Michelle, Kayce (UTC)

From: Posner, Stephen (UTC)
Sent: Monday, August 30, 2010 7:45 AM
To: Michelle, Kayce (UTC)
Cc: Talburt, Tammy (UTC)
Subject: FW: SOSA DEIS Comments on WRE proposal: Alternatives
Attachments: DEIS Comments Aug2010 - alternatives.pdf

Another comment letter from SOSA. Please process. Thanks.

Stephen Posner
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stephen.posner@utc.wa.gov

visit the EFSEC website at: www.efsec.wa.gov

-----Original Message-----
From: Posner, Stephen (COM)
Sent: Thursday, August 26, 2010 4:57 PM
To: Posner, Stephen (UTC)
Subject: FW: SOSA DEIS Comments on WRE proposal: Alternatives

----------[redacted]----------
From: Carol[SMTP:[redacted]@ARAMBURU-EUSTIS.COM]
Sent: Thursday, August 26, 2010 4:56:28 PM
To: Posner, Stephen (COM); AMMontano@bpa.gov
Cc: Rick Aramburu
Subject: SOSA DEIS Comments on WRE proposal: Alternatives Auto forwarded by a Rule

Gentlemen,

Attached please find comments on the DEIS for the Whistling Ridge Energy proposal (with Attachment A).

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August 26, 2010

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Andrew M. Montaño
Environmental Protection Specialist
Bonneville Power Administration
PO Box 3621 KEC-4
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Portland OR 97208-3621

Re: Comments on Draft EIS for Whistling Ridge Energy Project
DOE EIS - 0419: Failure to Consider Alternatives

Dear Messrs. Posner and Montaño:

This office represents Save Our Scenic Area (SOSA), a Washington corporation representing persons interested in the Whistling Ridge Energy Project (WRE). SOSA's primary mission is to preserve the Columbia River Gorge National Scenic Area view-shed; to further maintain the existing rural and scenic character of Underwood, Washington, and surrounding communities in Washington and Oregon; and work to preserve the intent of the Columbia River Gorge National Scenic Area Act. I write today to provide comments on the recently issued draft environmental impact statement (DEIS) for the WRE proposal.

WRE proposes to construct as many as 50 wind turbines on ridge lines on its property in Skamania County to produce a minimum of 70 MW. The project includes the construction and operation of a substation to be owned and operated by BPA that will connect the project to the Federal Columbia River Transmission System (FCRTS or the Grid). As discussed herein the project includes the turbines, the electrical connection system, the necessary infrastructure and the BPA substation. Though this project has been under development for some time, the applicant has identified only a range of wind turbine generators which "would likely range in size from 1.2 to 2.5 MW." DEIS at 1-9. However, the larger capacity turbines have larger diameter rotors (up to 100 meters), so it is unknown what the size of the machines would actually be. The proposal has multiple serious environmental impacts, including severe impacts on the visual surroundings of the Columbia River Gorge National Scenic Area.

A severe deficiency in the EIS is the failure to consider any alternative other than the applicant's minimum 70 MW proposal on its own property. Page 1-13 of the "Alternate Project Locations" includes only sites within the ownership of SDS. On page 1-14, the EIS states that the applicant considered a lesser number of turbines, but rejected such an alternative because it did not fit within SDS's concept of "economic feasibility." The failure to consider either alternate locations or alternate site configurations (with fewer wind turbines) is a fundamental and fatal defect in the DEIS, as was previously pointed out at the public hearing on the document. The responsible official must prepare a supplemental DEIS to address and thoroughly consider reasonable alternatives. This supplemental DEIS should be circulated for comment in the same manner as any DEIS under NEPA/SEPA rules and regulations.

After the DEIS was issued, the EFSEC and BPA issued Council Order No. 848 (June 29, 2010), which acknowledged public comments during the DEIS comment hearing on June 16, 2010 that identified "potentially serious errors in, or omissions from, the draft EIS." See page 2 of Order 848. That order requested that the applicant "incorporate into its direct presentation any information needed to address asserted significant flaws in the DEIS." Order 848 also indicated that the Final Environmental Impact Statement (FEIS) would not be issued before the adjudicative hearings began on December 8, 2010. SOSA and Friends of the Columbia Gorge (Friends) objected to Order 848 on July 8, 2010, requesting that the Council's responsible official require that the FEIS be issued prior to the commencement of the adjudicative hearings.

In its Order 850, the Council responded to the objections of Friends and SOSA. In that order, the Council indicated that:

> The comments [on the DEIS] are reviewed, responses are prepared and then the general agency practice is that the responsible official issues a draft final EIS (DFEIS).
>
> The DFEIS precedes the beginning of the adjudicative hearing. Its information is public and available. The environmental record is received in evidence; its information is available to the parties and the public during the adjudicative hearing. The content of the DFEIS is the equivalent of a FEIS. At the conclusion of the hearing process, the responsible official issues a FEIS, which may incorporate additional information received in the adjudicative hearing.

Order 850 at pages 3-4. Order 850 raises multiple issues regarding the proper procedures under SEPA and NEPA, as well as several unanswered questions, as follows:

1. There are no procedures under SEPA or NEPA by which an agency can issue a "DFEIS." Accordingly, it cannot be considered part of the SEPA or NEPA process.

2. Order 850 does not indicate whether interested parties may comment on the "DFEIS." Given that it is a draft document (though not one authorized by SEPA or NEPA), the DFEIS, if issued, should be properly noticed to agencies and persons who commented on the DEIS. There should be a comment period of a minimum of 45 days on the DFEIS.

3. Order 850 does not explain how the responsible official "may incorporate additional information received in the adjudicative hearing." Will the responsible official go through the entire administrative record to revise the DFEIS? More information is required on how that process will be implemented.

Based on the foregoing, SOSA still believes that the correct procedure to be followed, and one authorized by the rules under both SEPA and NEPA, is to issue a supplemental DEIS (SDEIS) correcting basic errors in the issued DEIS. The SDEIS would be subject to comment by interested agencies and members of the public. Our legal basis for this request is as follows:

The starting point for analysis of the alternative requirement is SEPA itself. RCW 43.21C.030(1)(c)(iii) makes clear that the "detailed statement" (which is now the environmental impact statement requirement) must consider "alternatives to the proposed action." Alternatives are so important under SEPA that each state agency, including EFSEC, has the responsibility to:

> Study, develop and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.

The details of consideration of alternatives in an EIS is found at WAC 197-11-440(5).

Under NEPA Rules, the consideration of alternatives is considered the heart of the EIS:

> Sec. 1502.14 Alternatives including the proposed action.
> This section is the heart of the environmental impact statement. Based on the information and analysis presented in the sections on the Affected Environment (Sec. 1502.15) and the Environmental Consequences (Sec. 1502.16), it should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public. In this section agencies shall:

> (a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.
> (b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.
> (c) Include reasonable alternatives not within the jurisdiction of the lead agency.
> (d) Include the alternative of no action.
> (e) Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.
> (f) Include appropriate mitigation measures not already included in the proposed action or alternatives.

(Emphasis supplied.)

As noted above, based on the applicant's own opinion of financial feasibility, the DEIS has not considered other alternatives; a position which appears to be unquestioned by the drafters of the DEIS. However, the applicant has not provided any information on financial feasibility and cannot so stricture and limit its proposal to avoid alternatives.

It appears that the applicant asserts, and EFSEC and BPA concur, that the proposal is for a private project on private property. See 197-11-440(5)(d). This exemption does not apply if the project includes a rezone or:

> if other locations for the type of proposed use have not been included or considered in existing planning or zoning documents.

The portion of the DEIS addressing land use regulation does not disclose that wind turbines were ever included or considered in planning documents adopted in Skamania County. See DEIS at pages 3-140 to 3-155.

The failure of the DEIS to consider alternatives is a fatal flaw for several reasons.

First, there are serious issues as to whether the proposal is consistent with local zoning. While the DEIS seems to claim that the project is consistent with Skamania County's comprehensive plan and zoning code, there are many reasons to believe it is not. On May 6, 2009 SOSA filed a lengthy letter directed to both Skamania County and EFSEC challenging the consistency of the proposal with local zoning. Among other matters, that letter pointed out that wind turbines or wind farms are not listed as permitted uses in the

Skamania County Zoning Ordinance or in the 2007 Skamania County Comprehensive plan.

The latter conclusion is confirmed by decision of the Skamania County Hearing Examiner made in February 2009 in a SEPA challenge to a determination of nonsignificance for adoption of a new zoning ordinance for Skamania County, which ordinance proposed regulating wind turbine development. Questions arose during the course of that hearing regarding whether the 2007 Skamania County Comprehensive Plan actually permitted or considered wind energy facilities. In her decision, the Hearing Examiner found as follows:

> The 2007 Comprehensive Plan does not contemplate the type of energy facilities described in the Planning Commission Recommended Draft.

See Findings and Decision, Finding 18 at page 8. The Hearing Examiner went on to rule that Skamania County was required to prepare an environmental impact statement prior to the adoption of its new zoning ordinance. Skamania County has never prepared the environmental impact statement ordered by the Examiner and the proposed zoning ordinance was not adopted.

Since Skamania County has adopted a zoning ordinance that does not provide for wind energy facilities, and its comprehensive plan does not contemplate such facilities, the exception in the SEPA Rules does not apply. Either WRE must apply for a rezone (which it has not) or EFSEC must preempt local zoning. The preemption decision by EFSEC would be the functional equivalent of a rezone because it provides approval for a previously unpermitted use.

In fact, EFSEC must make a determination of land use consistency and held a hearing on that subject on May 6, 2010. However, EFSEC did not make a decision on land use consistency at that time and has deferred such decision to be made in the course of the adjudicative hearings.

The consistency of the proposed project with local zoning has yet to be determined. The responsible official under SEPA, the EFSEC manager, accordingly cannot determine whether the WRE project is consistent with local zoning. If it is not, the Council may preempt local zoning, which would be the functional equivalent of a rezone for the project. Alternatives must accordingly be fully considered.

Second, the proposal is not a private project within the meaning of the SEPA Rules. This issue was previously considered in a Washington Supreme Court decision:

> Under the present statutes and administrative code, the question now before the court as to whether the EIS is adequate turns on whether the proposed project is a "public project" or a "private project".FN1

> FN1. It is unnecessary in this case to determine whether the "public"/ "private" distinction drawn in the administrative code accords with SEPA policy. We recognize that one commentator has suggested that in certain cases, the distinction may be unsound. See Richard L. Settle, The Washington State Environmental Policy Act: A Legal and Policy Analysis §14(b)(ii) (4th ed. 1993).

WAC 197-11-440(5)(d) provides in relevant part:

> When a proposal is for a private project on a specific site, the lead agency shall be required to evaluate only the no action alternative plus other reasonable alternatives for achieving the proposal's objective *on the same site....*

(Italics ours.) A "private project" is defined in WAC 197-11-780: "'Private project' means any proposal primarily initiated or sponsored by an individual or entity other than an agency."

Weyerhaeuser v. Pierce County, 124 Wn. 2d 26, 38-39, 873 P.2d 498, 505 (1994).

The project in *Weyerhaeuser* was a land fill proposed by a private applicant on private property. However, the court concluded it was a public project because of the close relationship between the county actions and the supposedly private project. The court went on to hold:

> We agree with the Weyerhaeusers that, as a matter of law, the proposed landfill is a public project, and the EIS must contain a sufficient discussion of offsite alternative proposals. Because it does not do so, it is inadequate as a matter of law.

The WRE project is similarly public for several reasons. First, the DEIS contains extensive discussion as to need for electric power to meet public needs for the region. See DEIS pages 1-4 to 1-7. This is clear in the DEIS at page 1-4: "The Applicant's purpose in proposing the Whistling Ridge Energy Project is to help meet the future need for energy resources." SDS also seeks to provide an additional renewable resource for electric utilities in Washington. Second, this project has been referenced by its proponents as a "semi-public" facility under the Skamania County zoning ordinance. See DEIS at page 3-147 to 149.

The WRE proposal is not exempt from alternatives analysis under SEPA or NEPA as it must be classified as a public facility.

Third, the DEIS cites numerous public documents that the project will supposedly comply with, including the Fifth Northwest Electric Power and Conservation Plan (DEIS at 1-4), the draft Sixth Northwest Electric Power Plan ("NPCC 2009", DEIS at 1-5), the "establishment of Renewable Portfolio Standards (RPS) at the state level" (DEIS at 1-

5), the requirement for "qualified alternative energy products" pursuant to state law (DEIS at 1-5). Each of these regulations and policies is substantially similar to the relationship between Pierce County and the developer in the *Weyerhaeuser* case. The DEIS touts the current proposal as meeting public needs and legislative mandates. WRE cannot promote the project "public" for one purpose, but claim it is "private" for another, especially where careful review of alternatives is required by SEPA and NEPA.

The result of the *Weyerhaeuser* case was as follows:

> The hearing examiner's decisions on the conditional use permit and the EIS appeal are reversed. The EIS must be revised to adequately address alternatives to the proposed project. In any new public hearing on this proposed project where county-staff-authored reports and an environmental impact statement are involved, the opportunity for oral cross examination of the staff members must be accorded.

124 Wn.2d at 47. The failure of the BPA and EFSEC to consider alternatives, including alternate locations and different configurations are fatal flaws in the DEIS. The current EIS should be withdrawn and a supplemental EIS complying with NEPA/SEPA rules and guidelines must be circulated for comment.

Fourth, there is considerable discussion of the need for the project's resources on a regional basis. See DEIS at 1-4 and 1-5. However, there are real questions as to need for this variable energy facility.

At the outset, it appears that most wind energy is not, as indicated at page 1-4 of the DEIS, used or useful in the Northwest. As indicated in the April 12, 2010 submission of BPA to the Federal Energy Regulatory Commission (FERC) on their docket Docket No. RM10-11-000 regarding regulation of "variable energy resources" (VER) at page 2:

> The need to clearly define balancing authority roles and responsibilities is especially important to BPA, because approximately 80 percent of the almost 2,800 MW of wind generation currently on BPA's system is exported to other balancing authorities, and BPA's preference customers should not bear costs of integrating wind generation that is exported to serve load outside of BPA's balancing authority.

Thus the EIS must consider whether the WR project or other wind projects actually meet loads in the Northwest.

In addition, as the BPA submission to FERC makes clear, it is necessary for balancing power to be available to meet loads when the wind does not blow. As noted by BPA in their comments on Docket No. RM10-11-000, at page 5, there are additional problems with balancing loads when wind energy resources are exported to California or to other

sink authorities. These facilities might include increased reliance on hydro resources or peaking facilities such as gas turbine plants. The EIS should consider whether additions of a VER like WR will result in the need for other peaking facilities to balance loads and whether the addition of a VER like WR is consistent with meeting demand.

Fifth, the DEIS repeatedly refers to the "economic feasibility" of the project when referring to the minimum output (70 MW) that is acceptable to the applicant. DEIS at 1-14. There is also reference to what utilities might require for the project at page 2-20 (project objectives "include providing a minimum level of generation to be attractive to utilities seeking to fulfill their RPS requirements, as well as providing a return on investment to the applicant."). However, most of this discussion is self-serving conclusions with no backup documentation. If the applicant seeks unilaterally to foreclose alternatives, then it must provide the economic and financial information to support these conclusions. The necessary data consists of costs of each of the various project elements, including labor and materials costs, costs for construction of roads, transmission lines and the substation, all leading to the overall cost and cost per kW or MW.

On the other side of the equation, the applicant must produce estimations of sales prices for the energy from the project, as well as actual support for the proposition that there is a minimum output that utilities would require. Further, actual land costs, by way of leases or property purchase, should be compared with other sites. Given the representations of the applicant, and the investment to date in the permitting, this "pro forma" type financial material should be readily available.

In addition, the EIS should consider whether placing a VER like WR on line will simply require construction of other facilities to balance loads, such as gas turbines or other facilities.

Sixth, the alternatives section of the DEIS must consider the problems of integrating wind power into the existing electric grid. These issues are discussed in the May 22, 2010 edition of the Seattle Times, which is incorporated by reference.

Because wind turbines only work while wind is blowing, other energy sources must be turned on when the wind stops or turned off or ramped down when the wind blows. This is illustrated by the recent review of the "BPA Balancing Authority Load and Total Wind, Hydro, and Thermal Generation, Near-Real-Time" for the period August 10-17, 2010. See Attachment A hereto. The load balancing data shows that wind generation on August 10, 2010 went from 2,202 MW to only 168 MW in just 12 hours. The simple meteorological explanation is that wind conditions went from higher speeds to near calm over this period. The new supplemental EIS should discuss the issues and problems related to integrating the Northwest power grid with wind power from this and other wind turbine projects.

Of more importance, the period of highest wind production did not correlate with increased electric loads for the Northwest. Thus when wind production was essentially zero on July 8-9, total loads in the BPA region were over 12,000 MW due to greater demand for cooling during this very hot spell. (The Clackamas weather station showed a high of 99°F on July 8 and 95°F on July 9.) When wind power generation rose on July 12 with increasing winds, loads dropped because of cooler temperatures (a high of 70°F on July 13.) Thus, if the wind is not blowing, base loads in the BPA region must be met by other power sources.[1] Accordingly, to meet loads, new wind power projects must be accompanied by new, firm, baseload power resources. While the region relies extensively on hydro power, in low water years, hydro power can be problematic. Indeed, according to the Seattle Times the BPA grid recently has cut back on receipt of wind energy because of capacity issues.

The new supplemental DEIS should discuss the erratic nature of wind energy and whether the addition of small quantities of wind energy will actually provide meaningful solutions to energy needs.

Seventh, in examining alternatives, the draft needs to compare the impacts of developing the proposed project with other alternate sources of wind energy being developed within the jurisdiction of EFSEC.

There are serious impacts related to the WRE proposal based largely on its location. The Underwood location will have serious visual and aesthetic impacts to extremely valuable and unique scenic resources found in the Columbia River Gorge, where because of its elevation the project will be seen by many persons over a broad area. Further, this forested location increases substantially the risks of bird and bat collisions with the turbine blades. Other environmental impacts are of concern because of the location of the turbines on steep ridgelines, which may restrict options for micrositing and increase impacts due to road building. This location should be compared with other possible sites, especially in southeast Washington where wind turbines are located away from populated areas and have lesser risk for bird or bat collisions.

Eighth, the section on alternatives in SEPA explicitly calls for an analysis of the alternative of future development of the proposal under WAC 197-11-440(5)(c) where the alternatives section of the EIS includes obligation to:

> (vii) Discuss the benefits and disadvantages of reserving for some future time the implementation of the proposal, as compared with possible approval at this time. The agency perspective should be that each

[1]The phenomenon is not limited to summer conditions. During the 10 day cold spell in January 2008, BPA records show very high loads, but no contribution from wind energy projects for more than 10 days.

> generation is, in effect, a trustee of the environment for succeeding generations. Particular attention should be given to the possibility of foreclosing future options by implementing the proposal.

For the present application, the DEIS must discuss the alternative of delaying the implementation of the WR proposal. In light of visual impacts, bird and bat kills and other serious impacts of the WR proposal, the DEIS should discuss the option of reserving the WRE project until such time as projects with lesser impacts have been permitted and constructed. The DEIS should accordingly discuss potential wind turbine sites, including those permitted, those under application, and those in areas where new applications are likely, for example, where land commitments in the form of leases are made by property owners to wind turbine developers.

Ninth, the proposed project requires an interconnection with the BPA transmission line together with the construction of a substation. That is clearly a public project, not a private project, and thus alternatives must be fully considered. As related to the substation it is understood that the BPA substation must be built with capacity to receive additional electric energy for interconnection with the FCRTS. Thus, the EIS must consider whether the BPA substation will act as an attraction for other energy projects to locate nearby. In this regard, SOSA notes that a natural gas pipeline traverses the north portion of the project area. See DEIS, Figure 2-3. In the recent past, the land owner SDS has promoted plans for a gas turbine for electrical generation in this area. The EIS must consider the possibility of a gas turbine project in the area, especially one that may have enhanced financial feasibility because of the proximity to both a fuel source (the gas pipeline) and a substation to connect that energy to the FCRTS. Given the need for balancing resources for VERs like WR, location of such a facility nearby appears more likely. Accordingly, the EIS must consider the impacts of such a gas turbine facility, including air emissions, noise, wildlife impacts and other impacts common to these facilities.

In addition, reports indicate that this year 68% of new wind turbine energy will be sold to California. The FEIS should identify whether power from the WR project will be sold and used in California or at any other location outside the state of Washington. Further, analysis should be made as to the capacity of transmission lines to accept the power from the WR project. Any contract or informal commitment between this applicant and public or private utilities should be identified in the FEIS and whether such parties are providing up front costs for this application and construction. If the power from this project is to be sold to out of state public or private consumers, then alternatives should be considered closer to where the power will be consumed.

Tenth, while SEPA contains the public v. private distinction, NEPA and the NEPA Guidelines contain no such exception. Since this DEIS is to meet NEPA requirements, there must be a full exploration of available alternatives under the terms of both NEPA

and SEPA rules. As cited above, the NEPA Guidelines require consideration of alternatives even though they may not be within the agency's jurisdiction.

Given the importance of alternatives analysis under both NEPA and SEPA, the failure of EFSEC and BPA to do this analysis now may mean that upcoming processes will have to be repeated should a court determine that the procedure adopted is illegal, resulting in a huge waste of time and resources of all involved.

In summary, the failure of the DEIS to discuss reasonable alternatives is a fatal flaw in that document. EFSEC and BPA should immediately withdraw the noncompliant DEIS and prepare a supplemental DEIS that considers all reasonable alternatives, not just those identified in this letter. The supplemental DEIS should be circulated for comment as required for any DEIS and no work on the final EIS should begin until all comments are in for the supplement.

Sincerely yours,

ARAMBURU & EUSTIS, LLP

J. Richard Aramburu

JRA:cc
cc: SOSA
Friends

BPA Balancing Authority Load and Total Wind, Hydro, and Thermal Generation, Near-Real-Time

Data automatically refreshes every 5 minutes...
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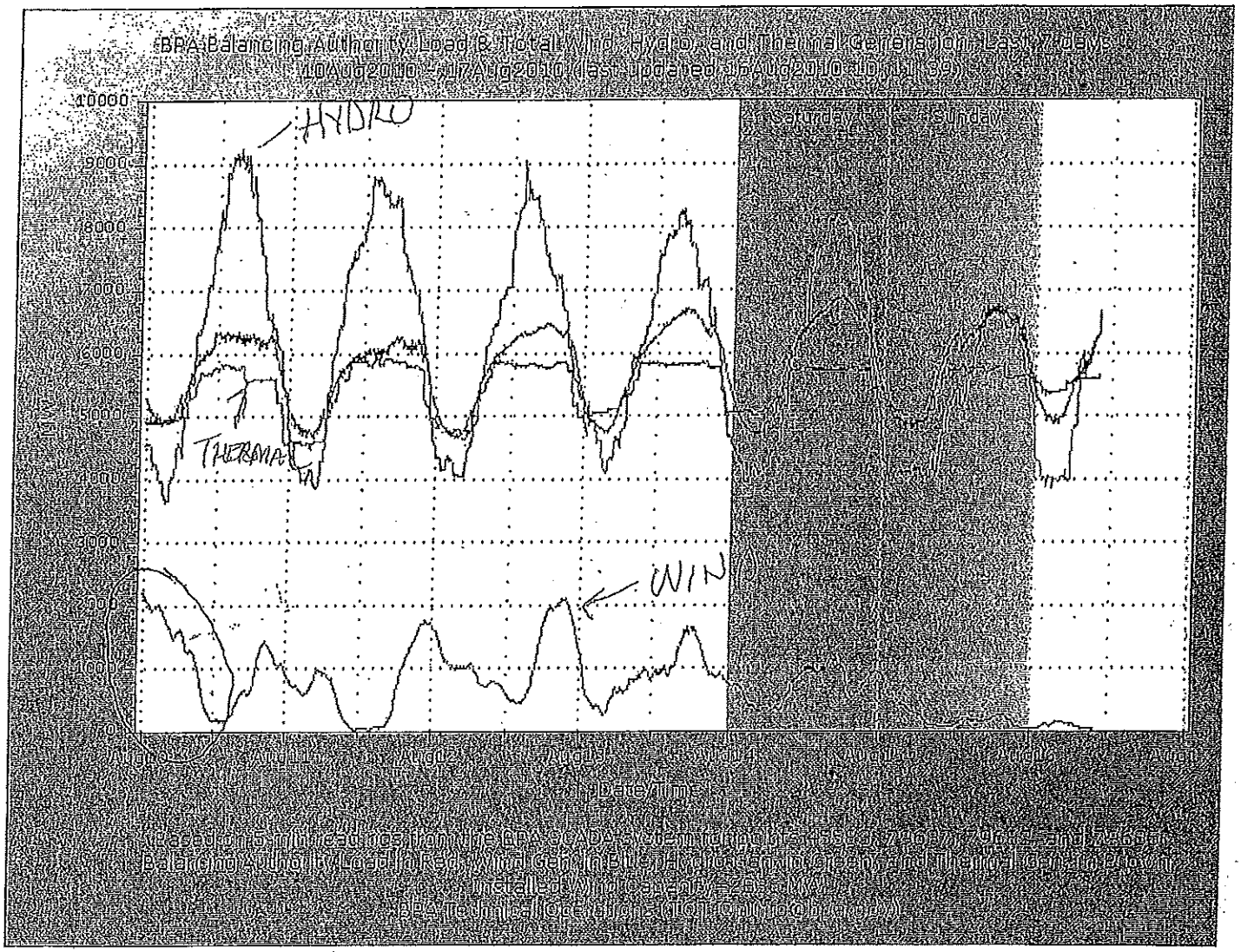

Image and data update independently of page refresh;
Content Manager: Bart McManus, Transmission Technical Operations, bamcmanus@bpa.gov

If you believe information on this site is missing or in error, please Submit that comment here.

Michelle, Kayce (UTC)

From: Posner, Stephen (UTC)
Sent: Monday, August 30, 2010 8:49 AM
To: Michelle, Kayce (UTC)
Cc: Talburt, Tammy (UTC)
Subject: FW: final Comment Letter from SOSA 27aug2010 4:58pm
Attachments: SOSA Comment on Whistling Ridge Energy Project Bats.pdf

Please process. I didn't see this one in the EFSEC mailbox. Thanks.

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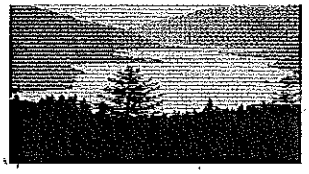
From: Posner, Stephen (COM)
Sent: Friday, August 27, 2010 5:00 PM
To: Posner, Stephen (UTC)
Subject: FW: final Comment Letter from SOSA 27aug2010 4:58pm

From: Tom Drach[SMTP:[redacted]@DROXCOMPANY.COM]
Sent: Friday, August 27, 2010 4:58:58 PM
To: Posner, Stephen (COM); AMMontano@bpa.gov
Cc: 'Rick Aramburu'
Subject: final Comment Letter from SOSA 27aug2010 4:58pm
Auto forwarded by a Rule

Gentlemen,

Please add the attached PDF comment letter from SOSA to the Public Record for the WRE project.

Regards
Tom Drach



Save Our Scenic Area (SOSA)
PO Box [redacted] Underwood WA 98651
www.saveourscenicarea.org

Comment on Whistling Ridge Energy Project

Draft Environmental Impact Statement (DEIS)

Comments on Bat Studies

August 27, 2010

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Andrew M. Montaño
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Bonneville Power Administration
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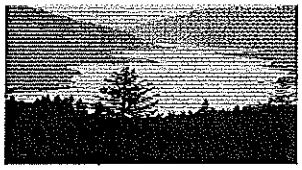
Portland, OR 97208-3621

Dear Messrs. Posner and Montaño:

Save Our Scenic Area (SOSA) is involved with the Whistling Ridge Energy (WRE) project application as an Intervener. SOSA is a non-profit corporation formed by concerned local Gorge citizens. Its primary mission is to help preserve the Columbia River Gorge National Scenic Area view-shed; to further maintain the existing rural and scenic character of Underwood, Washington, and surrounding communities in Washington and Oregon; and work to preserve the intent of the Columbia River Gorge National Scenic Area Act. I am writing today to provide comments on the recently issued draft environmental impact statement (DEIS) for the WRE proposal.

SOSA is submitting several different comment letters, covering a variety of subject matter within the DEIS. We have also reviewed the comments submitted by the Friends of Columbia Gorge, agree with them and incorporate them by reference. There are multiple environmental issues involved in the consideration of this project and it is important that each be given through consideration in the EIS process. We find that, in many areas, the present DEIS is completely insufficient and we urge that the NEPA/SEPA responsible officials prepare a supplemental DEIS.



Save Our Scenic Area (SOSA)
PO Box 41, Underwood WA 98651
www.saveourscenicarea.org

The following pages of written and charted comments, plus Exhibits, are intended to address some, but not all, of the deficiencies noted in the particular sections within the WRE DEIS that address Bats. In all cases, the deficiencies are explained. In most cases, particular remedies are suggested. Because no remedy is proposed by SOSA does not mean there should not be one implemented by the NEPA/SEPA responsible officials.

Prepared for Save Our Scenic Area
by Loreley Drach, M.S.

I am commenting on the methods, results and conclusions resulting within the Acoustic Bat Surveys and the text of the Whistling Ridge DEIS.

METHODS

Whistling Ridge Energy (WRE) hired the consultant WEST, Inc to perform bat surveys in 2007, 2008, and 2009. The bat survey consisted only of Anabat recordings at selected locations. This method has the ability to detect and record the ultrasonic calls allowing bat species to be identified and enumerated within the spatial range of the Anabat equipment. Use of the Anabat recorder however has limitations. Anabat recorders are used to determine activity. What specific activity is occurring, such as migration or feeding cannot be determined from the calls themselves. The limitations of the survey methods must be addressed and conclusions need to remain within the methodology limitations and not go beyond. WRE makes assertions that do not have any empirical basis in an attempt to lead reviewers to believe it has fulfilled the requirements of the DEIS.

To begin with, WEST, Inc. did not consistently achieve their own stated goals: "(1) characterize the local bat populations in a variety of habitats, (2) identify areas of high usage by bats, and (3) characterize the frequency of bat usage areas representative of where turbine strings would be located" if they were achieved at all.

(1) Local bat populations were not characterized in a variety of habitats. Implied in characterizing the bat populations is the identification of species and providing their composition of the calls in each habitat. Only one bat, the hoary bat, was identified. This bat in general only made up approximately 5-6% of the calls. Out of the 15 species of bats that may be present in the WRE area, six have status, and two are candidates for listing. Over 90% of the bat calls remains unidentified. WEST, Inc. states that they did not have the ability to detect individual species of bats. Perhaps WEST, Inc. does not have the ability to do so in house, but they could have sent out the recordings for analysis

by a qualified expert. WEST, Inc. provided text in a report for another wind development company Acciona demonstrating they have sent tapes out for expert analysis (Exhibit 1).

(2) During 2008, four locations closely representing the diversity of habitats and the turbine corridors in the WRE project area were monitored with the Anabat II recorders. These general habitat types included a wetland between two strings, a road corridor, and two clear cut locations.

(3) The 2007 survey did not state habitat type monitored and 2009 did not monitor a similar variety of habitats in the WRE area as in 2008. In 2009, WEST, Inc. only monitored areas similar to the one identified in 2008 as having the lowest activity. WEST, Inc. did not indicate whether they surveyed locations that would represent tree stands of 10, 20, and 30 years of growth. These tree ages would be present as the project area becomes reforested. WEST, Inc. surveyed highly disturbed locations only, worst case scenario from a species use standpoint. The results in 2009 therefore only represents the lowest probably use by surveying what appears to be the least desirable bat habitats, and in conditions only present for the first few years following completion of construction. Yet, only the 2009 activity data was used as the basis of comparison to other wind facilities with bat mortality data.

Bat activity numbers should be normalized by a fixed time period, like day, week, or month. In the case of WRE, they normalized by study period, when each year's study duration was different, as well as start and stop dates. The longer study period, lasting past normal activity periods for bats will indicate lower average values for the whole year's study.

The bat survey did not cover any of the bat activity during spring. The longest survey period covered June thru October. Bats have been seen adjacent to the WRE area as early as March. Wind in the PNW is most frequent during the winter and spring as frontal systems move in from the Pacific Ocean. Bats, with high springtime metabolic requirement would be vulnerable as they forage to recover lost fat from hibernation or migrate through the WRE site.

The WRE surveys discarded single calls. These single calls could belong to species that range on the quiet or non vocal side of the bat world. A table needs to be created showing which NW bats vocalize with two or more calls and which ones often use single calls.

Very significantly, the WRE bat survey failed to assess the prevalence of migrating bats through the project area. The DEIS makes statements that appear intended to demonstrate WRE does not believe they pose a significant risk to migrating bats, but these statements are not supported by any study or facts. Anabat recordings do not differentiate between bats feeding, migrating, or engaged in other activities. Simply noting what time of year activity was higher or lower does

not even suggest migration. Migration can only be elucidated from carefully designed and executed surveys.

Kunz et al. (2007) outlines some of the different technology and methods available for assessing nocturnal bats. Equipment such as tracking radar and thermal infrared imaging cameras can be used in conjunction with ultrasound microphones for bats and audio microphones for birds to obtain a greater picture of bat and bird migration and behavior in and through the WRE area. Because, bird migration was also not assessed, a bird and a bat could be hit with the nearly same proverbial stone should a migration survey be required.

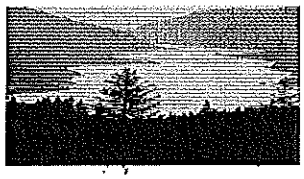
Bat experts with specialized knowledge were not consulted for information on location of hibernacula and maternity colonies, the only person consulted was a generalist WDFW habitat biologist, Bill Weiler (pg 3-80).

These deficiencies in the methods makes it difficult to truly assess what bat species may be at greatest risk both from a numbers issue a population perspective.

RESULTS and CONCLUSIONS

The acoustic bat surveys during 2008 better covered the diverse habitats currently available on or near the WRE site than either 2007 or 2009. The WRE project site contains wetlands, streams, ridges, low lying areas, clear cuts, varying ages of forest, and forest fringe areas. Not all these areas were monitored, but in 2008 several of them were. In 2008 three upland sampling locations, two clear cuts and a road corridor (July 3 to Oct 7) were monitored over 97 nights recording 39,326 bat passes and one additional sampling station next to a wetland (located between two rows of turbine strings) was monitored over 97 nights and recorded a whopping 17,269 bat passes (mean of **178.0** bat passes per detector night). The three upland locations had means of **14.3**, **73.8**, and **397.3** bat passes per detector night. ***These results appear to be some of the highest bat pass detections reported (and in three locations, the highest detections) of any wind turbine site in the U.S*** Compare to the numbers in the Activity column in Table 4 in appendix C-10, page 18. The highest activity on the table is 38.3 bat detections/detector night.

WRE suggests that bat use of the site is not high and states that the "extent of impacts is difficult to predict at this time (pg. 3-81)." The absolute extent cannot be precisely predicted, but a general ballpark statement can be made upon closer examination of the numbers. WRE agrees: "a) bat mortality shows a rough correlation with bat activity as measured by Anabat units (Table 4.)." The WRE Anabat monitors more than suggest high bat activity, it has been clearly demonstrated. It is reasonable to expect that bat mortality could be very high at the WRE location if turbines are installed.



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It is common knowledge that bats have been killed in far greater numbers than birds, particularly along the mountain ridges of the Eastern US. No information exists in the Pacific Northwest on bat mortality associated on the forested ridges of the Pacific Northwest, simply because no industrial wind projects have been built in this location to date. Whether resident or local populations are more at risk is completely unknown. In absence of information, a conservative approach would be best, especially in light of six status species of which two are candidates for listing, possibly inhabiting or migrating through the WRE area.

Bats do not have to be struck by wind turbines, but simply being in the proximity to a rotating blade may cause fatalities from barotrama (Baerwald et. al 2008). Whether bats are killed as a result of a random event or by some selective mechanism is not fully known. However, it appears that bats may be attracted to wind turbines (Horn et al. 2008).

Bats are long-lived and have low reproductive rates, making populations susceptible to localized extinction (Barclay and Harder 2003). Bat populations may not be able to withstand the existing rate of wind turbine fatalities (Kunz et al. 2007; Arnett et al. 2008). As the number of wind turbine facilities increase across the continent, even greater numbers of fatalities will occur. One serious bat problem looming on the horizon is the possibility that White Nose Syndrome may infect western bats. The cumulative effect of wind turbines and this devastating infection on bats has not been addressed in cumulative impacts. This information needs to be added, especially in light of the high bat activity at the WRE location.

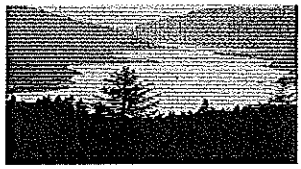
Society needs to take great care protecting these small flying mammals. Bats are significant consumers of human and agricultural pests. Without them life could be different.

CITATIONS:

ARNETT, E. B., ET AL. 2008. Patterns of bat fatalities at wind energy facilities in North America. Journal of Wildlife Management 71:61–78.

BAERWALD, E. F., G. H. D'AMOURS, B. J. KLUG, AND R. M. R. BARCLAY. 2008. Barotrauma is a significant cause of bat fatalities at wind turbines. Current Biology 18:R695–696.

Barclay, R.M.R., Harder, L.D., 2003. Life histories of bats: life in the slow lane. In: Kunz, T.H., Fenton, M.B. (Eds.), Bat Ecology. University of Chicago Press, Chicago, pp. 209–253.



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HORN, J. W., E. B. ARNETT, AND T. H. KUNZ. 2008. Behavioral responses of bats to working wind turbines. Journal of Wildlife Management 72:123–132

KUNZ, T. H., ET AL. 2007. Assessing impacts of wind-energy development on nocturnally active birds and bats: a guidance document. Journal of Wildlife Management 71:2449–2486.

Please also reference the charted comments on the pages below.

Thank you for this opportunity to comment on the DEIS. SOSA trusts that the DFEIS and FEIS will provide facts and analysis on the issues raised herein.

Regards,

Thomas Drach, PE
Board Member

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Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
comment #'s continued from previous Specific Comments submitted earlier								
108					nonexistent	Science based studies require a statement of all assumptions made to design a study and collect, analyze, and interpret data. This is completely nonexistent in the DEIS and Appendices.		
109	3	65	3.4.1.6	4	Bat acoustic studies conducted from 2007 through 2009 were implemented at various locations on the project site. The goal of the studies were to: (1) characterize the local bat populations in a variety of habitats, (2) identify areas of high usage by bats, and (3) characterize the frequency of bat usage areas representative of where turbine strings would be located. Studies were done across several seasons to estimate annual variation during breeding and periods of migration.	Goal (1) was not met. One cannot characterize the local bat populations (note plural) if one does not know what different populations of bats exist at the site. The Anabat recordings were only used to differentiate between high and low frequency calls, and only the call of the hoary bat (approximately 6% of the calls) was identified to species. Goal (3) only addressed one of a number of "representative" habitats, and this one habitat selected had the lowest activity of all monitored habitats. Only goal (2) was accomplished. Periods of migration were not identified by the study, only an assumption that migrating bats would migrate during the same period as bats on the East Coast of the US. Because migration by bats from or through the area were not studied, WRE cannot make any conclusions about migration. Not all bats migrate, some are residents, so unless one knows what migratory species are in or moving through the area nothing other that counts of presence can be made.		Identify all common and unique bat calls by Genus and Genus species and report along with location, date, time, wind speeds, and other meterological information. Provide all information in a supplemental DEIS. Characterize the local bat populations in a variety of habitats. Design study to specifically adress MIGRATION according to established best practices.
110	3	65	3.4.1.6	5	For all studies, passive Anabat II echolocation detectors coupled with Zero Crossing Analysis Interface Modules (ZCAIM; Titly Electronics Pty Ltd., NSW, Australia) were used in all survey years. Bat species are generally grouped into those that emit low frequency (<35 kHz) or high frequency (≥35 kHz) calls.	Bats need to be identifed to species, particularly in light of a number of species with an elevated status. The,Applicant's consultant, WEST INC, has demonstrated capability to provide this service and needs to perform this analysis. Bats should be grouped by Genus, and Genus Species in addition to low and high frequency calls.	Condonsed exerpts from WEST, Inc. bat study for Acciona: Analysis of bat calls was conducted using Analook software (DOS version). Species identification was aided by the Preliminary Key to the Qualitative Identification of Calls within the AnaBat System (Ameion 2005, unpublished data) All Myotis-like calls were identified to genus only and submitted to biologist, Eric Britzke, for identification to species.	Identify all common and unique bat calls by Genus and Genus species and report along with location, date, time, wind speeds, and other meterological information.

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Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
112	3	67	3.4.1.6		In 2009, the bat survey efforts were further refined to focus specifically on the types of locations where turbines would be sited.	This statement is patently false and misleading. The study design in 2008 represented the tubine locations by including areas near water sources. There are two water sources bats can use. One is the wetland just outside of 150 feet from some of southern the C string of turbines. The second, although mentioned a number of times during scoping, is from a creek below the southern A-array. This creek flows into an old reservoir located on the east side under the southern A string. It too provides a water source for bats. The 2009 survey selected locations far from water sources and as far from any size of trees that could be attained and is not representative of the diverse environment typical of a mountainous coniferous environment.		
113					General	No comparison to environmental conditions during the time Anabat equipment was operating.		
114					General	No mention of how bat use will increase in clearcuts as trees regrow.		
116					General	Bats data cannot be compared to other PNW use and mortality surveys. A those surveys occurred in the open, dry, unforested farmlands and grasslands and not in the damp coniferous forests and ridgelines of the Cascade Mountians. Patterns in use and activity are highly likely given differences in species and therefore behavior patterns of each individual species. Timing of reproduction and migration or hibernation is very likely to be different in the hot and dry environments than than in the forests of the Cascade Mountains for those species that inhabit both areas.		An expanded, in depth independent study needs to be performed over multiple years prior to any conclusions about seasonal and temporal use patterns and predicted mortality.
117	3	66	3.4.1.6	table 3.4-6	Table	Need to identify also what species are high and low frequency. A count shows that two high frequency and four low frequency bats have status. Of the low frequency bats one has been identifed but only makes up 5.9% of the total calls. This means that over 94% of the bat calls are unidentifed. Of particular interest, in the low frequency group, one species had been identifed as being in the area, leaving six not identified. Out of those six, four have status. In the high frequency group, two of the 8 have status. Overall, there is a very good chance that a number, if not all of these status species use this area, given the number of unidentifed calls.		Have expert biologists identify calls and present results along with detailed life history and overall abundance.

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Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
118	3	79	3.4.1.7	6	It is likely that some bat mortality would occur during operation; however, mortality estimates are difficult due to our lack of understanding of why bats collide with wind turbines....	It is common knowledge that it is not necessary to know why things happen to be able to assign an number to how often it may happen. It may be necessary to know why things happen to develop an effective solution. For example: Survival studies (mortality) in salmon are able to calculate the estimated number in a species population surviving through each dam, and the number surviving to the ocean based on the survival passage at each dam. Those numbers can be used to develop models of survival based on flow, temperature, size of fish, species, and timing of migration. It is not necessary to determine what exact or behavorial factor is involved. Same with bats. Scientists may not know what behavior exposes bats to be killed by wind turbines, but it IS known that bats are killed based on exposure (activity) to turbines. Significantly more than some are likely to be killed, especially if WRE is along a migration pathway. Population effect could result for a number of the bat species and particularly for Townsend's big eared bat.		
119	3	80	3.4.1.7	3	The timing of peak bat activity on the proposed project site (portions of July and August) does not coincide with when the highest levels of bat mortality have been documented at other wind projects in the US. Fatality studies have shown a peak in mortality in August and September and generally lower mortality earlier in the summer (citations)..... Rest of paragraph.	This section tries to suggest that because more bat calls were recorded in the summer months that mortality in migrating bats will be low. This does not correlate with other projects in the PNW. These other projects are in the eastern part of the state not having all the same species, a warmer drier environment with moderate fall weather where bat activity will remain higher longer into the fall. Second, bat mortality IS correlated with bat call recordings that indicate activity. Bat activity occurs until late September and early November with a peak in September. Because bat migration was not studied, no conclusions about bat migration can be made.		
120	3	80	3.4.1.7	4	After August 31, activity for all bats was very low relative to earlier dates, indicating that most bats had left the area for winter hibernacula or warmer climates.	This statement is not supported by an analysis of the numbers. Because species of bat calls are not identified and each species of bat has behavioral/physiological differences with response to oncomming winter, it cannot even be suggested that the bats left the area for hibernacula or warmer climates. For example: The Townsend's big eared bat's annual cycle includes an approximate 7 to 8 month period of peak activity in spring and summer when insects are most available and reproduction occurs. The life history and behavior of each bat species that may use the area needs to be incorporated into the timing of bat bat survey results and discussion. And the results need to include the identification of bat calls by the bat experts that specialize in studying each species of bats, especially the uncommon ones.	http://www.yoloconservationplan.org/yolo_pdfs/speciesaccounts/mammals/townsends-big-eared-bat.pdf	Identify bat call to species. Conduct a full bat migration study. Use accepted statistical analysis to compare bat abundance and movement in and through the WRE project area.
121	3	80	3.4.1.7	5	The project site does not contain topographic features, such as canyons, that may funnel migrating bats toward corridors where turbines would be placed.	Unfounded statements. There is no Pacific NW study on topographic effects on migrating bats to substantiate this. If so, cite the supporting document and do so for bat species that may migrate from or through the Pacific NW.		

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Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
122	3	80	3.4.1.7	5	No turbines would be constructed near wetlands or ponds, and cleared areas surrounding turbine strings would closely mimic clearcuts or young reforested areas, where to date, recorded bat activity levels on the project site were the lowest.	Absolutely incorrect assertion. Cedar swamp, a wetland discussed in the DEIS, is only a little over 150 feet from the C string of turbines to the east and a little further to the E string. The SB2 Anabat placed near the wetland recorded 178.0 bat passes per detector-night. The A string sits above an old reservoir that holds water the entire year. The Anabat placed in the A-string corridor recorded 73.8 bats per detector-night even though it was sitting out in the middle of a clearcut as were the detectors in 2009. By no stretch of the imagination is this a low number, only relatively lower than the extremely high numbers at two other locations in 2008. The numbers are so high, the developer did not want to compare them in the Table 4, page 18 appendix C-10. If 2008 numbers had been placed in the table, it would have reset the bar for all time high numbers of bats recorded per detector-night at wind turbine facilities.	DEIS Text.	Repair the defeciencies in the map and show the OLD RESERVOIR at the base of the southern A-Array. Provide acutual measures in FEET or METERS for each turbine within 2000 ft of a body of water.
123	3	59	3.4.1.5		Bat surveys conducted during ....., did not have the ability to detect individual species of bats. Based on the lack of detailed information of this species life history and habitat requirements and nature of the bat surveys conducted it is difficult to conclude with certainty with the likelihood of Keen's bats occurring on the project site. However, Due to the lack of old growth or mature forest types within the project area and the predominant commercial forestry use of the property, the likelihood of occurrence on the site is considered to be low.	Anabat II technology exists to identify, by call, individual bat species. This technology has existed for over 10 years. West has authored a paper where the Anabat technology was used to identify to species the majority of calls. Papers, abstacts, and exerpts are attached. The tapes need to be further analysed by a highly qualifed INDEPENDENT expert to identify bat calls with special emphasis to identify rare species. If WEST failed to set up the Anabat II correctly so that calls can be identified, then additional bat data collection needs to occur. Additionally, cumulative impacts should assess the possible future infection of bats by white nose syndrome. Increased mortality of ANY type, may directly affect these species future viability.		
124	3	75	3.4.2	4	Keen's Myotis and Townsend's Big Eared Bat. Surveys for bats were not able to identify ***all*** bats to species level.	Bats currently identified by the surveys, to Genus and Genus species, must be listed in a table form at the minimum. It is uncontionable to withhold such information, especially in light of this statement verifying the existence of bat species data.		Provide supplemental DEIS identifying how many Keen's Myotis and Townsend's Big Eared bat calls were detected by the Anabat II and locations, time of year, wind speeds, and other meterological information.
125	3	66	3.4.1.6	1	Two additional special status species, Keen's bat (Myotis keenii) and Townsend's big-eared bat (Corynorhinus townsendii), may occur but have not been identified in ***prior*** surveys.	The reason for doing the WRE survey is to perform a survey and determine what species are identified to use the area.		State whether either of these two species have been identified in the current DEIS study. This can only be achieved by reporting species calls identified on the Anabat II recording. What PRIOR surveys are being referred to here? Explain why it matters whether something was identified prior? What is the purpose of a current survey that can identify species if it only matters what is identified PRIOR?

