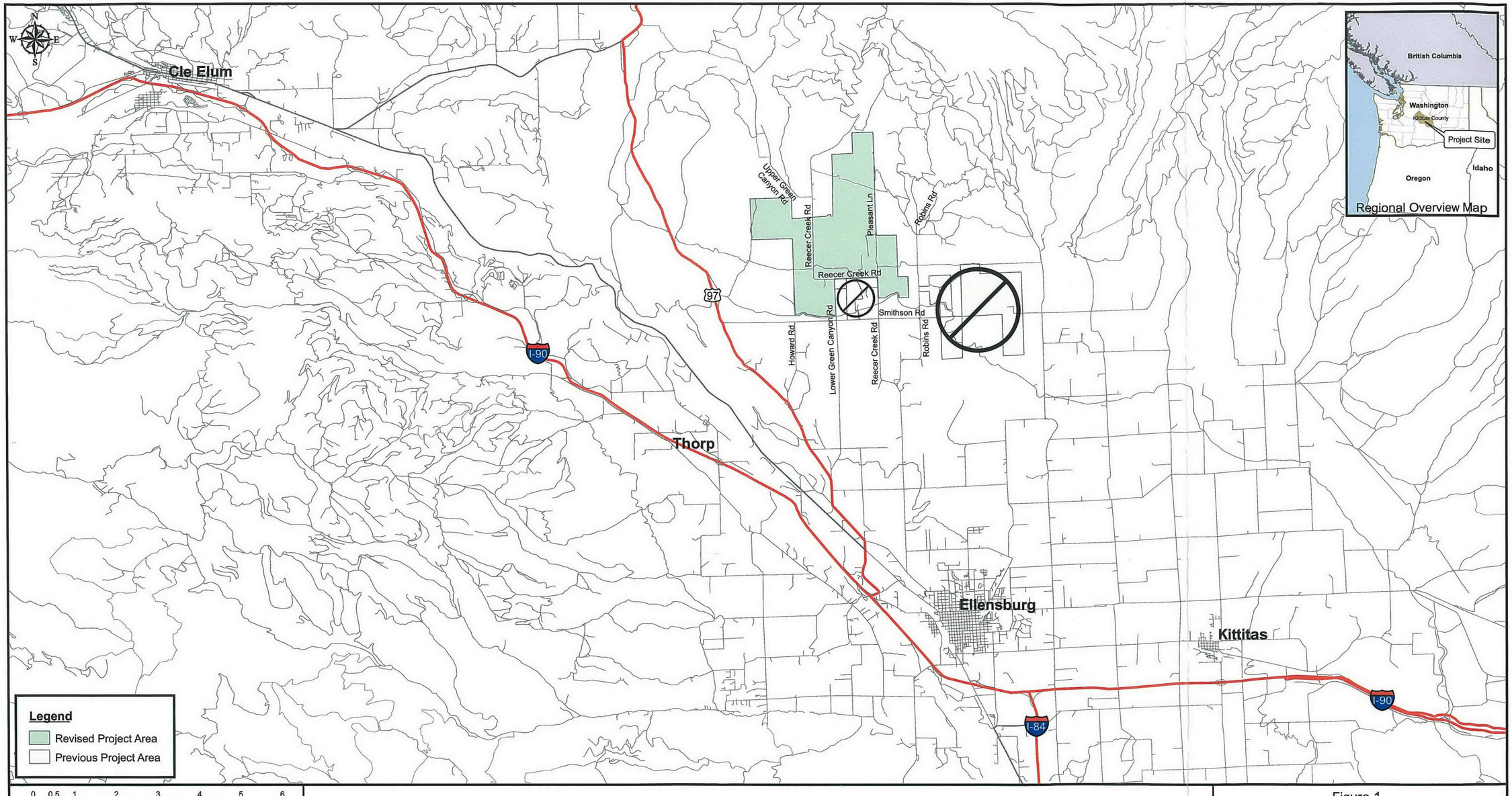
Desert Claim Wind Power

APPLICATION FOR SITE CERTIFICATION

November 2006

enXco



Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WIND POWER

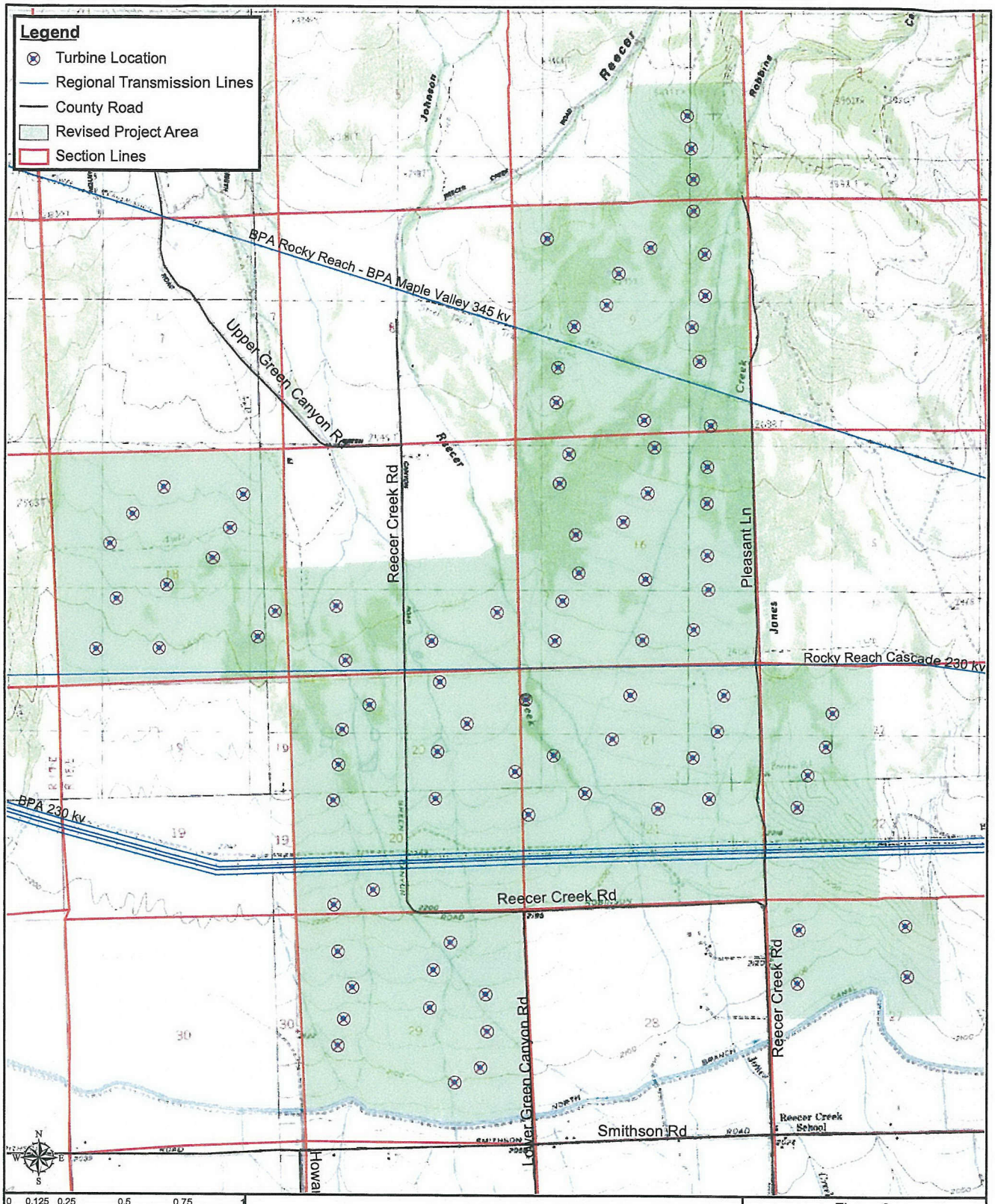
Kittitas County, Washington

Figure 1

REVISED PROJECT AREA AND SURROUNDING VICINITY

Date: 10/2/2006	GIS Analyst: avh

Map Source Information:



0 0.125 0.25 0.5 0.75 1
Miles
Scale 1:37,500

Desert Claim Wind Power
Kittitas County, Washington

DESERT CLAIM WIND POWER

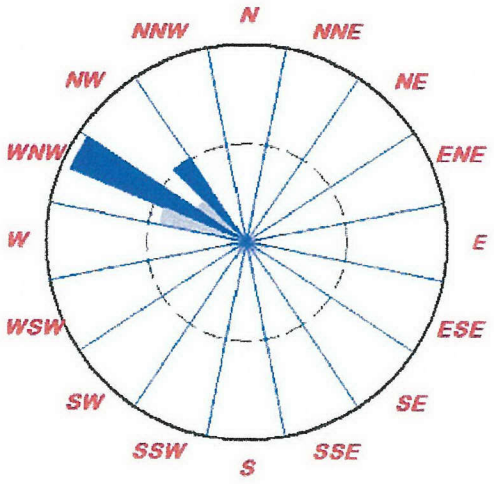
Kittitas County, Washington

Figure 2
REVISED PROJECT AREA

Date: 10/2/2006	GIS Analyst: avh

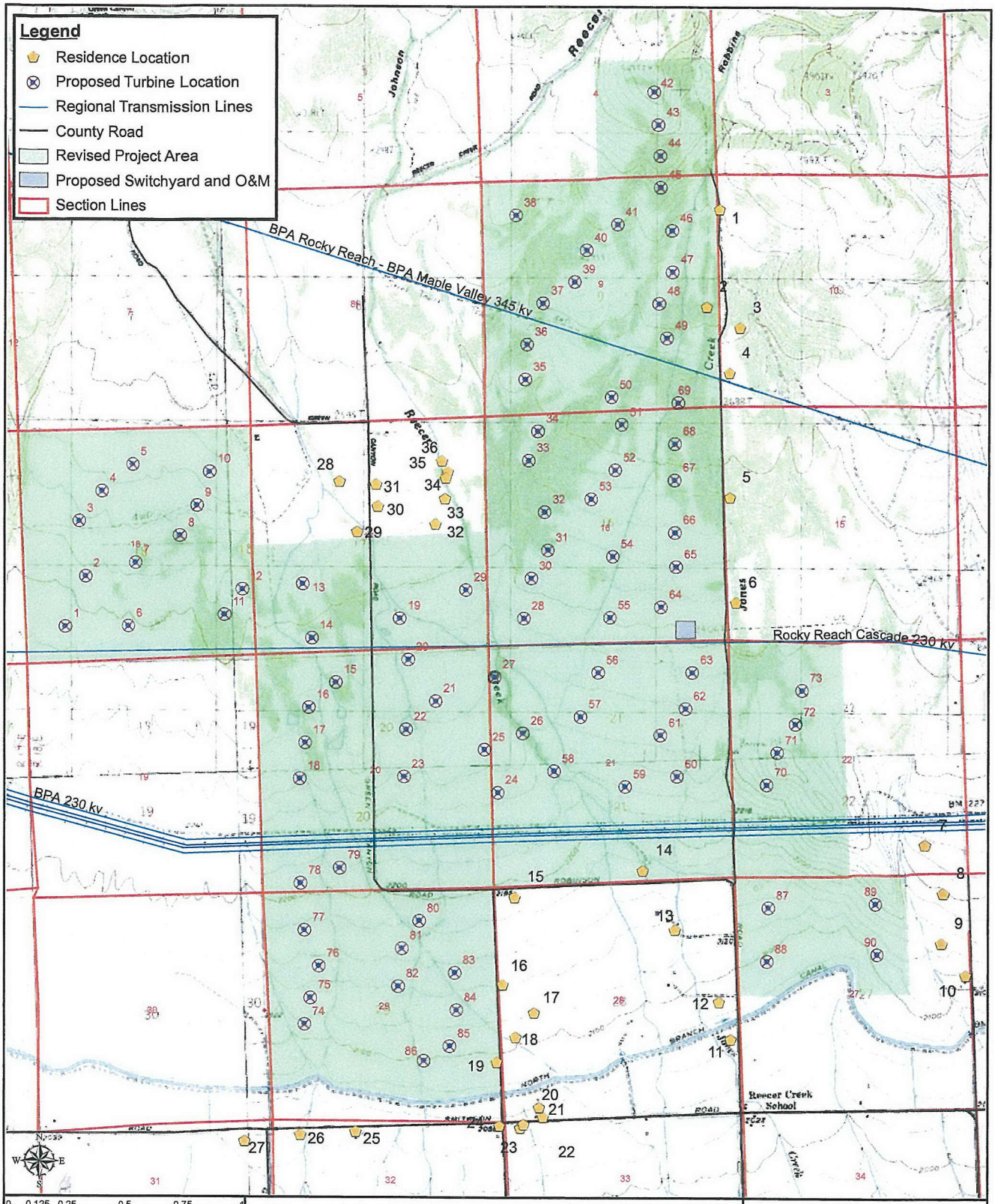
Map Source Information: USGS Topographic Map, 1:24,000 scale.

enXco - Desert Claim Project
Mast 209
50 m Wind Rose Graph
July 2001 - June 2005



Percent of Total Wind Energy (Wh/m^2):
Percent of Total Time:
Circle Center: 0.0%
Inner Circle: 32.5%
Outer Circle: 65.0%

Desert Claim Wind Power Kittitas County, Washington	**DESERT CLAIM WIND POWER** Kittitas County, Washington	Figure 3 **WIND ROSE FOR PROJECT AREA** Date: 10/2/2006 | GIS Analyst: avh Map Source Information: USGS Topographic Map, 1:24,000 scale.



DESERT CLAIM WIND POWER

Kittitas County, Washington

Figure 4

REVISED PROJECT AREA WITH NEIGHBORING RESIDENCES

Date: 10/2/2006	GIS Analyst: avh

Map Source Information: USGS Topographic Map, 1:24,000 scale.

