounters.

The goals of the NYS-DEC Guidelines NYS DEC (DEC noise guidelines 2001 .pdf)

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are to minimize the increase in the ambient background to not more than 3-6 dB to minimize the adverse effect of intruding noise sources. The table below was taken from the same publication. Typical human reactions to increasing the ambient noise by 5-10 dB are that the *new noise is intrusive*.

The expected frequent intrusions from the currently proposed wind farm at night in rural Orleans area, based on data taken by Clif Schneider, (Maple Ridge Clif Schneider study.pdf) in several operating wind farms is in the order of 45dB – 25dBA = 20dB with an expected *Human Reaction of Intolerable*.

Table B

HUMAN REACTION TO INCREASES IN SOUND PRESSURE LEVEL

Increase in Sound Pressure (dB)	Human Reaction
Under 5	Unnoticed to tolerable
5 - 10	Intrusive
10 - 15	Very noticeable
15 - 20	Objectionable
Over 20	Very objectionable to intolerable

(Down and Stocks - 1978)

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Conclusions:

The members of the Orleans Wind Committee unanimously agree that the most important regulation to be considered in any Local Law for Industrial Wind Turbines is the allowable noise. Our current law does not protect the residents of the Town of Orleans, and if not changed, will cause unnecessary complaints and potential health issues that could easily have been avoided with the proper regulations. Numerous studies by acoustical engineers have proven that the noise predicted by Wind Companies is often grossly underestimated due to incorrect and too few collection points, the wrong equipment and wrong time of the year. We, on this committee, sincerely hope the Town Board has trust in our recommendation that we have thoroughly studied the science and facts. The members of the wind committee cannot stress enough the need to change the noise limits and strongly suggest the amendment be written exactly as written at the end of this document to protect the residents of our Town.

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Recommendation:

The Wind Committee's consensus is that the Town of Orleans adopt a new noise ordinance in Local Law No 1 2007 for Wind Facilities that follows the spirit of the Guidelines written pro-bono by two well known and respected Acoustical Engineers, George Kamperman and Richard James put forth in the "Simple Guidelines for Siting Wind Turbines to Prevent Health Risks". Kamperman-James Ver 2.1 (Orleans) Noise Criteria for Siting Wind Turbines.pdf

Kamperman and James recommendations have 3 major parts:

- Establishing pre-construction long term background noise levels that exist now.
- Establishing wind turbine sound immersion limits that the wind farm must meet.
- Post construction wind farm noise compliance testing.

Audible Noise Limit dBA

No wind turbine or group of turbines shall be located in Town of Orleans wind district that cause an exceedance of the pre-construction night-time background sound levels by more than 5 dBA.

Test sites are to be located at the property line(s) of the receiving non-participating property(s).

Not to exceed 35 dBA (L_{Aeq}) within 100 feet of any occupied structure.

Low Frequency Noise Limit dBC

Low Frequency Noise Limit $L_{Aeq} - L_{A90} = 20$ dB or less

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NOISE CRITERIA FOR SITING WIND TURBINES TO PREVENT HEALTH RISKS²⁹

1. Establishing Long-Term Background Noise Level

- a. Instrumentation: ANSI or IEC Type 1 Precision Integrating Sound Level Meter plus meteorological instruments to measure wind velocity, temperature and humidity near the sound measuring microphone. Measurement procedure must meet ANSI S12.9, Part 3 except as noted in Section 4. below.
- b. Measurement location(s): Nearest property line(s) from proposed wind turbines representative of all non-participating residential property within 2.0 miles.
- c. Time of measurements and prevailing weather: The atmosphere must be classified as stable with no vertical heat flow to cause air mixing. Stable conditions occur in the evening and middle of the night with a clear sky and very light wind near the surface. Sound measurements are only valid when the measured wind speed at the microphone is less than 2 m/s (4.5 mph).
- d. Long-Term Background sound measurements: All data recording shall be a series of contiguous ten (10) minute measurements. The measurement objective is to determine the quietest ten minute period at each location of interest. Nighttime test periods are preferred unless daytime conditions are quieter. The following data shall be recorded simultaneously for each ten (10) minute measurement period: dBA data includes L_{A90} , L_{A10} , L_{Aeq} and dBC data includes L_{C90} , L_{C10} , and L_{Ceq} . Record the maximum wind speed at the microphone during the ten minutes, a simultaneous measurement of temperature and humidity at the microphone for each new location or each hour whichever is oftener shall also be recorded. A ten (10) minute measurement contains valid data provided: Both L_{A10} minus L_{A90} and L_{C10} minus L_{C90} are not greater than 10 dB and the maximum wind speed at the microphone is less than 2 m/s during the same ten (10) minute period as the acoustic data.

2. Wind Turbine Sound Immission Limits

No wind turbine or group of turbines shall be located so as to cause wind turbine sound immission at any location non-participating property containing a residence in excess of the limits in the following table:

Table of Not-To-Exceed Property Line Sound Immission Limits ¹			
Criteria	Condition	dBA	dBC
A	Immission above pre-construction background:	$L_{Aeq} = L_{A90} + 5$	$L_{Ceq} = L_{C90} + 5$
B	Maximum immission:	35 L_{Aeq}	55 L_{Ceq} for quiet ² rural environment 60 L_{Ceq} for rural-suburban environment
C	Immission spectra imbalance	L_{Ceq} (immission) minus (L_{A90} (background) +5) \leq 20 dB	
D	Prominent tone penalty:	5 dB	5 dB

Notes

- 1 Each Test is independent and exceedances of any test establishes non-compliance. Sound "immission" is the wind turbine noise emission as received at a property.
- 2 A "Quiet rural environment" is a location >2 miles from a major transportation artery without high traffic volume during otherwise quiet periods of the day or night.
- 3 Prominent tone as defined in IEC 61400-11. This Standard is not to be used for any other purpose.

¹ Procedures provided in Section 7. Measurement Procedures (ANSI 12.9 Part 3 with Amendments) of the most recent version of "The How To Guide To Siting Wind Turbines To Prevent Health Risks From Sound" by Kamperman and James and the apply to this table.

3. Wind Farm Noise Compliance Testing

All of the measurements outlined above in 1. Establishing Nighttime Background Noise Level must be repeated to determine compliance with 2. Wind Turbine Sound Immission Limits. The compliance test location is to be the pre-turbine background noise measurement location nearest to the home of the complainant in line with the wind farm and nearer to the wind farm. The time of day for the testing and the wind farm operating conditions plus wind speed and direction must replicate the conditions that generated the complaint. Procedures of ANSI S12.9- Part 3 apply except as noted in Section 4. The effect of instrumentation limits for wind and other factors must be recognized and followed.

Initial Report Wind Committee Findings And Recommendations

2. Wind Turbine Sound Immission Limits

No wind turbine or group of turbines shall be located so as to cause wind turbine sound immission at any location on non-participating property containing a residence in excess of the limits in the following table:

Table of Not-To-Exceed Property Line Sound Immission Limits ¹			
Criteria	Condition	dBA	dBC
A	Immission above pre-construction background:	$L_{Aeq} = L_{ASD} + 5$	$L_{Ceq} = L_{CSD} + 5$
B	Maximum Immission:	$35 L_{Aeq}$	55 L_{Ceq} for quiet ² rural environment 60 L_{Ceq} for rural-suburban environment
C	Immission spectra imbalance	L_{Ceq} (immission) minus (L_{ASD} (background) +5) ≤ 20 dB	
D	Prominent tone penalty:	5 dB	5 dB
Notes			
1	Each Test is independent and exceedances of any test establishes non-compliance. Sound "immission" is the wind turbine noise emission as received at a property.		
2	A "Quiet rural environment" is a location >2 miles from a major transportation artery without high traffic volume during otherwise quiet periods of the day or night.		
3	Prominent tone as defined in IEC 61400-11. This Standard is not to be used for any other purpose.		
¹ Procedures provided in Section 7. Measurement Procedures (ANSI 12.9 Part 3 with Amendments) of the most recent version of "The How To Guide To Siting Wind Turbines To Prevent Health Risks From Sound" by Kamperman and James and the apply to this table.			

C. Complaint Resolution Recommendations

A major concern found by the members of this committee is that residents who live in wind developments state that towns and developers ignore and do not take serious their complaints.

After discussion by the Orleans Wind Committee members, we have agreed to and suggest the town add to Local No 1 2007 the following procedures for the handling of complaints by residents. Each complaint will have different fines and time frames for mitigation dependent on which section of the Local law has been violated. Below are the suggested fines and time frames for each violation.

Since there have been many townships that did not have a complaint process in place and residents have been ignored by the licensee with no help from the towns, the following process should make the developers accountable.

Initial Report Wind Committee Findings And Recommendations

This committee believes that if the Safety Setback and Noise recommendations by this Wind Committee are adapted to our Local Law, the complaints by citizens in the Town Orleans should be very minimal.

The Orleans Wind Committee recommends the following:

The Town Board shall select four residents from the Town of Orleans to serve as a Complaint Board. In addition to the four residents there shall be one member of the Town Board, Planning Board and Zoning Board of Appeals.

The WECS licensee will keep in an interest bearing escrow account, at a local bank, the amount of \$100,000.00 in which to pay for the services of experts that may be employed by the Town to study or verify complaints by non participating residents. The balance of \$100,000.00 will be maintained at all times and the Town will control the use of the funds.

Should a non-participating resident have a complaint against the WECS licensee, they shall first bring their complaint to the Town Clerk who will notify the Town Board. The Town Board will refer the complaint to the Complaint Board. If the complaint Board finds it to be valid, they will notify the WECS licensee of the complaint. The licensee shall have the opportunity to mitigate the complaint. The time frame of mitigation and any fines assessed will be dependent on the nature of the complaint and how it is specified in this local law. The complaints may include, but will not be limited to: excessive noise, flicker or shadow effect, change in water quantity or quality, loss of or diminished telephone, TV, radio reception, interference with a medical device, changes in value to the residence, new presence of radon gas. Should it be necessary for the complaint to be verified by an expert, the Town shall select and employ a non biased firm to do testing, collect data or whatever else may be deemed necessary to determine the validity of the complaint. The funds for payment of these services will come from the established escrow account.

Should the WECS licensee be unable to mitigate the complaint in the time frame established for each complaint per the local law, fines to the Town and payments to the resident will be made by the licensee at the direction of the Complaint Board.

Initial Report Wind Committee Findings And Recommendations

Recommendations for consideration of Compliance process on the following categories:

1. Shadow Flicker Complaint Resolution Process:

If a written complaint along with a video is received by the Town Complaint Resolution Board (CRB) from a non-leaser identifying said turbine(s) (number) in the wind development project with a complaint of impact disturbance caused by shadow flicker the developer is to be notified within 72 hours by the CRB. The developer must then mitigate the complaint within 48 hours, if not sooner. This can be accomplished by shutting down of said offending turbine(s) during peak flicker hours. If the developer does not comply within said time limits, the Town Board will impose a fine of no less than \$500.00 per day, starting from first day of complaint, and no more than \$1000.00 per day, starting from first day of complaint. If not mitigated in seven days from date developer is notified, or at Towns discretion, permit to operate said turbines in question will be withdrawn.

2. Setbacks Complaint Resolution Process:

If a written complaint is received by the Town Complaint Resolution Board (CRB) from a non-leaser in the wind development project identifying that a setback requirement was non-compliant and found to be valid, meaning said setback does not meet requirement in the local law/ordinance the developer must comply immediately to correct the non-compliant problem. If the developer fails to comply, the Town will either fine developer not less than \$1,000.00 per day of violation and/or revoke the permit to operate.

3. Noise/Sleep Interference Complaint Resolution Process:

If a written complaint with a recorded time noise log of turbine(s) is made to the Town Complaint Resolution Board (CRB) from a non-leaser in the Town of Orleans with a charge of a noise disturbance the Town will notify the developer within five days after verification of said complaint. The Town may retain an independent acoustic investigation paid for with the funds in the escrow account, for verification. Copy of acoustic investigation will be given to person making complaint, the Town and the developer. If the developer is found to be non-compliant with the Town's local law noise ordinance, the developer will be made to shut down the turbine(s) during normal sleep hours, hours to be set by Town Board in the local law. Also if said complaint is found to be in non-compliance of

Initial Report Wind Committee Findings And Recommendations

local law/noise ordinance, the developer will be fined not less than \$500.00 per day, starting from the first day of complaint and not more than \$1000.00 per day for each turbine in non-compliance and/or revoke permit to operate.

4. Electromagnetic/Stray Voltage Complaint Resolution Process:

If a written complaint is received by the Town Complaint Resolution Board (CRB) from a resident due to an electromagnetic inference or stray voltage, the town will notify the developer within 48 hours of the complaint. The Town will hire a stray voltage investigation or electromagnetic interference investigation by a certified electrical engineer, at the costs of the developer, to validate said complaint. Should the complaint be valid, the developer will have one week (7 days) to rectify complaint. Should developer fail to satisfy complaint in this time frame, the fine would be, not less than \$500.00 per day, starting the first day of the complaint and not more than \$1000.00 per day, per turbine found in violation.

5. Protection of Aquifers, Ground Water and Wells:

If a complaint (either written or phoned in) is received by the Town Complaint Resolution Board (CRB) from a resident for disturbance of an aquifer, ground water or well water, the Town will notify the developer the same day. Water is a most basic need. The developer will have 24 hours to verify the complaint is due to development impact. If developer is the fault of the complaint the developer must make portable water available to resident(s) immediately along with a course of action to resolve the complaint.

If the developer determines the complaint is not related to the development, the Town may choose to hire a qualified engineer at the expense of the developer, to verify validity of the complaint. If the complaint is verified that the well is toxic then the developer and/or town is to notify the Department of Conservation (NYS DEC) immediately of such occurrence/accident. If such accident is under the jurisdiction of the NYS DEC policies then the NYS DEC will follow their protocol for correcting this occurrence. If the occurrence is not of a toxic contaminated spill then the developer will have five days after receiving findings that they are at fault of this disturbance to rectify the complaint. If developer fails to comply, the fine will be not less than \$1000.00 per day, starting from day of complaint and not more than \$2000.00 per day starting from the first day of complaint. These fines will be paid to the land owner that filed complaint. If a satisfactory solution cannot be made to rectify situation, the developer will be required to purchase the landowners property at fair market value, set prior to start of construction.

Initial Report Wind Committee Findings And Recommendations

The consensus of the committee is that all fines be paid to the Town of Orleans in all cases except the cases with well water impacts. Those fines that may be levied will go to the landowner only.

The Town does have the option of setting an additional fine to the developer as well.

IX. Catalog of Referenced Document Attachments

(Research is listed according to categories)

Numerous documents were reviewed by the committee to substantiate the committee's conclusion for the recommendation. (See Chapter IX) The committee offers the council two formats for referencing the documents; hardcopy and a CD.

Hardcopies are provided in a *separate catalog* of documents listed under each category of discussion. Each URL is referenced in dark blue and underlined. Each document referenced in light blue indicates the document is a pdf and on a CD disk.

A Shadow Flicker & Safety Setbacks

- A:1 Wind Energy Handbook, Burton, Sharpe, Jenkins, Bossanyi, Wiley & Sons Ltd, New York, 2001 pg. 527, (pdf)
- A:2 Ice Throw: Page 22-23 bethany-windturbinestudycommittteereport.(pdf)
- A:3 Taylor & Rand 1991 Guidelines for Wind Energy:(pdf),
[http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines_2007_WindEnergy/\\$FILE/Final+-+Wind+Energy.pdf](http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines_2007_WindEnergy/$FILE/Final+-+Wind+Energy.pdf)
- A:4 Vestas_complete_manual 400 ft tall. (pdf)
- A:5 High Wind Failure "Bethany Report" Page 20 (pdf)
- A:6 "Danish turbine failure": Endelig redegørelse for haveriforløb ved Halling og Sidinge2 (pdf)

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- A:7 "Image Shadow Casting from Wind Turbines" is available at <http://www.windpower.org/en/tour/env/shadow/index.htm>
- A:8 "Health, Hazard and Quality of Life Near Wind Power Installations: How Close is Too Close?" By Nina Pierpont, MD, PhD. An analysis of health risks near WECS facilities.(pdf)
- A:9 Michigan State University; "Wind Turbine Acoustic Noise White Paper" (pdf) (<http://web1.msue.msu.edu/cdnr/otsegowindflicker.pdf>)
- A:10 "Wind Farmer: The Wind Farm and Design and Optimization software" (www.garradhassan.com/windfarmer/flicker.htm).
- A:11 "WindFarm from ReSoft" (<http://members.aol.com/resoft/shadflick.htm>)
- A:12 Shadow calculator on the Danish wind power site (copyright protected) www.windpower.dk/tour/env/shadow/shadowc.htm
- A:13 "Photosensitive Epilepsy - Other Possible Triggers" by Professors G Harding (Aston University, England) and S Seri, 28 October 2005. Recommendations on lower limits for wind turbine shadow flicker.(pdf)
- A:14 "Public Health Impacts of Wind Turbines", Minnesota Dept of Health 2009 (pdf)

B: NOISE/Sleep Interference References

- B1: Orleans Noise Ordinance in Local Law No 1 2007 for Wind Facilities (pdf)
- B:2 Clayton Tocci Report & Summary.pdf Report on Clayton Farm Project, Clayton, NY, Report date 2/15/08; "Comments on Noise Analysis PPM Clayton Wind Farm" and Report date 8/25/08; "Executive Summary" (pdf)
- B:3 Charles Ebbing "Presentation to Orleans CWC/Public and Town Boards on Wind Farm Noise" (pdf)
- B:4 World Health Organization ("WHO") suggests using a dBC weighting.(pdf) <http://www.who.int/docstore/peh/noise/guidelines2.html>