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Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
126		78	3.4.1.7	3	Special Status Species	Not discused under 'special status species": Fringed myotis, Long-legged bat, pallid bat, and Western pipistrelle. These four other bats each have some status as detailed on Table 3.4-6.		Discuss undre special status species or state why their status on the table not qualify them for special status
127	3	80	3.4.1.7	5	The nearest know hibernaculum is located near the town of Trount Lake, nearly 20 miles north of the proposed project (B.Wieler, personal communication).	Townsend's big eared bat hibernaculum near Trout Lake is known and is one of the largest in Washington. However, other as of yet identifed hibernaculum, may exist nearby. A vast lava flow begin just a few miles west of the project site and it could contain hibernaculum. The project site is an area of old volcanic activity. Given that the Townsends big eared bat is difficult to identify through recordings, it is hard to find maternity colonies, and later in the season they may travel as much as 50 km, extra effort needs to be expended to determine if this at risk species is near to or using areas of the WRE project.		
128	3	60	3.4.1.5		There are no known roosting structures or maternity colonies occurring in the vicinity of the project area.	See comments on Keen's Myotis. Townsend's Big Eared Bat, a species of concern and a candidate for listing, is present in the region. One of the largest colonies at is located in lava cave nearer to Trout Lake to the north (400 bats?). Colonies are small compared to many other bat species and not many colonies are known to exist. The southern end of the old lava flow (can be seen from Google Earth) that may contain additional colonies is approximately three miles from the project .		
129	3	59	3.4.1.5		Bat surveys conducted during 2007, 2008, and 2009 (Appendices C-8, C-9, and C-10) did not have the ability to detect individual species of bats.	Completely inaccurate statement at the best. Hoary Bats were identified. It IS ACCEPTED THOUGHOUT THE BAT WORLD THAT THE ANABAT IS A PRODUCT TO COLLECT BAT CALLS AND TO IDENTIFY BAT CALLS TO SPECIES. TITLEY INC, AUSTRIALIA (the company that makes this product) PROMOTES THE ANABAT AS A GREAT PRODUCT BECAUSE OF THIS CAPABILITY! The DEIS text make this assertion a number of times and and is just a false the first time stated as every other time stated in the DEIS!		
130	C-8	3			Hoary bats comprised 5.7% of the total passes detected within the SWRA (20 of 348 bat passes: Table 1).	So, it is possible to identify bat species, so why not the remaining 94.3% of the calls? It is clear these tapes need to be reviewed by qualified experts.		

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Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
131	C-9	8			Acoustic bat surveys were unable to determine bat species present in the study area (except for hoary bats).....	So, it is possible to identify bat species, so why not the remaining 94.3% of the calls? It is clear hese tapes need to be reviewed by qualified experts.		
132	C-10	4		5	Hoary bats comprised 5.9% of the total passes detected within the WRWRA.	So, it is possible to identify bat species, so why not the remaining 94.3% of the calls? It is clear these tapes need to be reviewed by qualified experts.		
133	C-10	18	Table 4		Whistling Ridge, WA 8.09 This study	The number 8.09 (activity/detector night) is a lower number from a study that appears to have been manipulated in 2009 in an attempt to achieve a low number. The numbers from the 2008 study should also be placed on this table. The numbers from 2008 are 14.3, 73.8, 178.0, and 397.3 activity/detector night. An average of the three should be generated and put in the table. That average is likely to be well over 100.0 (bat calls)activity/detector night, and will be exceeding high relative to every other number in that column. Is this why it is left off the table?		

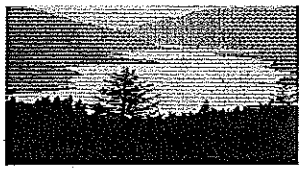

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Exhibit 1

West, Inc. Bat Identification White Paper

source: www.acciona-na.com/getattachment/6990b88d-6ff0-48e-990d-d208d4cb9776/

3.4 Nocturnal AnaBat Surveys

The objective of the nocturnal AnaBat surveys was to record the relative abundance of echo-locating bats flying through the sampling area during summer breeding season and the spring and fall migration seasons.

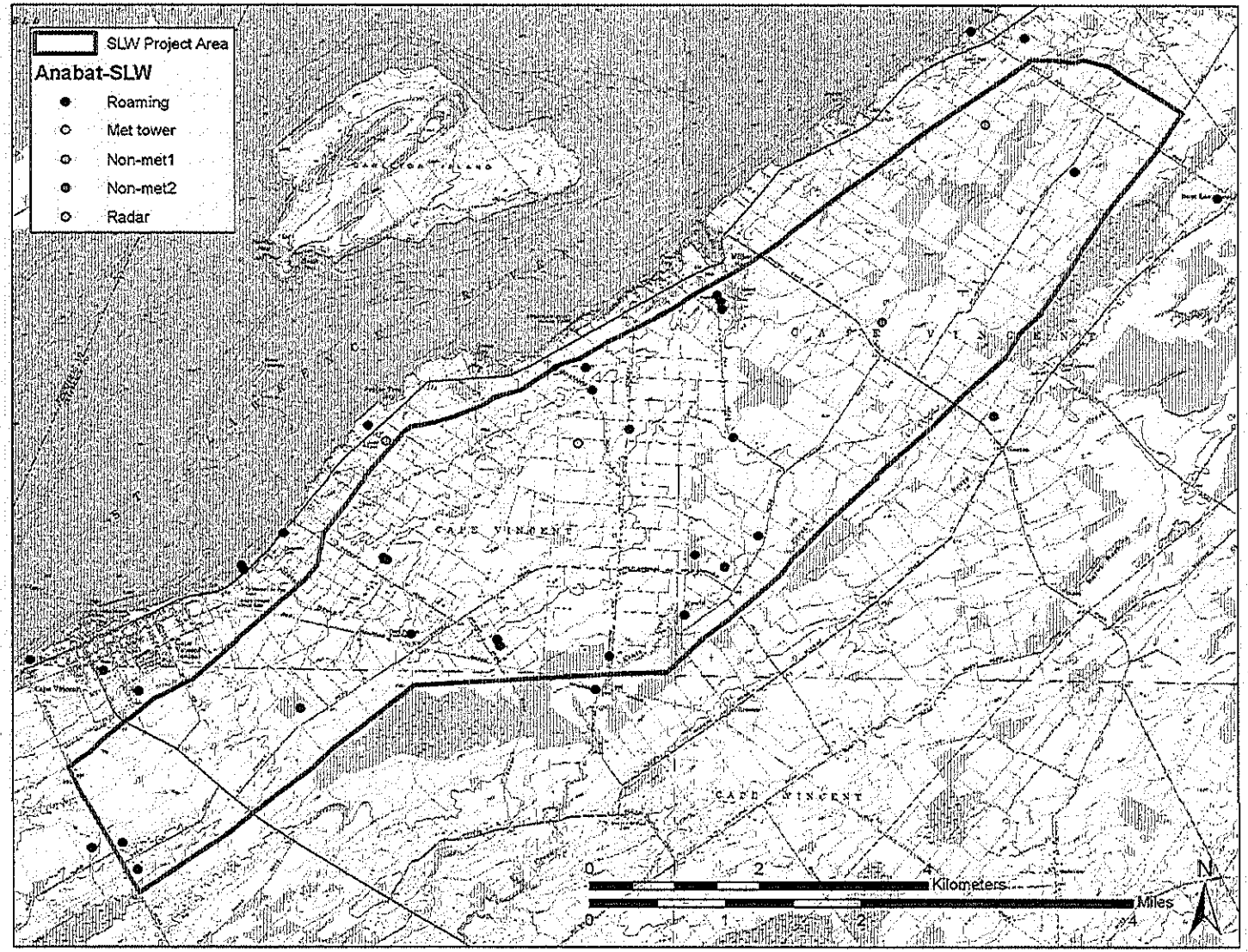
3.4.1 Methods

Bat activity at the project area was recorded using an AnaBat II ultrasonic bat detector attached to a zero-crossing analysis interface module (ZCAIM) which houses a compact flash memory card for temporary download of ultrasonic activity files. To sample continuously on remote mode (automatic data collection), the detector and ZCAIM were powered by an external 12V battery. Each AnaBat unit (detector, ZCAIM, and 12V battery) was enclosed inside a plastic box or dry bag with the detector microphone positioned against a PVC tube protruding from the box/bag. This design prevented water from damaging the AnaBat units without compromising the ability of the unit to detect ultrasonic noise in the environment. To limit variation among AnaBats, sensitivity settings were calibrated for each unit prior to data collection. Most AnaBat units were set at or near setting 7 on the sensitivity dial. Each passive AnaBat unit was positioned so that the microphone faced the same cardinal direction for each sampling period. Calls were recorded for passive sampling from approximately sunset to sunrise (1900 – 0700). AnaBat units were removed from the field approximately once per week to download files, recharge batteries, and troubleshoot technical problems. Data gathered from the passive AnaBat units at the met tower were used to calculate bat activity (designated as number of calls/night) present at the site during the sampling periods. Nights that experienced any number of technical difficulties were not included in the final analyses.

During the spring sampling season (April 13 – May 29), two AnaBat sampling locations were established. One unit was placed at ground level in the open grassy field at the base of the project met tower and another unit was deployed near a wooded edge (Non-met 1) to increase likelihood of detecting additional species (Figure 15). Access issues and technical difficulties with the AnaBat unit at the Non-met 1 location caused the unit to be relocated to a small farm pond near a wooded edge (Non-met 2) within the project boundary after a week of sampling. Acoustic sampling at these two locations (Met tower and Non-met 2) continued through spring and these locations were maintained through the summer sampling season (June 28 – August 8). During the fall season (August 13 – October 9), AnaBat sampling continued at ground level at the met tower. A second AnaBat unit was deployed from August 15 – October 16 in a tree approximately 10 m above ground near the radar survey station (Radar; Figure 15).

In addition to the stationary passive units, a "roaming" or mobile AnaBat unit was deployed during the summer to assess resident/breeding bat species present within the project area. Roaming sampling was conducted using a handheld AnaBat unit for 9 nights (3 sampling periods of 3 consecutive nights each) at habitats likely to have high numbers of resident bats. To select locations for active sampling, reconnaissance visits were made to the project area during the day time to select sampling locations based on the presence of travel corridors (trails and roads), linear landscape features (forest edges), and access to water; habitat features known to be important for bats. Active sampling was conducted from sunset until approximately 4-5 hours after sunset (2100 – 0100).

Figure 15. AnaBat survey locations for the project area.



Analysis of bat calls was conducted using Analook software (DOS version). Analook displays ultrasonic activity in a format similar to a sonogram used for analysis of bird vocalizations (e.g., frequency versus time). Species identification was aided by the Preliminary Key to the Qualitative Identification of Calls within the AnaBat System (Amelon 2005, unpublished data) where characteristics such as slope, frequency, minimum frequency, consistency of minimum frequency, and shape of pulse assist in the identification of bat vocalizations. Due to similarity of call characteristics, two species (big brown and silver-haired bat) were lumped into one species category. All *Myotis*-like calls were identified to genus only and submitted to NYSDEC-recommended biologist, Eric Britzke, for identification to species. To obtain species identifications, an ID filter (Britzke and Murray 2001) was loaded into Analook to determine calls sequences of sufficient quality and length for species identification to be attempted. Once separated, echolocation calls of sufficient quality and length were also identified using quantitative techniques (Britzke 2003). Quantitative analyses are conducted by a cross-validated classification model based on 10 extracted call parameters [duration (Dur), maximum frequency (Fmax), minimum frequency (Fmin), mean frequency (Fmean), duration to the knee (Tk), frequency of the knee (Fk), duration of the body (Tc), frequency of the body (Fc), initial slope (S1), and slope of the body (Sc)] collected from 1,846 sequences (35,979 calls) of 12 eastern U.S. bat species (Britzke 2003). Average accuracy rates for species identification using this statistical method ranges from 56.9% (*L. borealis*) to 98.5 % (*M. grisescens*), with accuracy rates for *Myotis sodalis* ranging from 81.4% to 88.6%.

3.4.2 Results

Passage Rates

The total number of calls and number of calls per night, recorded by each AnaBat unit varied by location and season (Table 4). The met tower AnaBat unit detected 769 bat calls total (19.72 calls/night) during the 39 days of spring sampling. Sampling at the two non-met locations during spring resulted in higher bat activity (29-33 calls/night) than at the met tower, despite changing in sampling location for the non-met unit. Summer sampling occurred at the met tower on 9 nights and recorded a total of 198 calls (22.0 calls/night). Approximately 2.5 times as many calls (55.56 calls/night) were recorded at the non-met 2 location during summer, likely indicating a nearby roosting colony of species and/or better habitat for foraging bats. During fall, the AnaBat unit positioned at ground level at the met tower recorded the lowest number of bat vocalizations per night (9.26 calls/night). Despite a similar number of sampling days, the AnaBat unit located at the radar sampling station recorded more bat calls/night (32.58). Approximately 93% of calls (n=1519) at the radar location were recorded between August 15 and August 21. Only 25% of the calls recorded at the met tower (n=117) were recorded during the same sampling period.

Table 4. Number of sampling days, total number of calls recorded, and calls/night recorded by each AnaBat unit for spring, summer, and fall sampling periods.

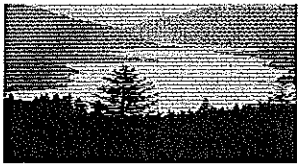
Season	Location	# of sampling days used in analysis	Total # of calls	# calls/night
Spring	Met tower low	39	769	**19.72**
	Non-met 1	11	320	**29.09**
	Non-met 2	24	782	**32.58**
Summer	Met tower low	9	198	**22.0**
	Non-met 2	9	500	**55.56**
Fall	Met tower low	50	463	**9.26**
	Radar	50	1629	**32.58**

Species Identification

Using qualitative analysis of search calls, 5 species groups of bats were positively identified at the met tower location (Table 5). As is typical with AnaBat sampling, the majority of vocalizations were unable to be identified due to the few number of pulses per call (<5 pulses/call sequence). Relative call frequency was calculated by dividing the number of calls recorded for each species by the total number of calls recorded at the met tower for each season. Of those calls that were able to be identified to species, *Lasiurus borealis* calls accounted for the majority of the vocalizations during all seasons at the met tower.

Summer sampling with the mobile AnaBat unit occurred on nine nights and recorded 464 bat calls (Table 6). The objective of the mobile sampling was to identify to the extent possible the species of bats using the St. Lawrence Windpower project area during the summer breeding season. As with the fixed station sampling, many calls could not be identified to species. One individual of an additional species, eastern pipistrelle (*Pipistrellus subflavus*), was recorded during the roaming surveys and not recorded during sampling at the passive monitoring stations. The highest number of recorded calls was of hoary bat (Table 6); however, 95% of those calls occurred on one night at one location and may have been from only one or a few individuals echolocating repeatedly near the AnaBat microphone.

Following the qualitative screening, 208 call files with characteristics resembling *Myotis* species were submitted to Eric Britzke for further analysis. Of those files, 76 calls (36.5%) did not contain sufficient enough information to be processed quantitatively. The remaining calls were analyzed quantitatively on a nightly basis by site (Britzke 2003). Calls meeting the quantitative criteria for the following species were identified: eastern red bat (22 calls), little brown bat (50 calls), northern myotis (44 calls), and Indiana bat (16 calls).



Save Our Scenic Area (SOSA)
PO Box [redacted], Underwood WA 98651
www.saveourscenicarea.org

Exhibit 2

Anabat Product Description and Specifications from Anabat website

ANABAT

Anabat Contents

Software/Firmware

Back to: Home

Overview

Anabat is a system designed to help users identify and survey bats by detecting and analysing their echolocation calls. It carries a strong emphasis on passive detection, in which the detector is used as a logging device to monitor bat activity in the absence of human intervention. But it is also very well suited to active monitoring, where the user watches bats in much the same ways as a birder watches birds. In that case, a bat detector is substituted for binoculars as the main enabling technology.

For passive monitoring, there are three main components to the system, a Bat Detector, a ZCAIM and software. In the newer SD1 model, the detector and ZCAIM are combined into one housing. The detector and ZCAIM can be placed in the field and protected from the weather, so they can monitor bats all night long, every night for months or even years at a time, while saving their data to a Compact Flash memory card (like those used in cameras). The card is typically swapped out in the field with an empty card, and then downloaded to extract the stored data, which can be viewed and managed in the AnalookW software.

For active monitoring, the ideal setup is an SD1 with an attached PDA, which allows in-the-hand monitoring of bat calls in real time. This arrangement gives the user maximum freedom of movement to follow bats on foot. Surveys can easily be conducted on foot or from a moving vehicle. The ability to see bat calls in real time has many benefits, making it much easier to associate different bat call types with the bats and their behaviour. See here for more details.

The Bat Detector is used to produce audible output from the ultrasonic (and therefore generally inaudible) sounds which bats generate in order to echolocate. While there are many types of bat detectors available commercially, those used in the Anabat system are the ANABAT II and SD1 detectors. The SD1 is a more recent model which combines a detector and ZCAIM (see below). These are frequency dividing (FD) detectors which provide a broadband frequency down-conversion, which generates audio signals with frequencies directly related to those the bat is producing. Many authors have treated Frequency Division detectors as poor cousins of the more complex detector types, because they provide less complete detail of the recorded bat calls. However, there are many tradeoffs in bat detector design, and the Anabat detectors provide a number of very important facilities which are not possible with other detectors. Anabat detectors make it very fast and easy to see the output which is of most value for species identification (the frequency-

time characteristics of bat calls), and they provide this in a manner which is extremely efficient in terms of data storage requirements and power consumption. Furthermore, the nature of the data generated by Anabat detectors is ideally suited to analysis using Zero-Crossings Analysis (ZCA), which provides very clear depictions of the important call details without the blurriness inherent in displays made using FFT (which is necessary for other forms of call analysis, and is also much slower and requires relatively huge amounts of data). FD and ZCA are used in combination to allow Anabat detectors to provide realtime displays of bat calls, and to facilitate long term passive monitoring. Other techniques, such as time-expansion, may give more complete depictions of call detail, but these extra details have little if any value for species identification and they impose other costs (such as not being able to record all the time, not being able to provide realtime displays and demanding vastly greater storage space) which limit their use in other ways.

The ZCAIM (Zero-Crossings Analysis Interface Module) is a piece of hardware which interfaces the audio-frequency signal from the Bat Detector to a computer, such as a PC, laptop or PDA. At this stage, only computers running the Windows operating system are supported. The ZCAIM is necessary to efficiently provide the fine temporal resolution required for ZCA. It is NOT true that normal computer sound cards can be used effectively for this purpose. The ZCAIM is included inside the SD1 detector, which provides the functionality of both the detector and ZCAIM in the one box. The older CF Storage ZCAIM is a separate piece of hardware intended for use with an Anabat II bat detector.

The software consists of two main programs:

CFCread which allows management of the ZCAIM for passive recording and downloading of data from CF cards.
AnalookW which allows viewing and manipulation (such as call parameter extraction) from saved Anabat data and has many facilities for data management.

two utility programs:

PicLoad which allows upgrading of the firmware in CF Storage ZCAIMs and SD1 detectors
AnaSun which provides computations of sun and moon rises and sets and twilight times.

and PIC firmware for the SD1 and CF Storage ZCAIM.

The Anabat hardware is avaliable from:

Titley Electronics
PO Box 19
Ballina
NSW 2478
Australia

Phone: +61 (02) 66 811017
Fax: +61 (02) 66 866617
Email: info@titley.com.au

Back to: Anabat Contents, Home

Latest AnaLookW software

AnaLookW version 3.3q dated 3 Oct 2006

Download ANALOOKW.ZIP (409 KB)

Latest AnaPocket software

AnaPocket version 2.5b dated 24 July 2007

Download ANAPOCKET.ZIP (163k)

Latest Storage ZCAIM and SD1 Software / Firmware

CFCread

Software required to read a CF card used in a storage ZCAIM, and also to set the time in the ZCAIM.

The version of CFCread which you use must be appropriate to the version of PIC firmware in use. The current version is Version 4.2a dated 31 Oct 2006. It should be paired with the latest PIC firmware for all the functionality to operate correctly. Always update CFCread and the PIC firmware together, if both are new. The most common problem with using incompatible firmware and software is that a new firmware version might store new codes onto the CF card which cannot be read by an earlier version of CFCread.

Version 4.2a, dated 31 Oct 2006

(to check version number, click on system menu at left of CFCread dalog title and open the ABOUT box)

Download CFCREAD.ZIP (196k)

PIC Loader

Software required to upload storage ZCAIM internal firmware via serial port.

PICLOAD version 3.7b dated 18 July 2007

(to check version number, click on system menu at left of PICload dialog title and open the ABOUT box)

Download PICLOAD.ZIP (164k)

PIC firmware

Storage ZCAIM and SD1 internal firmware, which can be upgraded via the serial port using PICLOAD. You MUST use the latest version of PICLOAD when updating the firmware.

Always make sure you upgrade to the latest CFCread version when you update the PIC firmware.

(to check version loaded into the storage ZCAIM, connect ZCAIM to laptop via serial cable and run CFCread, open port and read Version.)

Download SZ2.ZIP (13k - version 237g3) for earlier model Storage ZCAIMs using the PIC16F877 chip and with version numbers V2xxg3

Download SZ3.ZIP (14k - version 3019g) for later model Storage ZCAIMs using the PIC18F452 chip and with version numbers V3xxxg

Download SD1.ZIP (14k - version 4019g) for SD1 Storage Detectors with version numbers V4xxxg

Other Utility Software

ANASUN Version 1.0a

A utility which generates tables of Moonrise, Moonset, Sunrise, Sunset and Twilight times for either a whole year or a single month. Enter your position in degrees and decimals for latitude and longitude, and your time zone in hours relative to GMT (west of Greenwich is negative). Output is a text file, tab delimited for easy access by spreadsheet programs. Requires Windows 9x, NT or 2000.

Download ASUN10a.ZIP (114k)

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Technical Notes

- **Anabat File Formats**
- **Harmonics**
- **Glossary**
- **Epz and the Flatness display**
- **Weather Protection**
- **AnalookW call parameters**

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Contact Information

I am always anxious for feedback, and welcome criticism just as much as positive feedback. If you have any suggestions for improvement, or any corrections to make, please contact me by Email. I am also very interested to hear from anyone who thinks I have misrepresented anything, as I want this to be a web page which is useful and informative, and I don't mind including alternative viewpoints.

Email: corben@hoarybat.com

Last revised: September 02, 2007.

WR - DEIS
Public Comment #544

Late

Michelle, Kayce (UTC)

From: Posner, Stephen (UTC)
Sent: Monday, August 30, 2010 9:33 AM
To: Michelle, Kayce (UTC)
Cc: Talburt, Tammy (UTC)
Subject: FW: SOSA Additional Comment Materials 3:30 pm 27aug2010
Attachments: SOSA Exhibit 2F of Comments Chart 27aug2010.pdf; SOSA Comments Chart plus partial of Exhibits 27aug2010.pdf; SOSA Exhibit 2E of Comments Chart 27aug2010.pdf

SOSA Comment. I don't believe a copy was sent to the EFSEC mailbox. Thanks.

Stephen Posner
Energy Facility Site Evaluation Council
P.O. Box 43172
Olympia, WA 98504-3172
(360) 956-2063
stephen.posner@utc.wa.gov

visit the EFSEC website at: www.efsec.wa.gov

From: Posner, Stephen (COM)
Sent: Friday, August 27, 2010 3:31 PM
To: Posner, Stephen (UTC)
Subject: FW: SOSA Additional Comment Materials 3:30 pm 27aug2010

From: Tom Drach[SMTP:[redacted]@DROXCOMPANY.COM]
Sent: Friday, August 27, 2010 3:28:55 PM
To: Posner, Stephen (COM); AMMontano@bpa.gov
Cc: 'Rick Aramburu'
Subject: SOSA Additional Comment Materials 3:30 pm 27aug2010
Auto forwarded by a Rule

Gentlemen:

Please enter the attached PDFs into the public record for the Whistling Ridge Project Application.

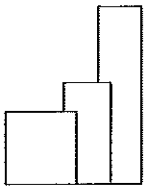
The attached PDFs concerns both general and specific comments in charted form, with Exhibits.

Please confirm receipt of this email today, as the deadline is 5 pm today.

Regards
Tom Drach

SOSA

541-490-3575



McCann Appraisal, LLC

June 8, 2010

Mike McLaughlin, Chairman
Adams County Board
Adams County Courthouse
507 Vermont St
Quincy, IL 62301

Re: Wind Turbine setbacks

Dear Chairman McLaughlin
and Members of the Adams County Board:

On behalf of my clients and as a real estate valuation advisor to the elected officials of Adams County, I am hereby submitting my written testimony as a professional real estate appraiser. Having been sworn in prior to expert testimony numerous times, I am quite familiar with the serious nature of giving my oath, and you may consider this written document to be a sworn affidavit. My opinions are also certified pursuant to Illinois Appraiser Licensing law and requirements.

I understand the County is considering a 1,000 foot residential setback requirement for wind turbines, and I have read that certain committee members are contemplating a recommendation increasing that to a 1,500 foot minimum. My testimony will address the adequacy of such setbacks, based upon a synopsis of widely known, reported and/or studied effects of living in close proximity to utility scale wind turbine projects. My testimony also includes results of my own independent study of property value impacts, and my professional opinions, recommendations and supporting illustrative comment are included along with supporting data I and other appraisers and researchers have developed as well.

Finally, I have projected the likely or probable impact to residential property values in Adams County, on the basis of what independent market research indicates. When considering an ordinance for setbacks from residential lots, as well as schools and other occupied dwellings or non-industrial land uses, I believe that my specialized expertise and experience as an appraiser familiar with wind farm issues is a relevant consideration for the policy-makers in Adams County.

Introduction

First and foremost, I understand very well that consideration of industrial scale wind energy projects is a unique situation for virtually every jurisdiction considering applications or requests from developers to build and operate such projects. They are intensive, large-scale projects with a decidedly industrial character, and most projects in

Illinois are proposed to "overlay" existing mixed-use residential and agricultural areas. This type of overlay is also sought in Adams County.

This is significant in the evaluation of land use compatibility or typical zoning standard compliance, since it is virtually impossible to introduce such a large scale project among existing low intensity residential uses without dramatically changing the character of the neighborhoods that will be encompassed by the turbine's land use overlay.

These large scale projects affect thousands of acres, and are far different than "typical" zoning variation or land use approval requests, such as a drive-through lane at a restaurant or bank, or a request to construct a gas station with a car wash. When the prudence of reviewing requests for smaller-scale, single uses is required to insure the new development does not adversely affect neighboring people or land uses, the immense scale and intensity of wind energy project development and operations demands even greater scrutiny and expert evaluation, which is often not financially feasible for smaller, rural counties.

My written testimony incorporates substantial experience with wind energy projects gained over the last 5 years, and 29 years experience as an appraiser. I have been qualified and testified in hundreds of contested and litigated land use matters, in zoning hearings, state and federal courts, and other public forums. I have been formally engaged to evaluate potential real estate impacts for 8 wind energy projects in Illinois, and have consulted with concerned citizens on a pro bono basis for several other projects throughout the United States. My qualifications and experience in this and numerous other impact studies, zoning compliance evaluations and property value damage claims is summarized within my professional biography included herein.

The ***Appraisal Institute*** has developed methodology and techniques for evaluating the effects of environmental contamination on the value of real property. The three potential effects that contamination can have on real property: cost effects, use effects, and risk (stigma) effects. All three effects are recognized as being present with utility-scale wind energy projects, as summarized in my written testimony.

Cost effects can include neighboring owner costs to attempt to mitigate against sound intrusion, shadow flicker, medical costs to deal with sleep deprivation related conditions, as well as, in some instances, the cost to rent substitute housing and potential legal costs incurred to protect individual owner's property rights, etc. For Agricultural property, there can be increased costs due to the loss of ability to retain aerial spraying services, which can result in increased cost for ground spraying methods and/or decreased crop yields.

Use effects include the loss of peaceful use and enjoyment of their homesteads for many turbine neighbors, and there is evidence that livestock has been adversely impacted by the noise from turbines, ranging from death (*goats in Taiwan*) to reproductive disorders (*See Wirtz case in Wisconsin*) and behavioral changes and

irritability of horses and cattle. These may also represent cost effects, in some cases, or other forms of financial impact.

Stigma effects can range from loss of aesthetics, diminished views and character of neighborhoods, to fear of health issues and noise disturbance, etc. This effect is often manifest in the lack of marketability of homes in the "footprint" and nearby properties most impacted by active turbines, and to varying degrees the known and unknown cost and use effects are also contributing factors to stigma effects.

My opinions are also based on use of the recognized and generally accepted methods for valuing contaminated properties – paired sales analysis (*i.e. Appendix C*), environmental case studies analysis (*i.e. Appendices B, D, E and F*) and multiple-regression analysis. *(i.e. Appendix D)*. I have also reviewed studies conducted by other appraisers, which yield similar indications of property value impacts.

In the Adams County matter, my evaluation of the proposed wind turbine setbacks is conducted from a real estate valuation perspective with a land use impact focus, since every land use has some impact upon neighboring land uses and residents. The impact can be substantially positive, negative, or so minimal as to be immeasurable in terms of property values. As I understand it, governmental policies and land use decisions are intended to prevent "significant" negative impacts on property values and the peaceful use and enjoyment of existing property by area residents.

Further, I believe the majority of my written testimony, and supporting basis thereof, is applicable to other locations characterized by residential uses interspersed with historically compatible agricultural land uses.

In order to be perfectly clear, I must also state that I have developed no professional opinion or conclusions as to the validity of the need for, or effectiveness of, industrial-scale wind energy projects for their intended purpose: the creation of renewable energy. While my research has disclosed considerable controversy on these topics as well, I leave those conclusions, opinions and corporate or governmental decisions to experts on electric utility issues and those technical aspects of these projects.

Thus, as a professional appraiser, I focus on the concept and reality of property value impacts. In order to understand the basis for any potential impacts, I have researched, collected, reviewed, studied and considered the same type of information available to anyone with an internet connected computer, which comprises the majority of the home-buying public in modern countries like the United States. I have also researched property values and value-related trends in larger wind energy project locations, to investigate whether industry claims are true or whether the neighboring citizens of such projects have valid claims regarding property value impacts.

Briefly stated, there is much to be concerned about as officials in Adams County whom are responsible for protecting the public health, safety and welfare, as well as the use and enjoyment of property and its underlying value.

As the balance of my written testimony and the supporting documentation indicates, I have developed a summary of professional expert opinions and wind energy project impact mitigation recommendations, which includes nine (9) primary opinions and ten (10) recommendations, as follows:

SUMMARY OF OPINIONS & RECOMMENDATIONS

Opinions

1. Residential property values are adversely and measurably impacted by close proximity of industrial-scale wind energy turbine projects to the residential properties, with value losses measured up to 2-miles from the nearest turbine(s), in some instances.

2. Impacts are most pronounced within "footprint" of such projects, and many ground-zero homes have been completely unmarketable, thus depriving many homeowners of reasonable market-based liquidity or pre-existing home equity.

3. Noise and sleep disturbance issues are mostly affecting people within 2-miles of the nearest turbines and 1-mile distances are commonplace, with many variables and fluctuating range of results occurring on a household by household basis.

4. Real estate sale data typically reveals a range of 25% to approximately 40% of value loss, with some instances of total loss as measured by abandonment and demolition of homes, some bought out by wind energy developers and others exhibiting nearly complete loss of marketability.

5. Serious impact to the "use & enjoyment" of many homes is an on-going occurrence, and many people are on record as confirming they have rented other dwellings, either individual families or as a homeowner group-funded mitigation response for use on nights when noise levels are increased well above ambient background noise and render their existing homes untenable.

6. Reports often cited by industry in support of claims that there is no property value, noise or health impacts are often mischaracterized, misquoted and/or are unreliable. The two most recent reports touted by wind developers and completed in December 2009 contain executive summaries that are so thoroughly cross-contingent that they are better described as "disclaimers" of the studies rather than solid, scientifically supported conclusions. Both reports ignore or fail to study very relevant and observable issues and trends.

7. If Adams County approves a setback of 1,000 feet, 1,500 feet, or any distance less than 2-miles, these types of property use and property value impacts are likely to occur to the detriment of Adams County residences and citizens for which the nearest turbines are proposed to be located.

8. The approval of wind energy projects within close proximity to occupied homes is tantamount to an inverse condemnation, or regulatory taking of private property rights, as the noise and impacts are in some respects a physical invasion, an

easement in gross over neighboring properties, and the direct impacts reduce property values and the rights of nearby neighbors.

9. A market value reduction of **$6.5 million** is projected for the residential property located in the footprint and within 2-miles of the pending Prairie Mills project located in east Adams County.

Recommendations

Therefore, if the County Board should choose to adopt the industry requested minimal setbacks, or some other setback of less than 2-miles from residential uses or occupied dwellings or structures such as schools, churches and nursing homes, I have developed a series of recommendations that would at least partially mitigate the widely experienced impacts prevalent with industrial scale wind turbines developments, as follows:

1. A Property Value Guarantee (PVG) should be required of the developer(s), significantly similar to the PVG attached hereto as **Appendix A**. A County-controlled fund or developer bond should be required to guarantee no undue delay in PVG payment(s) to legitimately affected homeowners, and/or to buy out homeowners located within 2-miles of any turbines if they elect to relocate away from the turbine project(s) and cannot sell for the pre-project market value of their properties. Such a guarantee is nominal in cost, relative to total project costs, and are used to condition high impact land use approvals such as landfills and even limestone quarries, as well as other wind energy developments (i.e. *DeKalb County, Illinois, etc.*)

2. An alternative to the bonding element of Recommendation # 1 would be to require that the developer(s) obtain a specialized insurance policy from a high-risk insurance carrier or legitimate insurer, such as Lloyds of London, if they will even insure against such impacts. If Lloyds was unwilling to provide such insurance, however, that should be compelling to the County that professional risk-management actuaries find such projects too risky for even them to insure. Under those possible circumstances the burden of risk is fairly placed with the developer, rather than the residential occupants who are being surrounded or otherwise directly impacted by close proximity of the projects.

3. If Adams County decides to permit projects, the limited evidence of impacts beyond a 2-mile setback would mitigate against the need for a PVG as cited in recommendation # 1.

4. If Adams County decides to permit projects, I recommend that the County require developer funding and a plan to constantly monitor not only sound levels in

decibels, but also in low frequency noise emissions from the turbines utilizing the best available technology, or at least homeowner reports and logs. There is significant evidence and personal accounts confirming that low frequency sound/noise is "felt" by nearby occupants, and, as I understand it, cannot be measured by decibels as audible noise is typically measured. Disclosure of the owner's actual experience to prospective buyers is necessary from both an ethical perspective and, I believe potentially under the Illinois Real Property Disclosure Act, as a "known" defect or detrimental condition. Thus, documentation should be created at the cost of the developer(s), to insure that appropriate disclosures can be made to any prospective buyer(s) of homes within the 2-mile zone.

5. Appropriate devices should be installed at the developers expense at all occupied dwellings and property lines within a 2-mile distance of any turbines, and the County should retain the ability to immediately enforce the shut-down of any turbines exceeding a level of 10 decibels or more above ambient background noise levels from any property/home experiencing that exceeded noise level. The proximity of constant or frequent noise sources is an adverse impact to the use and enjoyment of a residential property, and indicates a basis for loss of property value.

6. An alternative to recommendation # 5 would be to place a limit on hours of operation, requiring turbines within 2 miles of any occupied (non-participating) dwelling be shut off during normal sleeping hours (*i.e. 10 p.m. to 7 a.m.*).

7. If the County finds that the wind energy projects are desirable from a economic development goal or perspective, or for the "public good", I recommend that "footprint" and 2-mile distant neighboring homeowners (measured to lot line from the furthest span of turbine blades) be afforded the opportunity to sell to either the developer or the County, with possible use of eminent domain powers employed by the County, on behalf of and at the expense of the developer(s).

8. The financial assurance for decommissioning and reclamation of wind turbine pad sites, i.e., a bonding requirement, is also recommended as a County condition. To demonstrate solvency companies should pay the bond requirements before starting construction. It's basically insurance in case the company goes bankrupt or otherwise abandons the wind project without taking down the turbines and reclaiming the land. Coal mines, quarries, landfills and drilling companies have similar bond or financial assurance requirements.

9. An aesthetic landscaping requirement for wind project developers to plant mature trees or groves to shield the view between residential properties and turbines. Evergreens planted along property lines and/or other types of trees strategically planted between residential windows and turbines would partially alleviate aesthetic impacts from turbines.

10. The County should consider a moratorium on wind energy project development(s) in Adams County, until such time as:

- A thorough and complete Wind Energy Ordinance is developed and adopted by the County, which incorporates all the protection and authority of zoning, building and health codes.

- Appropriate Conditional or Special Use standards are developed and adopted, to insure wind developers carry the burden of their for-profit projects rather than the hosting jurisdiction(s) and/or neighboring property owners.

- The actual experiences of numerous existing turbine neighbors is documented thoroughly by an impartial group of professionals with appropriate qualifications in the various relevant fields of expertise, i.e., acoustic engineers, medical sciences, valuation professionals, etc.

The preceding recommendations are not intended to be all inclusive or to address all wind energy project issues and impacts. They are intended to address issues that affect the public health, safety and welfare of area residents, as well as their property values.

The following pages summarize portions of underlying support for the preceding opinions and recommendations.

General Impact Issues & Comment

Several Issues are relevant considerations to property value impacts. As the real estate market becomes more aware of complaints and problems attendant to living near turbines, a stigma is becoming common. Stigma issues are inextricably intertwined with property value trends, and the general public has varying but increasing levels of awareness of underlying issues and conflicts with wind energy projects.

The most measurable impact on home values is the distances from the industrial-scale turbines. The categories of impact that my research discloses as most typically related to distance include:

- Noise and "vibro-accoustic" effect.
- Aesthetics & compatibility.

Wildlife impacts, i.e., bird & bat kills, road damage, tax & fiscal impacts are also issues attendant to wind farms, but have little or no identifiable correlation to property value impacts, and are only mentioned in passing.

The following comments, excerpts and attachments attempt to summarize a representative sample of these issues, industry claims, market reactions and responses by McCann Appraisal, LLC.

First, as a part time Florida resident and homeowner, I am quite concerned about the ultimate impacts of the ongoing and catastrophic oil spill in the Gulf of Mexico. I mention this man-made disaster because I note certain parallels between the goals, claims and realities between the Gulf situation and the wind energy development trend.

One might argue that man-made disasters like the Gulf oil spill are part of the justification for pushing full steam ahead on wind energy projects, yet the parallels remain between off-shore oil drilling and wind turbine projects:

- Both project types seek to provide independent energy needs for the United States.
- Both are extremely large scale types of projects, notwithstanding the invisible & noiseless infrastructure of oil rigs to most citizens, i.e., no neighbors at sea.
- Both industries have gone on record with claims that their projects are "safe", will have very minimal impact on the environment, and include many "trust us" type statements, messages and public relations campaigns.
- Both have considerable evidence accumulated of "anecdotal", but nevertheless serious negative impacts that are long-term and affect a relatively small percentage of the population.
- Both have historically had influence on political and legislative decision makers.
- Questionable "science" is cited and utilized by the energy industry to support their PR claims and approval requests, with respect to property values and health

issues emanating from noise, and primarily the sleep interruptions. As an example, Exxon was able to obtain a written opinion that the Valdez spill did not damage coastal property values, despite the nearly complete destruction of the local fishing-based economy and the extensive environmental degradation from the oil spill.

- With accidents like the Valdez spill and now the BP Gulf catastrophe, and against the growing anecdotal list of impacts from industrial-scale wind turbine projects, it is justifiable to enforce the assurances and responsibilities of the energy industry, overall, and to place the cost of mitigating their impacts on the corporations who develop, own and operate the energy projects.

Further, when the term ***"Green Energy"*** is used, I perceive an implicit claim by the wind energy industry and even governmental policy goals that creation of such energy is (*intended to be*) of low or no impact on the environment. I consider impacts on people and their property values to be included in the term "environment".

There is however a considerable body of evidence that clearly shows there are in fact many circumstances where this intention does not match the reality, and is affecting many people, livestock, lifestyles, sleep and health issues, and the related underlying property values of wind turbine neighbors.

The Adams County consideration of a setback requirement is tantamount to a "zoning" ordinance, as it affects land use and compatibility with existing and neighboring land uses.

Zoning is defined in similar ways as:

- Dividing an area into zones or sections reserved for different purposes such as residence and business and manufacturing, etc.
- Legislative action for the purpose of regulating the use of property and the construction of buildings, facilities or structures within the area under the jurisdiction of the legislative body concerned.
- An exercise of police power by a municipality to regulate and control the character and use of property.
- Governmental authority over land use, intended to protect the public health, safety and welfare, while creating or preserving compatibility between land uses.

Most Zoning Ordinances require as a condition for approval of a special use, such as a wind energy generating project, that the ***"proposed use will not be injurious to the value of neighboring property"*** and/or "***will not prevent the use and enjoyment of neighboring property for uses to which it is already used or zoned"***.

Despite the consistently reported effects on neighboring people, a typical developer's answer to this is: ***There is no "scientific" evidence of health issues.***

My response to that is there has been no legitimate study by the wind industry to determine what, if any health effects are linked to proximity to turbines.

To my knowledge there are no scientific studies that prove bricks falling from a high rise scaffold will cause injury or worse to people walking below, but there is enough "anecdotal" evidence over time to warrant building codes and ordinances that require effective barriers to **protect the public health, safety & welfare** (*which is exactly what zoning and other ordinances are supposed to accomplish*)

According to the website for Adams County, the Division of Health Protection's Environmental Health Section responsibilities include:

- reduction of food borne illnesses through restaurant and food stand inspection
- assurance of safe drinking water through private and non-community water well system permitting and inspection
- regulation of proper wastewater disposal through on-site wastewater system permitting and inspection
- permitting and annual inspection of tanning parlors
- investigation of nuisance complaints relating to the above-mentioned areas of responsibility as well as rodents and trash
- annual surveillance of mosquitoes and birds for the presence of West Nile Virus

From a land use policy perspective, which is directly related to the use and impact on homes from turbines, I anticipate the County may need to increase staff to deal with nuisance complaints from turbines located closer to homes than cited in recommendations #3, #4, #5 & #6.

To my knowledge, there are no scientific studies that prove there are ***no*** ill health effects either. The recent (December 2009) AWEA/CWEA report is merely a literature review that reads more like a "disclaimer", in its conclusions regarding review of other studies, and claims there is no scientific proof of adverse health effects. In fact, research has disclosed one of the Doctor/authors of that industry funded report has directly contradicted his prior sworn testimony regarding low frequency sound impacts so, to my mind, the report is wholly unreliable.

I may add that If citizens parked a vehicle in front of County Board member or developers homes with an audible or physically perceptible "thump-thump" low frequency beat emitted all night, with an occasional gear screeching or jet engine noise for good measure, there is little doubt that the local law enforcement department would

be called with a disturbing the peace complaint. This complaint would also no doubt be enforceable, even if the vehicle was not actually parked on the complainant's property.

While the preceding remarks are perhaps as glib as industry claims that there are no adverse health, noise or property value effects, it is still an appropriate use of police powers of government bodies to ***prevent*** such disturbances.

But after the fact of a setback or other ordinance is approved, the noise generator has the authority of an ordinance approving the use to stand behind, and the local residents must either endure the disturbances, relocate or incur thousands of dollars in legal expenses just to be heard in a forum where the complaint is given new consideration, namely, in Court. This growing trend is costly for all involved, and can include the governmental body, participating land owners/lessors, as well as the developers and the innocent by-stander homeowners.

The alternative and, sadly, growing trend is for people to give up trying to deal with the problems of large turbines being developed in their midst, and abandon their homes (*See Wirtz family case in Wisconsin, etc).*

As a real estate appraiser with 25 years experience in evaluating zoning matters, I am unaware of any other land use in the 20 States in which I have worked that is permitted to cause such a nuisance that a property owner's rights are completely disregarded and protection of their property values marginalized to the point of meaningless and non-existent protection, via inadequate separation of incompatible uses based on industry-preferred setbacks.

I also suggest that when the governmental goal is economic development and tax revenue as the foundation for approval of these large-scale projects, they would be well advised to build in to their equation not only the cost of attorney fees to protect governmental decisions, but also the lost tax revenue from abandoned houses, potentially higher medical costs and injury claims from neighbors, road damage, and other ancillary costs that developers do not advertise, much less typically admit.

See the Canadian Hydro case for a group of neighboring homes bought out by the developer to eliminate certain vocal noise/health complaints, and note that those are not the first or last homes demolished as a direct impact of a wind energy project. Much can be read on the internet, and a summary of buy-outs is attached in **Appendix B**.

Adams County Background

Per Wikipedia, as of the census of 2000, there were **68,277 people** (66,234 residents projected for 2010), 26,860 households, and **17,996 families** residing in the county. The population density was **80 people per square mile** (31/km²). There were 29,386 housing units at an **average density of 34 per square mile.**

The median income for a household in the county was $34,784, and the median income for a family was $44,133 (Median Household Income projected for 2010 was $42,880). The per capita income for the county was $17,894. About 7.40% of families and 10.00% of the population were below the poverty line including 12.00% of those under age 18 and 8.90% of those aged 65 or over. 78% of county households earn less than $75,000 per year, leaving limited relocation options available to the majority of people in the Adams County.

Median Home Value for 2000 was $73,090 rising in 2005 to $106,059 and by 2010 had reached $132,445.

Property Value Impacts

Several physical factors, perceptions, stigma issues and concerns are reflected in the market trends used to measure property value impacts. The market trends include increased marketing time, decreased marketability and lower values for homes in relatively close proximity to new wind turbine projects. The negative factors typically include:

1. Audible sound and low frequency sound.
2. Health concerns and widely reported adverse affects at numerous project locations.
3. Sleep deprivation, which is sometimes also linked to health affects.
4. Aesthetic impacts due to introduction of large industrial-scale turbines into the immediate neighborhood, and which affects perceptions of compatibility and views from residential property.

The Appraiser has not attempted to isolate the level of value reduction related to each separate stigma issue, but has considered the sale price data to incorporate market awareness of these potential factors as a whole. Although the impacts vary from property to property, individual tolerances vary, and the distances between sale data and turbines also vary, adequate data exists to indicate that close proximity to turbines has a measureable and significant negative impact on residential property values.

I refer to **Appendix E** for a small sample of relevant sound and health concern research articles and reports, to assist the reader of this testimony in understanding the type of information still being developed regarding wind turbine noise. This sample is by no means complete or exhaustive as to the number of articles available to the general public on the internet, but it accurately reflects the trends and reported circumstances encountered by wind project neighbors.

Health concerns and impacts documented by Dr. Nina Piepont, the World Health Organization, and medical professionals from the United States, France, Canada, etc., link health impacts to noise issues primarily, and while not commonplace, there are

reports of noise being heard or "felt" as far as 2-miles from the nearest turbine to residences.