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WIND POWER

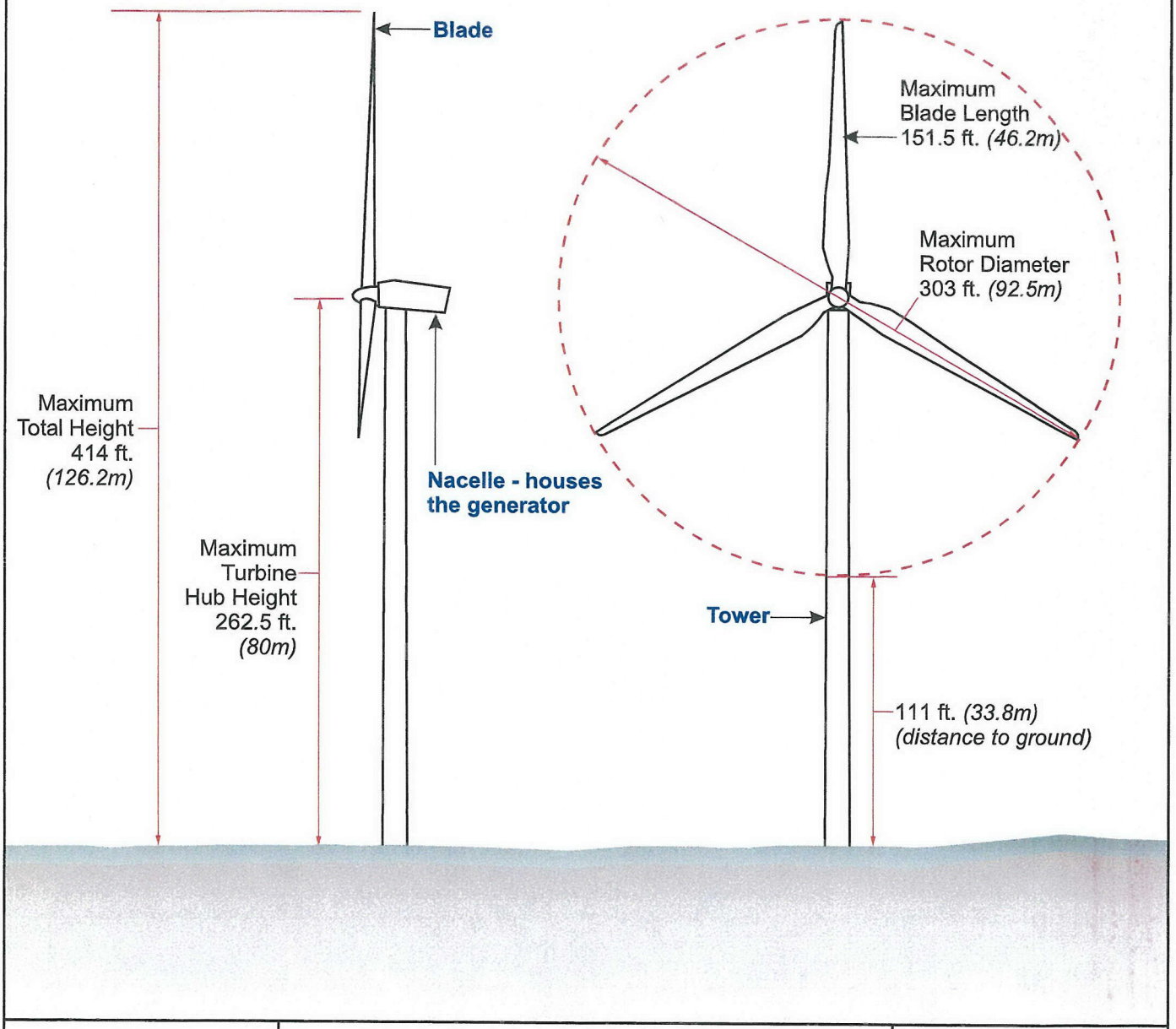
Kittitas County, Washington

Figure 5

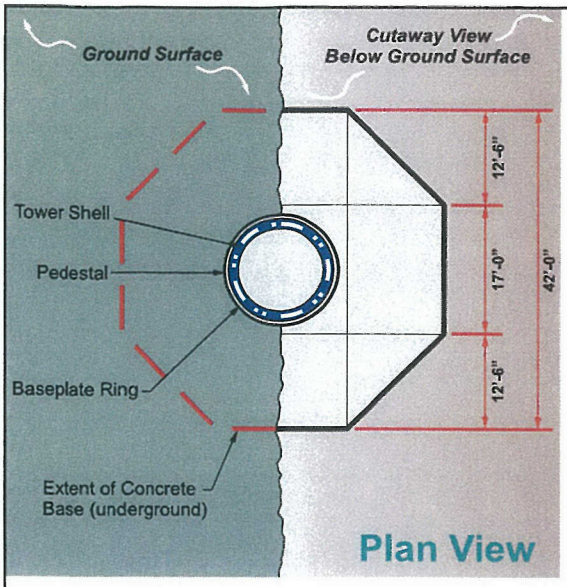
TYPICAL WIND TURBINES IN OPERATION

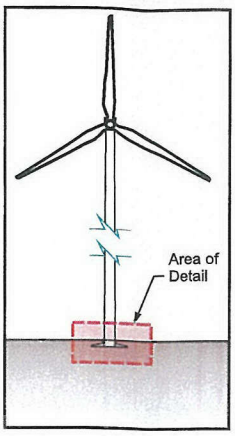
Date: 10/2/2006	GIS Analyst: avh

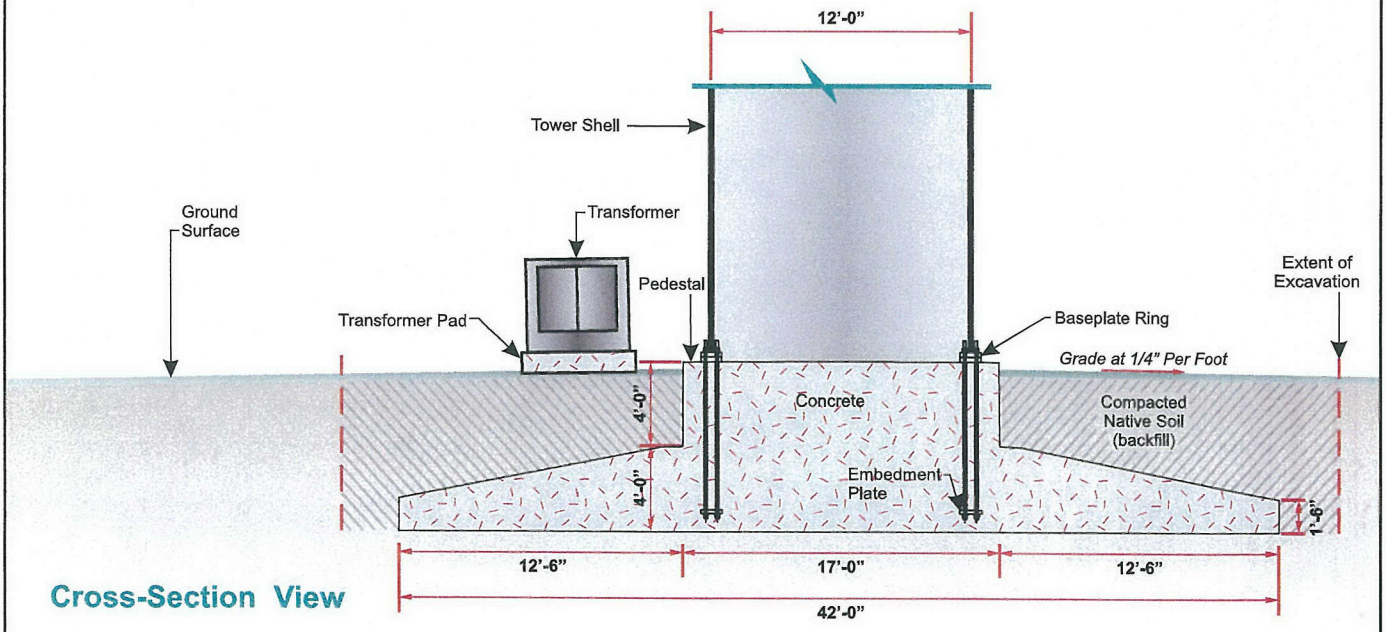
Map Source Information: USGS Topographic Map, 1:24,000 scale.



Not to Scale	**DESERT CLAIM WIND POWER**	Figure 6 **DIAGRAM OF PROPOSED WIND TURBINE**
Desert Claim Wind Power Kittitas County, Washington	Kittitas County, Washington	Date: 10/19/2006 | GIS Analyst: Map Source Information:

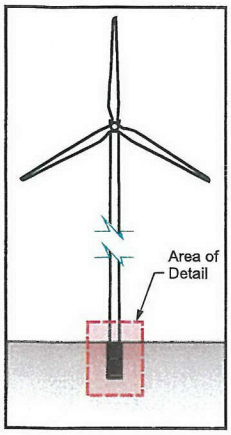


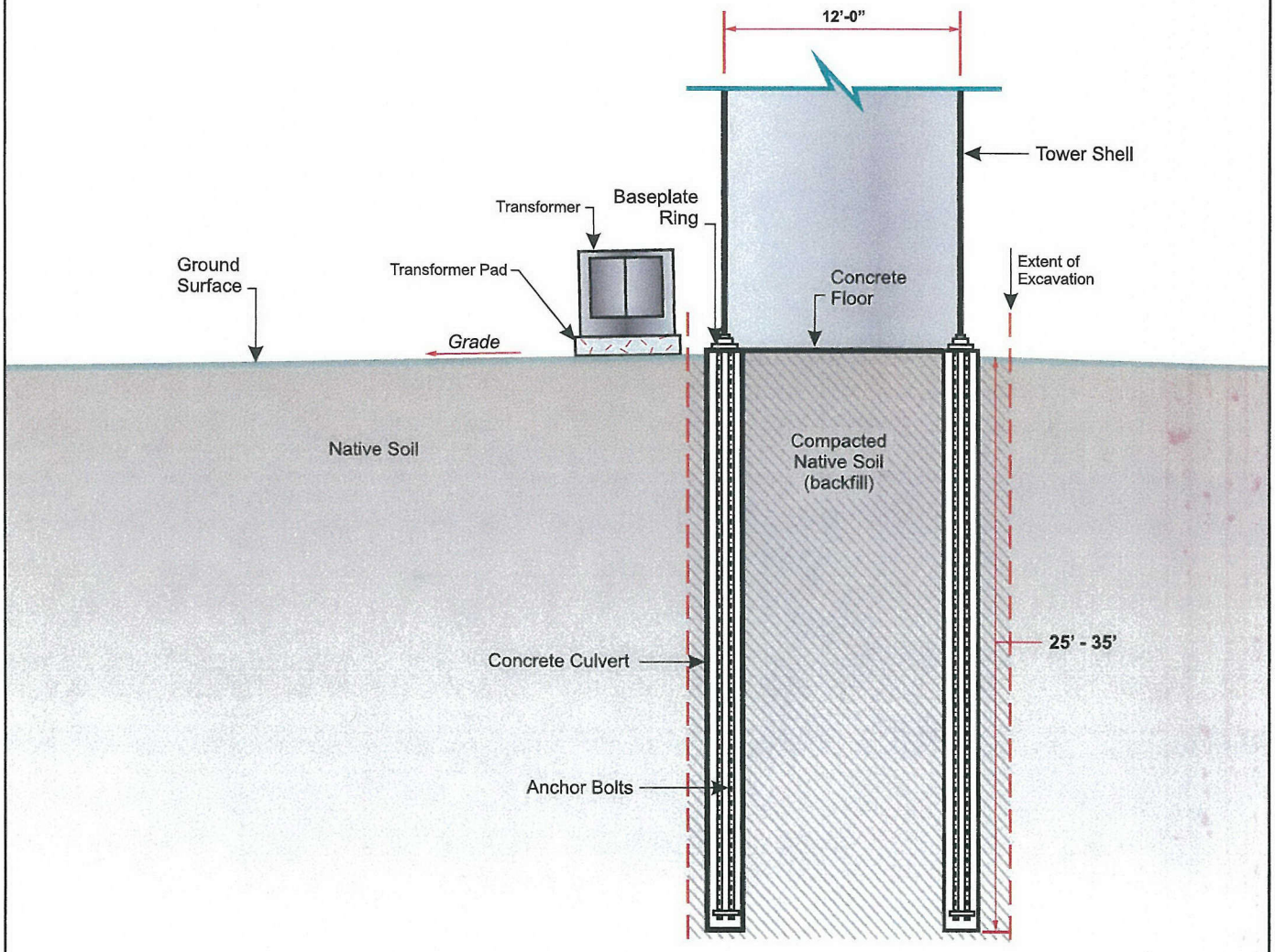




INVERTED T TYPE FOUNDATION

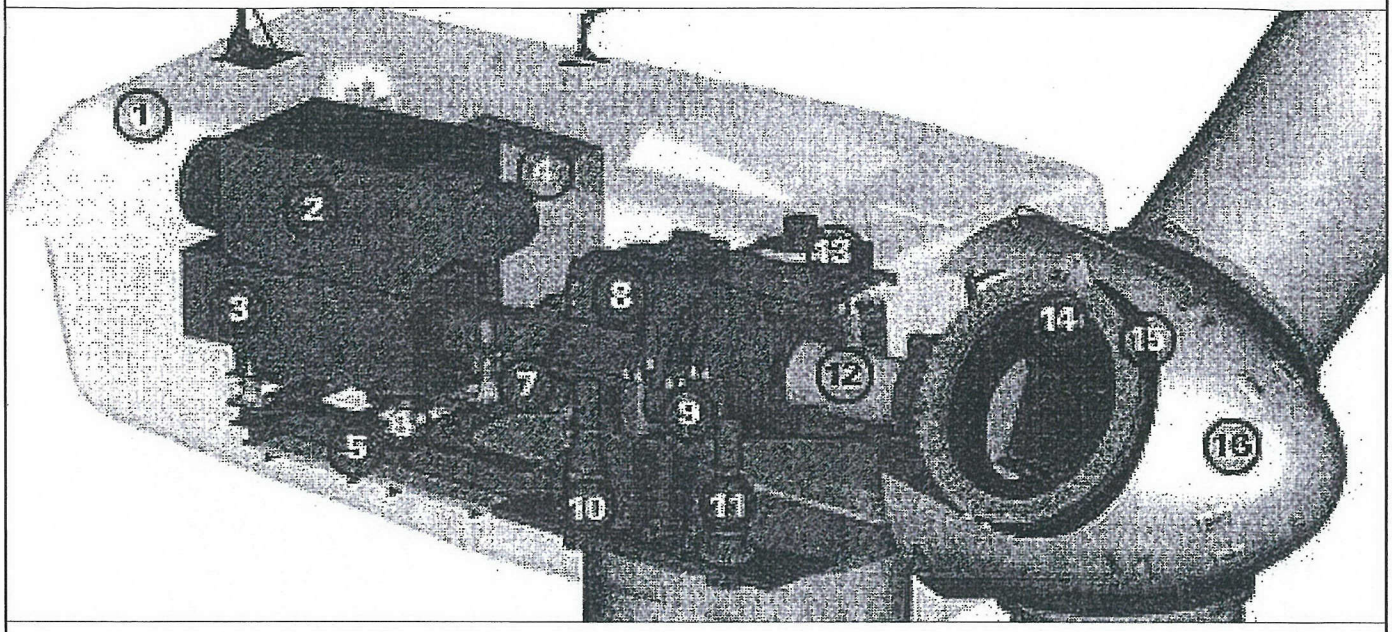
Not to Scale	**DESERT CLAIM WIND POWER**	Figure 7A **TYPICAL TURBINE FOUNDATION - INVERTED T**
Desert Claim Wind Power Kittitas County, Washington	Kittitas County, Washington	Date: 10/19/2006 | GIS Analyst: Map Source Information:





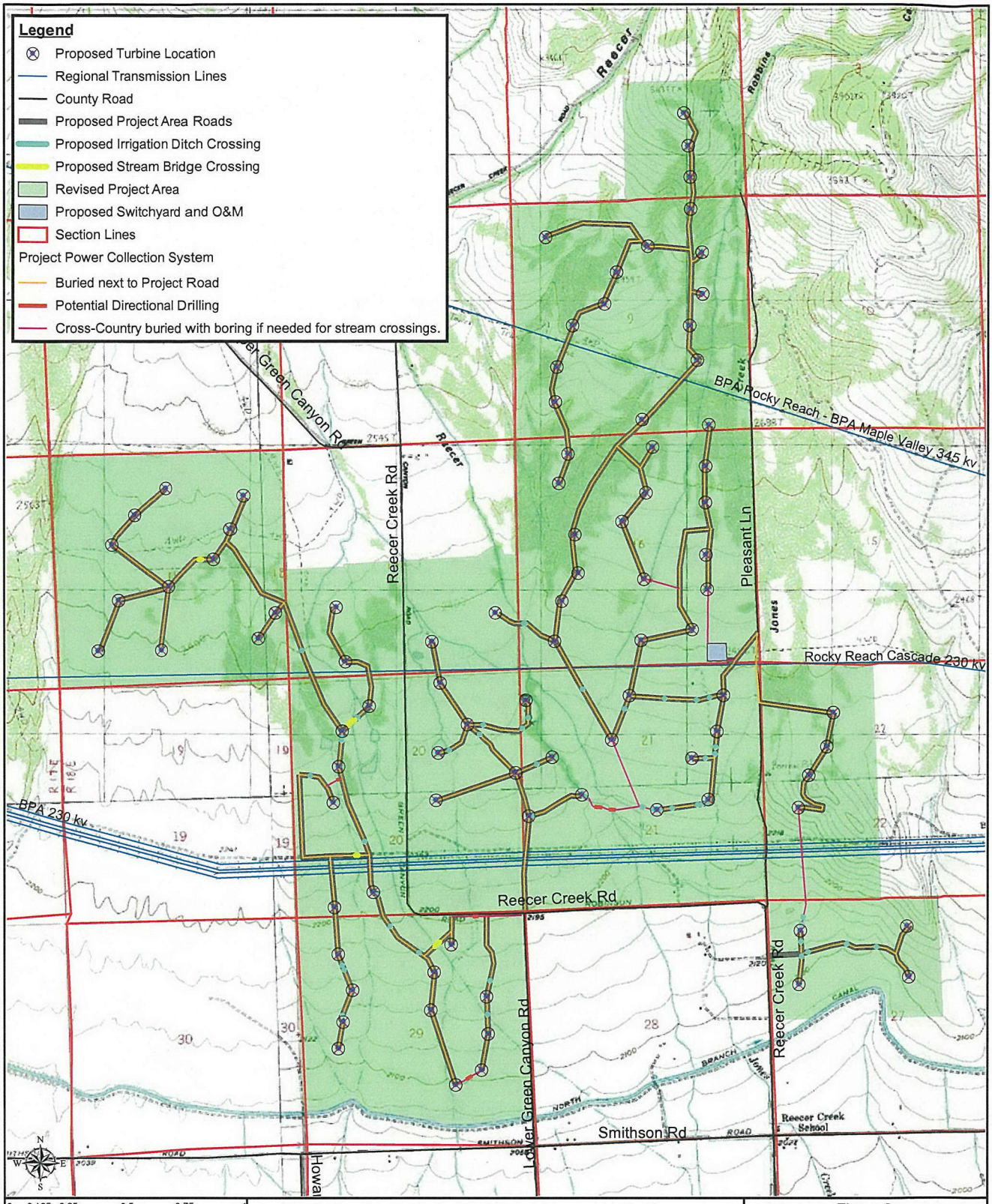
PILE TYPE FOUNDATION

Not to Scale	**DESERT CLAIM WIND POWER**	Figure 7B **TYPICAL TURBINE FOUNDATION - PILE TYPE**
Desert Claim Wind Power Kittitas County, Washington	Kittitas County, Washington	Date: 10/19/2006 | GIS Analyst: Map Source Information:



1. Nacelle
2. Heat Exchanger
3. Generator
4. Control Panel
5. Main Frame
6. Impact Noise Insulation
7. Hydraulic Parking Brake
8. Gearbox
9. Impact Noise Insulation
10. Yaw Drive
11. Yaw Drive
12. Rotor Shaft
13. Oil Cooler
14. Pitch Drive
15. Rotor Hub
16. Nose Cone

Not to Scale	**DESERT CLAIM WIND POWER**	Figure 8 **TYPICAL NACELLE CONFIGURATION**
Desert Claim Wind Power Kittitas County, Washington	Kittitas County, Washington	Date: 10/19/2006 | GIS Analyst: Map Source Information:



