

# 09hr\_SC-CUER\_CRule\_10-057\_pt03



Details:

(FORM UPDATED: 08/11/2010)

## WISCONSIN STATE LEGISLATURE ... PUBLIC HEARING - COMMITTEE RECORDS

### 2009-10

(session year)

### Senate

(Assembly, Senate or Joint)

### Committee on ... Commerce, Utilities, Energy, & Rail (SC-CUER)

### COMMITTEE NOTICES ...

- Committee Reports ... **CR**
- Executive Sessions ... **ES**
- Public Hearings ... **PH**

### INFORMATION COLLECTED BY COMMITTEE FOR AND AGAINST PROPOSAL

- Appointments ... **Appt** (w/Record of Comm. Proceedings)
- Clearinghouse Rules ... **CRule** (w/Record of Comm. Proceedings)
- Hearing Records ... bills and resolutions (w/Record of Comm. Proceedings)
  - (**ab** = Assembly Bill)                      (**ar** = Assembly Resolution)                      (**ajr** = Assembly Joint Resolution)
  - (**sb** = Senate Bill)                              (**sr** = Senate Resolution)                              (**sjr** = Senate Joint Resolution)
- Miscellaneous ... **Misc**

\* Contents organized for archiving by: Gigi Godwin (LRB) (July/2011)

October 9, 2010

**Senator Jeff Plale**

Chairman Committee on Commerce, Utilities, Energy, and Rail  
Room 313 South Capitol  
State Capitol  
P.O. Box 7882  
Madison, WI 53707-7882

Re: Wind Siting Clearinghouse Rule 10-057

Dear Senator Plale,

The Siting Rules presented to Committee on Commerce, Utilities, Energy, and Rail Members are incomplete and at best should be considered a work in progress.

The problems with the Rules began with the selection of Council members by PSC Chairman Callisto. The Council was heavily weighted with members who have a financial interest in wind energy, and fulfilled its purpose of reckless lowering of barriers to industrial wind turbine siting. The mix of members and the direction of the Chair never allowed for open discussion of the issues directly related to siting turbines too close to homes.

Chairman Callisto decided to exclude from the decision making process these items posted on the docket:

- Information or opinions about the cost of generating electricity from wind.
- Descriptions of personal accounts of persons living near wind energy systems in Wisconsin or other states.
- Third-hand accounts of persons living near wind energy systems in Wisconsin and other states.
- Expressions of support for wind development.
- Expressions of opposition to wind development.
- Copies of article, papers, press releases, reports and other publications filed by persons not the author of the publication.<sup>1</sup>

Concerned Wisconsin citizens posted over 1,800 items on the docket as requested by the PSC and were never told about these exclusions until long after the docket was closed. The voice of Wisconsin citizens and the hours of research to provide information were

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<sup>1</sup> PSC REF#137822 /Order Adopting Final Rules/Attachment A3 page 41/Other information received

ignored by Chairman Callisto and the PSC Commissioners. The recommendations of the Secretary of the Department of Agriculture were ignored. The recommendations of the Wisconsin Towns Association were ignored.

Chairman Callisto's and Siting Council Chairman Dan Ebert's goal and mission of removing barriers to siting industrial wind turbines has placed an unnecessary and likely unbearable burden on Wisconsin citizens.

The actions of Chairman Callisto and PSC staff under his direction are a violation of the public trust.

I have heard the term "the greater good" used to justify careless wind development. In order to determine the greater good, the information from all stakeholders, those who benefit and those who are bearing the burdens, must be made explicit and taken into consideration. The benefits of developing wind energy systems in Wisconsin are very much open to question. The PSC has been told by Clean Wisconsin that the installation of wind turbines to date has not resulted in any reduction of the use of coal-fired energy systems or in greenhouse gas emissions. The rationale given by the industry is that wind energy systems are the most economical way of complying with the Renewable Portfolio Standard (RPS) that the wind industry itself had promoted. It is hard to understand why the PSC would base state energy policy on such a self-serving rationale. On the other hand, the PSC Commissioners have ignored the input from citizen stakeholders who have been adversely impacted by poor siting decisions from the past and have ignored information from PSC staff about the siting standards that would be required to meet its own proposed rules. The PSC Commissioners have decided instead to rely on a mountain of paper assurances provided by the wind industry that nothing can go wrong rather than listen to Wisconsin citizens who live with wind turbines daily. Experience shows that keeping Wisconsin's RPS and wind development on track is extracting huge sacrifices from some of our citizens. This putative "greater good" has become an injustice for many who are forced to live inside wind energy facilities. Injustice is irredeemable. An injustice should never be used as a means to further a yet-to-be-determined greater good.

Wisconsin citizens live with the belief that Legislators and State agencies are there to protect them. Elected officials and the people they appoint have an intrinsic responsibility to protect the citizens. Residents forced to live with wind turbines are shocked to find that they have been abandoned to their fate.

How will you as lawmakers define the limits of government's interference with individual choice? How will you determine the reasonable amount of burden to be placed on citizens in the name of a theoretical "greater good"?

The rules as written may be a good start but are certainly not ready to become law. I ask that you send Clearinghouse rule 10-057 back to the PSC and the Wind Siting Council for additional refinement. Many areas of the rule are ambiguous and require clarification. The Wind Siting Council should move forward under the leadership of a facilitator who would work to improve the communication and decision making of the group.

I have included a list of the areas in the rule that I feel must be addressed before this rule becomes law.

Thank you for your consideration and your service to Wisconsin.

Regards,

A handwritten signature in black ink, appearing to read "Jim Bembinster". The signature is fluid and cursive, with a large initial "J" and a long, sweeping underline.

Jim Bembinster  
18002 W Cr C  
Evansville, WI 53536  
[jbembinster@att.net](mailto:jbembinster@att.net)

## **Areas of the Wind Siting Rule, Clearinghouse Rule 10-057 that require refinement and clarification.**

### **Complaint Resolution**

- The PSC must implement a method of complaint resolution for any rules they expect to become law.
- A nonparticipating resident is expected to contact the turbine owner / operator first with a complaint.
- Any resident with a complaint should be able to contact a government agency.
- Residents (200+) of the Blue Sky Green Field project in Fond Du Lac County have experience TV, radio, and cell phone reception problems for close to three years with little or no resolution.
- Complaint resolution must be clearly defined in the siting rules. Turbine owner/operators have not demonstrated that they will resolve complaints unless forced to do so.

### **Enforcement of the Rules**

- The task of enforcement will quickly outdistance the ability of local government.
- Town Boards meet once a month and if a resident's complaint is not on the agenda the Board could take no action.
- Enforcement must be done at the state level by an agency with enforcement and citation authority.
- Turbine noise complaints should be as easy as calling local law enforcement if someone is disturbing the peace.
- The siting rule as written now allows the violator (turbine owner / operator) to determine if they are in compliance, and they have 30 days to acknowledge the complaint.

### **Shadow Flicker Limits**

- No shadow flicker should be allowed on a non participating property.
- Most wind facilities in Wisconsin are about 15,000 acres. If a developer cannot find a better place to locate a turbine in all those acres then curtailment must be ordered by the PSC for the hours when shadow flicker will occur.

## **Maintenance Requirements**

- The rules proposed by the PSC must identify what is required of turbine owner / operators.
- Owner/operators in Wisconsin have not demonstrated that they are willing to protect our fragile environment.
- A zero tolerance for grease and oil leakage must be established.
- A turbine showing visual evidence of oil and grease leakage must be shut down until repaired and cleaned.

## **Protection for Agriculture**

- Wisconsin's process vegetable business is a 6.34 billion dollar industry that employs thousands of residents.
- This industry is totally dependent on the aerial application of crop enhancing chemicals.
- Aerial applicators will not fly inside or within a 1/2 mile boundary of any wind facility.
- Without a guaranty of aerial application the lucrative vegetable contracts and the jobs that go with them will disappear from Wisconsin.
- Sec. of Agriculture Rod Nilsestuen had requested this protection as part of the siting rules and was ignored.

## **Noise Limits**

- Noise limits must protect the nighttime hours when people sleep.
- A relative noise limit of 5dB over background will protect Wisconsin residents and is recommended by the turbine manufacture Vestas.
- The fixed 45dBA noise limit proposed in the siting rules will be 6 times as loud for some of our residents.
- The 45dBA noise limit would require a minimum setback of 2200', the siting rules allow a setback of 1250'.
- Computer modeling has failed to protect residents from excessive turbine noise.
- Computer modeling has been shown to underestimate the noise by 15dB or more.
- Wisconsin now has over 300 turbines operating. It's time to start measuring actual turbine noise instead of the garbage in garbage out computer sound modeling.
- There is no sound in the rural environment that has the ability to mask the noise produced by a industrial wind turbine. The character of wind turbine noise is unique and cannot be masked by the wind even though computer modeling shows it will.

- Computer modeling assumes that as the wind increases at hub height it also increases at the surface. This assumption is false. During times when the atmosphere is stable (temperature inversion) the wind speed will increase at the hub height and decrease at ground level. In Wisconsin we can experience a stable atmosphere 40% of the nights.

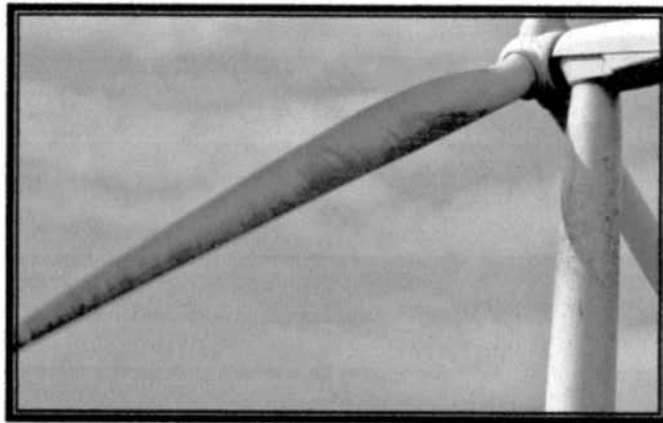
### **Setback Distances**

- Setbacks from nonparticipating property lines must be increased.
- The siting rules would allow a property line setback if 1.1 the turbine height or about 440'.
- The proposed safety setback of 1250' from a residence means that the turbine owner / operator are using 810' of a nonparticipating landowner's property. This also restricts the use of this land.
- Setback distances must protect the wind rights of nonparticipating property owners. This landowner may not be able to participate in the use of a future renewable energy device.

### **Decommissioning**

- When turbines reach the end of their useful life however many years that may be the owner/ operators and developers will be long gone.
- The state of Wisconsin and the taxpayers will be paying the bill for decommissioning.
- A bill should be introduced that will require turbine owner / operators to pay a fee for every MW of power generated into a fund to pay for the cost of decommissioning.
- This would be retroactive to include the turbines that are operating today.

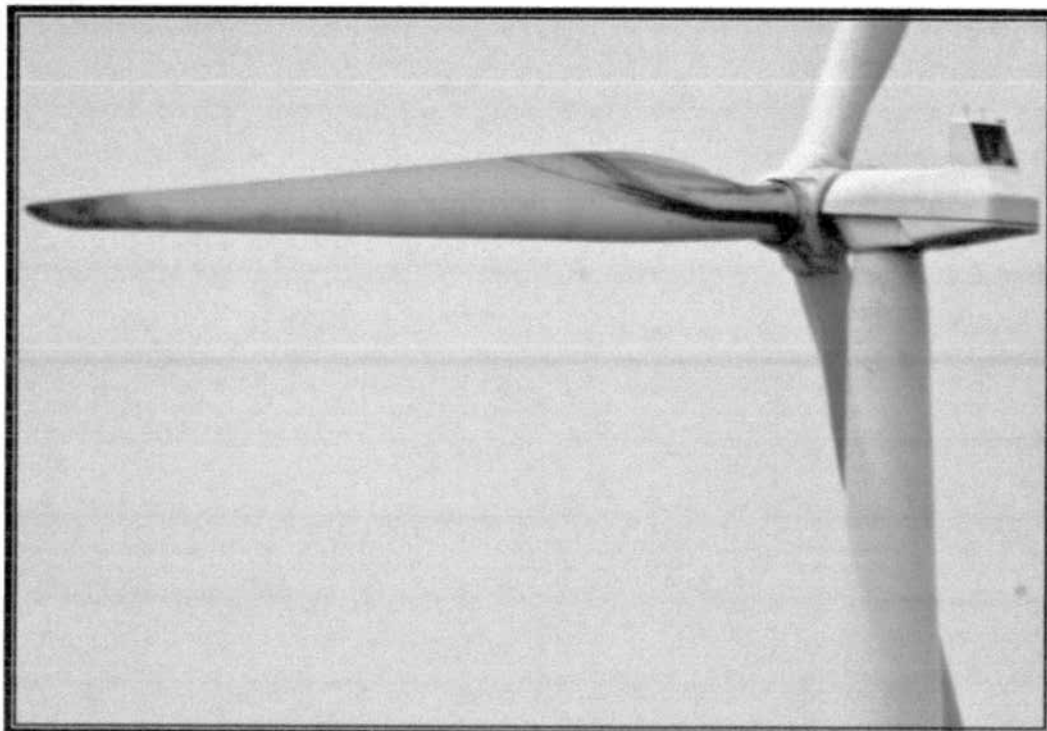
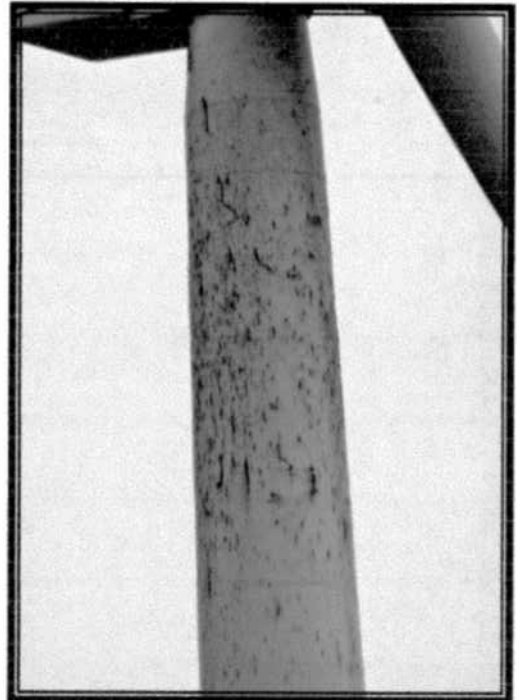
On June 19, 2010 I traveled thru the Blue Sky Green Field wind project in Fond Du Lac County. I was shocked to see the oil and grease coming from 6 or more of the two year old turbines. It's obvious that these turbines have been leaking for some time. The towers are sprayed with grease and oil around the entire 14' diameter. If this amount has collected on the tower how much has been thrown to the soil below by the 170' diameter rotor? One photo shows a turbine blade covered with oil the entire 134' length. At nominal speed the tip of the blade is traveling at about 170 MPH and would be capable of throwing this debris a long distance. Some of these turbines are placed near creeks that would carry this pollution even farther downstream. The lack of concern for Wisconsin's fragile environment demonstrated by wind developers and turbine owner/operators is appalling.