Aesthetic impacts or amenity factors, while more subjective and personal, have a well established relationship to property values. An attempted objective measurement of amenities represented by property sale data with vistas ranging from premium to poor is contained in **Appendix D, Figure ES-2**. This data was derived from the 2009 United States Department Of Energy (DOE) funded study, prepared by researchers affiliated with an acknowledged advocate of wind energy development, thus, it is not subject to being categorized as an "objector's study". Nevertheless, it is demonstrative that poor vistas (views) typically yield property sale prices **21% lower than homes with an average vista**, and approximately **34% lower than homes with a premium vista.**

Similarly, Figure **ES-4 in Appendix D** indicates measureable declines in property values over time, with reductions beginning after announcement of wind energy projects within a mile of home sales, and even steeper declines after the turbines have been operational for several years.

Finally, and despite the executive summary conclusions of the DOE funded study excerpted in **Appendix D, Figure ES-1** clearly shows a **5.3% to 5.5%** lower property value for homes within 1-mile of turbines, and a measured decline out to a 2 mile distance, as compared to the base-line home sales located more than 5-miles from turbines.

It is noted that this study analysis used regression analyses developed by the authors, and which has been subject to professional peer review criticism for the application of regression techniques and arguably incomplete or improper variables. Thus, this study may tend to minimize the actual impacts, as the carefully crafted language in the report's executive summary appears to indicate is the case.

What is clear is that there is a simple correlation or appropriate comparison between the data represented by Extreme Views of turbines and the Poor Vista views, as shown in the photograph appendices (D & E) within **Appendix D**, and the Poor Vista data shows a **21% lower than average value** for homes.

Appendix C contains data derived from Lee County Illinois Assessor records, and has in fact been used by an appraiser in Illinois for several different wind project developer zoning applications in Illinois and Wisconsin. After performing statistical analysis of select data with certain data excluded from the analysis, the appraiser was able to conclude that there was no measurable and statistically significant difference between home sales in zones within 2 miles and more than 2 miles from the nearest turbines of the Mendota Hills project.

However, there was also a 10% deviation from the mean, which indicates the conclusions are only valid beyond that deviation. In my opinion, discounting effects that lie within a 10% deviation is not indicative of appropriate consideration of value losses,

as a 10% loss of home value is a significant loss to most people in the marketplace, and goes well beyond typical price reductions of negotiated sales. Regardless, both the near and far data is presumably reflective of typical negotiations, yet only the pattern from the nearby property sales shows even further declines in average sale prices.

I have analyzed the same data, as shown in **Appendix C**, on the basis most similar to how the market views residential property. On its face, the data reflects a **25% lower average** sale price per square foot for homes located within 2-miles of turbines, as compared to homes outside the 2 mile zone.

My findings are consistent with other non-industry retained appraisal studies of property values near wind turbine projects, and I submit copies of those studies as supplemental documentation to this written testimony.

Appendix F contains a partial list of wind turbine neighbor complaints which are mostly unresolved. However, when combined with the sample of developer buyouts caused by noise/health effects shown in Appendix B as well as other reports of home abandonment, rental of replacement housing by neighbors, and the non-anecdotal data contained in Appendices C and D, there exists adequate data to indicate market support for Recommendation 1 (Appendix A) to Adams County.

Property Value Impact Projection – Adams County

The pending Prairie Mills (PM) project located in east Adams County has been disclosed to the degree that a number of turbine leases are known to exist in certain sections of Clayton, Concord, Columbus and Camp Point Townships.

Via review of reported turbine lease location information and comparison with Farm Plat Maps for the preceding Townships, it has been estimated that approximately 143 homes are located within the "footprint" of the project, and Forty seven (47) Sections are identified as locations for at least one (1) turbine in each Section, which represents a 47 square mile or 30,000+ acre "footprint" for the PM project. This indicates an existing residential development density of just over 3 homes per square mile. Based on an additional 47 sections for each surrounding/abutting square mile, the 2 mile impact zone is estimated to contain approximately 94 square miles with 282 homes.
(94 square miles X 3 homes per square mile = 282 homes)

According to Adams County demographic data researched, the median home value was $132,445 for 2010; say $130,000. Thus, aggregate residential home values in the probable impact area for the PM project, prior to development of the project, is estimated as follows:

Footprint homes:	143 X $130,000 = $18,590,000
2-mile zone:	282 X $130,000 = $36,660,000

Aggregate value: $55,250,000

Further review and disclosure of locations may increase the number of homes within the 2-mile zone, as it may incorporate higher density communities. I also recognize that the most severe impacts are realized by homes in the footprint, and those with the shortest setbacks from turbines outside the footprint. Those at the furthest points or with more effective screening afforded by topographic and landscaping features are not as likely to experience the maximum value impact. As a conservative check on the impact projections, I will utilize the 25% loss factor for homes in the footprint, and only a 5% value diminution factor as an average in the 2-mile zone. On this basis, property value losses projected due to the PM project are calculated as follows:

Footprint homes:	$18,590,000 X 25% =	$4,647,500
2-mile zone:	$36,660,000 X 5% =	$1,830,000
Aggregate value reduction:		$6,477,500 or **$6.5 million**

Thus, if each and every residential Property Owner within the footprint and the 2-mile zone elected to move and sold for the appraised value, and the developer in turn sold each home for the post-project reduced value, the developer would incur a cost or loss of about $6.5 million. This is equal to the cost of 2 to 3 turbines, and is essentially a "contingency" category in their financial pro-forma, but clearly not a cost-prohibitive factor that warrants or requires abandonment of the project.

On balance, if the typical developer claims are true, then no homeowners will be disturbed to the degree that they will seek to move away from the project, and the value impact cost that is fairly absorbed by the project developer can be viewed as an unlikely worst-case scenario. However, if the market data supported basis for projecting value losses should materialize to the full extent of the projected estimate, then the developers gain should not be at the financial expense of existing homeowners and families.

Further, at least one other wind energy project is proposed for Adams County, the Rock Creek project proposed for Ellington, Mendon South, Mendon North and Ursa Townships. Rumors of a third project have been discussed to some degree, but the Appraiser does not have adequate data to evaluate the level of impact probable in the latter two projects.

A somewhat meaningful projection of the impact of 2 or 3 projects, however, can be simply calculated by doubling or tripling the value losses projected for the Prairie Mills project, and refined at a later date on a pro-rata basis when the number of proposed turbines is known and the number of affected residential properties counted more accurately.

Further, based on the residential density of Adams County, overall, with an average density of 34 homes per square mile (also equal to 18.8 acres per home average), the

number of homes in the footprint is estimated without projecting value losses into nearby towns or villages.

Closing Comment

I trust that the preceding written testimony is useful to helping the Adams County Board in understanding better some of the issues that are commonplace with hosting wind energy project developments, and that complaints of neighbors are not just typical comment from people who don't want anything to ever change in their surroundings. There are real, tangible and discernible negative impacts and "stigma" associated with far too many wind projects to simply be an overly vocal minority.

When people react to the negative influences in ways that would normally seem extreme, such as filing lawsuits or selling their properties for steep discounts from what they should be worth on the open market, or give up on marketing attempts completely and end up abandoning homes, it is not a minor impact or "refrigerator noise" that triggers such market reactions. Those comparisons often made by wind energy representatives are disingenuous, based on virtually everything I have researched.

Market sale data analyzed not only by me, but also by proponents and highly paid consultants to the wind industry, can not hide the fact that these effects become measurably manifest in dollar terms, even if that is just one component of negative impacts.

To be sure, not every neighbor experiences the identical effects or has identical reactions, but the negative reactions are clearly widespread enough to warrant special measures, consideration and conditions to be placed on wind energy project developers, and use of setbacks that are well outside of industry preferences appears to be the single best way to avoid or minimize impacts.

I understand that my recommendation of a 2-mile setback exceeds most of the setbacks required by other communities, but then again it is not my goal to win favor with wind energy developers or to march in step with the typical community setback requirements. My setback recommendation also is fairly consistent with independent medical expert recommendations, which they have based on real-life experience in treating people suffering from closer proximity to turbines.

If it is Adams County's goal to avoid as much conflict as possible, the 2-mile setback, in my professional opinion, has the best chance of accomplishing this goal. However, if

the County wants all the benefits promised by wind energy, developers will likely indicate that their projects are not feasible with that kind of requirement. I believe that my recommendations in the event of shorter setbacks are reasonable, economically justified and feasible, and will help to keep "whole" the residents who would be the real hosts to the turbines, by having them as neighbors day and night.

Wind developers are running against the clock to get the funding and tax benefits via expediting their projects as quickly as possible while it is still available, and it is reminiscent of the wild-west pioneering days of this country. Yet, we all know how that turned out for the natives of the land used for expanding the nation. It is my belief that orderly and controlled growth will be better in the long run for the economic health of host communities and their residents, and Adams County is in a position to guide this trend in such a manner by adopting reasonable low or no impact setbacks, and/or adopting the recommendations that will reduce social and financial impacts of utility scale wind energy projects proposed in Adams County.

My best wishes to the County in this difficult decision making process.

Respectfully submitted,

McCANN APPRAIISAL, LLC

Michael S. McCann, CRA
State Certified General Real Estate Appraiser
License No. 553.001252 (Expires 9/30/2009)

ADDENDUM

- Appraisal Testimony Certification
- Professional Biography of Appraiser
- Adams County Map
- Adams County Market Profile & Demographics
- Adams County Township Map
- **Appendix A -** Property Value Guarantee Agreement
- **Appendix B -** Canadian Hydro home buy out records
- **Appendix C -** Mendota Hills Property Value Impact Sale Data
- **Appendix D -** DOE funded Multiple Regression Analysis study of wind energy project impact on residential property values.

  Figure ES-1
  Figure ES-2
  Figure ES-4
  Appendix D - Vista rating photographs
  Appendix E – View rating photographs

Cape Vincent Realtors Report on wind project impact on marketability of homes

- **Appendix E -** Case studies and articles regarding noise impact
-
- **Appendix F -** Representative sample of neighbor complaints

EXHIBIT A
CONTINGENT AND LIMITING CONDITIONS OF APPRAISAL AGREEMENT

The following terms and conditions apply to this and any engagement of McCann appraisal, LLC (McCann), by the client. Written, electronic or oral authorization by the client or their attorney or agent to proceed with the assignment shall constitute acceptance of these terms by the client.

It is assumed that the title to this property is good and marketable. No title search has been made, nor have we attempted to determine ownership of the property. The value estimate is given without regard to any questions of title, boundaries, or encroachments. It is assumed that all assessments are paid. We assume the property to be free and clear of liens and encumbrances except as noted. No attempt has been made to render an opinion or determine the status of easements that may pre-exist.

The legal description, if included herein, should be verified by legal counsel before being relied upon or used in any conveyance or other document.

Any exhibits in the report are intended to assist the reader in visualizing the property and its surroundings. The drawings are not intended as surveys and no responsibility is assumed for their cartographic accuracy. Drawings are not intended to be exact in size, scale, or detail.

Areas and dimensions of the property have not been physically measured unless specifically stated by McCann in the written appraisal report. If data is furnished by the Client or from plot plans or surveys furnished by the Client, or from public records, we assume it to be reasonably accurate. In the absence of current surveys, land areas may be based upon representations made by the owner's agents or our client. No responsibility is assumed for discrepancies, which may become evident from a licensed survey of the property.

Our value estimate involves only the real estate and all normal building equipment, if any improvements are involved in this appraisal. No consideration was given to personal property (or special equipment), unless stated.

It is assumed that the property is subject to lawful, competent and informed ownership and management unless noted.

Information in this report concerning market data was obtained from buyers, sellers, brokers, and attorneys, trade publications or public records. This information is believed to be reliable. Dimensions, areas, or data obtained from others is believed correct; however, no guarantee is made in that the appraiser did not personally measure same.

Any information, in whatever form, furnished by others is believed to be reliable; however, no responsibility is assumed for its accuracy. The client specifically waives any claim of liability, which may result from reliance on information furnished by others.

The physical condition of any improvements described herein was based on visual inspection only. Electrical, heating, cooling, plumbing, sewer and/or septic system, mechanical equipment and water supply were not specifically tested but were assumed to be in good working order, and adequate, unless otherwise specified. No liability is assumed for the soundness of structural members, since no engineering tests were made of same. The roof(s) of structures described herein are assumed to be in good repair unless otherwise noted.

If the client has any concern regarding the structural, mechanical or protective components of the improvements described herein, or the adequacy or quality of sewer, water or other utilities, it is suggested that independent contractors or experts in these disciplines be retained and consulted before relying upon this appraisal, or a specific written disclosure of the defect or property condition must be made to the appraiser as part of the assignment.

We have not been provided, nor are we familiar with any engineering studies made to determine the bearing capacity of the land. It is therefore assumed that soil and subsoil conditions are stable unless specifically outlined in this report. We assume no responsibility for any such conditions, which may render the property more or less valuable. The client assumes responsibility for obtaining any engineering study necessary to determine soil and subsoil conditions. The client agrees to provide same in advance of execution of this agreement, or to waive any and all liability, which may result from undisclosed soil or subsoil conditions.

The existence of potentially hazardous material used in the construction or maintenance of the building, such as urea formaldehyde insulation and/or asbestos insulation, which may or may not be present on the property, has not been considered. In addition, no deposit of toxic wastes, unless specifically disclosed to the appraiser in advance of submittal of the appraisal report, has been considered. The appraiser is not qualified to detect such substances and suggests the client seek an expert opinion, if desired. Further, this report does not consider the potential ramifications due to the presence of Underground Storage Tanks (UST) or the possible environmental impact due to the leakage and/or soil contamination, if present.

It is specifically noted that the appraiser(s) have not conducted tests to determine the presence of, or absence of, Radon. We are not qualified to detect the presence of Radon gas, which requires special tests and therefore must suggest that if the client is concerned as to the presence of Radon or any other potentially hazardous substances, he or she should take steps to have proper testing done by qualified firms who have the equipment and expertise to determine the presence of this substance in the property.

The separate allocation between land and improvements, if applicable, represents our judgment only under the existing utilization of the property. A re-evaluation should be made if the improvements are removed or substantially altered, and the land utilized for another purpose.

All information and comments concerning the location, neighborhood, trends, construction quality and costs, loss in value from whatever cause, condition, rents, or any other data for the property appraised herein, represents the estimates and opinions of the appraiser formed after an examination and study of the property.

Any valuation analysis of the income stream had been predicated upon financing conditions as specified in the appraisal report, which we have reason to believe are currently available for this property. Financing terms and conditions other than those indicated may alter the final value conclusions.

Expenses shown in the Income Capitalization Approach, if used, are estimates only, and are based on past operating history if available, and are stabilized as generally typical over a reasonable time period.

The appraiser is not required to give testimony or appear in court because of having made this appraisal, with reference to the property in question, unless arrangements have been made previously thereto. If the appraiser(s) is subpoenaed pursuant to court order, the Client will be required to compensate said appraiser(s) for their time at their regular hourly rates plus expenses.

All opinions, as to values stated, are presented as the appraiser's considered opinion based on the information set forth in the report. We assume no responsibility for changes in market conditions or for the inability of the Client or any other party to achieve their desired results based upon the appraised value. Further, some of the assumptions made can be subject to variation depending upon evolving events. We realize some assumptions may never occur and unanticipated events or circumstances may occur. Therefore, actual results achieved during the projection period may vary from those in our report.

Appraisals made subject to satisfactory completion of construction, repairs, alterations, remodeling or rehabilitation, are contingent upon completion of such work in a timely manner using good quality materials and workmanship and in substantial conformity to plans or descriptions or attachments made hereto.

The Americans with Disability Act (ADA) of 1990, (effective January 2, 1992), as passed by the United States Congress, establishes a clear and comprehensive prohibition of discrimination on the basis of disability. This public law (Titles I-V) addresses employment (1); public services (II); public accommodations and services operated by private entitles (III); telecommunications (IV); and miscellaneous provisions (V). The law covers all "commercial facilities" intended for non-residential use whose operations affect commerce. Most private manufacturing, industrial, and warehouse facilities, are neither considered public accommodations (even though their office area may be), nor are they generally subject to Title III of the law.

The appraiser has not made a specific compliance survey and analysis of the subject property to determine whether or not it is in conformity with the various detailed requirements of the ADA. It is possible that a compliance survey of the subject property, along with a detailed analysis of the requirements of the ADA, could uncover that the subject property is not in compliance with one or more of the requirements of the Act. If this situation occurs, it could have an adverse effect upon the market value of the subject property.

Unless otherwise noted, it is assumed that the construction and use of the appraised property, if improved, complies with all public authorities having jurisdiction, including but not limited to the National Environmental Protection Act and any other applicable federal, state, municipal, and local environment impact or energy laws or regulations.

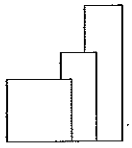
The appraisal services and appraisal report are intended and believed to be developed in compliance with the relevant requirements of the Uniform Standards of Professional Appraisal Practice (USPAP). A signatory of the appraisal report is licensed by the State of Illinois as a Certified General Real Estate Appraiser and is a Member or Associate Member of the Appraisal Institute. The Bylaws and Regulations of the Appraisal Institute require their members, candidates, or employers to control the use and distribution of each appraisal report signed by such member or candidate. Therefore, except as hereinafter provided, the party for whom the appraisal report was prepared may distribute copies of the appraisal report, in its entirety, to such third parties as may be selected by the party for whom the appraisal is prepared. Selected portions of this appraisal report, however, shall not be given to third parities without prior written

consent of the signatories of this appraisal report. Further, neither all nor any part of this appraisal report shall be disseminated to the general public by the use of advertising media, public relations media, news media, sales media or other media for public communication without the prior written consent of the signatories of the appraisal report. This restriction applies particularly as to the valuation conclusions, the identity of the appraisers, or any reference to the Appraisal Institute. McCann will retain the control and confidentiality of the clients file unless legally required to release such file.

The Appraiser/ consultant responsibility is limited to the client, and use of this appraisal by third parties shall be solely at the risk of the client and/or third parties. This report should not be used or relied upon by any other party except the client to whom the report is addressed. Any party, who uses or relies upon any information in the report without the appraiser's written consent, does so at his own risk.

It is the intent of the appraiser(s) and those that retain their services, that the liability of McCann for any allegation of negligent acts, omissions, misrepresentations, or erroneous reliance upon information provided by others, is limited to and shall not exceed the cost of the services rendered. In the event of any disagreement between the parties regarding the services performed, fees and/or expenses to be paid, or any other clause in this document, it is agreed that such dispute shall be submitted to arbitration. The client waives any cause of action in the event of their failure to file such claim within one year.

McCann retains all copyrights to any work product developed by McCann on this assignment, and licenses use of the report exclusively to the client in exchange for the professional fees disclosed in the proposal.



McCann Appraisal, LLC

CERTIFICATION

PROPERTY LOCATION: Adams County, Illinois
Wind Turbine Setback written testimony

The undersigned, representing McCANN APPRAISAL, LLC, do hereby certify to the best of our knowledge and belief that:

FIRST: The statements of fact contained in this written consulting testimony report are true and correct.

SECOND: The reported analyses, opinions and conclusions are limited only by the reported assumptions and limiting conditions and represents the personal, impartial and unbiased professional analyses, opinions, and conclusions of the undersigned.

THIRD: We have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to any of the parties involved.

FOURTH: We have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.

FIFTH: Our engagement in this assignment was not contingent upon developing or reporting predetermined results.

SIXTH: Our compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.

SEVENTH: Our analysis, opinions, and conclusions were developed, and this report has been prepared in conformity with the Uniform Standards of Professional Appraisal Practice.

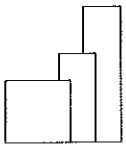
EIGHTH: No inspection was made by McCann Appraisal, LLC of the property that is the subject of this report.

NINTH: No one other than the undersigned provided significant real property appraisal assistance to the person signing this certification.

TENTH: Neither the undersigned nor McCann Appraisal, LLC has previously appraised the subject property.

IN WITNESS WHEREOF, THE UNDERSIGNED has caused these statements to be signed and attested to.

Michael S. McCann, CRA
State Certified General Real Estate Appraiser
Illinois License No.553.001252
(Expires 9/30/2011)



McCann Appraisal, LLC

PROFESSIONAL BIOGRAPHY

MICHAEL S. MCCANN, CRA

Michael S. McCann has been exclusively engaged in the real estate appraisal profession since 1980, and is the owner of McCann Appraisal, LLC.

EXPERIENCE

His appraisal experience has included market value appraisals in 20 states of virtually all types of commercial, office, residential, retail, industrial and vacant property, along with a wide variety of unique or special purpose real estate, such as limestone quarries, hotels, contaminated properties, etc. Appraisals have been prepared for purposes including condemnation, litigation, purchase, sale, estate planning, fractional interest valuation, leasehold and leased fee analysis, financing, divorce, damages and construction defects, easements, highway extension and widening, foreclosure, and numerous other purposes.

He has gained extensive experience in real estate zoning evaluations and property value impact studies, including analysis of gas-fired electric generating plants, shopping centers, industrial facilities, limestone quarries, sanitary landfills, transfer station, cell tower and wind farm projects. He has been retained as an independent consultant to municipalities, government agencies, corporations, attorneys, developers lending institutions and individual and private owners associations, and has completed appraisals for the States Attorney of Cook County, Illinois, for numerous downtown office buildings, major retail, hotel and commercial properties.

In addition to evaluation of eminent domain real estate acquisitions for both property owners & governmental condemning authorities, Mr. McCann has served as a Condemnation Commissioner (2000-2002) appointed by the United States District Court - Northern District, for the purpose of determining just compensation to property owners, under a federal condemnation matter for a natural gas pipeline project in Will County, Illinois.

He has been a speaker at seminars for the Appraisal Institute, the Illinois State Bar Association and Lorman Education Services on topics including the vacation of public right of ways (1986), and Property Taxation in the New Millennium (2000), Zoning and Land Use in Illinois (2005, 2006).

Related real estate expertise has been gained through negotiating transactions with a total in excess of $65 million for purchase and sales of acreage and smaller sites, commercial and residential properties, both as agent on behalf of private and governmental clients and personally.

EXPERT TESTIMONY

Deposition, trial and public hearing testimony has been given for assignments that include appraisals, studies and consultation regarding real estate located throughout the United States. He has qualified and testified as an expert witness in Federal Court and numerous State Circuit Courts for condemnation, property tax appeal, foreclosure, divorce, and property damage proceedings and zoning matters in the Counties of Cook, Will, DuPage, Boone, Lake, Madison, St. Clair, Iroquois, Fulton, McHenry, Ogle, Marshall, & Kendall, as well as the Chicago and Cook County Zoning Boards of Appeal, the Property Tax Appeal Board (PTAB) and tax court &

Commissions of Illinois, Wisconsin, and Ohio, Circuit Courts in New Jersey and Indiana, as well as zoning, planning, and land use and County Boards in Texas, Missouri, Idaho, Michigan, New Mexico and various metropolitan Chicago area locales. He has been certified as an expert on the Uniform Standards of Professional Appraisal Practice (USPAP) by the Cook County, Illinois Circuit Court.

PROJECT EXPERIENCE

Mr. McCann has substantial experience in large-scale condemnation and acquisition projects and project coordination at the request of various governmental agencies and departments. These include appraisals for land acquisition projects such as the Chicago White Sox Stadium project, the Southwest Transit (Orange Line) CTA rail extension to Chicago's Midway Airport, the United Center Stadium for the Chicago Bulls and Blackhawks, the minor league baseball league, Silver Cross Field stadium in Joliet, Illinois, I-355 tollway and numerous highway acquisition and improvement projects, railway ROW transactions, as well as many other urban renewal, acquisition and neighborhood revitalization projects.

REAL ESTATE EDUCATION

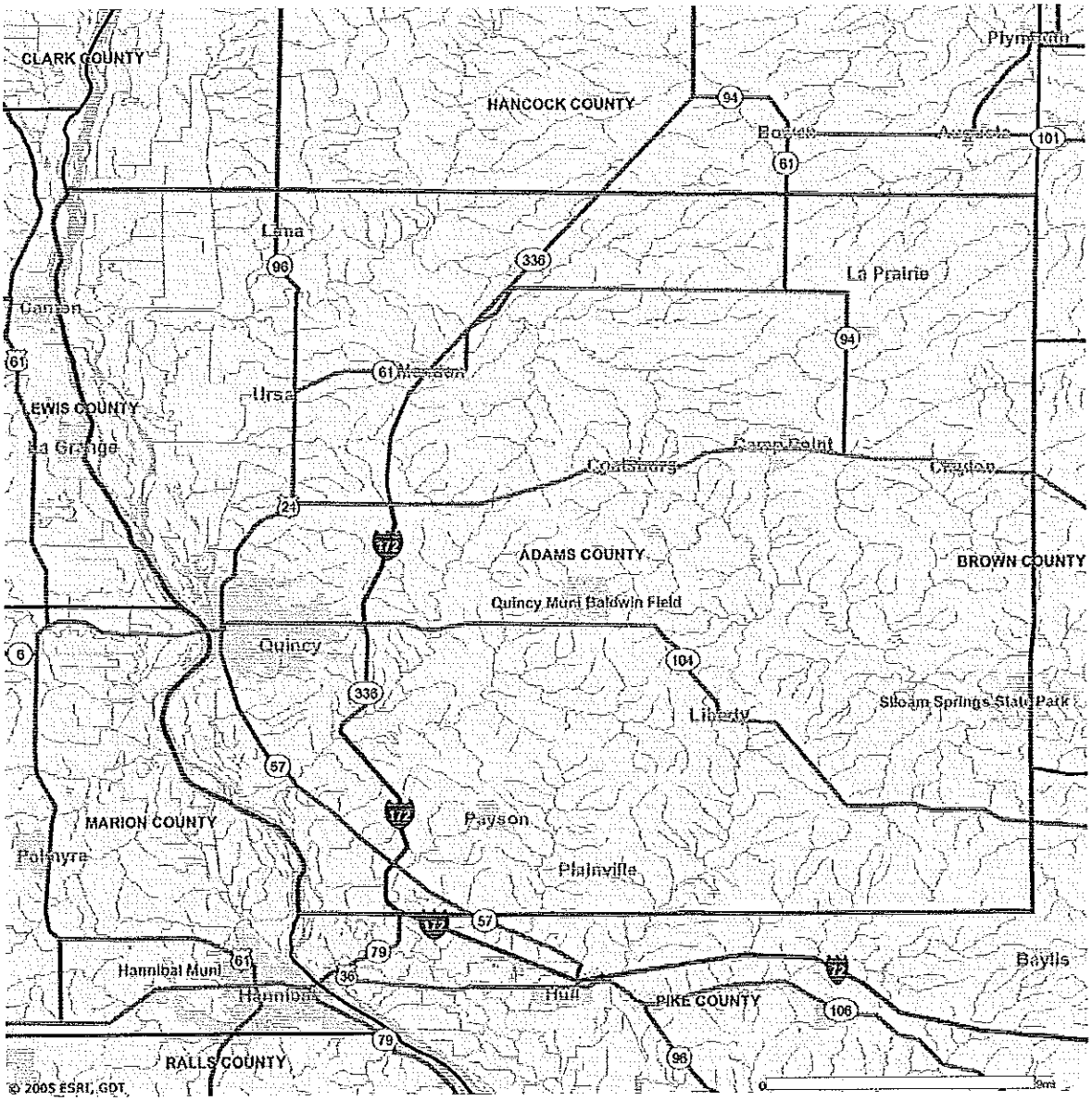
Specialized appraisal education includes successful completion of Real Estate Appraisal Principles, Appraisal Procedures, Residential Valuation, Capitalization Theory and Techniques Part A, Uniform Standards of Professional Appraisal Practice and USPAP update courses, Case Studies in Real Estate Valuation, Highest and Best Use and Market Analysis, Advanced Income Capitalization, Subdivision Analysis and Special Purpose Properties, Eminent Domain and Condemnation, and Valuation of Detrimental Conditions in Real Estate offered by the Appraisal Institute. In addition, he has completed the Society of Real Estate Appraisers' Marketability and Market Analysis course, the Executive Enterprises - Environmental Regulation course, and a variety of continuing education real estate classes and seminars offered by other appraisal education providers, such as Litigation Valuation, Appraising in a Changing Economy, etc. Real estate courses from state licensed appraisal education providers were all subsequent to two years of associate study at the College of DuPage for marketing and real estate, and exceed the requirements for the Illinois Certified General Real Estate Appraiser license. Michael McCann is current with all continuing education requirements.

DESIGNATIONS, PROFESSIONAL AFFILIATIONS & LICENSES

Mr. McCann is a State Certified Associate Member of the Appraisal Institute, and the National Association of Review Appraisers & Mortgage Underwriters designated him as a Certified Review Appraiser (CRA). He was elected in 2003 as a member of Lambda Alpha International, an honorary land economics society, and he served several years as a member of the Appraiser's Council of the Chicago Board of Realtors. He has held appraisal and sales licenses in several states, and is a State Certified General Real Estate Appraiser in the State of Illinois. *(License No. 533.001252, expiration September 30, 2011)*

Adams County Standard Map

January 10, 2006



Adams County Market Profile

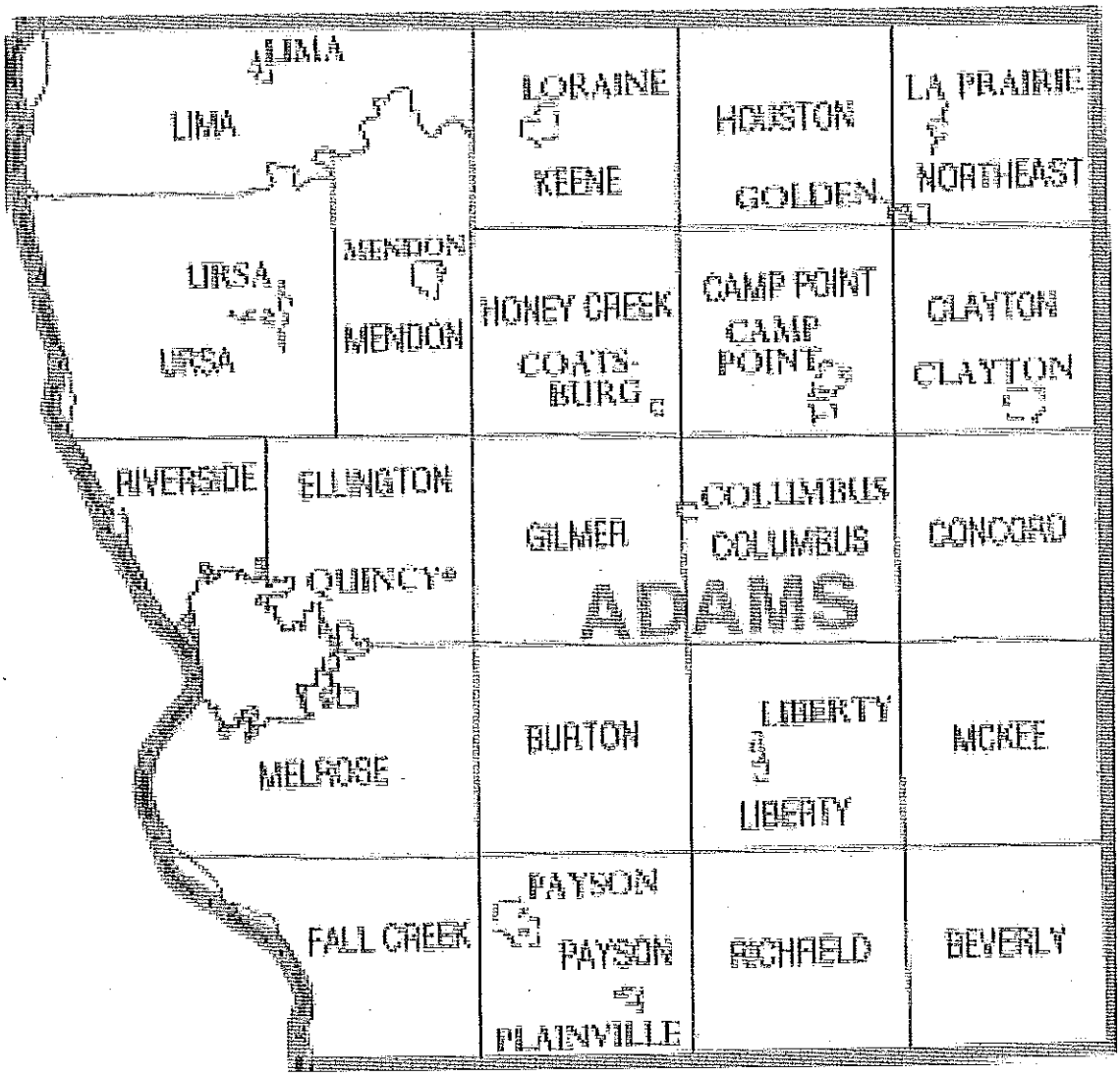
2010 Housing Units	29,633
Owner Occupied Housing Units	68.9%
Renter Occupied Housing Units	20.1%
Vacant Housing Units	11.0%
2000 Total Population	68,277
2005 Total Population	67,488
2010 Total Population	66,234

Median Household Income
2000 $34,800
2005 $38,723
2010 $42,880
Median Home Value
2000 $73,090
2005 $106,059
2010 $132,445
Per Capita Income
2000 $17,894
2005 $20,584
2010 $23,864
Median Age
2000 38.2
2005 39.4
2010 40.5

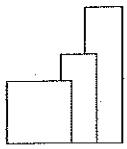
2010 Households by Income

Household Income Base	
< $15,000	13.8%
$15,000 - $24,999	13.0%
$25,000 - $34,999	13.7%
$35,000 - $49,999	16.9%
$50,000 - $74,999	20.7%
$75,000 - $99,999	9.3%
$100,000 - $149,999	1.8%
$150,000 - $199,999	2.2%
$200,000+	2.5%
Average Household Income	$58,213

Source:
U.S. Bureau of the Census, 2000 Census of Population and Housing. ESRI forecasts for 2005 and 2010.


LIMA
LIMA
LORAINE
KEENE
HOUSTON
GOLDEN
LA PRAIRIE
NORTHEAST
URSA
URSA
MENDON
MENDON
HONEY CREEK
COATS-
BURG
CAMP POINT
CAMP
POINT
CLAYTON
CLAYTON
RIVERSIDE
ELLINGTON
QUINCY*
GILMER
COLUMBUS
COLUMBUS
ADAMS
CONCORD
MELROSE
BURTON
LIBERTY
LIBERTY
MCKEE
FALL CREEK
PAYSON
PAYSON
PLAINVILLE
RICHFIELD
BEVERLY

Appendix A



McCann Appraisal, LLC

Property Value Guarantee Agreement

This Property Value Guarantee Agreement (Agreement") made and entered into on this ___ day of _____ , by and between *(Insert Developer Corp. Name)* _____, having its principal offices at _____("Guarantor") and _____, residing at (Insert address)_____, IL (zip)_____, ("Property Owners").

RECITALS

WHEREAS, Property Owners own eligible Property as described herein ("Property"), that
Property having the legal description as follows:

_____
_____
_____ Adams County, Illinois.

WHEREAS, Guarantor has been granted approvals by Adams County Ordinance No. _____ for the construction and operation of a wind energy center consisting of up to #_____ turbines on properties located in unincorporated _____Townships in Adams County, Illinois ["Wind Energy Center"];

WHEREAS, Guarantor desires to alleviate concerns and guarantee preservation of Property values of all Property located in proximity to the Wind Energy Center, specifically within two (2) miles of any wind turbine (measured from furthest reach of turbine blades to the Property); and WHEREAS, Guarantor is desires to provide for either continued occupancy of existing residences by Property Owners or otherwise not financially impacting neighboring Property Owners as a result of the Wind Energy project; and WHEREAS Property Owners are desirous of preserving equity in the Property, by ensuring that if the Property described herein is either diminished in value or sold at a price less than the ASKING PRICE as a result of proximity to the Wind Energy Center, as determined by the procedures contained herein, the Guarantor will guarantee payment to the Property Owners of such difference; or if Property owner is unable to sell the Property following a reasonable marketing period, as defined herein, the Guarantor will guarantee payment to the Property Owners of the full Appraised value and purchase the Property, as defined herein.

IT IS HEREBY AGREED AS FOLLOWS:

1. EFFECTIVE DATE OF AGREEMENT. This Agreement shall become effective and binding on Guarantor when signed by both parties. Notwithstanding the foregoing, if an administrative agency or court of competent jurisdiction rules or holds that the approvals

or permits issued by Adams County for the Wind Energy Center has been in excess of or in violation of said governmental body's authority or otherwise unlawful, and Guarantor has not constructed any of the wind turbines, then Guarantor's obligations under this Agreement shall be null and void. However, the construction of any or all of the proposed turbines shall render this agreement in full force and effect, and constitute the requirement of the Guarantor to fulfill all obligations to the Property owner, as defined herein.

2. ELIGIBILITY: EXERCISE OF GUARANTEE. (a) Property that is within two (2) miles of the tip of a turbine blade that is part of the Wind Energy Center is covered by this guarantee, to the extent the property is developed or approved for development on _____, the date Adams County voted to approve Ordinance No, _____approving the Wind Energy Center ("Ordinance Date"). Owners of such Property who were owners of record as of the Ordinance Date ("Property Owners"), or their legitimate heirs or assigns as described in Paragraph 14, are eligible to exercise this guarantee. In the event that the Property Owners wish to sell their eligible Property, and exercise the guarantee set out in this Agreement, they shall notify Guarantor of same in writing by certified mail and thereafter they shall make a good faith effort to sell said Property by entering into a listing contract with a licensed real estate broker pursuant to the terms herein. (b) Property Owners shall have a period of ten (10) years to execute this agreement from the Ordinance date cited in paragraph 2.

3. QUALIFIED PROFESSIONAL APPRAISER. For the purposes of this Agreement, a "qualified professional appraiser" shall mean a person who is licensed by the State of Illinois as a Certified General Appraiser or Licensed Residential Appraiser who (a) holds a valid Illinois license, (b) has not been subject to any suspension or revocation of license for any prior disciplinary action regarding their Illinois License by Illinois licensing authorities or from any professional association to which Appraiser is a member or affiliated with, and (c) has not been previously retained by either the wind energy industry or any citizens or citizens groups to opine in writing or in testimony as to wind energy projects effects on property values, hereafter deemed a "Qualified Professional Appraiser" (Appraiser), (d) is not related to the Property Owners, is not an employee or prior contractor of Guarantor or its affiliates and does not otherwise have a business relationship with Guarantor or Property Owners, and (e) who is a member of at least one national appraisal association that subscribes to the requirements of USPAP, (f) has at least 5 years experience in appraising and has worked within Adams County and/or any surrounding Counties during that period. (g)All appraisal reports shall conform to the Uniform Standards of Professional Appraisal Practice (USPAP), as required by current Illinois law. (h) The appraisal fee shall be paid in advance by the Guarantor to the County, for retention of the Appraiser by the County Attorney, who shall include a copy of this agreement to the Appraiser with the required fee, and a retention letter advising the Appraiser that the County, as a neutral party, is retaining the Appraiser and they are instructed to be independent of any influence from either party to this agreement. Guarantor agrees to reimburse the County for any services required of the Appraiser subsequent to delivery of the Appraisal Report, including but not limited to time expended responding to subpoena for testimony at deposition or trial.

4. AGREED TO ASKING PRICE. The ASKING PRICE is the value of the Property at the time the Property Owner decides to sell, with Property Owner discretion to either increase or decrease the asking price by no more than 5% difference with the Appraised Value. The ASKING PRICE of the Property may, however, be mutually agreed to by the Property Owners and the Guarantor. The ASKING PRICE may be mutually amended by agreement of the Property Owners and Guarantor at any time, subject to agreement.

5. DETERMINATION OF ASKING PRICE BY APPRAISAL If the parties are unable to agree on the ASKING PRICE of the Property prior to the Property Owner listing the Property for sale, then the Guarantor shall hire, at its expense, a second Appraiser and shall notify Property Owner of such Appraiser in writing with a resume or qualification summary for the Appraiser for review by the Property Owner. If the Property Owner objects to the Guarantor's choice of appraisers, it shall state those objections to Guarantor in writing within thirty (30) days of the notification of the choice of Appraiser. In the event Property Owner reasonably objects, the Guarantor shall choose another Appraiser, and proceed as described below. When a qualified professional appraiser is hired pursuant to this Paragraph 5, he or she shall be instructed to determine the market value which will become the ASKING PRICE, subject to Property Owner 5% discretion, of the Property as follows:

a. Assume that no wind energy center or utility scale wind turbine(s) are located within two (2) miles of the Property;
b. Utilize comparable sale data of property, developed as the Property was developed as of
the Ordinance Date and located a minimum of two (2) miles distance away from the Wind Energy Center, or further so that in the opinion of the appraiser the selling price of that comparable property was not influenced by the presence of the Wind Energy Center or any other wind energy project;
c. Utilize a minimum of three (3) comparable sale property, located approximately the same distance from major population centers (such as Quincy) so that in the opinion of the appraiser the selling price of the comparable property was not influenced by its closer or more distant proximity to new or existing population or employment centers.
d. Establish the market value which is based upon the Property as developed on the Appraisal inspection date, with consideration of any normal or typical maintenance, repairs or additions made during the effective term of this agreement;
e. Prepare a written narrative appraisal or residential form report supplemented as needed with written descriptions, analysis or comments, and which conforms to the requirements of USPAP:
f. Prepare the appraisal in full compliance with any and all state standards and state regulations which pertain to the preparation of an appraisal of the Property except those standards and regulations which conflict with these instructions; and
g. The appraiser shall note the condition of the premises, both interior and exterior, at the time of the appraisal.

If Property Owner and Guarantor accept the appraised value, then such value shall constitute the ASKING PRICE, and the Property Owners shall offer the above-described Property for sale at no less or more than a 5% difference with that price. If either the Property Owner or the Guarantor does not accept the appraised value, the non-accepting party may retain a second qualified professional Appraiser, of its choice, who shall not be made aware of the first appraised value and who shall determine the market value of the above-described Property on the basis of Paragraph 5(a) through (g) above. If both parties do not accept the original appraisal, they shall agree to the second qualified professional Appraiser and Guarantor shall pay the costs. In the event a second Appraisal is obtained pursuant to this paragraph and is within ten percent (10%) of the first Appraisal, the ASKING PRICE shall be the arithmetic average of the original appraised value and the second appraised value, unless the Guarantor or the Property Owner is unsatisfied with such Appraisal with specific reason(s) given in writing for disagreement with the Appraised value. In such event, the first two appraisers shall be instructed to agree on a third qualified professional Appraiser, at the sole expense of the Guarantor or the Property Owner, whichever is unsatisfied, unless both parties are unsatisfied in which case the expense shall be equally shared, and who shall not be made aware of either the first or second appraised values, and who shall determine the market value of the Property on the basis of Paragraph 4 (a) through (g) above. The ASKING PRICE will then be the arithmetic average of the three appraised values if the lowest value is no more than fifteen percent (15%) lower than the highest appraised value. If the fifteen percent (15%) range is exceeded the third Appraisal shall conclusively determine the ASKING PRICE for the purpose of this Agreement.

6. LISTING WITH BROKER. Property Owners shall utilize the services of a real estate broker/agent who shall be licensed in Illinois, is not financially affiliated with or related to the Appraiser, shall not be immediately related to the Property Owners or Guarantor as determined by being related no closer than second cousins and/or any history of sharing the same residence, and shall be a member of the Board of Realtors Multiple Listing Service or Exchange (Broker), unless these requirements are waived by the Guarantor upon the request of a Property Owner. Property Owners shall give Guarantor notice of the Broker with whom they wish to contract and shall obtain Guarantor's approval of said Broker within five (5) business days of written notice to Guarantor that Broker meets the no-relation requirement. Guarantor will not unreasonably withhold such approval and will confirm no relationship with Broker to the Property Owner. If the Guarantor objects to the Property Owners' choice of Broker, it shall state those objections, in writing to Property Owners. In the event Guarantor reasonably objects, the Property Owners shall choose another Broker, and proceed as described above. As sellers of the Property, Property Owners shall be responsible for the Brokerage commission or fee UNLESS the Property is purchased by Guarantor pursuant to Guarantor purchase of the Property after 180 days as provided for herein. Nothing herein shall prevent the Property Owner from selling the Property at a value higher than the ASKING PRICE as determined herein.

7.TERM OF LISTING. Property Owners shall list the Property, at the ASKING PRICE as determined in Paragraphs 4, 5 and 6, or at a higher value if agreed by Guarantor.

During the listing term, Property Owners shall accept any offer to purchase for the ASKING PRICE that is a bona-fide offer to purchase by a qualified buyer with a valid loan commitment or buyer otherwise acceptable to the Guarantor, provided that normal mortgage contingencies have been met or satisfied by buyer or waived by Property Owner and any home inspection contingency has been satisfied or waived by Property Owner. Said listing contract shall provide: (a) that the Broker shall list the Property in the multiple listing exchange; (b) that the Property will be so listed until the occurrence of either the (i) closed sale of the Property or (ii) expiration of a period of 180 days; (c) that the broker shall not be entitled to any commission after the expiration of the listing contract. The Property Owners shall cooperate with the Broker in obtaining a purchaser pursuant to the terms set forth in the listing agreement and shall make, in good faith, all reasonable efforts necessary to conclude a sale pursuant to the said terms. However, this shall not be construed as a requirement that Property Owner conceals their own experience with living in the Property, inclusive of any audible or inaudible noise effect emanating from the wind turbines.

8. OFFERS TO PURCHASE. Property Owners shall provide the Guarantor with written notification of every written contract or Offer to Purchase that they receive for the Property and agree, for a period of 180 days, not to accept any offer below the ASKING PRICE without the express and written approval of the Guarantor, provided that Guarantor responds within twenty four 24 hours of Notice from Property Owner. In no event shall the Property Owners entertain anything other than good faith, bona fide offers of purchase.

9. GUARANTOR'S CONSENT TO PURCHASE. Guarantor shall have the right to make a non-contingent counter offer(s) on any offers of purchase which are more than 5% below the ASKING PRICE, said counter offer to be tendered to the purchaser within twenty four (24) hours of notification by the Property Owner of the offer of purchase. In the event the buyer accepts or meets any such counteroffer made or requested by the Guarantor, or in the event the Guarantor otherwise consents to a sale of the Property more than 5% below the ASKING PRICE, the Guarantor shall pay the Property Owners, at closing, the difference between the ASKING PRICE and the sale price so established.

10. SALE WITHOUT GUARANTOR CONSENT. If the Property Owners have not received an offer of purchase at the ASKING PRICE within 180 days of listing the Property for sale, or the Guarantor has not consented to the sale of the Property below the ASKING PRICE, the Property Owners may sell the Property at the highest offer of purchase still pending or at the next good faith bona fide offer to purchase. It shall notify the Guarantor, in writing, of its intention to accept such offer.

11. PROPERTY OWNER'S CLAIM.
(a) If the Property has sold for less than the ASKING PRICE, as determined herein, and Property Owner believes that the reason for such lowered value is because of the Wind Energy Center's proximity to the Property, Property Owner shall make a claim to the Guarantor, requesting payment for the difference between the ASKING PRICE and the

sales price. Within thirty (30) days of such request, Guarantor shall pay the Property Owner the difference unless Guarantor, within that time, has demonstrated that the sale is not a bona-fide transaction.
(b) If the Property Owner has not received an offer of purchase at the ASKING PRICE after 180 days of listing the Property for sale, Guarantor shall, within thirty (30) days of notification in writing purchase the Property for the ASKING PRICE, unless Guarantor, within that time, has demonstrated conclusively that Property Owner did not reasonably cooperate wit the terms of a bona-fide sale contract.
© If the Property has not sold within 180 days of the Listing agreement, and Guarantor provides Multiple Listing Service statistics that demonstrate a median Marketing Time for all unincorporated Adams County residential properties is in excess of 180 days, as of the original Listing date, then Guarantor has the option of notifying the Property Owner that they must extend the Listing or enter into a separate listing agreement with a new Broker for a period of 180 days. If the extended Listing option pursuant to paragraph 11 © does not result in a bona-fide sale agreement within the second (2^{nd}) 180 day Listing term, then Guarantor must abide by the terms of paragraph 11 (b) and buy the Property for an increased price as determined by the Appraised Value plus the most recent Consumer Price Index (CPI) multiplied by 50%.