0 0.125 0.25 0.5 0.75 1
Miles
Scale 1:37,500

Desert Claim Wind Power
Kittitas County, Washington

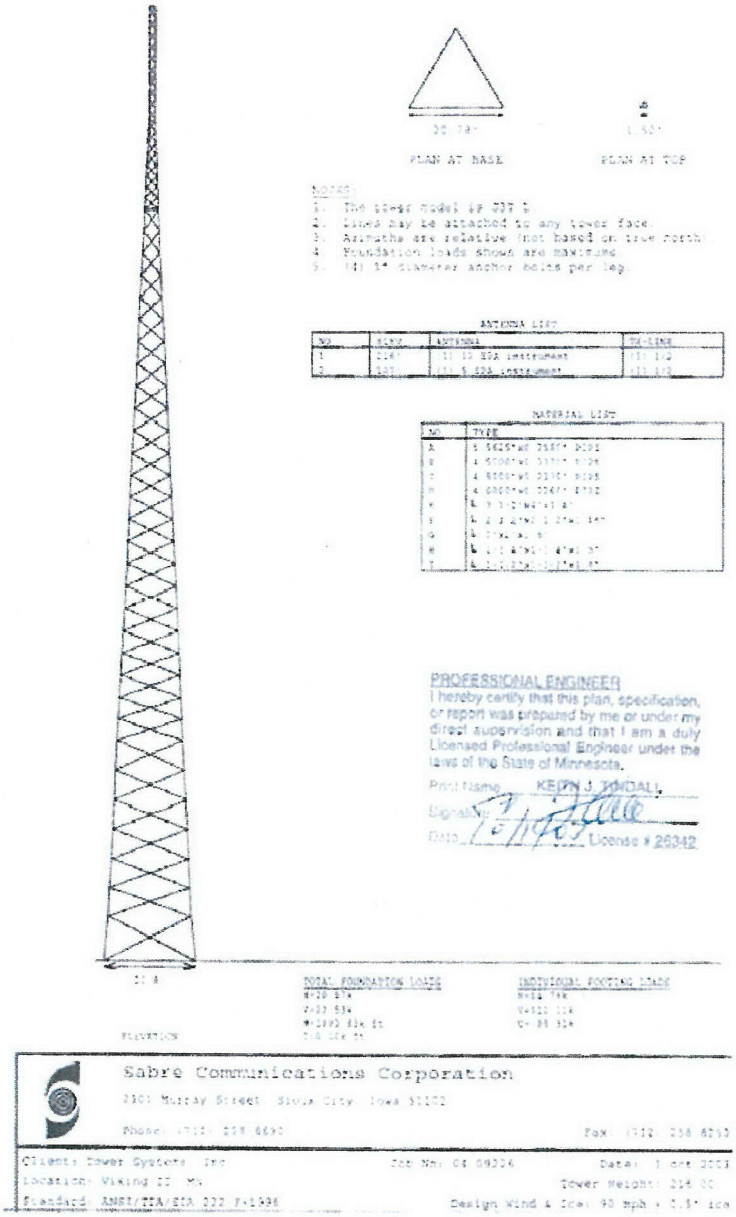
DESERT CLAIM WIND POWER

Kittitas County, Washington

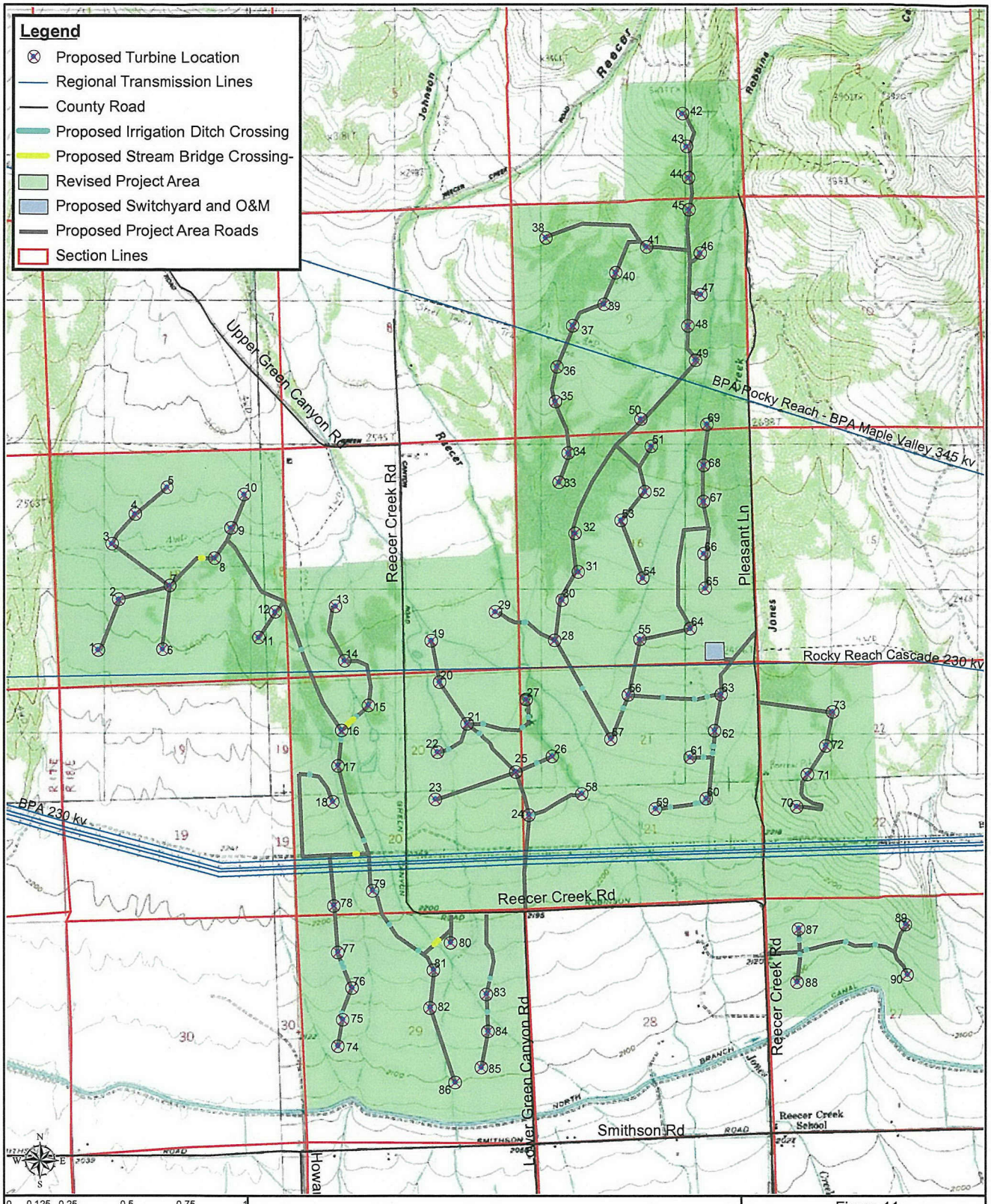
Figure 9
PROJECT POWER COLLECTION SYSTEM

Date:	GIS Analyst:
10/2/2006	avh

Map Source Information: USGS Topographic Map, 1:24,000 scale.



Desert Claim Wind Power Kittitas County, Washington	**DESERT CLAIM WIND POWER** Kittitas County, Washington	Figure 10 **TYPICAL PERMANENT MET TOWER** Date: 10/2/2006 | GIS Analyst: avh Map Source Information: USGS Topographic Map, 1:24,000 scale.



DESERT CLAIM WIND POWER

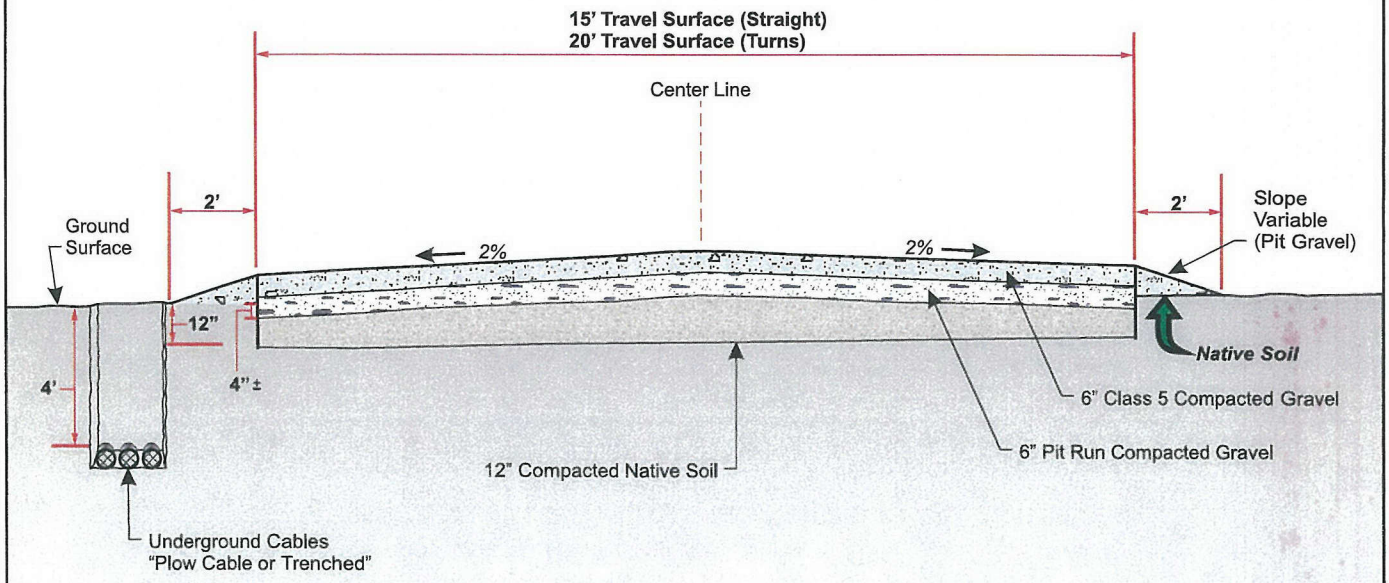
Kittitas County, Washington

Figure 11
PROJECT ACCESS ROAD SYSTEM

Date:	GIS Analyst:
10/2/2006	avh

Map Source Information: USGS Topographic Map, 1:24,000 scale.

Desert Claim Wind Power
Kittitas County, Washington



Not to Scale

Desert Claim Wind Power
Kittitas County, Washington

DESERT CLAIM WIND POWER

Kittitas County, Washington

Figure 12
TYPICAL ACCESS ROAD CROSS SECTION

Date: 10/19/2006	GIS Analyst:
Map Source Information:	

kpff Consulting Engineers

Analysis and Commentary:

Hazard Zones Resulting From Certain Defined Failures Of REpower MM92 Wind Turbines at the Desert Claim Project

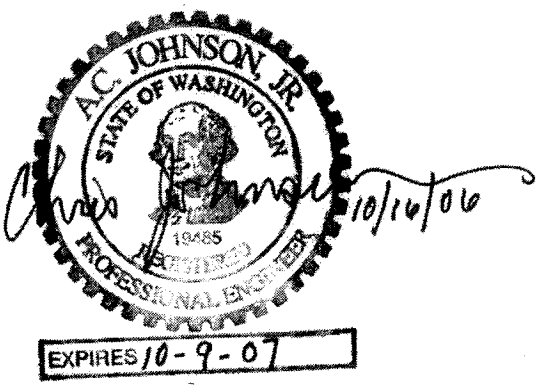
Prepared For

enXco Development Corporation
Escondido, CA

By

KPFF Consulting Engineers, Inc.
101 Stewart St. – Suite 800
Seattle, Washington 98101

October 8, 2006



Background

KPFF has been requested by enXco to provide analysis and commentary on possible hazards resulting from certain failures of the specified REpower MM92 wind turbine assembly. The primary author of this report has completed a similar analysis of a similar turbine assembly for Kittitas County, Washington, in preparation of the Environmental impact Statement (EIS) for the Desert Claim Wind Power Project. This report draws from the literature search and calculations previously completed for those reports.

Three types of failures were identified for consideration in this report:

1. Blade Throw: Loss of an entire blade by failure at the hub attachment.
2. Tower Failure: Complete failure of the tower, particularly at the base.
3. Ice Throw: Ice accretions being thrown from a moving rotor.

It is prudent to consider the potential hazard zones created by various failure modes and take appropriate measures to mitigate risks. One of the most commonly employed means of managing these risks is the imposition of setbacks. It must therefore be noted that the calculations herein of potentially affected areas are idealized and simplified. Extensive modeling of risks associated with various failures has not been accomplished by the industry, and, because the risks are rare, it is not possible to corroborate the calculations with experiential data. The use of safety factors over and above calculated distances is recommended practice when determining setbacks.

Basics

The following data regarding wind turbine structural, machinery, operating and siting characteristics were provided by enXco and from the REpower MM 92 technical specification for this study.

Given:

- REpower MM92 wind turbine
- Location – Kittitas County, WA
- Rotor diameter – 92.5 meters (303 feet)
- Tower height – 80 meters (262.5 feet)
- Cutout wind speed – 24 m/s (54 miles per hour)
- Rotation speed – Maximum of 17 rpm (revolutions per minute)
- Tower base at same elevation as surrounding area.

It must be noted that (1) blade throw distances are mainly in the plain of rotation, not down wind and (2) the prevailing wind direction does not uniquely define wind direction at time of failure. Therefore **the potential hazard zone created by any failure should be considered as a circle with the tower at the center**. In other words, it is not safe or good practice to determine setbacks based on prevailing wind direction, unless the turbines are physically limited to that orientation.

kpff Consulting Engineers

Blade Throw

If a blade detaches from the rotor, its trajectory will be dependent upon the loading and stress state at the time of failure, and on the type and progression of failure before separation. This having been said, it is still useful to perform a simplified calculation of possible throw distance for use as a reference when considering setbacks. The simplified worst-case loss of a whole blade would occur with the blade rotating at maximum speed, when the blade is oriented at 45° from the vertical and rising. This is the classic maximum trajectory case from standard physics texts and yields the results in the table below as illustrated in **Figure A**. Review of these data indicates that for the REpower MM92 defined above, the maximum calculated blade throw distance is 152.3 m (500 ft.) from the tower to tip of the fallen blade.

The simplifications in this calculation can be summarized as follows. First, lacking detailed design data for the rotor blade, the blade center of gravity has been conservatively located as if the blade were of uniform thickness. In reality the blade CG is much closer to the hub so the actual initial kinetic energy would be much lower than estimated – perhaps by as much as 40%-50% - and the thrown distance will be proportionately reduced. Secondly, it is assumed that the blade travels and lands oriented parallel to its flight path (i.e., like a javelin) in plane with its original plane of rotation. Thirdly, drag forces along and perpendicular to the flight path are assumed to be extremely small compared to the weight (several tons) of each blade.

Blade Throw Distances

Turbine Model	Rotor Diameter	Rotor Speed	Tower Height	Blade Throw
REpower MM92	92.5 m (303 ft.)	17 RPM (max.)	80 m (262.5 ft.)	500 ft.

As mentioned previously, setbacks should be larger than the calculated maximum distance to account for the simplifications and uncertainties inherent in the calculations. KPFF conservatively recommends using a multiplier of 1.25, to establish a safety setback of 625 ft.

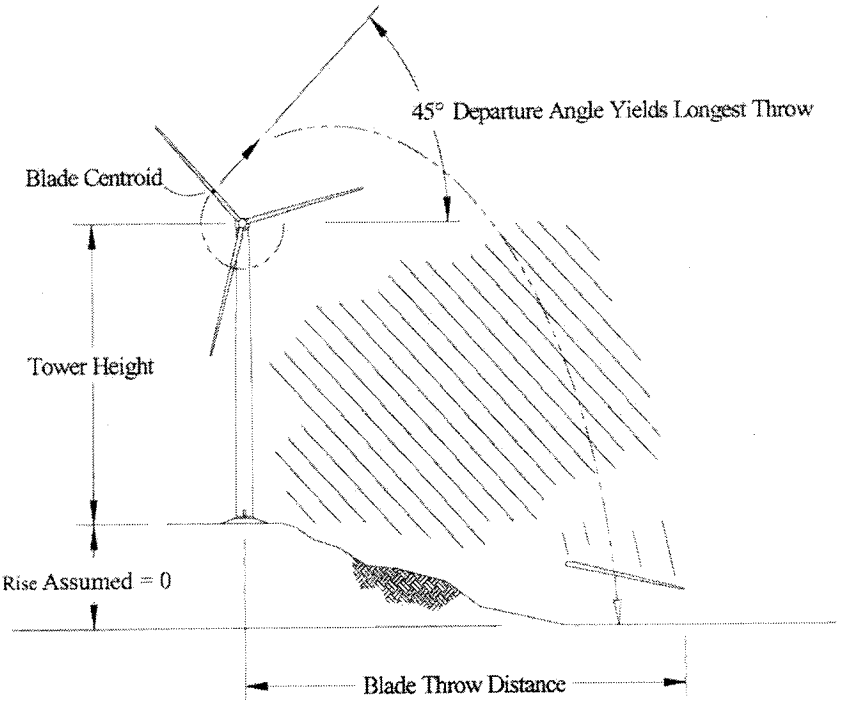


Figure A
Blade Throw Hazard Zone

Tower Collapse

Collapse of a turbine tower that has been constructed in accordance with international standards and local building codes is an extremely remote possibility. The Washington State Energy Facility Site Evaluation Council (2003) documented a personal communication with an insurance industry executive whose company insures over 12,000 wind turbines worldwide, indicating that he was not aware of any case of a tubular wind tower collapsing. In the unlikely event of a tower collapse, persons, animals and facilities within the area could be at risk of being struck by the tower, the nacelle or the turbine rotor blades. Each of these items weighs many tons, so it is reasonable to expect that being struck would result in damage, injury or death.

Failure of the tower at its base, or of its anchorage to the foundation, would create a hemispherical hazard zone with a radius approximately equal to the tower height (to the rotor centerline) plus one half of the rotor diameter. Persons, animals, and facilities within this radius would be at risk of being struck by the tower, generator assembly or rotor blades. For the specified REpower MM92 turbine and tower, the radius of the hazard zone under this scenario would be 126.3 meters (414 feet); this relates to a circular area at ground level of about 12.4 acres. Note that the area of potential impact due to tower collapse is smaller than that calculated for blade throw above.

Theoretically, it is also possible for tubular steel towers to buckle at some point along their length. Under this scenario the potential area of impact would be smaller than that of a tower failing at its base.

Ice Throw

Under certain conditions ice can form on wind turbine towers and rotor blades in a variety of ways. It has been observed that moving rotor blades are subject to heavier buildups of ice than stationary structures through the mechanism of rime icing (Morgan et al., 1998). Rime icing occurs when a sub-freezing structure is exposed to moisture-laden air with significant velocity. If the ice then becomes detached while the blades are rotating, there is the possibility of "ice throw" over a considerable distance from the turbine. Persons, animals and facilities within the ice throw hazard zone could theoretically be at risk of being struck by falling ice fragments.

Ice throw over 100 m (328 ft) has not been documented as a hazard and an ice throw injury report has not been found in the course of this or previous studies. One manufacturer recommends an ice throw exclusion zone with a radius of 125 m (410 ft) on the downwind side of the tower, which they cite as 125% of the largest recorded throw distance.

Summary of Findings

KPFF has conducted calculations that indicate a safety setback of 625 feet from each turbine tower will provide protection of people and facilities from the possibility of blade throw, tower failure and ice throw. Beyond this safety setback, no impacts from these hazards are expected.

Desert Claim Wind Power

APPLICATION FOR SITE CERTIFICATION

November 2006

enXco

November 3, 2006

Jim Luce, Chair
Energy Facility Site Evaluation Council
P.O. Box 43172
Olympia, Washington 98504-3172

Re: Desert Claim Wind Project – Application for Site Certification

Dear Chair Luce:

Desert Claim Wind Power LLC (Desert Claim or the Applicant) hereby applies for a Site Certification Agreement authorizing the construction and operation of a wind power project referred to as "the Desert Claim Project" or "the Project."