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- B:5 "Measuring Background Noise with an Attended, Mobile Survey during Nights with Stable Atmospheric Conditions". C Schneider Inter Noise 2009 Report (pdf)
- B:6 "Background Sound Measurements And Analysis In The Vicinity Of Cape Vincent", New York May 11, 2009 by Schomer and Associates. Inc. Paul Schomer Cape Vincent Measurement Report v5-2.(pdf)
Resume Paul Schomer.(pdf)
- B:7 "Guideline L For Assessing The Impact Of Air-Conditioning Outdoor Sound Levels in the Residential Community" ARI Guideline L-1997.(pdf)
- B:8 National Estimate of Outdoor Background Noise Based on General Type of Community Area and Nearby Automotive Traffic Activity, Rick James. "Typical Land-Use Situations and Associated Sound dBA" (pdf)
- B:9 Wind Industry Bulletin RSG INC. "Noise Standards for Wind Turbines Background document for New York Feb 2009" (pdf) page 2 of Noise_primer_for_wind_turbines.pdf
- B:10 "Maple Ridge Post Construction Noise Study" Cliff Schneider study (pdf)
- B:11 "World Health Organization Sleep Disturbance" (pdf)
<http://www.who.int/docstore/peh/noise/guidelines2.html>
- B: 12 International Standards Organization (ISO) recommendations; "1996-1971 report Table 9" (pdf)
- B:13 New York State DEC's report Assessing and Mitigating Sound Impacts DEC guidelines noise2000 (pdf)
<http://www.dec.ny.gov/regulations/2374.html>
- B:14 Kamperman & James October 28, 2008 Version 2.1 "The How To Guide to Criteria For Siting Wind Turbines to Prevent Health Risks From Sound" 08-11-02 Kamperman-James Ver 2 1 (Orleans) Noise Criteria for Siting Wind Turbines 2.1 (pdf)
<http://www.myotherdrive.com/dyn/pv/547.570910.02122008.28928.6a64fi/How%20to%20Guide%20for%20Siting%20Wind%20Turbines%20Kamperman%20and%20James.pdf?sort=0>

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- B:15 Town of Clayton (Lead Agent) "Horse Creek Noise Analysis called CH2MHILL Report" (includes portions of Orleans Township) (pdf)
http://www.iberdrolarenewables.us/horsecreek/AppendixI_Noise_05030/Noise_CH2MHILL_05030.pdf
- B:16 Fritz Van den Berg, G.P. 2003 Paper ID 160 "Wind Turbines at Night: Acoustical Practice and Sound Research" Effects of wind farm at night (pdf)
<http://www.myotherdrive.com/dyn/pv/500.431610.02122008.29196.6a64fi/g.p.%20van%20den%20berg%20effects%20of%20wind%20profile%20at%20night.pdf?sort=0>
- B:17 "Environmental Protection Agency Identifies Noise Levels Affecting Health and Welfare"; Noise Control Act of 1972 and the Quiet Communities Act of 1978: (pdf) <http://www.nonoise.org/library/envnoise/index.htm>
- B:18 "Environmental impacts of wind-energy projects" (pdf) :
<http://www.nap.edu/catalog/11935.html> planning for and regulating wind-energy development 209
- B:21 Dr. Alves-Pereira and Dr. Nuno Branco; "Wind Turbine Noise is Conducive to Vibroacoustic Disease" September 20, 2007 (pdf)
[http://www.garyabraham.com/files/wind/Public health and noise exposure.pdf](http://www.garyabraham.com/files/wind/Public%20health%20and%20noise%20exposure.pdf)
- B:19 Dr. Amanda Harry, "Wind Turbines, Noise and Health" February 2007 (pdf)
http://www.windturbinenoisehealthhumanrights.com/wtnoise_health_2007_a_barry.pdf
- B:20 Geoff Leventhall, (pdf) "Published Research on Low Frequency Noise and Its Effects" Department for Environment UK 2003
- B:21 Rick Bolton Acoustics; Bolton Report: (pdf) "Review of PPM energy noise assessment" <http://www.garyabraham.com/ECCOdocs.html>
- B:22 UK Noise Association, pdf "Location, Location, Location": An Investigation Into Wind Farms and Noise (2006) (pdf)
<http://www.garyabraham.com/ECCOdocs.html>

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- B:23 "Industrial Wind Power Plants Public Participation and the Legal Requirements that Apply"
[http://www.garyabraham.com/files/Industrial Wind Power Plants OUTLINE_8-13-07.pdf](http://www.garyabraham.com/files/Industrial_Wind_Power_Plants_OUTLINE_8-13-07.pdf)
- B:24 "Noise Radiation from Wind Turbines Installed Near Homes: Effects on Health." with an annotated review of the research and related issues by Barbara J Frey, BA, MA and Peter J Hadden, BSc, FRICS (pdf)
http://www.windturbinenoisehealthhumanrights.com/wtnhhr_june2007.pdf
- B:25 "Communicating the Noise Effects of Wind Farms" by Christopher Bajdek (pdf)
http://www.myotherdrive.com/dyn/pv/313.090310.02122008.28663.6a64fi/Bajdek_NC07.pdf?sort=0
- B:26 AEI Special Report: "Wind Energy Noise Impacts" (pdf)
<http://www.acousticecology.org/srwind.html>
- B:27 Presentations to Wind Committee
Charles Ebbing, Acoustic Engineer pdf Resume pdf
Richard R. James, E-Coustic Solutions Resume
Dr. Paul Carr, Engineer Resume
Clifford P. Schneider "Accuracy of Model Predictions and the Effects of Atmospheric Conditions" pdf

C Referenced: Community Wind Law/Ordinances

- C:1 Town of Union Rock County, Wisconsin Ordinance No 2008-06 (pdf)
<http://betterplan.squarespace.com/town-of-union-wind-ordinance/>
- C:2 Town of Lyme NY Wind Ordinance 2008 (pdf)
<http://www.townoflyme.com/old%20site/forms/Windlaw.htm>
- C:3 Trempeleau County Chapter 21 Law (pdf)
<http://betterplan.squarespace.com/the-trempeleau-county-wind-ord/>

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- C:4 Town of Allegany, New York Wind Energy Regulations Aug 2007 (pdf)
http://www.garyabraham.com/files/wind_laws/town_allegany_wind_energy_law_adopted_8-28-07.pdf
- C:5 Town of Orleans, Local Law No 1 2007 for Wind Facilities (pdf)

D Referenced: Communities: Citizens Moratorium and/or Wind Committee Reports

- D: 1 The Bethany Report Citizens Wind Committee pdf
<http://www.townofbethany.com/other%20pdf%20files/Wind%20Turbine%20Committee%20Report.pdf>
- D:2 Town of Union Large Wind Turbine Citizens Committee Report "setback and noise recommendations (347 pages) pdf
<http://betterplan.squarespace.com/town-of-union-final-report/>

E Research Wind Industry Websites

- E:1 NYSERDA: <http://www.nyserda.org/>
- E:2 AWEA: <http://www.awea.org/>

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The wind committee struggled with how best to describe the requirements for noise limitations that would protect people living in and adjacent to wind turbines. Understanding the overall noise concepts to accomplish this was presented in the first part of this report. ***Codifying*** these ideas into "written language" in the wind ordinance will be the difficult part for the Board. To that end, this committee includes Chapter X: ***a reference of Suggested Wording to aid this Board.***

We have included a table of contents which gives a clearer overview of the subjects that should be included to achieve the ***spirit*** of the Findings and Recommendations on Noise.

X: Suggested Wording for an Orleans Wind Ordinance That Follows the Spirit of the Wind Committee Findings and Recommendations

The Town of Orleans appointed a Wind Committee that has been meeting since January 15, 2009 to study and recommend Health and Safety aspects of Wind Energy Systems and make written recommendations to the Town Boards in order that they may expeditiously update the existing Wind Ordinance.

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TOWN OF ORLEANS WIND ENERGY SYSTEMS LICENSING ORDINANCE

RECITALS

WHEREAS, the Town of Orleans appointed an Orleans Citizens Wind Committee on Jan 15, 2009 to study and research Orleans present Local Law No 1 2007 for Wind Facilities on Health and Safety requirements and make written recommendations to the Town Board for amendments to adopt.

WHEREAS, the Orleans Wind Committee held public meetings from Jan 15, 2009 through July 2009 to research the health and safety effects of large wind turbines.

WHEREAS, reputable studies and research projects have been conducted regarding the Health and Safety aspects of Large Wind Turbines.

WHEREAS, the Orleans Wind Committee researched and reviewed many documents related to the sighting of large wind turbines, including but not limited to the following documents, reports and studies have been determined by the Town Board to be reasonably accurate, reliable and relevant to the health and safety effects of large wind turbines:

REFERENCES:

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<http://betterplan.squarespace.com/town-of-union-final-report/>

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Initial Report Wind Committee Findings And Recommendations

PURPOSE AND INTENT

Suggestions for revising Orleans Local Law No 1 2007 for Wind Facilities

This committee has identified a list of significant issues/concerns that are inadequate nor have been addressed in the Orleans present wind and should be considered in revising Orleans Local Law No 1 2007 for Wind Facilities.

A. License Required For Wind Energy System

No Wind Energy System over 100 KW shall be constructed or operated in the Town without first obtaining a WES License in accordance with this Ordinance.

APPLICATION AND LICENSING REQUIREMENTS AND STANDARDS

Sound Modeling, Sound Standards and Sound-Related Enforcement Procedures.

B. Applicant's Pre-licensing Sound Studies and Modeling

An application for a CEF License shall include a sound prediction model that includes the information and meets the requirements in section _____ (insert section) of this ordinance:

Information regarding the make and model of the turbines, Sound Power Levels (Lw) for each one-third octave band from 6.3 Hz up through 10,000 Hz, and a projection showing the expected dBA and dBC sound levels computed using the one-third octave band sound power levels (Lw) with appropriate corrections for modeling and measurement accuracy tolerances and directional patterns of the WTi for all areas within and to one (1) mile from the project boundary for the wind speed, direction and operating mode that would result in the worst case WTi sound emissions.

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The prediction model shall assume that the winds at hub height are sufficient for the highest sound emission operating mode even though the enforcement tests will be with ground level winds of 10 mph or less. This is to accommodate enforcement under weather conditions where there is significant difference in the wind speed between ground and hub heights. This condition often occurs during summer evenings when wind shear is affected by the reduction in solar heating of the earth's surface between sunset and sunrise.

The projection may be by means of computer model but shall include a description of all assumptions made in the model's construction and algorithms. If the model does not consider the effects of wind direction, geography of the terrain, and/or the effects of reinforcement from coherent sounds or tones from the turbines these should be identified and other means used to adjust the model's output to account for these factors. These results may be displayed as a contour map of the predicted levels, but should also include a table showing the predicted levels at noise-sensitive receptor sites and residences within the model's boundaries. The predicted values must include dBA and dBC values but shall also include un-weighted octave band sound pressure levels from 8 Hz to 10k Hz in data tables.

The Town will refer the applicant's information and sound studies to the Town engineer (if qualified in acoustics) or an Qualified Independent Acoustical Consultant for review and a determination whether the proposed WES will, based on pre-licensing studies and sound modeling, comply with the sound limits set forth in this Ordinance.

C. Independent Pre-licensing Sound Modeling

In any case in which a WES is located within one mile of a sensitive receptor the Town shall, and in other cases the Town may, require the preparation of an independent preconstruction noise study for each proposed Wind Turbine location conducted by a Qualified Independent Acoustical Consultant, in accordance with the procedures provided in this section and in the Appendix showing background dBA and dBC sound levels (L90 (10min)) over one or more valid ten (10) minute continuous measurement periods. The preconstruction baseline studies shall be conducted by an Independent Qualified Acoustical Consultant selected by the Town. The Qualified Independent Acoustical Consultant shall be selected and retained by the Town. The applicant shall be

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responsible for paying the Independent Qualified Acoustical Consultant's fees and all costs associated with conducting the study. The applicant shall provide financial security and reimburse the Town for the cost of the study in accordance with section _____ (insert section) of this ordinance.

D. Sound Limits.

No license shall be issued unless the pre-licensing information and sound modeling shows that the proposed WES will comply with the following sound limits and requirements.

1. Audible Sound Limit

No WTi or WES shall be located so as to cause an exceedance of the preconstruction/operation background sound levels by more than 5 dBA. The background sound levels shall be the L90A sound descriptor measured during a preconstruction noise study during the quietest time of night (10pm until 4am). All data sampling shall be one or more contiguous ten (10) minute measurements. L90A results are valid when L10A results are no more than 10 dBA above L90A for the same time period and L10C less L90C is no more than 15 dBC. Noise sensitive sites are to be selected based on wind development's predicted worst-case sound emissions (in LeqA and LeqC) which are to be provided by Applicant.

Test sites are to be located along the property line(s) of the receiving nonparticipating parcels.

A 5 dB penalty is applied for tones as defined in IEC 61400-11.

2. Low Frequency Sound Limit

The LeqC and L90C sound levels from the wind turbine at the receiving property shall not exceed the lower of either:

LeqC-L90A greater than 20 dB outside any occupied structure, or

A maximum not-to-exceed sound level of 50 dBC (L90C) from the wind turbines without contribution from other ambient sounds for properties located one mile or

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more away from state highways or other major roads or 55 dBC (L90C) for properties closer than one mile from a state highway or other major road.

These limits shall be assessed using the same nighttime and wind/weather conditions required in section _____ (insert section(s)). Turbine operating sound emissions shall represent worst case sound emissions for stable nighttime conditions with low winds at ground level and winds sufficient for full operating capacity at the hub.

General Standard

Not to exceed 35 dBA_{Leq 10 min.} within 100 feet of any occupied structure.

Sound Study and Measurement Requirements.

All instruments must meet ANSI or IEC Type 1 Precision integrating sound level meter performance specifications.

Procedures must meet ANSI S12.9 Part 3 including the addendum in the Appendix to this document. Where there are differences between the procedures and definitions of this document and ANSI standards the procedures and definitions of this document shall be applied. Where a standard's requirements may conflict with other standards the most stringent requirement shall apply.

Measurements for background sound levels shall be made when ground level winds are 2 m/s (4.5 mph) or less with wind speeds at the hub at or above nominal operating requirements and for other tests when ground level winds are 4 m/s (9 mph). Weather in the night often results in low ground level wind speed and nominal operating wind speeds at wind turbine hub heights.

IEC 61400-11 procedures are not suitable for enforcement of these requirements except for the presence of tones.

E. Post-construction Sound Measurements

Within twelve months after the date when the project is fully operational, and within four weeks of the anniversary date of the pre-construction background noise measurements, the Licensee shall repeat the existing sound environment measurements taken before the project approval. Post-construction sound level

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measurements shall be taken both with all WES's running and with all WES's off. At the discretion of the Town, the preconstruction background sound levels (L90A) can be substituted for the "all WES off" tests if a random sampling of 10% of the pre-construction study sites shows that background L90A and C conditions have not changed more than +/- 5 dB (dBA and dBC) measured under the preconstruction nighttime meteorological conditions. The post-construction measurements shall be reported to the Town (and available for public review) using the same format as used for the preconstruction sound studies. Post-construction noise studies shall be conducted by a firm chosen by the Town. Costs of these studies shall be reimbursed by the Licensee. The security required by section _____ (insert section) shall include these costs. The Licensee's consultant may observe the Town's consultant. The WES Licensee shall provide all technical information and wind farm data required by the Independent Qualified Acoustical Consultant before, during, and/or after any acoustical studies required by this document and for local area acoustical measurements.

F. Site Plan and Set-Back Requirements.

Site Plan Requirements. An application for a CEF License shall include a site plan containing the following information and meeting the following requirements:

The boundaries of all Project Parcels and Participating Parcels.

The boundaries of all Non-Participating Parcels located within 3,000 feet of any boundary of a Project Parcel.

The names, addresses and phone numbers of the owners of all Project Parcels, Participating Parcels, and Non-Participating Parcels located within 3,000 feet of any boundary of a Project Parcel.

An aerial photo showing all Project Parcels, Participating Parcels, and Non-Participating Parcels located within 3,000 feet of any boundary of a Project Parcel.

Existing zoning of each Project Parcel and all required zoning setbacks on each Project Parcel.

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The proposed location of all components of the proposed CEF, including but not limited to the wind turbine, tower, access roads, control facilities, meteorological towers, maintenance and all power collection and transmission systems.

The location and description of all structures located on Project Parcels, Participating Parcels, and any Non-Participating Parcel located within 3,000 feet of any boundary of a Project Parcel.

The location of all above-ground utility lines, telephone lines, and railroad rights-of-way located within 3000 feet of, or six times the diameter of rotor blades of a proposed Wind Turbine, whichever is greater.

The location of all public roads located within 3000 feet of, or six times the diameter of rotor blades of a proposed Wind Turbine, whichever is greater.

Dimensional representation and sizes of the structural components of the tower construction including the base, footings, tower, and blades.

The distance between each WES tower and each of the following shall be shown on the site plan: structures on all Project Parcels and Participating Parcels; structures on all Non-Participating Parcels located within 3,000 feet of any boundary of a Project Parcel; above ground utility lines, telephone lines, railroad rights of way, and public roads located within 3000 feet of, or six times the diameter of rotor blades of any proposed Wind Turbine, whichever is greater.

Schematic of electrical systems associated with the proposed CEF including all existing and proposed electrical connections.

Manufacturer's specifications and installation and operation instructions.

The size and scale of the site plan shall be as determined by the Town engineer. The scale map shall include a north arrow, the date, the scale, and reference to a section corner.

The site plan shall include such additional information as the Town engineer or Town Board may require.

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NOTE: This committee has recommended to the Town Board a solution to handle resident's complaints (Section VIII. C) Orleans Complaint Resolution Board. In addition, the following are examples of complaint and permit violations to assist the town in implementing language into the local law:

The Town Board shall retain continuing jurisdiction to modify, suspend or revoke all CEF Licenses in accordance with this section. Such authority shall be in addition to the Town's authority to prosecute violations and take other enforcement action.

In this section, "violation" means a violation of this Ordinance, or a violation of a CEF License issued under this Ordinance, or a violation of a CEF License Agreement entered into under this Ordinance.

Any resident of the Town or Town official may file a written complaint with the Town Clerk alleging that a CEF Licensee has committed or is committing a violation. Such complaints shall be forwarded to the Orleans Wind Turbine Complaint Board.

The Orleans Wind Turbine Complaint Board shall preliminarily review the complaint. In connection with its preliminary review, they may require the Town building inspector, engineer, attorney or other person or persons to conduct such investigations and make such reports as the Town Plan Board may direct. The Plan Board may request information from the holder of a CEF License, the complainant, and any other person or entity to assist with its preliminary review.

Following its preliminary review, the Orleans Wind Turbine Complaint Board may:

Dismiss the complaint;

Refer the complaint to the Town attorney for prosecution; or

Conduct a hearing to determine whether the alleged violation(s) have occurred, and what remedial action should be taken. Prior to such hearing, notice of the hearing shall be given to the holder of the CEF Licensee and the complainant, and in accordance with the Open Meeting Law. The holder of the CEF License and the complainant, and any other person, may appear at the hearing and may offer testimony and other relevant evidence, and may be represented by any attorney. If the Orleans Wind Turbine Complaint Board concludes that violations have occurred, the Board may:

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Impose conditions on the CEF License to the extent reasonably necessary to discontinue the violation(s) or avoid any recurrence thereof; or

Suspend the CEF License until such time as the CEF License holder presents a plan, satisfactory to the Planning Board that will discontinue the violation(s) or prevent any recurrence thereof, and on such further conditions as the Town Planning Board deems appropriate to discontinue and prevent further violations; or

Revoke the CEF License and direct decommissioning of the CEF, if the Town Planning Board concludes that no reasonable modification can be made to the CEF to discontinue or prevent violations; or

Refer the matter to the Town attorney for prosecution, subject to Town Board approval; or

Take no action, if the Town Planning Board concludes that no further action is needed to discontinue or prevent violations, and that prosecution is unwarranted.