On July 5, 2010 I traveled thru the Alliant Energy, Cedar Ridge Wind Project in Fond Du Lac County. This 41 turbine project started operation in December of 2008. I three photos shown are the worst of about six turbines that are leaking oil and grease and are in need of serious maintenance. All the leaking turbines I spotted are in operation. The lack of concern for Wisconsin's fragile environment demonstrated by wind developers and turbine owner/operators is appalling.

Turbines in this condition must be shut down until they are repaired and cleaned.



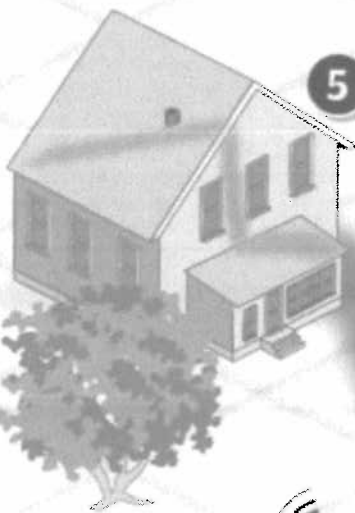
# Sound pollution from wind turbines

Wind turbines create noise from either the blades moving through the air or from the mechanical hub that produces the electricity. Sounds from wind turbines are a problem for some who live closest to the machines.

## 2 Pulsing sounds

**Outdoors** Turbines may appear to move slowly, but the tips of their blades often reach speeds of more than 100 mph. This, coupled with wind conditions that may include faster-moving air at the top of the arc and slower winds at the bottom, can produce a pulsing or oscillating sound.

**Indoors** Low-frequency sounds can penetrate walls and windows and are sensed as vibrations and pressure changes.



## 5 Shadows

The flickering shadows of rotating turbine blades at certain times of the day can also disturb residents.

## 4 Distance differences

Standing beneath a turbine may not be as noisy as standing further away. Depending on wind conditions, some types of sound increase with distance before becoming quieter.

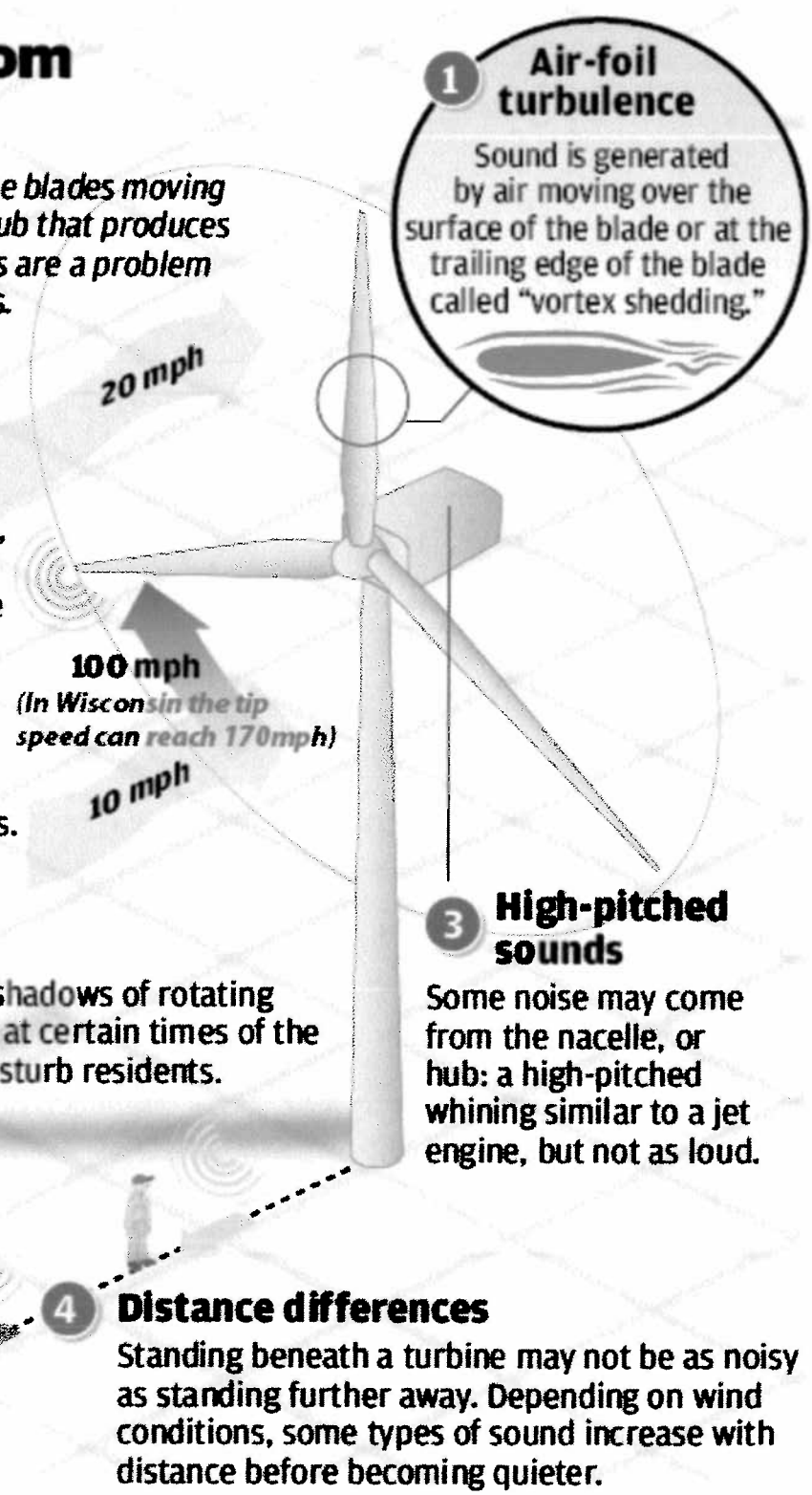
## 1 Air-foil turbulence

Sound is generated by air moving over the surface of the blade or at the trailing edge of the blade called "vortex shedding."



## 3 High-pitched sounds

Some noise may come from the nacelle, or hub: a high-pitched whining similar to a jet engine, but not as loud.





Jim Mueller

Contact

From: Julie Schneider [jschneider795@yahoo.com]

Sent: Saturday, October 09, 2010 4:56 PM

To: Jim Mueller

Subject: Fw: turbine rules

C-Rule 10-057?

Jim

I have included the memo below. I really am sad I can't go with because it is so important to our lives, but I have to keep my job too.

Good Luck! Let me know what happens? I am grateful people like you are staying involved. I do know the risk to your business regarding this Jim.

Julie

From: Julie Schneider [jschneider795@yahoo.com]

Sent: Wednesday, June 30, 2010 10:03 PM

To: Newman, Paul C - PSC

Subject: turbine rules

This memo is critical it be included with the new rules request for the turbines and this is our public reasons why we do not the government to exclude us from the Public Service Committee rule setting. We need to be grandfathered in to the new rules. Please assist me in getting this added?

We are asking you to hear us out before you make any more rules or decisions

Regarding windmills.

I am hearing you do not want to include us in your new regulations and you want

To leave us living in this environment without having to deal with our issues.

To do this is not only unfair, and inhumane, it is an act of "see no evil", that

Is disrespectful to us as citizens of this country. I am wondering if any of you voting

That way really feel "right" about it. I am asking you to reconsider.

Do you know what it is like to come home and not be able to watch tv when you

are devastated your 4 year old nephew has a brain tumor and you are desperate for something to take away the images that are burned in your brain of his pain, his huge "port" they stuck in his chest for future chemo. He had terrible misery and was moving continuously to escape pain. Do you know the images in your brain watching that? Do you have any idea how bad you want to go back to the comfort

of your home where you want to cry from mental exhaustion and then fall asleep watching some show that gives your mind an hour of rest? You turn on the television and you cannot watch it. It is "out" again. You cannot even imagine the sickness in your stomach when you realize your "sanctuary" at home is gone. You no longer have a place to go.

You have Constant flickering in the morning for an hour. You cannot escape from it, even with the blinds drawn. You cannot move into any room to be free of it if it has windows on that side of the home. You cannot fall asleep at night from the noise that ensues when Winds are more than 11 mph. It is not a "lulling" sound, but a grinding after rain. It is like a constant jet going over. It is also accompanied by a whooshing sound. It is not a comforting dull whoosh... It is a blackboard fingernail type noise that keeps you awake and drives you on the brink of madness. Everytime it rains, you cannot watch tv. Just when you are bored silly...you can't even watch tv. That has been taken away. You get irritable. But, W.E. and the people responsible don't really care. It isn't them. You find out they have given the neighbors radios, and all kinds of bandaids. They have told them they will pay for 120 channels on dishnetwork, but not you because you already had a dish. You are discriminated against. You fight and argue with them for over a year. You are so sick of it, and feel lost. What can you do? You have been lied to, argued with, discriminated against, and you are sick thinking about it. Sick to your stomach. Do you really think you wouldn't be like that? Try living it for even a week. You will not believe what this has done to your life. If you would have told me that 5 years ago, I would have said "I don't believe it".

We are peaceful people. We do not look to make trouble for anyone. We even waited to see how the windmills affected us before we judged them, because that is what is fair.

Yet, no one considered what is fair for us residents. We are in a low area. When I asked the engineer about the noise, and we asked them if they considered the geological location of them in respect to

homes, he admitted they did not. We told him We have constant droning. We have constant pressure we can feel in our ears. We wake 3-4 times a night. We have difficulty getting back to sleep. We live with flickering. We live with noise. When we walk now, we hear nothing. We used to hear birds. Now we hear an eerie silence. Nothing. We had moved here for privacy and quiet. We had moved here for wildlife and nature. That was taken away. Our beautiful view of the land was destroyed. Yet, that was the minor part. The major was the lack of sleep, the irritability, the headaches, the ear pressure, the flickering, the noise, the loss of home value. This isn't just a group of "whiners". This is reality. This is a company that stole our homes.

We are afraid. We had an expert on electrical here to tell us there is no such thing as stray voltage, yet we see cows die, etc in the news. "Oh no – there is no such thing as stray voltage. So, when we asked about energy surges, they couldn't answer that. We live in fear. We are worried when we let our 3 two year old grandchildren run in the yard. We are afraid to step on the lawn after a rain. We cannot stand it outside on the lawn during flickering, so we can't stand it inside our home, and we cannot stand it outside.

Our biggest complaint is our home value has dropped drastically. We had a couple people interested in our home, waiting for it to come up for sale. We finally decided maybe it was time. We are unhappy here now due to the windmills. But, of course, they are no longer interested. They said "No, we would NEVER want to live in that area – you have windmills." So I called the president of the North East Realtors Association. "Yes, you have a huge loss in value, he said. I don't know the exact percent, but I can tell you I do not have people willing to live in that area unless the price is drastically reduced or not at all. I would testify to that." So, we have home value loss. Everything we put into our home, was with a plan to sell it someday and retire in a smaller home. It is now gone. So basically our retirement was also taken away from us. Not just our home. Our retirement. Why are a small isolated group of people burdened with all the liabilities and burdened with health hazards and long term affects "for the good of the nation." It hasn't even been proven this will "help" the nation. In fact, the engineer admitted to us it wouldn't really. He also stated they put them where they had easy access to high lines. They didn't care if there were residents. They had no right to take away our property. They had not right to inflict us with flickering and noise without

restitution. How can you people even consider leaving us out of the rules being set up? Can you do that and sleep at night? Can you really turn your back and walk away knowing what has been taken from us? It doesn't matter because it isn't you?

Do you really want to believe you will never pay for that? We need to be grandfathered in to the new rules.

Do you know what it feels like to have your home literally "taken" from you without having a thing to say about it. Everything you have always worked for has now suddenly been taken from you without even a word. You never were able to voice your opinion because you were not the property owner where they stuck these units. Our happiness, health, well being, financial value, everything is gone. Yet, you want to ignore this, and just make "future" laws. Why would you do that to innocent people?

We are asking you, if you have any kind of conscience, to please reconsider that. Please help us. We haven't done anything except work hard for our homes. It feels like we have had them stolen, and no one wants to step outside of the box and help us. We

Are wondering how you can be so cold. Because we are a number? Well, this number tries to sleep. This number has headaches and pressure in our ears. We have flickering.

This number cannot believe a government allowed this. Cannot believe any fellow

Citizens would do that to someone. This number feels sick and hopeless and feels fear and disgust. We want our home back. It is that simple.

We live with days of "airline" type pressure in our ears and lack of sleep. We are often

Irritable. The flickering causes confusion. I race to get out of the house because I cannot

stand it. It is literally driving us mad. Why shouldn't we be compensated? Do you really believe that is right?

I am sickened when I hear no one will help. Why? What have we done to deserve that?

Why are you turning your backs on us? For greed? For political reasons? Please reconsider and get the residents, this was forced upon, some help. Please do what is right for us. The helpless feeling is sickening in my stomach. It is destroying us.

At a minimum, give us our home value back so we can move it we wish. We didn't ask for anything from the way you have destroyed our lives. We are simply asking for our home value back.

We argue when we are irritated that the tv doesn't work. We blame each other because neither of us has been able to get help from someone. We get so irritable it is unbelievable. I am ashamed, but it is still a fact. We have asked W.E Energies for

Help, and they came right out and told us "We won't deal with individuals on this."

W.E. Energies are thieves in our mind. . They have stolen our home. We are asking you now to help us. Please.

We are not “just a number”. We are people. We give to charities. We have family. We work for our home. We deserve our home value. We have worked our entire career for that. We just want the security of our home again, and the value returned to us. I don’t think that is much to ask when I hear about the High wages they pay workers, and the big money W.E. officials are reaping, and the government is “gaining”. We aren’t asking for big money. We are asking for our home value back so we can now make the choice on whether to move or not. Our choice has been taken away. We just want it returned. This is a small price for you to pay. Do not pass these rules without including us. Do not leave us on the side like a bastard child. We have a place in this group. Don’t kick us to the curb because of politics please. If someone stole from you, you would feel sick and you would want to be compensated. If someone destroyed your home, you would expect payback. If someone wrecked your lives, you would want it back like we do.

Please do not pass this without including us. Laws have been broken – like the nuisance law, and the reverse condemnation laws. No one has paid for these violations against us.

All we can do is ask you to please do what is right now.

Thank you for listening.

Mr & Mrs. David E Schneider

10/12/2010





CONTACT INFO:  
Glen R. Schwalbach  
920-680-2436

October 9, 2010

From: Todd Christensen  
Town Chairman  
Town of Morrison, Brown County, WI

Re: PSCW Wind Siting Rules  
Clearinghouse Rule 10-57

To: Senate Committee on Commerce, Utilities, Energy and Rail  
State of Wisconsin

Dear Committee Members:

Our town has literally spent hundreds of hours on wind siting issues in establishing our original town ordinance, understanding the impact of the Invenergy 150-megawatt wind complex proposed to have 59 turbines in our town, and reacting to the drafting of the PSCW's wind siting rules.

With a lot of citizens' input from those opposed and those for wind turbines, our town board and I decided that the issues are very technical and complex and cannot be resolved by emotional bias. Besides this, the so-called studies on the effects of wind turbines on humans were conflicting in their conclusions and many times were more scientific opinion, rather than scientific fact.