Desert Claim Project

The Desert Claim Project is a 180 megawatt (MW) wind power project located on approximately 4,783 acres in unincorporated Kittitas County, eight miles northwest of the city of Ellensburg. The Project consists of up to 90 turbines and the associated electrical collection system that would allow the Project to connect with the regional high-voltage transmission grid.

The Project Area includes land leased from five private land owners and the Washington Department of Natural Resources (WDNR). Unlike many wind power projects with turbines located along ridgelines, the Desert Claim Project occupies a relatively flat valley, with turbines spread throughout the project area. A 625-foot safety setback surrounds each turbine. Under the proposed turbine configuration, all non-participating residences are at least 1,106 feet from a turbine, and there are only seven non-participating residences located within 1,500 feet of a turbine.

The Project will use REpower MM92 model turbines. This turbine model has a tower height of 262.5 feet (80 meters), a rotor diameter of 303 feet (92.5 meters) and a total height of 414 feet (126.5 meters). Each turbine has a nameplate generating capacity of 2.0 MW.

Jim Luce, EFSEC Chair
November 3, 2006

Applicant

The Applicant is Desert Claim Wind Power LLC, a Washington limited liability company that was created for the sole purpose of developing, permitting, financing, constructing and operating the Project. Desert Claim is wholly owned and managed by enXco, Inc. (enXco).

enXco is a privately-held company based in California that develops, constructs and operates commercial-scale wind energy projects. enXco has owned and operated wind energy projects in the United States for more than twenty years. It currently has approximately 1,375 MW of wind power projects in operation, and projects totaling another 4,200 MW under development.

For purposes of WAC 463-60-025, Desert Claim designates David Steeb as its agent:

David Steeb, Project Director
Desert Claim Wind Power LLC
P.O. Box 4
Woodinville, WA 98072
Telephone: 425-941-3774
E-mail: davids@enxco.com

Contacts regarding this application should be directed to Mr. Steeb or the Applicant's attorney:

Karen McGaffey
Perkins Coie LLP
1201 Third Avenue, Suite 4800
Seattle, WA 98101
Telephone: 206-359-6368
E-mail: kmcgaffey@perkinscoie.com

Project History

In early 2001, Desert Claim began evaluating potential sites for a commercial-scale wind power project in Kittitas County. Desert Claim reviewed publicly available wind resource information and collected meteorological data with six temporary met towers erected at several sites within the County. After identifying a promising site and obtaining leases from landowners, Desert Claim performed studies aimed at determining project feasibility and environmental impacts.

In Washington, wind power projects may be permitted either through local land use permitting proceedings or through the EFSEC permitting process established by RCW chapter 80.50. The EFSEC permitting process was originally conceived as a one-stop shop

for permitting energy projects. In recent years, however, EFSEC's land use consistency process has been interpreted to require an applicant to attempt to obtain approval from a local land use authority in instances where local zoning codes do not unequivocally authorize a project. This has created an unusual situation for renewable energy projects proposed in counties with case-by-case permitting processes. If an applicant applies to EFSEC for approval, it must suspend the EFSEC proceedings so that it can go through the County process in an attempt to obtain local "land use consistency." Of course, if an applicant obtained local land use approval, it not would require EFSEC's approval because EFSEC does not have exclusive jurisdiction over renewable energy projects.[1]

Recognizing that the EFSEC process would require Desert Claim to at least try to obtain land use approval from Kittitas County as a prerequisite to EFSEC making a decision on an application, Desert Claim decided to begin its permitting efforts with the County. It hoped it would receive County approval, and would not need to file an application with EFSEC. However, it intended to file an application with EFSEC and request preemption if it did not obtain County approval. This approach seemed more efficient than first filing an application with EFSEC, then asking EFSEC to suspend its proceedings so that it could file an application with the County, and then later resuming the EFSEC process.[2]

For these reasons, Desert Claim filed an application with Kittitas County in January 2003. In connection with this application, the County prepared an Environmental Impact Statement (EIS). Following publication of the Final EIS and after conducting various public meetings and hearings, the Kittitas County Board of County Commissioners ultimately issued a resolution denying Desert Claim's application in April 2005.

Changes from the Original Project Proposal

Desert Claim has considered the issues identified in the Board of County Commissioners' decision as well as the issues raised by citizens during the local permitting process, and has made several modifications to the Project to address those issues. Having already made considerable efforts to obtain local land use consistency, Desert Claim now applies to EFSEC for a Site Certification Agreement authorizing construction and operation of the Project.

The following is a summary of the primary changes Desert Claim has made to the Project since the Kittitas County Board of County Commissioners' decision:

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[1] In contrast, EFSEC does have exclusive jurisdiction over thermal facilities with a capacity of 350 MW or more. Thus, depending upon its size, a traditional fossil fuel fired generation facility either must obtain local approval or must obtain EFSEC approval.

[2] This is, in effect, what has occurred in connection with the Kittitas Valley Project that is now under review by the Council.

- The Project Area has been consolidated from four separate parcels t one contiguous area. The Project Area has also been reduced from 5,237 acres to 4,783 acres, removing approximately 2,046 acres of private land that previously made up the eastern portion of the Project and adding approximately 1,592 acres of land leased from the Washington Department of Natural Resources (WDNR).

- The total number of turbines has been reduced by 25%, from 120 to 90.

- The turbine model has changed from the General Electric Wind Energy 1.5sl turbine to the REpower MM92 turbine.

- There are only 32 non-participating residences located within 3,000 feet of a proposed turbine. Only seven of those are located less than 1,500 from a proposed turbine and the closest one is 1,106 feet from a proposed turbine.

- Sound from the Project will be no more than 50 dBA, the state nighttime limit for residential properties, at the Project Area boundary.

- Shadow flicker at adjacent residences has been substantially reduced. For those residences (if any) that are affected by perceptible shadow flicker, Desert Claim will stop the blades of the wind turbine that causes the flicker during those hours and conditions when shadow flicker occurs, or offer a voluntary waiver agreement to the land-owners in lieu of stopping the turbine.

- The Project will not result in any temporary or permanent impacts to wetlands, streams or their buffers.

- Daytime white strobe lighting has been eliminated and nighttime red lighting has been reduced to only 36 of the Project turbines.

A more detailed description of the Project is provided in the Project Description, which is attached at Tab 1.

Materials Supporting Application

Applications to the Council for Site Certification have typically been organized in a way that closely tracks the standard organization of Environmental Impact Statements prepared pursuant to the State Environmental Policy Act (SEPA) in order to facilitate the Council's preparation of an EIS. EFSEC regulations generally require this organization. *See* WAC 463-60-012. In this instance, however, Kittitas County has already published a Final EIS on the Project. Reorganizing that information would be inefficient and seems unnecessary when EFSEC can rely upon the existing SEPA document. *See* RCW 43.21C.034; WAC 197-11-600, -630.

For this reason, pursuant to WAC 463-60-115, Desert Claim requests a waiver from the Council's prescribed organization. Desert Claim is providing the Council with materials necessary to evaluate the Project and to satisfy the Council's regulations, without duplicating the effort that went into preparing the EIS.

In addition to this letter, Desert Claim's application consists of the following materials:

Tab 1	Project Description
Tab 2	Visual Simulations
Tab 3	Regulatory Matrix
Tab 4	Wetland and Stream Report
Tab 5	Vegetation and Wildlife Report
Tab 6	Supplemental Sound Analysis
Tab 7	Turbine Hazard Analysis
Tab 8	Supplemental Shadow Flicker Analysis
Tab 9	FAA Lighting Plan
Tab 10	Supplemental Information Required by Council Regulations
Tab 11	Final EIS (on CD)

Desert Claim also requests a waiver from the requirements of WAC 463-60-175 (Heat Dissipation System), 463-60-185 (Aquatic Discharge System), 463-60-255 (Emission Control), and 463-60-536 (Air emissions permits and authorizations) which do not apply to a wind power project.

Fees

A check for forty-five thousand dollars ($45,000.00) is being provided under separate cover.

Jim Luce, EFSEC Chair
November 3, 2006

Desert Claim looks forward to working with the Council and its staff in processing this Application for Site Certification.

Sincerely,

David Steeb
Project Director

AVIATION SYSTEMS INC.
Aviation Consultants

Date: August 31, 2006
ASI ID: 06-N-0248.WA.001
Site ID: Desert Claim
Structure Height: 415 Feet AGL

Mr. David Steeb
enXco
PO Box 4
Woodinville, WA 98072

Dear ~~Mr. Steeb~~ Dave:

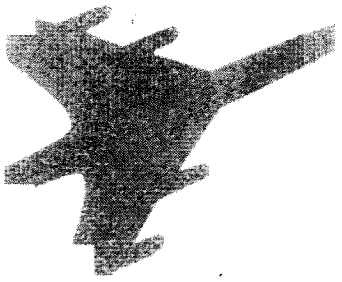
Enclosed please find the current list of proposed turbine locations along with lighting recommendations for each turbine in the Desert Claim Wind Project. This lighting plan was developed in compliance with the FAA Advisory Circular (AC) 70/7460-1K, Change 1 and on the basis of our discussions with FAA Regional offices regarding their current policy. However, final review by FAA could require some changes.

The lighting plan calls for the lighting of 36 out of 90 wind turbines, the equivalent of 40% overall. Please note any changes to the project may require the development of a new lighting plan. As requested, ASI has electronically filed the 90 wind turbines with the FAA and hard copies of these submittals are also enclosed for your records.

Sincerely,

Jerry Chavkin
Vice President, Airspace Operations

Enclosures: Wind Turbine List
Map
FAA Filings



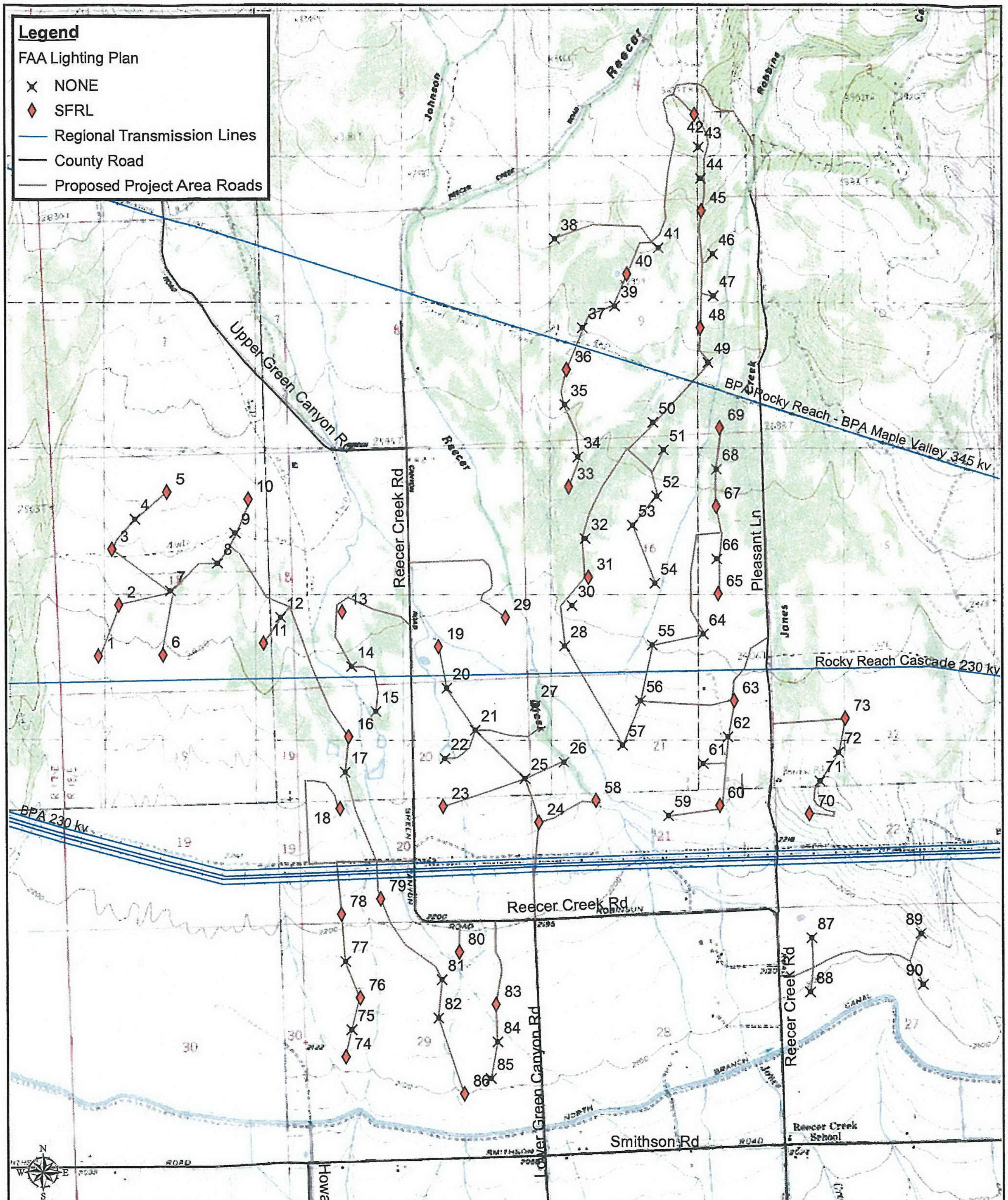
2510 West 237th Street • Suite 210 • Torrance, CA 90505
Tel: 310.530.3188 • Fax: 310.530.3850 • Email: asi@aviationsystems.com • www.aviationsystems.com

Turbine ID	Latitude (NAD 83)	Longitude (NAD 83)	Site Elevation AMSL (ft)	Marking/ Lighting
1	47-07-56.71	120-38-27.60	2378	SFRL
2	47-08-14.28	120-38.20.40	2427	SFRL
3	47-08-26.52	120-38-24.00	2469	SFRL
4	47-08-33.00	120-38-16.80	2503	NONE
5	47-08-38.76	120-38-06.00	2530	SFRL
6	47-08-02.76	120-38-09.60	2394	SFRL
7	47-08-16.80	120-38-06.00	2449	NONE
8	47-08-22.56	120-37-51.60	2466	NONE
9	47-08-29.40	120-37-44.40	2488	NONE
10	47-08-36.60	120-37-40.80	2535	SFRL
11	47-08-04.56	120-37-37.20	2425	SFRL
12	47-08-10.32	120-37-30.00	2426	NONE
13	47-08-16.04	120-37-12.00	2429	SFRL
14	47-07-58.80	120-37-08.40	2388	NONE
15	47-07-48.72	120-37-01.20	2361	NONE
16	47-07-43.32	120-37-12.00	2343	SFRL
17	47-07-35.40	120-37-12.00	2319	NONE
18	47-07-27.48	120-37-15.60	2281	SFRL
19	47-08-02.76	120-36-39.60	2378	SFRL
20	47-07-53.40	120-36-39.60	2357	NONE
21	47-07-44.04	120-36-28.80	2329	NONE
22	47-07-37.92	120-36-39.60	2310	NONE
23	47-07-27.48	120-36-39.60	2278	SFRL
24	47-07-23.16	120-36-10.80	2263	SFRL
25	47-07-32.88	120-36-14.40	2289	NONE
26	47-07-36.12	120-36-00.00	2279	NONE
27	47-07-49.08	120-36-10.80	2319	NONE
28	47-08-02.04	120-36-00.00	2366	NONE
29	47-08-08.88	120-36-18.00	2381	SFRL
30	47-08-11.04	120-35-56.40	2411	NONE
31	47-08-17.16	120-35-52.80	2449	SFRL
32	47-08-25.80	120-35-52.80	2481	NONE
33	47-08-37.32	120-35-56.40	2519	SFRL
34	47-08-43.80	120-35-52.80	2569	NONE
35	47-08-55.32	120-35-56.40	2611	NONE
36	47-09-03.24	120-35-56.40	2699	SFRL
37	47-09-12.24	120-35-49.20	2831	NONE
38	47-09-32.04	120-36-00.00	3017	NONE
39	47-09-16.92	120-35-42.00	2921	NONE
40	47-09-23.76	120-35-34.80	2953	SFRL
41	47-09-29.52	120-35-24.00	2997	NONE
42	47-09-59.04	120-35-13.20	3642	SFRL
43	47-09-51.84	120-35-13.20	3461	NONE

Turbine ID	Latitude (NAD 83)	Longitude (NAD 83)	Site Elevation AMSL (ft)	Marking/ Lighting
44	47-09-44.64	120-35-09.60	3287	NONE
45	47-09-37.44	120-35-13.20	3174	SFRL
46	47-09-27.72	120-35-09.60	2978	NONE
47	47-09-18.36	120-35-09.60	2892	NONE
48	47-09-11.52	120-35-13.20	2836	SFRL
49	47-09-03.96	120-35-09.60	2782	NONE
50	47-08-51.00	120-35-27.60	2659	NONE
51	47-08-44.88	120-35-27.60	2639	NONE
52	47-08-34.80	120-35-27.60	2578	NONE
53	47-08-28.32	120-35-38.40	2534	NONE
54	47-08-15.36	120-35-31.20	2472	NONE
55	47-08-01.68	120-35-31.20	2401	NONE
56	47-07-49.44	120-35-34.80	2335	NONE
57	47-07-39.72	120-35-42.00	2291	NONE
58	47-07-27.48	120-35-52.80	2245	SFRL
59	47-07-23.88	120-35-27.60	2241	NONE
60	47-07-25.68	120-35-13.20	2256	SFRL
61	47-07-35.04	120-35-16.80	2290	NONE
62	47-07-40.80	120-35-09.60	2317	NONE
63	47-07-48.72	120-35-06.00	2360	SFRL
64	47-08-03.84	120-35-16.80	2420	NONE
65	47-08-12.48	120-35-09.60	2477	SFRL
66	47-08-20.40	120-35-09.60	2512	NONE
67	47-08-31.92	120-35-09.60	2578	SFRL
68	47-08-40.20	120-35-09.60	2626	NONE
69	47-08-49.20	120-34-06.00	2681	SFRL
70	47-07-23.16	120-34-40.80	2333	SFRL
71	47-07-30.36	120-34-37.20	2397	NONE
72	47-07-36.48	120-34-33.60	2363	NONE
73	47-07-44.04	120-37-30.00	2363	SFRL
74	47-06-32.76	120-37-15.60	2115	SFRL
75	47-06-38.52	120-37-12.00	2131	NONE
76	47-06-45.72	120-37-08.40	2152	SFRL
77	47-06-53.64	120-37-15.60	2175	NONE
78	47-07-04.08	120-37-15.60	2207	SFRL
79	47-07-07.32	120-37-01.20	2219	SFRL
80	47-06-55.08	120-36-36.00	2183	SFRL
81	47-06-48.96	120-36-43.20	2165	NONE
82	47-06-40.68	120-36-43.20	2143	NONE
83	47-06-43.20	120-36-25.20	2154	SFRL
84	47-06-34.92	120-36-25.20	2129	NONE
85	47-06-27.00	120-36-28.80	2106	NONE
86	47-06-23.76	120-36-36.00	2099	SFRL

Turbine ID	Latitude (NAD 83)	Longitude (NAD 83)	Site Elevation AMSL (ft)	Marking/ Lighting
87	47-06-55.80	120-34-44.40	2131	NONE
88	47-06-43.92	120-34-44.40	2096	NONE
89	47-06-56.16	120-34-08.40	2193	NONE
90	47-06-44.64	120-34-08.40	2110	NONE

All Turbines - White Structures
Wind Turbine Height - 415' AGL
SFRL - Simultaneous Flashing Red Lights
None - Unlit



0 0.125 0.25 0.5 0.75 1
Miles
Scale 1:37,500

Desert Claim Wind Power
Kittitas County, Washington

DESERT CLAIM WIND POWER

Kittitas County, Washington

Figure 14
FAA LIGHTING PLAN

Date: 10/9/2006	GIS Analyst: avh

Map Source Information: USGS Topographic Map, 1:24,000 scale.