Following any such hearing, the Planning Board's written decision shall be furnished to the CEF License holder and to the complainant. An appeal from a decision of the Town Planning Board may be taken to the Town Board as provided in this section.

An appeal from the decision of the Orleans Wind Turbine Complaint Board may be taken to the Town Board by the CEF License holder or a complainant. Such appeal must be in writing and must specify the grounds thereof, and must be filed with the Town Clerk within ten days after the final action of the Orleans Wind Turbine Complaint Board. The Town Clerk shall provide any appeal to the Town Board. The Town Board shall fix a reasonable time for the hearing of the appeal, and shall give public notice thereof as well as due notice to the CEF Licensee and the complainant. The action of the Orleans Wind Turbine Complaint Board shall be sustained unless the Town Board, by a favorable vote of the majority of all members of the Town Board, reverses or modifies the Town Planning Board's determination. An appeal from a decision of the Town Board shall be by certiorari review, which shall be commenced within 30 days after the decision of the Town Board.

G. Introduction

The potential impact of sound and sound induced building vibration associated with the operation of wind powered electric generators is often a primary concern for citizens living near proposed wind energy systems (WES(s)). This is especially true of projects located near homes, residential neighborhoods, businesses, schools, and hospitals in quiet residential and rural communities. Determining the likely sound and vibration impacts is a highly technical undertaking and requires a serious effort in order to collect reliable and meaningful data for both the public and decision makers.

This protocol is based in part on criteria published in American National Standards S12.9 - Quantities and Procedures for Description and Measurement of Environmental Sound, and S12.18 and for the measurement of sound pressure level outdoors.

The purpose is to first, establish a consistent and scientifically sound procedure for evaluating existing background levels of audible and low frequency sound in a WES project area, and second to use the information provided by the Applicant in its Application showing the predicted over-all sound levels in terms of dBA and dBC¹ as part of the required information submitted with the application.

These values shall be presented as overlays to the applicant's iso-level plot plan graphics (dBA and dBC) and in tabular form with location information sufficient to permit comparison of the baseline results to the predicted levels. This comparison will use the level limits of the ordinance to determine the likely impact operation of a new wind energy system project will have on the existing community soundscape. If the comparison demonstrates that the WES project will not exceed any of the level limits the project will be considered to be within allowable limits for safety and health. If the Applicant submits only partial information required for this comparison the application cannot be approved. In all cases the burden to establish the operation as meeting safety and health limits will be on the Applicant.

¹ Calculated from one-third octave band sound power levels (LW per IEC 61400-11) provided by the wind turbine manufacturer covering the frequency range from 6.3 Hz to 10,000 HZ or higher.

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Next it addresses requirements for the sound propagation model to be supplied with the application.

Finally, if the project is approved, this Appendix covers the study needed to compare the post-build sound levels to the predictions and the baseline study. The level limits in the ordinance apply to the post-build study. In addition, if there have been any complaints about WES sound or low frequency noise emissions by any resident of an occupied dwelling that property will be included in the post-build study for evaluation against the rules for sound level limits and compliance.

The characteristics of the proposed WES project and the features of the surrounding environment will influence the design of the sound and vibration study. Site layout, types of WES(s) selected and the existence of other significant local audible and low frequency sound sources and sensitive receptors should be taken into consideration when designing a sound and vibration study. The work will be performed by an independent qualified acoustical consultant for both the pre-construction background and post-construction sound studies as described in the body of the ordinance.

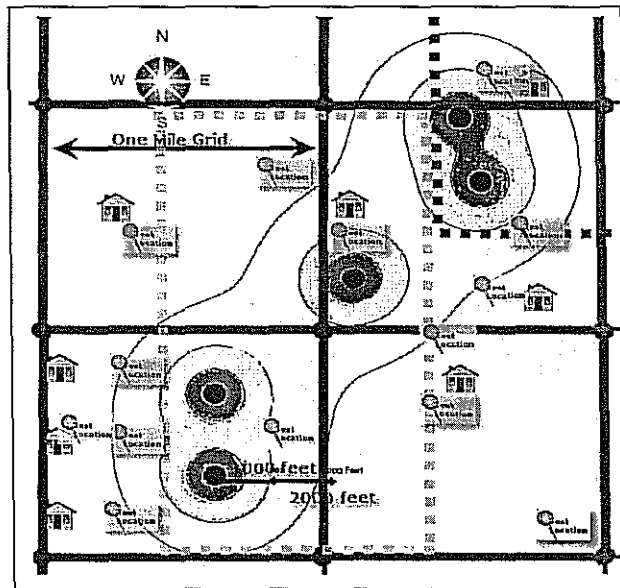
H. Instrumentation

All instruments and other tools used to measure audible, inaudible and low frequency sound shall meet the requirements for ANSI or IEC Type 1 Integrating Averaging Sound Level Meter with frequency range from 6.3 Hz to 20k Hz and capability to simultaneously measure dBA LN and dBC LN. The instrument must also be capable of measuring low level background sounds down to 20 dBA. Measurements shall only be made with the instrument manufacturer's approved wind screen. A compatible acoustic field calibrator is required with certified ± 0.2 dB accuracy. Portable meteorological measurement requirements are outlined in ANSI S12.9 Part 3 and are required to be located within 5m of the sound measuring microphone. The microphone shall be located at a height of 1.2 to 1.5 meters for all tests unless circumstances require a different measurement position. In that case, the reasons shall be documented and include any adjustments needed to make the results correspond to the preferred measurement location.

I. Measurement of Pre-Construction Sound Environment (Base-lines)

An assessment of the proposed WES project areas existing sound environment is necessary in order to predict the likely impact resulting from a proposed project. The following guidelines must be used in developing a reasonable estimate of an area's existing background sound environment. All testing is to be performed by an independent qualified acoustical consultant approved by the Town. The WES applicant may file objections detailing any concerns it may have with the Town's selection. These concerns will be addressed in the study. Objections must be filed prior to the start of the noise study. All measurements are to be conducted with ANSI or IEC Type 1 certified and calibrated test equipment per reference specification at the end of this Appendix. Test results will be reported to the Town or its appointed representative.

Sites with No Existing Wind Energy Systems (Base-line Sound Study)



J. Sound level measurements shall be taken as follows:

The results of the model showing the predicted worst case dBA and dBC sound emissions of the proposed WES project will be overlaid on a map (or separate dBA and dBC maps) of the project area. An example (above) shows an

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approximately two (2) mile square section with iso-level contour lines prepared by the applicant, sensitive receptors (homes) and locations selected for the baseline dBA and dBC sound tests whichever are the controlling metric. The test points shall be located at the property line bounding the property of the turbine's host closest to the wind turbine. Additional sites may be added if appropriate. A grid comprised of one (1) mile boundaries (each grid cell is one (1) square mile) should be used to assist in identifying between two (2) to ten (10) measurement points per cell. The grid shall extend to a minimum of one (1) mile beyond the perimeter of the project boundary. This may be extended to more than one mile at the discretion of the Town. The measurement points shall be selected to represent the noise sensitive receptor sites based on the anticipated sound propagation from the combined WTi in the project. Usually, this will be the closest WTi. If there is more than one WTi near-by then more than one test site may be required.

The intent is to anticipate the locations along the bounding property line that will receive the highest sound emissions. The site that will be most likely negatively affected by the WES project's sound emissions should be given first priority in testing. These sites may include sites adjacent to occupied dwellings or other noise sensitive receptor sites. Sites shall be selected to represent the locations where the background soundscapes reflect the quietest locations of the sensitive receptor sites. Background sound levels (and one-third octave band sound pressure levels for the sound measuring consultants file) shall be obtained according to the definitions and procedures provided in the ordinance and recognized acoustical testing practice and standards.

All properties within the proposed WES project boundaries will be considered for this study.

One test shall be conducted during the period defined by the months of April through November with the preferred time being the months of June through August. These months are normally associated with more contact with the outdoors and when homes may have open windows during the evening and night. Unless directed otherwise by the Town the season chosen for testing will represent the background soundscape for other seasons. At the discretion of the Town, tests may be scheduled for other seasons.

All measurement points (MPs) shall be located with assistance from with the Town staff and property owner(s) and positioned such that no significant obstruction (building, trees, etc.) blocks sound and vibration from the nearest

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proposed WES site. Duration of measurements shall be a minimum of ten continuous minutes for each criterion at each location. The duration must include at least 6 minutes that are not affected by transient sounds from near-by and non-nature sources. Multiple 10 minute samples over longer periods such as 30 minutes or one (1) hour may be used to improve the reliability of the L90 values. The ten minute sample with the lowest valid L90 values will be used to define the background sound.

The tests at each site selected for this study shall be taken during the expected 'quietest period of the day or night' as appropriate for the site. For the purpose of determining background sound characteristics the preferred testing time is from 10 pm until 4 am. If circumstances indicated that a different time of the day should be sampled the test may be conducted at the alternate time if approved by the Town.

Sound level measurements must be made on a weekday of a non-holiday week. Weekend measurements may be taken at selected sites where there are weekend activities that may be affected by WTi sound.

Measurements must be taken at 1.2 to 1.5 meters above the ground and at least 15 feet from any reflective surface following ANSI 12.9 Part 3 protocol including selected options and other requirements outlined later in this Section.

1. Reporting

For each Measurement Point and for each measurement period, provide each of the following measurements:

- (a) LAeq, L10, and L90, in dBA
- (b) LCeq, L10, and L90, in dBC

A narrative description of any intermittent sounds registered during each measurement. This may be augmented with video and audio recordings.

A narrative description of the steady sounds that form the background soundscape. This may be augmented with video and audio recordings.

Wind speed and direction at the Measurement Point, humidity and temperature at time of measurement will be included in the documentation. Corresponding

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information from the nearest 10 meter weather reporting station shall also be obtained.

Measurements taken when wind speeds exceed 2m/s (4.5 mph) at the microphone location will not be considered valid for this study. A windscreen of the type recommended by the monitoring instrument's manufacturer must be used for all data collection.

Provide a map and/or diagram clearly showing (using plot plan provided by Town or Applicant):

The layout of the project area, including topography, the project boundary lines, and property lines.

The locations of the Measurement Points.

The minimum and maximum distance between any Measurement Points.

The location of significant local non-WES sound and vibration sources.

The distance between all MPs and significant local sound sources. And,

The location of all sensitive receptors including but not limited to: schools, day-care centers, hospitals, residences, residential neighborhoods, places of worship, and elderly care facilities.

2. Sites with Existing Wind Energy Systems

Two complete sets of sound level measurements must be taken as defined below:

One set of measurements with the wind generator(s) off unless the Town elects to substitute the sound data collected for the background sound study collected as part of an earlier baseline study. Wind speeds must be suitable for background testing.

One set of measurements with the wind generator(s) running with wind speed at hub height sufficient to meet nominal power output or higher and at 2 m/s or below at the microphone location. Conditions should represent the worst case sound emissions from the WES project. This will normally involve tests taken during the evening or night when winds are calm (2m/sec or less) at the ground surface yet, at hub height, sufficient to operate the turbines.

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Sound level measurements and meteorological conditions at the microphone shall be taken and documented as discussed above.

3. Sound Level Estimate for Proposed Wind Energy Systems (when adding more WTi to existing project)

Sound Level Estimate for Proposed Wind Energy Systems (when adding more WTi to existing project)

In order to estimate the sound impact of the proposed WES project on the existing environment an estimate of the sound produced by the proposed WES(s) under worst-case conditions for producing sound emissions must be provided. This study may be conducted by a firm chosen by the WES operator with oversight provided by the Town.

The qualifications of the firm should be presented along with details of the procedure that will be used, software applications, and any limitations to the software or prediction methods.

Provide the manufacturer's sound power level (L_w) characteristics for the proposed WES(s) operating at full load utilizing the methodology in IEC 61400-11 Wind Turbine Noise Standard. Provide one-third octave band L_w sound power level information from 6.3 Hz to 10k Hz. Furnish the data with and without A-weighting. Provide sound pressure levels predicted for the WES(s) in combination and at full operation and at maximum sound power output for all areas where the predictions indicate dBA levels of 30 dBA and above. The same area shall be used for reporting the predicted dBC levels. Contour lines shall be in increments of 5 dB.

Present tables with the predicted sound levels for the proposed WES(s) in dBA, dBC and at all octave band centers (8 Hz to 10k Hz) for distances of 500, 1000, 1500, 2000, 2500 and 5000 feet from the center of the area with the highest density of WES(s). For projects with multiple WES(s), the combined sound level impact for all WES(s) operating at full load must be estimated.

The above tables must include the impact (increased dBA L_{eq} and dBC L_{eq} above baseline L90 Background sound levels) of the WES operations on all residential and other noise sensitive receiving locations within the project boundary. To the

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extent possible, the tables should include the sites tested in the background study.

Provide a contour map of the expected sound level from the new WES(s), using 5 dBA and 5 dBC increments created by the proposed WES(s) extending out to a distance of at least 3000 feet from the project boundary or the 35 dBA or 50 dBC boundary whichever is greater.

Provide a description of the impact of the proposed sound from the WES project on the existing environment. The results should anticipate the receptor sites that will be most negatively impacted by the WES project and to the extent possible provide data for each MP that are likely to be selected in the background sound study (note the sensitive receptor MPs):

Report expected changes to existing sound levels for LAeq, L10 and L90, in dBA

Report expected changes to existing sound levels for LCeq, L10 and L90, in dBC

Report the predicted sound pressure levels for each of the 1/1 octave bands as un-weighted dB in tabular form from 8 Hz to 10k Hz.

Report all assumptions made in arriving at the estimate of impact, any limitations that might cause the sound levels to exceed the values of the estimate, and any conclusions reached regarding the potential effects on people living near the project area. If the effects of blade swish, worst case weather, or operating conditions are not reflected in the model a discussion of how these factors could increase the predicted values is required.

Include an estimate of the number of hours of operation expected from the proposed WES(s) and under what conditions the WES(s) would be expected to run. Any differences from the information filed with the Application should be addressed.

4. Post-Construction Measurements

Post Construction Measurements should be conducted by a qualified noise consultant selected by and under the direction of the Town. The requirements of this Appendix for Sites with Existing Wind Energy Systems shall apply

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Within twelve months of the date when the project is fully operational, and within one month of the anniversary date of the Pre-construction ambient noise measurements, repeat the existing sound environment measurements taken before the project approval. Post-construction sound level measurements shall be taken both with all WES(s) running and with all WES(s) off except as provided the ordinance.

Report post-construction measurements to the Town using the same format as used for the background sound study.

Project Boundary: A continuous line encompassing all WES(s) and related equipment associated with the WES project.

K. Terms and Definitions

Aerodynamic Sound means a noise that is caused by the flow of air over and past the blades of a WES.

Ambient Sound. Ambient noise encompasses all sound present in a given environment, being usually a composite of sounds from many sources near and far. It includes intermittent noise events, such as, from aircraft flying over, dogs barking, wind gusts, mobile farm or construction machinery, and the occasional vehicle traveling along a nearby road. The ambient also includes insect and other nearby sounds from birds and animals or people. The near-by and transient events are all part of the ambient sound environment but are not to be considered part of the background sound. If present, a different time or location should be selected for determining the L90 background sound levels.

Anemometer means a device for measuring the speed and direction of the wind.

Applicant means the individual or business entity that seeks to secure a license under this Ordinance.

A-Weighted Sound Level (dBA). A measure of over-all sound pressure level designed to reflect the response of the human ear, which does not respond equally to all frequencies. It is used to describe sound in a manner representative of the human ear's response. It reduces the effects of the lower frequency sound energy with respect to the frequencies from Hz to 1000 Hz and above . The

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resultant sound level is said to be A-weighted and the units are dBA. Sound level meters have an A-weighting network for measuring A-weighted sound levels (dBA) meeting the characteristics and weighting specified in ANSI Specifications for Integrating Averaging Sound Level Meters, S1.43-1997 for Type 1 instruments and be capable of accurate readings (corrections for internal noise and microphone response permitted) at 20 dBA or lower.

Background Sound (L90) refers to the sounds that would normally be present at least 90% of the time. Background sounds are those heard during lulls in the ambient sound environment. That is, when transient sounds from flora, fauna, and wind are not present. Background sound levels vary during different times of the day and night. Because a WES operates 24/7, the background sound levels of interest are those during the quieter periods which are often the evening and night. Sounds from near-by birds and animals or people must be excluded from the background sound test data.

Background sound level (dBA and dBC (as L90)) is the sound level present for at least 90% of the time during a period of observation that is representative of the quiet time for the soundscape under evaluation and with duration of ten (10) continuous minutes. Several contiguous ten (10) minute tests may be performed in one hour to determine the statistical stability of the sound environment. Longer term tests, such as 24 hours or multiple days are not appropriate since the purpose is to define the quiet time background sound level. It is defined by the L90A and L90C descriptors. It may be considered to be the quietest one (1) minute during a ten (10) minute test. L90A results are valid only when L10A results are no more than 10 dBA above L90A for the same time period. L10C less L90C should not exceed 15 dBC to be valid.

Measurement periods such as at dusk when bird and insect activity is high or the early morning hours when the 'dawn chorus' is present are not acceptable measurement times. Further, background L90 sound levels documenting the pre-construction baseline conditions should be determined when the ten minute average wind speed is 2 meters per second (4.5 mph) or less at the ground level/microphone location.

Blade Passage Frequency (BPF) means the frequency at which the blades of a turbine pass a particular point during each revolution (e.g. lowest point or highest point in rotation) in terms of events per second. A three bladed turbine rotating at 28 rpm would have a BPF of 1.4 Hz. [E.g. ((3 blades times 28rpm)/60 seconds per minute = 1.4 Hz BPF)]

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C-Weighted Sound Level (dBC). Similar in concept to the A-Weighted sound Level (dBA) but C-weighting does not de-emphasize the frequencies below 1k Hz as A-weighting does. It is used for measurements that must include the contribution of low frequencies in a single number representing the entire frequency spectrum. Sound level meters have a C-weighting network for measuring C-weighted sound levels (dBC) meeting the characteristics and weighting specified in ANSI S1.43-1997 Specifications for Integrating Averaging Sound Level Meters for Type 1 instruments.