So, we hired a Professional Engineer, licensed in Wisconsin, to help us establish a process for gathering citizens' input in an objective manner, evaluate national and international scientific studies and reports, and, from this work, draft credible comments and testimony to the PSCW's process for drafting the state's wind siting rules. We feel we accomplished our goal of focusing on public safety and health.

But the fact still remains that there are no statistically-controlled, epidemiological studies which establish that wind turbines are safe or harmful. Such studies have not been done. There are studies, some peer-reviewed, which concluded there is no harm and others which indicate there are adverse effects, especially from noise. None of these rank as adequate, conclusive scientific studies.

It is essential that your committee delay these rules until they can be based upon epidemiological studies performed in Wisconsin's existing wind farms where numerous health complaints are being reported while some residents say they have no problems. The University of Wisconsin should be able to design and manage such studies in a year or two. Such studies would also help the PSCW establish requirements for large wind projects which are under their purview. A one- or two-year delay would still enable any utility which still needs some wind in its portfolio to do so by 2015.

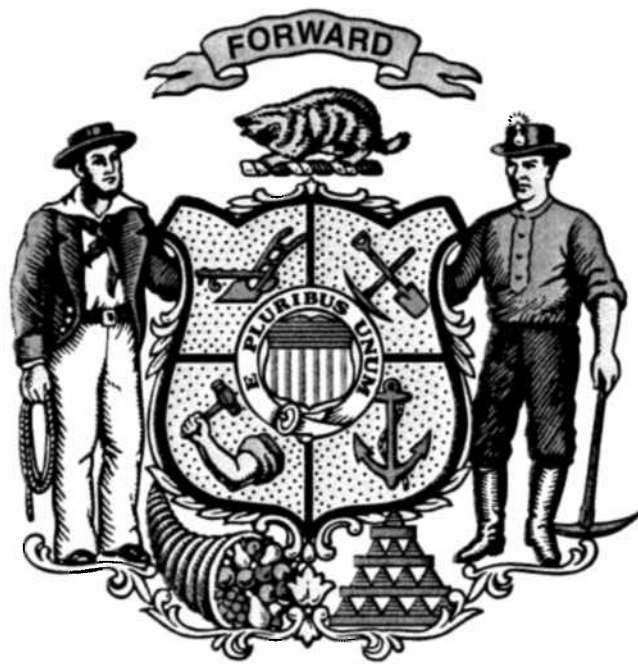
These studies certainly would benefit wind developers by providing a solid basis for designing wind farms, expediting project applications, and reducing future litigation settlements. They should step up and fund such studies. There may be help from the U.S. Department of Energy as well.

I also ask you to request the PSCW to improve the rules for advance notice to the town boards and to the community for better protection of landowners and their property. We suggest a temporary franchise for a wind developer while they contact landowners and inform the community. This would mute the developers concern for being trumped by another developer during their easement procurement activity.

Sincerely submitted,

A handwritten signature in black ink that reads "Todd Christensen" followed by a horizontal line extending to the right.

Todd Christensen  
Morrison Town Chairman



October 10, 2010

Senator Jeff Plale  
Chairman of Senate Committee on Commerce, Utilities, Energy, and Rail  
P.O. Box 7882  
Madison, WI 53707-7882

Senator Plale:

I would like to be submitted for the record for the  
Senate PUBLIC HEARING  
Committee on Commerce, Utilities, Energy, and Rail  
Clearinghouse Rule ~~10-057~~  
Relating to the siting of wind energy systems.

**I AM OPPOSED TO THE CURRENTLY PROPOSED WIND SITING RULES. THEY ARE WAY TOO CLOSE TO OUR HOMES.**

Thank you for holding a public hearing on the Wisconsin State Wind Turbine Siting Rules introduced to the Wisconsin Senate on September 2, 2010 by the Public Service Commission of Wisconsin.

I would just like to make a few points about the process behind how ACT 40 brought this to the Senate and what impact the proposed rule will have on Wisconsin.

The Minority Report from Act 40 clearly shows that the 15 person siting council was extremely slanted toward wind development with 11 wind proponents and 4 looking out for the health and safety of Wisconsin residents. Dan Ebert, chairman of the 15 person wind siting council, clearly ignored all attempts by Larry Wunsch and others to protect citizens with greater setbacks and lower sound decibels. Larry Wunsch was also on the 15 person council and lives in the Forward Wind Turbine project in Fond Du Lac, Wisconsin. Larry has first-hand experience which should have been taken into account instead of pushing 3.1 times the height of the turbine and 45 decibels at night down to the Senate. Studies show this setback should be at least ½ mile and sound levels should only be 5 decibels over ambient. Ambient is the current noise level and 5 over would already be 50% louder than the current noise level. ½ mile should be from a property line so property use isn't stolen from the Wisconsin land owner.

The Ledge Wind Project is proposed all around my home so I have been active over the last year in the responsible siting of wind turbines. I was very concerned about the impact so I went down to the WE Energies Blue Sky Green Fields wind turbine project near Fond Du Lac on 5/22/2010 and interviewed 10 people living in the project area. All 10 had experienced negative affects and 5 of them I recorded on video and I've submit this video DVD as part of my notarized testimony.(with each of their permission) I was amazed to find that people had been fighting to get their TV and radio reception back from the minute the project was live. They have been woken up several times a week by these turbines being noisy and being placed too close to their homes. This even involved 2 of 10 people who signed contracts for the wind turbines and wished they hadn't because they are too close to their homes and they cannot enjoy sleeping, opening their windows, hunting, or sitting on their decks to relax. We cannot continue to impact so many residents by each wind turbine that is erected. These people haven't been able to sell their homes and I talked to one person who had to abandon their home because of the health impacts of placing these too close to their home. Several of these people I interviewed were taking one or two different sleeping medications since these turbines went online just to get some sleep.

There is a problem here and the State Health Department won't conduct a study because they are appointed by Governor Doyle and they are afraid to lose their job if they show there is a problem with siting these too close to homes. If a study will not be conducted then you must error on the side of health and safety. Please push the state health department to do their job!

There needs to be rules included to protect those negatively impacted with a property protection plan as Commissioner Azar pointed out in her letter to Senate President Risser and Speaker Sheridan.

Our bedrock is right at the surface here in Brown County and our wells already have a long history of manure contamination. 81 miles of trenches and 100 foundations in the middle of farm fields with exposed bedrock will certainly have an impact. Some level of control must be given to the local boards to regulate for local issues such as this.

Our manufacturers in Wisconsin cannot stand higher electric rates mandated by wind. As we add too many wind turbines to our grid the cost of updating the transmission line system will continue to be passed down to our manufacturers and they will be forced to leave the state and take Wisconsin jobs with them.

These industrial turbines are being pushed through under the guise of a "farm" so they avoid inspections and regulations and this too should be included in the wind siting rules.

It should also be illegal for wind developers to sign-up town officials of any kind. This must be in the new state-wide siting rules. I live in the Town of Morrison in Brown County and 2 out of 3 of my town board members, our zoning administrator, and 4 out of 7 of our planning committee members have a wind turbine contract in the Ledge Wind Project which is proposing 100 turbines in the towns of Morrison, Glenmore, Wrightstown, and Holland. 2 out of 3 of the Wrightstown board members have also signed contracts. How can they be impartial board members when they are receiving monetary gain from the project. Wind developers should also have to disclose their intent to develop an area prior to signing up land owners by holding a town-wide meeting.

You don't have to look far to know there is a problem, you just have to look. Please put on the brakes and take a few months to conduct a study before we destroy more families and communities. We need industry and we need family in Wisconsin. We don't need industry stealing from our family living room, our family bedroom, and our family pocket book.

Here is the online location of the videos that are part of my 10/13/2010 Senate Public Hearing on Wind Turbine Siting Rules testimony. I'm providing this in case you cannot accept DVDs. (I had to split them into 5 separate videos because of the youtube limitations):

[http://www.youtube.com/watch?v=GIbzYXSM0zs&layer\\_token=30fd99341a3167cc](http://www.youtube.com/watch?v=GIbzYXSM0zs&layer_token=30fd99341a3167cc)

[http://www.youtube.com/watch?v=pzh106w1IRA&layer\\_token=5422aca72bfde2c2](http://www.youtube.com/watch?v=pzh106w1IRA&layer_token=5422aca72bfde2c2)

[http://www.youtube.com/watch?v=9PvPXU0io\\_A&layer\\_token=3affccee951c2680](http://www.youtube.com/watch?v=9PvPXU0io_A&layer_token=3affccee951c2680)

[http://www.youtube.com/watch?v=34oOPKNJv-E&layer\\_token=11e52b0a21d359d3](http://www.youtube.com/watch?v=34oOPKNJv-E&layer_token=11e52b0a21d359d3)

<http://www.youtube.com/watch?v=34Ro4tZd-B0>

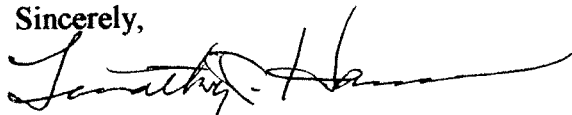
These 5 videos are also available at this address (labeled Interview1 – Interview5):  
http://www.bccrwe.com/index.php?option=com\_content&view=article&id=60&Itemid=87  
All 5 interviews are under this heading:

"Interviews with residents of a Wisconsin Wind Farm"

Here is what I'm asking you to do with the current wind siting rules:

1. Setback: Change from 3.1 times the height of the turbine to 1/2 mile from a property line.
2. Noise: Change from 50 decibels and 45 decibels at night to 5 decibels over ambient.
3. Include property protection plans where the wind developer must buy the impacted home at the current market value of a similar home that is not near a wind turbine project.
4. Give some control back to the local towns who are closest to project area
5. Inspect and regulate this industry like any other industrial power plant.
6. Make it illegal for wind developers to sign contracts with town officials.
7. Force the State Health Department to conduct an epidemiological study of existing residents of wind projects.

Sincerely,



10/12/2010

Timothy J. Harmann  
4544 Mill Road  
Denmark, Wisconsin 54208  
920-864-7111  
[tharmann@theglobalnet.net](mailto:tharmann@theglobalnet.net)

**Attachment:** DVD of 5 people I personally interviewed that live in the WE Energies Blue Sky Green Fields project near Fond Du Lac, Wisconsin. (southeast corner of Lake Winnebago)

State of Wisconsin  
County of Brown

On this day October 12<sup>th</sup> 2010, personally appeared before me,

Timothy Harmann

to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.

  
Notary's Signature

10/17/10 10/20/13  
Notary Expiration Date

Notary's Seal





Tim Harmann  
interviews 5 people  
living in an industrial  
wind project. 5/22/10

memorex

DVD+R  
18 4738 120

Taken in Blue Sky Green  
Fields WE Energy  
Project.  
Senate Public Hearing  
10-13-2010

Added to the LRBS  
legal library collection.





To: Wisconsin Senate Committee on Commerce, Utilities, Energy and Rail

Date: October 10, 2010

Subject: Comments on clearing house rule 10-057(PSC 128)

Senators;

The PSC 128 wind turbine siting rules are in need of change.

The setbacks need to be measured from property lines to respect the rights of the non-participating land owners.

The sound levels are to apply starting at the non-participating land owner's property line and anywhere on that non-participating property, because a person should be safe on all areas of a person's land and wind turbines tend to be sited on multiple sides of non participating land.

The sound levels should have a limit of 5 dB(A) above ambient sound levels. Simple because the state has a very large diversity of ambient sound levels.

The state should perform a study on the health effects of the turbines before rushing into these rules. PSC has not incorporated any of the findings of the Mars Hills Turbine Project Health Effects-Pilot Study that is documenting the health effects of the turbines.

The PSC has not responded to questions about manufacturer calculated blade throw distances. It appears the PSC has not considered this information. Yet when I submit blade throw calculated distances that show debris is thrown at significant distance, this information is not refuted nor is it incorporated in the safely set back distance.

I do not understand why it is such a hard concept for people to understand that setbacks should be from property lines. Government must understand this, since a tax bill is based on the land right up to the property line. PSC 128 creates a virtual nightmare for rural property owners. These rules allow a single 500 foot turbine to be erected on a 40 acre field without permission from any of the neighboring land owners, this one 500 foot turbine has now stopped any housing development on 133 acres of the neighbors surrounding land. That's what the PSC has done with these rules. How can any individual, business, township, village, or city have any development plans with these types of rules.

The wind developers say if the setbacks are increased they will not be able to site wind turbines, nothing is stopping the developers from obtaining easements from the land owners!

In fact, in other states wind turbine developers are siting turbines using rules that measure substantial distances the from the non participating property lines.

The PSC 128 rules allow the owner to use their own software to demonstrate compliance of sound requirements in the planning stage, the rules have the owners perform the pre and post construction sound measurements, the rules have the owners perform the measurements in response to noise complaints. There is no third party in the whole process. The owners are unregulated. These rules need to insert an independent third party review into this sound measurement process from the planning, to the pre and post installation sound studies, and into the complaint process.

PSC 128 subchapter IV discusses complaints. I hope you also read this chapter carefully. The surrounding residences are to rely on the owner of the turbines to compile a list of complaints. These rules need to provide a third party that compiles the wind turbine complaints and enforces the rules. This whole process should be at the cost of the wind developers not dropped on the local governments.

I am currently far safer living near the two nuclear plants than near a wind facility. These nuclear plants are regulated and I know that the safety standards are being monitored. The plants would be shutdown if they are not in compliance with safety regulations. I live by the nuclear plants and I am not considered collateral damage, but if wind turbines are constructed by me, I can be considered collateral damage. Why not build more nuclear plants, they produce higher quality jobs, more megawatts per acre and less costly power.