12.AGRICULTURAL LAND. This agreement requires payment by the Guarantor to any non-participating agricultural land owners with Property located within 2 miles of the Wind Turbines, on the basis of increased costs, if any, resulting from AG property owners loss of aerial spraying services, provided that (a) Ag Property owner has utilized aerial spraying services for at least 1 of the last 3 years during crop seasons; (b) aerial spraying services either decline to continue service to the Ag Property in question as a direct result of pilot safety concerns from wind turbine structures or increase the cost of services to the Ag Property in question; (c) lower lease rates are agreed between Ag Property owner and tenant farmer as a result of tenant farmers increased costs described in paragraph 12 (a) and/or (b). Cost increases and Ag Property Owner compensation shall be based on either the actual cost increase for continued use of aerial spaying services active in Adams County or the actual contracted 3^{rd} party cost of alternative application of AG chemicals minus the last documented cost for aerial application of AG chemicals. Guarantor shall be provided documented cost differences as soon as practical after costs are incurred by the Ag Property Owner, and shall submit payment to Ag Property Owner within 60 days of notice by Ag property Owner. However, Guarantor shall have the right to have cost information reviewed by and independent auditor during the 60 day period, and if payment due the Ag Property Owner is disputed by Guarantor, they shall have the right to submit the payment claims to arbitration In Adams County, Illinois.

13. TERMINATION OF GUARANTOR'S OBLIGATIONS. This Agreement shall terminate and Guarantor shall have no obligation to guarantee the Property value or purchase price once any wind turbines located within two (2) miles of the Property are decommissioned and demolished and operations at the Wind Energy Center have been permanently terminated as the result of any corporate decision, order, judgment, or

decree issued by a federal, state, or local agency, court, or unit of government having jurisdiction under administrative code, statute, law, or ordinances.

14.PROPERTY OWNER OPTION AND ALTERNATIVE TO RELOCATION. In the event that any Property Owner elects to remain in their home and not relocate pursuant to the preceding terms and conditions of the Property Value Guarantee, Property Owners located in the footprint or within one (1) mile of the perimeter of the footprint shall notify Guarantor within 3 years of commencement of operations of the Wind Energy Project that they are exercising their option under paragraph 14, and shall be compensated by the developer in a cash amount equal to 25% of the Appraised Value, as set forth in paragraph 5 of this agreement. Property Owners located between one (1) mile and two (2) miles of said footprint perimeter shall have 2 years to exercise the paragraph 14 option, and compensation shall be equal to 5% of the Appraised Value, as set forth in paragraph 5 of this agreement. Any exercise of the paragraph 14 Property Owner Option and payment to Property Owner by Guarantor shall constitute a full waiver and release of any future property value diminution claim or right to sell to the Guarantor as otherwise provided for in this agreement.

15. ASSIGNMENT OR TRANSFER. Neither this Agreement nor the rights under it may be assigned, conveyed, or otherwise transferred by Property Owners. The guarantee given by Guarantor to guarantee the Property value and to purchase the Property is personal, and does not run with the land; however, said Agreement shall inure to the benefit of the Property Owners, their personal representatives, trustees, guardians, custodians or their heirs; but, in all events, shall terminate after any closed sale of the Property.

16. APPLICATION OF LAW DISPUTES. This Agreement shall be construed consistent with law in the State of Illinois. Disputes concerning the application or terms of this Agreement shall be subject to the circuit court jurisdiction of Adams County.

GUARANTOR:

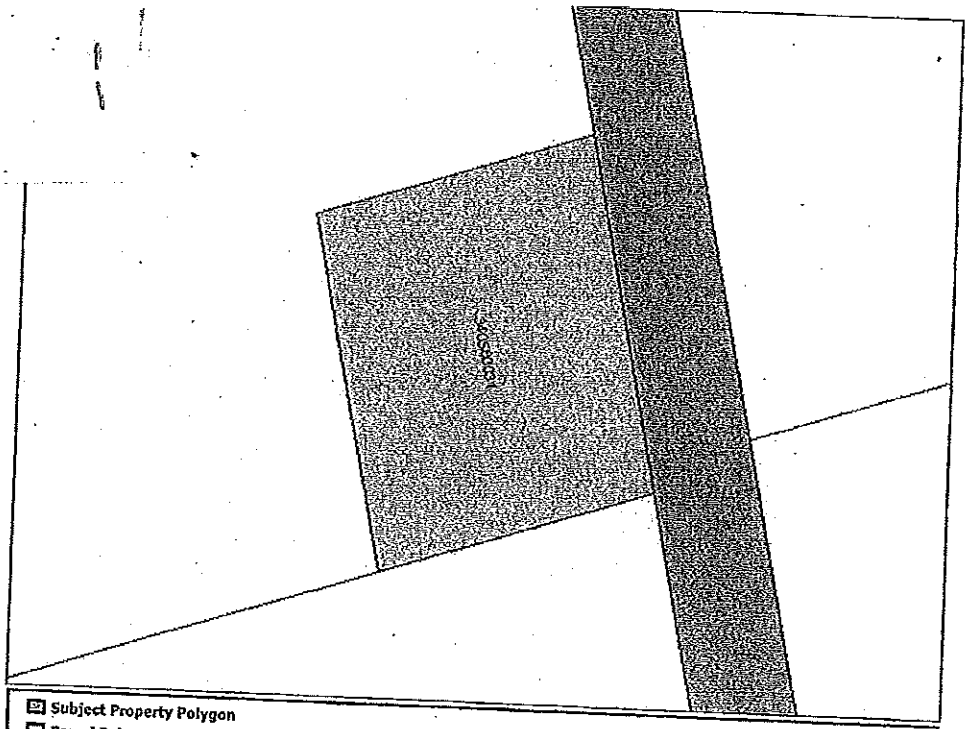
By _____
Name Title Date

PROPERTY OWNERS:

By _____
Name Date

Notary _____

Appendix B



SUBJECT PROPERTY IDENTIFICATION INFORMATION	
LRO	07
PIN	340560031
ASSESSMENT ROLL NUMBER	220800000409590
REGISTRATION TYPE	LT
LAND REGISTRY STATUS	ACTIVE
MUNICIPALITY	N/A
ADDRESS	N/A
AREA	4052 m2
PERIMETER	258 m

DESCRIPTION	PT LT 29 CON 7, PT 1 7R742 ; AMARANTH
PARTY TO:	ASHBEE, BARBARA JOAN

SALES HISTORY

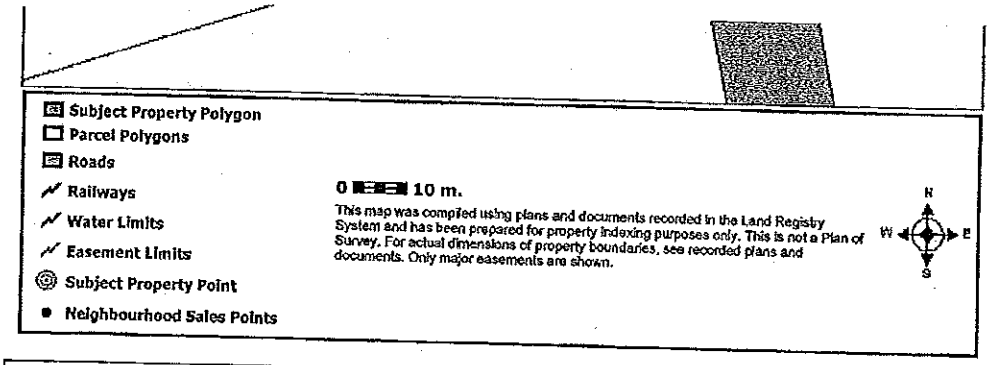
INSTRUMENT NUMBER	REGISTRATION DATE	CONSIDERATION VALUE	INSTRUMENT TYPE	PARTY TO
DC43624	01/31/2005	204750	T	ASHBEE, BARBARA JOAN
MF212464	06/30/1994	[redacted]	T	[redacted]

Reports Not the Official Record. Reports, other than the Parcel Register, obtained through Geowarehouse are not the official government record and will not necessarily reflect the current status of interests in land.

Currency of Information. Data contained in the Geowarehouse reports are not maintained real-time. Data contained in reports, other than the Parcel Register, may be out of date ten business days or more from data contained in POLARIS.

Coverage. Data, information and other products and services accessed through the Land Registry Information Services are limited to land registry offices in the areas identified on the coverage map.

Completeness of the Sales History Report. Some Sales History Reports may be incomplete due to the amount of data collected during POLARIS title automation. Subject properties may also show nominal consideration or sales price (e.g. $2) in cases such as transfers between spouses or in tax exempt transfers.



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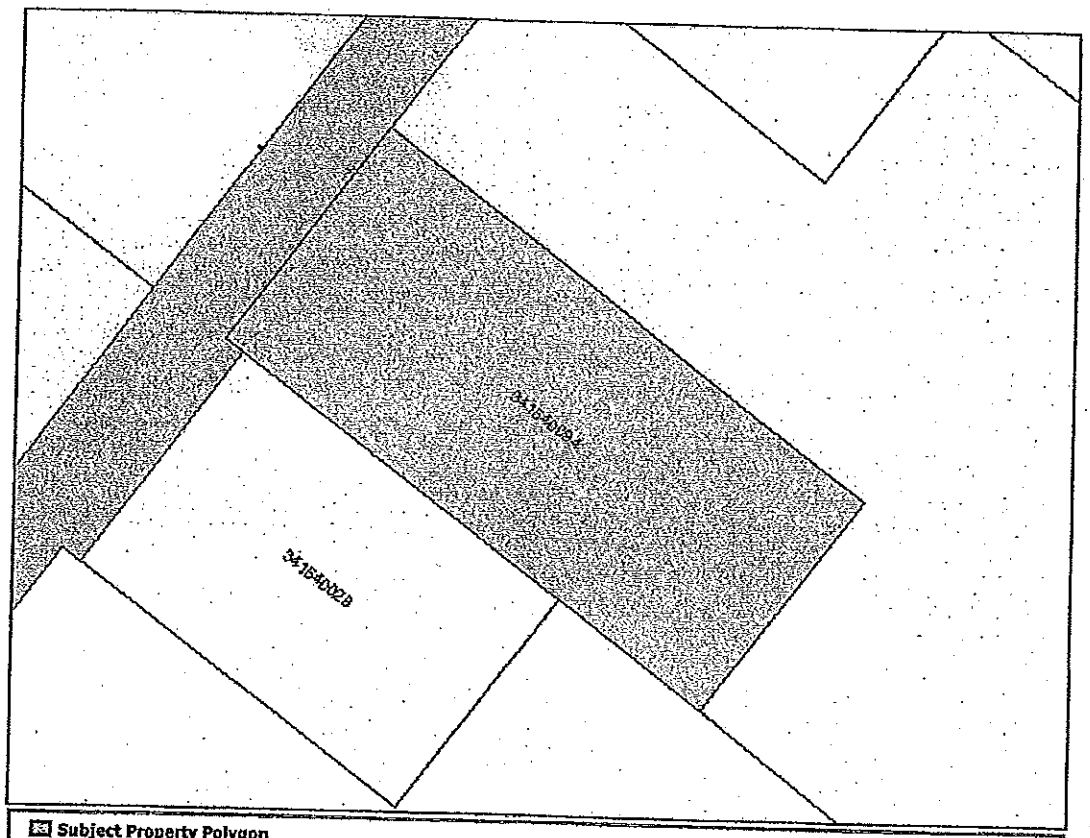

Subject Property Polygon
Parcel Polygons
Roads
Railways
Water Limits
Easement Limits
Subject Property Point
Neighbourhood Sales Points

0 10 m.

This map was compiled using plans and documents recorded in the Land Registry System and has been prepared for property indexing purposes only. This is not a Plan of Survey. For actual dimensions of property boundaries, see recorded plans and documents. Only major easements are shown.

N W E S

SUBJECT PROPERTY IDENTIFICATION INFORMATION	
LRO	07
PIN	341540094
ASSESSMENT ROLL NUMBER	N/A
REGISTRATION TYPE	LT
LAND REGISTRY STATUS	ACTIVE
MUNICIPALITY	N/A
ADDRESS	58232 COUNTY ROAD, R.R. 6
AREA	8408 m2
PERIMETER	398 m
DESCRIPTION	PT LT 291, CON 2 SWTS, PT 2, 7R4396 ; MELANCTHON
PARTY TO:	CANADIAN HYDRO DEVELOPERS INC.

SALES HISTORY

INSTRUMENT NUMBER	REGISTRATION DATE	CONSIDERATION VALUE	INSTRUMENT TYPE	PARTY TO
DC48597	06/30/2005	299000	T	CANADIAN HYDRO DEVELOPERS INC.
LTD33017	01/12/2001	[redacted]	T	WILLIAMS, SANDRA MARIE BLANCHE; WILLIAMS, STEPHEN ROGER BLAINE
LTD11538	07/31/1998	[redacted]	T	[redacted]
MF229782	08/08/1997	[redacted]	T	[redacted]

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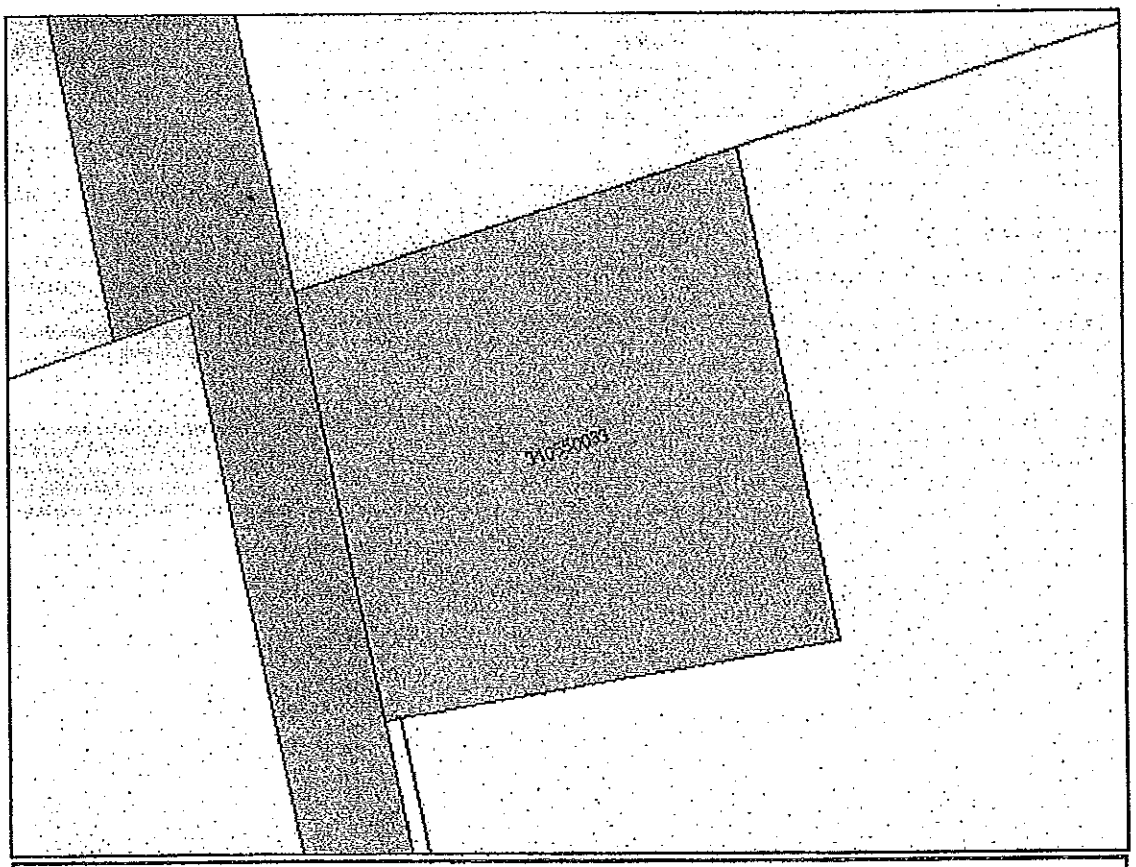
Completeness of the Sales History Report. Some Sales History Reports may be incomplete due to the amount of data collected during POLARIS title automation. Subject properties may also show nominal consideration or sales price (e.g. $2) in cases such as transfers between spouses or in tax exempt transfers.



Subject Property Polygon
Parcel Polygons
Roads
Railways
Water Limits
Easement Limits
Subject Property Point
Neighbourhood Sales Points

0 10 m.

This map was compiled using plans and documents recorded in the Land Registry System and has been prepared for property indexing purposes only. This is not a Plan of Survey. For actual dimensions of property boundaries, see recorded plans and documents. Only major easements are shown.

N W E S

SUBJECT PROPERTY IDENTIFICATION INFORMATION	
LRO	07
PIN	340550033
ASSESSMENT ROLL NUMBER	220800000321580
REGISTRATION TYPE	LT
LAND REGISTRY STATUS	ACTIVE
MUNICIPALITY	N/A
ADDRESS	N/A
AREA	7622 m2
PERIMETER	350 m
DESCRIPTION	PT LT 29, CON 5, PT 1, 7R787 ; AMARANTH
PARTY TO:	CANADIAN HYDRO DEVELOPERS, INC.

SALES HISTORY

INSTRUMENT NUMBER	REGISTRATION DATE	CONSIDERATION VALUE	INSTRUMENT TYPE	PARTY TO
DC81185	11/15/2007	500000	T	CANADIAN HYDRO DEVELOPERS, INC.
LTD11172	07/20/1998	[redacted]	T	BROWNELL, ROY; BROWNELL, TERESA
MF124008	05/15/1984	[redacted]	T	[redacted]

Reports Not the Official Record. Reports, other than the Parcel Register, obtained through Geowarehouse are not the official government record and will not necessarily reflect the current status of interests in land.

Currency of Information. Data contained in the Geowarehouse reports are not maintained real-time. Data contained in reports, other than the Parcel Register, may be out of date ten business days or more from data contained in POLARIS.

Coverage. Data, information and other products and services accessed through the Land Registry Information Services are limited to land registry offices in the areas identified on the coverage map.

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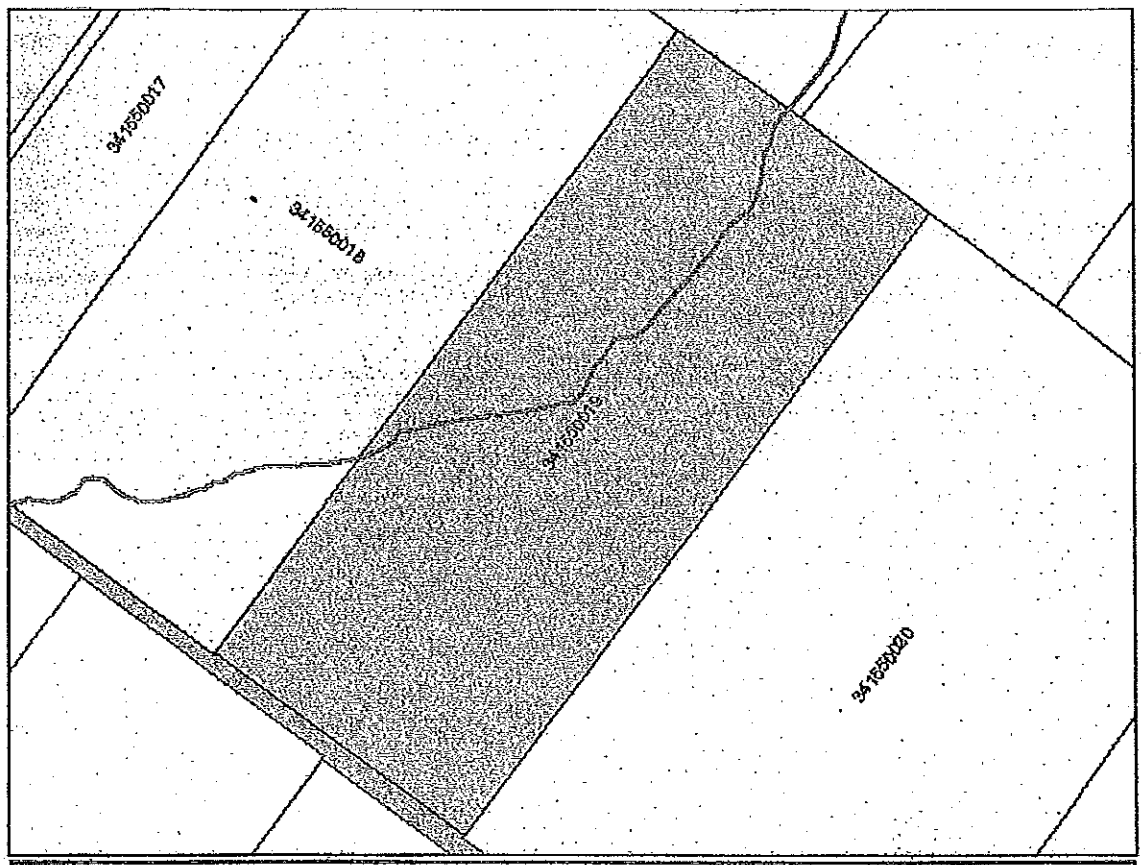

Subject Property Polygon
Parcel Polygons
Roads
Railways
Water Limits
Easement Limits
Subject Property Point
Neighbourhood Sales Points

0 100 m.

This map was compiled using plans and documents recorded in the Land Registry System and has been prepared for property indexing purposes only. This is not a Plan of Survey. For actual dimensions of property boundaries, see recorded plans and documents. Only major easements are shown.

N W E S

SUBJECT PROPERTY IDENTIFICATION INFORMATION	
LRO	07
PIN	341550019
ASSESSMENT ROLL NUMBER	221900000521900
REGISTRATION TYPE	LT
LAND REGISTRY STATUS	ACTIVE
MUNICIPALITY	N/A
ADDRESS	N/A
AREA	409793 m2
PERIMETER	2836 m
DESCRIPTION	PT LTS 284 & 285, CON 4 SWTS AS IN MF163913 ; MELANCTHON
PARTY TO:	CANADIAN HYDRO DEVELOPERS, INC.

SALES HISTORY

INSTRUMENT NUMBER	REGISTRATION DATE	CONSIDERATION VALUE	INSTRUMENT TYPE	PARTY TO
DC80536	10/30/2007	350000	T	CANADIAN HYDRO DEVELOPERS, INC.
MF163913	12/09/1988	[redacted]	T	BENVENETE, WALTER MARK

Reports Not the Official Record. Reports, other than the Parcel Register, obtained through Geowarehouse are not the official government record and will not necessarily reflect the current status of interests in land.

Currency of Information. Data contained in the Geowarehouse reports are not maintained real-time. Data contained in reports, other than the Parcel Register, may be out of date ten business days or more from data contained in POLARIS.

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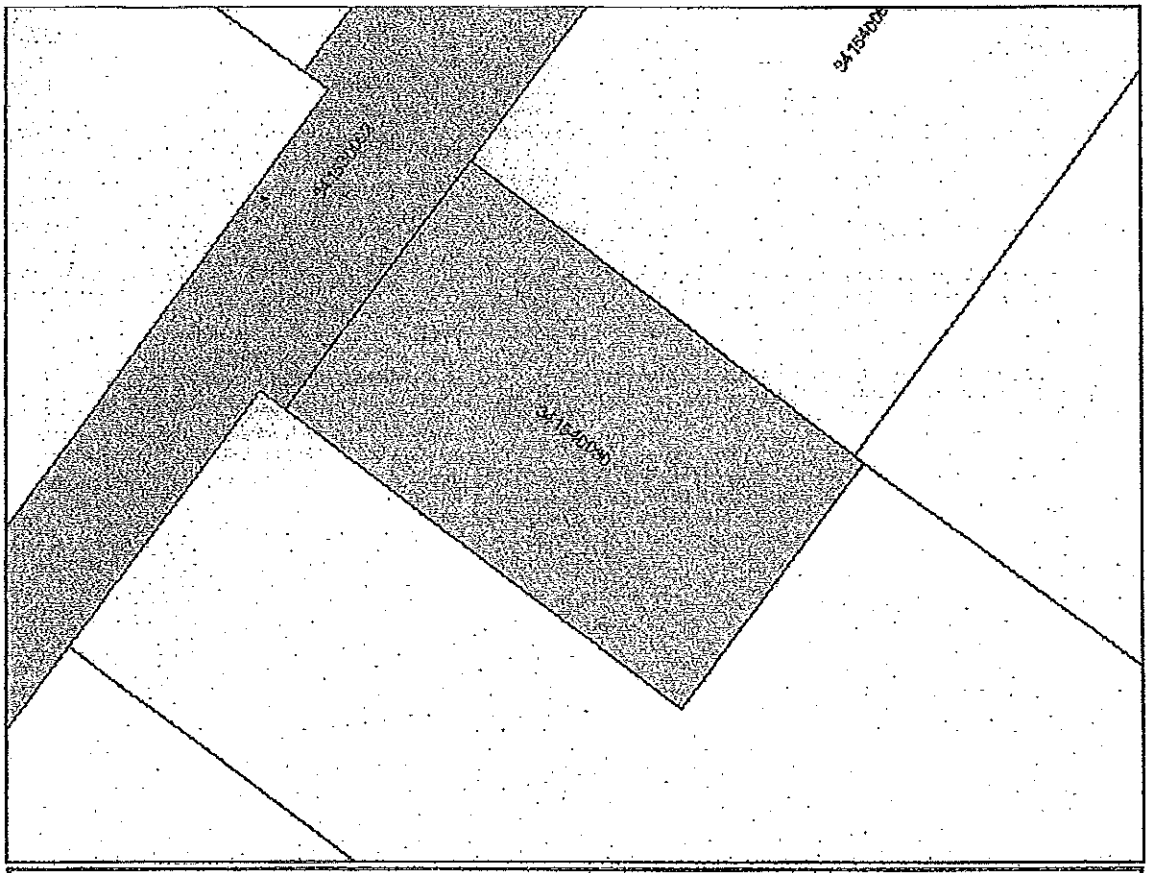

SUBJECT PROPERTY IDENTIFICATION INFORMATION	
LRO	07
PIN	341540030
ASSESSMENT ROLL NUMBER	221900000613850
REGISTRATION TYPE	LT
LAND REGISTRY STATUS	ACTIVE
MUNICIPALITY	SHELBURNE
ADDRESS	58234 COUNTRY ROAD 17
AREA	4048 m2
PERIMETER	262 m
DESCRIPTION	PT LT 291, CON 2 SWTS, PT 2, 7R924 ; MELANCTHON
PARTY TO:	CANADIAN HYDRO DEVELOPERS, INC.

LES HISTORY

INSTRUMENT NUMBER	REGISTRATION DATE	CONSIDERATION VALUE	INSTRUMENT TYPE	PARTY TO
DC77599	08/17/2007	302670	T	CANADIAN HYDRO DEVELOPERS, INC.
MF68694	03/11/1975	[redacted]	T	FRASER, BRUCE; FRASER HELEN

Reports Not the Official Record. Reports, other than the Parcel Register, obtained through Geowarehouse are not the official government record and will not necessarily reflect the current status of interests in land.

Currency of Information. Data contained in the Geowarehouse reports are not maintained real-time. Data contained in reports, other than the Parce Register, may be out of date ten business days or more from data contained in POLARIS.

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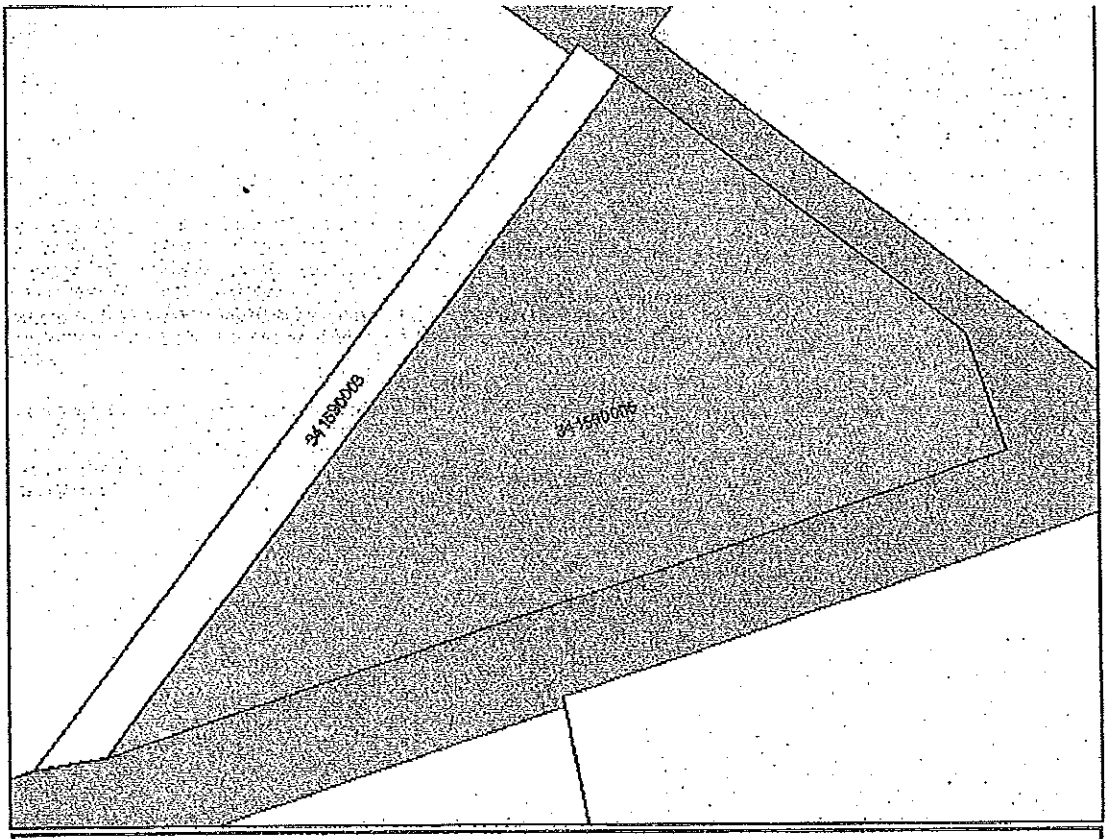

SUBJECT PROPERTY IDENTIFICATION INFORMATION	
LRO	07
PIN	341590005
ASSESSMENT ROLL NUMBER	221900000401800
REGISTRATION TYPE	LT
LAND REGISTRY STATUS	ACTIVE
MUNICIPALITY	N/A
ADDRESS	N/A
AREA	40515 m2
PERIMETER	965 m
DESCRIPTION	PT LT 1, CON 5 SWTS AS IN MF157736 ; MELANCTHON
PARTY TO:	CANADIAN HYDRO DEVELOPERS, INC.

ES HISTORY

INSTRUMENT NUMBER	REGISTRATION DATE	CONSIDERATION VALUE	INSTRUMENT TYPE	PARTY TO
DC70069	01/31/2007	305000	T	CANADIAN HYDRO DEVELOPERS, INC.
LTD9504	05/15/1998	[redacted]	T	BARLOW, DAVID CHARLES; BARLOW, SHERYL ANN
MF157736	06/15/1988	[redacted]	T	[redacted]

Reports Not the Official Record. Reports, other than the Parcel Register, obtained through Geowarehouse are not the official government record and will not necessarily reflect the current status of interests in land.

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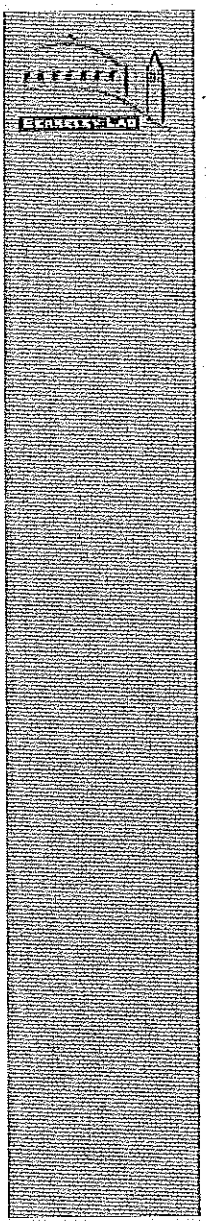
Appendix C

Mendota Hills Wind Energy Project

Sale #	Address	Sale Date	Price	Grantor	Grantee	Style	Size SF	$/SF
1	629 W. Chestnut	Oct 2003	$37,000	Estes	Lipe	1.5	1,161	$31.87
2	323 W. Chestnut	Oct 2004	$40,000	Reed	Hovious	1.5	1,425	$28.07
3	1019 Steward Rd.	May 2003	$40,000	Houle-Ward	Reyns	2	1,408	$28.41
4	91143 Paw Paw	Mar 2005	$187,000	Zaylik	Pachero	2	1,571	$119.03
5	1224 IL Rte. 251	Jun 2003	$138,000	Gittleson	Kowalski	2	1,272	$108.49
6	339 Chestnut St.	Jan 2003	$72,000	White	Flynn	2	1,684	$42.76
7	630 W. Chestnut	Sep 2003	$126,000	Eddy	Morath, Sr.	1.5	1,728	$72.92
8	427 Chestnut St.	Oct 2003	$87,000	Hesik	Rourke, Jr.	1.5	1,380	$63.04
9	138 Cherry St.	Sep 2004	$80,000	Hammond	Alexander	1.5	1,326	$60.33
10	536 W. Cherry	Oct 2004	$63,500	Johnson	Fitzpatrick	1.5	999	$63.56
11	885 Compton Rd.	Oct 2004	$68,900	Boysen	Gellings	1	480	$143.54
12	518 W. Cherry St.	Apr 2003	$87,500	Allen	Beckman	1	927	$94.39
13	222 Maple St.	Dec 2004	$150,000	Clark	Cummings	1	1,852	$80.99
14	444 W. Main St.	Mar 2005	$109,900	Miller	Michaels	1	1,402	$78.39
15	2874 Beemerville	Jul 2003	$367,000	Finkboner	DGNB TRT	1	2,201	$166.74
						Average sale price		$78.84
16	1310 Melugins Grove	Apr 2004	$179,000	Lyons	Overton	2	1,952	$91.70
17	2612 Shady Oaks Rd.	Apr 2003	$131,000	Smith	Papiech	1.5	1,208	$108.44
18	3448 Cyclone Rd.	Mar 2003	$105,900	Munyon	Pippenger	2	1,456	$72.73
19	2524 Johnson St.	Aug 2004	$61,800	Copeland	Lampson	1.5	948	$65.19
20	741 Third St.	Feb 2004	$63,500	Eckhardt	Rosales	1.5	868	$73.16
21	613 Church Rd.	May 2003	$115,000	Merkel	Parpart	1.5	1,458	$78.88
22	3435 Willow Creek	Jun 2003	$118,000	Swiatek	Brydun	2	884	$133.48
23	3021 Cottage Hill	Mar 2005	$182,000	Russ	Curtis	1.5	1,239	$146.89
24	3385 Willow Creek	Mar 2003	$180,000	McCoy	Carver	2	2,840	$63.38
25	745 Second St.	Dec 2004	$59,000	Wilson	Calderon	1.5	1,161	$50.82
26	761 4th St.	Mar 2003	$68,000	Stewart	Elsinger	1	724	$93.92
27	2774 Welland Rd.	Apr 2003	$93,000	Batha	Crumpton	1.5	1,104	$84.24
28	558 Earlville Rd.	Jan 2003	$145,000	Hodge	Ikeler	2	1,280	$113.28
29	2505 Wood St.	Aug 2004	$105,000	Janiak	Bullock	2	1,812	$57.95
30	385 Earlville Rd.	Aug 2004	$280,000	Rago	Diehl	2	2,142	$130.72
31	3095 Cyclone Rd.	Dec 2004	$169,900	Summerhill	Rainbolt	2	2,048	$82.96
32	742 Second St.	Jan 2003	$103,000	Delhotal	Stewart	2	1,876	$54.90
33	395 Angling Rd.	Mar 2005	$119,000	BMV Prop.	Herendeen	1	680	$175.00
34	2515 Wood St.	Apr 2004	$80,000	Jones	Sarver	1	912	$87.72
35	1218 Locust Rd.	Jan 2005	$169,000	Wachowski	Gembeck	1	1,040	$162.50
36	901 Melugens Grove	Aug 2003	$228,000	Kidd	Rajan	1	2,000	$114.00
37	1490 German Rd.	Aug 2004	$85,000	Firlit	Challand	2	2,144	$39.65
38	603 Ogee Rd.	Apr 2004	$285,000	Anderson	Miller	1	1,920	$148.44
39	546 Carnahan Rd.	Jan 2005	$110,000	Coley	Sarabia	1	1,296	$84.88
40	1353 County Line	Nov 2003	$185,000	Vallejo	Bozaeth	1.5	1,338	$138.27
41	2512 Johnson St.	Feb 2005	$123,000	Montavon	Sutton	2	2,232	$55.11
42	2509 Herman Rd.	Apr 2004	$142,900	Bresson	Arjes	1	1,404	$101.78
43	955 Woodlawn	Jul 2003	$265,000	Swan	LaRosa	1.5	1,918	$138.16
44	1279 Locust Rd.	Mar 2003	$270,000	Witte	olin	1	2,156	$125.23
45	648 Ogee	Nov 2003	$225,000	Fickenscher	Rojas	1	1,768	$127.26
46	1339 Woodlawn Rd.	Sep 2003	$230,000	Howell	Bamhill	1	1,701	$135.21
47	1349 Woodlawn Rd.	May 2003	$207,500	Howell	Wiskari	1	1,809	$114.70
48	711 O'Gee Rd.	Aug 2004	$185,000	Groevengoed	Carabal	1	1,352	$136.83
49	1295 Locust Rd.	May 2004	$300,000	Hagan	Lowe	1	2,672	$112.28
50	860 Paw Paw Rd.	May 2004	$185,000	Wiskur	Pogreba	1	1,148	$161.15
51	3011 Honeysuckle	Mar 2005	$355,000	Abbott	Brandt	2	3,655	$97.13
52	489 Earlville Rd.	Nov 2004	$165,000	Schlafke	Fromhertz	2	1,400	$127.86
53	2512 Shaw Rd.	Jun 2004	$153,500	Hlavin	Kapinski	2	1,638	$93.71
						Average sale price		$104.72

Sales 17 - 53 located > 2 miles from turbines	$104.72	sq ft
Sales 1 - 16 located within 2 miles of turbines	$78.84	sq ft
Difference in sale price per square foot	$25.89	sq ft
Average Value diminution within 2 miles of turbines	**25%**	

Appendix D



LBNL-2329E

ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY

The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis

Ben Hoen, Ryan Wiser, Peter Cappers, Mark Thayer, and Gautam Sethi

Environmental Energy Technologies Division

December 2009

Download from http://eetd.lbl.gov/EA/EMP

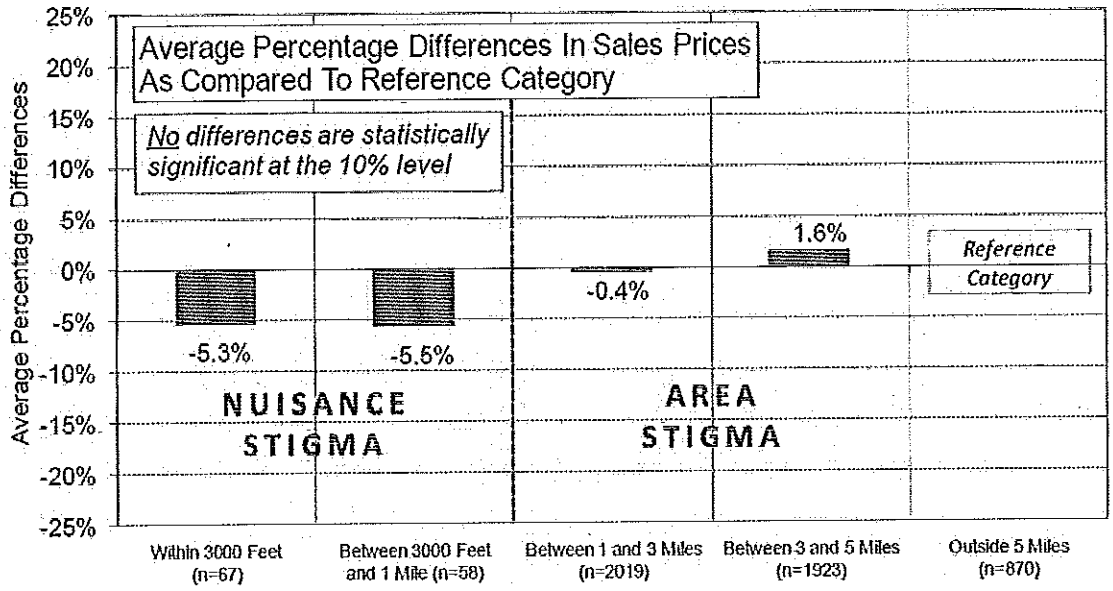
The work described in this report was funded by the Office of Energy Efficiency and Renewable Energy (Wind & Hydropower Technologies Program) of the U.S. Department of Energy under Contract No. DE-AC02-05CH1123.

This report was prepared by the above authors for the U.S. Department of Energy under Contract No. DE-AC02- 05CH1123.

It has been reported that the contractors payment for the report was $500,0000.

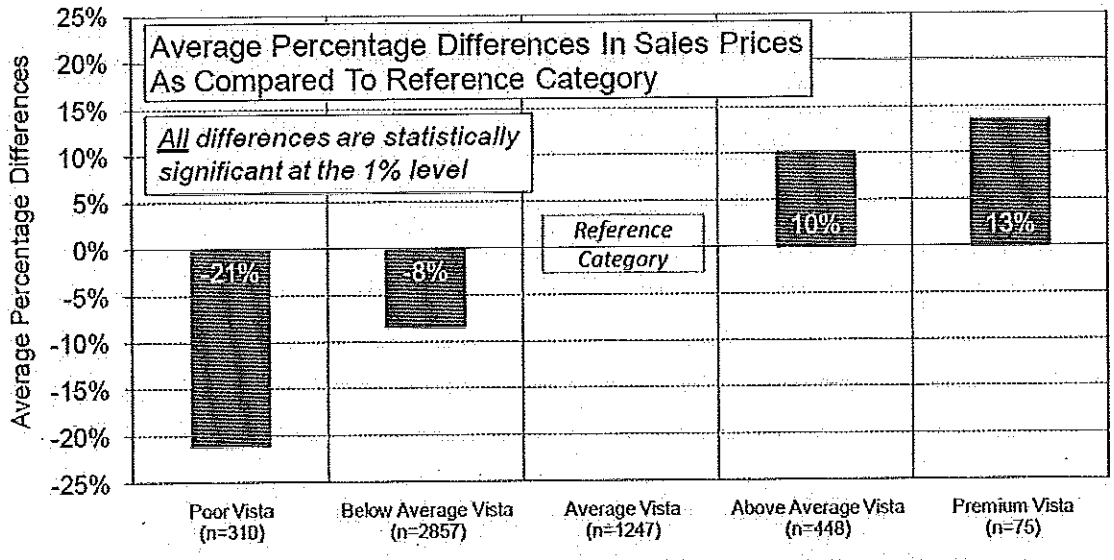
The following Figures ES-1, ES-2, ES-4 and photograph Appendix D & E were copied from this report without any editing by McCann Appraisal, LLC.