Decibel (dB). A dimensionless unit which denotes the ratio between two quantities that are proportional to power, energy or intensity. One of these quantities is a designated reference by which all other quantities of identical units are divided. The sound pressure level (Lp) in decibels is equal to 10 times the logarithm (to the base 10) of the ratio between the pressure squared divided by the reference pressure squared. The reference pressure used in acoustics is 20 MicroPascals.

Distance attenuation. Means the reduction of a sound or attenuation by distance. The effect of distance attenuation depends on the type of sound sources. Most sounds or noises we encounter in daily life are from sources which can be characterized as either point or line sources. If a sound source produces spherical spreading of sound in all directions, it is a point source. For a point source, the noise level decreases by 6 dB per doubling of distance from the source. If the sound source produces cylindrical spreading of sound such as a stream of motor vehicles on a busy road at a distance, it may be considered as a line source. For a line source, the noise level decreases by 3 dB per doubling of distance from the source. Turbines mounted in a row should be considered as a line source.

Frequency. The number of oscillations or cycles per unit of time. Acoustical frequency is usually expressed in units of Hertz (Hz) where one Hz is equal to one cycle per second.

Good Utility Practice. Means any of the practices, methods and acts with respect to the safe operation of a CEF engaged in or approved by a significant portion of the electric utility industry and, in particular, those portions of the industry with experience in the construction, operation and maintenance of wind turbines during the relevant time period; or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the

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decision is made, could be expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method or act to the exclusion of all others, but rather to be acceptable practices, methods or acts generally accepted in the region.

Health means a state of complete physical and mental well being, not merely the absence of disease or infirmity. This definition was adapted from the World Health Organization definition of health in "Guidelines for Community Noise", pages 19 and 20.

Height means the total distance measured from the grade of the property as existed prior to the construction of the wind energy system, facility, tower, turbine, or related facility at the base to its highest point.

Hertz (Hz). Frequency of sound expressed by cycles per second.

Impulsive Sound refers to short-term acoustical impulses typically lasting less than one second each. It may be the only sound emitted from a noise source or it may be a component of a more complex sound. For evaluation of wind turbines, impulsive sound includes swishing or thumping sounds.

INCE means Institute of Noise Control Engineers. The Institute of Noise Control Engineering of the USA ("INCE/USA") is a non-profit professional organization incorporated in Washington, DC. A primary purpose of the INCE/USA is to promote engineering solutions to environmental, product, machinery, industrial and other noise problems. INCE/USA is a Member of the Society of the International Institute of Noise Control Engineering, an international consortium of organizations with interest in acoustics and noise control.

Infra-Sound. Sound with energy in the frequency range of 20 Hz and below is considered to be infrasound is normally considered to not be audible unless in relatively high amplitude. The most significant exterior noise-induced dwelling vibration occurs in the frequency range between 5 Hz and 50 Hz. Moreover, even levels below the threshold of audibility can still cause measurable resonances inside dwelling interiors. Conditions that support or magnify resonance may also exist in human body cavities and organs under certain conditions, although no specific test for infrasound is provided in this document, its presence will be accounted for in the comparison of dBA and dBC sound levels for the complaint

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test provided later in this document. See low-frequency sound (LFN) for more information.

Low Frequency Sound (LFN) refers to sounds with energy in the lower frequency range of 20 to 200 Hz. LFN is deemed to be excessive when the difference between a C-weighted sound pressure level and an A-weighted sound pressure level is greater than 20 decibels at any measurement point outside or inside a noise sensitive receptor site, residence, or other occupied structure. E.G. C-A>20 dB.

Measurement Point (MP) means location where sound and/or vibration measurements are taken such that no significant obstruction blocks sound and vibration from the site. The Measurement Point should be located so as to not be near large objects such as buildings and in the line-of-sight to the nearest turbines. Proximity to large buildings or other structures should be twice the largest dimension of the structure, if possible.

Measurement of Wind Speed. For measurements conducted to establish the background sound pressure levels (dBA, dBC, L90 10 min, and etc.) the wind speed at the microphone's Measurement Point shall average 2 m/s (4.5 mph) or less for valid background measurements. For valid measurements conducted to establish the post-construction sound level the wind speed at the microphone's Measurement Point shall not exceed 4 m/s (9 mph) average and the wind speed at the WES blade height shall be at or above the nominal rated wind speed. For purposes of enforcement, the wind speed and direction at the WES blade height shall be selected to reproduce the conditions leading to the enforcement action while also restricting wind speeds at the microphone to 4 m/s (9 mph).

For purposes of models used to predict the sound levels and sound pressure levels of the WES to be submitted with the Application, the Wind Speed shall be the speed that will result in the worst-case dBA and dBC sound levels in the community adjacent the nearest WES. For the purpose of constructing the model the wind direction shall consider the dominant wind direction for the seasons from the late Spring to early Fall. If other wind directions may cause levels to exceed those of the predominant wind direction at nearby sensitive receptors, these levels and conditions shall be included in the Application.

Mechanical Noise means sound produced as a byproduct of the operation of the mechanical components of a WES(s) such as the gearbox, generator and transformers.

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Noise means any unwanted sound. Not all noise needs to be excessively loud to represent an annoyance or interference.

Non-Participating Parcel means a parcel of real estate that is neither a Project Parcel nor a Participating Parcel.

Occupied Structure means a building in which people live, work or frequent.

Participating Parcel means a parcel of real estate that is not a Project Parcel, but is subject to an agreement between the owner and applicant allowing the construction of all or part of a CEF closer to a Participating Parcel property line or structure on the Participating Parcel than would be permitted under this Ordinance in the absence of such an agreement. To qualify as a Participating Parcel, the agreement between the owner and the applicant must be approved by the Town Board under this Ordinance.

Project Boundary means the boundaries of the CEF as shown on the site plan submitted to and approved by the Town in accordance with this Ordinance.

Project Parcel or Project Parcels means the parcel or parcels of real estate on which all or any part of a CEF will be constructed.

Property Line means the recognized and mapped property parcel boundary line.

Pure Tone. A sound for which the sound pressure is a simple sinusoidal function of the time, and characterized by its singleness of pitch. Pure tones can be part of a more complex sound wave that has other characteristics.

Qualified Independent Acoustical Consultant. Qualifications for persons conducting baseline and other measurements and reviews related to the application for a WES or for enforcement actions against an operating WES include, at a minimum, demonstration of competence in the specialty of community noise testing and Full Membership in the Institute of Noise Control Engineers (INCE). Certifications such as Professional Engineer (P.E.) do not test for competence in acoustical principles and measurement and are thus not, without further qualification, appropriate for work under this Ordinance. The Independent Qualified Acoustical Consultant can have no direct or indirect financial or other relationship to an Applicant.

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Sensitive Receptor means places or structures intended for human habitation, whether inhabited or not, public parks, state and federal wildlife areas, the manicured areas of recreational establishments designed for public use, including but not limited to golf courses, camp grounds and other nonagricultural state or federal licensed businesses. These areas are more likely to be sensitive to the exposure of the noise, vibration, shadow or flicker, etc. generated by a WES or CEF. These areas include, but are not limited to: schools, daycare centers, elder care facilities, hospitals, places of seated assemblage, non-agricultural businesses and residences.

Sound. A fluctuation of air pressure which is propagated as a wave through air

Sound Power. The total sound energy radiated by a source per unit time. The unit of measurement is the watt. Abbreviated as Lw. This information is determined for the WES manufacturer under laboratory conditions specified by IEC 61400-11 and provided to the local developer for use in computer model construction. It cannot be assumed that these values represent the highest sound output for any operating condition. They reflect the operating conditions required to meet the IEC 61400-11 requirements. The lowest frequency is 50 Hz for acoustic power (Lw) requirement in IEC 61400-11. This Ordinance requires wind turbine certified acoustic power (Lw) levels at rated load for the total frequency range from 6.3 Hz to 10k Hz in one-third octave frequency bands tabulated to the nearest 0.1 dB. The frequency range of 6.3 Hz to 10k Hz shall be used throughout this Ordinance for all sound level modeling, measuring and reporting.

Sound Pressure. The instantaneous difference between the actual pressure produced by a sound wave and the average or barometric pressure at a given point in space.

Sound Pressure Level (SPL). 20 times the logarithm, to the base 10, of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micronewtons per square meter. In equation form, sound pressure level in units of decibels is expressed as $SPL (dB) = 20 \log p/pr$.

Spectrum. The description of a sound wave's resolution into its components of frequency and amplitude. The WES manufacturer is required to supply a one-third octave band frequency spectrum of the wind turbine sound emission at 90% of rated power. The published sound spectrum is often inappropriately presented as A-weighted values rather than dBC or dBZ. This information is used to project

Initial Report Wind Committee Findings And Recommendations

the wind farm sound levels at all locations of interest. Confirmation of the projected sound spectrum can be determined with a small portable one-third octave band frequency (spectrum) analyzer. The frequency range of interest for wind turbine noise is approximately 10 Hz to 10k Hz.

Statistical Noise Levels. Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAN, where LAN is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, L10 is the noise level exceeded for 10% of the time. Of particular relevance, are: LA10 and LC10 the noise level exceed for 10% of the ten (10) minute interval. This is commonly referred to as the average maximum noise level. LA90 and LC90 the noise level exceeded for 90% of the ten (10) minute sample period. The L90 noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level. Leq is the frequency-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

Tonal Sound (sometimes referred to as Pure Tone). A sound for which the sound pressure is a simple sinusoidal function of the time, and characterized by its singleness of pitch. Tonal sound can be simple or complex.

Wind Energy Systems (WES) means equipment that converts and then transfers energy from the wind into usable forms of energy on a large, industrial scale for commercial or utility purposes. Small scale wind systems of less than 170 feet in height with a 60-foot rotor diameter and a nameplate capacity of less than 100 kilowatts or less are exempt from this definition and the provisions of this Ordinance.

Wind Energy Systems Facility or Facility or CEF means all of the land and equipment used by the Wind Energy System and its support facilities including the wind turbine, tower, access roads, control facilities, meteorological towers, maintenance and all power collection and transmission systems.

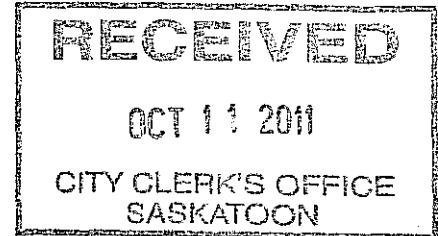
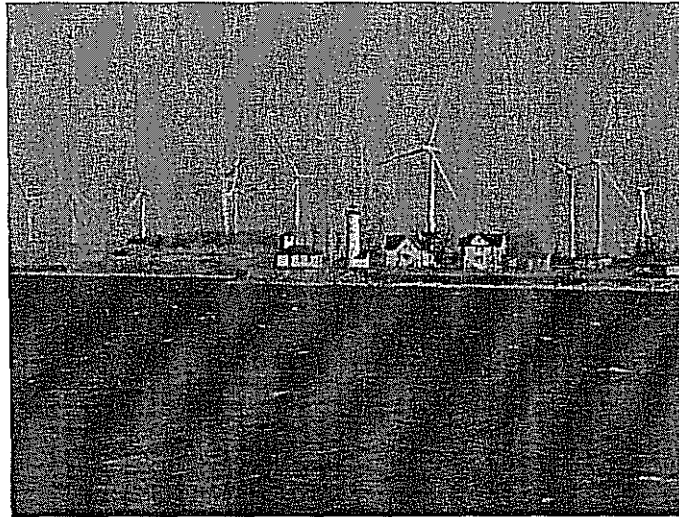
Wind Energy Systems Facility License or CEF License means a license to construct and operate a Wind Energy System issued by the Town of Orleans in accordance with this Ordinance.

Initial Report Wind Committee Findings And Recommendations

Wind Turbine or Turbine (WTi) means a mechanical device which captures the kinetic energy of the wind and converts it into electricity. The primary components of a wind turbine are the blade assembly, electrical generator and tower.

**Findings and Recommendations
Orleans Citizens Wind Committee**

Environmental / Health & Safety Considerations



Part Two

- C. Electronic & Electromagnetic Interference**
- D. Stray Voltage AKA Ground Current**
- E. Construction Disruption**
- F. Earthquake Seismic Effects**
- G. Fire Risks & Fire Department Needs**
- H. Ground Water Impacts & Protection of Aquifers**
- I. Lightening Protection**
- J. Lighting Turbine Towers**
- K. Storm Water, Runoff Erosion**
- L. Road Upkeep & Repair**
- M. Security (Vandalism Terrorism)**
- N. Radon**

III. Article IV Local Law Small Wind Conversation Systems

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I. Introduction to Orleans Citizens Wind Committee Recommendations Part Two

The members of the Orleans's Citizens Wind Committee were given the charge of reviewing the existing Orleans wind law; Local Law No 1 2007 for Wind Facilities and determine if this law may or may not adequately protect residents in the Orleans community that will reside adjacent to industrial turbines in the designated "**overlay district**". Orleans Local Law or Zoning Ordinance has one purpose and that is to **protect the health, welfare and public safety of residents living in an industrial wind farm**. The citizens Wind Committee was not given the charge to determine the existence of and/or provide the economic potential for a wind farm in Orleans.

After thoroughly studying the existing wind law and wind development this committee has determined through substantiated scientific facts that the Local Law in its present format does not adequately protect the Orleans community. Through the course of eight months this committee has determined that the present local law protecting the residents is based on wind developer's basic "industrial wind development standards". These "standards" set in the present local law are the setbacks and noise levels. This committee had to determine using scientific research and substantiated facts as to whether these "standards" can coexist within the Orleans environment and still protect the community from potential industrial turbine impacts.

The Committee had to address recommendations on the most critical concerns in the Local Law on noise levels and turbine safety setbacks first. These two categories have been documented in Part One, "Shadow Flicker/Safety Setbacks and Noise/Sleep Interference". This document was submitted to the Town Council on August 13, 2009. In document Part One this committee also included the committee's; Introduction and Scope, Committee Members Biography, Work to Date, Information on Committee Research, Recommendation for a Complaint Resolution Board, Catalog of Referenced documents, Terms and Definitions and a Suggested Wording for Noise Ordinance for Orleans Wind Ordinance using the Committee's recommendations. These categories are not repeated in this document.

During our course of study and research of wind development it was determined that the Orleans's Local Law lacked other areas of potential concerns that affected the health, welfare and public safety for residents in Orleans that will live in and/or adjacent to the wind overlay district. The consensus of this committee felt a responsibility to address these concerns and provide recommendations to the council for consideration to be included in Orleans Local Law No 1 2007 for Wind Facilities.

This document "Part Two, Environmental Health and Safety Considerations" includes the following categories of research for your review:

Electronic & Electromagnetic Interference, Stray Voltage, Construction Disruption, Earthquake Seismic Effects, Fire Risks & Fire Department Needs, Ground Water Impacts & Protection of Aquifers, Lightning Protection, Lighting Turbine Towers, Storm Water and Runoff Erosion, Road Upkeep & Repair, Security (Vandalism/Terrorism) and Radon.

The recommendations by this committee follows each category. References pertaining to each of these categories has been converted to either one or two formants; (1) in a pdf document designated in light blue then placed on a cd for your review. (2) a website address is listed in dark blue.

Included in this document, the committee reviewed and has commented on the existing provisions in Article IV for Small Wind Energy Conversion Systems for Orleans.

In addition, you will find at the end of this document a category "Summary Orleans Citizens Wind Committee Recommendations". This section lists both Part One and Part Two of the committee's recommendations submitted to the Council.

The Committee fully realizes that the Town Board may want to discuss and understand the Wind Committee's Recommendations and Findings with the Committee and encourages the Board to meet with them to discuss the Findings or Recommendations.

J. Stephen Bingeman Chair

Judy Tubolino, Vice Chair

Patricia Booras-Miller

Rosemary Forbes

William Di Trinco

Darryl Hyde

Date

II. Environmental Health & Safety Considerations Part Two

A. Shadow Flicker/Safety Setback - See Part One

B. Noise/Sleep Interference - See Part One

C. Electronic & Electromagnetic Interference

Telephone reception, both land line and cell phone, along with adequate television reception is vital to any community. Both of these tools are a part of our everyday life. Telephones are used to contact emergency services for help. Television broadcasting informs homes for school closings and employed workers when severe weather is in our area. Residents in rural areas are located many miles from schools and employment.

Research shows that electronic and electromagnetic interference are problems that can occur inside or close to WECS locations. The problems found were:

Static interference or "ghosting" which occurs when the signals are reflected off the turbine towers. Following turbine construction, an increase in the amount and severity of ghosting was seen. Then there is the dynamic interference caused by the production of a secondary or interference signal reflected from the rotating turbine blades, seen as a periodic variation in picture brightness or color.

A recent article was written in the Thousand Islands Sun on April 29, 2009 "Channel 7, Fox 28 Expecting Interruptions" which explained in detail this concern.

Based on previous studies, North America's video signal standard called NTSC, suggests that interference may occur with HDTV. It is expected that HDTV would be less likely to suffer the static (tower-related) effects but more likely to suffer dynamic (blade spinning) interference which would take the form of frozen frames and pixilation. Research papers suggest that other wireless and/or broadcast consumer services would suffer similarly, including cellular and wireless networking services. ("A Simplified Guide to the NTSC Video Signal", pdf <http://www.seanet.com/~bradford/ntscvideo.htm>).

Electronic (cell phone and TV) interference is the second highest major complaint by residents. In the Town of Eagle near Buffalo, the community of Bliss New York which has 67 turbines (height is 265 ft with setbacks of 1000 ft) has a severe impact with electronic and electromagnetic interference. Committee member Judy Tubolino had the opportunity to speak directly with Town of Bliss Supervisor J. Kushner. Supervisor Kushner states that this is the number one complaint by their residents. This complaint supersedes even the noise complaints. Supervisor Kushner's advice is that Orleans perform an extensive review with developers preconstruction regarding tower placements and signal interference locations. Their developer is Noble.

Preventative measures can reduce or even eliminate these issues, but they must be taken during WECS project planning stages. Wind energy companies need to factor in the location of all local radio communications towers, over-the-air RF links and areas of served populations. In Trempealeau County WI their local law states that their developer must provide sites of communication towers and TV transmission corridors along with the turbine sites on their pre-construction maps for any proposed wind project. Trempealeau County Local Law requirements to avoid potential reception impacts are: (a) A one thousand (1,000) feet microwave communication corridor between turbines must be maintained if the turbine facility is located between transmission towers. (b) Communication tower – Wind turbine setback shall be at least one (1) mile to prevent signal interference. (Trempealeau County WI Wind Ordinance 11/28/07, Page 9 (231) #20; pdf).