Respectfully,



Jeff Roberts

12113 Tannery Rd.

Mishicot, WI 54228

Attached:

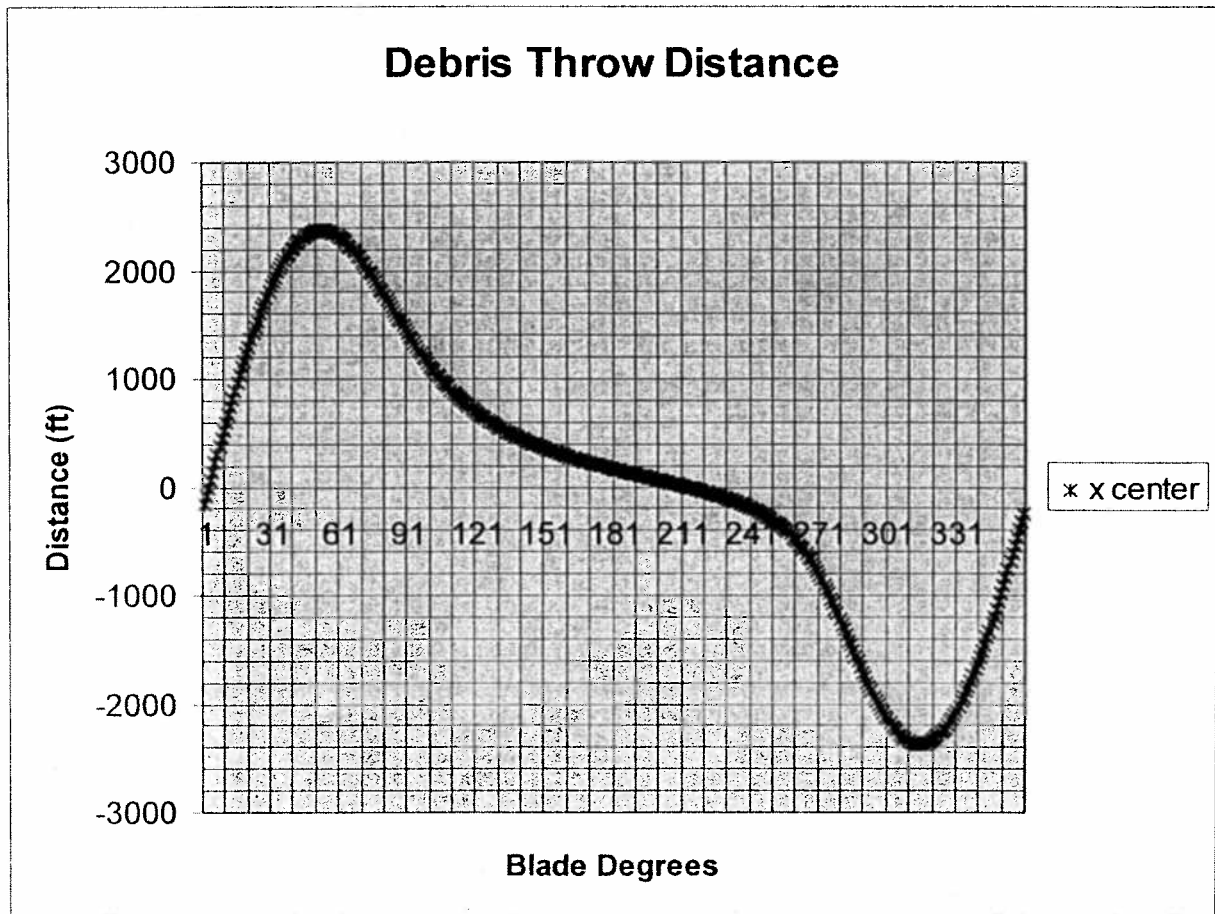
1. Jeff Roberts authored "Debris Throw Distance" (13 pages)
2. Jeff Roberts authored "PSC 128 Interaction with nonparticipating land" (5 pages)
3. Mars Hill Wind Turbine Project Health Effects - Pilot Study (20 pages)

## Debris Throw Analysis

Energy companies have come to our area and will not provide debris throw distances. Emerging Energies told me at the public meeting that the turbine blades do not fail and that debris throw is not a problem. There are many industry studies on debris throw distances for turbines, in fact guidance is provided by the turbine manufactures for safe distance based on debris throw. In an effort to provide a sanity check to numbers published by the turbine manufactures, a separate analysis is performed.

The analysis shows that debris thrown from the proposed turbine can travel significant distance.

There are 227 out of 360 degrees of debris release point that could possibly result in debris thrown greater than 1.1 times the height of the turbine (541.2 ft).



This chart is based on 328 foot (100 meter) diameter turbine with a hub height of 328 feet (100 meters) rotating at a speed of 15 rpm.

This is a worst case analysis and air resistance is not included. It should be noted that wind turbine blades are very aerodynamic.

The debris throw distances were calculated using standard principles of physics. The equation that describes motion is as follows.

$$\text{Distance} = V \times \cos(a) \times [ V \times \sin(a) / G + [ (v \times \sin(a) ^2 )/G^2 - 2 \times Y/G]^{.5} ]$$

Where:      V = is the tangential speed (ft/sec)  
              a = the angle relative to horizontal  
              G = the acceleration of gravity (32.2 ft/sec<sup>2</sup>)  
              Y = the distance to the ground from the point of release

The distances of debris throw were corrected for the release point relative to the tower center. The distances are from the centerline of the tower base. The attached 11 pages (attachment 1) are the results of the calculation for each degree of blade angle.

The calculation was verified against available calculation provided at:  
<http://hyperphysics.phy-astr.gsu.edu/hbase/traj.html#tra3>

The distance will increase upon an over speed event of the turbine.

This analysis shows that turbine size and rotor speed must be considered when placing turbines to meets the safety setbacks of the ordinance. Using a safe distance of 1.1 times the height of a turbine as a safety setback does not result in a safe installation.

This turbine will throw debris farther than a 1.1 time height distance 2 out of 3 times upon a blade failure.

The manufacturer numbers are not for the worst case debris throw distances.

  
Jeff Roberts

10/19/2008

Performed by:  
Jeff Roberts

Attachment 1

Turbine Debris Throw Distance

Date: 10/19/2008

Rotor Radius (ft)	Rotation angle (degrees)	Rotation angle (radians)	Tangential release angle (degrees)	Tangential release angle (radians)	Vertical Height relative to hub (ft)	Horizontal distance relative to hub (ft)	Rotor speed (rpm)	Rotor tip speed (ft/sec)	Total distance from release point (ft)	(Y) Release height to ground (ft)	Distance of travel from tower (ft)
164	0	0.000	90	1.571	0.00	164.00	15	257.61	0.00	-328.00	-164.00
164	1	0.017	89	1.553	2.86	163.98	15	257.61	77.30	-330.86	-86.67
164	2	0.035	88	1.536	5.72	163.90	15	257.61	154.60	-333.72	-9.30
164	3	0.052	87	1.518	8.58	163.78	15	257.61	231.82	-336.58	68.05
164	4	0.070	86	1.501	11.44	163.60	15	257.61	308.87	-339.44	145.27
164	5	0.087	85	1.484	14.29	163.38	15	257.61	385.67	-342.29	222.30
164	6	0.105	84	1.466	17.14	163.10	15	257.61	462.14	-345.14	299.03
164	7	0.122	83	1.449	19.99	162.78	15	257.61	538.18	-347.99	375.40
164	8	0.140	82	1.431	22.82	162.40	15	257.61	613.72	-350.82	451.31
164	9	0.157	81	1.414	25.66	161.98	15	257.61	688.67	-353.66	526.69
164	10	0.175	80	1.396	28.48	161.51	15	257.61	762.97	-356.48	601.46
164	11	0.192	79	1.379	31.29	160.99	15	257.61	836.51	-359.29	675.52
164	12	0.209	78	1.361	34.10	160.42	15	257.61	909.23	-362.10	748.82
164	13	0.227	77	1.344	36.89	159.80	15	257.61	981.05	-364.89	821.25
164	14	0.244	76	1.326	39.68	159.13	15	257.61	1051.89	-367.68	892.76
164	15	0.262	75	1.309	42.45	158.41	15	257.61	1121.68	-370.45	963.26
164	16	0.279	74	1.292	45.20	157.65	15	257.61	1190.33	-373.20	1032.69
164	17	0.297	73	1.274	47.95	156.83	15	257.61	1257.79	-375.95	1100.96
164	18	0.314	72	1.257	50.68	155.97	15	257.61	1323.99	-378.68	1168.01
164	19	0.332	71	1.239	53.39	155.07	15	257.61	1388.84	-381.39	1233.77
164	20	0.349	70	1.222	56.09	154.11	15	257.61	1452.29	-384.09	1298.18
164	21	0.367	69	1.204	58.77	153.11	15	257.61	1514.27	-386.77	1361.16
164	22	0.384	68	1.187	61.44	152.06	15	257.61	1574.72	-389.44	1422.66
164	23	0.401	67	1.169	64.08	150.96	15	257.61	1633.58	-392.08	1482.61
164	24	0.419	66	1.152	66.70	149.82	15	257.61	1690.79	-394.70	1540.97
164	25	0.436	65	1.134	69.31	148.63	15	257.61	1746.29	-397.31	1597.66
164	26	0.454	64	1.117	71.89	147.40	15	257.61	1800.04	-399.89	1652.64
164	27	0.471	63	1.100	74.45	146.13	15	257.61	1851.98	-402.45	1705.85
164	28	0.489	62	1.082	76.99	144.80	15	257.61	1902.06	-404.99	1757.26
164	29	0.506	61	1.065	79.51	143.44	15	257.61	1950.24	-407.51	1806.80

Attachment 1

Performed by:  
Jeff Roberts

Date: 10/19/2008

Turbine Debris Throw Distance

164	30	0.524	60	1.047	82.00	142.03	15	257.61	1996.47	-410.00	1854.45
164	31	0.541	59	1.030	84.47	140.58	15	257.61	2040.72	-412.47	1900.15
164	32	0.559	58	1.012	86.91	139.08	15	257.61	2082.95	-414.91	1943.87
164	33	0.576	57	0.995	89.32	137.54	15	257.61	2123.12	-417.32	1985.58
164	34	0.593	56	0.977	91.71	135.96	15	257.61	2161.21	-419.71	2025.24
164	35	0.611	55	0.960	94.07	134.34	15	257.61	2197.17	-422.07	2062.83
164	36	0.628	54	0.942	96.40	132.68	15	257.61	2231.00	-424.40	2098.32
164	37	0.646	53	0.925	98.70	130.98	15	257.61	2262.66	-426.70	2131.69
164	38	0.663	52	0.908	100.97	129.23	15	257.61	2292.14	-428.97	2162.91
164	39	0.681	51	0.890	103.21	127.45	15	257.61	2319.43	-431.21	2191.98
164	40	0.698	50	0.873	105.42	125.63	15	257.61	2344.50	-433.42	2218.87
164	41	0.716	49	0.855	107.59	123.77	15	257.61	2367.35	-435.59	2243.58
164	42	0.733	48	0.838	109.74	121.88	15	257.61	2387.98	-437.74	2266.11
164	43	0.750	47	0.820	111.85	119.94	15	257.61	2406.38	-439.85	2286.44
164	44	0.768	46	0.803	113.92	117.97	15	257.61	2422.56	-441.92	2304.58
164	45	0.785	45	0.785	115.97	115.97	15	257.61	2436.51	-443.97	2320.54
164	46	0.803	44	0.768	117.97	113.92	15	257.61	2448.24	-445.97	2334.32
164	47	0.820	43	0.750	119.94	111.85	15	257.61	2457.77	-447.94	2345.93
164	48	0.838	42	0.733	121.88	109.74	15	257.61	2465.12	-449.88	2355.38
164	49	0.855	41	0.716	123.77	107.59	15	257.61	2470.28	-451.77	2362.69
164	50	0.873	40	0.698	125.63	105.42	15	257.61	2473.30	-453.63	2367.89
164	51	0.890	39	0.681	127.45	103.21	15	257.61	2474.20	-455.45	2370.99
164	52	0.908	38	0.663	129.23	100.97	15	257.61	2472.99	-457.23	2372.02
164	53	0.925	37	0.646	130.98	98.70	15	257.61	2469.72	-458.98	2371.02
164	54	0.942	36	0.628	132.68	96.40	15	257.61	2464.41	-460.68	2368.02
164	55	0.960	35	0.611	134.34	94.07	15	257.61	2457.11	-462.34	2363.05
164	56	0.977	34	0.593	135.96	91.71	15	257.61	2447.86	-463.96	2356.15
164	57	0.995	33	0.576	137.54	89.32	15	257.61	2436.70	-465.54	2347.38
164	58	1.012	32	0.559	139.08	86.91	15	257.61	2423.68	-467.08	2336.77
164	59	1.030	31	0.541	140.58	84.47	15	257.61	2408.85	-468.58	2324.38
164	60	1.047	30	0.524	142.03	82.00	15	257.61	2392.26	-470.03	2310.26
164	61	1.065	29	0.506	143.44	79.51	15	257.61	2373.97	-471.44	2294.46
164	62	1.082	28	0.489	144.80	76.99	15	257.61	2354.04	-472.80	2277.04
164	63	1.100	27	0.471	146.13	74.45	15	257.61	2332.53	-474.13	2258.07

Performed by:  
Jeff Roberts

Date: 10/19/2008

Attachment 1

Turbine Debris Throw Distance

164	64	1.117	26	0.454	147.40	71.89	15	257.61	2309.50	-475.40	2237.61
164	65	1.134	25	0.436	148.63	69.31	15	257.61	2285.03	-476.63	2215.72
164	66	1.152	24	0.419	149.82	66.70	15	257.61	2259.17	-477.82	2192.47
164	67	1.169	23	0.401	150.96	64.08	15	257.61	2232.01	-478.96	2167.93
164	68	1.187	22	0.384	152.06	61.44	15	257.61	2203.62	-480.06	2142.19
164	69	1.204	21	0.367	153.11	58.77	15	257.61	2174.07	-481.11	2115.30
164	70	1.222	20	0.349	154.11	56.09	15	257.61	2143.44	-482.11	2087.34
164	71	1.239	19	0.332	155.07	53.39	15	257.61	2111.80	-483.07	2058.40
164	72	1.257	18	0.314	155.97	50.68	15	257.61	2079.23	-483.97	2028.55
164	73	1.274	17	0.297	156.83	47.95	15	257.61	2045.82	-484.83	1997.88
164	74	1.292	16	0.279	157.65	45.20	15	257.61	2011.65	-485.65	1966.45
164	75	1.309	15	0.262	158.41	42.45	15	257.61	1976.79	-486.41	1934.35
164	76	1.326	14	0.244	159.13	39.68	15	257.61	1941.33	-487.13	1901.66
164	77	1.344	13	0.227	159.80	36.89	15	257.61	1905.35	-487.80	1868.45
164	78	1.361	12	0.209	160.42	34.10	15	257.61	1868.92	-488.42	1834.82
164	79	1.379	11	0.192	160.99	31.29	15	257.61	1832.13	-488.99	1800.83
164	80	1.396	10	0.175	161.51	28.48	15	257.61	1795.05	-489.51	1766.57
164	81	1.414	9	0.157	161.98	25.66	15	257.61	1757.76	-489.98	1732.10
164	82	1.431	8	0.140	162.40	22.82	15	257.61	1720.33	-490.40	1697.51
164	83	1.449	7	0.122	162.78	19.99	15	257.61	1682.84	-490.78	1662.86
164	84	1.466	6	0.105	163.10	17.14	15	257.61	1645.36	-491.10	1628.22
164	85	1.484	5	0.087	163.38	14.29	15	257.61	1607.95	-491.38	1593.65
164	86	1.501	4	0.070	163.60	11.44	15	257.61	1570.67	-491.60	1559.23
164	87	1.518	3	0.052	163.78	8.58	15	257.61	1533.59	-491.78	1525.01
164	88	1.536	2	0.035	163.90	5.72	15	257.61	1496.76	-491.90	1491.04
164	89	1.553	1	0.017	163.98	2.86	15	257.61	1460.24	-491.98	1457.38
164	90	1.571	0	0.000	164.00	0.00	15	257.61	1424.08	-492.00	1424.08
164	91	1.588	-1	-0.017	163.98	-2.86	15	257.61	1388.31	-491.98	1391.18
164	92	1.606	-2	-0.035	163.90	-5.72	15	257.61	1353.00	-491.90	1358.72
164	93	1.623	-3	-0.052	163.78	-8.58	15	257.61	1318.16	-491.78	1326.74
164	94	1.641	-4	-0.070	163.60	-11.44	15	257.61	1283.84	-491.60	1295.28
164	95	1.658	-5	-0.087	163.38	-14.29	15	257.61	1250.06	-491.38	1264.36
164	96	1.676	-6	-0.105	163.10	-17.14	15	257.61	1216.86	-491.10	1234.00
164	97	1.693	-7	-0.122	162.78	-19.99	15	257.61	1184.25	-490.78	1204.24