Desert Claim Wind Power

Project Description

TABLE OF CONTENTS

1. INTRODUCTION

This Project Description is part of the Application for Site Certification (Application) for the Desert Claim Wind Power Project (the Project). The Project is a renewable wind energy generation facility that will consist of up to 90 wind turbines and have a nameplate capacity of up to 180 megawatts (MW). The Project will be located in unincorporated Kittitas County, approximately 8 miles northwest of Ellensburg, Washington **(Figure 1)**.

Desert Claim Wind Power LLC (Desert Claim or the Applicant) originally applied to Kittitas County for the land use approvals and permits necessary to construct and operate an earlier version of the Project. Kittitas County evaluated the environmental impacts associated with the original project proposal in a Final Environmental Impact Statement published in August 2004 (County FEIS). The Kittitas County Board of County Commissions ultimately denied Desert Claim's application. Since the County's decision, Desert Claim has made significant modifications to the Project to further reduce potential impacts and to respond to feedback from Kittitas County and its residents.

This Project Description includes the following sections. **Section 2** identifies the Project site and describes the existing conditions at that site. **Section 3** describes the facilities that will comprise the completed Project. **Section 4** addresses the construction process. **Section 5** addresses operation and maintenance. **Section 6** summarizes mitigation measures that have been incorporated in the Project. **Section 7** addresses provisions for future decommissioning of the Project. **Section 8** contains a list of cited references. All figures are grouped together at the end of the Project Description.

Many of the topics addressed in this Project Description are discussed in greater detail in the County FEIS, an electronic copy of which is provided with this Application. This Project Description highlights the revisions that have been made in the Project since it was considered by Kittitas County from 2003 to 2005. The following are the most significant of those changes:

- The Project Area has been consolidated from four separate parcels to one contiguous area. The Project Area has also been reduced from 5,237 acres to approximately 4,783 acres, removing approximately 2,046 acres of private land that previously made up the eastern portion of the Project and adding approximately 1,592 acres of land leased from the Washington Department of Natural Resources (WDNR).

- The number of turbines has been reduced by 25%, from 120 to 90.

- The turbine model has changed from the 1.5 MW General Electric Wind Energy 1.5sl turbine to the 2.0 MW REpower MM92 turbine.

- There are only 32 non-participating residences located within 3,000 feet of a proposed turbine. Only seven of those are located less than 1,500 feet from a proposed turbine, with the closest one at 1,106 feet from a proposed turbine.

- Sound from the Project will be 50 dBA or less at the Project Area boundary.

- Shadow flicker at adjacent residences has been substantially reduced. For those residences (if any) that are still affected by perceptible shadow flicker, Desert Claim will stop the blades of the wind turbine that causes the flicker during those hours and conditions when shadow flicker occurs, or offer a voluntary waiver agreement to the landowners in lieu of stopping the turbine.

- The Project will not result in any temporary or permanent impacts to wetlands, streams or specified buffers.

- Daytime white strobe lighting has been eliminated and nighttime red lighting has been reduced to thirty-six of the Project turbines.

2. EXISTING PROJECT SITE CONDITIONS

The revised Project Area is shown in **Figure 2**. It contains approximately 4,783 acres of land owned by five private landowners and WDNR, all of whom have signed agreements authorizing the Applicant to seek permits to construct and operate the Project on their lands.

The southern edge of the Project Area is located approximately 8 miles north of the central part of Ellensburg. The Project Area extends approximately 3.5 miles from west to east and up to 4.5 miles in a north-to-south direction. The southwestern corner of the Project Area is more than 1.5 miles east of U.S. Route 97 and can be accessed from U.S. Route 97 via Smithson Road. Access to the Project Area from Ellensburg can be via Wilson Creek Road, Robbins Road, Pheasant Lane, Reecer Creek Road or Lower Green Canyon Road.

2.1 Physical Setting

The Project Area is situated along the northern margin of the Kittitas Valley, which is the broad valley area of central Kittitas County on either side of the Yakima River between Lookout Mountain and the Yakima Canyon. Unlike many wind projects that consist of turbine strings located along high ridgelines, the Desert Claim Project is generally spread out over the rising valley floor. The terrain within the Project Area is relatively flat and open, with a gradual south-to-north rise in elevation totaling approximately 1,000 feet over a distance of approximately four miles. Surface elevations range from approximately 2,100 feet to 2,500 feet above sea level across most of the Project Area. The northernmost portion of the Project Area lies within the foothills of the Wenatchee Mountains (a portion of the Cascade mountain range). The highest elevations and steepest slopes in the Project Area are in Township 19N, Range 18E, Sections 9 and 4, where the Project Area includes a foothill ridge rising from approximately 2,600 feet to approximately 3,100 feet in elevation.

Geologically, the Project Area is located on a broad alluvial fan at the base of the mountains. The alluvial fan is a gently sloping area built up by soils carried down and deposited over millennia by water generated by receding glaciers that at one time covered the mountainous area to the north. Several small, gently sloping creeks flow generally north to south across the Project Area, forming shallow depressions across the otherwise even landscape.

The Kittitas Valley has an arid to semi-arid climate, with annual precipitation in Ellensburg averaging 8.5 inches per year (Kittitas County Conservation District 2003). Some patches of native shrub-steppe or grassland vegetation remain, particularly around the outer edges of the valley, while the existing vegetative cover in most of the valley is dominated by agricultural cultivation and landscape plantings.

2.2 Wind Resource

The climate of the Kittitas Valley is strongly influenced by surrounding mountainous terrain and air masses traveling to the east from the Pacific Ocean towards central and eastern Washington. The Cascade Mountains form a north-south topographic and climatic barrier influencing prevailing wind direction, temperatures and precipitation. Cooling and condensation occur as air rises over the western slope of the Cascades, producing heavy precipitation in the mountains. As the air masses descend along the eastern slope they become warmer and drier, however, producing lighter precipitation and consistent winds in the Kittitas Valley. Prevailing local winds are generally from the west to northwest and are strongest in the spring and summer. The wind speed in Ellensburg averages approximately 4.8 meters/second (m/s) (11 miles per hour (mph)) for the year, with seasonal averages of over 6 m/s (13 mph) for the spring and nearly 7 m/s (16 mph) in the summer (NREL 2003). **Figure 3** illustrates prevailing wind patterns for the Project Area.

Publicly available wind resource maps characterize the Project Area and surrounding lands as an area of Class 4 (Good) wind resource, with typical wind speeds at a height of 164 feet (50 meters) averaging 15.7 to 16.8 mph (Northwest Sustainable Energy for Economic Development, 2003). Average wind speeds of at least 13 mph are currently considered to be the minimum requirement for economic utility-scale wind power plants (AWEA 2003). The desired baseline criterion for feasible, utility-scale wind power production (depending on the model of turbine selected) is a wind speed of 13 to 15 mph at least 30 percent of the time annually. However, these thresholds are likely to be lowered as utilities and the public continue to desire more renewable wind power.

The Applicant collected meteorological (met) data at multiple sites within Kittitas County beginning in 2001, as part of its resource exploration studies. Six temporary met towers were erected in several locations. Each tower was equipped with several anemometers to measure wind speed, a wind vane to measure wind direction and a temperature sensor. All of the instruments provided site data to loggers that recorded the observed data. The met data collected over the past five years confirm that there is a sufficient commercial wind resource for power generation in the proposed Project Area.

2.3 Land Ownership and Use

2.3.1 Land Ownership

The Project Area consists of portions of Township 19N, Range 18E, Sections 4, 9, 16, 17, 18, 20, 21, 22, 27 and 29.

Of the 4,783 acres of land within the Project Area, 3,191 acres are owned privately by five landowners and 1,592 acres are owned by WDNR. The following rights-of-way easements cross the Project Area:

- Bonneville Power Administration (BPA) maintains five electrical transmission lines that cross the Project Area;
- Puget Sound Energy (PSE) maintains one transmission line that crosses the Project Area;
- Kittitas County Public Utility District (PUD) maintains the electrical distribution system that serves the Project Area and vicinity; and
- Kittitas County maintains the county roads within and adjacent to the Project Area.

2.3.2 Land Use

The Project Area is in a rural, relatively lightly populated section of Kittitas County and is characterized primarily by agricultural uses. Much of the land within and surrounding the Project Area is cultivated for feed crop production or pasture. Extensive areas of rangeland are used for grazing. Rural residential development occurs in a number of locations, including dwellings on farm or ranch properties, scattered residences on large lots, and a few small clusters of homes.

There are 36 residences located within the vicinity of the Project Area. Of these, 4 are residences of participating property owners. **Table 1** indicates the distance from each of these residences to the nearest proposed turbine. **Figure 4** shows the locations of these residences.

Table 1
Nearby Residences and Distances from Nearest Proposed Turbine

Residence Number (See Figure 4)	Distance to Nearest Proposed Turbine	Residence Number (See Figure 4)	Distance to Nearest Proposed Turbine
1	1,182 feet	19*	1,119 feet
2*	1,057 feet	20	2,450 feet
3	1,661 feet	21	2,652 feet
4	1,351 feet	22	2,449 feet
5	1,311 feet	23	2,434 feet
6	1,576 feet	24	2,119 feet
7	1,743 feet	25	2,178 feet
8	1,543 feet	26	2,482 feet
9	1,453 feet	27	2,960 feet
10	2,022 feet	28	2,474 feet
11	1,953 feet	29	1,694 feet
12	1,433 feet	30	2,439 feet
13*	2,179 feet	31	2,802 feet
14*	1,937 feet	32	1,662 feet
15	2,224 feet	33	2,052 feet
16	1,106 feet	34	1,896 feet
17	1,746 feet	35	1,832 feet
18	1,475 feet	36	1,947 feet

*Participating Property Owner

The Project Area is within a major cross-state electrical transmission corridor that links hydroelectric dams on the Columbia River with the large power consumer market of western Washington. Six high-voltage transmission lines cross or are adjacent to the Project Area; five are owned and operated by BPA and one by PSE. A BPA regional substation is located on a 133-acre parcel two and a half miles east of the Project Area.

The Kittitas Reclamation District North Branch Canal, which provides irrigation water for much of the northern part of the Kittitas Valley, traverses east to west in the vicinity of Smithson Road, generally along or near the southern edge of the Project Area. Most irrigated agriculture occurs downhill and south of the canal and the Project Area.

Wenatchee National Forest lands north of the Project Area are used for recreation, grazing and commercial forestry. Recreational activities include camping, hiking, horseback riding, mountain biking, off-road vehicle use, hunting, snowmobiling and cross-country skiing. Members of the Yakama Nation hunt, gather plants, and conduct other traditional activities in the vicinity of the Project Area, pursuant to reserved treaty rights applicable to ceded lands. The private lands of the Project Area are not open to general public use. Some low-intensity outdoor recreational uses, including hunting, horseback riding, snowmobiling and off-road vehicle use, occur with the permission of individual landowners.

Most of the land within the Project Area is zoned Ag-20 (agricultural use, with a 20-acre minimum parcel size) under the Kittitas County Code. The northwestern portion of the Project

Area is within a foothill-area zoned as Forest & Range (FR). Residential development at a maximum density of 20 acres per dwelling unit is allowed in this zone. The entire Project Area and the adjacent lands are within a large area designated as Rural in the Kittitas County Comprehensive Plan. Forested areas to the north are designated as Commercial Forest.

3. PROJECT FACILITIES

Wind energy projects consist of several types of facilities, including the wind turbines themselves, power collection, substation and transmission facilities, access roads, and an operations and maintenance facility. Each component is described below, based on the Project planning information available at this stage.

3.1 Wind Turbines

The proposed Project includes a maximum of 90 wind turbines. The term "turbine" refers to the entire structure that produces electricity. Each turbine consists of three rotor blades connected at the rotor hub, a nacelle (the housing for the generator, which is connected via a gear box and rotor to the blades), and a tubular tower anchored to a tower foundation. Each of these turbine components is discussed below. **Figure 5** is a photograph of typical wind turbines currently in use.

The Applicant proposes to use the REpower MM92 turbine in this Project. The REpower MM92 has a 2.0 MW nameplate generation capacity. It has a total height from the ground to the blade tip point straight up of 414 feet (126.5 meters). Each tower (measured to the rotor hub) is 262.5 feet (80 meters) tall, and the rotor blades have a 303 feet (92.5 meters) diameter and will be 111 feet (33.8 meters) above the ground when pointing straight down. This model of turbine is slightly taller than the General Electric turbines originally proposed for this Project. **Figure 6** illustrates the typical turbine that will be used for the Project.

3.1.1 Towers

Tubular steel towers will support the nacelle, rotor and blades. The purpose of the tower is to position the turbine blades high enough to intercept winds that are stronger than those near the ground surface, and to avoid wind turbulence that might be created by nearby trees, buildings, terrain or other obstructions (National Wind Coordinating Committee 2002). Each tower will be a maximum of 262.5 feet (80 meters) in turbine hub height. The tower will have a diameter of approximately 14 at the base, tapering at the top of the structure. When fully assembled, each tower will weigh approximately 160 tons. The heavy, rolled steel forming the tower structure will have a smooth exterior surface. The turbine towers will be painted a neutral color as directed by the FAA.

A locked steel door will provide secured access to the base of each tower. A locked, computerized control cabinet will be located inside the tower at the base. Cables and a steel ladder will extend within the hollow tower interior from the tower base to the nacelle, to provide access for turbine maintenance.

3.1.2 Foundations

The freestanding, tubular towers will sit atop steel and concrete foundations designed for the specific subsurface conditions at the individual turbine sites. There are two industry-standard foundation designs that could be used in the Project. These are depicted in **Figures 7A** and **7B**.

Figure 7A illustrates an inverted T foundation, which employs a relatively shallow concrete base with a relatively large diameter. The maximum depth of the base will be about 8 feet below the ground surface and the diameter will be up to 80 feet. The turbine tower will be anchored to the foundation base by a base plate ring consisting of long, steel bolts extending nearly to the bottom of the concrete base.

The second type of foundation is a pile foundation. **Figure 7B** provides a cross-section view. A cylindrical culvert is used to anchor the tower base. Inner and outer sections of culvert pipe of slightly different diameter are sunk into an excavation that will range from 25 to 35 feet in depth, depending on specific subsurface conditions, and are backfilled with compacted soil. Two parallel rings of full-length steel anchor bolts extend from the tower base plate through the culvert section, which is filled with concrete after installation of the bolts.

A registered engineer will select the appropriate foundation design for each turbine location based on site-specific information of geotechnical conditions present, advice on load-bearing capacities from a geotechnical engineer, and the design engineer's recommendations. The foundation designs will conform to State and County requirements and standard industry practices. A Washington registered engineer will review and approve all foundation designs.

3.1.3 Nacelle and Rotors

The nacelle is the rectangular housing that covers the operating mechanism of the turbine. Each nacelle will be approximately 35 feet long, 10 feet wide and 13 feet high. The exterior surface will be constructed of fiberglass lined with sound-absorbing foam. The generator, gear box and associated control equipment for the turbine will be housed inside the shell of the nacelle (see **Figure 8**). The nacelle will be accessed internally through the tower, and most servicing of the machinery will be conducted within the nacelle in order to protect the equipment and the workers from the elements.

The rotor assembly for each turbine will include three blades, and will be attached to the front of the nacelle at the hub. The Project will use an upwind turbine design, in which the nacelle is turned into the wind to place the generator and tower behind the blades. The blades will be composed of laminated fiberglass or a fiberglass composite, and will have a smooth outer surface. Each blade will be fabricated offsite in one piece, transported to the Project site, and then bolted to the rotor hub, raised into position by crane and connected to the nacelle.

The equipment inside the nacelle will include electrical motors used to turn the nacelle and rotors into the wind, and to control the pitch of the rotor blades, and an automatic braking system. The pitch of the rotor blades will be controlled by a computer that will rotate them continually on their axis to maintain the optimum angle to the wind to maximize generation output at a given wind direction and speed. At wind speeds above the maximum safety threshold of 54 mph, the

blades will be rotated into a feathered position and the braking system will stop the rotor from turning. After 10 minutes and when the wind speed reduces to below 54 mph, the blades will rotate their pitch into the wind and start turning again.

The control system can be programmed to stop the blades of a specific turbine during those times and conditions (if any) when that turbine causes perceptible shadow flicker at a nearby residence. The owners of the affected residence may elect to execute a voluntary waiver agreement with the Applicant in lieu of stopping the turbine affecting their residence.