One mitigation measure, when signal degradation results from wind turbines for TV interference, is replacing off-air reception with cable or satellite systems. The Town of Orleans has many locations that do not offer their residents the capability of connecting to a cable broadcast system. The town may consider this an option as part of the application process with a proposed developer. Mitigation measures for telephone interference must be done pre-construction. It is the sites of the turbine machines that will indicate if this problem exists. Developers engineering and design firms have access to State and Federal communication towers that would affect broadcasts from transmitters.

Recommendation:

Town of Orleans shall require the WECS operator and at least one independent engineering firm to conduct pre and post construction signal evaluations for television, cell phone and wireless network interference. The WECS operator shall provide, in their wind development site proposal map locations of all communication towers and TV reception corridors in addition to the turbine site placements. The Town shall require the WECS operator to restore signals to pre-construction levels at its own expense or resolve at the direction of the complaint board.

D. Stray Voltage AKA Ground Earth-Current

The concern raised by this committee regarding stray voltage and earth-current from wind turbine generators impacting local dairy and livestock farms in our community was discussed.

If a system is not properly wired, the grounded point(s) at which a system is grounded can develop a voltage that can push current through the earth and end up contacting unintended objects. Hence the name "stray voltage".

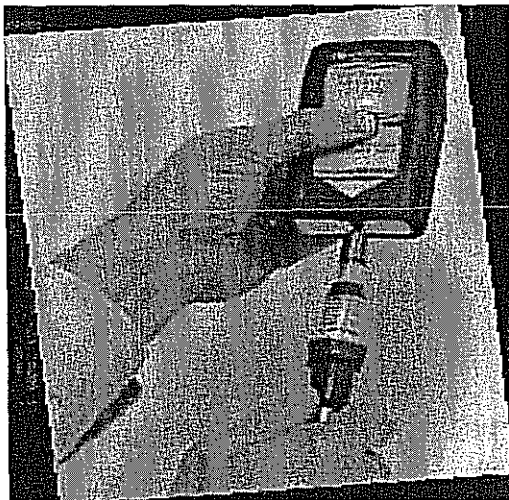
No one disputes that this primarily affects cattle, whose legs are far enough apart to stand on two points where different voltage levels in the ground exist. The cow may or may not feel this voltage difference depending on the level and duration of the exposure per America Wind Energy Association (AWEA) pdf page 21 "Guide for State and Local Governments" <http://maec.msu.edu/Guide%20for%20MPSC%20Rule%20web.pdf>.

Research into the existence of turbine stray voltage is worldwide and are affects from both large and small wind turbines. Livestock are ten times more sensitive to electricity and electronic interference than humans, as they are often standing in water or on moist area locations near the barn such as manure and in fields. (Each square foot of manure storage surface area would collect about 3.5 cu ft, or 26.1 gallons, of precipitation each year. Ref: Lewis County Ag Digest pg 3 July 2007)

Research informs us that the farmer bears the burden of "stray voltage" affecting his livestock. AWEA, American Wind Energy Association states on page 2 from their document "Residential Wind Systems and "Stray Voltage" (pdf) that "these problems are a direct result of poor grounding practices, improper or inadequate wiring, or the breakdown of insulation in old wires or loads. In other words, they are problems on a particular customer's side of the utility billing meter that result in electricity seeking an alternate path back to the generating source, the utility." Which of course is the turbine.

Research informs us that farmers located in wind farms with livestock have had a costly expense of the burden to fix the problem. Large dairy farms have had out of pocket expenses up to \$50,000.00 trying to correct the problem. (Pages 8 to 10 "Final Report Lincoln WI Moratorium Committee" pdf.) The side effects from impacts to livestock is damaging to farmers. It is a must that the problem of "stray voltage" be corrected

LV-S-5 Voltage Detector being used with Tester



This committee feels that the "welfare" of residents who own dairy and livestock producing farms are at risks in the Town of Orleans. It is important for the Town of Orleans to be concerned for the future of our dairy farmers. Industrial turbines are a electrical producing machine. Livestock and milk producing farmers that will be located in and adjacent to industrial turbines must be informed pre-construction of the potential hazards to their livestock prior to a wind farm development. Every farmer must be encouraged to have adequate "voltage" testing of their facilities prior to turbines being erected

around where their livestock will be. Agricultural and State Agencies have documents that can be of help to the council and farmers for preconstruction testing. There are several types of testing instruments and they vary in costs. Jefferson County has agencies such as the Cooperative Extension and Northern New York Agricultural Development Program as well as New York State Farm Bureau to seek advice for names of qualified businesses that perform stray voltage testing. Cornell also offers an article "Reduce the Risks of Stray Voltage" by Richard Peterson pdf and <http://www.ansci.cornell.edu/pdfs/pd2008aprilp39.pdf>. Some instruments are simple in nature such as a hand held voltmeter to the advanced high tech computerized systems as show below which is a mobile testing unit.



SVD2000 Mobile Contact Voltage Detection System

Conclusion:

Orleans should be concerned about stray voltage that may have the potential to affect the welfare of our dairy and livestock farmers living adjacent to the industrial turbines. In addition the developer must properly install industrial turbines according to both federal and state regulations of the National Electric Code as well as maintaining these regulations for the life of the turbines.

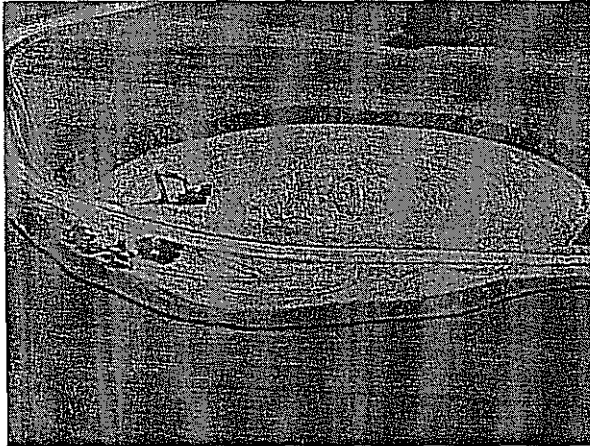
Recommendation:

Orleans shall require any CWECs project to meet the latest version National Electric Code for the life of the project.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

E. Construction Disruption

Wind developers try to keep the initial construction phase of industrial wind farm installations to a relatively short period of time such as 12 to 18 months if possible. Construction disruption is a major impact to residents during this phase. Research informs us that developers work very hard to get the development done in as little time as possible. Regardless of the time element the construction phase affects the health, safety and welfare of the residents living in and adjacent to the project. Research showed this committee that the construction phase has site specific causes for concerns to our residents safety while studying the construction phase. These are addressed for your review in the following categories in this document: *H; Ground Water Impacts & Protection of Aquifers, K; Storm Water Runoff Erosion and L; Road Upkeep & Repair.*



WECS facilities, particularly the turbines themselves, are extremely large construction processes, resulting in infrastructure impacts to Orleans as well as to the individual landowners. Orleans needs to put in place rules and complaint resolution to govern this process.

(Pictured here is the pad preparation for one turbine from the Cohocton Wind Farm NY)

The Clayton Horse Creek project DEIS informs us the preparation pad for each of our turbines is 400 ft in diameter;

<http://www.iberdrolarenewables.us/horsecreek/> Appendix A - Project Construction 05030.

Considerations include:

- Roadways: Disruption to existing traffic patterns; wear and tear on roadways
- Temporary and permanent access roads
- Utilities: relocation and/or addition of power lines
- Communications lines and poles
- Possible relocation or addition of cell and/or TV transmission towers
- General: generation of dust
- Quarry operations
- Drainage issues
- Well Water impact
- Construction noise

Installation will require transporting heavy equipment and significant quantities of stone, gravel and concrete by trucks in rapid succession for each turbine base. Road dust is a

major concern by residents during construction. Wolfe Island residents have offered videos of their experience: See <http://www.youtube.com/watch?v=P-via0ec-AY>.

Wind turbine components are delivered to the installation site by "oversized" trucks. These trucks carrying turbine blades require wide turning lanes and specific routes based on bridge weight capacities. Turbine components and blades may require regular interruptions of traffic patterns. Developers have to obtain authorization by NYS Department of Transportation, the County Highway Dept. and the Town Highway Dept. to approve their traffic routes. National Grid is also involved due to overhead "electrical wires" that need to be relocated for transport of turbine parts.

Recommendation:

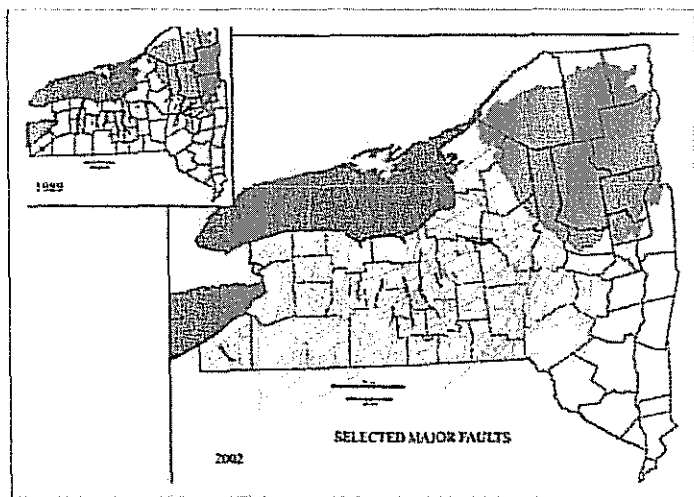
The developer shall be required to submit regular scheduling reports to the Town, indicating work completed to date, in progress and scheduled; this report shall include locations, construction routes and impacted property lots. The developer and/or an independent oversight agency should be required to actively monitor and address dust levels via standard construction techniques. Any impact reports submitted with application should address proposed routes, overhead obstructions and any necessary electrical or communications lines changes that would be made. The Town shall specify a limit on hours of heavy operation to a reasonable time frame. The Town shall consider the safe placement of new access roads.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

F. Earthquake Seismic Effects

Seismic activity is not unknown to townships located in New York State along Lake Ontario and the St. Lawrence River. In fact hundreds of earthquakes have been

recorded in northern New York. The first being recorded in 1733. The still visible results of unrecorded seismic events is apparent if you hike on Grindstone Island in Clayton, NY.



The Township of Orleans is one of many that are located in the major St. Lawrence fault zone. The St. Lawrence Fault is active. The origin of this fault begins at the northeastern part of Lake Ontario

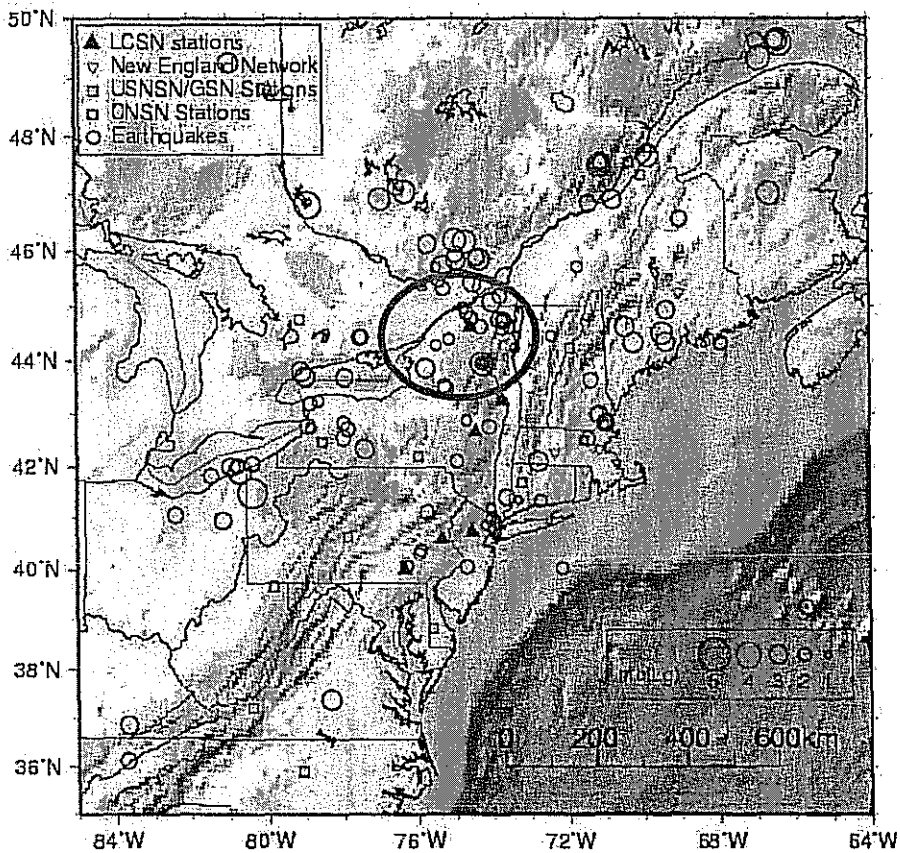
extending upstream to Massena, NY (USA) and Cornwall, Canada (Ontario Providence). In 1997, numerous submarine dives uncovered paleotectonic bedrock faults (shifting of plates from original origin).

A report by J.L. Wallach Geosciences Inc in Science Direct (Volume 353, Issues 1-4, 23 August 2002, Pages 45-74 pdf) "The presence, characteristics and earthquake implications of the St. Lawrence fault zone within and near Lake Ontario (Canada-USA) states " these attributes, combined with the large earthquakes associated with the St. Lawrence fault zone well to the northeast of Lake Ontario suggest that the seismic risk in the area surrounding and including Lake Ontario is likely much greater than previously believed".

Since 1990s with advances in modern technology and space travel, New Yorkers are part of an ongoing cooperative seismic network systems called the Lamont Cooperative Seismic Network (LCSN) which connects to the National Seismic System. New York State has seismographic stations located at the State University of New York at Potsdam and the Adirondack Community College. These are just two of the nine seismic reading stations located in New York who are continuously monitoring seismic

activity along the St. Lawrence Fault Zone.

Earthquakes Recorded by LCSN, 1998-2001



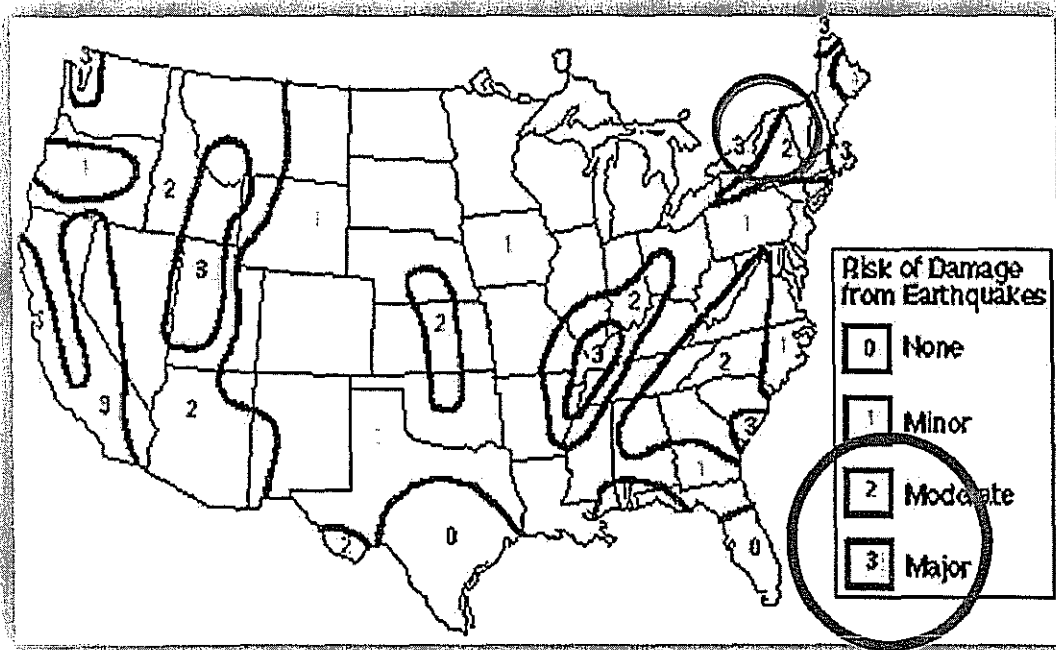
During the period of July 1, 1998 through June 30, 2001, Lamont Cooperative Seismic Network recorded over 120 earthquakes in the northeast. These earthquakes ranged from a magnitude of 1.2 to 5.4. (see figure below)

This data shows epicenters of the earthquakes that have occurred during July 1, 1998 through June 30, 2001 in the northeastern

U.S. and southeastern Canada recorded at LCSN stations (circles). The circle size is proportional to the size of the earthquakes. Seismographic stations in the region are plotted for reference: LCSN stations (solid triangles), New England Network (inverted triangles), the Canadian National Seismograph Network (CNSN) (open squares) and USNSN (solid squares). (Lamont Cooperative Seismic Network and the National Seismic System: Earthquake Hazard Studies in the Northeastern United States., pdf http://www.ldeo.columbia.edu/LCSN/Report/LCSN_Tech_Report-98-01.pdf)

A few areas of the mid-western and eastern United States are more prone to earthquakes than others. The most earthquake-prone areas include Charleston, South Carolina, eastern Massachusetts, *the St. Lawrence River area* and the central Mississippi River Valley. Others sections of this part of the country are prone to earthquakes, but can expect fewer quakes of smaller magnitude.

Below is a map showing the risk of damage by earthquakes for the continental United States. "Risks of Damage from Earthquakes" See figure below (<http://www.geo.mtu.edu/UPSeis/area.htm>) The figure below shows that we are at risk level 2 (the second highest in the nation).



The recognition of faults and their histories allows a better understanding of seismic risks and the design requirements required to prevent major collapses of bridges, buildings and other structures like wind turbines, that can be designed to be earthquake resistant. In many cases this involves designing structures which fail in a soft failure mode, that is, the structures may be damaged by the earthquake and require significant repairs or replacement, but they do not create undue safety problems during or immediately after

Recommendations:

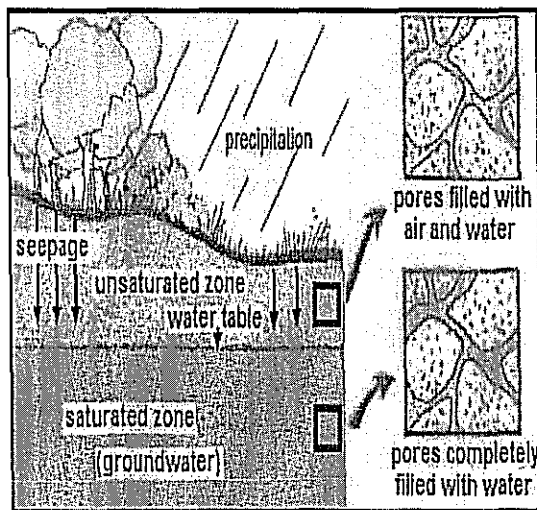
The Town of Orleans requires any WECS developer provide necessary fire-fighting equipment and fire department training at its own expense. The WECS developer must also submit a fire protection and emergency response plan acceptable to the Orleans Town Board, created in consultation with the Orleans Fire Department having jurisdiction over the proposed district.