Attachment 1

Performed by:  
Jeff Roberts

Date: 10/19/2008

Turbine Debris Throw Distance

164	98	1.710	-8	-0.140	162.40	-22.82	15	257.61	1152.25	-490.40	1175.08
164	99	1.728	-9	-0.157	161.98	-25.66	15	257.61	1120.89	-489.98	1146.54
164	100	1.745	-10	-0.175	161.51	-28.48	15	257.61	1090.16	-489.51	1118.63
164	101	1.763	-11	-0.192	160.99	-31.29	15	257.61	1060.07	-488.99	1091.37
164	102	1.780	-12	-0.209	160.42	-34.10	15	257.61	1030.65	-488.42	1064.74
164	103	1.798	-13	-0.227	159.80	-36.89	15	257.61	1001.88	-487.80	1038.77
164	104	1.815	-14	-0.244	159.13	-39.68	15	257.61	973.76	-487.13	1013.44
164	105	1.833	-15	-0.262	158.41	-42.45	15	257.61	946.31	-486.41	988.75
164	106	1.850	-16	-0.279	157.65	-45.20	15	257.61	919.50	-485.65	964.71
164	107	1.868	-17	-0.297	156.83	-47.95	15	257.61	893.34	-484.83	941.29
164	108	1.885	-18	-0.314	155.97	-50.68	15	257.61	867.83	-483.97	918.50
164	109	1.902	-19	-0.332	155.07	-53.39	15	257.61	842.94	-483.07	896.33
164	110	1.920	-20	-0.349	154.11	-56.09	15	257.61	818.67	-482.11	874.76
164	111	1.937	-21	-0.367	153.11	-58.77	15	257.61	795.01	-481.11	853.78
164	112	1.955	-22	-0.384	152.06	-61.44	15	257.61	771.95	-480.06	833.39
164	113	1.972	-23	-0.401	150.96	-64.08	15	257.61	749.48	-478.96	813.56
164	114	1.990	-24	-0.419	149.82	-66.70	15	257.61	727.58	-477.82	794.28
164	115	2.007	-25	-0.436	148.63	-69.31	15	257.61	706.23	-476.63	775.54
164	116	2.025	-26	-0.454	147.40	-71.89	15	257.61	685.43	-475.40	757.33
164	117	2.042	-27	-0.471	146.13	-74.45	15	257.61	665.17	-474.13	739.62
164	118	2.059	-28	-0.489	144.80	-76.99	15	257.61	645.41	-472.80	722.41
164	119	2.077	-29	-0.506	143.44	-79.51	15	257.61	626.17	-471.44	705.67
164	120	2.094	-30	-0.524	142.03	-82.00	15	257.61	607.41	-470.03	689.41
164	121	2.112	-31	-0.541	140.58	-84.47	15	257.61	589.12	-468.58	673.59
164	122	2.129	-32	-0.559	139.08	-86.91	15	257.61	571.29	-467.08	658.20
164	123	2.147	-33	-0.576	137.54	-89.32	15	257.61	553.91	-465.54	643.23
164	124	2.164	-34	-0.593	135.96	-91.71	15	257.61	536.96	-463.96	628.67
164	125	2.182	-35	-0.611	134.34	-94.07	15	257.61	520.44	-462.34	614.50
164	126	2.199	-36	-0.628	132.68	-96.40	15	257.61	504.31	-460.68	600.71
164	127	2.217	-37	-0.646	130.98	-98.70	15	257.61	488.59	-458.98	587.28
164	128	2.234	-38	-0.663	129.23	-100.97	15	257.61	473.24	-457.23	574.21
164	129	2.251	-39	-0.681	127.45	-103.21	15	257.61	458.26	-455.45	561.47
164	130	2.269	-40	-0.698	125.63	-105.42	15	257.61	443.64	-453.63	549.06
164	131	2.286	-41	-0.716	123.77	-107.59	15	257.61	429.37	-451.77	536.97

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Performed by:  
Jeff Roberts

Date: 10/19/2008

Attachment 1

Turbine Debris Throw Distance

164	132	2.304	-42	-0.733	121.88	-109.74	15	257.61	415.44	-449.88	525.17
164	133	2.321	-43	-0.750	119.94	-111.85	15	257.61	401.82	-447.94	513.67
164	134	2.339	-44	-0.768	117.97	-113.92	15	257.61	388.53	-445.97	502.45
164	135	2.356	-45	-0.785	115.97	-115.97	15	257.61	375.54	-443.97	491.50
164	136	2.374	-46	-0.803	113.92	-117.97	15	257.61	362.84	-441.92	480.81
164	137	2.391	-47	-0.820	111.85	-119.94	15	257.61	350.43	-439.85	470.38
164	138	2.409	-48	-0.838	109.74	-121.88	15	257.61	338.30	-437.74	460.18
164	139	2.426	-49	-0.855	107.59	-123.77	15	257.61	326.44	-435.59	450.21
164	140	2.443	-50	-0.873	105.42	-125.63	15	257.61	314.84	-433.42	440.47
164	141	2.461	-51	-0.890	103.21	-127.45	15	257.61	303.50	-431.21	430.95
164	142	2.478	-52	-0.908	100.97	-129.23	15	257.61	292.39	-428.97	421.63
164	143	2.496	-53	-0.925	98.70	-130.98	15	257.61	281.53	-426.70	412.51
164	144	2.513	-54	-0.942	96.40	-132.68	15	257.61	270.90	-424.40	403.58
164	145	2.531	-55	-0.960	94.07	-134.34	15	257.61	260.50	-422.07	394.84
164	146	2.548	-56	-0.977	91.71	-135.96	15	257.61	250.31	-419.71	386.27
164	147	2.566	-57	-0.995	89.32	-137.54	15	257.61	240.33	-417.32	377.88
164	148	2.583	-58	-1.012	86.91	-139.08	15	257.61	230.56	-414.91	369.64
164	149	2.601	-59	-1.030	84.47	-140.58	15	257.61	221.00	-412.47	361.57
164	150	2.618	-60	-1.047	82.00	-142.03	15	257.61	211.62	-410.00	353.65
164	151	2.635	-61	-1.065	79.51	-143.44	15	257.61	202.44	-407.51	345.88
164	152	2.653	-62	-1.082	76.99	-144.80	15	257.61	193.44	-404.99	338.24
164	153	2.670	-63	-1.100	74.45	-146.13	15	257.61	184.62	-402.45	330.74
164	154	2.688	-64	-1.117	71.89	-147.40	15	257.61	175.97	-399.89	323.38
164	155	2.705	-65	-1.134	69.31	-148.63	15	257.61	167.50	-397.31	316.13
164	156	2.723	-66	-1.152	66.70	-149.82	15	257.61	159.19	-394.70	309.01
164	157	2.740	-67	-1.169	64.08	-150.96	15	257.61	151.04	-392.08	302.00
164	158	2.758	-68	-1.187	61.44	-152.06	15	257.61	143.05	-389.44	295.11
164	159	2.775	-69	-1.204	58.77	-153.11	15	257.61	135.21	-386.77	288.32
164	160	2.793	-70	-1.222	56.09	-154.11	15	257.61	127.52	-384.09	281.63
164	161	2.810	-71	-1.239	53.39	-155.07	15	257.61	119.98	-381.39	275.04
164	162	2.827	-72	-1.257	50.68	-155.97	15	257.61	112.58	-378.68	268.55
164	163	2.845	-73	-1.274	47.95	-156.83	15	257.61	105.32	-375.95	262.15
164	164	2.862	-74	-1.292	45.20	-157.65	15	257.61	98.19	-373.20	255.83
164	165	2.880	-75	-1.309	42.45	-158.41	15	257.61	91.19	-370.45	249.60

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Attachment 1

Performed by:  
Jeff Roberts

Date: 10/19/2008

Turbine Debris Throw Distance

164	166	2.897	-1.326	39.68	-159.13	15	257.61	84.32	-367.68	243.45
164	167	2.915	-1.344	36.89	-159.80	15	257.61	77.58	-364.89	237.38
164	168	2.932	-1.361	34.10	-160.42	15	257.61	70.96	-362.10	231.38
164	169	2.950	-1.379	31.29	-160.99	15	257.61	64.46	-359.29	225.44
164	170	2.967	-1.396	28.48	-161.51	15	257.61	58.07	-356.48	219.58
164	171	2.985	-1.414	25.66	-161.98	15	257.61	51.80	-353.66	213.78
164	172	3.002	-1.431	22.82	-162.40	15	257.61	45.64	-350.82	208.04
164	173	3.019	-1.449	19.99	-162.78	15	257.61	39.58	-347.99	202.36
164	174	3.037	-1.466	17.14	-163.10	15	257.61	33.64	-345.14	196.74
164	175	3.054	-1.484	14.29	-163.38	15	257.61	27.79	-342.29	191.16
164	176	3.072	-1.501	11.44	-163.60	15	257.61	22.04	-339.44	185.64
164	177	3.089	-1.518	8.58	-163.78	15	257.61	16.39	-336.58	180.17
164	178	3.107	-1.536	5.72	-163.90	15	257.61	10.84	-333.72	174.74
164	179	3.124	-1.553	2.86	-163.98	15	257.61	5.37	-330.86	169.35
164	180	3.142	-1.571	0.00	-164.00	15	257.61	0.00	-328.00	164.00
164	181	3.159	-1.588	-2.86	-163.98	15	257.61	-5.29	-325.14	158.69
164	182	3.176	-1.606	-5.72	-163.90	15	257.61	-10.49	-322.28	153.41
164	183	3.194	-1.623	-8.58	-163.78	15	257.61	-15.61	-319.42	148.17
164	184	3.211	-1.641	-11.44	-163.60	15	257.61	-20.65	-316.56	142.95
164	185	3.229	-1.658	-14.29	-163.38	15	257.61	-25.61	-313.71	137.76
164	186	3.246	-1.676	-17.14	-163.10	15	257.61	-30.50	-310.86	132.60
164	187	3.264	-1.693	-19.99	-162.78	15	257.61	-35.32	-308.01	127.46
164	188	3.281	-1.710	-22.82	-162.40	15	257.61	-40.06	-305.18	122.34
164	189	3.299	-1.728	-25.66	-161.98	15	257.61	-44.74	-302.34	117.24
164	190	3.316	-1.745	-28.48	-161.51	15	257.61	-49.36	-299.52	112.15
164	191	3.334	-1.763	-31.29	-160.99	15	257.61	-53.91	-296.71	107.08
164	192	3.351	-1.780	-34.10	-160.42	15	257.61	-58.40	-293.90	102.01
164	193	3.368	-1.798	-36.89	-159.80	15	257.61	-62.84	-291.11	96.96
164	194	3.386	-1.815	-39.68	-159.13	15	257.61	-67.22	-288.32	91.91
164	195	3.403	-1.833	-42.45	-158.41	15	257.61	-71.55	-285.55	86.87
164	196	3.421	-1.850	-45.20	-157.65	15	257.61	-75.83	-282.80	81.82
164	197	3.438	-1.868	-47.95	-156.83	15	257.61	-80.06	-280.05	76.78
164	198	3.456	-1.885	-50.68	-155.97	15	257.61	-84.25	-277.32	71.73
164	199	3.473	-1.902	-53.39	-155.07	15	257.61	-88.40	-274.61	66.67

Attachment 1

Performed by:  
Jeff Roberts

Date: 10/19/2008

Turbine Debris Throw Distance

164	200	3.491	-110	-1.920	-56.09	-154.11	15	257.61	-92.51	-271.91	61.60
164	201	3.508	-111	-1.937	-58.77	-153.11	15	257.61	-96.58	-269.23	56.52
164	202	3.526	-112	-1.955	-61.44	-152.06	15	257.61	-100.63	-266.56	51.43
164	203	3.543	-113	-1.972	-64.08	-150.96	15	257.61	-104.64	-263.92	46.32
164	204	3.560	-114	-1.990	-66.70	-149.82	15	257.61	-108.63	-261.30	41.19
164	205	3.578	-115	-2.007	-69.31	-148.63	15	257.61	-112.60	-258.69	36.04
164	206	3.595	-116	-2.025	-71.89	-147.40	15	257.61	-116.55	-256.11	30.85
164	207	3.613	-117	-2.042	-74.45	-146.13	15	257.61	-120.48	-253.55	25.64
164	208	3.630	-118	-2.059	-76.99	-144.80	15	257.61	-124.40	-251.01	20.40
164	209	3.648	-119	-2.077	-79.51	-143.44	15	257.61	-128.32	-248.49	15.12
164	210	3.665	-120	-2.094	-82.00	-142.03	15	257.61	-132.23	-246.00	9.80
164	211	3.683	-121	-2.112	-84.47	-140.58	15	257.61	-136.14	-243.53	4.43
164	212	3.700	-122	-2.129	-86.91	-139.08	15	257.61	-140.06	-241.09	-0.98
164	213	3.718	-123	-2.147	-89.32	-137.54	15	257.61	-143.99	-238.68	-6.45
164	214	3.735	-124	-2.164	-91.71	-135.96	15	257.61	-147.93	-236.29	-11.97
164	215	3.752	-125	-2.182	-94.07	-134.34	15	257.61	-151.89	-233.93	-17.55
164	216	3.770	-126	-2.199	-96.40	-132.68	15	257.61	-155.87	-231.60	-23.20
164	217	3.787	-127	-2.217	-98.70	-130.98	15	257.61	-159.89	-229.30	-28.91
164	218	3.805	-128	-2.234	-100.97	-129.23	15	257.61	-163.94	-227.03	-34.70
164	219	3.822	-129	-2.251	-103.21	-127.45	15	257.61	-168.03	-224.79	-40.58
164	220	3.840	-130	-2.269	-105.42	-125.63	15	257.61	-172.17	-222.58	-46.53
164	221	3.857	-131	-2.286	-107.59	-123.77	15	257.61	-176.36	-220.41	-52.58
164	222	3.875	-132	-2.304	-109.74	-121.88	15	257.61	-180.61	-218.26	-58.73
164	223	3.892	-133	-2.321	-111.85	-119.94	15	257.61	-184.93	-216.15	-64.99
164	224	3.910	-134	-2.339	-113.92	-117.97	15	257.61	-189.33	-214.08	-71.36
164	225	3.927	-135	-2.356	-115.97	-115.97	15	257.61	-193.81	-212.03	-77.84
164	226	3.944	-136	-2.374	-117.97	-113.92	15	257.61	-198.38	-210.03	-84.46
164	227	3.962	-137	-2.391	-119.94	-111.85	15	257.61	-203.06	-208.06	-91.21
164	228	3.979	-138	-2.409	-121.88	-109.74	15	257.61	-207.85	-206.12	-98.11
164	229	3.997	-139	-2.426	-123.77	-107.59	15	257.61	-212.76	-204.23	-105.16
164	230	4.014	-140	-2.443	-125.63	-105.42	15	257.61	-217.80	-202.37	-112.38
164	231	4.032	-141	-2.461	-127.45	-103.21	15	257.61	-222.99	-200.55	-119.78
164	232	4.049	-142	-2.478	-129.23	-100.97	15	257.61	-228.34	-198.77	-127.37
164	233	4.067	-143	-2.496	-130.98	-98.70	15	257.61	-233.85	-197.02	-135.16