3.1.4 Turbine Locations

A maximum of 90 turbines will be installed within the Project Area, distributed across the Project site as shown in **Figure 4**. The turbine placement plan was determined using computerized modeling software that incorporated the field-verified residence data, stream setbacks and wetland buffers, the performance-based safety zone setback and wind resource considerations from metrological data collected in the Project Area, long-term weather data, Project Area topography and environmental factors such as stream setbacks, wetland buffers, and the State noise standards. The objective of the turbine location plan is to provide each turbine with optimum exposure to wind from all directions, with emphasis on exposure to the prevailing northwesterly wind direction. Sufficient spacing was established between wind turbine towers to minimize array and wake losses (i.e., energy losses created by turbulence between and among the turbines). Turbines may be micro-sited (re-located by up to 300 feet) at each location during the pre-construction detailed site design to maintain stipulated siting requirements, and/or during construction to avoid environmental features that become apparent during construction activities.

The distribution of turbines for the Project differs from what is often seen at wind energy projects. Many wind projects locate turbines in long strings along high ridge tops. Unlike many locations where winds are strongest along ridge tops, winds in the Project vicinity typically come out of the northwest from the upper valley, after funneling through passes in the Cascade Mountains, and spread out on the lower, flat portion of the northern Kittitas Valley. The Project will locate turbines over a broad plain in response to this wind pattern.

The turbine layout incorporates a minimum 625-foot safety zone setback from all buildings, Project Area boundaries, adjoining property lines, public roads and utility transmission corridors. This safety setback is designed to ensure protection against potential mechanical failures and hazards, such as blade throw, ice throw and tower collapse (KPFF Consulting Engineers 2006). The previous application to Kittitas County that was analyzed in the County FEIS used a 487-foot safety setback because the proposed turbine model was smaller.

3.2 Project Electrical System

The electrical system for the Project will consist of three primary components: the power collection system, a Project substation and an interconnection to the regional power transmission grid. The function of the electrical system will be to collect the electricity produced by the Project turbines and convert it to higher-voltage electricity to be fed into the regional power system.

3.2.1 Power Collection System

The power collection system has been configured to avoid sensitive environmental features identified in the County FEIS, especially streams and wetlands. Power collection cables have been placed underground or on road water crossing structures except, in limited cases, where it is not reasonably feasible to do so.

The generator housed in the nacelle of each turbine will produce electricity at 575 volts. Low-voltage cables located inside the tower will carry the electricity from the nacelle through the tower to a transformer mounted on a concrete pad adjacent to the base of each tower. The pad will be approximately 8 to 9 feet square and 1 foot thick. The transformer will occupy almost the entire area of the concrete pad and will be approximately 5 feet high. The transformer will raise the voltage from 575 volts to 34.5 kilovolts (kV).

Electricity will be carried underground from the transformer into a 34.5-kV power cable installed as part of the power collection system. The network of power collection cables will connect the 90 turbines to the Project substation. Junction boxes that merge multiple incoming cables into one outgoing line will be installed at various locations within the Project Area to facilitate the collection of power from turbines. **Figure 9** illustrates the expected layout of the power collection system.

Power collection cables will be placed underground except where it is not reasonable to do so based on site-specific physical conditions (i.e., where it will be less disruptive to sensitive environmental features to place the cables above ground, or where steep and/or rocky terrain favored the use of overhead cable). Underground cables will be installed in trenches or plowed-in at a depth of 4 feet below the ground surface. At stream crossings, the cables may be located on the road bridge or structure. In certain areas, the underground cables may be encased in concrete to provide additional protection and stability in the ground.

Overhead collection lines will be carried on single wood-pole structures typically 37 feet high, similar to the typical "telephone/electrical" pole seen along roads. The structures for overhead lines will provide a conductor spacing of at least 3 feet, to reduce the possibility of conductors contacting each other in storms.

Overall, the collection system is estimated to contain approximately 24 lineal miles of underground cable, with less than 1.5 lineal miles of overhead power poles and cable to be substituted for underground cable, if needed in areas where it was not appropriate to bury cable. Power collection lines will be located within the properties that comprise the Project Area except for those portions that will be bored or trenched under County roads to connect parcels on either side of the County road..

3.2.2 Substation

An electrical substation will be needed to provide a further increase or step-up in voltage for the power collected from the Project turbines. The substation is shown on **Figure 9**, near the southeastern corner of Section 16, T. 19N, R. 18E, approximately 1 mile north of the intersection of Reecer Creek Road and Pheasant Lane. This location abuts the PSE Rocky Reach-Cascade

230 kV transmission line that crosses the Project Area. The final selection of the substation location will be made after the interconnection point has been determined with the transmission system owner and the utility purchasing the power generated by the Project.

One or more large power transformers located within the Project substation will step-up or raise the voltage of the electricity flowing from the Project power collection system to meet the higher voltage of the receiving electrical transmission line. Substation equipment will include power transformer(s), disconnect switches, and metering relays. The substation will include a small building that will house the power generation control and relaying equipment, station batteries, and the supervisory control and data acquisition (SCADA) system. The entire substation area will be cleared, graded and covered with gravel, and will be surrounded by a chain-link fence. The completed substation will occupy approximately 2 acres. The substation will be designed to meet the standards of the National Electric Safety Code and the requirements of the entity operating the receiving transmission line. The operations and maintenance facility, including a building, parking and outside storage space, will be co-located with the Project substation and will require an additional 1 to 2 acres.

3.2.3 Transmission Interconnection

An overhead transmission line will be constructed to connect the Project substation with one of the high-voltage electrical transmission lines that cross the Project Area. The Applicant has not yet negotiated a power sale agreement or completed an interconnection agreement, but has identified several options for interconnecting the Project to the regional transmission network. Existing regional transmission lines located on the Project Area include the following:

- BPA operates five transmission lines, at voltages ranging from 230 kV to 500 kV, within a major corridor that extends west from the Columbia River hydroelectric system and essentially bisects the Project Area.

- PSE's Rocky Reach-Cascade 230 kV line follows a generally east-to-west path through the Project Area, near the proposed substation location.

The Project substation location is just to the north of the PSE line within this corridor. The characteristics of the interconnection facility will depend upon which transmission option is selected for the interconnection. The interconnection line would be no longer than approximately 300 feet for a connection to the PSE line or 4,000 feet for a connection to BPA lines within the Project Area. If the Project were connected to a 230-kV transmission line, the interconnection line would likely be mounted on either wood poles or H-frame structures. The structures would likely be from 70 to nearly 100 feet in height and would typically be spaced several hundred feet apart.

3.3 Meteorological Towers

Five temporary met towers are currently installed in the Project Area. Project development typically involves the use of temporary met towers during the exploration and design phases. Temporary met towers are usually slender, tubular aluminum structures that are secured by multiple guy wires that extend up to 110 feet from the tower base.

Permanent met towers are standard features of utility-scale wind power projects. These towers will be self-supporting steel structures with concrete foundations. **Figure 10** is a drawing of a typical permanent met tower. The towers will have multiple anemometers to measure wind speed and direction at different elevations, and will be placed at strategic locations that best support automated control of the turbine operations. The Applicant proposes to construct up to four permanent met towers. They will be approximately 212 feet (65 meters) tall, free-standing rather than secured by guy wires, and set on concrete bases.

3.4 Access Roads

Road access to the Project Area is currently provided by a number of existing public roads. Kittitas County roads that cross or pass adjacent to parcels within the Project Area include Smithson Road, Reecer Creek Road, Pheasant Lane and Lower Green Canyon Road.

The Project will include a system of Project roads providing access to all 90 turbines, the substation and other key facilities. The proposed access road system is approximately 22 miles in length and is shown in **Figure 11**. The Project roads will connect with the existing public road system at a number of locations including six points along various sections of Reecer Creek Road; and three points on Pheasant Lane.

The Project access roads will be single-lane roads with a 15-foot travel surface width for straight sections and up to a 20-foot travel surface width for curved sections. Project access roads will have a compacted gravel surface. **Figure 12** shows a typical cross-section for the access roads. Stream crossing structures are incorporated into the Project access road system to allow for crossing of wetlands and streams, including any buffers.

Detailed plans for the Project road system and the connections to county roads will be prepared following micro-siting of the turbines. Project access road connections to county roads will be designed pursuant to County road ingress and egress standards.

3.5 Operation and Maintenance Facility

The proposed Project facilities include a permanent building to support ongoing operations and maintenance (O&M) activities. The O&M building will include an enclosed bay for storage of equipment, parts and supplies; a workshop; an office for administration and monitoring of the facility; restroom and kitchen facilities; and parking for vehicles. The enclosed space needed for the O&M building is approximately 5,000 square feet, and the overall footprint, including parking and outside storage, will be up to approximately 2 acres.

The O&M facility will be located at the Project substation site, one mile north of the intersection of Reecer Creek Road and Pheasant Lane. Domestic water for the O&M facility at this location will either be acquired from the landowner or obtained by developing an exempt well. Water consumption will be considerably less than 5,000 gallons per day. Restroom and kitchen facilities will drain into an on-site septic system. The O&M facility will be surrounded by a fenced enclosure with a locked gate.

3.6 Safety and Control Systems

The Project will include a communication system for monitoring and controlling the turbines. The communication system will use either copper lines, similar to telephone lines, or fiber-optic lines. Communication lines typically run to each turbine, parallel to the low- and medium-voltage power collection lines. The communication lines will be either underground or overhead on poles. In the latter case, both types of lines are thin and not highly visible. The rotor control and braking system will be a key component of the Project safety systems.

Aircraft safety lighting will be installed on the exterior of some nacelles, to comply with Federal Aviation Administration (FAA) rules for structure lighting. Specific requirements for the Project will be developed in conjunction with the FAA, based on the turbine heights and site-specific conditions. Under the Project's lighting plan, 36 of the total 90 turbines will be equipped with synchronized low-intensity flashing red lights (L-864) for nighttime use. Experience with FAA reviews of prior lighting plans indicates this configuration should meet the FAA requirements (Chavkin 2006).

Each wind turbine, including the rotor blades, will be equipped with a lightning protection system, which will be connected to an underground grounding arrangement to facilitate lightning flow safely to the ground. All equipment, cables, and structures comprising the wind turbines will be connected to a metallic, Project-wide grounding network.

Turbine towers will be locked, and the substation will be fenced and locked to prevent unauthorized entry.

3.7 Visitor Facilities

The Project is expected to provide some level of attraction or interest for tourists who want to view a working wind energy facility. The Project will develop visitor facilities to accommodate public interest in the Project, minimize potential traffic impacts to the surrounding area, reduce the potential for trespass, and ensure visitor safety.

The Applicant has not yet developed specific plans for visitor facilities, but they will likely consist of a roadside turnout adjacent to a County road at a location providing a suitable view of Project wind turbines, with an information kiosk and appropriate signage. The Applicant is tentatively considering siting the visitor facilities near the junction of Reecer Creek Road and Lower Green Canyon Road within the Project Area. The Applicant will construct and maintain any visitor facilities.

4. CONSTRUCTION PROCESS

Construction of the Project will involve standard construction procedures typically used for wind energy projects in the Northwest. The Project Area has relatively flat or gently sloping terrain and good drainage, so it is suitable for the construction of roads and turbine foundations. This section summarizes the schedule and general sequence for the construction process, and describes procedures to be used for construction of the various Project components.

4.1 Schedule and General Sequence

The construction process will be completed over an approximately 9-month period. The primary tasks in the construction process are:

- survey and stake Project facility locations;
- construct Project access roads and turbine pads;
- construct foundations for towers;
- excavate trenches for underground utilities;
- place underground power collection and communication cables in trenches;
- construct overhead power collection and communication cables and interconnection with the BPA or PSE transmission line;
- construct the Project substation;
- construct the Project operation and maintenance facility;
- transport tower sections to the site and assemble towers;
- assemble and install nacelles, rotors and other turbine equipment;
- install safety and control systems;
- test all Project systems; and
- conduct final site grading, reclamation and cleanup.

Habitat, sensitive areas and cultural protection areas within the Project Area will be delineated, defined in contracting documents and marked in the field, pursuant to consultations with Washington Department of Fish and Wildlife (WDFW) personnel.

In general, the first few months of construction activity will involve initial civil and electrical construction, including construction of the Project access roads and tower foundations, the power collection system and communication lines, and the Project substation. Tower installation will be accomplished in phases. As Project access roads and tower foundations are completed, turbines will be erected. Installation of the nacelles, rotors and associated equipment will be the final task of major construction activity for each turbine. The Applicant expects to begin commercial operation within one month after commissioning the first wind turbine.

4.2 Construction Equipment and Space Requirements

Constructing the Project will require the use of various types of construction equipment. **Table 2** summarizes the types and functions of construction equipment that are typically used in the construction of commercial wind energy projects.

Table 2
Typical Construction Equipment for Wind Energy Projects

Equipment	Use
Bulldozer	Road and pad construction, substation, O&M facility, construction staging areas
Grader	Road and pad construction, substation, O&M facility, construction staging areas
Water trucks	Compaction, erosion and dust control
Roller/compactor	Road and pad compaction
Loader	Loading/unloading/moving construction materials
Backhoe/trenching machine	Excavating trenches for underground utilities
Truck-mounted drilling rig, augur	Drilling tower foundations, holes for power poles
Concrete trucks and pumps	Pouring tower and other structure foundations
Cranes	Erecting towers, nacelles and rotors
Dump trucks	Hauling road and pad construction materials
Flatbed trucks	Hauling towers, blades and other equipment
Pickup trucks	General use and hauling minor equipment
Small hydraulic cranes/forklifts	Loading and unloading equipment
Rough terrain forklift	Lifting equipment
Truck-mounted high reach	Aerial framing and clipping
Truck-mounted tensioner and cable reels	Stringing power collection/transmission lines
Winch truck	Realign power collection/transmission structures
Construction Cranes	Off-loading and erecting towers, nacelles, blades

Source: BPA 2001

Construction activities will require temporary disturbance of a larger area than will be occupied by the permanent Project facilities. **Table 3** identifies the estimated area that will be disturbed in construction and within the permanent footprint of the various Project components.

Table 3
Estimated Area of Construction Disturbance and Permanent Facilities

Project Feature	Temporary Construction Disturbance (acres)	Permanent Project Footprint (acres)
Wind Turbine Pads	93.4	9.9
Internal Power Collection System [1]	3.8	0.1
Project Substation	2.8	2.0
Transmission and Above-Ground Collection	1.0	0.1
Met Towers	0.5	0.1
Project Access Roads [2]	156.8	59.6
Project O&M Facility [3]	2.8	2.0
Construction Staging/Storage	19.5	-
Total Area	280.7	73.8
Percent of Project Area	5.9%	1.4%

[1] Power collection system within Project Area (under ground) with 85 percent contained within access road areas.
[2] Area for Project access roads increased 15 percent to include curves and intersections to non-Project roads.
[3] O&M Facility to be co-located with Project substation; disturbance and permanent footprint in addition to substation area.

4.3 Work Force

Approximately 120 to 150 people will likely be employed at some time during Project construction. Some of these workers will be employees of Desert Claim or enXco, Inc., but most will work for various construction contractors and equipment vendors who will provide construction goods and services to the Project. The size of the construction work force present at any given time will vary with the schedule of tasks in the construction process. Relatively few construction workers will be present during the initial and final stages of construction activity, for example. The road/pad and tower foundation construction tasks are likely to be the Project activities with the greatest labor requirements. Based on the nature and sequence of construction activity, the peak work force is not likely to exceed 60 to 75 workers at any given time.

The Applicant will use local construction contractors and suppliers to the extent possible. Based on experience with other wind energy projects in the Northwest, it is likely that local firms and workers will be available for tasks such as surveying, site clearing and grading, road and turbine foundation construction, and site restoration/cleanup. Tasks such as transmission line and substation construction, turbine assembly, installing safety and control systems, and testing require more specialized skills that are less likely to be available locally, and therefore, may be performed by non-local firms and workers.

4.4 Erosion and Sedimentation Control

Erosion and sedimentation control will be standard practice during active construction and during the restoration and cleanup stage of the construction process. The Applicant will develop and implement of a Temporary Erosion and Sedimentation Control Plan (TESCP). This design-level plan will prescribe the use of Best Management Practices that are standard features of such plans. The Project TESCP will be based on and comply with the Washington Department of Ecology's *Stormwater Management Manual for Eastern Washington.* The TESCP will also address the erosion control and water quality conditions of the National Pollutant Discharge Elimination System (NPDES) construction stormwater discharge general permit.

Based on the applicable standards, the TESCP will include using coverings for exposed soils (e.g., straw, jute netting, or soil stabilizers), stormwater detention ponds, sediment control basins and traps, and other well-established measures. Surface water runoff will be directed away from cut-and-fill slopes and other disturbed areas, and into ditches that drain to natural drainage features. Exposed areas will be re-vegetated as soon as possible following completion of the corresponding construction task.

Erosion and sedimentation control measures will be implemented at the beginning of the construction process, following the survey and staking task. Areas of native shrub-steppe habitat and other environmental features to be avoided will also be marked at this time. Provisions for restoration of temporarily disturbed areas will be determined through consultations with WDFW and EFSEC.

4.5 Roads and Turbine Pads

Heavy construction activity for the Project will start with clearing and grading for the Project access roads and turbine pads. In some locations existing private farm roads will be used as segments of the Project access road system. These existing road segments will be improved as necessary to comply with the design standards for the Project roads. Improvement activities could include grading to modify the road geometry, filling in low spots, replacing culverts and other drainage features, replacing cattle guards as needed, and applying new gravel to the road surface. Improvements to existing roads will be coordinated with the landowners to minimize crop damage and ensure suitable access for the landowners.

New graveled roads will be constructed in areas where existing roads could not be used for access to the turbines. These roads will vary in width; having 15-foot travel surface widths for straight sections and 20-foot travel surface widths for curved sections. Project access roads will have turnouts at the turbine pads and other selected locations. Stream crossing structures will be incorporated into the Project access road system to allow for crossing of wetlands and streams, including any buffers. The temporary disturbance area along the Project access road routes is assumed to be approximately 35 to 50 feet wide under typical circumstances, with a wider area needed in locations where cuts and fills are required to construct and stabilize roads on slopes. The temporary disturbance width along the access roads will also accommodate trenching for Project utility lines and will accommodate access for cranes needed to erect the turbines. Temporary construction disturbance around the turbine pads is assumed to occupy an area with a

radius of approximately 120 feet around the tower foundation, representing about 45,000 square feet or about 1 acre per turbine.