Figure ES-1: Base Model Results: Area and Nuisance Stigma



The reference category consists of transactions for homes situated more than five miles from the nearest turbine, and that occured after construction began on the wind facility

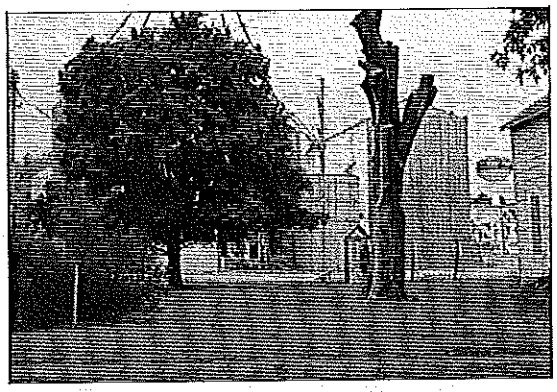
Figure ES-2: Base Model Results: Scenic Vista



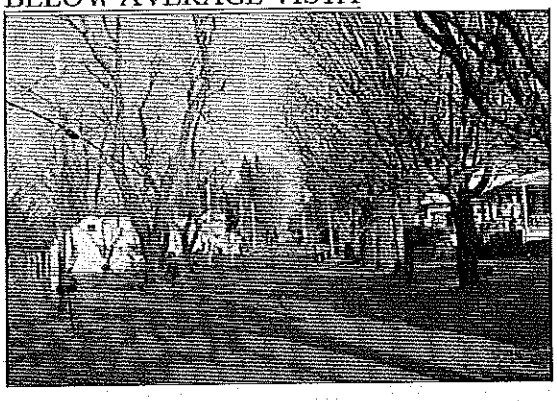
The reference category consists of transactions for homes with an Average Vista, and that occurred after construction began on the wind facility

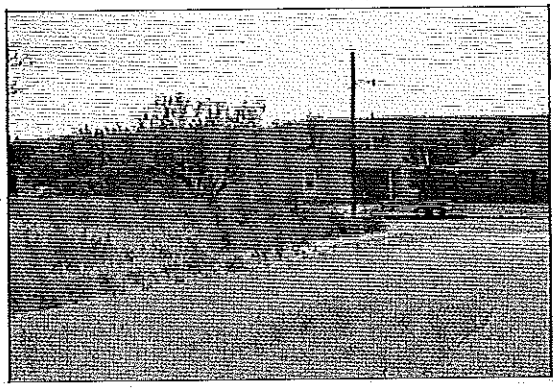
Appendix D: Vista Ratings with Photos

POOR VISTA

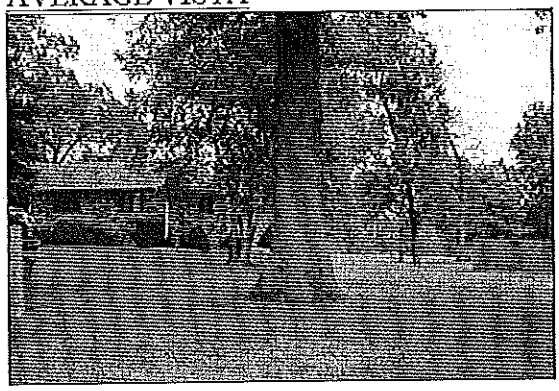


BELOW AVERAGE VISTA

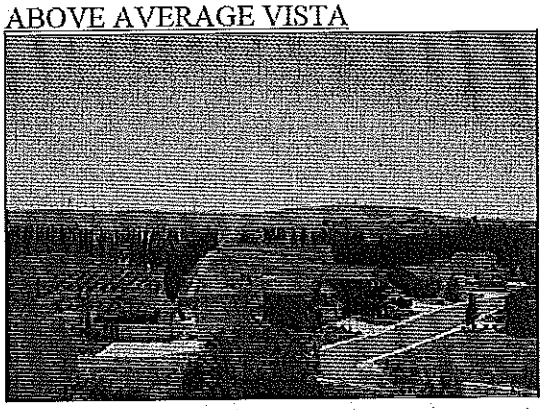


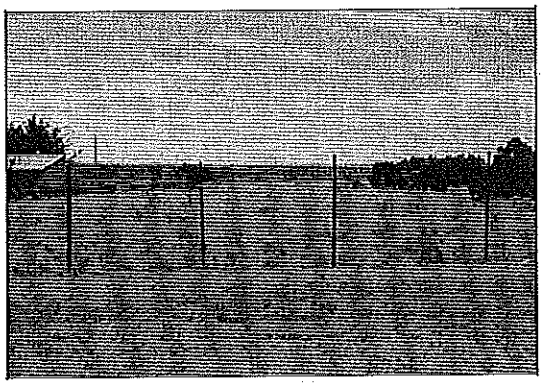


AVERAGE VISTA

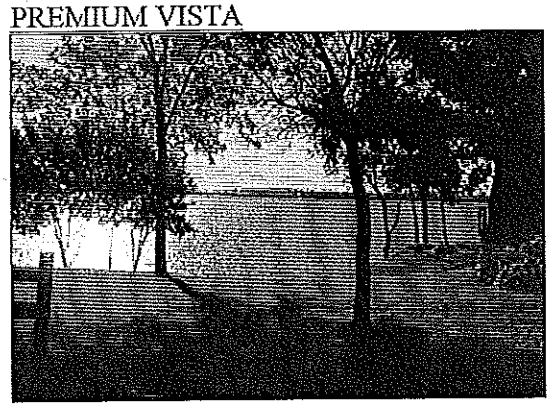


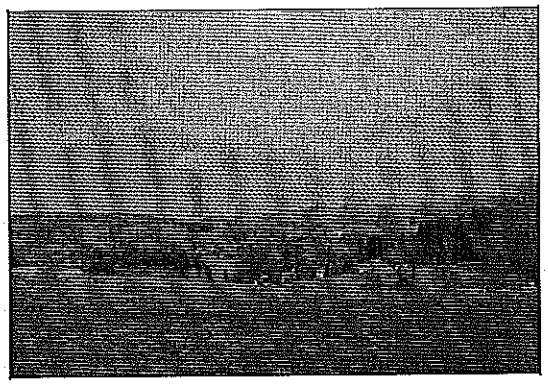
ABOVE AVERAGE VISTA





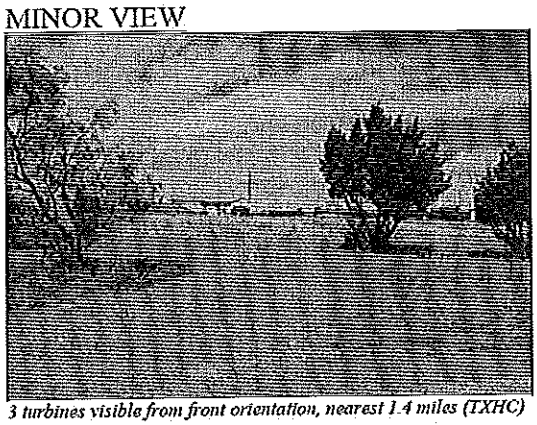
PREMIUM VISTA



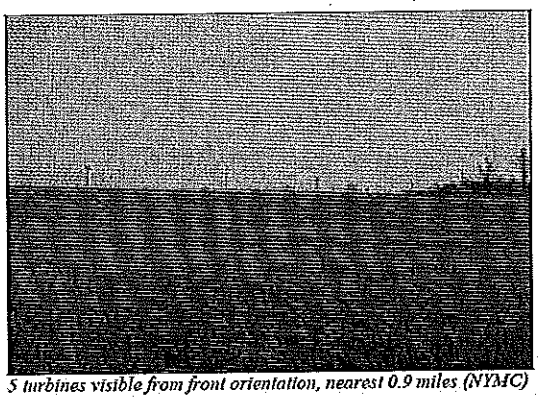


Appendix E: View Ratings with Photos

MINOR VIEW

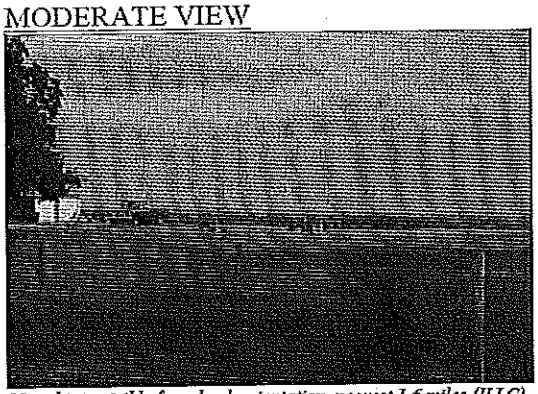


3 turbines visible from front orientation, nearest 1.4 miles (TXHC)

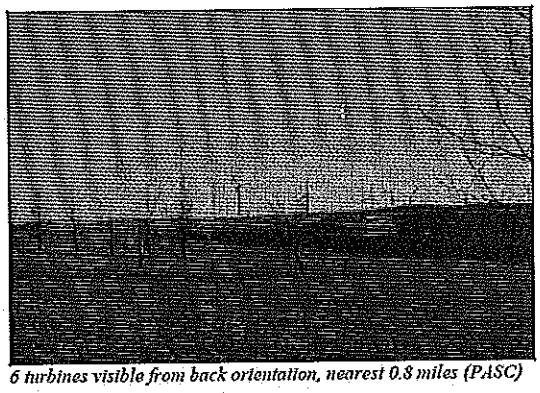


5 turbines visible from front orientation, nearest 0.9 miles (NYMC)

MODERATE VIEW

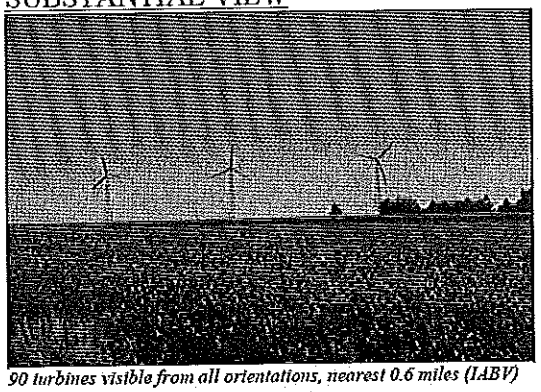


18 turbines visible from back orientation, nearest 1.6 miles (ILLC)

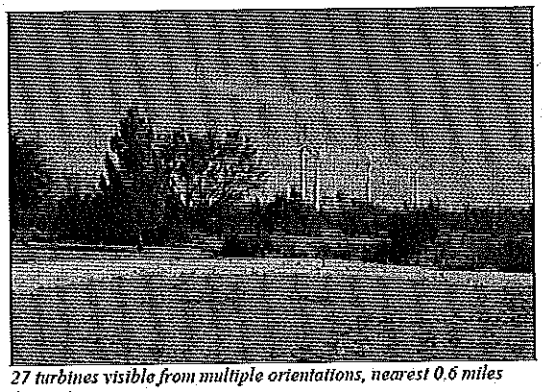


6 turbines visible from back orientation, nearest 0.8 miles (PASC)

SUBSTANTIAL VIEW

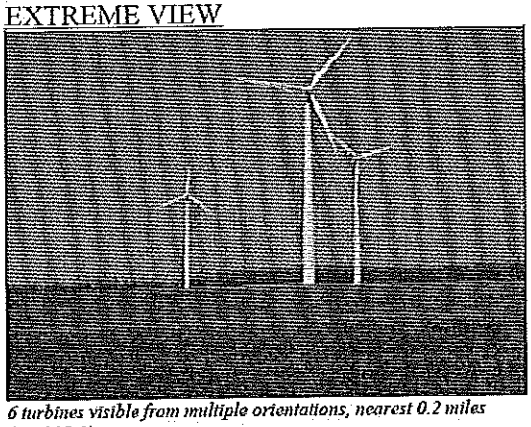


90 turbines visible from all orientations, nearest 0.6 miles (IABV)

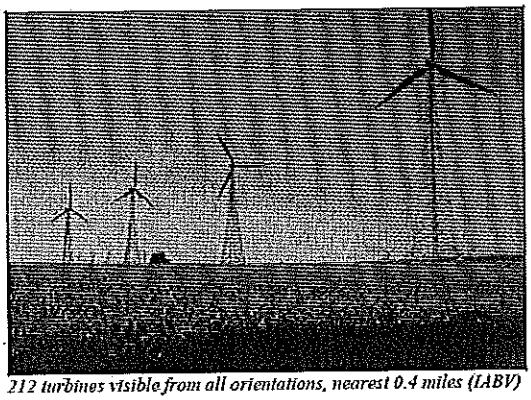


27 turbines visible from multiple orientations, nearest 0.6 miles (TXHC)

EXTREME VIEW

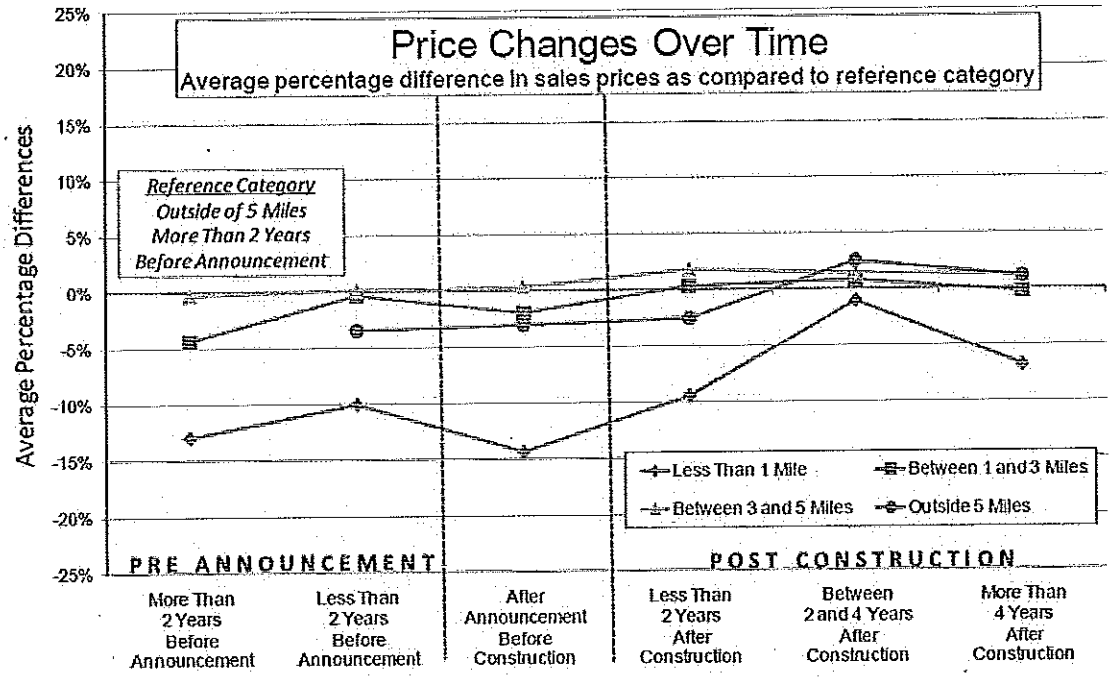


6 turbines visible from multiple orientations, nearest 0.2 miles (WIKCDC)



212 turbines visible from all orientations, nearest 0.4 miles (LABV)

Figure ES - 4: Temporal Aspects Model Results: Area and Nuisance Stigma



The reference category consists of transactions of homes situated more than five miles from where the nearest turbine would eventually be located and that occurred more than two years before announcement of the facility

Property values blowing in the wind

REALTOR'S REPORT: Proposed turbine projects put damper on residential property sales in Cape Vincent
By NANCY MADSEN
TIMES STAFF WRITER
WEDNESDAY, APRIL 7, 2010

Sales records show that Cape Vincent has had a steeper decline in residential property sales than its neighbors and real estate professionals are starting to blame proposed wind power developments.

"People do not want to buy near windmills," said Amanda J. Miller, owner of Lake Ontario Realty, Dexter, who specializes in waterfront property sales. "They avoid purchasing in towns like Cape Vincent."

She presented her views and a report on property values to the Jefferson County Board of Legislators on Tuesday night.

In other countries that have had wind power development for a while, they have seen 40 percent to 60 percent drops in resale values, she said. Closer to home, she's had clients pull out of deals and refuse to consider areas that are possible sites for wind turbines.

"Even if people don't mind looking at it, they're not going to put their investment in an area where they're going to have turbines depreciate it," Ms. Miller said in a phone interview on Monday. "They don't want to look at them, see them, and others don't want to buy because they don't know what the wind turbines will do for property values."

National studies have gone both ways, some saying that wind turbines have no effect on property values and others saying the projects hurt property values.

Data on the local real estate trends were compiled by Clifford J. Schneider, a Cape Vincent resident and former fisheries biologist with the state Department of Environmental Conservation.

The analysis compared Cape Vincent sales, closing prices and days on market to those in Alexandria Bay, Brownville, Clayton and Lyme from 2000 through 2009. The analysis included houses of more than 1,000 square feet on the Jefferson-Lewis Board of Realtors Multiple Listing Service.

Both overall residential sales and a subset of waterfront residential sales were analyzed.

Closings for the 2006-09 period declined 8.4 percent in the other four towns and 15.4 percent in Cape Vincent, though that was not statistically significant.

In waterfront properties over the last decade, closings fell 12 percent in Cape Vincent and 4.6 percent in the four-town average. In the more recent 2006-09 period, closings fell 10 percent per

year for the four-town average and 25 percent in Cape Vincent. The difference in the decline was statistically significant.

Cape Vincent had 10 residential property closings in 2009, three of which were waterfront.

"This should be a good wake-up call to people," Ms. Miller said.

Average days on market declined for the four towns by 9.5 percent per year through the decade. Through the decade, the trend was a drop by 7.3 percent per year in Cape Vincent, but in 2006-09 the days on market increased 58.5 percent per year, while the four-town average increased 10 percent.

"There is some evidence that the Cape Vincent housing market is in a slump, more so than what would normally be credited to the decline in the general economy," the report said.

The economy is playing some role in the decreased number of sales.

"Things are slow partly because the overall economy is so bad," said Brooks J. Bragdon, a real estate sales agent and Cape Vincent councilman. "But things are even slower in areas overdeveloped by wind turbines."

Some local wind farm opponents are pushing for a property value assurance agreement, in which a developer would pay the difference between a property's sale price and the value of comparable property outside of a wind power development if the property loses value.

The two real estate professionals said that won't be enough.

"I don't put too much stock into it because the aesthetics of the area are so valuable that you can't put a dollar figure onto it," Mr. Bragdon said. "We should address the setbacks and make them reasonable according to the zoning law and comprehensive plan and state and federal rules without getting into compensating people for lost value."

Ms. Miller agreed.

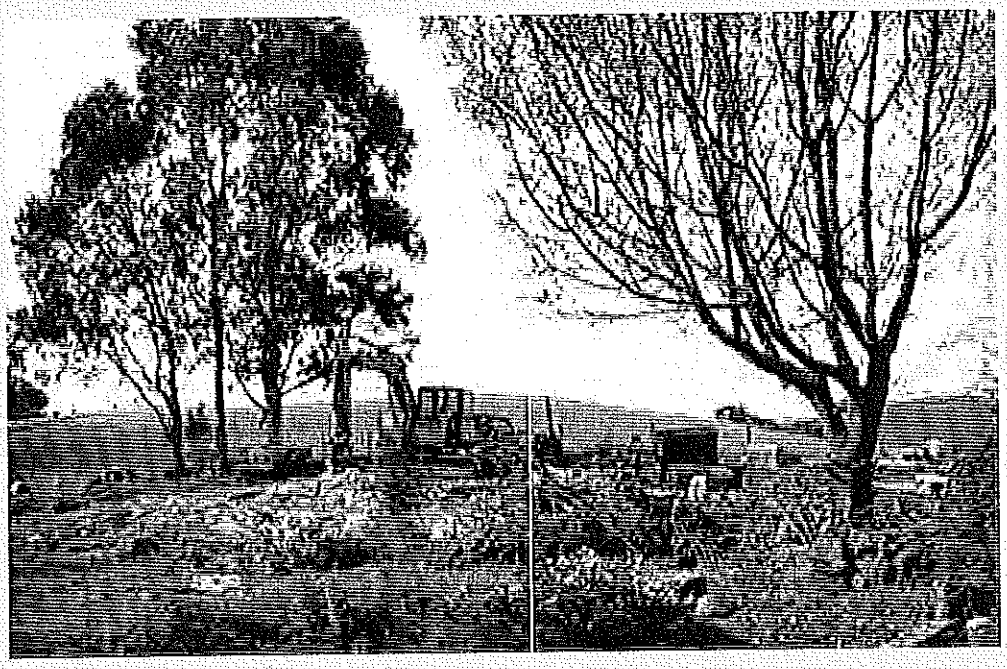
"It doesn't take care of the tourism economy," she said. "There's no way to solve that."

Appendix E

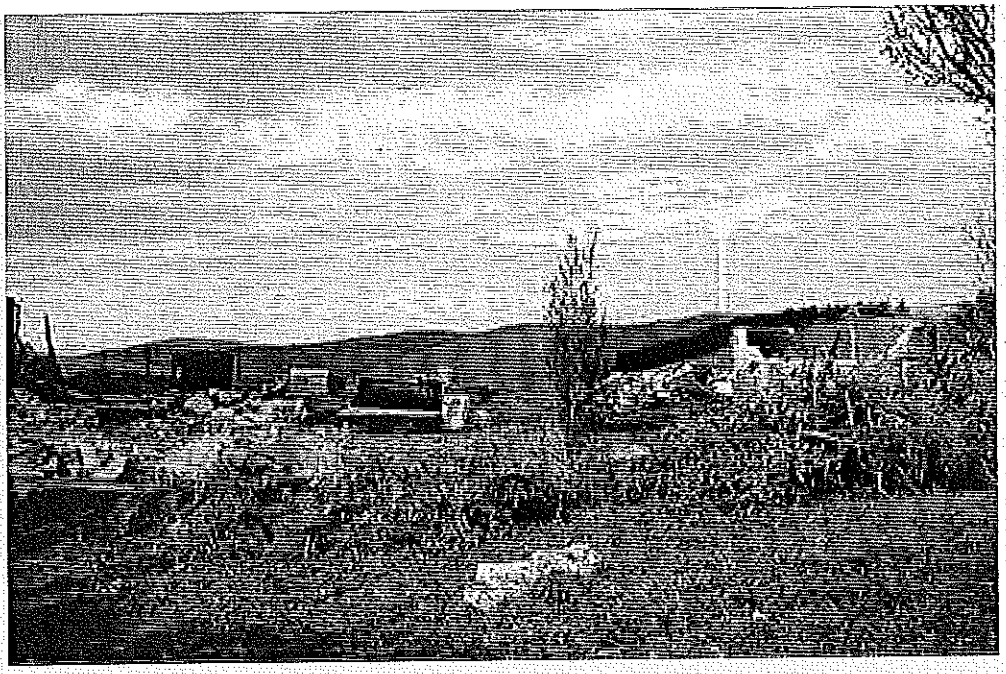
On ABC's Stateline, Lane Crockett of the wind industry said, "There is no evidence whatsoever in any peer-reviewed article or medical assessment that says there's any health effect from wind farms."

Worldwide, people are experiencing noise problems from wind farms, Nina Pierpont's research has been published with peer review, and the wind industry's story that people are not affected by noise from wind turbine noise is far from the truth.

The noise problem was experienced by residents near the Toora wind farm more than 4 years ago.



Early in 2007, Stanwell, Queensland Government, owners of the Toora wind farm, bought Les Osbourne's house which was about 600 metres or so from the nearest turbine and then bulldozed the house. Les was originally in favour of Stanwell building turbines all around him, believing the spin about there not being any noise problems. In fact he signed the petition in favour of the windfarm 5 times. Once the wind farm was built he started to suffer from the noise.



The house, being demolished in the photos, is just across the road from Jayne & Steve's place who also suffered from the low frequency noise so much it affected their health and the company was required to institute temporary shutdowns of turbines.

And why is it the Brumby government does not want to use current noise standards and the wind industry is reacting so strongly against a national code for wind farm development?

Acoustic Ecology Institute

Wind Farm Noise: 2009 in Review

In the most extreme cases, families are forced to move from their homes to escape the effects of the ongoing noise disturbances. These are not necessarily people living extremely close to turbines; such unlivable situations have occurred from 1000 feet to over a half-mile from the closest turbines. Some wind farm developers have actually bought out neighbors that were especially impacted[7], though most are left to make the best they can with a piece of property that will be difficult, if not impossible[8], to sell. I have not seen any comprehensive listing of residents who had to move, but such reports are becoming more common in the US, Canada, and the UK, totaling perhaps three to six per year.

Oregon wind farm ruled too loud: six months to find fix

Human impacts, News, Wind turbines No Comments »

The Morrow County Planning Board ruled this week that the Willow Creek Energy Center, an 80-turbine wind farm, is producing noise levels that violate Oregon's noise limits, and gave Invenergy, the wind farm's owner, six months to get the turbines into compliance. The wind farm began operating in January 2009, and by March, several neighbors within a half mile had raised serious concerns about the noise (see this article for details), including regularly having difficulty sleeping. Noise monitoring then took place, and in January of this year, the Planning Board received the results, which showed that noise levels at four homes sometimes exceeded the limit of 37dB. There was some contention at that meeting, as neighbors had hired independent noise monitoring consultants, whose records showed more consistent violations than those of the Invenergy-hired consultant; the differences were pegged to the fact that the Invenergy consultant did not record in high wind speeds, contending that the noise gets no louder above wind speeds of 9m/s. It is unclear from initial news reports whether the wind farm will be required to comply with the noise limits based on the Invenergy sound monitoring protocol, which found excess noise just 10% of the time at one house, and less frequent slight violations at three others, or whether they'll use the more comprehensive techniques used by the local citizens, which found violations more consistently at two homes (one just over the limit, the other often over 40dB), with one home experiencing excess noise on 22 out of 37 nights.

Carla McLane, Planning Director for Morrow County, noted that while the commission did rule the wind farm was violating state regulations, it found the turbines only crossed the noise threshold at certain times of day and under certain conditions. "Some would want to view it in black and white and if it's a violation then you have to shut them down," McLane said. "Others would want to view it in terms of shade of gray and say it's not an ongoing and continuous violation. It's an intermittent violation."

"I'm not sure how someone can say this is an unusual, infrequent event," said Kerrie Standlee, one of the neighbors' noise consultants. "To me, 59 percent (of nights with excess noise) is not occasional or unusual."

Standlee's noise study also went beyond Invenergy's in that he gave the residents a sheet of paper to log their experiences with time and date. He then overlaid those comments on the data and showed that when the residents reported high noise, the wind was blowing from a particular direction or at a particular speed. This last bit of information may offer Invenergy some direction about when they might shut down turbines if they want to avoid the worst of the noise issues, during the six months they have to get into compliance.

The Planning Board struggled with the conflicting approaches, according the the East Oregonian (article archived here). "I have a very hard time coming to a concrete conclusion on which study I feel is accurate," Commissioner Pamela Schmidt said. "I'm not a licensed engineer in acoustics myself and there's been so much information I can't make a decision." Invenergy claimed that the background ambient noise varies, so that in higher wind periods, it should be allowed to exceed 36dB; yet, in its permit, it used the 26dB ambient standard, which is the state's default if measurements are not made ahead of time. Complicating matters more is the fact that, as the East Oregonian noted, "the rule does not direct agencies on how to administer the rule or decide conflicts such as the one between Invenergy and its neighbors. The agency that originally enforced the rule, the Oregon Department of Environmental Quality, has since defunded and destaffed its noise program."

It's worth noting that the noise issues seem to be quite pronounced even at sound levels of 40dB. Oregon's 36dB limit is among the most conservative in the country; it's based on being 10dB above average night time ambient noise levels, which have been measured at 26dB. It appears that noise issues may well be present even when the measured sound levels are at or very near 36dB; this is in synch with reports from elsewhere, which suggest that people accustomed to quiet rural night time soundscapes are quite easily disturbed when turbine noise becomes one of the loudest local sounds, even when absolute noise levels are not extreme. In general, acousticians consider a sound to become readily audible when it is 5dB above ambient, with disturbance considered likely when it reaches 10dB above ambient.

26

Clifton Maine considers 4000 foot setbacks for wind turbines

Human impacts, News, Wind turbines No Comments »

A private landowner in Clifton, Maine, is hoping to erect four commercial wind turbines on a small ridge known as Pisgah Mountain, and sell the energy to the local utility, Bangor Hydro. Hearing of negative experiences in other Maine towns, including Mars Hill and Vinalhaven, some local residents are concerned about noise impacts and effects on wildlife. The town of Clifton has drafted a new ordinance that sets 4000 feet as the minimum distance between a turbine and a neighboring house; this ordinance will go before voters on June 8. In both other towns, affected families live within 3500 feet of the local turbines.

"What we have on this site is setbacks to the closest residence of a little over 4,300 feet," says Paul Fuller, who owns the 240 acres where the turbines would be built. "I think we could boast that that is the farthest setback of any wind farm in the state of Maine at this point." Several other homes are within a mile to mile and a half of the location.

If this project moves ahead, it would be one of the first to do so with regulatory setbacks of over 1500-1700 feet, which are commonly used in Maine and elsewhere in the US, as developers aim to reach a 45dB limit at homes. The ordinance allows sound levels of up to 50dB during the day and 40dB at night; past experience would suggest that at this distance, these sound levels are unlikely to be reached, though it is entirely possible that the turbines will be somewhat audible up to a mile or so away at times (night time noise levels in rural areas can be as low as 20-25db). Some community advocates urge setbacks of a mile or mile and a quarter, to more surely eliminate

audible noise issues; this project would be a valuable "guinea pig" for the helping answer the crucial question of where the proper balance lies between wind development and respecting the rural soundscape of small towns.
Read more and see a news clip at WLBZ2.com

22

UK addresses challenges in assessing wind farm noise

Human impacts, News, Wind turbines No Comments »

England's primary environmental agency, the Department for Environment, Food, and Rural Affairs (DEFRA), has commissioned a study to improve techniques for assessing wind farm noise. "There is a possibility that local authorities are not currently investigating complaints about noise from wind farms due to the absence of any formal technical guidance," an internal document reads. "Defra wishes to let a contract to provide local authorities with a methodology by which to investigate noise from wind farms, to support local authority enforcement of statutory nuisance legislation." According to the Telegraph, the report is due out later this year, and should make it easier for local councils to respond to noise complaints. A recent survey suggests that about one in seven UK wind farms have spurred noise complaints; noise campaigners contend that many people who are bothered do not file formal complaints, since they are rarely acted upon.

Meanwhile, also in the UK, the Bradford Planning Inspector upheld a ruling by the city Council to deny a permit for building a single large turbine at a factory in town. The applicant had appealed the denial, since its noise studies showed that that the turbine would be in compliance with the federal noise code ETSU-R-97, which is the only code named in the statutes. However, the investigating Bradford Council Environmental Health officer used several other noise level methodologies when he visited a similar turbine in Norfolk. Using World Health Organisation and British Standard guidelines and codes of practice, as well as ETSU-R-97, he came to the conclusion that the Princes Soft Drinks turbine would cause a noise nuisance for nearby residents. The Planning ruling noted that even according to the company's modeling, "for some dwellings under certain conditions, the emitted turbine noise is likely to lead to complaints. Furthermore, according to WHO standards, there would be times when this noise could result in sleep disturbance, or prove to be a serious annoyance to residents. I find this to be unacceptable."

Councillor John Ruding said: "I am delighted that the inspector agreed with the local community and their voices have been heard. "These proposals were an experiment on people's lives which was not acceptable." Earlier, at the time that the company appealed the initial denial, another Councillor, James Cairns, had noted, "The Council has done its best. Its officers didn't believe it was feasible in the area. Bradford is not against wind turbines - if you go up onto the moors, you will see them. But turbines of this size have not been tried and tested in urban areas."

14

Third of a mile setback doesn't prevent wind turbine noise issues in Falmouth

Human impacts, News, Wind turbines No Comments »

When the town-owned wind turbine began operating at the Falmouth, MA wastewater treatment facility in March, most townspeople saw it as the most striking example of the town's far-reaching commitment to sustainability. Since then, it's generated about a third of the town's electricity needs, and a second turbine is being readied for installation nearby this summer. As noted at a forum on the town's many energy-savings initiatives, in discussing the second turbine: "The special thing about the site is it's remote. The nearest home is about 1/3 mile away, which is important in terms of noise and appearance." (This is just under 1800 feet, or 600 yards.)

But over the few weeks since the first turbine began operating, residents are finding the noise much more disruptive than they'd imagined. According to the Cape Cod Times, some neighbors who live in the sparsely populated, wooded area around the treatment facility were horrified when they heard the noise. "It's destroyed our capacity to enjoy our homes," Kathy Elder said. Elder said the noise surrounds her residence, alternating between a jet's whine, thunder and a thumping that sometimes can be felt.

The town has received formal complaints from six residents, one of whom, Annie Hart Cool, has gathered over 40 names of people within a mile or so who say they are affected. She notes that her husband enjoys working in their yard after work, "but when he comes back inside and his head is hurting, you know something's wrong."

Assistant Town Manager Heather Harper says that the town has asked Vestas, the turbine manufacturer, to come check whether there are any mechanical issues that may be causing elevated noise levels, and is asking residents to compile records of when the sound is worst, to help the town figure out how to respond. "This has been a community project from the beginning," Harper said. "We're genuinely concerned and we take the complaints very seriously." At the same time, Harper noted that "We didn't expect no sound, but it should meet all governmental standards." This is, indeed, often the issue: governmental noise standards, which tend to range from 40-50dB, are not always sufficient to avoid negative impacts on the nearest neighbors.

UPDATE: Another local newspaper covers the brewing controversy.

03

South Dakota residents fail to get half-mile wind farm setbacks

Human impacts, News, Wind turbines 1 Comment »

An excellent 3-part series on wind farm development ran this week in the Bismark Tribune. It has a good balance of the excitement and economic benefits that attract farmers to the industry, and well-stated concerns from those who want larger setbacks in order to protect neighbors from noise. The grey area around health impacts is navigated quite well, with a well-grounded emphasis on steep disruption; and most strikingly, the piece includes acknowledgement that there is individual variability in how easily people can adapt to a new and potentially intrusive noise source.

Interestingly, there are repeated indications that in this community, as in others, a half mile setback was seen as the "sweet spot" that could accommodate both industry and neighbors; in initial community meetings, there was significant support for a one-mile setback, while a general consensus emerged that a half mile would be tolerable to most people. Nonetheless, the county decided to go with a third of a mile (1750-foot) setback, which has some community members concerned that the turbines will be audible enough to be disruptive at times.

25

Maine towns keep wind farms at arm's length as state looks to far offshore sites

Human impacts, News, Ocean, Wind turbines No Comments »

"As goes Maine, so goes the Nation?" While this old political truism has faded in recent decades, the State of Maine is currently blazing trails in carefully considered wind power development. At the local level, small towns continue to pass moratoriums and strict setback standards. Most recently, Thorndike became the third town to set a one-mile setback, with the neighboring town of Dixmont taking up a similar ordinance at this week's town meeting. Meanwhile, two more towns, Avon and New Vineyard, joined four others who have hit the pause button on any wind farm developments by adopting moratoriums on any permits. These actions come in the wake of three projects that have generated significant noise issues for neighbors out to as far as 3000-3500 feet; thus, half-mile setbacks are being seen as not enough to avoid risk of disrupting rural lifestyles.

While these towns see the state as being overly aggressive in supporting ridgetop wind farms (abetted by the fact that a former Governor is one of the state's leading wind developers), when it comes to offshore wind development, the state's goals will be much more welcome for most coastal communities. Instead of opening Maine state waters to windfarm leasing, the legislature's Committee on Utilities and Energy is redrafting controversial ocean windfarm bill LD 1810 to do the very opposite. Under changes to be finalized today at the committee's 2nd worksession on the bill, "An Act To Implement the Recommendations of the Governor's Ocean Energy Task Force" will focus Maine instead on constructing floating deepwater windmills on land, and then deploying them at locations ten miles offshore and further, where wind speeds and higher and more consistent and fisheries are less impacted.

The plan received an enthusiastic response from the Maine Lobstermens Association, which has been very concerned about the impacts of any traditional bottom-mounted wind turbines on their activities near shore.

Habib Dagher, who leads the University of Maine's offshore wind project, offered a timeline for getting deepwater wind energy going off Maine. "Our goal is build our first demonstration floating turbine - a third-scale turbine about 120 feet above the water - next year, and place it in the water the year after in the Monhegan site," Dagher said. "In 2013 we would build the first 4 or 5 megawatt unit, In 2014 and 2015, a 25 megawatt farm." He predicted that offshore wind would keep growing: "The next phase is development of a large scale 500 to 1,000 megawatt farm. We have at least one developer interested to do that and have it operational in 2020"

22

UK: Noise complaints at 37 of 255 wind farms

Human impacts, News, Wind turbines 1 Comment »

Here's a bit of news that might be spun either way, depending on your predilection. Jane Davis, who was driven from her home by wind farm noise, has been compiling information on English wind farms and noise complaints; she has found that 37 wind farms have spurred some sort of noise complaints nationwide. This amounts to about 1 in 7 UK wind farms, in contrast to an oft-repeated mantra that "only four" UK wind farms had noise issues, and they'd been "resolved." The new numbers could support those cautioning that wind farm noise issues are more widespread than generally acknowledged, AND those who claim that noise issues are the exception rather than the

rule; it certainly reinforces AEI's theme that we need to acknowledge that a minority of people are affected by noise around wind farms, and that we must come to grips with how to address this.

This article in the Telegraph details some of the information shared at a gathering of wind farm noise campaigners, WindCon2010. Gillian Haythornthwaite, who lives near the wind farm in Askam with her partner Barry Moon, said it has been a "devastating" experience. "It is a dreadfully irritating whoosh, whoosh noise," she said. "It is unbearable to be outside in the garden when there is the noise."

Read the rest of this entry »

23

Ontario wind tech and health research chair named-background is solid in tech, weak on health

Health, Wind turbines No Comments »

Electrical engineer Siva Sivoththaman has been named to the newly-created Ontario provincial Research Chair in Renewable Energy Technologies and Health. Local activist groups that have raised concerns about the effects of wind farm noise on neighbors had hoped that this position, created as part of Ontario's new Green Energy Act, would take the lead in formally investigating the negative health effects some neighbors of wind farms have reported. However, the choice appears to be more oriented toward the technology aspect of the Chair's responsibilities. As noted in the request for proposals: "The Chair in Renewable Energy Technologies and Health will focus first on emerging science and technology related to wind turbines, and then will explore the potential health effects from renewable energy."

According to a news release, "Dr. Sivoththaman will bring focus to multi-disciplinary activities in renewable energy technologies and health, ensuring that health and safety are top priorities in the induction of new technologies. His research program will develop new technical approaches and will provide guidelines in setting standards to ensure health and safety in the manufacturing, use, and end-of-life phases of renewable energy technologies." Sivoththaman's research centres on silicon-based crystalline and thin-film photovoltaic devices, and he serves as director of the Centre for Photovoltaic Systems and Devices, which occupies much of the photovoltaic research building beside Matthews Hall. His interest extends to nanocrystalline semiconductors, and he was the first director of the University of Waterloo's nanotechnology engineering program when it was launched in 2004.

Two leading Ontario wind activist groups expressed their disappointment with the choice; Wind Concerns Ontario said "We have no faith in any meaningful body of evidence being produced on health effects from wind turbines by this government-funded non expert and Ontarians will suffer for it," while the Society for Wind Vigilance chair Dr. Robert McMurtry said the choice missed the mark in that "the lead and expertise of this Research Chair would more appropriately have been a clinician scientist. We strongly encourage the new Chair to seek the appropriate collaborators as the research program is established."

It is as yet unclear what the Chair's timeline will be in addressing the dual (and quite distinct) topics he is charged with overseeing. Given the widespread concern about health effects, and the role this concern is playing in the wind development process in Ontario and elsewhere, we hope that the two topics will be pursued simultaneously. And indeed, as McMurtry suggests, it is clear that the Chair will need to bring in some experts in health and

acoustics to effectively address the health aspects; in the spirit of collaboration and inclusiveness, we can also hope that his research/investigative team draws from qualified experts who have expressed concerns about wind noise, as well as those who have previously worked on reports that found few health effects.

11

Vinalhaven begins month-long "experiment" in reducing noise issues

Human impacts, News, Wind turbines 4 Comments »

The Fox Islands Electrical Cooperative on Vinalhaven, an island off the coast of Maine, has begun a month-long experiment as a first step in trying to come up with a local solution to noise issues from three wind turbines that began operating in November. About two dozen people within a half-mile of the turbines have reported annoying levels of noise, with six property owners claiming that their lives are severely impacted. Others in the same area who can hear the turbines are not particularly bothered by the noise.

Shortly after the turbines started operating, and some residents (including some who were excited about the wind farm, and some who had been skeptical) reported unexpected noise issues, neighbors began noting the times that the sound was most troublesome, in an effort to identify what wind directions or atmospheric conditions might be most to blame. At its January meeting the Board of the electric coop decided to conduct a month-long "experiment" during February, in which the turbines would be slowed down in random patterns. Sound measurements will be made throughout the month, and the 38 households within a half-mile are being asked to log their sense of the noise on a regular basis (half these households are summer people, so are unlikely to be participating). In a letter to coop members, the board said the experiment "will enable us, as a community, to figure out what to do and come to a solution that works, as well as possible, for everyone."

A very detailed article in The Working Waterfront, a local paper, features a variety of comments from a locals about the process that is underway to find a community-based solution to the noise problems. Some find that the noise is moderate enough to be tolerable, easily drowned out by other sounds such as the TV or a car passing by, or being no more bothersome than a dishwasher running in another room; one person remembers the noisy generator that used to provide power to the town in the 60s and 70s, which people got used to. Some who have been disturbed share their perceptions, as well; Ethan Hall notes that "I've never heard anything in my life that sounds like it." Both he and Lindgren (another neighbor being affected) believe that current sound measurement standards do not take into account the complexity of turbine noise and its true impact. "The nature of the sound is so unique, that to try and quantify or qualify it with a strict dBa [decibel] measurement is an entirely inadequate way of describing the effect on people and surroundings," Hall feels. An hour-long radio interview with Hall and others being affected, recorded this past December, is available on the WERU website.

The Acoustic Ecology Institute

May 31, 2010

Lawsuits begin to crop up, challenging nearby wind farms

In recent months, several lawsuits and formal complaints have been filed, claiming unlawful nuisance and/or impacts on property values and quality of life near wind farms. Most recently, sixteen residents sued the Michigan Wind I wind farm and its developers, laying out a series of complaints, including (as detailed in the Huron Daily Tribune):

- Private nuisance from, among other things, sustained and highly annoying audible noise and amplitude modulation in both audible and sub-audible frequencies
- Negligent design of a wind farm, including a noise assessment that estimated only audible noise levels within the dBA range, and did not consider low frequency noise or impulse noise
- Negligent misrepresentation, claiming the wind companies made false representations in board of commissioner and planning commissioner meetings and public hearings when company representatives said the wind farm's operations would not result in a noise nuisance or cause adverse health effects to adjacent landowners. "(The defendants) were negligent in making these misrepresentations because, as the parties seeking approval to construct a wind turbine farm in Huron County, they had a duty to use reasonable care to provide Huron County and its citizens with both accurate and complete information," the lawsuit states. The plaintiffs claim the wind companies provided inaccurate and/or incomplete information about the audible turbine noise levels, and no information about low frequency noise, infrasound and/or impulse noise emitted from the turbines.

In Pennsylvania, the Allegheny Ridge Wind Farm settled out of court this week as a lawsuit brought by Todd and Jill Stull was moving toward a jury trial in July. The suit alleged that the company misrepresented the noise levels that would be generated by assuring residents the noise would e minimal. The agreement is bound by confidentiality, so no details are available. See earlier coverage of the lawsuit here.

Meanwhile, in neighboring Wisconsin, a family that abandoned their home near the Forward Energy Wind Center, is assessing their options after the state Public Service Commission dismissed a complaint they filed, seeking compensation from the wind developer for business losses from their alpaca farm, health impacts and property value losses. The PSC determined that they did not have jurisdiction to consider the complaint, and recommended the family seek relief in circuit court. Read more on this in the Milwaukee Daily Reporter.

In Maine, neighbors of the Mars Hill wind farm filed suit in August, seeking compsensation for what they say is a resulting drop in their property values along with emotional and physical distress.

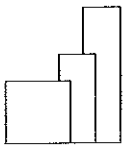
In 2006, residents near a Texas wind farm were rebuffed by courts in their region, which ruled that noise issues were aesthetic claims, and did not qualify for relief under nuisance laws. There, turbine noise averaged 28 dBA at

a distance of 1.7 miles from the wind turbines, and 44 dBA at 1,700 feet; it's worth noting that night time ambient sound levels are likely between 20 and 30dB in this ranch land.

Across the pond, a court in France responded to a noise complaint by ordering 8 wind turbines shut down from 10pm to 7am.

And, while not a court challenge, residents in Massachusetts have asked the state public health commissioner to assess the health and well-being effects of living near wind farms. Since a single turbine began operating in Falmouth, over forty nearby residents have struggled with noise issues; one, an air traffic controller, is concerned that sleep disruptions he's experiencing will affect his job performance.

http://aeinews.org/archives/926



McCann Appraisal, LLC

Interview with Ann and Jason Wirtz
N1157 Hwy YY
Oakfield, WI 53065
902 960 5246
Dodge County, Wisconsin
Conducted on the evening of May 2, 2009 by Lynda Barry

WIND TURBINE NOISE FORCES WISCONSIN FAMILY TO ABANDON HOME

TOWN OF OAKFIELD- While lawmakers in Madison consider a bill which will override local government and give the Public Service Commission of Wisconsin siting authority for wind farms throughout the state, one Dodge County family already living in a wind farm approved by the PSC has decided to abandon their home due to turbine noise.

Ann and Jason Wirtz have a pretty Wisconsin farmhouse near the Town of Oakfield. It's the kind of place that had people stopping by to ask if the family would consider selling it.

"They'd just pull into our driveway," says Ann. "There were people who said if we ever decided to sell it, we should call them."

Although turn-of-the-century house needed a lot of work when they bought it, they didn't mind. The Wirtz family planned to stay. They both grew up in the area and wanted to raise their children there.

"I thought we were going to live here for the rest of our lives." says Ann, a mother of four. "I thought one of our kids was going to live here after us."

This was before 86 industrial wind turbines went up around their home as part of the Forward Energy wind project which began operation in March of 2008. The closest turbine is to the Wirtz home is less than 1300 feet from their door.

"Last night it was whining," said Ann. "It wasn't just the whoosh whoosh whoosh or the roaring. It was a high pitched whine. And I don't just hear them, I can feel them."
She describes a feeling like a beat in her head, a pulse that matches the turbine's rhythm.
"Last night was really bad," she said.

She says she knows which nights are going to be loud by which way the turbine blades are facing, and her family dreads the nights when the wind is out of the west. "That's when they are the loudest."

Jason said he found out there was a wind farm planned for his area from a neighbor he ran into at the post office. "He asked me if I knew anything about the turbines coming in. I didn't." Jason came home and mentioned it to Ann.

"When I first heard about it I wasn't that alarmed." says Ann, "People were saying how bad they could be, but I just didn't believe them at first."

She assumed the turbines would be sited much further away from her home, unaware of the controversy over the setbacks approved by the Public Service Commission of Wisconsin which allows turbines to be sited close as 1000 feet to the homes of people like the Wirtzes.

"All those orange flags they put in were way back there. I was thinking it wouldn't be too bad. And then when that access road started coming in so close I said, 'what the heck is going on?'

Meanwhile, Jason had been attending town meetings and learning more about the project. The more he learned, the more worried he became. Five months before the turbines went up, the Wirtz family decided to sell their house.

They called people who had let them know they'd be interested in buying it. "When they found out about the turbines," said Ann, "They weren't interested anymore."

Wirtz family prepared the house to put on the market. In November of 2007, the home, sitting on eight acres, was appraised for $320,000. But this once sought-after property could find no buyers. "As soon as people found out about the wind farm coming in," says Ann. "That was it. And once they started building the roads to the turbines, forget it. They'd ask what that road was for, we'd tell them and we'd never hear from them again."

After the turbines went up, interested buyers stopped showing up altogether.

"We tried to find another realtor," said Ann, "They'd ask 'is it near the wind turbines?' and when they found out it was, they wouldn't even bother to come out to the house to look at it. One realtor told me it wasn't worth her marketing dollars to even list it because if it was in the wind farm she knew she couldn't sell it. I mean have you ever heard of a real estate agent turning down a chance to sell a house?"

Another realtor said they would have to price it well under $200,000 to get anyone to even look at it. "At that price we were going to be $50,000 worse than when we started, " said Ann. "And that didn't include the 12 years of work we put into the place."

But the Wirtzes were increasingly anxious to get away from the turbines. While Jason, who works nights, wasn't having much trouble with the turbine noise, it was keeping Ann and her children from sleeping well at night. They were tired all the time. They were also getting frequent headaches.

And there was trouble with their animals as well. The Wirtz family raise alpaca and have a breeding herd. Ann says the Alpaca became jumpy the first day the turbines went on line. "Normally they are so calm. But the day the towers started up, they seemed to panic. They were on their back legs right away."

Ann says the herd had always been docile and healthy, with no breeding problems. Since the wind farm started up, their temperament has changed and none of the females have been able to carry a pregnancy to full term. " They're nervous all the time now. I can't prove anything but I do know my animals. And I really felt something was wrong. All the years we've had them we've never had a problem."

At night herd shelters in the large metal shed behind the Wirtz home. When the turbines are loud, Ann says the sound echoes inside the shed and the metal vibrates and hums. "The noise in here gets just unbelievable. When the tin starts to vibrate in here, they can't stand it. I have to find them a better home. This is torture for them."

The same turbine noise has driven Ann out of her own bedroom "I can't stand to be in that room anymore. I don't sleep at all. My sleep has been terrible." Instead she sleeps on the couch where a fan on their pellet stove helps counter the turbine noise. "My number one complaint is how tired I am all the time," says Ann, "I never had that before, ever."

Says Jason, "We don't have air conditioning, we didn't want it and we didn't need it. In the summer we just opened the windows and let cross breezes cool the house. But the first summer with the turbine noise we had to shut the windows and turn on the fan. We couldn't stand it."

After one of the children was recently diagnosed with a severe stress-related illness, the Wirtzes decided they'd had enough. They decided the health of their family was more important than keeping their home, and they are abandoning it.

"Now, after all the trouble we've had living here" said Ann, " If a family showed up and wanted to buy the place and they had kids, I don't think I could sell it to them. Knowing what I know about living here, I just don't think I could put another family through this."

They are now looking for a place in a nearby village. "We were born and raised in the country but we're thinking of moving to Oakfield because they aren't going to plop a 400 foot turbine in the middle of the village, says Jason. "And I know I'm going to have to drive by this place every day on my way to work. It's going to make me sick to see it, but I can't stay here anymore."

Ann adds, "I say we move near whoever it is that decides on the setbacks because you know they'll never have a turbine by their place"

Jason and Ann sit at the dining room table and point out the elaborate woodwork they'd stripped and re-finished by hand. Jason holds a picture of the farmhouse from happier times. Earlier that day they'd met with the people at the bank to let them know they were giving up their home.