Orleans requires that each turbine be clearly labeled with a postal address compatible with the 911 emergency system to facilitate locating the fire.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

H. Ground Water Impacts & Protection of Aquifers

A. Ground Water and Environment in Orleans:

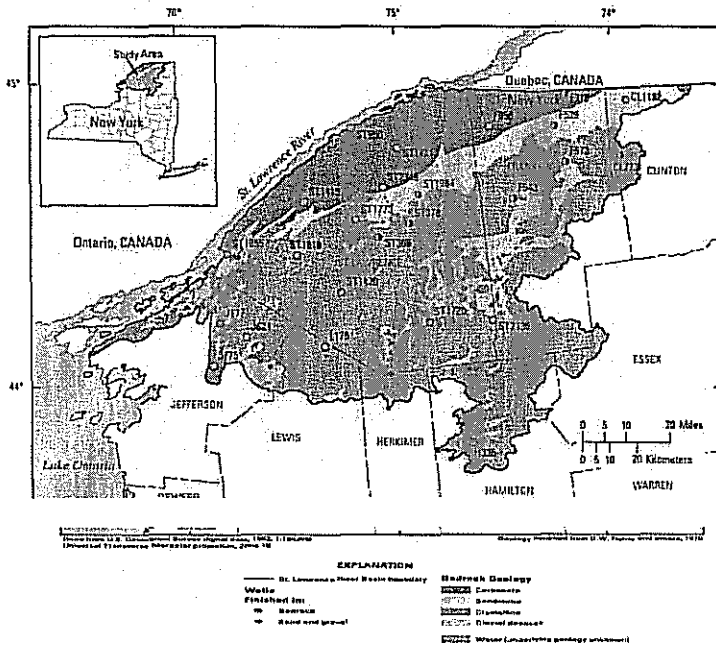


Orleans is inundated with numerous wetlands. The ground coverage is an average of 1 to 3 ft of soil and then carbonate - sandstone rock layers are formed which sits on an aquifer system.

We contacted the NYS DEC department at their head Environmental Office in Troy, NY. Both the Federal USGS (U.S. Geological Survey), US Department of Interior and the NYS DEC work together. They were helpful in providing us with guidance and statistics in locating information on the geology of the Orleans Environment.

Orleans converges with two major water-flow basins: The St. Lawrence River Basin (Figure 1) and the New York and New England Carbonate-Rock Aquifer (Black River Basin (http://pubs.usgs.gov/ha/ha730/ch_m/gif/M085.GIF) (Figure 2).

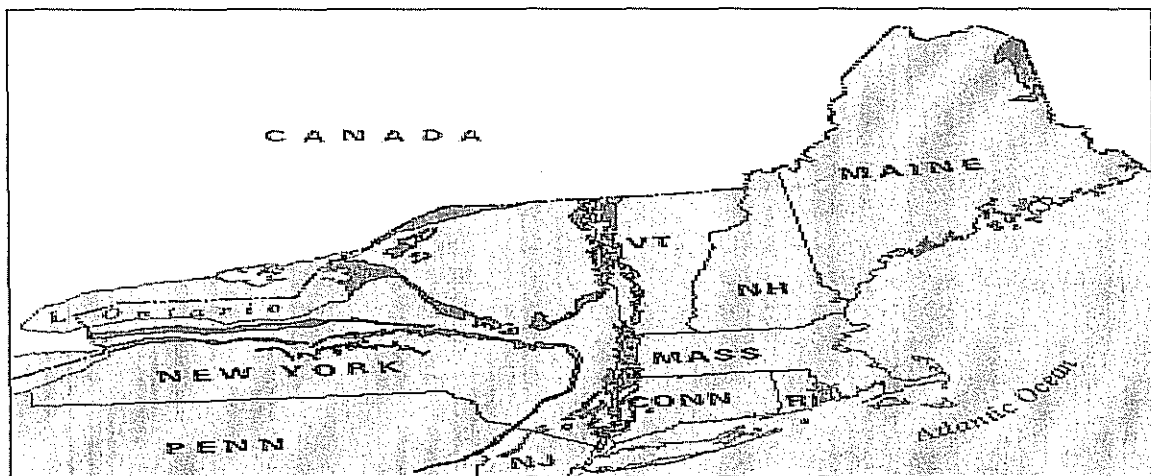
Figure 1



The USGS in cooperation with NYS DEC performed a full study of the St. Lawrence River Basin. (Ref;"Ground Water Quality in the St. Lawrence River Basin 2005-06" pdf)

The USGS performed the study on the Black River Basin. NYS DEC has performed much of their study but not in its entirety. However due to the Horse Creek industrial wind project, NYS DEC has to take an increasing role in their study analysis for the Black River Basin. (NYS DEC SEQR response on the Horse Creek DEIS pages 16 to 18 pdf).

figure 2



EXPLANATION
 New York and New England carbonate-rock aquifers

Consolidated bedrock aquifers in this area are in consolidated rocks of sedimentary, igneous, and metamorphic origin. These consolidated rocks yield water primarily from bedding planes, fractures, joints, and faults, rather than from intergranular pores. Carbonate rocks generally yield more water than other types of consolidated rocks because carbonate rocks are subject to dissolution by slightly acidic ground water.

Recommendation:

To ensure the protection of surface and ground water resources surrounding wind project area(s) in the Town of Orleans:

Limit Blasting. It is recommended to apply constraints that the foundations have to be dug without the use of blasting. Workers are to use pneumatic hammers, rather than blasting.

Ground water investigation, survey, fate and impact analysis of identified contaminants relative to identified wells, and wetland impact analysis.

A comprehensive preconstruction survey of Krast features be conducted in the Town of Orleans by a qualified engineering firm experienced and knowledgeable in Krast geology. This survey will include the proposed wind district and extend to one mile geologically beyond the surrounding wind project.

Well testing be performed preconstruction of all wells within one mile of the project area by a unbiased firm chosen by the Town and paid for by the developer applicant.

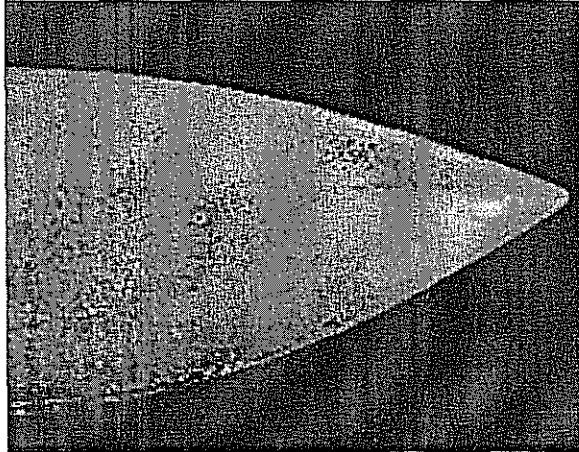
Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

1. Lightning Protection

The protection of industrial turbines from lightning damage is increasingly important as turbines increase in size and are placed in locations where access to carry out repairs may be difficult. Turbine blade manufactures are constantly working with new technology to improve blade tips. Blade tip destruction by lightning is costly for developers as well as a high risk maintenance problem for workers. This committee encourages Orleans lease owners to investigate fully the developer's history as well as the turbine manufacture for past history of the number of post-construction blade and gear box changes. This can be costly to our leasers due to the fact that heavy equipment (cranes and etc) will potentially be necessary to repair the problem.

As blades are the most common attachment point of lightning, they must be adequately protected. In addition, the passage of lightning current through wind turbine bearings introduces a risk of lightning damage to these vital components.

Lightning strikes are a wind turbines worst enemy. Without effective lightning protection, both the blades and the turbine itself can be severely damaged by the powerful energy surges in lightning. In the US the National Lightning Safety Institute " Lightning Hazard Reduction at Wind Farms; pdf www.lightningsafety.com/nlsi_lhm/wind1.html



Severe damage to a blade (left)

A lightning strike on an unprotected blade can lead to temperature increases of up to 30,000°C and result in an explosive expansion of the air within the blade. This can cause damage to the blade surface, delaminating, cracking on both the leading and trailing edge, as well as melted glue. Lightning strikes can also cause hidden damage that over time will result in a significant reduction of the blade's service life. "Taming The Power of Lightening" by

LM Glassfiber manufactures of turbine blades, pdf
<http://www.lmglassfiber.com/Products/Lightning.aspx>.

Investigations relating to the improvement of blade lightning protection systems have been carried out, including experiments designed to address the difficult problems involved in the protection of hydraulic cylinders used for tip brake control.

Work has also focused on the ability of lightning current to cause damage to wind turbine bearings. The work has been a mixture of computer simulations and experimental testing using high-voltage and high-current facilities.

Recommendation:

The Town shall require adequate conducting path from the tip of each turbine to the ground, using a multi-receptor system, to minimize lightning damage to turbines. The Town shall require turbines be sited at 3000 ft or 10 times the diameter of rotor blade, whichever is greater, from residential, historic, schools and wildlife refuse areas.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

J. Lighting Turbine Towers

American Wind Energy Association publication; "Wind Turbine Lighting" 5/14/05, (Ref: pdf on cd and <http://www.nrel.gov/docs/fy02osti/31115.pdf>) states that lighting the perimeter of wind projects with simultaneously flashing lights is sufficient to indicate one large obstacle to pilots and that only one light is needed on each turbine nacelle. On February 1, 2007 the US Department of Transportation Federal Aviation Administration has amended the Federal Aviation Administration's standards for marking and lighting structures to promote aviation safety "FAA Advisory Circular: Obstruction Marking and Lighting" pdf www.windaction.org/documents/7912.

There is an avian concern as steady burning red lights can attract birds and place them in danger. Night-migrating birds are attracted to the lights and fly in circles around the towers. The FAA is testing simultaneously flashing red lights that do not appear to attract night-migrating birds.

Residents near communication towers find that red lights are less intrusive than white lights, because white lights can direct a significant amount of light to the ground.

Development of Obstruction Lighting Standards for Wind Turbine Farms (Reference: www.airtech.tc.faa.gov/safety/downloads/TN05-50.pdf -and on pdf: pg 16 and 17) states that obstruction lights within a group of hazardous objects should have unlighted separations or gaps of no more than ¼ to ½ mile if the group appearance is to be maintained. This is especially critical if the arrangement of objects is essentially linear, as is the case with most groupings of wind turbines.

Recommendation:

The Town require the WECS developer to select a configuration of minimal lighting which meets FAA requirements. Use red lights being tested by FAA. Any strobing light will be required to be equipped with an RF choke and an adequate neutral pursuant to National Electric code IEEE 519 standards. Minimum downward directed security lighting for ground level facilities shall be allowed as approved on the site plan.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

K. Storm Water Runoff, Erosion & Sedimentation

Clearing and soil disturbance is required in order to erect the turbines, access roads, foundation excavation, laying underground cabling, the erection of the overhead

transmission lines and the formation of areas to be used for storage areas, and a site office, etc.

Water quality issues of concern include increases in runoff, erosion and resulting sedimentation. Adverse impacts include:

- Degradation of high quality waters, failure to meet water quality standards,
- adverse habitat impacts, such as loss of habitat
- loss of wetland functions and values.

Construction for access roads need to be relatively wide in order to accommodate the size of machinery and equipment needed to erect wind turbines. Access road construction may involve extensive grading, cuts, and fills.

The amount of cleared vegetation area may be significant, and must be analyzed for aesthetic impacts and wildlife impacts as well as erosion and water quality concerns.

Stream crossings may be a concern. Stream crossing can cause erosion and sedimentation resulting in water quality impacts. The Town may want to request the installation of bridges rather than culverts for crossings of permanent streams in order to minimize stream and riparian impacts. Pertinent information on erosion and sedimentation control can be found in " Section 3-H Erosion and Sedimentation Control Plan, including Phosphorus Impact Analysis and Control Plan " (pdf <http://www.maine.gov/doc/lurc/projects/Evergreen/Part%20H%20Erosion%20and%20Sedimentation%20Control.doc>)



This photo is from the Highland Wind Farm construction project in Cambria, PA.:

<http://www.braymanconstruction.com/pdf/HighlandWind.pdf>.

The Highland Wind Farm project consists of 25 turbines.

<http://highlandwindfarm.com/project.htm>.

This environment closely resembles that of upstate New York (numerous wetlands and streams).

Requirements set in the New York State's "Standards and Specifications for Erosion and Sediment Control" mandate that an erosion and sediment control plan be prepared when industrial disturbances are imminent. (Reference pdf <http://www.dec.ny.gov/chemical/29066.html>).

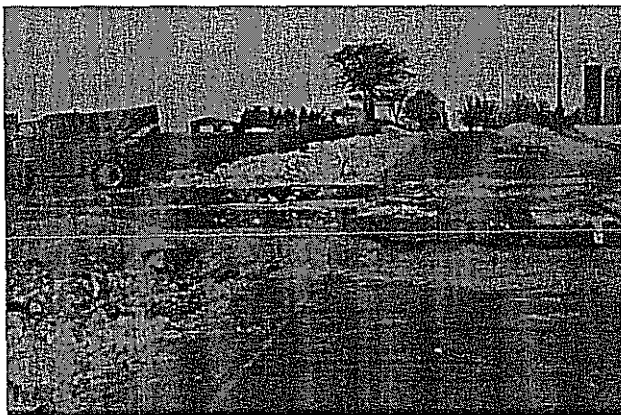
Recommendations:

Construction site monitoring and inspection by a professional, who is independent of the project developer, is essential for effective storm water and erosion management control. Because of the hydrologic variability, a standard site-specific EIS (Environmental Impact Study) should be required. The WECS Applicant should be required to provide a description of the impacts that the proposed Wind Energy Facility may cause and a description of how the Applicant will mitigate impacts. This analysis shall include: a description of baseline conditions and the impacts that the proposed use may cause. The Applicant should be required to provide a preliminary plan showing any existing and proposed grading for the Wind Energy Facility site. A drainage and erosion control plan should be required, accompanied by a description of practices that will be utilized to prevent erosion and run-off during construction. If there are any modifications to this plan, the Applicant will provide a final drainage and erosion control plan prior to commencement of construction. Soil loss predictions for each turbine location must be made using RUSLE (*Revised Universal Soil Loss*) equations. Some state required studies require a full year data set using a plan to address all points covered by the Storm Water Pollution Prevention Plan (SWPPP) check list as per New York state standards.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

L. Road Upkeep & Repair

Components delivered to the installation site by truck would be of significant weight.



Nacelles, typically delivered on two sections, can have a total weight of 80 tons. Unassembled cranes, typically transported in as many as 15 trucks, can weigh as much as 450 tons.

Construction photo from Cohocton.

Due to the weight of parts and equipment, it is likely that damage would occur to any roads used by the WECS developers, even with infrastructure reinforcement

improvements prior to construction.

WECS developers are often required to submit proposed construction routes and timetables to the Town for approval. The Town may choose to have construction routes posted primarily on county roads or primarily on a few central roads to contain the damage.

Construction photo from Cohocton.



Developers are typically required to return the roads to town/county specifications once the project is completed. Standard language in ordinances suggests that roads should be completed to the satisfaction of the Town Highway Supervisor and that a surety bond or other financial instrument should be established to ensure the completion of this task. The State of Kansas offers excellent example of this recommendation in their book; "Wind Energy Handbook: Guideline Options for Kansas Cities and Counties" Pages 23 and 24. (pdf

http://www.kansasenergy.org/Kansas_Siting_Guidelines.PDF).

Developers should construct the smallest number of turbine access roads it can. Access roads should be low-profile roads so farming equipment can cross them. Where an access road is to cross a stream or drainage way, it should be designed and constructed so runoff from the upper portion of the watershed can readily flow to the lower portion of the watershed. Also, FEMA regulations pertaining to building a structure in a flood zone for Region II (New York) should be followed. (FEMA Region II Hazard Mitigation Plan Toolkit: Risk Assessment, <http://www.fema.gov/about/regions/regionii/mitigation.shtm>).

Recommendations:

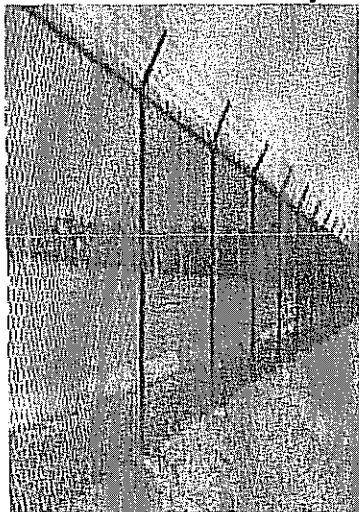
The town require the WECS developer to submit proposed construction routes to the town for approval, restore all roads to county and town specifications, within one month of the developer's last use of such road, and submit a surety bond or other financial instrument to ensure that road repair is completed. The town require the WECS developer to submit an analysis of impact on local transportation regarding impacts anticipated during construction, reconstruction, modification or operation of WECS. Transportation impacts to be considered shall include potential damage to local road surfaces, road beds and associated structures, potential traffic tie-ups by haulers of WECS materials, impact on school bus routes and visitors to the WECS facility.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

M. Public Access At Turbine Sites - Security (Vandalism / Terrorism)

During visits by the committee to the Maple Ridge Wind facility in Lowville the committee has concerns regarding the physical security by the developer around the turbine sites. The Maple Ridge facility is 29 miles long and has a sparse population of full time residents. However Maple Ridge does have seasonal visitors participating in outdoor recreation; ATV trails, snowmobiling, hikers and hunters. Maple Ridge also surrounds a vast State Recreational Park which allows accessibility for recreation.