Topsoil removed during grading for access road and turbine pad construction will be stockpiled onsite adjacent to the disturbed areas. The removed topsoil will be re-spread in cut-and-fill slopes, and these areas will be re-vegetated as soon as possible after road construction was completed. No offsite deposition of excavated material will be needed. Once grading for the roads and pads in a given sector of the Project had been completed, fill materials (gravel, soil and sand) needed for road and pad bases and road surfaces will be hauled to the construction site, deposited, graded and compacted as needed. Native materials from the Project Area will be used to the greatest extent possible to meet fill material needs and achieve a cut-and-fill balance within the Project Area. If fill must be imported, gravel and/or crushed rock provided by local permitted sources will be used. Quantities of filling and grading for the Project have not yet been estimated because they are dependent on the mix of tower foundations to be used, and the type of foundation for each of the 90 turbine locations will be determined based on site-specific geotechnical investigation. These quantities will be estimated after the type of tower foundation is determined for each turbine. Based on information developed for other wind energy projects of a comparable scale, however, the total volume of cut and fill quantities for the Project could be in the range of approximately 250,000 to 300,000 cubic yards. Gravel and other construction materials purchased by the road construction contractor from existing, permitted local sources will be trucked to the construction site via public roads.

4.6 Staging Areas

Temporary laydown or staging areas will be established in the Project Area to support various construction functions. These include temporary storage of tower sections, nacelles and other turbine components; temporary storage of other equipment and supplies; parking of construction vehicles and equipment; parking of construction workers' personal vehicles; and possible installation of portable fuel tanks surrounded by earthen berms for spill control. Staging area locations and dimensions have not yet been determined. One or more staging area approximately 10 acres in size will be needed; these temporary facilities will be placed near existing roads and on previously disturbed land (e.g., heavily grazed and/or crop or pasture lands).

4.7 Concrete Supply

The Applicant will contract with one or more local construction companies to install the tower foundations and pads and the transformer pads. These facilities will require sizable volumes of concrete. The construction contractor will be responsible for obtaining the aggregate and concrete necessary to build these features. The contractor could elect to purchase the construction materials from local suppliers, in which case concrete would be manufactured at an existing local plant and trucked to the Project.

Alternatively, the contractor could choose to construct one or more temporary concrete batch plants within or near the Project Area, to minimize the cost impact of transporting concrete to the Project. In this event, the location and characteristics of the batch plant(s) would be determined

by the contractor, and the contractor would be responsible for obtaining any land use or environmental permits required to develop the facilities.

If the batch plant option were selected, the contractor would likely use a portable unit that could be moved to different locations within the Project Area as needed. The batch plant(s) would be set up in a temporary staging area, as described previously, and would use cement, aggregate and water purchased from local sources and delivered to the temporary site by truck. A diesel generator would likely be used to power the plant. Approximately 2 to 3 acres would be required to support a typical temporary batch plant and related facilities. The site would include approximately one acre for the plant itself, 1 acre for raw material stockpiles, and 1 acre for parking, equipment storage and a settling pond.

Portable concrete batch plants, defined as plants that operate at a site for less than one year, are permitted under the State of Washington's Sand and Gravel General NPDES Permit. The general permit specifies discharge limits and requires the operator to develop plans for monitoring, stormwater pollution prevention plan, erosion and sediment control, and spill prevention and control. The permit requires restoration of the site after the portable plant is removed. Best management practices for concrete truck washout require that a settling pond be built to catch the washdown runoff and stormwater runoff. A water storage tank could be used at the plant site to store water hauled from an off-site source if water was not available at the batch plant site.

4.8 Turbine Foundations

Once the Project roads are constructed, excavation will begin for turbine foundations. As described in Section 3.1.2, inverted-T and pile-type foundations are likely to be used, with selection of the foundation design depending on site-specific conditions at each turbine location. In either case, construction of the foundation typically requires 3 days per tower with foundation construction activities expected to occur for approximately 4 to 5 months during the Project's construction process.

The inverted-T foundation requires a circular excavation approximately 8 feet deep and 90 feet in diameter (see **Figure 7A**). Construction for this design involves excavation with a backhoe; placement of a layer of compacted fill at the bottom of the hole; pouring an octagonal-shaped, reinforced-concrete (concrete poured over steel rebar) footing up to 4 feet deep on top of the fill; pouring a 4-foot deep reinforced-concrete pedestal on top of the footing; and covering the footing and pedestal with compacted backfill and topsoil. Steel anchor bolts extending through the pedestal to near the base of the footing will be used in a subsequent step to fix the tower to the foundation.

The pile foundation requires excavating a hole ranging from 25 feet to 35 feet deep (depending on site-specific subsurface conditions) and approximately 18 feet in diameter (see **Figure 7B**). A cylindrical, corrugated metal form approximately 16 feet in diameter will be inserted in the hole, and another cylindrical corrugated form several feet smaller in diameter will be placed inside the larger form. The space between the two forms will be filled with reinforced concrete and two rings of anchor bolts, and the space inside the inner metal form will be filled with compacted backfill.

If bedrock were encountered at any turbine location, rock anchors would likely be used to secure the base of the foundation. Rock anchors would be used in conjunction with either foundation design. Use of explosives (blasting) might be required for installation of rock anchors.

The Applicant will engage a geotechnical specialist to prepare a geotechnical report for the Project that will be used to determine the appropriate foundation design for each turbine location. The Applicant will also engage a licensed civil engineer during construction to inspect each foundation pour and prepare a quality assurance report for each foundation.

4.9 Collection System

The power collection system for the Project will be installed using underground cable, except where it is not feasible to do so and avoid sensitive environmental features. The cable will be located within the disturbance area for construction of the Project road system to the maximum possible extent. At stream crossings, the cables may be located on the road bridge or structure. Underground cable will be installed using a trenched or plowed-in method. The trenching method requires excavating a trench approximately 3 to 5 feet wide and approximately 2 to 4 feet deep, laying the electrical cables in a part of the trench, partially backfilling the trench, laying parallel communication cables, and backfilling the entire trench. Under the plowed method, the power collection and communication cables will be installed without the need to excavate an open trench; instead, the cables will be directly plowed into the ground. In either case, topsoil will be replaced on the surface of the disturbed area and will be reseeded with native plants. In certain areas, the underground cables may be encased in concrete to provide additional protection and stability in the ground.

Overhead 34.5-kV collector lines will be used in areas where underground cables are not appropriate. Overhead collection cables will be mounted on new or existing wooden poles of approximately 37 feet in height. Construction for these facilities will require heavy equipment access within a corridor approximately 8 to 12 feet wide along each overhead line, plus a temporary laydown and work area around the base of each pole. The poles will be placed in holes excavated by augur, and minimal or no clearing and grading will be required for constructing overhead lines.

4.10 Transmission Connection

Developing the Project transmission interconnection will require constructing an overhead transmission line from the Project substation to the existing transmission line selected as the reception point for power generated by the Project. The transmission interconnection is expected to be a 230-kV line that will be supported on wood-pole structures approximately 76 feet in height. Standard industry construction practices will be used for this facility, including surveying, right-of-way preparation, materials hauling, structure assembly and erection, ground wire and conductor stringing, and cleanup and restoration.

A licensed surveyor will survey the transmission line route and stake structure locations. Holes for the transmission structures will be drilled or augured, typically to a depth of 4 to 6 feet and a width of 2 feet. Construction materials will be hauled by truck to the route and the structures will be assembled on site. Conductor stringing equipment will be placed at either end of the

transmission connection; additional areas might be needed for angle locations along the route. Construction activity will be concentrated at staging areas and around structure locations. Cleanup and restoration of disturbed areas will occur following stringing and testing of the line. Excess topsoil will be tamped around poles or spread on the right-of-way, and disturbed areas will be reseeded with native plants or agricultural crops, depending on the adjacent use.

4.11 Substation and Operation and Maintenance Facility

The Project substation will be constructed while the electrical system components were being installed. Construction activities will include clearing and grading the substation site, which will occupy up to approximately 2 acres; constructing concrete pads for transformers, the control building and other equipment; installing the electrical equipment; assembling the control building; covering the remainder of the site with gravel; and constructing a chain-link fence around the perimeter of the substation site.

The Project operation and maintenance facility will be constructed on a two-acre site located adjacent to the Project substation. It will involve conventional building construction techniques including site clearing and grading, constructing a concrete pad for the building, framing and finishing the building, installing electrical wiring and plumbing, and constructing a septic system and drain field.

4.12 Turbine Equipment

Once a sufficient number of tower foundations are in place and finished, the first turbine towers, nacelles and blades will be brought to the Project Area for placement. The turbine components will be transported to the Project Area by truck and trailer. The towers will have three sections, each approximately 70 to 90 feet long. They will be delivered by trailers, each carrying one tower section. Large cranes will lift the multiple tower sections into place. The bottom section will be bolted to the circular ring(s) of anchor bolts on the foundation pedestal, and the upper sections will be sequentially bolted in place.

Following foundation construction, the nacelles, rotors and other components will be delivered to the tower locations. The nacelle will be hoisted to the top of the tower by crane and bolted to the tower. The rotor hub and blades will be assembled on the ground, and the assembly will be lifted by crane and secured to the nacelle.

The permanent met towers will also be installed during this stage of the construction process. The tower components will be transported to the construction site in sections, hoisted by crane and anchored to the met tower foundations.

4.13 Final Grading and Restoration

Final grading of disturbed surfaces within the Project Area will occur following completion of the heavy construction activities, and any additional gravel needed will be placed on the Project access roads. All areas temporarily disturbed by Project construction will be restored to their original condition and reseeded with native vegetation. Areas subject to construction activity will be inspected for the presence of noxious weeds and treated as necessary. Long-term

stormwater management and erosion control measures. A final site cleanup will be made before shifting responsibility for the Project Area to the Project operations and maintenance crew, including collection and disposal of all construction debris and other waste materials that could not be reused. County roads will be restored to their pre-Project condition.

4.14 Testing

Following completion of construction activities on the first group of wind turbines, approximately a month of testing will occur before commercial operation begins. Testing will involve inspections of the mechanical, electrical and communication systems to ensure they are working properly and performing according to their respective specifications. The testing process will include checks of each wind turbine and the overall Project control system. Technicians qualified for the specific systems will perform all inspections.

4.15 Transportation and Access Management

Management of construction access and traffic will be a specific focus during the construction process, primarily because of the roadway and traffic considerations associated with transportation of construction materials and turbine components to the Project Area. The Applicant will develop a Construction Traffic Management Plan that will address transportation and access concerns during the construction period. The plan will define access routes and procedures to be used by various types of construction equipment and material shipments, approved hours of operation for construction traffic, safety provisions and other management requirements.

5. OPERATION AND MAINTENANCE

The Applicant intends to operate and maintain the Project once construction is complete and the Project begins commercial operation, though some utilities have shown an interest in purchasing the Project and operating it themselves. Electricity generated by the Project will be sold to power marketing entities, such as BPA ; local and regional public utilities, such as the Kittitas County PUD and the Grant County PUD; and/or regional investor-owned utilities, such as PSE and Avista. Power from the Project will ultimately be distributed by utilities to their customers. This section summarizes the activities associated with long-term operation and maintenance of the Project.

5.1 Functions

Long-term operation and maintenance activities for the Project will include the following functions:

- round-the-clock monitoring of Project output, the safety and control system and the performance of individual wind turbines;
- controlling turbine operations as necessary to meet scheduled power deliveries and implement scheduled outages for scheduled turbine maintenance;

- performing periodic, routine testing and maintenance of the turbines as needed to maximize performance and detect potential mechanical difficulties;

- on-site repairs of Project equipment in response to malfunctions or scheduled maintenance;

- patrolling the Project Area to ensure security and monitor on-site conditions, including inspection for erosion, re-vegetation success, unauthorized uses and potential wildlife impacts;

- periodic maintenance of Project access roads, including grading and application of additional gravel, as necessary; and

- implementing the noxious weed control plan.

Through the life of the Project, the Applicant will follow an operations and maintenance protocol that will specify the timing of routine turbine maintenance and inspection. Such a protocol typically adheres to a program developed by the turbine manufacturer, similar to the way automobile manufacturers define recommended maintenance. Scheduled maintenance will be conducted approximately every six months on each wind turbine. On average, each turbine will require 40 hours to 50 hours of scheduled mechanical and electrical maintenance per year.

Most servicing of the turbines will be performed within the nacelle via access through the tower, rather than using a crane to remove the turbine from the tower. The use of a crane and equipment transport vehicles for turbine adjustments, larger repairs or replacement of rotors or nacelle equipment will be needed on an occasional basis. Routine maintenance will include replacing lubricants and hydraulic fluids at specified intervals. The towers will need to be repainted on a periodic basis. All lubricants, hydraulic fluids, paints, solvents and other potential hazardous substances will be carefully stored, used and disposed of in accordance with applicable laws and regulations.

5.2 Work Force

The Project will employ 8 to 10 full-time staff for long-term operations and maintenance. This staff will include an operations manager, technicians specializing in maintenance and repair of the turbines, and field staff responsible for other Project functions. Most of the O&M staff could be hired from the local work force.

5.3 Access Management

All Project access roads will be posted and maintained as private roads, with locked gates to minimize unauthorized access. Public roads within and adjacent to the Project Area will remain open to public use, as in their current condition.

5.4 Safety Measures

The wind turbines will be monitored continuously by a supervisory control and data acquisition (SCADA) system. Each turbine will be equipped with monitors that communicate operation conditions through communication lines (installed in the same trench as the power collection system). Alarm systems will be triggered if operational characteristics fall outside set limits. Each turbine will have an automatic braking system to shut down the rotor in the event of malfunctions or excessive wind speeds

The turbines will use synthetic oil as a lubricant in the gearboxes and hydraulic fluid for the blade pitch actuators. Each turbine will contain lubricating oil. Turbine oil will be tested regularly and replaced as needed. Waste oil and fluid collected during maintenance will be transferred to an approved waste facility.

enXco has developed and implemented standard safety plans at the wind energy facilities that it operates. The safety plans include key components that are specific to wind energy facilities, such as fire safety and emergency tower rescue programs. These programs define hazards that could be present, prescribe procedures to be followed by operations and maintenance personnel, identify equipment needed to implement the programs, and specify applicable training requirements. These safety plans will be employed for the Project, with Project-specific modifications as necessary.

5.5 Expected Operating Patterns

The Project's wind turbines will not operate during all hours of the year because the wind does not blow at sufficient speeds to operate the turbines all of the time. The Applicant has collected over 5 years of meteorological data within the Project Area. These data were correlated with existing public data collected at Bowers Field. Based on the combined wind data, the Applicant expects the Project to operate approximately 60 percent of the time annually. This equates that of the 8,760 hours in a year, the turbines are expected to operate approximately 5,300 hours, and be idle during the remaining 3,500 hours, though annual and seasonal variations are expected.

Based on recent historical wind data, the majority of the annual production from the Project will occur from March through October. There are approximately 5,880 hours during this 8-month period. The turbines will likely be in production (i.e., the blades will be turning and producing some electricity) approximately 71 percent of the time during the spring-summer period, or approximately 4,170 hours. The turbines will be idle the remaining 29 percent of the time, or approximately 1,700 hours. Out of the approximately 2,880 hours in the fall and winter months from November through February, the turbines will be in production approximately 36 percent of the time (i.e., approximately 1,040 hours) and sitting idle the remaining 64 percent of the time (i.e., approximately 1,840 hours). During both periods of the year, the majority of the daily production and operation time will occur during daylight hours. Over the course of the year, two-thirds (67 percent) of the production and operation will likely occur from 7 a.m. to 10 p.m.

6. MITIGATION MEASURES

The Applicant will incorporate mitigation measures into the Project consistent with and based upon the analysis contained in the County FEIS and presented in this Application. This section summarizes the mitigation measures outlined in Chapter 3 of the County FEIS, along with updated measures proposed by the Applicant.

6.1 Erosion (County FEIS § 3.1)

The Applicant will develop and implement a Construction Stormwater Pollution Prevention Plan (SWPPP) that satisfies the requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activities. The SWPPP will include Best Management Practices (BMPs) recommended by Ecology's *Stormwater Management Manual for Eastern Washington.* The Construction SWPPP will include measures for temporary erosion and sedimentation control, and will identify a regular inspection and maintenance schedule for all erosion control structures.

6.2 Landslides (County FEIS § 3.1)

To mitigate potential landslide hazards as a result of construction, the Applicant will use setback distances for structures, infiltration systems, and detention ponds, where appropriate and feasible. The setback distances are based on the analysis in the County FEIS, and are more stringent than those recommended in the *Uniform Building Code.* Setback distances could be reduced and/or eliminated depending upon the detailed design plans and additional, site-specific studies of the geological conditions.

The Applicant will generally maintain a minimum setback distance of 125 feet between Project facilities and areas classified as Landslide Hazard Zone 1, and a setback distance of 50 feet between Project facilities and areas classified as Landslide Hazard Zone 2.

In addition to these setbacks, the Applicant will implement the following mitigation measures:

- If construction occurs within areas of the Project Area classified as Landslide Hazard Zones 1 and 2, then stormwater from those construction sites will be collected and tightlined away from the top of such areas.

- No fill, topsoil, or other debris will be placed over the top of areas within Landslide Hazard Zone 1. Any fill planned for slopes steeper than 5H:1V (Horizontal : Vertical) will be benched and compacted into the hillside pursuant to a geotechnical engineer's recommendations.

- The Applicant will not remove any vegetation from areas within Landslide Hazard Zone 1, with the exception of dead or diseased trees, unless approved by a geotechnical engineer. Vegetation removed from Landslide Hazard Zone 2 areas will be limited to the immediate vicinity of construction.

- The Applicant will retain a geotechnical engineer licensed in Washington State to review and approve all grading, erosion, and drainage control plans prior to construction to assist in reducing the landslide risks from and to the Project.

6.3 Seismic Activity (County FEIS § 3.1)

The Applicant will comply with the building code in effect in Kittitas County when construction commences, whether the Uniform Building Code of 1997 or the International Building Code of 2000.