Attachment 1

Performed by:  
Jeff Roberts

Date: 10/19/2008

Turbine Debris Throw Distance

164	234	4.084	-144	-2.513	-132.68	-96.40	15	257.61	-239.56	-195.32	-143.16
164	235	4.102	-145	-2.531	-134.34	-94.07	15	257.61	-245.46	-193.66	-151.40
164	236	4.119	-146	-2.548	-135.96	-91.71	15	257.61	-251.58	-192.04	-159.88
164	237	4.136	-147	-2.566	-137.54	-89.32	15	257.61	-257.94	-190.46	-168.62
164	238	4.154	-148	-2.583	-139.08	-86.91	15	257.61	-264.55	-188.92	-177.65
164	239	4.171	-149	-2.601	-140.58	-84.47	15	257.61	-271.44	-187.42	-186.97
164	240	4.189	-150	-2.618	-142.03	-82.00	15	257.61	-278.62	-185.97	-196.62
164	241	4.206	-151	-2.635	-143.44	-79.51	15	257.61	-286.12	-184.56	-206.61
164	242	4.224	-152	-2.653	-144.80	-76.99	15	257.61	-293.97	-183.20	-216.97
164	243	4.241	-153	-2.670	-146.13	-74.45	15	257.61	-302.18	-181.87	-227.73
164	244	4.259	-154	-2.688	-147.40	-71.89	15	257.61	-310.80	-180.60	-238.91
164	245	4.276	-155	-2.705	-148.63	-69.31	15	257.61	-319.85	-179.37	-250.54
164	246	4.294	-156	-2.723	-149.82	-66.70	15	257.61	-329.37	-178.18	-262.66
164	247	4.311	-157	-2.740	-150.96	-64.08	15	257.61	-339.38	-177.04	-275.30
164	248	4.328	-158	-2.758	-152.06	-61.44	15	257.61	-349.94	-175.94	-288.50
164	249	4.346	-159	-2.775	-153.11	-58.77	15	257.61	-361.07	-174.89	-302.30
164	250	4.363	-160	-2.793	-154.11	-56.09	15	257.61	-372.83	-172.93	-316.74
164	251	4.381	-161	-2.810	-155.07	-53.39	15	257.61	-386.26	-172.03	-331.87
164	252	4.398	-162	-2.827	-155.97	-50.68	15	257.61	-398.41	-172.03	-347.73
164	253	4.416	-163	-2.845	-156.83	-47.95	15	257.61	-412.33	-171.17	-364.39
164	254	4.433	-164	-2.862	-157.65	-45.20	15	257.61	-427.08	-170.35	-381.88
164	255	4.451	-165	-2.880	-158.41	-42.45	15	257.61	-442.71	-169.59	-400.27
164	256	4.468	-166	-2.897	-159.13	-39.68	15	257.61	-459.29	-168.87	-419.61
164	257	4.485	-167	-2.915	-159.80	-36.89	15	257.61	-476.87	-168.20	-439.98
164	258	4.503	-168	-2.932	-160.42	-34.10	15	257.61	-495.51	-167.58	-461.42
164	259	4.520	-169	-2.950	-160.99	-31.29	15	257.61	-515.29	-167.01	-484.00
164	260	4.538	-170	-2.967	-161.51	-28.48	15	257.61	-536.26	-166.49	-507.78
164	261	4.555	-171	-2.985	-161.98	-25.66	15	257.61	-558.48	-166.02	-532.82
164	262	4.573	-172	-3.002	-162.40	-22.82	15	257.61	-582.01	-165.60	-559.18
164	263	4.590	-173	-3.019	-162.78	-19.99	15	257.61	-606.90	-165.22	-586.91
164	264	4.608	-174	-3.037	-163.10	-17.14	15	257.61	-633.20	-164.90	-616.06
164	265	4.625	-175	-3.054	-163.38	-14.29	15	257.61	-660.96	-164.62	-646.67
164	266	4.643	-176	-3.072	-163.60	-11.44	15	257.61	-690.20	-164.40	-678.76
164	267	4.660	-177	-3.089	-163.78	-8.58	15	257.61	-720.94	-164.22	-712.36

Performed by:  
Jeff Roberts

Date: 10/19/2008

Attachment 1  
Turbine Debris Throw Distance

164	268	4.677	-178	-3.107	-163.90	-5.72	15	257.61	-753.19	-164.10	-747.47
164	269	4.695	-179	-3.124	-163.98	-2.86	15	257.61	-786.95	-164.02	-784.09
164	270	4.712	-180	-3.142	-164.00	0.00	15	257.61	-822.19	-164.00	-822.19
164	271	4.730	-181	-3.159	-163.98	2.86	15	257.61	-858.88	-164.02	-861.74
164	272	4.747	-182	-3.176	-163.90	5.72	15	257.61	-896.96	-164.10	-902.68
164	273	4.765	-183	-3.194	-163.78	8.58	15	257.61	-936.37	-164.22	-944.96
164	274	4.782	-184	-3.211	-163.60	11.44	15	257.61	-977.03	-164.40	-988.47
164	275	4.800	-185	-3.229	-163.38	14.29	15	257.61	-1018.84	-164.62	-1033.14
164	276	4.817	-186	-3.246	-163.10	17.14	15	257.61	-1061.70	-164.90	-1078.85
164	277	4.835	-187	-3.264	-162.78	19.99	15	257.61	-1105.49	-165.22	-1125.48
164	278	4.852	-188	-3.281	-162.40	22.82	15	257.61	-1150.09	-165.60	-1172.91
164	279	4.869	-189	-3.299	-161.98	25.66	15	257.61	-1195.35	-166.02	-1221.01
164	280	4.887	-190	-3.316	-161.51	28.48	15	257.61	-1241.15	-166.49	-1269.63
164	281	4.904	-191	-3.334	-160.99	31.29	15	257.61	-1287.34	-167.01	-1318.64
164	282	4.922	-192	-3.351	-160.42	34.10	15	257.61	-1333.79	-167.58	-1367.88
164	283	4.939	-193	-3.368	-159.80	36.89	15	257.61	-1380.34	-168.20	-1417.23
164	284	4.957	-194	-3.386	-159.13	39.68	15	257.61	-1426.86	-168.87	-1466.53
164	285	4.974	-195	-3.403	-158.41	42.45	15	257.61	-1473.20	-169.59	-1515.65
164	286	4.992	-196	-3.421	-157.65	45.20	15	257.61	-1519.23	-170.35	-1564.43
164	287	5.009	-197	-3.438	-156.83	47.95	15	257.61	-1564.81	-171.17	-1612.76
164	288	5.027	-198	-3.456	-155.97	50.68	15	257.61	-1609.82	-172.03	-1660.50
164	289	5.044	-199	-3.473	-155.07	53.39	15	257.61	-1654.12	-172.93	-1707.52
164	290	5.061	-200	-3.491	-154.11	56.09	15	257.61	-1697.60	-173.89	-1753.69
164	291	5.079	-201	-3.508	-153.11	58.77	15	257.61	-1740.13	-174.89	-1798.90
164	292	5.096	-202	-3.526	-152.06	61.44	15	257.61	-1781.61	-175.94	-1843.04
164	293	5.114	-203	-3.543	-150.96	64.08	15	257.61	-1821.92	-177.04	-1886.00
164	294	5.131	-204	-3.560	-149.82	66.70	15	257.61	-1860.97	-178.18	-1927.67
164	295	5.149	-205	-3.578	-148.63	69.31	15	257.61	-1898.65	-179.37	-1967.95
164	296	5.166	-206	-3.595	-147.40	71.89	15	257.61	-1934.87	-180.60	-2006.76
164	297	5.184	-207	-3.613	-146.13	74.45	15	257.61	-1969.54	-181.87	-2044.00
164	298	5.201	-208	-3.630	-144.80	76.99	15	257.61	-2002.59	-183.20	-2079.58
164	299	5.219	-209	-3.648	-143.44	79.51	15	257.61	-2033.92	-184.56	-2113.43
164	300	5.236	-210	-3.665	-142.03	82.00	15	257.61	-2063.47	-185.97	-2145.47
164	301	5.253	-211	-3.683	-140.58	84.47	15	257.61	-2091.17	-187.42	-2175.63

Attachment 1

Performed by:  
Jeff Roberts

Date: 10/19/2008

Turbine Debris Throw Distance

164	302	5.271	-212	-3.700	-139.08	86.91	15	257.61	-2116.94	-188.92	-2203.85
164	303	5.288	-213	-3.718	-137.54	89.32	15	257.61	-2140.73	-190.46	-2230.05
164	304	5.306	-214	-3.735	-135.96	91.71	15	257.61	-2162.48	-192.04	-2254.19
164	305	5.323	-215	-3.752	-134.34	94.07	15	257.61	-2182.14	-193.66	-2276.21
164	306	5.341	-216	-3.770	-132.68	96.40	15	257.61	-2199.66	-195.32	-2296.05
164	307	5.358	-217	-3.787	-130.98	98.70	15	257.61	-2214.99	-197.02	-2313.68
164	308	5.376	-218	-3.805	-129.23	100.97	15	257.61	-2228.09	-198.77	-2329.06
164	309	5.393	-219	-3.822	-127.45	103.21	15	257.61	-2238.92	-200.55	-2342.13
164	310	5.411	-220	-3.840	-125.63	105.42	15	257.61	-2247.46	-202.37	-2352.88
164	311	5.428	-221	-3.857	-123.77	107.59	15	257.61	-2253.67	-204.23	-2361.26
164	312	5.445	-222	-3.875	-121.88	109.74	15	257.61	-2257.53	-206.12	-2367.26
164	313	5.463	-223	-3.892	-119.94	111.85	15	257.61	-2259.01	-208.06	-2370.86
164	314	5.480	-224	-3.910	-117.97	113.92	15	257.61	-2258.10	-210.03	-2372.02
164	315	5.498	-225	-3.927	-115.97	115.97	15	257.61	-2254.78	-212.03	-2370.74
164	316	5.515	-226	-3.944	-113.92	117.97	15	257.61	-2249.04	-214.08	-2367.01
164	317	5.533	-227	-3.962	-111.85	119.94	15	257.61	-2240.88	-216.15	-2360.82
164	318	5.550	-228	-3.979	-109.74	121.88	15	257.61	-2230.29	-218.26	-2352.16
164	319	5.568	-229	-3.997	-107.59	123.77	15	257.61	-2217.27	-220.41	-2341.04
164	320	5.585	-230	-4.014	-105.42	125.63	15	257.61	-2201.82	-222.58	-2327.46
164	321	5.603	-231	-4.032	-103.21	127.45	15	257.61	-2183.96	-224.79	-2311.41
164	322	5.620	-232	-4.049	-100.97	129.23	15	257.61	-2163.69	-227.03	-2292.92
164	323	5.637	-233	-4.067	-98.70	130.98	15	257.61	-2141.02	-229.30	-2272.00
164	324	5.655	-234	-4.084	-96.40	132.68	15	257.61	-2115.97	-231.60	-2248.65
164	325	5.672	-235	-4.102	-94.07	134.34	15	257.61	-2088.57	-233.93	-2222.91
164	326	5.690	-236	-4.119	-91.71	135.96	15	257.61	-2058.83	-236.29	-2194.79
164	327	5.707	-237	-4.136	-89.32	137.54	15	257.61	-2026.78	-238.68	-2164.32
164	328	5.725	-238	-4.154	-86.91	139.08	15	257.61	-1992.45	-241.09	-2131.53
164	329	5.742	-239	-4.171	-84.47	140.58	15	257.61	-1955.87	-243.53	-2096.45
164	330	5.760	-240	-4.189	-82.00	142.03	15	257.61	-1917.08	-246.00	-2059.11
164	331	5.777	-241	-4.206	-79.51	143.44	15	257.61	-1876.12	-248.49	-2019.56
164	332	5.794	-242	-4.224	-76.99	144.80	15	257.61	-1833.03	-251.01	-1977.83
164	333	5.812	-243	-4.241	-74.45	146.13	15	257.61	-1787.84	-253.55	-1933.97
164	334	5.829	-244	-4.259	-71.89	147.40	15	257.61	-1740.61	-256.11	-1888.02
164	335	5.847	-245	-4.276	-69.31	148.63	15	257.61	-1691.39	-258.69	-1840.03

Performed by:  
Jeff Roberts

Date: 10/19/2008

Attachment 1

Turbine Debris Throw Distance

164	336	5.864	-246	-4.294	-66.70	149.82	15	257.61	-1640.23	-261.30	-1790.05
164	337	5.882	-247	-4.311	-64.08	150.96	15	257.61	-1587.18	-263.92	-1738.14
164	338	5.899	-248	-4.328	-61.44	152.06	15	257.61	-1532.30	-266.56	-1684.35
164	339	5.917	-249	-4.346	-58.77	153.11	15	257.61	-1475.64	-269.23	-1628.75
164	340	5.934	-250	-4.363	-56.09	154.11	15	257.61	-1417.27	-271.91	-1571.38
164	341	5.952	-251	-4.381	-53.39	155.07	15	257.61	-1357.26	-274.61	-1512.32
164	342	5.969	-252	-4.398	-50.68	155.97	15	257.61	-1295.66	-277.32	-1451.63
164	343	5.986	-253	-4.416	-47.95	156.83	15	257.61	-1232.54	-280.05	-1389.37
164	344	6.004	-254	-4.433	-45.20	157.65	15	257.61	-1167.97	-282.80	-1325.62
164	345	6.021	-255	-4.451	-42.45	158.41	15	257.61	-1102.03	-285.55	-1260.44
164	346	6.039	-256	-4.468	-39.68	159.13	15	257.61	-1034.78	-288.32	-1193.91
164	347	6.056	-257	-4.485	-36.89	159.80	15	257.61	-966.31	-291.11	-1126.10
164	348	6.074	-258	-4.503	-34.10	160.42	15	257.61	-896.67	-293.90	-1057.09
164	349	6.091	-259	-4.520	-31.29	160.99	15	257.61	-825.96	-296.71	-986.95
164	350	6.109	-260	-4.538	-28.48	161.51	15	257.61	-754.25	-299.52	-915.76
164	351	6.126	-261	-4.555	-25.66	161.98	15	257.61	-681.62	-302.34	-843.60
164	352	6.144	-262	-4.573	-22.82	162.40	15	257.61	-608.14	-305.18	-770.55
164	353	6.161	-263	-4.590	-19.99	162.78	15	257.61	-533.91	-308.01	-696.69
164	354	6.178	-264	-4.608	-17.14	163.10	15	257.61	-459.00	-310.86	-622.10
164	355	6.196	-265	-4.625	-14.29	163.38	15	257.61	-383.50	-313.71	-546.87
164	356	6.213	-266	-4.643	-11.44	163.60	15	257.61	-307.48	-316.56	-471.08
164	357	6.231	-267	-4.660	-8.58	163.78	15	257.61	-231.04	-319.42	-394.81
164	358	6.248	-268	-4.677	-5.72	163.90	15	257.61	-154.25	-322.28	-318.15
164	359	6.266	-269	-4.695	-2.86	163.98	15	257.61	-77.21	-325.14	-241.19

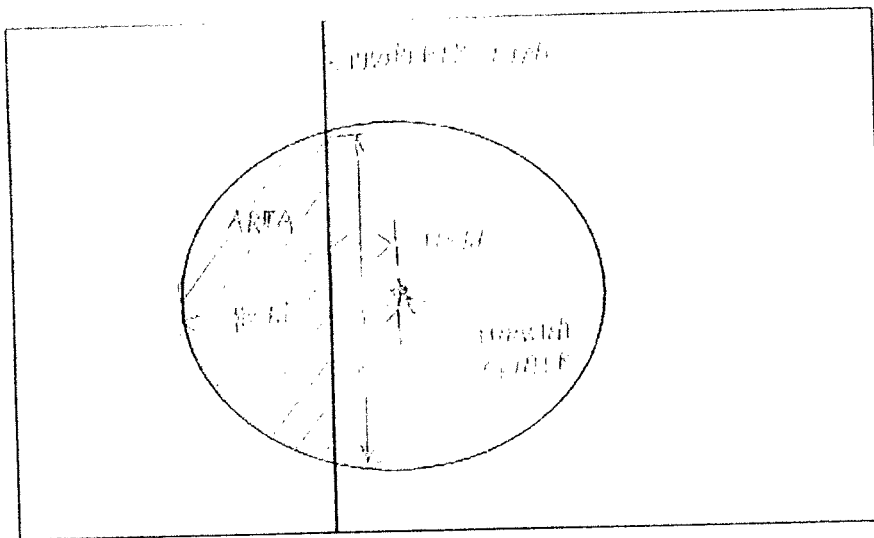


## PSC 128 Interaction with nonparticipating land

The picture below shows how the setbacks interact with the non participating adjacent landowner's property.