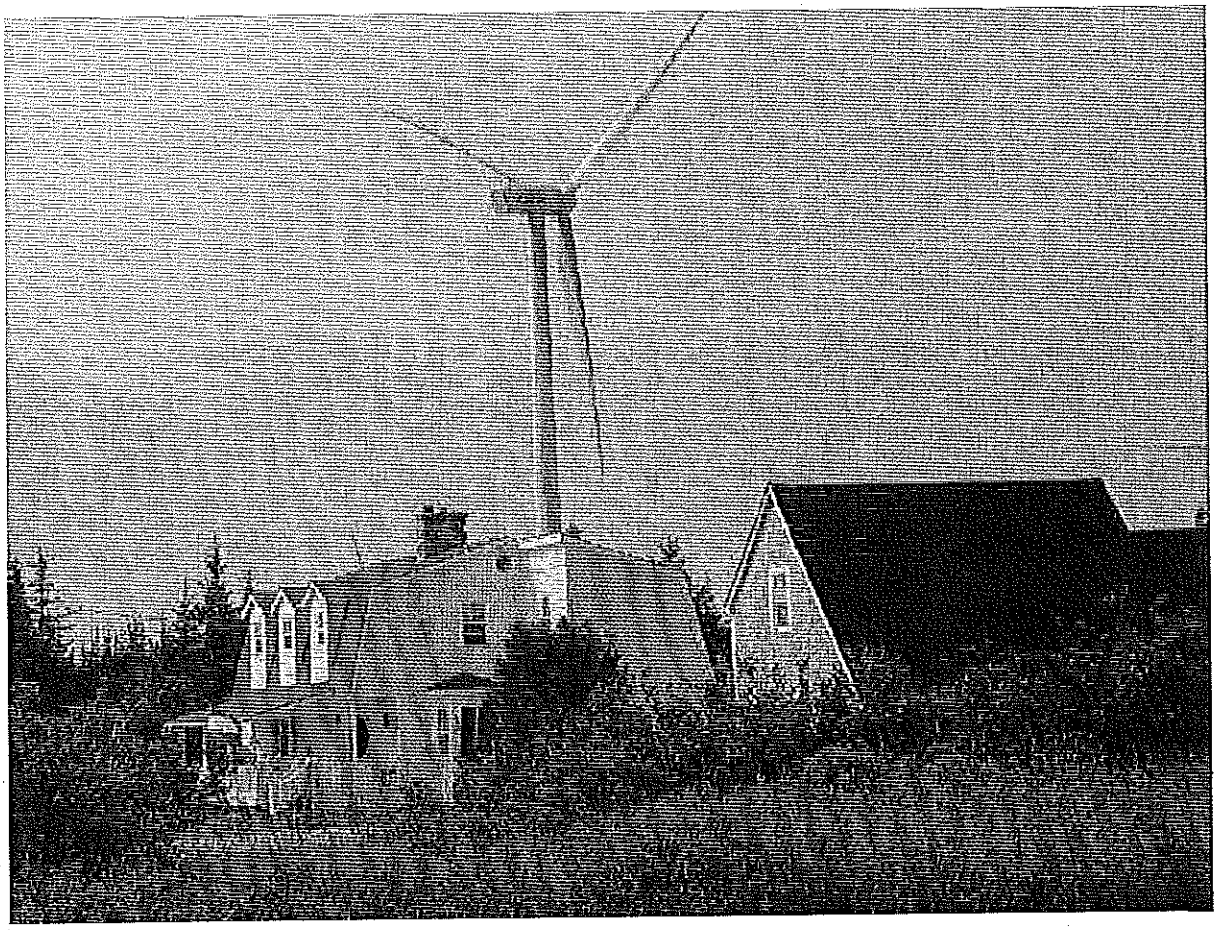
Jason says, "At least we're young enough to start over. My mom, she doesn't have much money and now she has turbines around her house. She said, 'This house was my retirement,' Her and my dad put everything into that house. Now I don't know what she's going to do." Jason says, " The quality of life we had here is just gone. I grew up here and I loved it here. But I don't anymore. "

Appendix F

Representative Sample of Neighbor Complaints

Name	State	Project	MW	Turbine Setback	Notes
Rene Taylor	IL	Twin Grove	396	1500	sued over substation near home; suit dropped but can be brought again
David & Stephanie Hulthen	IL	Illinois Wind		1500	complained
Patty Spalding	MA	Newburyport			complained; worked to get ordinance changed
Sharon Eddy	MA	Falmouth			complained
Todd Family	ME	Mars Hill	42	2500	sued town and company
Carol Cowperthwaith	ME	Mars Hill	42	2500	sued town and company
Phil Bloomstein	ME	Freedom		1000	no action
Ethan Hall	ME	Vinalhaven		2500	threatening suit. Wind company claims they are trying to fix the problem
David and Sally Wylie	ME	Vinalhaven		2500	threatening suit. Wind company claims they are trying to fix the problem
Art and Cherly Lindgren	ME	Vinalhaven	42	2500	threatening suit. Wind company claims they are trying to fix the problem
Fletcher Family	ME	Mars Hill	42	2500	sued town and company
Boyd Family	ME	Mars Hill	42	2500	sued town and company
Harris Family	ME	Mars Hill	42	2500	sued town and company
Burtchell Family	ME	Mars Hill	42	2500	sued town and company
Gene Champagne	MI	Harvest Wind Farm			registered complaint
Charlie Porter	MO				sued wind company, case dropped
Daniel & Carolyn d'Entremont	Nova Scotia	Pubnico Point		1000	abandoned home
Tim Yancey	NY	Maple Ridge			filed complaints
Jessica	NY	Sheldon Wind			no action
Jim and Judi Hall	NY	Cohocton Wind			filed complaints
Hal Graham	NY	Cohocton Wind		1000	has turbine on land; came out against wind company
Colette McLean	Ont			1000	developer purchased her home
Barbara Ashbee-Lormand	Ont			1000	abandoned home
Dale Rankin	TX	Horse Hollow			sued but lost in court
John Ruggiero	TX	Barton Chapel		2500	complained to county
Tom Shea	VT	Searburg		1000	complained; asked for property value reduction
Larry Wausch	WI			1500	complained
Gerry Meyer	WI	Forward Wind		1100	complained
Ann and Jason Wirtz	WI	Forward Wind		1000	abandoned home; filed suit
Tony S. Moyer	WI	Cedar Ridge		1320	complained
Barbara Aper	IL	Rail Splitter		1500	sued; settled; sold at reduced price. Horizon wind guarenteed property value
Todd and Jill Stutes	PA	Allegheny Ridge		2000	sued over noise; case accepted in court and pending

Why did the people who once lived in this house have to abandon it?



The home in the photo above was made uninhabitable by wind turbine noise and vibration. The family who once lived here were forced to abandon their home in 2006. Three years later, it remains empty and unsold. To read more about this story, http://www.windaction.org/news/3003

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Tuning and sensitivity of the human vestibular system to low-frequency vibration

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ABSTRACT

Mechanoreceptive hair-cells of the vertebrate inner ear have a remarkable sensitivity to displacement, whether excited by sound, whole-body acceleration or substrate-borne vibration. In response to seismic or substrate-borne vibration, thresholds for vestibular afferent fibre activation have been reported in anamniotes (fish and frogs) in the range −120 to −90 dB re 1 g. In this article, we demonstrate for the first time that the human vestibular system is also extremely sensitive to low-frequency and infrasound vibrations by making use of a new technique for measuring vestibular activation, via the vestibulo-ocular reflex (VOR). We found a highly tuned response to whole-head vibration in the transmastoid plane with a best frequency of about 100 Hz. At the best frequency we obtained VOR responses at intensities of less than −70 dB re 1 g, which was 15 dB lower than the threshold of hearing for bone-conducted sound in humans at this frequency. Given the likely synaptic attenuation of the VOR pathway, human receptor sensitivity is probably an order of magnitude lower, thus approaching the seismic sensitivity of the frog ear. These results extend our knowledge of vibration-sensitivity of vestibular afferents but also are remarkable as they indicate that the seismic sensitivity of the human vestibular system exceeds that of the cochlea for low-frequencies.

The otolith organs, the sacculus, utriculus and lagena, primarily respond to whole-body acceleration or tilt in gravity [9]. In fish these also are important auditory structures for acoustic near-field (particle motion) sensing [13,17]. Several studies have determined behavioral particle motion audiograms for non-specialist species of fish, e.g. the cod, plaice and dab [4]. These have indicated that the region of best sensitivity lies between 40 and 120 Hz, with threshold acceleration values of about −120 dB re 1 g at 80 Hz. During the course of evolution the amniote ear developed new structures for far-field (sound pressure) hearing in air, including the basilar papilla and the mammalian cochlea [6].

It has been established, however, that the otolith organs in terrestrial vertebrates have conserved a particular sensitivity to substrate- or bone-conducted sound [2,15,16,22] consistent with their function as near-field sound sensors in fish [4]. In some species of frog the saccule shows a fish-like band-pass response to acceleration with best frequencies between 20 and 160 Hz and thresholds between −90 and −120 dB re 1 g, while others show a low-pass response with best frequencies at 10–20 Hz [14]. Sensitivity to audio-frequency vibration has also been demonstrated in mammalian vestibular organs. In the monkey [27] best frequencies were between 125 and 177 Hz, with phase-locking threshold as low as −80 dB re 1 g, and in the guinea-pig at 500 Hz thresholds were 10 dB above the ABR threshold [3]. At present, however, no such threshold measurements have been obtained for the human vestibular system and this was the aim of our study.

Non-invasive assessment of human vestibular sensitivity can be accomplished by measurement of the powerful vestibulo-ocular reflexes (VOR) to head acceleration. The VOR normally serves to maintain eye gaze with head tilt or rotation and its main effects are mediated by a simple three-neuron arc connecting the vestibular portion of the 8th nerve to the motor neurones of the extraocular muscles [1]. In response to stimuli such as head movements, reflex activity occurs in the extraocular muscles, producing a compensatory eye movement. By placing surface electrodes around the eyes, synchronous muscle activity can be recorded in the form of ocular vestibular evoked myogenic potentials (OVEMPs) [23,25]. These responses are vestibular, rather than cochlear, in origin as they are present in deaf patients but are absent in patients with loss of vestibular function [18,24]. We aimed to measure the tuning and sensitivity of OVEMPs to whole head vibration in the transmastoid plane.

Four volunteers (2 females and 2 males between 31 and 52 years of age) with no auditory or vestibular deficits were stimulated using sinusoidal accelerations between 12.5 and 800 Hz (12.5, 25, 50, 100, 200, 400 and 800 Hz). The subjects were seated

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Fig. 1. A photograph of the experimental apparatus used to apply a perspex rod (attached to a B&K 4810 mini-shaker) with a constant tonic force to the mastoid of the subject. The stimulator is mounted on a 2:1 lever which can rotate freely in the horizontal plane and is pivoted on a vertical adjustable stand. A torque is applied at the opposite end of the lever by means of a mass M suspended by wire over a pulley below the fulcrum which can be adjusted so that the tension in the wire acts at an angle θ to the plane of the lever. The tonic force at the mastoid then is given by $F = 1/2Mg\cos\theta$, which for a mass of 1 kg and applied angle of 45° is 3.5 N.

upright and directed their gaze upwards (for frequency tuning) or straight ahead (for threshold determination), as this provided the best signal to noise ratio. A 70-year-old patient with autoimmune vestibular disease was tested as a control. He had no VEMP response measured from the neck muscles when stimulated with standard stimuli (air- and bone-conducted 500 Hz, 2 ms tone bursts at 142 dB peak SPL and 136 dB peak FL, respectively). There was no response to conventional caloric stimulation and minimal response to ice water stimulation. He was stimulated at 100 Hz only and OVEMPs were recorded during up-gaze.

Stimuli were delivered by a cylindrical perspex rod (diameter 2.5 cm, length 9.2 cm) attached to a vibrator ("Minishaker", model 4810, Bruel & Kjaer P/L, Denmark). The rod was placed normal to the skull in the horizontal plane just above the mastoid in order to produce primarily translational head acceleration (Fig. 1). A constant force was maintained by a pulley system with a weight of 1–2 kg. Stimuli were generated by means of customized software, using a laboratory interface (1401plus, Cambridge Electronic Design, Cambridge, UK).

Head acceleration along the y-axis was measured using two accelerometers (model 751-100, Endevco, California, USA) placed normally to the skull on the temporal bone directly superior to the ears and held in place by tight elastic bandages. For all stimulus frequencies, skull acceleration was kept constant at −20 dB re 1 g (0.1 g) by adjusting the driving voltage to the stimulator as required. This excluded effects of skull resonance. OVEMPs were measured using pairs of Ag/AgCl electrodes in bipolar montages. The first electrodes were placed on the orbital margin inferior to the eye and the second 2–3 cm below on the cheek, with an earth electrode over the sternum. Stimuli were presented for 100–1000 repetitions at a fixed rate of approximately 3 Hz. EMG was amplified and bandpass filtered (5–1000 Hz), then sampled at 10 kHz from 10 ms before to 290 ms following stimulus onset and averaged. Blink artefacts were automatically rejected. Amplification and analog filtering were performed by a bank of D150 amplifiers (Digitimer Ltd., Welwyn Garden City, UK) and their outputs sampled by means of a second CED 1401plus using SIGNAL software.

For frequency tuning the results for the four normal volunteers were averaged and a spectral analysis carried out. This was done digitally by a bank of filters or resonators (damped sinusoids) with impulse response $y(t) = \sqrt{2\alpha}\exp(-\alpha t)\exp(i\omega t)$ spaced logarithmically on the frequency-axis (24 per octave) and with a constant-Q tuning such that $\alpha = \omega/2Q$ where the sharpness of tuning was defined by $Q = 32$. The output was obtained by taking the root peak power over time for each frequency channel scaled by $\omega/2$ to normalise for the different duration of the stimuli and to make the peak power in time- and frequency-domain equivalent. The frequency response was fitted using a second-order velocity resonance curve such that the OVEMP magnitude as a function of frequency $V(\omega)$ was approximated by

$$V(\omega) = G\left[\frac{\omega^2}{(\omega_0 - \omega)^2 + \gamma^2\omega^2}\right]^{1/2} \quad (1)$$

where G is the gain, $\omega_0 = 2\pi f_0$ is the resonance frequency and $\gamma = \omega_0/Q$ is the damping factor.

OVEMP and auditory perceptual thresholds were measured in the four normal volunteers using the best frequency (100 Hz). Responses close to threshold were considered present if they had at least two clear peaks at the correct latency. Threshold measurements were obtained from the average of the OVEMP responses across the subjects in order to increase the signal-to-noise ratio. Amplitudes were measured using the clearest peak. Near threshold, the presence of a response was confirmed by a cross-correlation between the signal and response. The OVEMP magnitude as a function of acceleration $V(a)$ was plotted against the stimulus level using a log-log scale, assuming a power law of the form

$$V(a) = ka^{\beta} \quad (2)$$

where k is a scaling constant and β is the power law parameter. When transformed logarithmically the power law becomes linearized, so that β may be obtained from the slope of the linear regression.

The mean auditory threshold x_T and dispersion σ were obtained by fitting a logistic function:

$$p(x) = \left\{1 + \exp\left[-\frac{(x - x_T)}{\sigma}\right]\right\}^{-1} \quad (3)$$

where $x = 20\log(a)$ and $p(x)$ is the probability of hearing the stimulus. This may be linearized by letting $y = \ln(p/(1-p))$ so that the logistic function becomes $y = x/\sigma - x_T/\sigma$. The parameters x_T and σ may then be obtained from the slope m and intercept c of the linear regression such that $\sigma = 1/m$ and $x_T = -c \times \sigma$.

When the head was vibrated at different frequencies it produced OVEMPs which differed in amplitude and morphology (Fig. 2). The best frequency in all four volunteer subjects was 100 Hz, which evoked responses which were clearly out of phase in the two eyes. The 100 Hz tuning can be seen in both the morphology, which displays ringing (Fig. 2), and when the response is analysed in the frequency domain (Fig. 3). In the patient with vestibular hypofunction only very small responses were seen, despite adequate head acceleration (Fig. 4).

The response obtained in normal subjects was indicative of a system resonance and indeed the data was fitted quite well using the velocity resonance equation with $f_0 = 80$ Hz and quality factor $Q = 2$ (Fig. 5a, Eq. (1)). At or close to the best frequency it was possible to measure responses to very small head accelerations which required averaging even to read the peak acceleration. When stimulus intensity at 100 Hz was systematically reduced, responses were recorded in the averaged response (across the four subjects) to accelerations as low as 70.2 dB below 1 g (Fig. 5b). When transformed logarithmically the OVEMP amplitude growth curves were well-fitted with a linear regression with slopes (β) ranging from 0.6 to 0.8 (Fig. 5b, Eq. (2)).

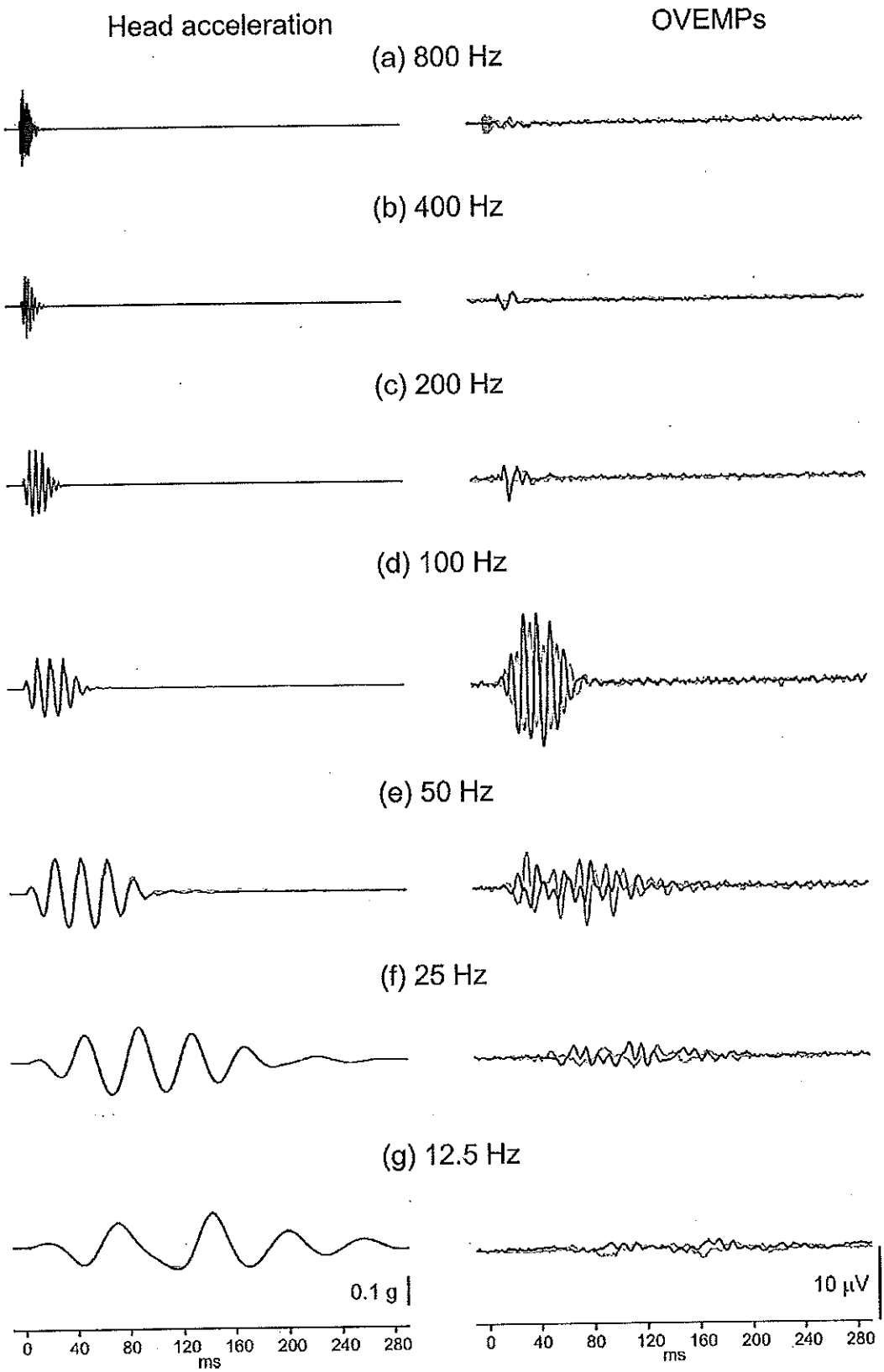

Fig. 2. Head acceleration measured from the left (black) and right (grey) mastoids (left column) and OVEMP responses from the left (black) and right (grey) eyes (right column) to sinusoidal vibrations at 800–12.5 Hz (parts a–g). The head moved as a whole in response to the applied forces and positive acceleration was always towards the left. Stimuli had lengths of 5 cycles (1 cycle rise, 2 hold and 2 fall), except at 800 Hz (duration 12.5 ms: 2.5 ms rise, 5 hold, 5 fall) and 12.5 Hz (duration 2 cycles: 1/2 rise, 1 hold and 1/2 fall).

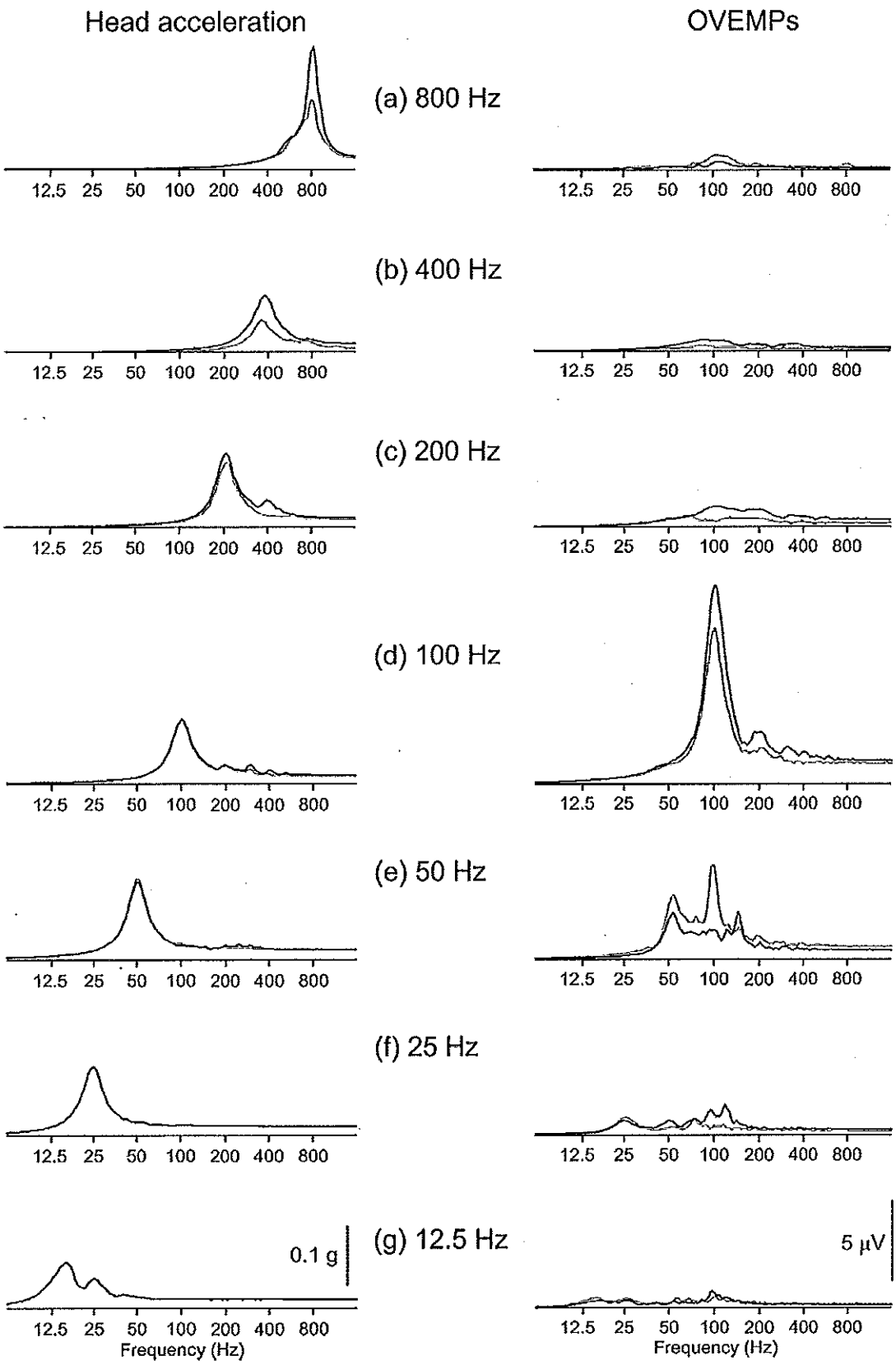

Fig. 3. The root power spectrum of the head accelerations (left column) and OVEMP responses (right column) to sinusoidal vibrations at 800–12.5 Hz (parts a–g) (black = left and grey = right).

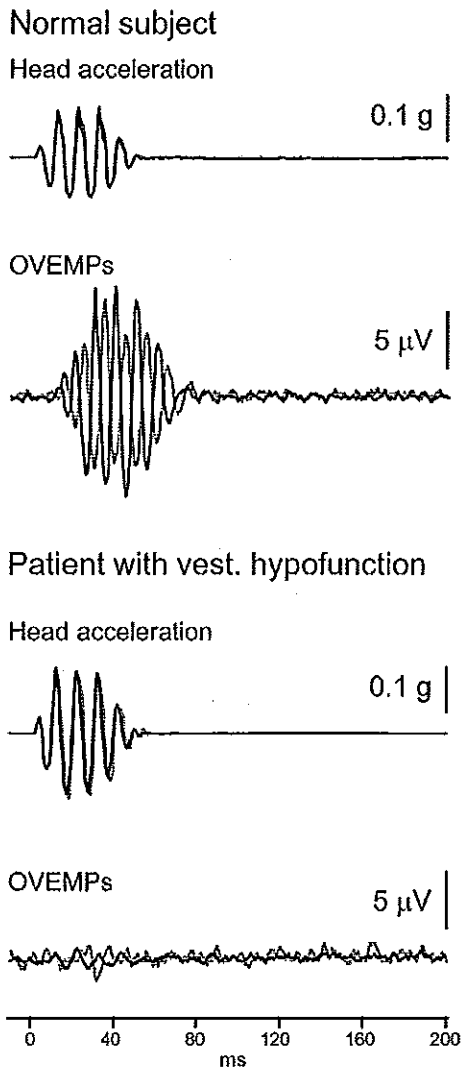

Fig. 4. Head acceleration and OVEMPs recorded from a normal subject (upper traces) and a patient with bilateral vestibular hypofunction (lower traces), who were best matched for age. Head acceleration, measured from the left (black) and right (grey) sides of the head, was slightly greater in the patient. Despite this, the OVEMPs, measured from the left (black) and right (grey) eyes, were very small in the patient compared to the control subject.

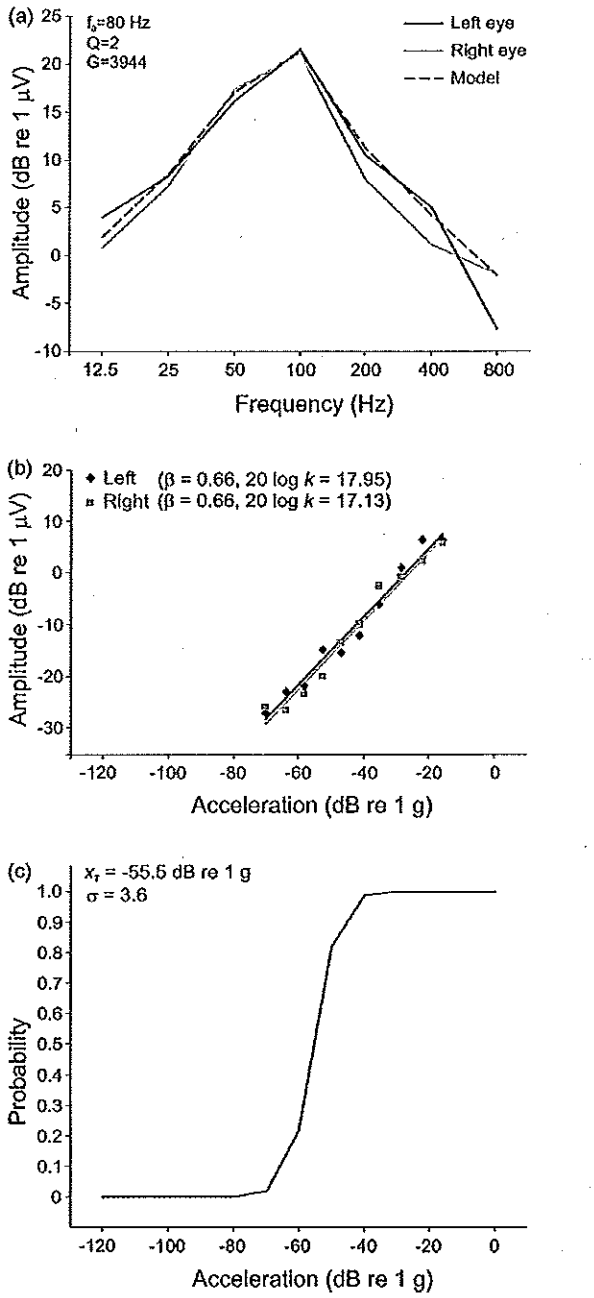

Fig. 5. (a) OVEMP amplitude in the average of four subjects as a function of stimulus frequency (Eq. (1))(in all sections left eye = black, right eye = grey), (b) growth in mean OVEMP amplitude as a function of mean head acceleration (Eq. (2))and (c) probability of hearing the stimulus as a function of head acceleration (Eq. (3)).

At the lowest intensity the subjects could not hear or feel the stimulus on the mastoid. The estimated auditory threshold at 100 Hz (Fig. 5c, Eq. (3)) was approximately 55 dB below 1 g, which compares well with previous estimates [26]. The mean perceptual threshold was some 15 dB higher than the lowest intensity at which we could measure an OVEMP in the averaged response.

Our results show very clearly that OVEMPs are highly tuned with a best frequency of about 100 Hz and with a band-pass characteristic between about 25 and 200 Hz, thus showing a strong similarity with data from afferent fibres of the anamniote otoliths. The lowest intensity at which we were able to record a reliable OVEMP in the averaged response was −70.2 dB re 1 g, which is comparable with Graybiel and Patterson's [7] estimate of 3.44×10^{-4} g (−69.2 dB re 1 g) for the threshold for stimulation of the human otolith organ using acceleration. This value is 20–50 dB above estimated thresholds for the 8th nerve afferent data in anamniotes. However, as in the case of estimating auditory thresholds from the auditory evoked potentials (AEP), which can overestimate thresholds by as much as 20 dB or more [11], especially for low-frequency sound, it is almost certainly the case that our OVEMP thresholds are 20 dB or more above the primary afferent threshold. There will be some signal loss during synaptic transmission in the VOR pathway and also the signal-to-noise characteristics will be reduced from surface EMG recordings, with many other muscles contributing noise. Allowing for this additional factor, our estimated threshold lies between 0 and 30 dB of the anamniote values. We may postulate therefore that human vestibular afferents in response to audio-frequency vibration do indeed fall within the sensitivity range of fibres innervating the frog saccule. With regards the growth in response, the power law slopes we obtained, 0.6–0.8, were in the range found

both physiologically and psychophysically for the auditory system [20].

The very low thresholds we found are remarkable as they suggest that humans possess a frog- or fish-like sensory mechanism which appears to exceed the cochlea for detection of substrate-borne low-frequency vibration and which until now has not been properly recognised. Previous reports have shown that vibration around 100 Hz is an effective means of activating the vestibular system in humans but signs of such activation are usually not evident in normal subjects, only becoming apparent in the presence of a unilateral lesion [8,10,12]. By measuring OVEMP responses to low-frequency vibration, not only is vestibular activation evident in normal volunteers, but very low stimulus intensities can be shown to be effective.

These observations raise some fundamental questions regarding the mechanisms that may contribute to the tuning and sensitivity properties. Hair-cells are known to exhibit electrical resonance in the low-frequency range due to the interaction of transduction and basolateral currents [9,19]. The otolith organs are known to have a mechanical tuning due to their elastic and inertial properties, the band-width of their mechanical response extending to 500 Hz [5]. It is possible also that the neural properties of the VOR circuit contribute to the tuning. In addition, a fundamental question is also raised as to the possible behavioral consequences, if any, such a mechanism may have. Several, not necessarily mutually exclusive, hypotheses have been proposed. It has been suggested that vestibular acoustic sensitivity could contribute to the quality of acoustic perception and acoustic affect and may account for the compulsion to exposure to loud low-frequency sound [22]. As early as the 1930s Tait [21] suggested that the otoliths in humans could contribute to the perception of one's own voice. Given the threshold values we have obtained, there can be no doubt that the voice will itself activate the vestibular system. Our findings should therefore stimulate further investigations into the questions raised by the remarkable human vestibular sensitivity to low-frequency seismic energy.

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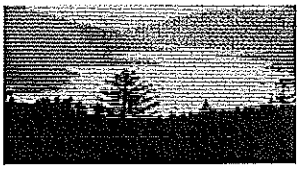


Save Our Scenic Area (SOSA)
PO Box 41, Underwood WA 98651
www.saveourscenicarea.org

Comment on Whistling Ridge Energy Project

Draft Environmental Impact Statement (DEIS)

Specific and General Comments of Sections 1 thru 3

August 27, 2010

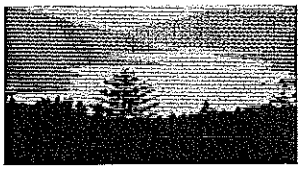
Stephen Posner
Energy Facility Site Manager
Washington EFSEC
905 Plum Street SE, 3rd Floor
PO Box 43712
Olympia, WA 98504-3712

Andrew M. Montaño
Environmental Protection Specialist
Bonneville Power Administration
PO Box 3621 - KEC-4
905 NE 11th Avenue
Portland, OR 97208-3621

Dear Messrs. Posner and Montaño:

Save Our Scenic Area (SOSA) is involved with the Whistling Ridge Energy (WRE) project application as an Intervener. SOSA is a non-profit corporation formed by concerned local Gorge citizens. Its primary mission is to help preserve the Columbia River Gorge National Scenic Area view-shed; to further maintain the existing rural and scenic character of Underwood, Washington, and surrounding communities in Washington and Oregon; and work to preserve the intent of the Columbia River Gorge National Scenic Area Act. I am writing today to provide comments on the recently issued draft environmental impact statement (DEIS) for the WRE proposal.

SOSA is submitting several different comment letters, covering a variety of subject matter within the DEIS. We have also reviewed the comments submitted by the Friends of Columbia Gorge, agree with them and incorporate them by reference. There are multiple environmental issues involved in the consideration of this project and it is important that each be given through consideration in the EIS process. We find that, in many areas, the present DEIS is completely insufficient and we urge that the NEPA/SEPA responsible officials prepare a supplemental DEIS.



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The following 24 pages of charted comments, plus Exhibits, are intended to address some, but not all, of the deficiencies noted in the WRE DEIS. In all cases, the deficiencies are explained. In most cases, particular remedies are suggested. Because no remedy is proposed by SOSA does not mean there should not be one implemented by the NEPA/SEPA responsible officials.
Two of the larger sized Exhibits will be included as separate PDF files: exhibit 2E and exhibit 2F.
All other exhibits appear at the end of this charted comment letter/file.

Thank you for this opportunity to comment on the DEIS. SOSA trusts that the DFEIS and FEIS will provide facts and analysis on the issues raised herein.

Regards,

Thomas Drach, PE
Board Member

Specific DEIS Comments from Save Our Scenic Area (SOSA)

August 27, 2010 PO Box 41, Underwood WA 98651 www.saveourscenicarea.org

Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
1	1	1	1.1	1	...and there is a proven wind resource at the site.	The use of the word "proven" should require substantiation. A review of government websites, like the National Renewable Energy Labs (NREL), found at windpowermaps.org, shows a wind rating for the WRE site as Marginal to Fair. They should provide met tower data, and the location of such. The only currently observed tower, from a public vantage point, is located on the highest predicted wind power location within the site, so additional met tower data should be provided at the lowest predicted locations as well. Given the Federal Investment Tax Credit, it is imperative that the public grants are used up on the best potential wind resources first, which this site is NOT. (according to goverment predicted models) The Applicant should justify with supportably detail data to demonstrate otherwise. see also comment at 1-9 (1.4.1)	Exhibit 2B Exhibit 2C	Wind Resource must be quantified by met tower data in multiple locations, and with wind direction in all THREE axes. Then these data must be compared to the alternative of wind resources in the Eastern portion of WA State. Wind power versus wind speeds must be discussed and compared.
2	1	7	1.3.1	2	BPA must consider the environmental consequences of its proposed actions—in this case, the proposed interconnection of the project to the FCRTS—under NEPA...	BPA must consider under NEPA, not only the environmental impacts of the substation, but also the environment impacts of the WRE project as a whole, when issuing it's Record of Decision		BPA must consider under NEPA, not only the environmental impacts of the substation, but also the environment impacts of the WRE project as a whole, when issuing it's Record of Decision
3	1	8	1.3.2	4	Those agencies may use this EIS in order to fulfill their NEPA or SEPA responsibilities.	Providing that the final EIS is a fair, accurate, clear, and truthful document of the issues.		Issue a complete and accurate final EIS as the document used by Decision-makers in the Adjudicative process.
4	1	9	1.4	1	Two alternatives are evaluated in this EIS: the Proposed Action (authorizing construction and operation of the proposed Whistling Ridge Energy Project and associated components) and the No Action alternative ...	Proposed Action and No Action alone does not satisfy SEPA or NEPA requirements. The extent of available lands in the analysis should be determined by partnerships or contracts between Applicant and other parties/investors.		Reference SOSA comment letter addressing the topic specifically, in detail
5	1	9	1.4.1	2	• The site has a proven, robust wind resource	- No legal data exists for A1-7, South of South BPA line, due to no conditional use permits issued by Skamania County, confirmed by Public Information Request, Drach to Skamania County Planning Dept. July 2010 - Any Met tower Data in the Appendicies? - NREL wind power maps show the WRE site ranging from Marginal to Fair, as compared to typical Eastern WA projects listed as Fair to Good (www.windpowermaps.org) see also comment at 1-7 (1.3.1)	Exhibit 2G	Wind Resource must be quantified by met tower data in multiple locations, and with wind direction in all THREE axes. Then these data must be compared to the alternative of wind resources in the Eastern portion of WA State. Wind power versus wind speeds must be discussed and compared.
6	1	11	1.4.1.3	3	. The Underwood Tap to Bonneville Powerhouse 1-North Camas 115-kV line adjacent to North Bonneville-Midway 230-kV transmission line would require a new steel lattice structure to raise the conductors such that the 230-kV line can cross underneath for this interconnection.	The explanation of this requirement is unclear.		Provide a graphic of the substation site and locations of extra towers required. Identify if this is related to both potential substation locations.

Specific DEIS Comments from Save Our Scenic Area (SOSA)

August 27, 2010 PO Box 41, Underwood WA 98651 www.saveourscenicarea.org

Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
7	1	12	1.4.1.5	4	Less than 5,000 gallons per day is anticipated for kitchen and bathroom use.	No mention of quantity of water used to wash/clean Wind Turbine Blades and Towers. No mention of detergents involved in cleaning operation, nor potential release of chemicals into ground water from Turbine cleaning operations.		All uses of water at the site must be discussed, and the impacts of ALL water releases into the environment must be identified and addressed. I.e. washing the exterior of the Industrial Equipment.
8	1	12	1.4.2	1	This [No Action]alternative would not help the state of Washington in achieving the renewable energy goals mandated by the state's RPS.	This is true for the ALL ALternatives, Action or No Action. There is no control over which state gets credit for the Renewable Energy from WRE, the power is sold to the highest bidder. EFSEC would need to condition WRE's permit to sell its power only to Washington State entities, resulting in possible legal complications.		The EIS can not claim that WA RPS are benefitted as a result of this Project as proposed. This must be removed as a discussed Benefit of the Project, unless an approved permit conditions the sale of WRE power ONLY to Washington State CONSUMERS, via utility contracts.
9	1	13	1.4.3.1	2	• Applicant-owned land that contained high ridges on which to place wind turbines with little impact to the continued underlying use of the land for commercial forestry	Applicant states in DEIS that commercial forestry would cease for the life of the Project. Plus, why are high ridges mutually exclusive for wind, this is not true for most all Projects in Eastern WA and OR. Note: this citation is one of 3 KEY criteria for establishing a site. It is flawed in logic, and will bias the conclusion that only the proposed site is feasible.		The Alternatives analysis must be redone with the criteria removing the requirement of placement on a high ridge, as this artificially excludes viable lands. Remove the limitation of placement only in areas used for commercial forestry.
10	1	13	1.4.3.1	2	• Land in proximity to existing high voltage transmission lines	Proximity simply translates to a financial impact, which would be covered as a potential negative in a proposed alternative. Simply not including an alternative due to cost is not complying with SEPA and NEPA. It is up to the decision-makers to determine if those potential extra costs outweigh any potential benefits of the alternate location.		The DEIS should identify viable Alternatives by including projects in lower impact areas. In the case of a location distant from the GRID, presumably a larger MW capacity would be contemplated to justify the extra cost, and these analyses should be made available to all to understand.
11	1	14	1.4.3.2	3	These objectives include providing a minimum level of generation to be attractive to utilities seeking to fulfill their RPS requirements, ...	Documentation should support these claims as to the minimum level power genereation, as well as the Entities (presumed Buyers) which have conditioned future potential agreements upon said minimum level of power generation, and the service area of said Entities. (ie. WA, CA, AZ, etc.)		The EIS should include written statements from prospective Utilities which might purchase power from WRE, stating whatever conditions should exist for a Purchase Agreement to be negotiated at some future date.
12	1	14	1.4.3.2	3	In order to provide this return, the Applicant has determined that the project must be capable of producing a minimum of 70 MW.	Unsubstantiated claim, this is a private project operated for the public good, therefore financial analysis and justification is NOT exempt from review. (ie for WA RPS mandates)		The EIS should include written statements from prospective Utilities which might purchase power from WRE, stating whatever conditions should exist for a Purchase Agreement to be negotiated at some future date.

Specific DEIS Comments from Save Our Scenic Area (SOSA)

August 27, 2010 PO Box 41, Underwood WA 98651 www.saveourscenicarea.org

Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
13	1	15	1.4.3.5	1	**Alternative Project Configurations** As discussed above, the proposed project site contains a series of ridge lines that are conducive to locating wind turbines but at the same time are limiting as to where those turbines can be placed. This means that there are limited options for locating wind turbines within the site.	With the restricted area cited in the DEIS for Turbine micro-siting, the minimum 70MW economic viability number, and the marginal wind conditions cited by NREL, any ersatz assumptions about Project perfomance could lead to economic failure. With such a tight margin for error, as claimed by the Applicant, the overall Project risks appear to surpass the proposed benefits. This must be considered by the Council in contrast to the same circumstances of Kittitas, Big Horse, etc. Economic viability, with the Federal PTC, and without the Federal ITC of 30%, should be validated by the SEPA Responsible Official.		WRE, touted as a project to help WA society to meet its RPS goals, is a project for the Public welfare, and must include financial viability. The project's decision-makers must have the financial date, so potential Environmental COSTS to the public can be weighed relative to potential private PROFITS.
14	1	16	1.4.3.6	2	Alternative Access Roads • **Route 1:** Ausplund Road to a private logging road vacated by Skamania County in 1987, which crosses private property (not owned by the Applicant) that is currently used for residential, agricultural orchards, and commercial timber production and harvest	There is at least a 500' portion of the old Ausplund Road that does not exist, it is overgrown with trees. (Picture attached) The portions of Ausplund Road Private are not available to the Applicant. Road building and improvements within the CRGNSA have been acknowledged by the Applicant as not allowed. This is simply NOT a viable Alternative, and therefore does not satisfy the SEPA requirments. Applicant failed to include viable alternatives, like **Little Buck Creek Road**, which publicly connects with their land, and would **reduce** traffic congestion on Cook-Underwood Road, since it turns off early in the proposed route.	Exhibit 2A	The EIS must remove Ausplund Road from consideration, and replace it with a known viable alternative - namely Little Buck Creek Road, or other real, existing route.
15	2	22	2.3.6	2				
16								
17	1	16	1.4.3.6	2	Alternative Access Roads • **Route 2:** Kollock-Knapp Road to Scoggins Road to a private logging road called the CG2930 road on County Assessor's maps, which crosses property owned by the Applicant that is currently used for commercial timber production and harvest	Kollack-Knapp Road was officially retracted by the Applicant in its Amended Application submitted around October 2009. By the Applicants own statements, it is NOT a viable Alternative, and therefore does not satisfy the SEPA requirments. Applicant failed to include viable alternatives, like **Lacock-Kolchner Road**, via Little Buck Creek Road, which publicly connects with their land, and would **also reduce** traffic congestion on Cook-Underwood Road, since it turns off early in the proposed route.	Exhibit 2A	The EIS must remove Kollack-Knapp Road from consideration, and replace it with a known viable alternative - namely Lacock-Kolchner Road, or other real, existing route.
18	2	22	2.3.6	2				
19								
20	1	22	1.6	Table 1-1	Table 1.1 Row 1: Earth - Construction: A detailed geotechnical invesetigation **would be** performed to identify any sub-surface conditions	This is yet another example of a deficiency in the DEIS - no-one can assess the environmental impact of massive recontouring, excavating and roadbuilding on steep slopes, until the geotechnical asssessment is completed and included in the DEIS. This Study must be done, and included in the FEIS. Moderate to Severe changes to topography are likely, given the steep terrain and soil types. Prevailing winds would place the Turbines on the steepest Western slopes of the Ridge, and/or risk loss of critical performance if set too far to the leeward side of the Ridge. Economic viability could be at risk if geotechnical report finds problems. Please note that the economics appear marginal, so the risk level could be high.	Exhibit 2D	The steep ridges of the proposed WRE project present significant geotechnical challenges that do not exist for projects placed in farming area. The EIS must include real and likely ground-displacing activities, the volumes of material to be moved, the locations of displaced material, the depths needed to secure foundations, etc. if for no other reason than to ensure the Applicant that realistic construction costs do not render the project economically unviable.

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Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
21	1	23	1.6	Table 1-1	Table 1.1 Row 2: Biological Resources, Column 4: Impact of No Action Alternative: Potential Impacts from construction of fossil fuel power plants.	Please clarify the language, as SOSA's interpretation is that the Applicant would thus potentially pursue a fossil fuel (natural gas) plant at this site, if No Action on the Wind Plant was followed. One may already be being planned even if the Wind plant is permitted.		Clarify the statement by indicating if this is a general statement, or specific to the vicinity of the proposed WRE project. (i.e. within 10 mile radius)
22	1	23	1.6	Table 1-1	Table 1.1 Row 2: Construction, Column 5: Micrositing of turbines and associated facilities would allow sensitive resources discovered during construction to be avoided.	Applicant states in DEIS that the micrositing corridor is very narrow along the ridge line due to steep slopes on both sides. Any discovery of sensitive resources, or even geologic hazards, could disrupt or preclude a major portion of the entire Project, thus placing it in financial jeopardy. Compared to Facilities cited in farm lands and grass/shrub/steppe topography, this site has almost no flexibility to adjust to problems discovered during construction.		No concrete remedy to suggest, and no pun intended.
23	1	24	1.6	Table 1-1	Table 1.1 Row 1: Operation, Column 2: There would likely be some mortality to birds and bats....., though not in sufficient quantities to affect population viability.	This is a sweeping and dangerous generalization. PLUS, what constitutes a given species' viability has NOT been defined anywhere in this DEIS. Such a subjective assertion does injustice to the scientific principles and integrity required in any EIS. The data is sufficient to clearly show greatly elevated bird and bat numbers compared to recent wind projects in Klickitat County, WA. And the actual mortalities **far exceeded** predicted mortalities at those sites. One should assume a similar trend for these Projects in close proximity. It is a great leap to go from predicting mortality to predicting a species viability. In this Project site, how many Goshawks can society loose? How many Townsend Big Eared Bats can society loose before they are non-viable? It really depends on who you ask. Rather than forcing the issue, society should first choose and deplete the sites for Wind Turbines where man has **already developed** - meaning - use up the nation's farmland for wind energy before clear cutting the forest to do so.		The EIS should remand the Bat studies for completion again, using the mature technology of the Anabat 2 hardware, and Analook software, which is capable of identifying species of Bats, not just a threshold 35KHz between big and small bats. A significant discrepancy between the WEST 2008 and 2009 studies is the duplicative sensors and the filtered noise percentages, confirming the underlying assumptions between the two studies changed dramatically, but were not discussed.
24	1	24	1.6	Table 1-1	Table 1.1 Column 5: Convene a Technical Advisory Committee to evaluate the mitigation and monitoring program....	If created, this Committee should be much more than just Advisory. If just advisory, then it must answer to some entity other than the Applicant, that can rule and enforce mitigation actions. The composition of such a Committee and Authority should be composed of the Applicant, government agencies, and identified stake-holders in the interest of the environment. As such, organizations like the state and regional Audobon societies, The Friends of the Columbia Gorge, and others should be ongoing participants in the review and development of appropriate mitigation measures. Furthermore, a Committee or Authority without juristictional authority to limit operating hours is useless, and does not further the dynamic balance between human and environmental needs which will occur over the life of this Project (and beyond..).		The EIS should include fine details, outlining the structure and authority of a Committee that is not just advisory, but one that could implement any level of mitigation and operation restrictions if deemed appropriate. EFSEC Decision-makers should have a clear idea of the likely protections which could be applied during Project Operations, in the event actual impacts and deaths exceed estimated impacts and deaths.