The Orleans community including the Amish farmers is highly populated more so than the Maple Ridge facility. The Orleans wind "overlay" district is much smaller than Maple Ridge. Orleans community has a large number of hunters, ATV and snowmobile participants. Our Amish community lives off their lands. Orleans land owners have freely allowed with permission their neighbors, friends and family to participate in these activities. It concerns this committee to question the welfare of citizens who will have access to participate in recreational activities in close proximity of turbines. It is recommended by this committee that the developer hold informational meetings to the public, the Amish community and the schools regarding participating in recreation and hunting activities in close proximities to turbine sites. The developer needs to inform the citizens of the necessary



precautions that the community must adhere to in order to participate in hunting and recreational activities while living next to turbines.

The committee recommends that applicants should have each turbine secured and provided with remote intrusion monitoring as well as the central monitoring point. Each turbine *base* should be enclosed by a 12 ft chain link fence.

General Electric, Harrisburg, PA has released a patent for a wind turbine monitoring system having a central monitoring device for one or more wind turbines. The central monitoring device is capable of receiving signals from one or more wind turbines. The wind turbines each include one or more cameras arranged and disposed to provide visual signals transmittable to the central monitoring device. The visual signals generated by the cameras provide sufficient information to the central monitoring device to determine whether maintenance to the wind turbine is required. A method for providing maintenance to a wind turbine is also disclosed. Visual signals include images wherein vandalism is visible. General Electric Corp., Harrisburg, PA "Wind Turbine Maintenance System" (Ref: <http://www.faqs.org/patents/app/20090153656>, and pdf).

Research from the Bethany Wind Committee Report; section 15, page 30 describes their committee's research while visiting Maple Ridge Wind facilities in 2006 (pdf); "During our trip to Maple Ridge, committee members walked right into the central monitoring station unchallenged. Such lax physical security is not acceptable for a facility providing electricity to our national grid. Each turbine should be secured and provided with remote intrusion monitoring as well as the central monitoring point." Committee members, Patricia Booras-Miller and Judy Tubolino participated in a Maple Ridge tour in 2008, hosted by the Planning Board of the Town of Clayton and found PPM Energy/Iberdola has in effect this recommendation by the Bethany Wind Committee. They informed the tour that no unauthorized personnel is allowed in the central computerized monitoring station.

Recommendation:

The Town shall require the WECS operator, in addition to randomized two-token authentication for Internet protection, to enact and maintain physical security protocols including locks and remote intrusion monitoring of the control center.

The town shall require the WECS operator to place visual monitoring devices on turbines.

The town shall require the developer to install a 12 foot high chain link fence surrounding the concrete base of the turbine.

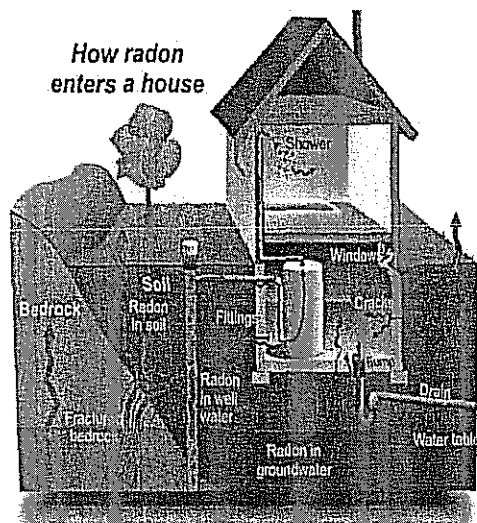
Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

N. Radon

On September 22, 2009 The World Health Organization Press Release: " Radon gas has been identified as the leading cause of lung cancer for non-smokers according to recent studies conducted throughout the world. The World Health Organization states that as many as 14% of the lung cancer cases in many countries (including the United States) are caused by exposure to radon gas. These recent findings have led to the establishment of a new standard for action of 2.7 for indoor radon levels". The World Health Organization has released their Handbook on Indoor Radon which strongly validates the worldwide threat of exposure to radon gas. According to handbook, WHO has been studying the effects of radon exposure since 1979. (WHO Radon Handbook, pdf http://whqlibdoc.who.int/publications/2009/9789241547673_eng.pdf).

Radon is a colorless, odorless, radioactive gas which is created naturally by the breakdown of uranium and radium. Radon gas is continuously released from rocks and soil containing these two elements. Uranium and radium may be found in almost all soil and rock, but are most often associated with those containing granite, shale, and phosphate. Once formed, radon itself decays into other radioactive elements, known as "radon daughters" or "progeny". The rate at which a radioactive element decays is expressed as its half-life. (A half-life is the time it takes for half of a radioactive element in a sample to decay into another element.) Radon has a half-life of about three days; its daughter particles all have half-lives of less than half an hour. NYS Attorney General Andrew Cuomo "Radon: The Invisible Intruder" (Ref pdf http://www.oag.state.ny.us/environmental/radon_brochure.pdf)

The Surgeon General has declared radon exposure to be the second leading cause of lung cancer deaths in the United States, after smoking. Exposure to natural radon is estimated to be responsible for 7,000 to 30,000 lung cancer deaths each year in the United States. As with other forms of cancer, lung cancer resulting from exposure to radon may develop over many years before it is diagnosed. New York State Department of Health: Dr. Michael Kitto and Dr. Charles Kunz, Laboratory of Inorganic and Nuclear Chemistry (Ref pdf <http://www.wadsworth.org/databank/aug-00.html>)



A. Exposure to Radon:

Radon gas continuously seeps into the air from uranium- and radium-bearing soil and rock. Outdoors, due to dilution in the ambient air, concentrations are generally so low as to be insignificant. However, if the gas becomes trapped in a poorly ventilated, enclosed space, the concentrations will build up. This can be a problem in any structure built on rocks or soil naturally emitting this gas. Any home may have elevated radon levels.

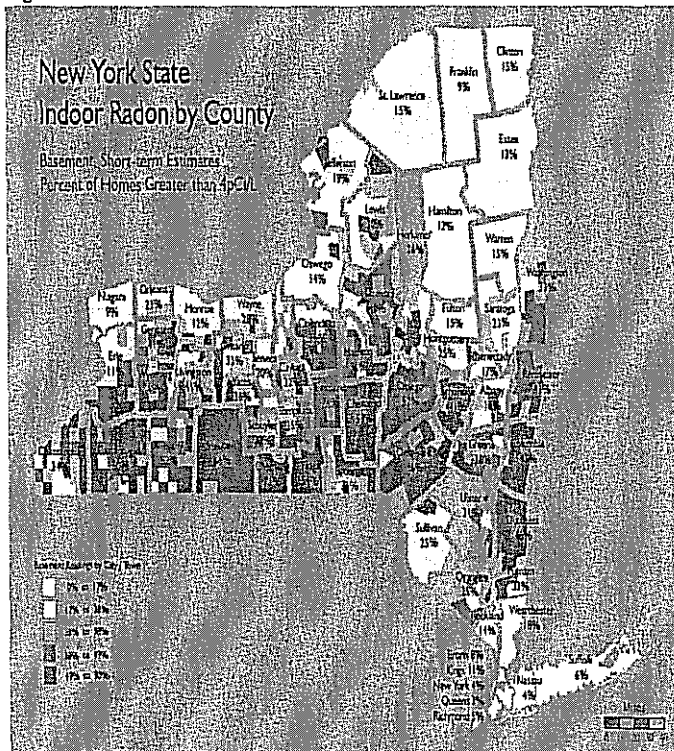
Figure 1

Gaseous radon can enter a home through foundation cracks, openings for pipes, wall/floor joints, chimneys, sumps, unfinished crawl spaces, and hollow, concrete block foundations (see figure 1, produced by WHO). Once inside, the gas may be trapped and accumulate, especially during the winter months when windows are seldom open.

B. Well Water Exposure:

Well water can be contaminated with radon and may carry radon into a house through the water pipes. Tests show that radon may be dispersed into the air when such water is aerated, running or heated. Municipal water supplies are normally aerated, which releases radon gas from the water before it enters a house. Most public water sources therefore pose little threat. Since water from private wells is generally not aerated before entering the home, it is more likely to contain radon, if it is drawn from uranium- or radium bearing rocks.

Figure 2



When radon-contaminated water is heated, agitated, or running, as in a dishwasher, washing machine, or shower, the radon will be released into the surrounding air. Studies show that the cancer risk associated with inhaling radon gas released from contaminated water is greater than that from drinking such water. The EPA estimates that 100 to 1800 annual lung cancer deaths are the result of inhaling radon from household water.

Radon has been detected, at varying levels, in every county in New York.

This New York State map (figure 2 pg 30) shows township level estimates of the percent of homes with indoor radon exceeding the U.S. Environmental Protection Agency's (EPA) recommended action level of four picocuries per liter of air (pCi/L). It was developed using nearly 45,000 short-term basement measurements and correlations to surface geology. Typically, radon enters homes at the soil-foundation level. US Environmental Protection Agency "A citizens Guide to Radon" March 26, 2009, (Ref pdf <http://www.epa.gov/radon/pubs/citguide.html>).

Conclusion:

Radon exposure to humans has become a serious concern by the World Health Organization, the EPA and the United Nations (pdf http://www.unscear.org/docs/reports/2006/09-81160_Report_Annex_E_2006_Web.pdf).

Radon is found throughout Northern Jefferson County Townships which includes Orleans and Clayton. The naturally occurring radon can be disturbed when the developer blasts during construction for each turbine, underground cables and for above ground transmission line poles.

Recommendation:

The town shall require the developer to perform pre and post construction of not less than 6 months testing for radon gas in homes that are located within one mile of all blasting locations. The developer will provide results of both the pre and post construction testing to the Town and to the resident. If radon testing is positive from the post construction testing, the developer is financially responsible to pay all radon mitigation fees.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

III. Small Wind Energy Conversion Systems Article IV Local Law

Orleans Local Law No 1 2007 for Wind Energy Facilities includes a separate section, Article IV, for the application of small wind energy in the Orleans wind overlay district. Like large wind applications, restrictions apply to small wind as well.

To meet our nations rally for increasing alternative energy resources small wind turbines are included in this demand. There are increasing numbers of residents who want to erect small wind turbines on their properties. The costs incentives for these applications are increasing in all states across the US. In New York, we have New York State Energy Research and Development Authority also known as NYSERDA has "On Site Small Wind in New York-Cash Incentives Available".

<http://www.powernaturally.org/Programs/Wind/incentives.asp?i=8>

Many townships are considering small wind facilities in lieu of large wind. New York NYSERDA states: "An on-site or small wind power energy system can provide consumers in windy locations with a cushion against electric power price increases.

Wind energy systems not only help customers reduce their electricity purchases from utilities, they also help reduce U.S. dependence on fossil fuels, and they are nonpolluting. Cash incentives for installing wind energy are available in New York and vary between 15-70% depending on the installation". Power Naturally:
http://www.powernaturally.org/Programs/Wind/OnSite_SmallWind.asp?i=8

In addition to NYSERDA, the American Wind Energy Association know as AWEA offers instructions and guidelines for applications for small wind facilities. AWEA 2008 publication "In the Public Interest How and Why to Permit for Small Wind Systems A Guide for State and Local Governments" (pdf) offers the town and residents helpful information.

As with large wind turbines, small wind turbines generate noise and shadow flicker. Review of the Orleans local law on small wind facility generators show that protective measures for residents is adequate. Our Local Wind Law has protection for residents living adjacent to small wind turbines from noise impacts. Our Local Law stipulates the use of the New York State Environmental Conservation (DEC) noise guidelines "Assessing and Mitigating Noise Impacts" (pdf) ". Orleans noise ordinance states: "a Small WECS shall be designed, installed, and operated so that noise generated by the system shall not exceed ambient noise levels (exclusive of the development proposed) by more than 6 dBA at the nearest property line to any proposed Small WECS". (Orleans Local Law page 14 pdf).

One of the concerns by the committee has in review of the qualifications is the height requirements. This was due to the fact that NYSERDA cash incentives are on towers 80 up to 100 ft tall. After consulting with the with the town zoning officer, variances can be issued and as we have Article V for waivers in the local law, this is not a problem.

The second concern is that of compliant and mitigation measures therefore, the committee recommends that small wind facilities are to be included in the Complaint Board process..

Recommendation:

Complaint Board: Complaint resolution including mitigation and any fines assessed to the owner of the small WECS to be handled at the discretion of the Complaint Board and the Town Board.

IV. Catalog of Referenced Document

(Research is listed according to categories)

Numerous documents were reviewed by the committee to substantiate the committee's conclusion for the recommendation. The committee offers the council two formats for referencing the documents; a CD with a pdf of each document (the pdf on cd is identified in light blue) and URL of the website location is referenced in dark blue..

C. Electronic & Electromagnetic Interference

1. "A Simplified Guide to the NTSC Video Signal", pdf and <http://www.seanet.com/~bradford/ntscvideo.html>
2. Thousand Islands Sun on Wednesday April 29, 2009 "Channel 7, Fox 28 Expecting Interruptions"
3. Trempealeau County WI Wind Ordinance 11/28/07, Page 9 (231) #20; pdf).
4. Boston Scientific "Electromagnetic Interference (EMI) and Implantable Device Systems pdf;
http://www.bostonscientific.com/templatedata/imports/HTML/CRM/A_Closer_Look/pdfs/ACL_EMI_and_Implantable_Devices_080408.pdf

D. Stray Voltage AKA Ground Current

1. America Wind Energy Association (AWEA) pdf page 21"Guide for State and Local Governments"
<http://maec.msu.edu/Guide%20for%20MPSC%20Rule%20web.pdf>.
2. AWEA, American Wind Energy Association states on page 2 from their document "Residential Wind Systems and "Stray Voltage" pdf
3. "Final Report Lincoln WI Moratorium Committee" Pages 8 to 10 pdf.
4. "Reduce the Risks of Stray Voltage" by Richard Peterson, Cornell pdf and <http://www.ansci.cornell.edu/pdfs/pd2008aprilp39.pdf>

E. Construction Disruption

1. <http://www.iberdrolarenewables.us/horsecreek/> Appendix A - Project Construction 05030. Horse Creek DEIS
2. Wolfe Island dust <http://www.youtube.com/watch?v=P-via0ec-AY>
3. Town of Bethany, Wind Committee Report; pdf, pages; 12-13

F. Earthquake Seismic Effects References:

1. "The presence, characteristics and earthquake implications of the St. Lawrence fault zone within and near Lake Ontario (Canada-USA)", pdf, and <http://www.ScienceDirect.com> Volume 353, Issues 1-4, 23 August 2002, Pages 45-74

2. Lamont Cooperative Seismic Network and the National Seismic System: Earthquake Hazard Studies in the Northeastern United States., pdf
http://www.ideo.columbia.edu/LCSN/Report/LCSN_Tech_Report-98-01.pdf
3. "Risks of Damage from Earthquakes", pdf and
<http://www.geo.mtu.edu/UPSeis/area.htm>

G. Fire Risk & Fire Department Needs References:

1. Summary of Wind Turbine Accident data to 31 March 2009, pdf and
<http://www.caithnesswindfarms.co.uk/accidents.pdf>
2. Emergency Management Guidelines for Wind Farms, pdf and
http://www.cfa.vic.gov.au/documents/CFA_Guidelines_For_Wind_Farms.pdf
3. Town of Bethany, Wind Committee Report; pdf. page 16

H. Ground Water Impacts & Protection Aquifers

1. U.S. Geological Survey, US Department of Interior, Ref;"Ground Water Quality in the St. Lawrence River Basin 2005-06" pdf
2. New York and New England Carbonate-Rock Aquifer;
http://pubs.usgs.gov/ha/ha730/ch_m/gif/M085.GIF
3. NY State Department of Conservation Comment Report on the DEIS Horse Creek Wind Farm PPM Energy/Iberdola 2007; pages 16-18 pdf "Geology and Ground Water Impacts".
4. The Town of Cherry Valley, NY hired an engineering firm to perform a pre-construction survey for ground water impacts, pdf and
<http://otsego2000.org/documents/NikPressleyReport.pdf>
5. Town of Bethany, Wind Committee Report pdf, page 17
6. Town of Union, WI Large Wind Turbine Citizens Committee Report; page 88 pdf

I. Lightning Protection

1. The National Lightning Safety Institute "Lightning Hazard Reduction at Wind Farms; pdf www.lightningsafety.com/nlsi_lhm/wind1.html
2. Severe damage to a blade "Taming The Power of Lightening" by LM Glassfiber manufactures of turbine blades, pdf
<http://www.lmglassfiber.com/Products/Lightning.aspx>
3. When lightning strikes wind turbines II pdf and www.wind-watch.org/news/2009/04/14/when-lightning-strikes-wind-turbines-ii/
4. Town of Bethany, Wind Committee Report; pdf, page 25

J. Lighting Turbine Towers

1. American Wind Energy Association publication; "Wind Turbine Lighting" 5/14/05 pdf <http://www.nrel.gov/docs/fy02osti/31115.pdf>
2. FAA Advisory Circular: Obstruction Marking and Lighting pdf www.windaction.org/documents/7912
3. Development of Obstruction Lighting Standards for Wind Turbine Farms pdf www.airtech.tc.faa.gov/safety/downloads/TN05-50.pdf -pg 16 and 17

K. Storm Water Runoff, Erosion & Sedimentation

1. Section 3-H Erosion and Sedimentation Control Plan, including Phosphorus Impact Analysis and Control Plan - pdf www.maine.gov/doc/lurc/projects/Evergreen/Part%20H%20Erosion%20and%20Sedimentation%20Control.doc
2. Highland Wind Farm Construction and project <http://www.braymanconstruction.com/pdf/HighlandWind.pdf>.
3. The New York State Standards and Specifications for Erosion and Sediment Control pdf www.dec.ny.gov/chemical/29066.html
4. FHWA/Environmental Review Toolkit/project development/ NEPA- pdf www.environment.fhwa.dot.gov/projdev/docueis.asp
5. Developing your Storm Water Pollution Prevention Plan pdf <http://128.113.2.9/~kilduff/Stormwater/EPA%20swppp%20guide.pdf>
6. Erosion and Water Quality Concerns for Industrial Scale Wind Turbines and Wind Test Towers pdf www.vermontwindpolicy.org/workingpapers/erosion.pdf
7. "Wind energy and the environment" pdf www.awea.org/faq/wwt_environment.html

L. Road Upkeep & Repair

1. "Wind Energy Handbook: Guideline Options for Kansas Cities and Counties" Pages 23 and 24. (pdf http://www.kansasenergy.org/Kansas_Siting_Guidelines.PDF).
2. FEMA Region II Hazard Mitigation Plan Toolkit: Risk Assessment, <http://www.fema.gov/about/regions/regionii/mitigation.shtm>
3. Town of Bethany, Wind Committee Report; pdf Page 29

M. Public Access at Turbine Sites - Security (Vandalism / Terrorism)

1. General Electric Corp., Harrisburg, PA "Wind Turbine Maintenance System" pdf <http://www.fags.org/patents/app/20090153656.pdf>
2. Town of Bethany, Wind Committee Report; pdf Page 30

N. Radon

1. World Health Organization "Radon Handbook", pdf
http://whqlibdoc.who.int/publications/2009/9789241547673_eng.pdf
2. NYS Attorney General Andrew Cuomo "Radon: The Invisible Intruder" (Ref pdf
http://www.oag.state.ny.us/environmental/radon_brochure.pdf)
3. New York State Department of Health: Dr. Michael Kitto and Dr. Charles Kunz, Laboratory of Inorganic and Nuclear Chemistry pdf
<http://www.wadsworth.org/databank/aug-00.html>
4. US Environmental Protection Agency "A citizens Guide to Radon" March 26, 2009 pdf <http://www.epa.gov/radon/pubs/citguide.html>
5. United Nations (pdf http://www.unscc.org/docs/reports/2006/09-81160_Report_Annex_E_2006_Web.pdf).