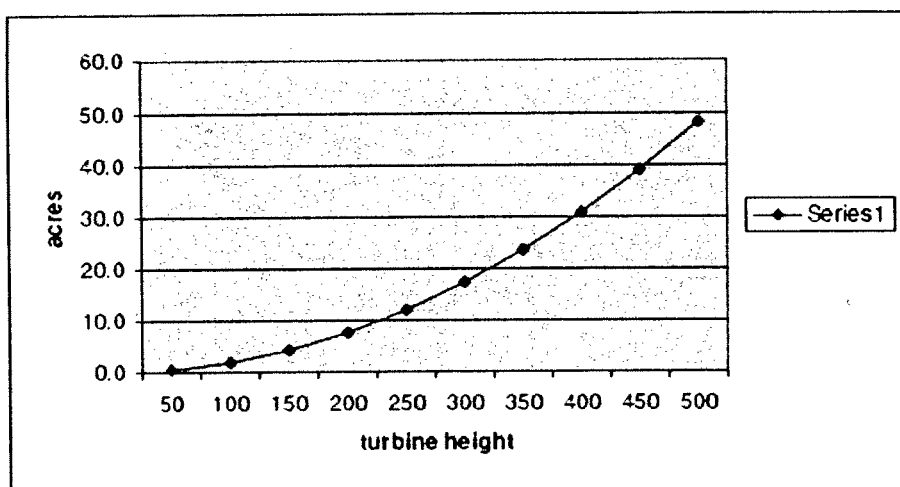
The picture shows several key items:

1. The "property line" is shown.
2. The "turbine center" is shown.
3. The "area" of influence on the non participating property owner.
4. The distance "c" which is the length of the area of influence at the property line.
5. The distance " $H \times 1.1$ " which is the PSC's proposed distance from a non participating property line.
6. The distance " $H \times 3.1$ " which is the PSC's proposed distance that an occupied structure can be safely located.



On the attached page a table and a graph were created that shows the effects on the non participating land owners verses various turbine maximum heights.

h (feet)	c (feet)	Area (sqft)	acres	h x 1.1 (feet)	h x 3.1 (feet)
50	289.8	20959.9	0.5	55	155
100	579.7	83839.4	1.9	110	310
150	869.5	188638.7	4.3	165	465
200	1159.3	335357.7	7.7	220	620
250	1449.1	523996.4	12.0	275	775
300	1739.0	754554.8	17.3	330	930
350	2028.8	1027032.9	23.6	385	1085
400	2318.6	1341430.7	30.8	440	1240
450	2608.4	1697748.3	39.0	495	1395
500	2898.3	2095985.5	48.1	550	1550



Lets say I have built a home 112 feet from the road and 66 feet from the adjacent property line. My forty acres is 2640 feet deep by 660 feet wide. Now my neighbor decides to install a 500 foot wind turbine.

He is allowed to be within 1550 feet of my house and 550 feet from my property line. My neighbor has now just about completely taken all of my property for use as a safety buffer zone. (see attached to scale illustration). The only areas of my property that would be acceptable for habitation is the small arc where my current house is located and the small arc at the very back of my property.

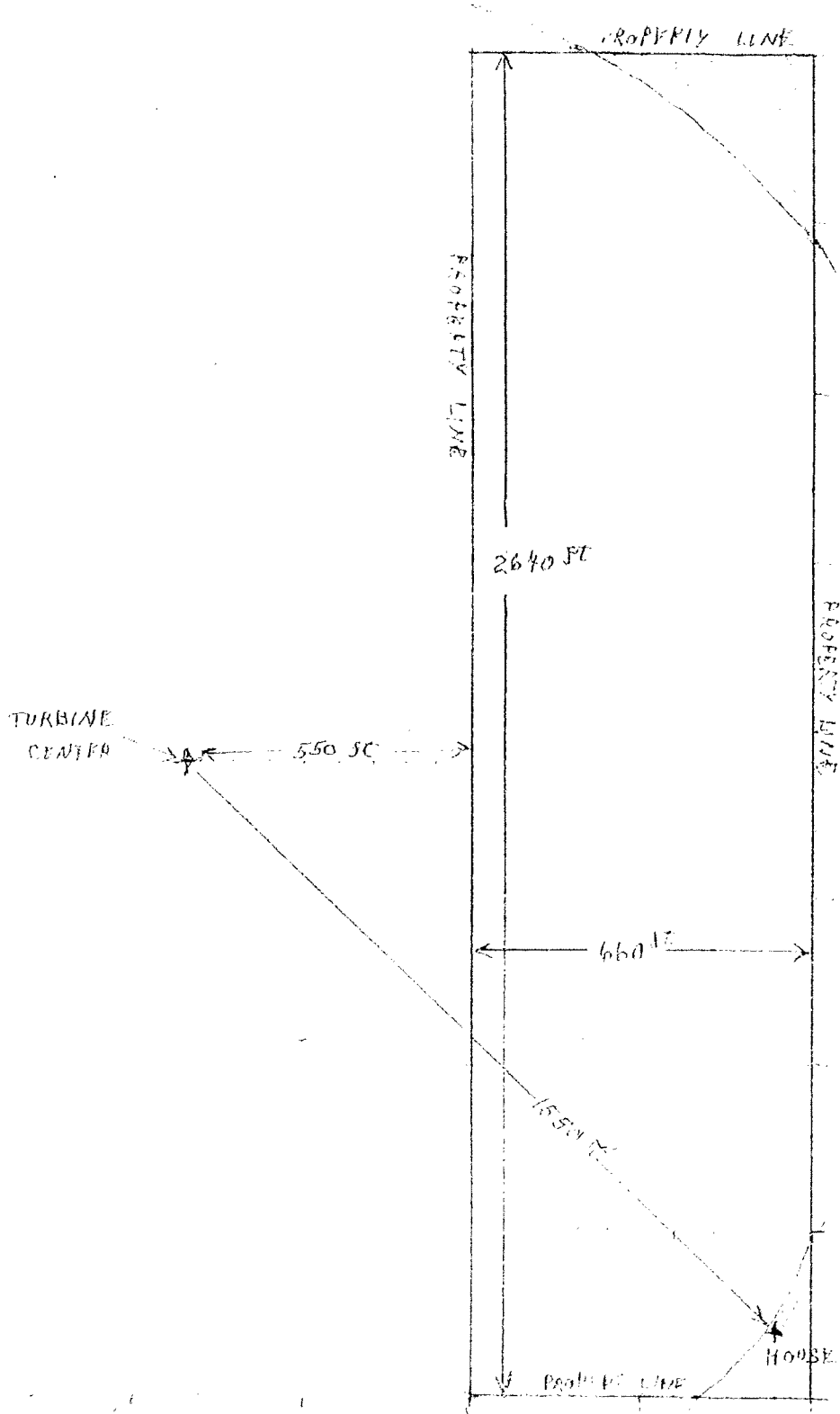
I have a right to be safe anywhere on my property. It is quite obvious that the 3.1 times height is to be measured from my property line to respect my rights as a non participating property owner. If I want to give an easement because I have no future plans for the land than that would also be my right and I would then be part of the Wind Installation.

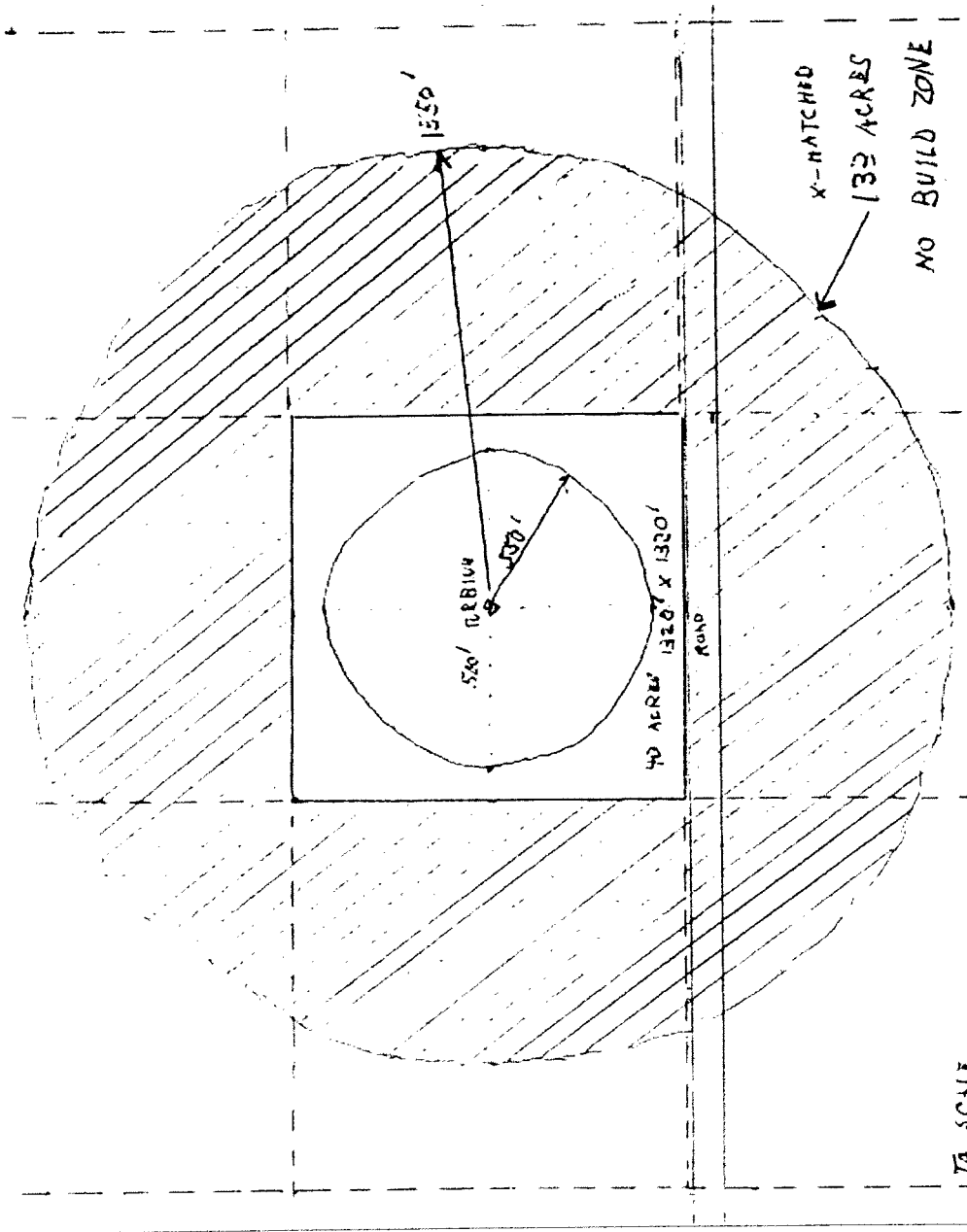
Unfortunately, the rules set-up by the PSC have even greater effects on adjacent land when the same 500 foot turbine is placed on a square 40 acre field. A person who only owns 40 acres of property can put a 500 foot turbine on that land per the PSC rules

without asking any permission from adjacent landowners. When this turbine is placed on that land over 130 acres of adjacent land has just been made into a safety buffer zone. This amount of land use rights taking is incredible large. See the second attached illustration.

Jeff Roberts

12113 Tannery Rd.  
Mishicot, WI 54228



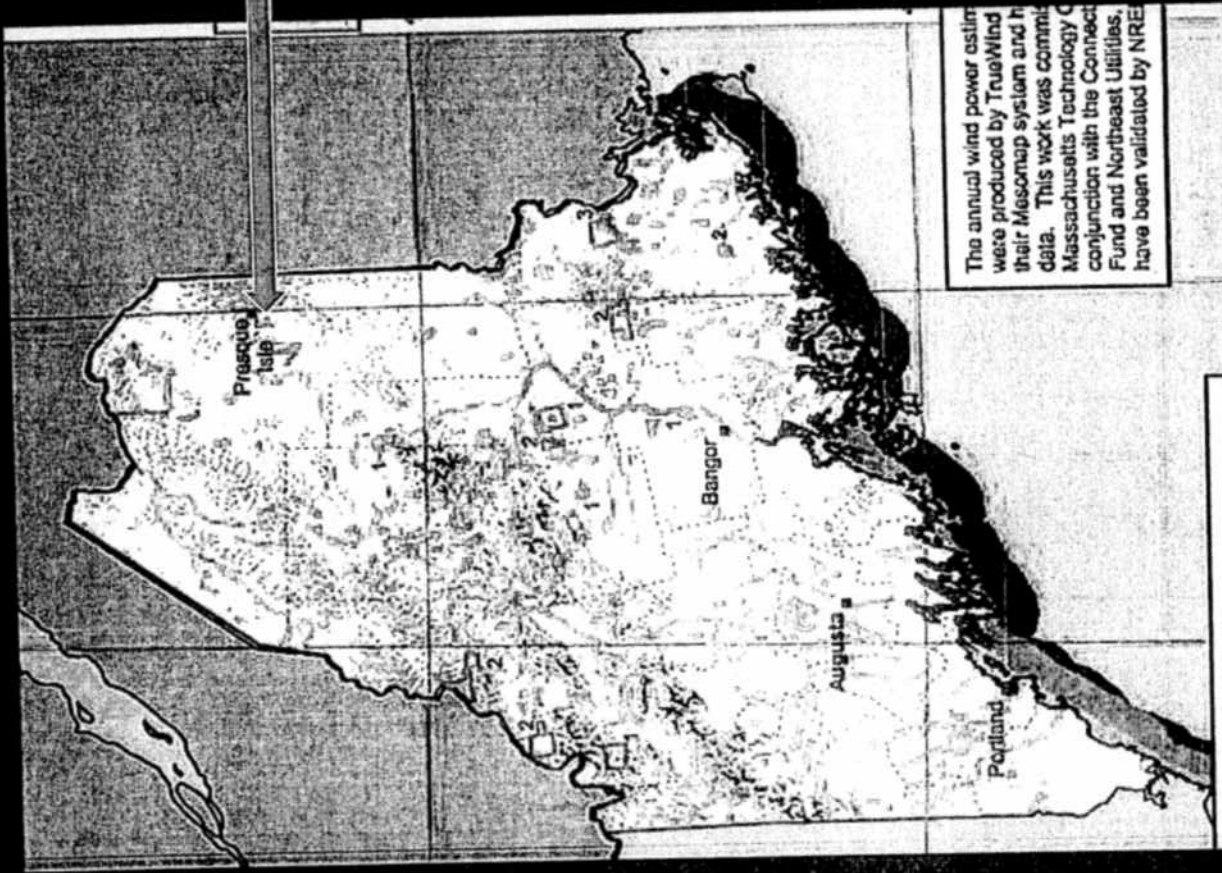


# Mars Hill Wind Turbine Project

## Health Effects –Pilot Study

- 28 turbines, 389 ft tall
- Online Dec 06, Complete Mar 07
- ~30 adults, ~15 children live within 3500 feet (1km) within ~18 homes.