Specific DEIS Comments from Save Our Scenic Area (SOSA)

August 27, 2010 PO Box 41, Underwood WA 98651 www.saveourscenicares.org

Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
25	1	26	1.6	Table 1-1	Table 1.1 Column 2: **Operation:** Turbine fires are possible, however .....are extremely rare.	This issue is **serious**, because even if the potential occurance is low, the risk to ALL residents of Underwood's lives and properties is extremely high. Any standardized risk assessment model uses the product of "occurance" and "severity of occurance" to assess risk. (for example - FMEA -Failure Modes Effects Analysis) It appears the Applicant wants to oversimplify this issue by not considering the issue in a proper manner. This Project is proposed in a Forest environment: an ingniteable fuel source in close proximity to the Turbines. There are areas in the Project site that cannot be clearcut to reduce the fire risk - namely the western slopes where identified slide hazards exist, and there are unlogged lands on the western slopes owned by Washington state DNR. (between North BPA line and South BPA line ~1 mile?) The statement about being extremely rare is based upon typical wind farm topography and elevation. The steep terrain, and unconfirmed meteorological data, combined with elevated fuel loads compared to the norm, may likely result in a catastrophic wildfire event. Without comparible scenarios, existing data should not be relied on. In the alternative, the Applicant could continue its current site condition by maintaining the massive clearcutting already undertaken thoughout most of the Project area. This, however, would result in the effective "permanent" removal of the "forest" ecosystem, and those environmental impacts would then need to be addressed, and presumably mitigated. Again, cost is a major part of the equation, and this Applicant has already said they are on the edge of viability. One can insure property, but not lives.		The DEIS should consider the Environmental impacts of the project, as if the entire site were removed from Forestry alltogether, and the ground maintained with minimal fuel loads.
26	1	26	1.6	Table 1-1	Table 1.1 Column 2: **Operation:** At a distance beyond 2500 feet, shadow flicker is considered..... Even if shadow flicker were a proven impact, none of the planned turbines are within 2500 feet of existing residences.	The statement fails to identify a permited residential structure, applied well prior to WRE's Application, that is within 2000 feet of the proposed Facility.		Consider adding the following language to the end of the existing sentence: " , and the permitted residence at 2000 feet could be mitigated by appropriate vegetative screening placed by the Applicant on its land, adjacent to the affected residence." Since this 80 acres of land, in the Project Site, was just logged in June/July 2010, new vegetation will need to be planted if this measure is deemed appropriate.

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Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
27	1	26	1.6	Table 1-1	Table 1.1 Column 2: **Operation:** EMF from the project will be lower than those of many common household appliances and would have no health or safety impacts.	Please provide/include data to support this assertion. Not only Electromagnetic Fields (EMF) should be included, but also stray electrical voltage produced during normal operations, during lightning storms, and especially power must be dumped into the ground during temporary grid overload conditions. One of SOSA's members, Tom Drach, and his family live at a residence roughly 2500 feet from proposed Turbines. There is strong evidence to suggest such stray electricity would pose a safety impact, due to potential failure of Electrical services and systems dependent upon such. For example, Ground-Fault Electrical Devices required by WA Code. The geology of this area is known to contain faults and fractures, which would tend to carry electrical energy much, much further than in an homogenous isotropic type soils, which is likely assumed in the Applicant's analysis.		Any proposed permit should include provisions for nearby residents to fully remedy issues related to stray voltage and stray electro-magnetic energy, with the entire cost burden placed on the Applicant.
28	1	28	1.6	Table 1-1	Table 1.1 Visual Resources, Column 2: Operation: The turbines would be visible from some viewpoints, including some within the CRGNSA. This project has the potential to create low to moderate levels of visual impact at key viewpoints.	The statements made here should be quantified, or terminology defined more precisely. The wording tends to minimize the issue, and "low to moderate" should have some reference scale for decision-makers to know how to gage severity on a commonly understood basis. Such subjectivity, especially in a summary, can lead to erroneous interpretations. (decision-makers with limited time to review may rely on the Summary to inform them as to the critical issues involved)		Quantify the visual impacts in table format for each Key Viewing Area within the CRGNSA, as well as other noteworthy points in view of the proposed project. Remove subjectivity by implementing an intuitive, commonly understood reference scheme.
29	1	31 AND 33	1.6	Table 1-1	Table 1.1 Public Services and Utilities, Column 2: Operation: The project's assessed value could be as much as $87.5 million, and this would generate approximately $800,000 per year in tax distributions..... AND Table 1.1 Socioeconomics, Column 2: Operation: The proposed project would have an estimated value of $87.5 million, which would represent an increase of 6.5% in assessed value in the County. At current tax rates, the increase in property tax revenue to the County would be $731,500 annually.	The statement in Table 1.1 must accurately reflect the **likely** financial benefit, rather than the **theoretical** maximum, so the decision makers can weigh the true benefit appropriately. WRE's number **grossly exaggerates** the tax benefit to municipal, County, and local jurisdictions. The SEPA responsible official should contact Mr. Gabe Spencer, Skamania County Assessor, to confirm these numbers are not accurate. A member of SOSA had a conversation with Mr. Spencer on June 24, 2010, and left with the following understanding: Scenario 1 - Project remains privately owned during operation - then Assessed Value will be a negotiated 10 year average value which will remain constant for the first 10 years - to offer more uniform cash flow for the County Budget versus Straight Line or MACRS depreciation methods. (ref Klickitat County model) Furthermore, by complex Budget laws, residents in the Underwood District would otherwise be potentially subject to the shortfall in revenue as depreciation mounted from the Project. (Surely this would be a strong negative for Underwood Community) So- under the 10 year average scenario - WRE's tax payments would be closer to $350,000 per year, NOT $800,000. Scenario 2 - The Project is acquired by a WA state recognized public utility, like PSE. The tax for this is not determined by local real tax law, but by a complex formula within the State Dept. of Revenue (WDOR). According to Ms. Chris Miller, Columbia County, WA Assessor, their Projects which have fallen under WDOR jurisdiction have only provided thier County with approximately one-third (33%) of the revenue claimed by the Applicant using the same assumptions as WRE has here. So this value would be ~$266,000, NOT $800,000 per year.	Mr. Gabe Spencer Skamania County, WA Assessor 509-427-3720 Ms. Chris Miller Columbia County, WA Assessor 509-382-2131 Mr. Van Vandenberg Klickitat County, WA Assessor 509-773-3715	The SEPA Responsible Official should consult with the Skamania County Assessor to determine the potential financial outcomes, and report as such in the EIS. The only data provided in the EIS is clearly based on the Applicants information to the SEPA responsible official, and does not reflect the two MOST likely scenarios. If the present DEIS scenario is maintained, it should reflect a declining tax payment based on equipment depreciation, and the real, long-term burden on the Underwood residents thru increased levy rates.

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Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
30	1	31	1.6	Table 1-1	Table 1.1 Public Services and Utilities, Column 5: Operation: Fire Protection: [list of 9 bulleted items]	For the Operation phase of the project, nowhere is there listed an intent to construct and maintain a water reservoir or storage capacity for on-site fire suppresion of the Project site if a Turbine fire failed to be contained. Given the fuel loads present, and lack of water, any Fire Protection and Prevention Plan should be required to include a storage reservoir suitable for use by both land-based equipment and fire-suppresion helicopters. Due to steep terrain, the turbulent updrafts present along the ridgeline would limit the ability of fixed-wing aircraft to assist in fire suppression at key areas of the Project site. Simply complying with existing DNR regulations, as the Applicant suggests, does not suffice, for the DNR statues could not have contemplated the operation of industrial-grade mechanical and electrical equipment of this magnitude operating in a forested environment, and 24 hours a day, a good portion of which without human observation.		Include the requirement for, and analyze the impacts of, establishing a fire suppression reservoir, or holding tanks to combat runaway fires.
31	1	33	1.6	Table 1-1	Table 1.1 Socioeconomics, Column 2: Operation: The project would employ eight to nine employees; most would be hired from the local area.	Please also include the number of Full-Time Equivalences (FTE's) that these eight to nine employees would provide. This is the best way to clarify for the decision-makers how much benefit is realized thru Project operation.		Include Full-Time Equivalents (FTE's) as part of the description of Operations Personnel.
32	1	33	1.6	Table 1-1	Table 1.1 Socioeconomics, Column 2: Operation: Based on a review of available studies, operation of the project is not expected to create adverse impact to property values.	Data on this subject is limited for a number of reasons. Significant differences in underlying assumptions hold for the WRE project. As such, "... a Property Value Guarantee (PVG) should be required of the developer. A State-controlled fund or developer bond should be required to guarantee no undue delay in PVG payment(s) to legitimately affected homeowners, and/or to buy out homeowners located within 2-miles of any turbines if they elect to relocate away from the turbine project(s) and cannot sell for the pre-project market value of their properties. Such a guarantee is nominal in cost, relative to total project costs, and are used to condition high impact land use approvals such as landfills and even limestone quarries, as well as other wind energy developments." *	Exhibit 2F, attached as separate PDF file due to size. * - Citation from McCann Appraisal LLC Property Value Report to Adams County Board, IL, June 8, 2010, copy included in Appedix This report includes several other recommendations, appropriate for conditioning the WRE Application, to protect residents if Developer claims are later determined to be incorrect.	The EIS should include, in the Appendix, a reference Template on a Property Value Guarantee, which generally outlines the structure and authority of such a Guaranted by the Applicant. Decision-makers should have a clear idea of the likely protections which would be result, in the event they choose to implement such, as part of any conditioning of a project permit.

Specific DEIS Comments from Save Our Scenic Area (SOSA)

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Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
33	1	34	1.7	Table 1-2	Table 1-2 Row 4: Biological Resources, Column 2: This level is not expected to be high enough to impact species viability.	See our response for text on page 1-24, Table 1-1, Row 1, Column 2		The EIS should remand the Bat studies for completion again, using the mature technology of the Anabat 2 hardware, and Analook software, which is capable of identifying species of Bats, not just a threshold 35KHz between big and small bats. A significant discrepancy between the WEST 2008 and 2009 studies is the duplicative sensors and the filtered noise percentages, confirming the underlying assumptions between the two studies changed dramatically, but were not disclosed or discussed.
34	1	34	1.7	Table 1-2	Table 1-2 Row 5: **Public Health and Safety**, Column 2: Unavoidable adverse impacts to **environmental health** are anticipated to be minimal.	Please amend or clarify this statement, as it **OMITS** any reference to **Public Safety**. (The Element of the Environment heading is: Public Health and Safety) Plus, should one assume that the word "environmental" used in the DEIS is synonomous with "Public"? Also, please refer to our comments above about the serious issue of Fire Safety, Public life, and public property damage resulting from a failed Fire Management scenario. (Ref comment at Page 1-26: Table 1.1 Column 2: Operation: Turbine fires are possible, however .....are extremely rare.)		Please correct the wording to address Public Health and Safety, rather than environmental health.
35	1	35	1.7	Table 1-2	Table 1-2 Row 1 (on page 1-35) column 2: **Noise:** ...and operation noise is predicted to be less than the nighttime threshold of 50 dbA Leq, per Washington State and Skamania County regulations.	Even though Oregon has much more progressive laws on noise and setbacks, the minimum legal standard in WA is the (woefully inadequate) Washington Administrative Code (WAC 173-60).WA noise standards. The public welfare is better served by, and EFSEC is encouraged to so condition, the Environmental Protection Agency Guidelines: In April 1973, the local EPA Region X office published a document titled, "Environmental Impact Statement Guidelines." This document discusses potential impacts from noise increases in terms of expected community response to the introduced noise source. This regional EPA guideline document suggests the following potential community responses to ranges of noise increases: • Up to 5 dBA increase – few complaints if gradual increase • 5 to 10 dBA increase – more complaints, especially if conflict with sleeping hours • Over 10-dBA increase – substantial number of complaints According to the EPA Region X document, generally no mitigation is required if the increase is less than 5 dBA. Some mitigation should be considered for increases of 5 to 10 dBA. Increases greater than 10 dBA would be considered serious and would warrant close attention.	Kittitas Desert Claim 2004 FEIS at 3-192 : Environmental Protection Agency Guidelines All Verbal and Written comments submitted by Keith Brown and/or Teresa Robbins for the WRE DEIS, are incorporated by reference here by SOSA.	Consider requiring the Applicant to follow the document titled, "Environmental Impact Statement Guidelines," which would limit noise to 10 dBA over typical background levels (25 dBA nighttime, 35 dBA daytime, typ. for rural areas) Thus making the condition for noise not to exceed 35 dBA at night, and 45 dBA during the day. The WAC code did not comtemplate noise sources from Wind Turbines, and their proximity to residential use. Furthermore, SOSA incorporates the recommendations of Keith Brown and Teresa Robbins by reference, regarding all the aspects of the noise subject.
36	3	289	3.18	-	• Short-term noise impacts during construction is exempt so long as it occurs during daytime hours, and operation noise is predicted to be less than the nighttime threshold of 50 dBA Leq per Washington State and Skamania County regulations.			

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37	2	14	2.1.5	Table 2-4	Operations and Maintainance Staff: Table describing number of personnel.	This table should include the number of Full-Time Equivalences (FTE's) that these eight to nine employees would provide. This is the best way to clarify for the decision-makers the extent of "jobs" created by this Project. Median salary ranges for each type of position would also be informative.		Include Full-Time Equivalents (FTE's) as part of the description of Operations Personnel.
38	2	19	2.3	-	• **The project must be located in an area with a steady supply of robust wind power,** and on a site on which construction can reasonably occur (no significant geotechnical constraints)	Both terms "steady" and "robust" have not been substantiated with independent data, or data from the Applicant. (i.e. met tower data in velocity, durations, 3-Dimensional directions) The DEIS does not even demonstrate that the "preferred" alternative meets these criteria.		1) Quantify the terms "steady" and "robust." 2) Support the "preferred" alternative with data compared to item 1 above. 3) Evaluate other alternatives against the standards established in item 1 above.
39	2	19	2.3	-	• The project must be located in an area with a steady supply of robust wind power, **and on a site on which construction can reasonably occur (no significant geotechnical constraints)**	The "preferred" alternative has not had a final Geotechnical Assessment done. DEIS at Appendix B. This preliminary assessment does not include subsurface core sampling below ~10 feet. Foundation concrete depth expected to be 30 feet. In this report, URS already anticipates using rock anchors to resist the overturning moment of the Turbine, since soil conditions are not suitable for traditional mat-slab gravity-held foundations.		
40	2	19 -	2.3	-	• The project must be located in an area with a steady supply of robust wind power, **and on a site on which construction can reasonably occur (no significant geotechnical constraints)**	The micrositing corridor for proposed Turbines A1-7 averages ONLY 170 feet wide, before entering into Landslide Hazard Area (LHA) Class II. The URS report (DEIS at Appendix B) states no Turbines will be sited on LHA Class II (or I, implied) soils. With a Foundation diameter of 60 feet (typ.) there is very limited ability to site these machines. The Applicant's "preferred" alternative does not even qualify for consideration, according to their own standards.		Since no other alternatives have been offered, other than the No Action alternative, one or two other Alternatives must be added to compare the reasonableness of construction from a geotechnical perspective.
41	2	19	2.3	-	• To reduce startup costs, the project must be located on land the Applicant owns and controls, and land that can serve a dual purpose of commercial forestry and power production	Generally speaking, most Land Lease agreements are based more on output, than on fixed rates, and they may or may not include up front costs. These are an insignificantly low percentage of the construction costs (read "startup costs") that this argument can only speak to the marginal economic viability of this project. As for land that can serve a dual purpose of revenue generation over the life of the project, similar to wheat farming, this has NOTHING to do with STARTUP COSTS. These are self serving, self-imposed constraints, designed to artificially restrict consideration of any other alternative.		Disclose financial justification of how these particular startup costs materially effects project viability, or remove that as a "constraint" in evaluating Alternatives.
42	2	19	2.3	-	• To enable the power to reach urban markets and eliminate the cost and time required to construct new transmission lines, the project must be located in proximity to existing high-voltage transmission lines	Proximity to existing high-voltage transmission lines is PURELY a matter of economics, and has nothing to do with power reaching urban markets.		Restate the "constraint" to incorporate the additional costs, due to this factor, into the potential viability of other alternatives. Such that the economic viability of WRE has a certain savings over Alternative B, C, and D, for example.

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43	3	130	3.7.2.2	2	Low Frequency Sound	This is an phenomenon that is still being studied, and as such needs to be treated with caution and concern, relating to the impacts to nearby residents. There is ample material to garner sufficient doubt to the claims made in the DEIS. Time to comment is not sufficient, so SOSA must incorporate by reference the comments by Keith Brown and Teresa Robbins.	Exhibit 2E - Tuning and Sensitivity of the human vestibular system to low-frequency vibration," Todd, Rosengren, Colebatch: Nueroscience Letters 444 (2008) pgs 36-41	Impose a C-Scale (dBC) requirement for noise emmissions from EFSEC permitted projects, in addition to the proposed 35 max total dBA nighttime, and 45 max. total dBA daytime levels mentioned above.
44	3	160	3.9.1.3	3	Simulations were prepared assuming a conservative scenario of 50 turbines. This approach to creating simulations most likely overstates the visual impacts. This is because the Applicant has applied for EFSEC certification for a maximum of 75 MW. **If 2.5 MW turbines were to be used, only 30 turbines could be built, and overall visual impact would be less. ...**	Because the DEIS contemplates the use of 2.5MW turbines to reduce the visual impact of the proposed project, this needs to be one of the Alternatives to consider under Section 1.4 of this EIS.		Add to the Alternatives in Section 1.4, a proposed project configuration of 30 Turbines of 2.5MW capacity.
45	3	164 to 172	3.9.2.3	All	3.9.2.3 Viewpoints (entire section)	The assignment of Scenic Quality and Viewer Sensitivity to the Viewpoints are fundamentally bias towards the Applicant's interests. Even if the author wrote this from a desk in the middle of Yosemite or any world class visual destination, one would be challenged to rate most locations in and around the CRGNSA anything but a 5 or 6, based on Table 3.9-1 DEIS at 3-158. The assignment of Viewer Sensitivity are based on a focus of facts only to justify the lowest ratings.	Exhibit 2H	As opposed to inserting such important analyses in the body text of the DEIS, a truly quantitative analysis needs to be performed by a qualified independent landscape architect.
46	3	164 to 172	3.9.1	All	3.9.1 METHODOLOGY (basis for whole section)	The Visual Analysis is NOT complete or meaningful. As presented with only "Scenic Quality" and "Viewer Sensitivity" as separate factors, there has been no coupling of factors in a scientific or statistical basis for decision-makers to relate the visual impacts to a defined standard, or to a relative reference frame. No accurate conclusions could reasonably be made about Visual Impact of the project, given the format existing in this DEIS.		Professionals in this field would be able to offer guidance on how to identify and quantify the common variables, and to combine them in such a way as to numerically demonstrate a given Viewpoint's potential degradation relative to some tangible reference point. The work done on this subject must by a credential expert. The Visual resource Management System used by the BLM seems more relevant for this EFSEC Application, due to its visual objectives for lands with multiple managment objectives.
47	3	164 to 172	3.9.2.3	All	3.9.2.3 Viewpoints (entire section)	There are a number of important Viewpoints that were omitted, for example - Panorama Point in Hood River County, Oregon.		The majorly significant viewpoint of Panorama Point, OR must be included in this analysis. It is a KVA within the CRGNSA, one of the most visited.

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48	3	172	3.9.2.3	3	Viewpoint 23: Ausplund Road End Scenic Quality. This viewpoint represents the view from local area roadways at specific intersections where local area travelers might converge. These roads are old logging roads that have been upgraded to meet the local residential use. However, they are still used for logging and would be used in the construction portion of this project. This would include upgrading and in some instances widening the roads, which can affect visual quality. This view is from the end of the Ausplund Road, which would be used to access the area for construction and maintenance. Very few viewers beyond those associated with the project would see this viewshed. Without the vehicles in the foreground, the scenic quality rating assigned to this view is moderate. Viewer Sensitivity. When considering the distance of the project from this viewpoint (less then 1 mile), the portion of the project that is visible from the viewpoint, the viewer types (local area workers and residence), and the scenic quality rating, the level of sensitivity was rated as low to moderate.	1) This Viewpoint (23) is near the end of Ausplund Road, looking to the NNW direction. This intersection represents a viewpoint central to 4 separate legal parcels, 3 of which have homes on them with active residential use. This site is roughly 1/2 mile from the proposed project. Each of these agriculturally-zoned parcels have about one acre each established for residential use. Submitted for your review is a picture taken from the home at the "end" of Ausplund Road, which is a typical view from most all the homes on Ausplund Road, and many, many homes in Underwood as a whole. This is not a Scenic Quality of 3, but rather a very substantial 6. (ref AusRdEndSouthView.pdf)	SOSA Comment letter of Aug. 27, 2010 - titled Visual Analysis Section 3.9	This viewpoint, as with ALL the others in this DEIS, cannot be judged for Scenic Quality SOLEY on its view of the proposed project. The starkly contradictory photo introduced here should establish that most of the Viewpoint analyses are faulty and bias, and must be remanded for reevaluation, or utilize a more appropriate Methodology (3.9.1) and objective consultant.
49	3	10	3.1.2.1		The changes to topography would be minor to moderate depending on location	"Changes in topography" denotes significant earth moving. Need detailed maps and and grading/excavating plans to able to assess the extent of the topographical changes.		The extent of topographical changes should be idlentified in the DEIS test, as well as the photmontages.
50	3	11	3.1.2.1		Landslide evaluation....without danger....to surrounding environment. No obvious recent mass wasting features were observed in the arial photos or during sight reconnaissance. Class III LHAs were delinicated adjacent to proposed wind turbines along the southern Tower Line A and along Tower Line C.	Fails to show detailed topography, detailed topographical changes, and how it affects landslide danger. Attempts to depict turbines outside of slide area, but common knowledge dictates the pad and activities will be in the unstable slopes.		
51	3	17	3.2.1		Like hydropower production of electricity from wind produces no direct emissions of greenhouse gases or other pollutants. The generation of wind also displaces generation from individual folll fuel fired power plants or units thereby reducing fuel consumption and the resulting air emissions that would have otherwise occurred.	Patently false, and rebutt by adding papers that actually state that greenhouse gas emmissions will increase that we are displacing clean hydropower because most dams used water from run-of-the-river and storage as a result is limited, both in capacity and for fish. Include articles that demonstrate as more wind is integrated into the system, the more difficult it is for BPA to balance without harming fish. Include paper that shows tha that BPA desire that wind energy operators aquires its own balancing reserves and that means NG generation and increasing emissions.		
52	3	20	3.2.2		.....there would be no emissions from the operation of the turbines	True, but backup would release emissions therefore the operation of the farm would result to increasenet emissions in the region.		Include impacts due to firm power backup, and idling gas plants during wind power operations.
53					Entire document	This DEIS divides and splits information in a way that makes it difficult for the reviewers to assess any aspect of concern without reading the entire document word for word and placing wording into a spreadsheet for organization as is done here.	Too many to put in here and not time effective	Redo the entire DEIS and organize into a coherent and comprehensible document.

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54	3	3	3.1.1.2		Above the basalts are a variety of younger volcanic rocks and sedimentary materials that range from.....	These are materials that contribute to instabilty on slopes. Need clear topo maps that show where turbines are to be placed so the interaction between loose layers and steep slope can be identified.		
55	3	11	3.1.2.1		entire section	No information is given as to how cite decommissioning will occur so impacts cannot be assessed.		
56	3	12	3.1.3		entire section	no mitigation measures can be identified because of the above deficiecy		
57	3	18	3.2.1		The Skamania Fish Hatchery.....	Average temps taken from fish hatchery that cannot be googled for address? Precipitation is higher and snowfall is significantly lower as elevation decreases and one proceeds west. Underwood recievess approx 40 inches of rainfall a year and snowfall is measured in feet. WRE location can expect 4-5 feet of snow on the ground during winter and over 10 feet annual snowfall.		
58	3	34	3.4.1.1		The project site contains a network of roads ranging in width from approximately 8 to 20 feet.	The 20 ft rd was built specifically for hauling WRE equipment. Roads to support logging activities are 8-10 ft.		
59	3	35	3.4.1.1		As a result, the project area includes no native habitat and is permanently committed to use by commercial forestry operations and utility infrastructure.	The area contains "no unaffected habitat" but under a normal logging regime that does not include an expedited process for turbines, habitat that can support many of the native species would exist.		
60	3	35	3.4.1.2		Five vegetation communities.....	Two of the first five vegetation communities do not naturally occur in the area and are only present following logging and only for a few years. This is not an accurate representation.		
61	3	45-46	3.4.1.5		One bald eagle was recorded on the project site in 2009 during surveys for northern goshawk. In addition, three bald eagles were observed during the winter of 2008-2009 during baseline avian surveys. Two were observed flying within the rotor-swept area, and one below.	Bald eagles use the Columbia River, Little White Salmon and White Salmon Rivers as overwintering and nesting habitat. As the bald eagle population recovers further, more eagles will reside in the area. WRE spans a saddle between Underwood Mtn and Nestor Peak between the Little White and the White Salmon River. It is not unexpected that bald eagles would hunt the WRE area and use it as a shortcut between the two river basins. WRE, if permitted, may likely be the first project to kill bald eagles in the Pacific Northwest.		There must be a discussion of the long-term risks and impacts to Bald Eagles. Nesting and over-wintering are not addressed.
62	3	46	3.4.1.5		In Washington State, goshawks occur year-round and in some areas only during the non-breeding seasons. The project site is located in an area where either may occur, and the eastern slope of the Cascades is considered the most common place to find this "uncommon" species (Bird Web 2009).	Should state that "The Northern Goshawk occur year round in breeding areas and and in some areas only during the non breeding season." "The project site lies in an area that either may occur."		
63	3	46	3.4.1.5		Northern goshawks were recorded during avian surveys during the fall of 2004 and the summer of 2006. A total of five individuals were sighted; two during the fall and three during the summer. They were observed flying both within and above the rotor-swept height during surveys.	Demonstrates that breeding populations exist and WRE if permitted may be the first project to kill this "uncommon" species and breeding population impacted.		

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64	3	47	3.4.1.5	4	Northern goshawk surveys were conducted during the spring and summer seasons in 2004, 2008, and 2009..... (No northern goshawk responses were recorded in 2004, 2008, 2008.)	No northern goshawk responses were recorded, but yet they were noted during avian surveys. A basic rule of all survey work is that presence affirms presence; absence does not affirm the subject not present, just that it was not detected by some established measure. In the case of the northern goshawk survey, none were detected but yet, goshawks were affirmed as being present during the avian survey. The only message to take home is that the goshawk survey was not successful at detecing northern goshawks. The surveyers need to re-evaluate survey methods and determine why they were not successful at stimulating northern goshawks to respond in a manner that could be recorded. This is a serious issue when one considers that the other other bird-of-prey surveys are dependent on a response as well. It throws into doubt all the bird-of-prey response-dependent surveys.		
65	3	46	3.4.1.5		Two golden eagles were recorded during the fall of 2004. One was observed flying at a height within the rotor-swept area, and one was observed flying above the rotor-swept area.	Golden eagles are documented to fly through the WRE project area and are, like the other raptors, at high risk of being killed.		
66	3	49	3.4.1.5		The Applicant conducted surveys and analysis to confirm the absence of northern spotted owls.	This statement demonstrates a bias by looking for a specific outcome. It is exremely difficult to definatively "confirm" absence, but reasonable to provide some probability of use at any given time. Spotted owls historically have, with high probability, been present in the area of the project. Vast clearcutting has reduced the modern small chance to a very small chance that spotted owls would be present in the WRE area at any given point in time for the near future. Surveys were conducted for northern goshawks and none were "detected" in a common place to find an uncommon species either.		
67	3	56	3.4.1.5		Forest practices within a SOSEA are therefore allowed to proceed so long as they do not affect the 40 percent suitable habitat threshold.	Forest practices will not continue in the area as outlined in..... because the forest may never be allowed to grow trees of a marketable size. This represents a forest conversion in a SOSEA. This permanently and effectively reduces the SOSEA size and creates more fringe area relative to the SOSEA area.		Don't allow Turbines anywhere near, established SOSEA's, regardless of whether recent Spotted Owl activity has not been "observed."
68	3	45	3.4.1.5			Fails to state that the Little White Salmon is approximately 1 mile west of the project area. Ignores the potential flight corridor between the Little White Salmon River and the White Salmon rivers over the saddle formed by Nestor Peak and Underwood Mtn where WRE is located.		

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69	3	56	3.4.1.5		There were 21 birds observed during summer 2006 avian surveys, and six recorded during the spring of 2009. All 21 observed in 2006 were within the rotor-swept area; it is not reported in 2009 how many were in the rotor swept area. None were recorded during the fall of 2004 or the winter of 2008-2009.	The WRE area is highly used by this species. Reporting absence in the fall and winter is misleading as this bird leaves begins its migration to S. America in August. Because 100% of the birds recorded in 2006 were in the rotor swept area, it is reasonable to assume that 100% of those recorded in spring 2009 would be in the rotor-swept area. Even though fewer numbers were observed in the spring, this is a particularly bad time to lose any member of the species. For each female lost, future recruitment is reduced. If three of the six are females and each female produces 3-4 offspring, then a lost of three females could represent a recruitment of 9-12 additional birds. The bird counts represent a minimum. There is no extrapolation over area. No method for comparing counts to scientific studies of local population levels. There is no mention of how loss of forest habitat from extensive clearcuts affects reproduction. For a species on the decline, it is important to consider all actions of direct and indirect losses to the population. This has not been done for a migratory species.		
70	3	57	3.4.1.5		In Washington, pileated woodpeckers occur year round but are uncommon in the vicinity of the project site. ... During avian surveys in the project area, six pileated woodpeckers were recorded in the fall, two during the winter, seven during the the spring, and none in the summer.	Doing the math, six plus two, plus seven equals 15 pileated woodpeckers observored. According to the Applicants own study numbers, pileated woodpeckers are anything but uncommon in the vicinity of the project site. Fifteen pileated woodpecker sightings is especially significant. These birds are fiercely territorial and the observation of such high numbers in periods seperated by many years in some instances, is telling of the perserverance and number of territories in the vicinity of the project. Lack of sighting in the summer months, does not indicate absence, only lack of detection. The DEIS must be changed to reflect the significant use of the project vicinity by pileated woodpeckers. It is important to note here that pileated woodpeckers prefer habitats with large trees. Contrary to the Applicants claim, extensive logging in the area has not completely removed use by species that prefer habitats with older tree areas. Pileated woodpeckers demonstrate the resilience of some species to changing habitats. Therefore it should not be assumed that just because extensive logging has occured in the project are that species will leave and therefore not be at risk. Pileated woodpeckers will fly at height that puts them into the rotor swept		
71	3	57	3.4.1.5		During fall 2004 avian surveys, 15 Vaux's swifts were recorded in three groups, 87 percent of which occurred within the rotor-swept area. Four were recoroded in two groups during the summer of 2006, all of which occurered within the rotor-swept area.	Doing the math, a total of 17 out of 19 Vaux's swifts were observed in the rotor-swept area for a number of almost 90% in the rotor swept area. This percentage applied to the 11 birds observed in the 2009 period would place a total of 10 swifts in the rotor-swept area. In total, 28 of the 31 of the observed swifts (in that short period alone) were at risk of being killed. It is even more reasonable to assume that all the swifts have the potential to use the rotor-swept area and all members of the population are at risk. Again, this is a conservative number due to the very limited nature of the survey. Because original data was not supplied, the temporal seperation in years, and lack of overlap between fixed points it is reasonable to assume that most if not all swifts were not counted more than once.		

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72	3	59	3.4.1.5		Bat surveys conducted during ..... did not have the ability to detect individual species of bats. Based on the lack of detailed information of this species life history and habitat requirements and nature of the bat surveys conducted it is difficult to conclude with certainty with the likelihood of Keen's bats occurring on the project site. However, Due to the lack of old growth or mature forest types within the project area and the predominant commercial forestry use of the property, the likelihood of occurrence on the site is considered to be low.	Anabat II technology exists to identify, by call, individual bat species. This technology has existed for over 10 years. West has authored a paper where the Anabat technology was used to identify to species the majority of calls. Papers, abstacts, and exerpts are attached. The tapes need to be further analysed by a highly qualifed INDEPENDENT expert to identify bat calls with special emphasis to identify rare species. If WEST failed to set up the Anabat II correctly so that calls can be identified, then additional bat data collection needs to occur. Additionally, cumulative impacts should assess the possible future infection of bats by white nose syndrome. Increased mortality of ANY type, may directly affect these species future viability.		
73	3	60	3.4.1.5		There are no known roosting structures or maternity colonies occurring in the vicinity of the project area.	See comments on Keen's Myotis. Townsend's Big Eared Bat, a species of concern and a canidate for listing, is present in the region. One of the largest colonies at 400 bats is located in lava cave nearer to Trout Lake to the north. Colonies are small compared to many other bat species and not many colonies are known to exist. The southern end of the old lava flow (can be seen from Google Earth) that may contain additional colonies is approximately three miles from the project.		
74	3	62	3.4.1.6		Table 3.4-5	One year round bird, the northern pygmy owl was not observed during ANY study, yet is common in the area. This speaks again to to the basic rule, absence does not absence does not affirm the subject not present. Northern Pygmy owl and any other species that are likely to exist should be added to the list and represented as is the Northern saw-whet owl.		
75	3	63-64	3.4.1.6		This annual rate is low relative to raptor use at 36 other wind-energy facilities that implemented similar protocols and had three or four season surveys.	It is very important to note that a number of raptor species use the WRE area and rotor-swept area are sensitive, canidates for listing, or formerly listed recovering species. This number needs to be compared relative to other wind energy facilities as well. Appendix C4 page 9 states: American kestrels...,red tailed hawks...., and golden eagles...were killed more often than predicted based on abundance. ... It is likely that many factors, in addition to abundance, are important in predicting raptor mortality.		
76	3	65	3.4.1.6	2	The WDFW Priority Habitats and Species database was searched for known occurrences of raptor nests. The only recorded nest was for an osprey, more than one mile east of the project site.	This database is not complete nor comprehensive and cannot be used as an authority. Just as the goshawk survey was not able to generate a response, any attempts, if one had been attempted, would likely not have found nests. WDFW is not allowed to enter SDS property unless permission is obtained and escorted by an SDS representative. It is highly unlikely any nests would be known.		
77	3	64	3.4.1.6		Fall migration surveys (2004)	The DEIS fails to assess bird migration through the project area. This DEIS ONLY makes daytime observational counts of birds during four seasonal time periods, fall, winter, spring, and summer. Nothing in this section or study assesses fall migration, the regular seasonal journey of species from one one location to another. This is a serious defeciency because migrating birds are at significant risk when flying through the rotor-swept area. Birds migrate at varying heights by species and weather conditions. Conditions with poor visability such as clouds, mist, fog can lower the migration paths of higher flying species so they too are exposed to the rotor swept area. These weather conditions are common in the spring, winter, and fall along the ridges of the Cascade Mountians. Include studies that describe methods of detecting bird movement at night for migration studies.		

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78	3	64	3.4.1.6		Three species of raptors were observed, including red-tailed hawk, northern goshawk, and sharp-shinned hawk.	Northern Goshawk observed in spite of surveys failing to detect any.		
79	C4	7	1		Ten species were always seen flying withing the ZOR (zone of risk); however, these were based on fewer than five observations.	These species need to be identified clearly in the text and a table. These species are the ones most likely to be wiped out of the sky, and since these species are likely in low numbers, population impacts could accrue.		A table needs to be created in the DEIS, not in the appendices only, but in the main text under operation impacts to birds, with species in one column, percent of time birds were seen in the rotor-swept area (zone of risk) the number of birds and the total number of 'groups". Sort by highest percent in rotor-swept area first. Supplemental DEIS (complete redo is better) with this information and others should be issued for comment and review.
80					All general bird surveys.	Although over 200 data sheets exist, more information should be given about the locations these birds were observed.		
81	3	64	3.4.1.6		For all bird species combined, use of the project site by avian species was slightly higher during the summer breeding season than during the fall migration period.	There was no fall migration assessment for birds or any other wildlife in this DEIS. All comments to bird migration need to be removed from the document		
82	3	69	3.4.1.6	1	Several large mammals occur within the project site.	No detailed review or study exists on the potential impact to mammal habitats or movement patterns.		Redo and expand this section and provide for public review through a completely redone DEIS or a supplemental DEIS

Specific DEIS Comments from Save Our Scenic Area (SOSA)

August 27, 2010 PO Box 41, Underwood WA 98651 www.saveourscenicarea.org

Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
83	3	72	3.4.1.7	1	From 150 feet to 500 feet from the base of the turbine towers, tree height would be limited to 50 feet above the turbine base within an area formed by a 90 degree arc centered on the ordinary downwind direction (figure 2-4 in Chapter 2).	DEIS fails to state exactly what locations and affected acres will be within an area formed by a 90 degree arc..... DEIS fails to reveal how many turbines are proposed in a topographical area that does not meet the 90 degree arc requirement. The DEIS fails to provide an analysis of acres will affected and to what degree in topographical areas that do not meet the area formed by a 90 degree arc requirement. This significant deficiency does not allow agencies or the public to assess what the impacts to forestry and forest habitat from siting wind turbines in forested areas will be. During scoping, a comment requesting this information was submitted.	Topographical maps show little, if any, areas meet the condition of "an area formed by a 90 degree arc centered on the ordinary downwind direction."	Rewrite section of DEIS with a complete analysis, in light of the expanded information. A map of the project area and the all area around it that could be impacted to create and maintain airflow needs to be included. Include a table of the affected habitat types and display the expected length of time for the forest to be fully renewed for viable timber harvest. If harvest will not be allowed to renewed to an age of 50-80 years for any reason, then show age it will atain. Any sections on forest, animals, and habitats that would be affected in light of this information needs to be updated and resubmitted for public comment through a completely updated DEIS or a supplemental DEIS.
84	3	74	3.4.1.7	1	No wetlands or wetland buffers are located within the project footprint.	Misleading statement. A wetland is included in the project footprint, as it is within the project area borders. This wetland has been and will continue to be impacted if the project is permitted. SDS obtained a permit to harvest timber in the WMZ from DNR. This disturbing activity may have, like most logging operations, damaged the WMZ that could remove silt in runoff from construction activities.	DNR Maps and FPA's	Update and correct this section with the most recent forestry actions that are planned or have occurred. Correct and place this information in DEIS and resubmit for comments.
85	3	77	3.4.1.7	1	No wetlands or wetland buffers are located within the project operation area.	Misleading statement. A wetland is included in the project operation area, as it is within the project area borders and a possible wind impediment. This wetland has been and will continue to be impacted if the project is permitted. SDS obtained a permit to harvest trees in the RMZ of the wetland (or is it called a WMZ?) from DNR (FPA #2704045 and #2704443). Because this wetland is along a road accessing project area from the east, it raises the question of whether the logging occured to improve the road for WRE access or for logging operations or in the words of a long time local "to remove an environmental problem" (sensitive species).	DNR Maps and FPA's	Update and correct this section with the most recent forestry actions that are planned or have occurred. Correct and place this information in DEIS and resubmit to public for comments.
86	3	74	3.4.1.7	2	Roadway improvements to the County or private logging roads are not expected to affect wetlands. This information was confirmed through field investigations performed in May and July 2009.	This Report is not cited as existing in Appendix	DEIS	Include this report in DEIS and resubmit to public for comments.

Specific DEIS Comments from Save Our Scenic Area (SOSA)

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Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
87	3	74	3.4.1.7	7	Construction of the proposed project would result in the permanent loss of 21.86 acres of managed coniferous or mixed deciduous-coniferous forest.	Here it state that the loss of forest will be permanent, yet prior arguments stated "for the life of the project estimated to be 30 years."	DEIS	Show actual permanent loss of forest from construction and operation of the project. Rewrite this section of DEIS with a complete analysis, in light of the expanded information. Include a map of the entire forest area that could be impacted to improve airflow. Include a table of the affected habitat types and display the expected length of time for the forest to be fully renewed for viable timber harvest. If harvest will not be allowed to renewed to an age of 50-80 years for any reason, then show age it will be allowed to atain and the differetial in board feet at harvest. Any sections on forest, animals, and habitats that would be affected in light of this information needs to be updated and resubmitted for public comment through a completely updated DEIS or a supplemental DEIS.
88	3	77	3.4.1.7	1	Operation of the project would result in no further impacts to habitats on the project site.	Operation of the project would result in the LONG TERM and perhaps permanent removal of functional forest in the airflow area. Trees in the airflow area may never be allowed to regrow to a size that could prove needed habitat.	DEIS	Remore this statement and others like it.
89	3	76	3.4.1.7	4	In order to determine which species (including special status species).....are most at risk for turbine fatalities a relative collision risk....	This analysis is not appropriate for determining risk because it is dependent on observational counts. Uncommon species would never have a high risk.	Basic statistical knowledge.	Use percent of species observed in rotor swept area. Put in suplemental DEIS or rewritten DEIS.
90	3	50	3.4.1.5	2	Surveys were conducted in 2003, 2004, 2008, and 2009	NSO surveys were conducted in 2007 as well. During one of the visits in particular, slash burning on Chemawa Hill above this area could have affected obtaining a result. Survey was known to occur in the fall, which according to Bill Weller, WDFW Biologist, was not the correct time of the year to be conducting owl surveys. Although the design was flawed, those data sheets need to be made available to the public for review.		Make available to public in supplemental DEIS or rewritten DEIS.

Specific DEIS Comments from Save Our Scenic Area (SOSA)

August 27, 2010 PO Box 41, Underwood WA 98651 www.saveourscenicarea.org

Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
91	3	77	3.4.1.7	7	Bald eagles, although fairly common in Washington State, are likely uncomon visitors to the project site. The potential for ongoing occurrence of bald eagle on the project site is very low. The potential for bald eagle fatalities as a result of turbine strikke is also considered to be extremely low.	DEIS has failed to analyse increasing Bald Eagle presence in the Columbia River Gorge mainstem and tributaries. The central gorge with an overwintering population from other parts of the U.S./Canada and a growing resident nesting population, has become much more common in the area and the numbers in the area is expected to increase as the overall recovering bald eagle population increases. DEIS has failed to address the potential use of the area by bald eagles to shortcut across the saddleback through WRE project area between the White Salmon River and the Little White Salmon River. The potential for use of the area and a turbine strike is increasing with increasing populations, particularly in light of the use of airspace in the rotor-swept area.		Include USFWS data on producing and overwintering populations. Include the likelihood of a fatality should an eagle pass through two strings of turbines as is present on the site. (Survival as calculated in fish, only in this case estimated from available science) If not calculated, use the number generated from percent of observations in rotor swept area relative to the population in the White Salmon to Little White Salmon Rivers and Columbia River between those two rivers. Extrapolate for an increasing population.
92	3	77	3.4.1.7	8	Two golden eagles were recorded on the project site ....considered to be at a relatively low risk for collision with turbines at this site.	Every golden eagle that enters the WRE area, like bald eagles, are at risk of being killed by the turbine blades. Golden eagles are quite possibly using the site more than rarely, perhaps a better word to use is infrequently. Because of the timing and nature of this study, little can be said about the frequency of visits, other than, golden eagles were observed during the limited bird surveys.		
93	3	78	3.4.1.7	3	This includes the occurrence of five individuals, four of which were flying within the rotor swept area. Similar to the golden eagle, this species may be at risk of increased foraging activity in open areas around turbines because they hunt for prey that occurs on the ground in cleared areas. However given their rare occurence on the project site, the potential for turbine related fatalities for this species is extremely low.	First, northern goshawks are not "rare" in the WRE area. Northern Goshawks have been observed flying southeast from the WRE project area into the farmland south of the project area, presumably to hunt. During logging under DNR FPA# 2704293 in June-July 2010 on a unit (named Fern) just below Chemawa Hill (southern A-array), a northern goshawk was observed flying and repeatedly crying rfor two days just south of where the logging activities were taking place. Quite possibly, a nesting tree may have been removed from the riparian zone with reportedly 100+ year old trees (the riparian zone repeatedly not mentioned by the Applicant) being logged. A request was lodged by an adjacent landowner with the Southeast Regional Office in Ellensberg to have a DNR employee enter the area and check for eggs or chicks that might have survived. The request was refused by DNR stating that they have no rules on the books and are not responsible for regulating any wildlife.		Change text to acknowlege prevalence of this uncommon bird in the WRE area. Change text to state that the potential for turbine related fatalities is high based on the presence of northern goshawk in the area AND the high percent of observed northern goshawks flying in the rotor swept area. Reissue the DEIS with corrections or a supplemental DEIS for public comment.

Specific DEIS Comments from Save Our Scenic Area (SOSA)

August 27, 2010 PO Box 41, Underwood WA 98651 www.saveourscenicarea.org

Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
94		78	3.4.1.7	3	General	Relative index using all bird species is not applicable.		If a relative index is to be used it should be divided into general class of birds, ie: raptors. This will give the public a better understanding of which raptor is at greatest risk of turbine caused fatality based on total number of raptors, number of each species observed, and flying in the rotor-swept area. Although a qualifer must be stated that ALL raptors are at significant risk for turbine caused fatality because of their size and hunting behavior.
95	3	79	3.4.1.7	1	Based on this analysis and surveys on the project site, the estimated raptor/vulture fatality rate is zero per MW/year, which is an extremely low estimate compared to many wind projects.	The so called analysis **does not in any way reflect the risk of raptors/vultures to turbine caused fatality**. This distorts and falsely inplies that a relative index predicts mortality. The relative risk index only provides an indication of how many of a species were in the rotor-swept area relative to other species. In fact, larger birds, because of their larger wing spans and body size, are more likely to be struck than a small bird occupying only a small space in the rotor swept area. Birds spending more time in the rotor-swept area are more likely to be killed. Environmental conditions when birds are in the rotor-swept area can affect fatality, and so forth. The lack of assumptions to account for shortcomings is a fatal flaw in any "study" and certainly is for this one.		This Study's list of assumptions must be reevaluated and independently confirmed. Remove this and other incorrect statements of non-fact.
96					nonexistent	Science based studies require a statement of all assumptions made to design a study and collect, analyze, and interprot data. This is completely nonexistent in the DEIS and Appendices.		
97	3	79	3.4.1.7	1	Further, data collected from the project site indicate that the area is not within a major migratory pathway, at least during fall migration.	No migration data on any species was collected, only observational counts of animals on different days/seasons. Because migration requires some movement, and movement was not demonstrated in any "study" whatsoever, migration conclusions cannot be made.		Remove references to "migration" from existing DEIS language until such time actual migration studies are completed and documented.
98	3	79	3.4.1.7	2	Pileated woodpeckers were recorded on the site, but not flying.	Pileated woodpeckers do fly at rotor-swept height. They do not take the bus.		A more accurate conclusion is suggested here: "Because pileated woodpeckers were not observed flying, the relative index was zero. Pileated woodpeckers may fly at rotor-swept height through the WRE project area and may be killed as a result."