III. Small Wind Energy Conversion Systems Article IV Local Law

1. NYSEDA "On Site Small Wind in New York-Cash Incentives Available".
<http://www.powernaturally.org/Programs/Wind/incentives.asp?i=8>
2. In the Public Interest How and Why to Permit for Small Wind Systems A Guide for State and Local Governments" (pdf)
3. New York State Environmental Conservation (DEC) noise guidelines "Assessing and Mitigating Noise Impacts" (pdf)
4. Orleans Local Law page 14 pdf

Referenced: Community Wind Law/Ordinances Used in all Categories

1. Town of Union Rock County, Wisconsin Ordinance No 2008-06 (pdf)
<http://betterplan.squarespace.com/town-of-union-wind-ordinance/>
2. Trempeleau County Chapter 21 Law (pdf)
<http://betterplan.squarespace.com/the-trempeleau-county-wind-ord/>
3. Town of Allegany, New York Wind Energy Regulations Aug 2007 (pdf)
http://www.garyabraham.com/files/wind_laws/town_allegany_wind_energy_law_adopted_8-28-07.pdf
4. Town of Orleans, Local Law No 1 2007 for Wind Facilities (pdf)

V. Summary of Orleans Citizens Wind Committee Recommendations Part One and Part Two

A. *Shadow Flicker/Safety Setback Recommendation:*

The consensus of the Orleans Wind Committee is that the Turbines be set back at least 3000 ft or 10 Turbine Rotor Diameters (whichever is greater) from the property lines and from nearby affected roads/intersections to avoid significant Flicker Problems.

It is also recommended that the Town shall specify coating materials or effects in zoning.

The Town should also specify a setback distance from property lines and roadways to eliminate shadow flicker.

The Town should also require shutdown of the turbines during periods of peak flicker if that becomes a problem.

The Town should require the WECS developer to mitigate any unexpected shadow flicker effects promptly at its own expense.

B. *Noise/Sleep Interference Recommendation:*

The Wind Committee's consensus is that the Town of Orleans adopt a new noise ordinance in Local Law No 1 2007 for Wind Facilities that follows the spirit of the Guidelines written pro-bono by two well known and respected Acoustical Engineers, George Kamperman and Richard James put forth in the "Simple Guidelines for Siting Wind Turbines to Prevent Health Risks". Kamperman-James Ver 2.1

Kamperman and James recommendations have 3 major parts:

- Establishing pre-construction long term background noise levels that exist now.
- Establishing wind turbine sound immersion limits that the wind farm must meet.
- Post construction wind farm noise compliance testing.

Sound Limits:

Audible Noise Limit dBA: No wind turbine or group of turbines shall be located in Town of Orleans wind district that cause an exceedance of the pre-construction night-time background sound levels by more than 5 dBA.

Test sites are to be located at the property line(s) of the receiving non-participating property(s).

Not to exceed 35 dBA (LAeq) within 100 feet of any occupied structure.

Low Frequency Noise Limit dBC : Low Frequency Noise
Limit LAeq – LA90 = 20 dB or less

C. *Electronic & Electromagnetic Interference Recommendation:*

Town of Orleans shall require the WECS operator and at least one independent engineering firm to conduct pre and post construction signal evaluations for television, cell phone and wireless network interference. The WECS operator shall provide, in their wind development site proposal map locations of all communication towers and TV reception corridors in addition to the turbine site placements. The Town shall require the WECS operator to restore signals to pre-construction levels at its own expense or resolve at the direction of the complaint board.

D. *Stray Voltage AKA Ground Current Recommendation:*

Orleans shall require any CWECS project to meet the latest version National Electric Code for the life of the project.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

E. *Construction Disruption Recommendation:*

The developer shall be required to submit regular scheduling reports to the Town, indicating work completed to date, in progress and scheduled; this report shall include locations, construction routes and impacted property lots. The developer and/or an independent oversight agency should be required to actively monitor and address dust levels via standard construction techniques. Any impact reports submitted with application should address proposed routes, overhead obstructions and any necessary electrical or communications lines changes that would be made. The Town shall specify a limit on hours of heavy operation to a reasonable time frame. The Town shall consider the safe placement of new access roads.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

F. *Earthquake Seismic Effects Recommendation:*

Orleans shall require that the Town of Orleans select and the WECS developer fund an independent Engineering Study and produce a complete report on the likely effect of seismic activity consistent with historical data on all the Wind Farm Facilities.

Due to the fact that Orleans environment lies on the St. Lawrence seismic fault the developer must submit an earthquake preparedness manual to the Town for protecting the residents in the event of an earthquake of sufficient magnitude to affect the operation of any part of the wind farm.

It is recommended that the Developer educate and share with the Town of Orleans volunteer fire department and the department of public works their safety mechanisms and protocol for continued quality assurance on safety standards when seismic events occur.

G. Fire Risks & Fire Department Needs Recommendation:

The Town of Orleans requires any WECS developer provide necessary fire-fighting equipment and fire department training at its own expense. The WECS developer must also submit a fire protection and emergency response plan acceptable to the Orleans Town Board, created in consultation with the Orleans Fire Department having jurisdiction over the proposed district.

Orleans requires that each turbine be clearly labeled with a postal address compatible with the 911 emergency system to facilitate locating the fire.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

H. Ground Water Impacts & Protection of Aquifers Recommendation:

To ensure the protection of surface and ground water resources surrounding wind project area(s) in the Town of Orleans:

Limit Blasting. It is recommended to apply constraints that the foundations have to be dug without the use of blasting. Workers are to use pneumatic hammers, rather than blasting.

Ground water investigation, survey, fate and impact analysis of identified contaminants relative to identified wells, and wetland impact analysis.

A comprehensive preconstruction survey of Krast features be conducted in the Town of Orleans by a qualified engineering firm experienced and knowledgeable in Krast geology. This survey will include the proposed wind district and extend to one mile geologically beyond the surrounding wind project.

Well testing be performed preconstruction of all wells within one mile of the project area by a unbiased firm chosen by the Town and paid for by the developer applicant.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

I. Lightning Protection Recommendation:

The Town shall require adequate conducting path from the tip of each turbine to the ground, using a multi-receptor system, to minimize lightning damage to turbines. The Town shall require turbines be sited at 3000 ft or 10 times the diameter of rotor blade, whichever is greater, from residential, historic, schools and wildlife refuse areas.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

J. Lighting Turbine Towers Recommendation:

The Town require the WECS developer to select a configuration of minimal lighting which meets FAA requirements. Use red lights being tested by FAA. Any strobing light will be required to be equipped with an RF choke and an adequate neutral pursuant to National Electric code IEEE 519 standards. Minimum downward directed security lighting for ground level facilities shall be allowed as approved on the site plan.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

K. Storm Water, Runoff Erosion Recommendation:

Construction site monitoring and inspection by a professional, who is independent of the project developer, is essential for effective storm water and erosion management control. Because of the hydrologic variability, a standard site-specific EIS (Environmental Impact Study) should be required. The WECS Applicant should be required to provide a description of the impacts that the proposed Wind Energy Facility may cause and a description of how the Applicant will mitigate impacts. This analysis shall include: a description of baseline conditions and the impacts that the proposed use may cause. The Applicant should be required to provide a preliminary plan showing any existing and proposed grading for the Wind Energy Facility site. A drainage and erosion control plan should be required, accompanied by a description of practices that will be utilized to prevent erosion and run-off during construction. If there are any modifications to this plan, the Applicant will provide a final drainage and erosion control plan prior to commencement of construction. Soil loss predictions for each turbine location must be made using RUSLE (*Revised Universal Soil Loss*) equations. Some state required studies require a full year data set using a plan to address all points covered by the Storm Water Pollution Prevention Plan (SWPPP) check list as per New York state standards.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

L. Road Upkeep & Repair Recommendation:

The town require the WECS developer to submit proposed construction routes to the town for approval, restore all roads to county and town specifications, within one month of the developer's last use of such road, and submit a surety bond or other financial instrument to ensure that road repair is completed. The town require the WECS developer to submit an analysis of impact on local transportation regarding impacts anticipated during construction, reconstruction, modification or operation of WECS. Transportation impacts to be considered shall include potential damage to local road surfaces, road beds and associated structures, potential traffic tie-ups by haulers of WECS materials, impact on school bus routes and visitors to the WECS facility.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

M. Public Access At Turbine Sites - Security (Vandalism /Terrorism)

Recommendation:

The Town shall require the WECS operator, in addition to randomized two-token authentication for Internet protection, to enact and maintain physical security protocols including locks and remote intrusion monitoring of the control center.

The town shall require the WECS operator to place visual monitoring devices on turbines.

The town shall require the developer to install a 12 foot high chain link fence surrounding the concrete base of the turbine.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

N. Radon Recommendation:

The town shall require the developer to perform pre and post construction of not less than 6 months testing for radon gas in homes that are located within one mile of all blasting locations. The developer will provide results of both the pre and post construction testing to the Town and to the resident. If radon testing is positive from the post construction testing, the developer is financially responsible to pay all radon mitigation fees.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

**III. Small Wind Energy Conversion Systems Article IV Local Law
Recommendation:**

Complaint Board: Complaint resolution including mitigation and any fines assessed to the owner of the small WECS to be handled at the discretion of the Complaint Board and the Town Board.

P+O 1.
6220-1

From: CityCouncilWebForm
Sent: October 06, 2011 2:16 PM
To: City Council
Subject: Write a Letter to City Council

TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

Keith Moen
NSBA
9-1724 Quebec Avenue
Saskatoon
Saskatchewan
S7K 1V9

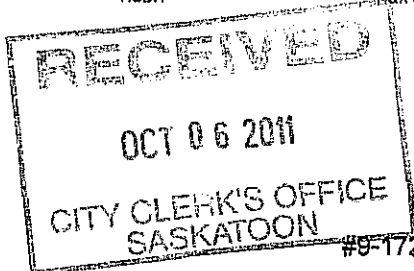
EMAIL ADDRESS:

keith.moen@nsbasask.com

COMMENTS:

I am supplying by fax a letter to Council for your consideration regarding the proposed traffic calming measures on Avenue C. I would also like to speak to Council on the matter. Thank you.

Keith Moen



Phone: 306.242.3060
 Fax: 306.242.2205
 Email: info@nsbasask.com
 Website: www.nsbasask.com

6320-1

#8-1724 Quebec Avenue, Saskatoon, SK S7K 1V9

October 6, 2011

His Worship the Mayor and Members of City Council
 222 3rd Avenue North
 Saskatoon, Saskatchewan S7K 0J5

Re: Request to speak to Council regarding proposed traffic calming measures on Avenue C corridor

The NSBA applauds City Council for many visionary and impactful measures taken to alleviate traffic congestion and address other necessary infrastructure needs. Having said that, however, traversing through Saskatoon's north end, particularly in the area of Circle Drive, between Avenue C and Millar Avenue, is often an exercise in frustration. This thoroughfare was not originally properly designed to provide a consistent, flowing corridor for traffic. Nor has it kept pace with the growth that we're experiencing. As a result, increasingly frustrated drivers have looked for alternate routes to follow. With limited options, Avenue C is one of these routes. Therefore, we are disappointed to learn that traffic calming measures are being considered on Avenue C in the area of 38th Street to 41st Street. We do not believe this will provide an improvement from either a traffic flow or safety perspective. Furthermore, it certainly will have a negative effect on the area's commercial activity.

Of primary concern – and this cannot be overemphasized – any moves to disrupt traffic flow on the Avenue C corridor will severely and detrimentally impact all businesses in the area. If you make it hard for consumers to reach a business, they will simply choose not to go there. Aside from the obvious hardship placed unnecessarily on these businesses – several of which may be forced to relocate at considerable expense – such measures could also result in an undesirable void or vacuum in what was formerly a strategic, viable, commercial area. Once businesses move away and the region becomes unpopulated, it could become a haven to the homeless and criminal activity including – but certainly not limited to – vandalism, graffiti, trespassing/squatting, drug use and a number of other possibilities. None of these scenarios reflect well upon our city, nor do they foster and promote a safe environment.

Secondly, the traffic volume and data compiled by the City (attached, Appendix A) indicates that traffic is traveling at a low rate of speed through this corridor, particularly in the residential area. This makes the safety argument for such proposed changes a non-starter. If safety truly is a concern for that area of Avenue C, the NSBA would propose and support an active corridor type of crosswalk as is being proposed for 33rd Street at Avenue D and Avenue C.

And finally, eliminating the Avenue C option for through traffic will only add to the congestion on what are already over-congested corridors of Circle Drive and Idylwyld Drive. This will lead to more driver frustration, possible road rage, potentially increased traffic violations and what I would suspect would be an even greater safety concern than what you currently have, which would make the result of the proposed changes the exact opposite of its intention.

In conclusion, I strongly encourage you to keep the Avenue C corridor between 38th Street and 42nd Street open for through traffic in the near and foreseeable future.

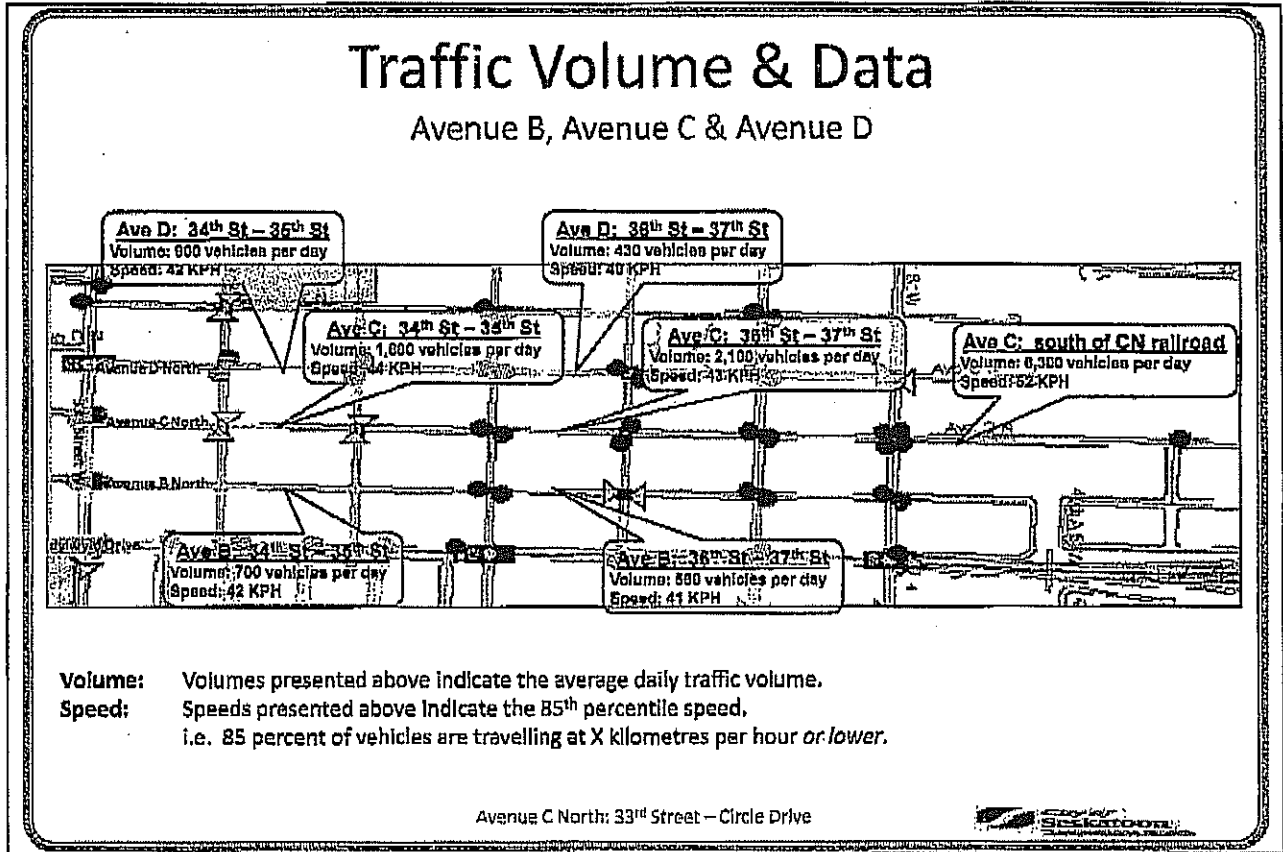
Sincerely,

Keith Moen
 Executive Director

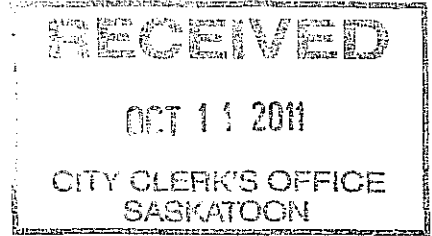
"Supporting Saskatoon's business community"

APPENDIX A

13/06/2011



From: CityCouncilWebForm
Sent: October 11, 2011 10:37 AM
To: City Council
Subject: Write a Letter to City Council



TO HIS WORSHIP THE MAYOR AND MEMBERS OF CITY COUNCIL

FROM:

kelly harrington
59 Howell ave
saskatoon
Saskatchewan
S7L 3S9

EMAIL ADDRESS:

kharrington@sasktel.net

COMMENTS:

Having the right turn only at 38th and ave C will create a larger problem for those who live along 38th and those of us on Howell ave. Rush hour traffic is bad enough in this area. We also have speeders who use the alley on Howell ave to speed rather than deal with the speed humps and road narrowing. This has become dangerous and I am not even comfortable stepping out my back gate. To further direct traffic down these streets just takes one problem and moves it to another. This is not a real fix to the issue of traffic flow in residential areas