# Mars Hill, Maine



## **Cross Sectional Controlled Study**

Attempt made to capture all adults on the three roads – drastically reduces sampling bias

Subjects and controls approached by investigator – essentially all agreed – very low self selection bias

Controls well matched by age and sex



Initiated after media reports of complaints  
and no government investigation

Pilot Study – not meant to evaluate full dose  
response (distance versus symptoms  
mapping), but to assess for relative risks of  
sleep disturbance and health complaints

Goal: Collect preliminary data for Maine  
Medical Association.

## Mars Hill Wind Turbine Project Health Effects – Preliminary Findings

### Population Sample - Demographics

- *22 subjects interviewed. 10 female, 12 male.*
- *Subjects: Distance to nearest turbine ranges 1200 – 3400 ft; Mean distance 2500 feet*
- *27 controls interviewed. 12 female, 13 male.*
- *Controls: Average distance 15,000-16,000 feet.*

### AGE AND SEX MATCHED

# Mars Hill Wind Turbine Project Health Effects – Pilot Study

## Subjects and Controls: Sex, Age, Distance

F	67	3400
F	62	2400
F	65	2500
F	73	3000
F	66	3200
F	38	1200
F	41	2300
F	49	2500
F	41	1500
F	18	1500

**Avg. Age: 52**  
**Range: 18-73**

M	65	3400
M	77	2400
M	75	3000
M	74	3200
M	52	1200
M	50	2100
M	51	2400
M	47	2300
M	58	2400
M	79	1500
M	56	1200
M	43	1500

**Avg. Age: 61**  
**Range: 43-79**

F	31	~15,000
F	50	~15,000
F	33	~15,000
F	63	~15,000
F	28	~15,000
F	40	~15,000
F	77	~15,000
F	64	~15,000
F	73	~15,000
F	70	~15,000
F	19	~15,000
F	81	~15,000
F	56	~15,000

**Avg. Age: 51**  
**Range: 19-81**

M	65	~15,000
M	60	~15,000
M	61	~15,000
M	40	~15,000
M	57	~15,000
M	40	~15,000
M	47	~15,000
M	39	~15,000
M	74	~15,000
M	81	~15,000
M	33	~15,000
M	47	~15,000
M	55	~15,000
M	43	~15,000

**Avg. Age: 57**  
**Range: 33-81**

# Troubled by Shadow Flicker

Exposed # 22

Non Exposed # 27

symptom	Exposed # 22		Non Exposed # 27	
	Number	Percentage	Number	Percentage
Nausea	2	9%	0	0
Dizziness	4*	18%	0	0
Trigger Migraine	1	5%	0	0
Unease	2	9%	0	0
new Rx	0	0	0	0
Total # Affected	7	32%	0	0

\*2 subjects had dizziness AND nausea

# Unintentional Weight Change

Unintentional

Exposed # 22

Non Exposed # 27

<i>symptom</i>	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>
Increase	6	27%	0	0
Decrease	2	9%	1	4%
new Rx	0	0	0	0
Total # Affected	8	36%	1	4%

# Headaches

New or worsened

Exposed # 22

Non Exposed # 27

symptom	Number	Percentage	Number	Percentage
New	7	32%	0	0
Worse	0	0	1	4%
↑migraine	2	9%	0	0
New Rx	2	9%	0	0
↑ Rx	1	9%	0	0
Total Rx	3	14%	0	0%
Total # Affected	9	41%	1	4%

New or worsened

# Auditory/Vestibular

Exposed # 22

Non Exposed # 27

<i>symptom</i>	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>
<b>Dizziness</b>	3	14%	0	0
<b>Tinnitus</b>	3	14%	0	0
<b>Ear Pain</b>	1	5%	0	0
<b>Ear Pulse</b>	3	14%	0	0
<b>new Rx</b>	0	0	0	0
<b>Total # Affected</b>	9	41%	0	0

# New or worsened Sleep Disturbance

New or worsened

Exposed # 22

CONTROLS # 27

Symptom	Number	Percentage	Number	Percentage
Falling Asleep	10	45%	0	0
Waking 1-2/wk	17	77%	1	4
3-4/wk	4	18%	0	0
5-7/wk	5	23%	0	0
New Rx	9	41%	0	0
Total # Affected	5	23%	0	0%
	18	82%	1	4%



New or worsened

# Psychiatric Symptoms

Exposed # 22

Non Exposed # 27

symptom	Number	Percentage	Number	Percentage
stress	13	59%	0	0
anger	17	77%	0	0
anxiety	7	32%	0	0
irritability	6	27%	0	0
hopelessness	12	55%	0	0
Depression	10	45%	0	0
<i>new</i>	8	36		
<i>worsened</i>	2	9		
New or ↑ <b>Rx</b>	4	18%	0	0

12 of 20

# Prescription Medication Use

Exposed # 22

Non Exposed # 27

symptom	Number	Number
Accepted Rx	12	4
new ↑ Rx	3	0
Total New Or ↑ Rx	15	4

15 New or increased prescriptions (12 people)  
 11 additional prescriptions offered and declined  
 in subject group

# Types of Medications

## Subjects:

Cymbalta

Mirtazepine

Trazodone

Hydrocodone

Topamax

Anxiolytics (2)

BP meds (3)

Lexapro

Zoloft

Meloxicam

Tylenol III

## Controls

Antihypertensives: 3

Antiarthritic 1

# Quality of Life Perception

Exposed # 22

Non Exposed # 27

symptom	Exposed # 22		Non Exposed # 27	
	Number	Percentage	Number	Percentage
Increased	0	0	0	0
Decreased	21	95%	0	0
Considered moving away	19	86%	0	0

# Quality of Life Perception

“No desire to go outside”

“Feel trapped”

“Dreams have been dashed”

“Was our dream home . . . it's all been stolen from us”

“My husband's (who has MS) only pleasure in life was to see the wild animals. They are gone.”

“Sinking feeling every night when I (come home) and see them.”

# Anger

“ Absolute rage – you feel you want to kill someone, and don’t know who to kill ”

*(67 y.o. woman)*

“ So angry I could kill ”

*(65 y.o. man)*

“ Makes my blood boil ”

*(65 y.o. woman)*

# Hopelessness

“ Nobody will help us ”

“ This is an awful thing to have happen to you ”

“ People don't believe us – (complaints) fall on  
deaf ears ”

“ No one cares. No one listens.”

“ They just tread on us.”

# Mars Hill ME DEP Nighttime Noise Variance 45=>50 dbA

“There are 4 protected locations where the noise level would be above 45 dBA, but less than 50 dBA, which is approximately equivalent to the noise that songbirds make . . . the Department finds that the applicants’ project will not have an unreasonable adverse impact . . . and therefore grants a variance from the noise standards for the windpower farm.”

DONE AND DATED AT AUGUSTA, MAINE, THIS 1<sup>ST</sup> DAY OF JUNE, 2004.

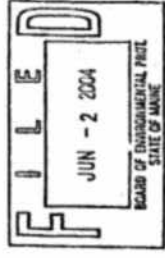
DEPARTMENT OF ENVIRONMENTAL PROTECTION

By: Dawn R. Gallagher  
DAWN R. GALLAGHER, COMMISSIONER

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application January 12, 2004  
Date of application acceptance January 22, 2004

Date filed with Board of Environmental Protection  
RC/L21635AN/BN





*“Daddy, I’m going to  
sleep at the hotel with  
Mom.”*



C-Rule 10-057?

October 10, 2010 – We heard an owl tonight. It is the second time I have heard an owl since construction began. We used to have owls in the woods behind our house on a regular basis.

One of the first siting council meetings in the PSC center in Madison I asked A PSC staff member about no mention of wildlife in the items to be discussed. I was told that would be up to the DNR to respond to. I have read the DNR letter concerning wind and wildlife. It is so weak it is pathetic. It is all generalizations and no requirements. These happenings are going on world wide wherever large industrial wind turbines are places. Why is the PSC blind on this? Instead of promoting wind energy why isn't the Sierra Club and other environmental groups striving to protect the wildlife rather than kill it and stress it? Why won't the wind energy victims be heard? \$\$\$\$\$\$

Gerry Meyer  
Brownsville WI



October 11, 2010

Senator Jeff Plale  
Chairman of Senate Committee on Commerce, Utilities, Energy, and Rail  
P.O. Box 7882  
Madison, WI 53707-7882

Senator Plale:

**I would like to be submitted for the record for the  
Senate PUBLIC HEARING  
Committee on Commerce, Utilities, Energy, and Rail  
Clearinghouse Rule 10-057  
Relating to the siting of wind energy systems.**

I AM **OPPOSED** TO THE CURRENTLY PROPOSED WIND SITING RULES. THEY ARE WAY TOO CLOSE TO OUR HOMES.

Thank you for holding a public hearing on the Wisconsin State Wind Turbine Siting Rules introduced to the Wisconsin Senate on September 2, 2010 by the Public Service Commission of Wisconsin.

The Ledge Wind Project is proposed all around my home so I have a very vested interest in it as it relates to my family. I have spent countless hours researching information available on the web from those who have been involved in wind a lot longer than Wisconsin. The report from the W.H.O. speaks volumes in regards to safe siting. The live testimonies from residents in Fond du Lac's wind ghetto have backed up issues concerning health and safety as well. As our Brown County Board of Health stated, what is the rush to put these beasts up? Where are the health studies? There is a problem when the State Health Department won't conduct a study because they are appointed by Governor Doyle and they are afraid to lose their jobs if they show evidence of problems with siting these too close to homes. If a study will not be conducted then you must error on the side of health and safety, I beg of you! Please push the state health department to do their job!

I find the reports of discontinued TV and radio reception to be annoyances and probably quite frustrating, but what concerns me the most is the fact that my young family and I would be subjected to interrupted sleep which leads to health issues. I cannot imagine having to keep my windows closed and room darkening blinds installed just to try to survive! How can anyone takes those rights away from me? Who will take a stand against big wind and greed to protect the families of Wisconsin? Health studies would show that these aren't issues that might happen, but rather, to what extent that they WILL happen. What person of moral and ethical substance could look into the facts associated with the current siting rules and not question the potential adverse risk to the health and safety of human beings? Please, hear the outcry, and help us.

I can't speak for all the townships, but here in Morrison, we have had devastating contamination of our wells due to the near surface bedrock. Do proponents really think that digging 81 miles of trenches and 100 foundations into our area farm fields often laden with manure, will have no impact on our wells?? Please, to think such would mean complete naivety. Can anyone offer a guarantee and full restoration with no expense to homeowners when it does happen? Interestingly, no one is willing.

Additionally, I am extremely alarmed that as a homeowner, property owner and tax payer, I can be violated when it comes to filling the pockets of those with less than desired integrity. In another act that

resembles more of a socialistic country than one of democracy, our local government's ordinances and requests have been completely overlooked and ignored. I'm tired of this kind of authoritative rule, and I'm looking forward to our November elections. There is not a United States citizen out there, who would concede to the giving up of their rights to a portion of their property and yet, that is just what happens when these turbines are placed so close to neighboring property. Where is the justice in this? I have worked too hard, and have paid too much in property taxes, to be taken advantage of like this.

In the very least, there needs to be rules included to protect those negatively impacted with a property protection plan as Commissioner Azar pointed out in her letter to Senate President Risser and Speaker Sheridan.

Let's be realistic....Wisconsin a wind state??? Look at how we're rated. Based on the amount of wind we receive and our population density, this is a complete joke. Not only that, but our manufacturers cannot stand higher electric rates mandated by wind. As we add so many wind turbines to our grid the cost of updating the transmission line system will continue to be passed down to our manufacturers and they will be forced to leave the state and take Wisconsin jobs with them. Not to mention the increased energy costs to consumers like me and you.

These industrial turbines are being pushed through under the disguise of a "farm" so they avoid inspections and regulations and this too should be included in the wind siting rules.

It should also be illegal for wind developers to sign-up town officials of any kind. This must be in the new state-wide siting rules. I live in the Town of Morrison in Brown County and 2 out of 3 of my town board members, our zoning administrator, and 4 out of 7 of our planning committee members have a wind turbine contract in the Ledge Wind Project which is proposing 100 turbines in the towns of Morrison, Glenmore, Wrightstown, and Holland. 2 out of 3 of the Wrightstown board members have also signed contracts. How can they be impartial board members when they are receiving monetary gain from the project? Wind developers should also have to disclose their intent to develop an area prior to signing up land owners by holding a town-wide meeting. Its truly a project that has been seasoned with deception, greed, self-interest and lack of integrity.

You don't have to look far to know there is a problem, you just have to look. Please put on the brakes and take a few months to conduct a study before we destroy more families and communities. We need industry and we need families in Wisconsin. We don't need industry stealing from our families living room, bedrooms, and our pocket books.

**Here is what I'm asking you to do with the current wind siting rules:**

- 1. Setback: Change from 3.1 times the height of the turbine to ½ mile from a property line.**
- 2. Noise: Change from 50 decibels and 45 decibels at night to 5 decibels over ambient.**
- 3. Include property protection plans where the wind developer must buy the impacted home at the current market value of a similar home that is not near a wind turbine project.**
- 4. Give some control back to the local towns who are closest to project area**
- 5. Inspect and regulate this industry like any other industrial power plant.**
- 6. Make it illegal for wind developers to sign contracts with town officials.**
- 7. Force the State Health Department to conduct an epidemiological study of existing residents of wind projects.**

Sincerely,



Lisa Harmann  
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State of Wisconsin  
County of Brown

On this day 10-12-10, personally appeared before me,

Lisa Harmann,

to me known to be the person described in and who executed the within and foregoing instrument, and acknowledged that he/she signed the same as his/her voluntary act and deed, for the uses and purposes therein mentioned.

Catalina Tapada

Notary's Signature

May 06, 2013

Notary's Expiration Date

Notary's Seal