Specific DEIS Comments from Save Our Scenic Area (SOSA)

August 27, 2010 PO Box 41, Underwood WA 98651 www.saveourscenicarea.org

Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
99	3	79	3.4.1.7	1	Vaux's swifts.....were commonly observed flying at rotor-swept heights	More than SOME deaths should be expected based on the percentages of birds in the rotor swept area.		Change to "Vaux's swifts....were commonly observed flying at rotor-swept heights, and SIGNIFICANT turbine related mortality may occur.
100	3	79	3.4.1.7	1	Olive-sided flycatchers.....were commonly observed flying at rotor-swept heights	More than SOME deaths should be expected based on the percentages of birds in the rotor swept area.		Change to "Olive-sided flycatchers....were commonly observed flying at rotor-swept heights, and SIGNIFICANT turbine related mortality may occur."
101	3	79	3.4.1.7	1	Western bluebird.....were commonly observed flying at rotor-swept heights	More than SOME deaths should be expected based on the percentages of birds in the rotor swept area.		Change wording to "Western bluebirds....were commonly observed flying at rotor-swept heights, and SIGNIFICANT turbine related mortality may occur."
102					Waterfowl, waterbirds, and shorebirds were not observed using lands within the project site during this study, and mortality involving this group is expected to be rare.	These species area migratory birds and would not be be expected to be seen USING LAND within the project site as there is no large body of water, but the AIRSPACE would be used during migration. Migratory birds, including water using species have been killed during migration by wind turbines at many different projects throughout the U.S. and world. Migratory birds of ALL species are at risk. Migration has NOT been assessed in any study within this DEIS.		Remove all reference to "migration" from any study and DEIS text. Require a full study on spring and fall migration be conducted according to best experimental design and current research protocols. Included in any assessment of migration by mammal (including bats) and avian species, needs to cover 24 hour time periods when environmental and seasonal conditions are favorable for every species (particularly status species) and for 3 years to account for annual variation.
103	3	79	3.4.1.7	1	Turkey vultures are known to have very low susceptibiltly to turbine collisions (Orloff and Flannery 1992).	Old Citation based on older, smaller turbines. Provide updated current information to support any assertion.		Base conclusions on more recent information to reflect the latest generation of industrial wind turbines. Review Canadian and European white and grey papers on turkey vulture and cousin fatalities at wind turbine facilities.
104	3	79	3.4.1.7		General	The DEIS is deficent because the studies have failed identify the underlying asumptions used in design, data collection, and analysis that could affect extent and validity of conclusions. The assumptions mush be qualified by the authors as to the appropiatness of the study. Because of this lack of assumptions, independent reviewers are unable to confirm the intregrity of the methodology and conclusions.		The reports and the conclusions must be reissued with this information in a SEIS or a replacement DEIS.

Specific DEIS Comments from Save Our Scenic Area (SOSA)

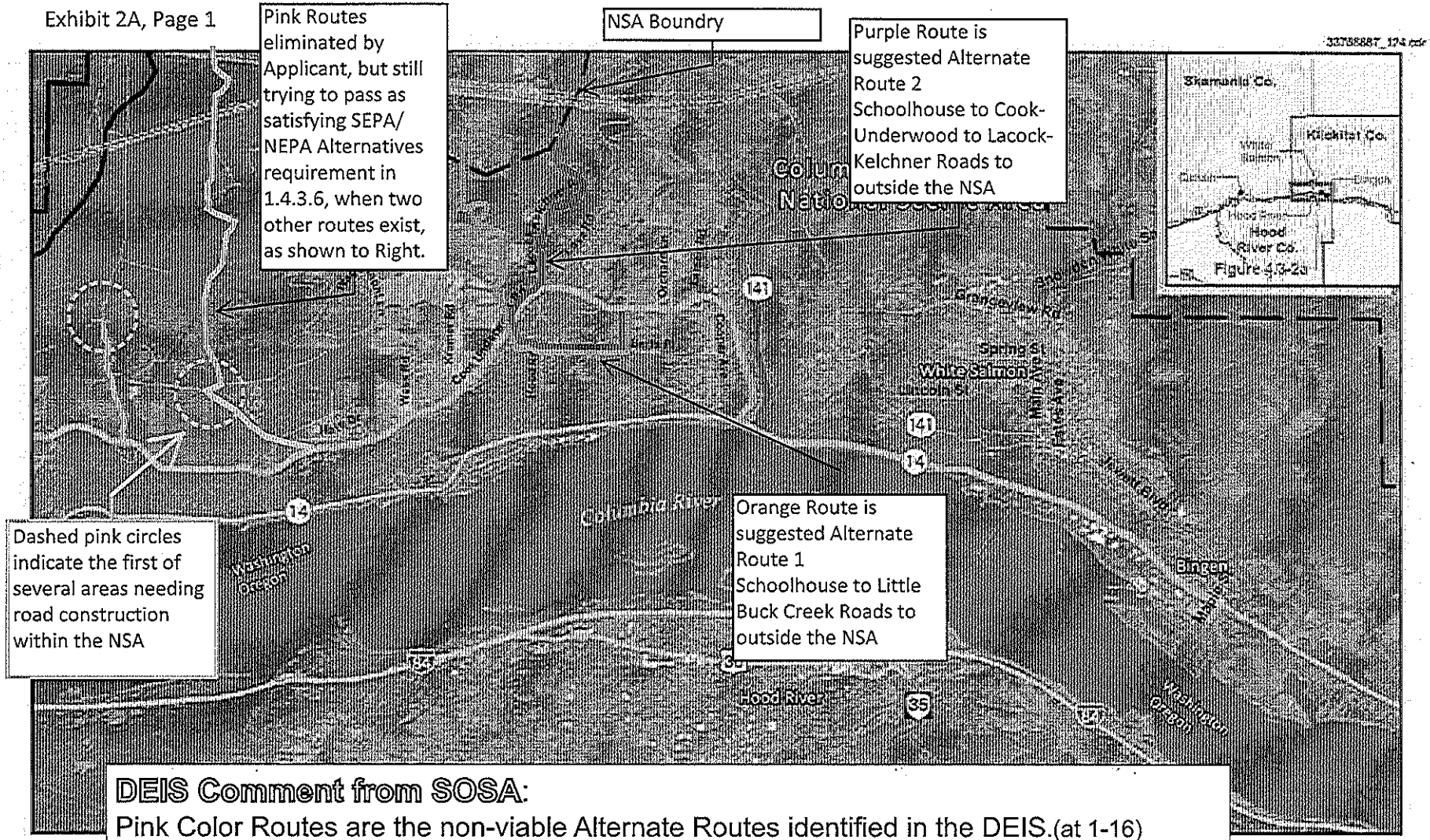
August 27, 2010 PO Box 41, Underwood WA 98651 www.saveourscenicarea.org

Comment #	Section Number	Page Number	Heading Number	Paragraph Number	DEIS Text	Declared Deficiency	References	Remedy
105	3	79	3.4.1.7	3	These collisions would likely be rare and it is unlikely that the Project would have any negative impacts on population levels on and near the project site.	Acutally, the opposite is true. Collisions are very likely to occur. The shear number of turbines and their configuration along a ridge poses a very high risk to special status and uncommon species, as well as migrating birds and bats of all kinds.		Compare to other forested ridgetop wind turbine projects in Eastern USA, with the statement that because no turbines have been place in conifer forests of the NW, it cannot accurately reflect numbers only provide general basis of comparison. It MUST be stated that placement of wind turbines along ridges is likely to rusult in extremely high mortality of resident and migratory birds and bats as has occured in the Eastern US when placed along forested ridges.
106	3	79	3.4.1.7	4	...in Washington and Oregon indicate that less correlation between pre-construction surveys and turbine-related mortality is observed in non-raptor species. The lack of correlation may be because most fatalities are among nocturnal migrants that are not accounted for during surveys.	This statement admits there is a lack of a migration study. Most fatalities are among nocturnal migrants, and most species migrate at night. At no point, during day or night, was any study of bird or bat migration through the project area.		Require a three year study on bird and bat migration by qualified researchers using scientifically accepted methods and design protocols. Provide results for review by public and governmental entities.
107	3	9	3.1.2.1		The primary impacts during construction would be potential for erosion, landslides, soil compaction and changes to topography	Where these impacts will occur needs to be disclosed fully, particularly where changes to topography will occur.		Provide a supplemental DEIS that fully discloses where the topographical changes will occur and provide before and after contour maps for all locations.

Comment #	General Comment from SOSA for the Whistling Ridge Energy DEIS	Remedy
GC-1	Need Met Tower data at proposed location on the Western (prevailing windward) slope. This data must include 3-dimensional wind direction, as well as wind speeds. At least one should be located South of the South BPA line, along the A1-7 string. This area topographically should result in the worst case scenario for turbulence and off-axis wind direction. Turbine efficiency is based on laminar flow in the direction of the Turbine Axis. Turbines placed on a steep slope will suffer significantly reduced performance, which must be quantified in the EIS to ensure economic viability for the Applicant.	Applicant should demonstrate to EFSEC Council that the "wind power" resources at this proposed site meet or exceed that of existing or permitted WA Wind Turbine Facilities. "Wind Power" is defined as the agregatized product of wind speed with time. The purpose would be to provide some basis to justify and offset the increased environmental impacts of this project, relative to those existing WA Wind Turbine Facilities.
GC-2	BPA yard size of 4+ acres invites and encourages future growth, which must be evaluated now.	BPA must, or the DEIS must, identify the minimum size of land needed to house a 75 Megawatt Substation, and only permit, purchase, and develop such a BPA Facility, if the proposed WRE project is approved. Any larger size of land or power capacity would trigger additional review requirements for WRE Application in the BPA NEPA process.
GC-3	It appears that BPA may have initiated agreements with the landowner for specific parcels of land, which would be premature prior to the completion of an FEIS, perhaps even a ROD.	BPA must not enter into contractural agreements or commitments until the lawfully allowable time.
GC-4	Certain claims by the Applicant can neither be substantiated with certainty or refuted with certainty. In these cases, the Council should neither consider a claim to be a benefit or a detriment to the proposed Project. For example, Global warming, reduction in CO2 emmissions, as supported by several scientific papers concluding that the "jury is still out" on some of these issues.	The EFSEC Council should consider these types of claims as neither a significant benefit or a significant detriment to the proposed Project.
GC-5	The State of Oregon has on their books very good scenic protections, not only for the National Scenic Area, but a huge number of State public lands which are deemed appropriate to save from visual intrusion of Wind Turbines. Washington State should prepare and release an analogous document. EFSEC should consider the spirit of Oregon's protections, and apply similar standards when considering the overall benefits to society and the public welfare.	EFSEC should consider the spirit of Oregon's scenic protections relating to Energy Facilty Siting, and apply similar standards when considering the overall benefits to society and the public welfare. Longer term, EFSEC is urged to pass some guidelines similar in spirit to the Oregon statues, either within the Department, or at the State legislative level.
GC-6	The layout of information within the DEIS makes it difficult to understand and assess the true nature of the Project.	No obvious remedy to suggest.
GC-7	Incorporate others' testimony by reference	SOSA hereby incorporates by reference, the comments of: Keith Brown and Teresa Robbins, Skamania County Residents (SCR) Mike and Joyce Eastwick, SCR Mary Repar, SCR Friends of the Columbia Gorge Dawn Stover, Klickitat County Resident Sally Newell, SCR Paul Smith, SCR

GC-8	Applicant must provide met data and "wind power" analysis (confidentially if needed) to EFSEC Council to justify why this site is sooooo much better that others, that it could justify or warrant consideration in light of all the issues against. Wind Power is defined as the integral of wind "energy" with time. This is commonly approximated as a function of average wind speed spanned out over a long time period. and timeOne must note that the calculated wind speeds(or power) just north of the north BPA line are a maximum for the project site, and the average for the site, as a whole, would be considerably less.	Financial justification for the Project needs to be disclosed and verified.
GC-9	It appears that many general and specific issues raised in the Scoping Report are not addressed, or not adequated addressed. To ensure the integrity of the Scoping Process, SOSA recommends the DEIS or "FDEIS" include a "Response Matrix" - which would indicate the location(s) within the DEIS where the response, rebuttal, or otherwise answer to EACH scoping comment can be found.	Close the loop with the public comments by indicating responses in a "Response Matrix" as described to the left.
GC-10	Issues raised in the Scoping Process, under the Category of "Documents" (Issue Code "DX"), are not broken down in any detail. Lack of categorization of the individual documents, and subjects within, could have led to an important issue not being addressed. As part of the "Results Matrix" comment above, any matter raised in the "DX" issue code should be re-categorized separably into the other Categories, and likewise noted where these issues are addressed in the DEIS. Furthermore, a supplementary DEIS or a new DEIS should be issued and public comment provided.	see above and left
GC-11	Speculation here, but such efforts could be explained by the future "relative" ease of proposing a Natural Gas Energy Plant on ajoining lands, given a number of factors, the least of which is the NG pipeline running thru the currently proposed Wind project.	If any knowledge of plans for additional development at or near the proposed site of WRE, the impacts from such must be addressed at this time.

Exhibit 2A, Page 1



DEIS Comment from SOSA:

Pink Color Routes are the non-viable Alternate Routes identified in the DEIS.(at 1-16) Ausplund Road is NOT a possible alternative, given new road building within the NSA would be required, which the Applicant has acknowledged is not allowed for this use within the NSA. Pictures of the now-overgrown portion of Ausplund road is shown on following pages.

DEIS states in 1.4.3.6 (at 1-16) that both Alternatives have been eliminated as an alternative due to road construction requirements within the NSA.

As such, the DEIS is deficient in that no Construction Roadway alternatives are identified or considered. SOSA has identified two alternatives - namely Schoolhouse to Little Buck Creek Road, and Lalock-Kelchner Roads, both of which will take traffic out of the NSA and allow the Applicant to build roads on property which it ALREADY owns, all the way to the proposed Project site.

DEIS at 3-216

Figure 3.11-1
s from the East

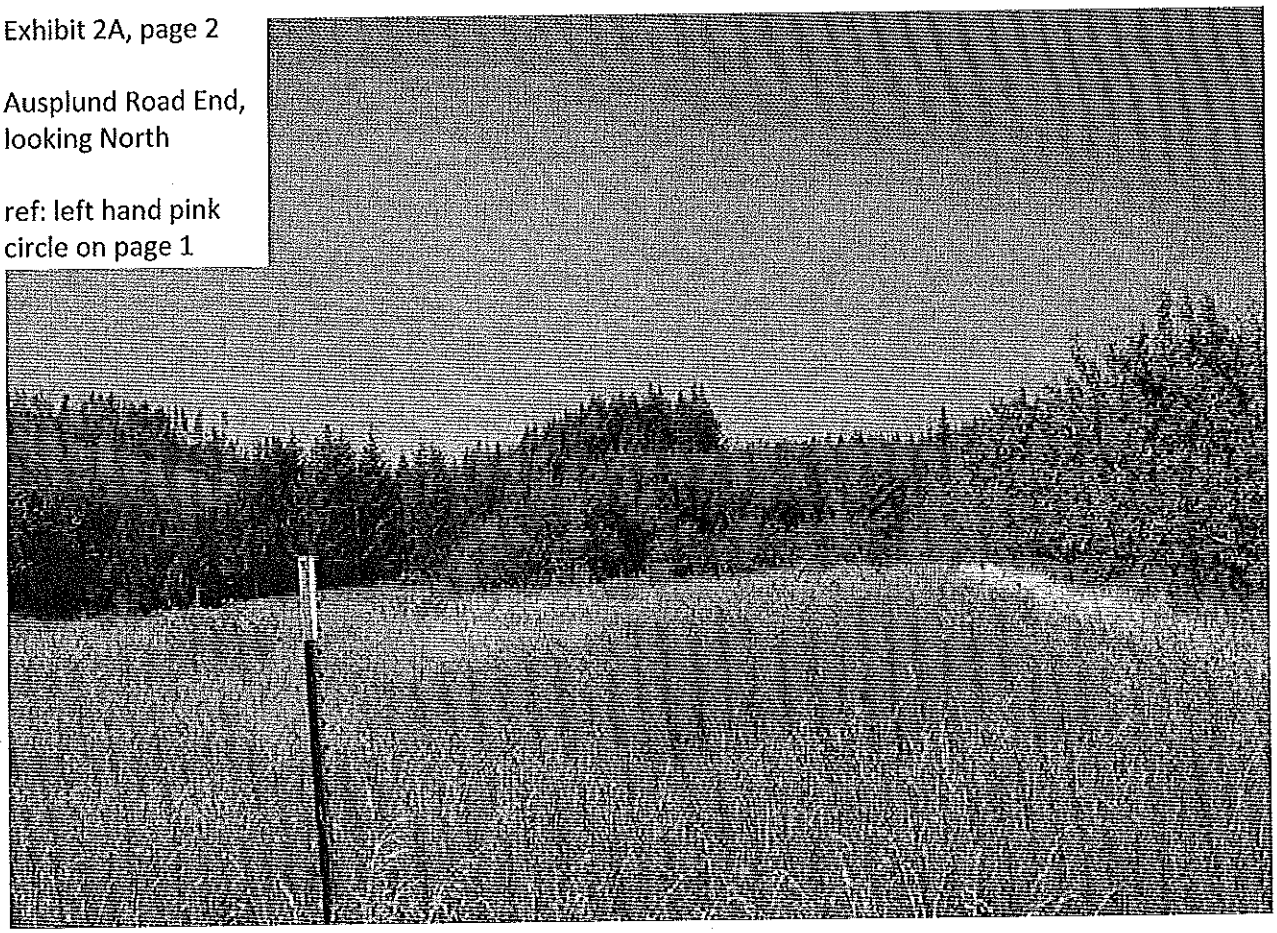
URS

Ridge Energy Project
ia County, Washington

Exhibit 2A, page 2

Ausplund Road End, looking North

ref: left hand pink circle on page 1



Ausplund Road End, looking North

ref: left hand pink circle on page 1

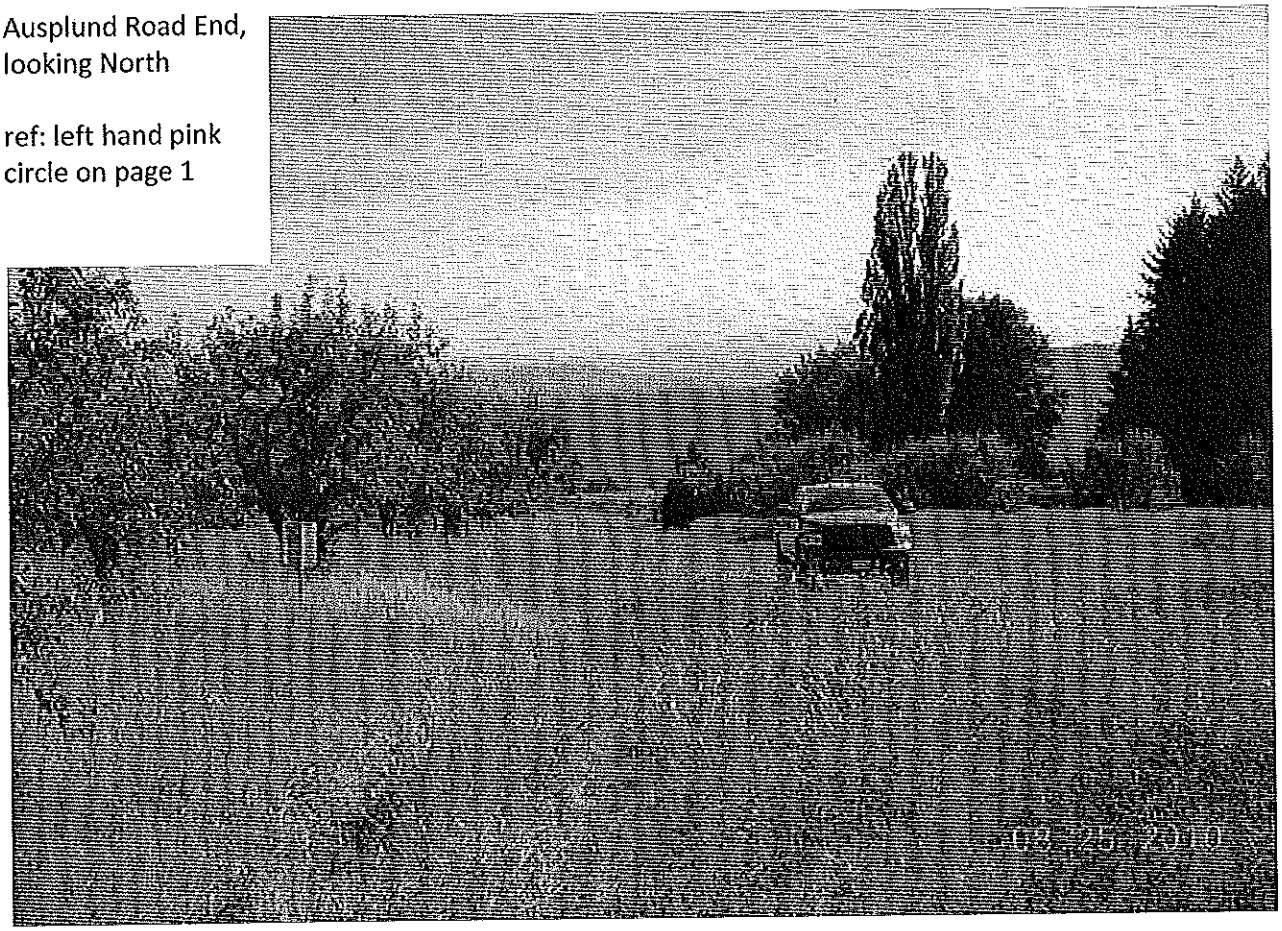


Exhibit 2B

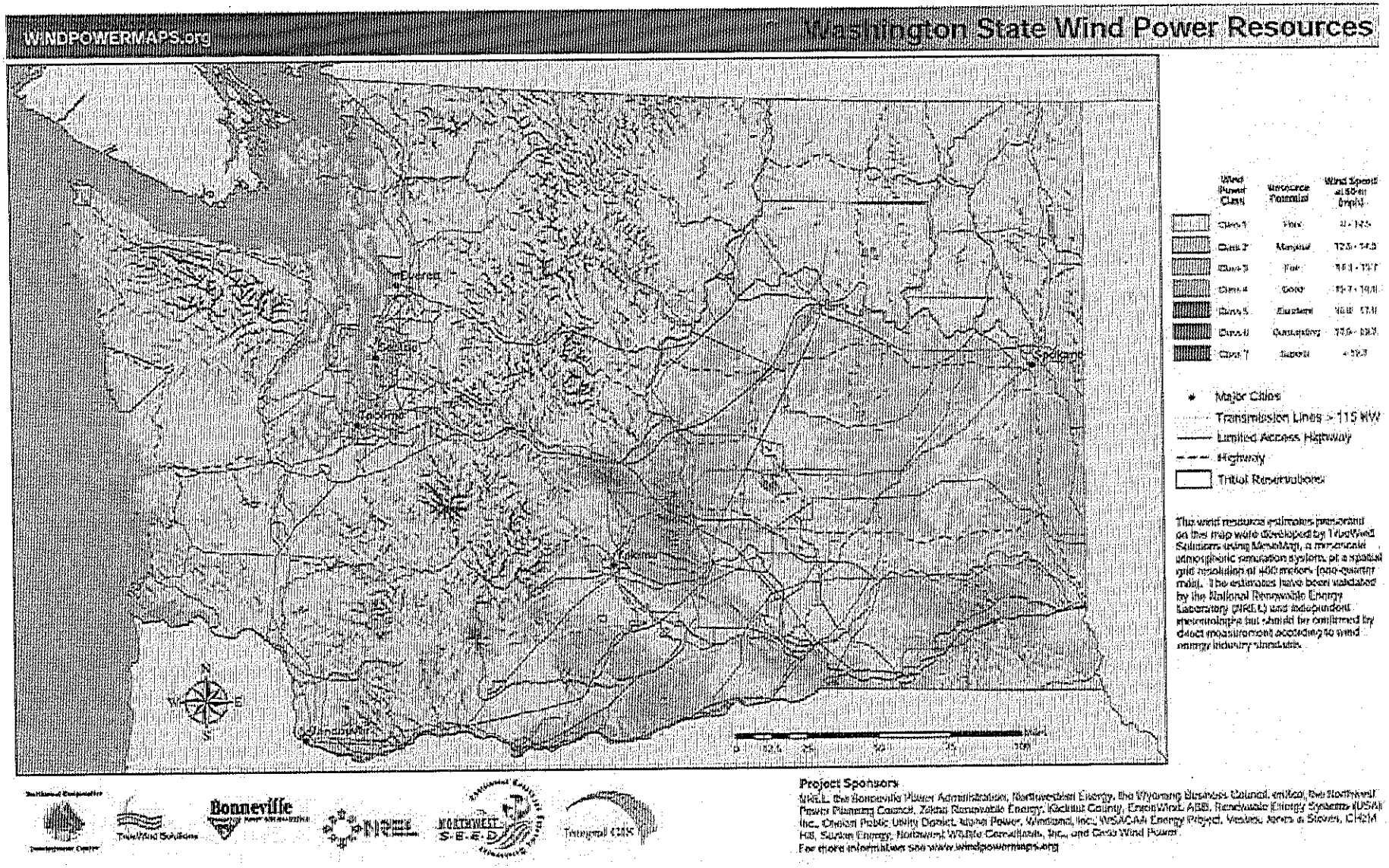
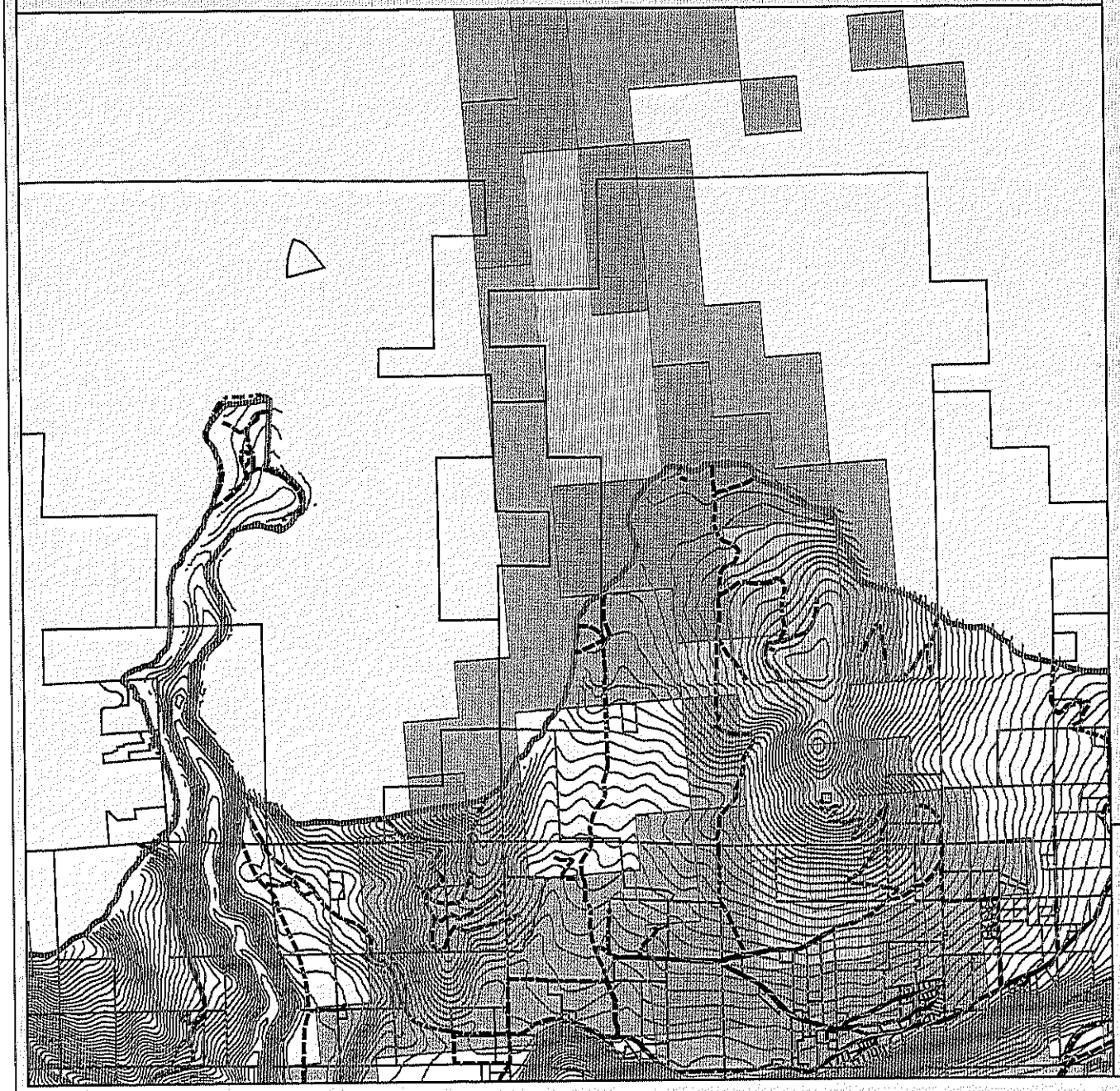

WINDPOWERMAPS.org
Washington State Wind Power Resources
Wind Power Class
Resource Potential
Wind Speed at 50-m (mph)
Major Cities
Transmission Lines > 115 kV
Limited Access Highway
Highway
Tribal Reservations
The wind resource estimates presented on this map were developed by TrueWind Solutions using MesoMap, a mesoscale atmospheric simulation system, at a spatial grid resolution of 200 meters (one-quarter mile). The estimates have been validated by the National Renewable Energy Laboratory (NREL) and independent meteorologists but should be confirmed by direct measurement according to wind energy industry standards.
Project Sponsors
NREL, the Bonneville Power Administration, Northwestern Energy, the Wyoming Business Council, enXco, the Northwest Power Planning Council, Zilkha Renewable Energy, Klickitat County, EnergyWorx, ABB, Renewable Energy Systems (USA) Inc., Chelan Public Utility District, Alpine Power, Windland, Inc., WSA/CAA Energy Project, Vestas, Jones & Stokes, CH2M Hill, Sustain Energy, Northwest Wildlife Consultants, Inc., and Cross Wind Power
For more information see www.windpowermaps.org

Exhibit 2C

National Renewable Energy Laboratories
Wind Speed Data for the Whistling Ridge Energy Project



Friends of the Columbia Gorge

Legend

- topo_40
- road
- GMA
- SMA
- nsa_taxlots

WPC

- 1
- 2
- 3
- 4
- 5
- 6
- 7

2,000 0 2,000 4,000 Feet

Map Date: 24 Aug 10

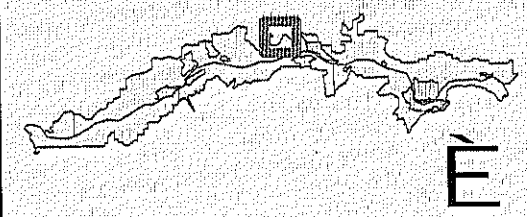


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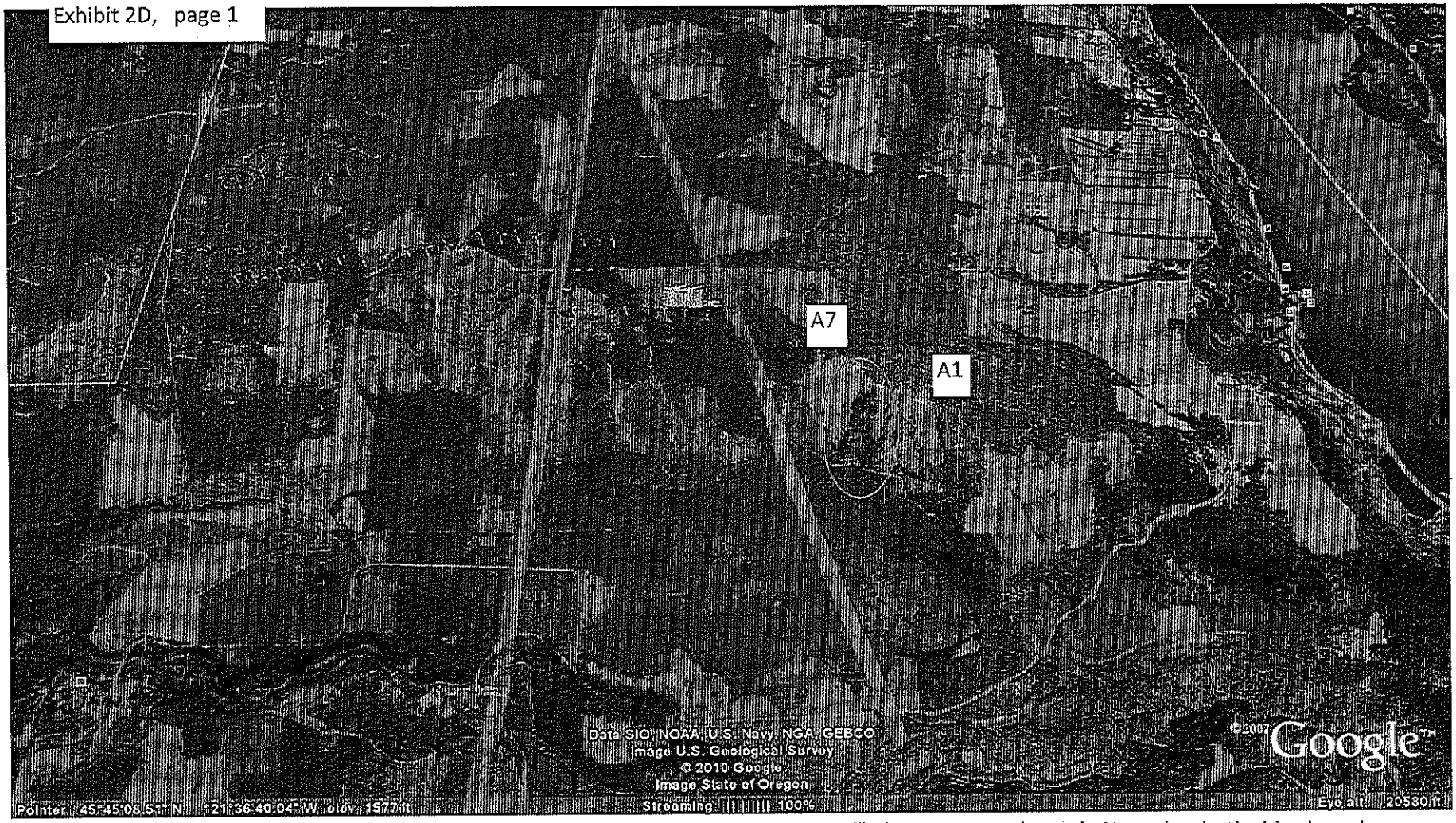
Exhibit 2D, page 1



← North

The forested area inside the "red oval" above was not logged. Note that both sides have been clear cut in 2003-4 on this 70%+ slope. Ref FPA's 2702754 and 2702799

This location is on the west slope at the south end of the proposed project, in the middle of Turbine String A1- A7.

The SEPA responsible official should investigate the nature of this area being restricted from logging, and what other information the DNR might have on this issue. They may contact the FP Forester named in the above FPA's, Tony Gilmer, who is still a State employee. contact Department of Natural Resources, Husum Office 509-493-3218 x222 for his contact information

Exhibit 2D, page 2

View looking east from Mill B flats on Cook-Underwood Road
section with trees remains unlogged

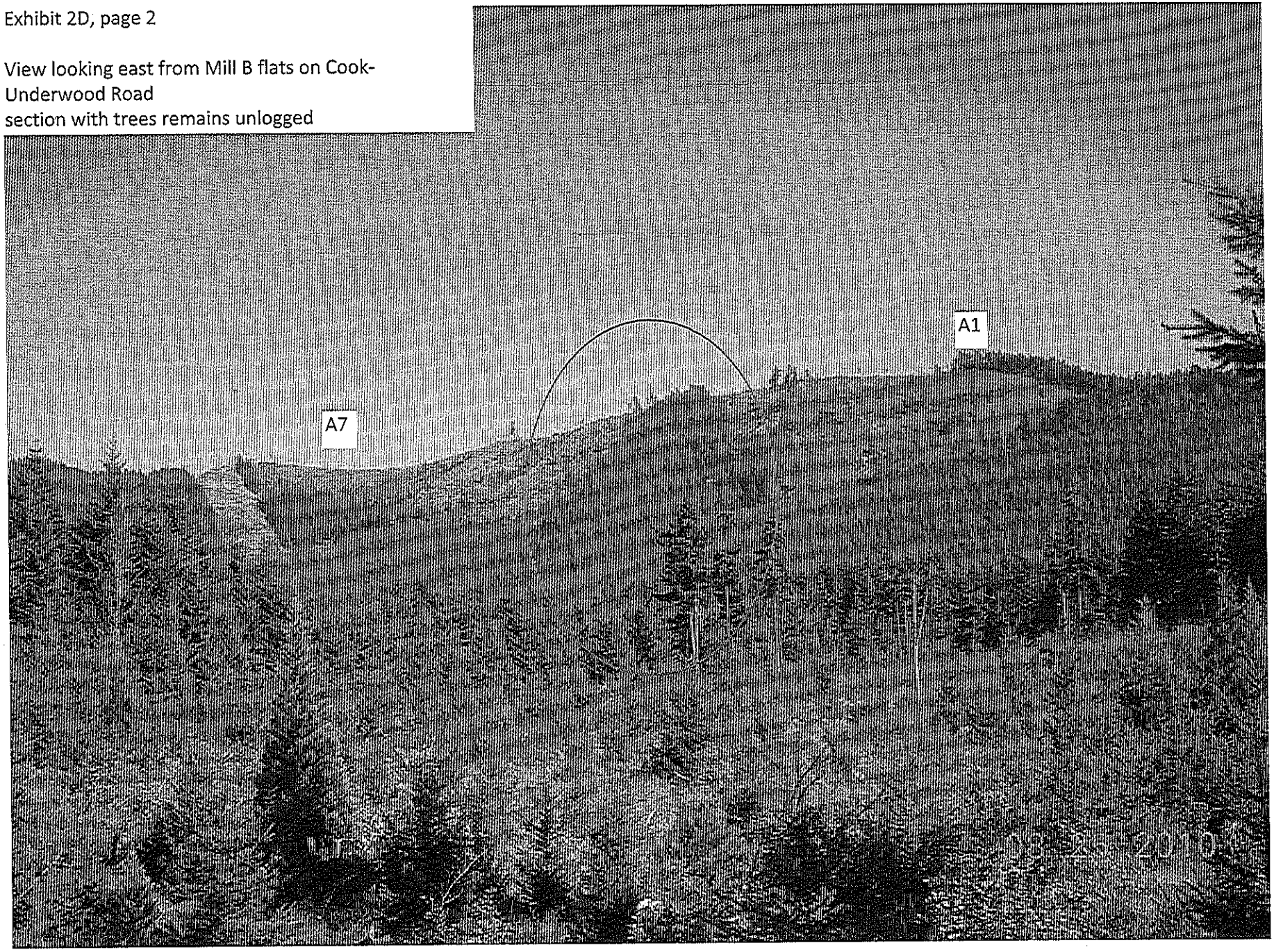


Exhibit 2G

Skamania County
Community Development Department

Skamania County Courthouse Annex
Post Office Box 790
Stevenson, Washington 98648
509 427-3900 FAX: 866-266-1534

August 11, 2010

Tom & Loreley Drach
P.O. Box 67
Underwood, WA 98651

RE: Request for Public Information dated July 6, 2010

Dear Mr. & Mrs. Drach,

This letter is in response to your Request for Public Information for any Skamania County Community Development issued permits, allowed administrative uses, or allowed outright uses, within the Forest Agriculture 20 zone in Township-Range-Section 03-10-18 and 03-09-13, between the years 2002 – 2010.

Our department has searched our paper records, electronic records, and emails as per your request. We have not received any applications or permitted any uses within the geographic area described, including records or correspondence related to meteorological towers. There is one Boundary Line Adjustment review, file number BLA-04-09, that was completed in 2004 that falls within the described area however it was not related to meteorological towers as far as any of our record show. Copies of this Boundary Line Adjustment (BLA) file are available to you by confirmation.

Sincerely,

Bonnie L. Anderson
Administrative Assistant

Exhibit 2H

OAR 345-022-0040(1)(g) prohibits energy projects that are "likely to result in significant adverse impact" to the Columbia River Gorge National Scenic Area.

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http://www.sos.state.or.us/archives/rules/OARs_300/OAR_345/345_022.html

345-022-0040

Protected Areas

(1) Except as provided in sections (2) and (3), the Council shall not issue a site certificate for a proposed facility located in the areas listed below. To **issue a site certificate for a proposed facility located outside the areas listed below, the Council must find that, taking into account mitigation, the design, construction and operation of the facility are not likely to result in significant adverse impact to the areas listed below.** References in this rule to protected areas designated under federal or state statutes or regulations are to the designations in effect as of May 11, 2007:

(a) National parks, including but not limited to Crater Lake National Park and Fort Clatsop National Memorial;

(b) National monuments, including but not limited to John Day Fossil Bed National Monument, Newberry National Volcanic Monument and Oregon Caves National Monument;

(c) Wilderness areas established pursuant to The Wilderness Act, 16 U.S.C. 1131 et seq. and areas recommended for designation as wilderness areas pursuant to 43 U.S.C. 1782;

(d) National and state wildlife refuges, including but not limited to Ankeny, Bandon Marsh, Baskett Slough, Bear Valley, Cape Meares, Cold Springs, Deer Flat, Hart Mountain, Julia Butler Hansen, Klamath Forest, Lewis and Clark, Lower Klamath, Malheur, McKay Creek, Oregon Islands, Sheldon, Three Arch Rocks, Umatilla, Upper Klamath, and William L. Finley;

(e) National coordination areas, including but not limited to Government Island, Ochoco and Summer Lake;

(f) National and state fish hatcheries, including but not limited to Eagle Creek and Warm Springs;

(g) National recreation and scenic areas, including but not limited to Oregon Dunes National Recreation Area, Hell's Canyon National Recreation Area, and the Oregon Cascades Recreation Area, and **Columbia River Gorge National Scenic Area;**

(h) State parks and waysides as listed by the Oregon Department of Parks and Recreation and the Willamette River Greenway;

(i) State natural heritage areas listed in the Oregon Register of Natural Heritage Areas pursuant to ORS 273.581;

(j) State estuarine sanctuaries, including but not limited to South Slough Estuarine Sanctuary, OAR chapter 142;

(k) Scenic waterways designated pursuant to ORS 390.826, wild or scenic rivers designated pursuant to 16 U.S.C. 1271 et seq., and those waterways and rivers listed as potentials for designation;

(L) Experimental areas established by the Rangeland Resources Program, College of Agriculture, Oregon State University: the Prineville site, the Burns (Squaw Butte) site, the Starkey site and the Union site;

(m) Agricultural experimental stations established by the College of Agriculture, Oregon State University, including but not limited to:

Coastal Oregon Marine Experiment Station, Astoria

Mid-Columbia Agriculture Research and Extension Center, Hood River

Agriculture Research and Extension Center, Hermiston

Columbia Basin Agriculture Research Center, Pendleton

Columbia Basin Agriculture Research Center, Moro

North Willamette Research and Extension Center, Aurora

East Oregon Agriculture Research Center, Union

Malheur Experiment Station, Ontario

Eastern Oregon Agriculture Research Center, Burns

Eastern Oregon Agriculture Research Center, Squaw Butte

Central Oregon Experiment Station, Madras

Central Oregon Experiment Station, Powell Butte

Central Oregon Experiment Station, Redmond

Central Station, Corvallis

Coastal Oregon Marine Experiment Station, Newport

Southern Oregon Experiment Station, Medford

Klamath Experiment Station, Klamath Falls;

(n) Research forests established by the College of Forestry, Oregon State University, including but not limited to McDonald Forest, Paul M. Dunn Forest, the Blodgett Tract in Columbia County, the Spaulding Tract in the Mary's Peak area and the Marchel Tract;

(o) Bureau of Land Management areas of critical environmental concern, outstanding natural areas and research natural areas;

(p) State wildlife areas and management areas identified in OAR chapter 635, division 8.

Late WR - DEIS Public Comment #545

Michelle, Kayce (UTC)

From: Joyce Leggatt [[redacted]@harbor-properties.com]
Sent: Monday, August 30, 2010 10:35 AM
To: EFSEC (UTC)
Subject: Whistling Ridge Negatively Impacts Columbia Gorge

I am writing to comment on the DEIS for the Whistling Ridge Energy Project, proposed in the Underwood, WA area, near the Skamania and Klickitat county lines.

This proposal is likely to have different and greater wildlife impacts than any other wind energy facility proposed in the State of Washington, because it is proposed along a forested ridgeline in the foothills of the Cascade Mountains and on the boundary of the Columbia River Gorge National Scenic Area. The proposed project would cause significant negative impacts to sensitive wildlife and plant habitat, and would degrade the outstanding scenic beauty of the Lewis and Clark National Historic Trail and Columbia River Gorge National Scenic Area.

I am concerned that the DEIS is fundamentally flawed because it fails to provide a credible alternatives analysis. EFSEC and BPA need to consider other alternatives, including other means of providing electricity (including increasing efficiency and reducing consumption), other sites for wind energy, other configurations, deleting turbines to reduce impacts, alternative routes for hauling turbines to avoid traffic impacts to the National Scenic Area, etc. Only two alternatives are meaningfully considered in the DEIS (the proposal and the no-action alternative). This is inadequate.

The DEIS has other flaws. The DEIS fails to adequately analyze the potential cumulative impacts of this project when considered with other existing and likely future wind energy projects and other development projects in the region. The photo simulations in the DEIS are inadequate and misleading. Some of them have cloudy backgrounds, thus not adequately representing the full extent of the impacts, and other simulations are out scale. Additional viewpoints need to be considered, including views from the Historic Columbia River Highway. The DEIS erroneously concludes that the scenic impacts would not be significant, even though most of the turbines would be visible from designated key viewing areas within the National Scenic Area. In addition, the BPA and EFSEC have not adequately consulted with the Yakama Nation to ensure the protection of cultural resources.

Lastly, EFSEC and BPA need to fix the flaws in the DEIS, issue a revised or supplemental DEIS, and make substantial revisions to the EIS to fully inform the public about the true environmental impacts of the project. If another DEIS is issued the 50-turbine layout should be rejected.

Thank you for extending the public comment period and allowing me to submit these comments into the record.

Joyce Leggatt
[redacted] NE Bridgeton Rd #6
Portland, OR 97211

WR - DEIS
Public Comment #546

Michelle, Kayce (UTC) **Late**

From: Ian Shelley [redacted]@comcast.net]
Sent: Monday, August 30, 2010 11:50 AM
To: EFSEC (UTC)
Subject: Whistling Ridge Negatively Impacts Columbia Gorge

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Ian Shelley
[redacted] SW Wilshire St.
Portland, OR 97225