6.4 Air Quality (County FEIS § 3.2)

The Applicant will implement the following standard practices to reduce the air emissions from construction activity:

- To reduce emissions from construction equipment and vehicles, the construction contractor will be required to use well-maintained equipment and avoid prolonged periods of vehicle and equipment idling.

- Dust produced by construction will be reduced by spraying water or other dust suppressants over areas of exposed soils such as storage yards and construction roadways. Roads and other areas that might be exposed for prolonged periods will be paved, planted with a vegetation ground cover, or covered with gravel. Subject to receiving approval from appropriate agencies, the Applicant may use dust palliatives, such as calcium chloride, on road surfaces to reduce the amount of dust created by vehicle traffic on unpaved roads. A 25 mph speed limit will be maintained on unpaved roads within the Project Area.

- Truck beds will be covered when transporting dirt/soil outside of the Project Area.

- All stored construction materials that may cause air emissions will be covered;

6.5 Surface Water (County FEIS § 3.3; Wetlands and Stream Report – Tab 4)

The revised project configuration avoids any temporary or permanent impact to streams or wetlands, or their specified buffers.

Project construction staging areas will not be located within 100 feet of drainages or any other body of water to reduce the potential contamination from spills. The Applicant will use BMPs to control the use and disposal of waste materials during and following Project construction, including implementation of a spill prevention, containment and control plan.

The Applicant will store hazardous materials, such as lubricants, in approved containers and storage facilities. The Applicant will provide on-call spill response services either through a contract with a qualified environmental remediation services firm or with qualified in-house personnel.

6.6 Vegetation (County FEIS § 3.4; Vegetation and Wildlife Report – Tab 5)

During project construction, the Applicant will employ BMPs to reduce peripheral impacts to adjacent native vegetation and habitats and to minimize the construction footprint. The Applicant will micro-site Project facilities to minimize impacts from roads and utility crossings to riparian habitat to the greatest extent possible.

The Applicant will incorporate the following mitigation measures to facilitate restoration of temporarily disturbed areas in the Project Area and to avoid, minimize or reduce impacts of noxious weeds:

- Standards for site restoration will be established as part of the Final Construction Plans. The post-construction restoration or reclamation plan for the temporarily disturbed areas will include provisions for continuing active restoration until site stability or the reference standards are achieved.

- Site reclamation and reseeding will occur during the time of year when seed germination and establishment is most likely to be successful.

- The construction contractor will be required to clean construction vehicles prior to bringing them in to the Project Area from outside areas.

- Disturbed areas will be re-vegetated as quickly as possible with native species.

- If the construction contractor uses hay for sediment control or other purposes, it will certify that the hay bales are weed free.

- Noxious weeds that have established themselves as a result of the Project will be actively controlled in consultation with the Kittitas County Weed Control Board.

6.7 Wetlands (County FEIS § 3.4; Stream and Wetland Report – Tab 4)

The Project has been designed to avoid temporary or permanent impacts to wetlands, including specified buffers, in the Project Area. Any work adjacent to wetlands will adhere to the applicable laws, including federal and state regulations. If wetlands are inadvertently disturbed during construction, the Applicant will restore the wetlands and re-vegetate them if appropriate.

6.8 Wildlife (County FEIS § 3.4; Vegetation & Wildlife Report – Tab 5)

Technical Advisory Committee

The Applicant will establish a Technical Advisory Committee (TAC) pursuant to the *WDFW Wind Power Guidelines*. The TAC will ensure that monitoring data is considered in a forum in which independent and informed parties can collaborate with the Applicant. The TAC will make recommendations to EFSEC if it concludes that additional studies or mitigation are warranted to address impacts that were either not foreseen in the Application or County EIS, or exceed impacts that were projected.

The TAC will have up to nine (9) members. Pursuant to the Guidelines, the TAC will be composed of one representative each from U.S. Fish and Wildlife Service, the Washington Department of Fish and Wildlife, the Washington Department of Natural Resources, Kittitas County, and the Project owner/developer, at least one representative from amongst the five private participating landowners, and up to three more members, including local landowners or other concerned interests (e.g., Kittitas Audubon Society). The Applicant will provide meeting space and logistical support for the TAC, but TAC members will not be reimbursed for any time or expenses related to their participation on the TAC.

Pursuant to the Guidelines, the TAC may recommend additional or alternative mitigation measures from those contained in this Agreement. Any recommendation by the TAC must be approved by a majority of the TAC which majority must include the representatives from WDFW, USFW and WDNR. The Applicant may accept the TAC's recommendation voluntarily. In the event that the Applicant does not accept a TAC recommendation, the TAC may forward the recommendation to EFSEC. EFSEC will then determine whether: (i) the TAC's recommendation is reasonably necessary to mitigate identified adverse impacts of the Project; and (ii) the TAC's recommendation is reasonable and capable of being implemented. If the EFSEC makes such findings, EFSEC will require the Applicant to implement the recommendation.

The Applicant will develop a Post-construction Avian Monitoring Plan in coordination with the TAC. At a minimum, the monitoring plan will include: (i) a 1-year standardized fatality monitoring program involving carcass searches, scavenger removal trials, a searcher efficiency trials; and (ii) a standard procedure for O&M personnel to report incidental bird fatalities and/or bird injuries over the life of the Project. The protocol for the fatality monitoring study will be similar to protocols used at other, newer-generation wind plants in northeastern Oregon and southeastern Washington.

The primary impacts associated with the Project are expected to be loss of shrub steppe habitat, fatalities of birds, and potential displacement effects on mule deer. The Applicant will provide the following mitigation measures to address these impacts:

- The Applicant will identify environmental features such as riparian corridors and raptor nest sites that are not to be disturbed. Those areas will be mapped, flagged, and/or identified to all contractors working on-site as "no disturbance" zones during the construction phase.

- The Applicant will develop a site management plan to, at a minimum, identify Environmental Features and wildlife areas (e.g., raptor nests), provide adequate on-site waste disposal, and establish fire management and erosion control procedures.

- Raptor nests within ½ mile of construction areas will be monitored for activity prior to construction to determine the need for construction timing restrictions around active nests.

- All power and communication lines on-site will be buried underground where feasible.

- All overhead power line poles will be equipped with anti perching devices.

- Permanent met towers on-site will be free-standing to eliminate the potential for avian collisions with guy wires.

6.9 Livestock and Hunting

Livestock grazing will not be allowed in those Project areas in which active construction is occurring. Hunting will not be allowed in the Project Area during construction.

6.10 Habitat Mitigation Parcel

The Applicant will establish, either in the Project Area or elsewhere, an approximately 200-acre Mitigation Parcel to mitigate for all temporary and permanent impacts to habitat caused by the Project. The Mitigation Parcel will satisfy the following mitigation ratios set forth in the *WDFW Wind Power Guidelines:*

	Temporary Impact	**Permanent Impact**
Land Subject to Imminent Development	n/a	1 to 1
Grassland or CRP Land	0.1 to 1	1 to 1
Shrub-steppe Habitat	0.5 to 1	2 to 1

6.11 Energy and Natural Resources (County FEIS § 3.5)

No significant impacts to energy and natural resources would occur, and therefore, no mitigation measures are proposed.

6.12 Cultural Resources (County FEIS § 3.6)

The Applicant will address how it will avoid cultural sites in the micro-siting process. If any Project facilities are identified as impacting cultural sites, the Applicant will evaluate data on site-specific geotechnical and wind characteristics to determine whether it will be feasible to relocate the facilities in question, and thereby avoid direct impact to cultural resources.

The Applicant will develop a Cultural Resources Monitoring Plan for monitoring construction activities and responding to the discovery of archeological artifacts or buried human remains. The Plan will provide for monitoring of ground-disturbing construction activities and evaluation and treatment of unanticipated archaeological resources that might be discovered during construction.

The Applicant will maintain 100-foot design and construction buffers as measured from any ground-disturbing construction activities and the archaeological and historical sites identified during the cultural resource survey, even though these sites do not meet the standard qualifications for National Register of Historic Places. The Project archaeologist will flag off or otherwise delineate the archaeological sites with a 100-foot buffer. Ground disturbing actions within a specified radius of any archaeological sites, either recorded during the initial survey or previously documented, will be monitored by a professional archaeologist to prevent damage or destruction to both known and unanticipated archaeological resources.

If any archaeological artifacts, including but not limited to human remains, are observed, disturbance and/or excavation in that area will cease, and the Applicant will notify the Office of OAHP, EFSEC, and the affected tribes. At that time, appropriate treatment and mitigation measures will be developed in coordination with the agencies and tribes. If the Project cannot be moved or re-routed to avoid the resources, the Applicant will test the resources for eligibility for listing on the National Register of Historic Places. Depending on the outcome of the testing for eligibility, the Applicant will prepare a mitigation plan in consultation with OAHP and any affected tribes.

Prior to any excavation of, or disturbance to, the archaeological sites, the Applicant will obtain an excavation permit from OAHP pursuant to the requirements of RCW 27.53.060. The Project archaeologist will remove any flagging tape or pin flags at the end of the construction-monitoring phase of the Project.

6.13 Land and Shoreline Use (County FEIS § 3.7)

No significant impacts would occur, and therefore, no mitigation measures were identified.

6.14 Mechanical Hazards (County FEIS § 3.8; Hazard Report – Tab 7)

The Applicant intends to use the REpower MM92 turbine for the Project. This turbine is equipped with multiple safety systems as standard equipment, including rotor speed controlled by a redundant pitch control system, an automatic backup disk brake system, multiple temperature sensors and a control system that will shut a turbine down and take it off-line if an overheat or overspeed condition is detected. The turbines also will be equipped with a lightning protection system.

The Applicant will use turbines designed to the requirements of the International Electrotechnical Committee (IEC) 61400-1 Standard, which is sufficient to assure that the static, dynamic and defined-life fatigue stresses in the turbine blade will not be exceeded under the combined load cases expected at the Project Area.

Public access will be restricted and no high-value public facilities will be located within the safety zone established.

6.15 Tower Collapse, Blade Throw and Ice Throw

The Project configuration includes a 625-foot safety zone setback from the Project boundary and all public roads and existing utility transmission corridors. The setback was calculated for the specific turbine model selected for the Project. The 625-foot safety zone is sufficient to provide adequate and reasonable protection for tower collapse, blade throw and ice throw hazards associated with the Project (KFPP Consulting 2006).

6.16 Fire Hazards

The Applicant will provide the following measures intended to prevent fires and minimize the consequences of any fires that might occur:

- During the construction period, all workers will be given fire safety training.
- The Applicant, through its construction contractor, will implement a work plan that minimizes the risk of fire.
- Appropriate fire suppression equipment will be available to designated employees trained in its use.
- The construction contractor will use mufflers and spark arrestors on all construction equipment.
- The Final Construction Plans will provide for required construction shutdowns, and limitations on "hot" work when necessary, as directed above.
- During operation, the Applicant will provide regular turbine maintenance, including review of real-time and stored temperature sensor readings that will be used to highlight developing problems and facilitate prevention of equipment-caused fire.
- The Applicant will use turbines that have a temperature recording and control system that include real-time monitoring, operator alarms and automatic turbine shut-down mechanisms in each nacelle in order to supplement the Project's standard fire prevention measures.
- The Applicant will maintain updated emergency contact information and coordination procedures within the O&M Facility.

6.17 Electrical Hazards (County FEIS § 3.8)

The Applicant will use the following mitigating measures to minimize potential health and safety risks associated with electrical hazards from the Project:

- Prior to starting construction, the construction contractor will prepare and maintain a safety plan in compliance with Washington requirements. This plan

will be kept on-site and will detail how to manage hazardous materials such as fuel, and how to respond to emergency situations.

- During construction, the contractors will hold regular crew safety meetings to go over potential safety issues and concerns related to working on electrical facilities.

- At the end of each workday, the contractor and subcontractors will secure the site to protect equipment and the general public.

- Selected employees will be trained, as necessary, in tower climbing, cardiopulmonary resuscitation, first aid, rescue techniques, and safety equipment inspection.

- If implosion bolts are used to connect the conductors, they will be installed in such a way as to minimize potential health and safety risks to workers.

- Project workers will stay on established Project access roads during routine operation and maintenance activities.

- Vegetation will be trimmed to avoid contact with collection and interconnection lines.

- All new Project power collection system cables and interconnection transmission lines will be constructed and operated to meet the National Electrical Safety Code.

- Installation crews will clearly mark the location of all buried Project Power Collection System cables.

The Applicant will provide the following mitigating measures to address potential telecommunications interference associated with electromagnetic or physical conditions that might result from the Project:

- The Applicant will conduct a study of potential microwave interference prior to final location of turbines, and move or eliminate turbines that will block microwave pathways.

- The Applicant will conduct baseline monitoring of television reception quality within a one-half mile of the Project Area. Means to accomplish this can range from contracted studies by qualified professionals to sample before-and-after videotaping.

6.18 Shadow Flicker (Shadow Flicker Report – Tab 7)

The Applicant has revised the Project configuration to substantially reduce the potential for adjacent residences to experience shadow flicker (GEC 2006b). Shadow flicker is not expected to be noticeable beyond 1,500 feet from a turbine. If non-participating residences located less

than 1,500 feet from a turbine experience shadow flicker, the Applicant will stop the blades of the wind turbine that causes the flicker during those hours and conditions when shadow flicker occurs, or offer a voluntary waiver agreement to the landowner in lieu of stopping the turbine.

6.19 Noise (County FEIS § 3.9; Sound Report- Tab 5)

The Applicant has revised the Project layout so that sound levels during Project operation will be 50 dBA or less at the Project Area boundary. (GEC 2006a).

In order to minimize noise during construction, the Applicant's construction contractor will be required to employ standard management practices, including the following measures:

- require use of properly sized and maintained mufflers, use of engine intake silencers and engine enclosures when the engine is the dominant source of noise, and that idle equipment be turned off when not in use for extended periods of time;

- stationary equipment will be placed as far away from residential receiving locations as possible whenever construction occurs within 100 feet of the project boundary. Where this is infeasible, portable noise barriers will be placed around the equipment with the opening directed away from a receiving property;

- require use of hydraulic or electric models for impact tools -- such as jackhammers, rock drills and pavement breakers – to reduce construction and demolition noise; and

- require operators to lift rather than drag materials wherever feasible.

6.20 Aesthetics, Light and Glare (County FEIS § 3.10)

In order to minimize aesthetic, light and glare impacts during Project construction, the Applicant will:

- Periodically remove construction debris.

- To the greatest extent possible, locate construction staging and storage areas away from adjacent county roads.

- Replace native vegetation disturbed in non-road surface areas or non-turbine areas as soon as possible.

- Seed or cover temporarily stockpiled materials and disturbed sites that will sit dormant for more than 3 months to keep down dust and prevent soil erosion.

- In order to minimize the aesthetic, light and glare impacts of the Project, the Applicant will:

- Maintain high-quality turbine towers, nacelles, and blades, and remove or promptly repair all parts of non-functioning turbines.

- Store vehicles and maintenance equipment within the Project Area at the Project Sub-station and/or the O&M Facility. Keep the operation and maintenance area clean.

To the extent feasible, the Applicant will:

- Construct Project buildings of local materials and in local building styles to maximize their fit in the vernacular landscape.

- Use native shrub-steppe vegetation around buildings and equipment boxes to integrate the structures into surrounding landscape.

- Use existing roads to access turbines.

- Not piggyback advertising, cell antennas, or other clutter on the turbines and not display the logo of the manufacturer prominently on the turbine nacelle.

- Use low-reflectivity, neutral-color finishes for turbines, and other Project facilities. Earth-tone finish will be used on the O&M Facility to better blend it with the surrounding landscape.

- Minimize security lighting at the Project substation, and make any ground level security lighting motion-sensitive so that most of the time it does not impact the night landscape. Use lighting devices designed to be least visible from ground level.

6.21 Recreation (County FEIS § 3.11)

No significant impacts to recreation were identified, and therefore, no mitigation measures are proposed.

6.22 Ground Transportation (County FEIS § 3.12)

Construction

The Applicant will mitigate traffic impacts associated with construction of the Project by developing and implementing a Construction Traffic Management Plan.

Operation

To minimize traffic impacts during Project operation, the Applicant will construct a roadside visitor facility or "Tourist Kiosk" within the Project Area. The Tourist Kiosk will be located at a viewpoint at least 50 feet off of the County road, with adequate stacking space for vehicles

entering the Tourist Kiosk area. Short-term parking will be provided for up to ten vehicles, with adequate space for recreational vehicles to turn around.

6.23 Air Transportation (County FEIS § 3.13; FAA Lighting Report – Tab 9)

The Applicant will provide to EFSEC copies of the Determination of Non-Hazard certificates issued by the Federal Aviation Administration (FAA) and related information, which demonstrates that the Project will not impact approved flight approaches, flight communications or operations at the Kittitas County Airport (Bowers Field).

The Applicant will equip approximately thirty-six turbines with FAA required synchronized flashing red lights for evening/nighttime hours (Chavkin 2006).

6.24 Public Services

Fire Protection and Emergency Medical Services

The Applicant entered into a Fire Services Agreement with Kittitas County Fire Protection District No. 2 on February 10, 2005. The Fire Services Agreement includes a fire prevention and fire control plan for the Project. The Applicant will work with the Fire District No. 2 to identify water supplies within the Project Area required for firefighting.

The Applicant will meet implement the following measures to reduce fire risk:

- During construction, power equipment will be equipped with safety features, including spark arrestors and/or approved mufflers, fire extinguishers and shovels.
- Equipment shutdowns will be required during periods of general industrial fire precautions in the local area, and limitations regarding "hot" work with electrical equipment and facilities will be observed.
- In order to prevent fires caused by catalytic converters on vehicles, designated parking areas will be created for workers' vehicles.
- Designated worker smoking areas will be established to reduce the potential for fire.
- The Applicant will develop and implement a worker-oriented fire prevention program to provide additional knowledge of wildfire prevention and control practices to workers.
- The Applicant will provide a "knox box," a fire service access box containing master keys, in all secured areas (i.e., buildings or gates) to facilitate access to the site by fire and emergency medical crews.
- The Applicant will provide fire, emergency medical, police agencies, and KITTCOM with emergency contact and response information relating to the

design of the Project, including the detailed maps of Project access roads, on-site facilities, and Turbines, and an addressing plan.

- The Applicant will institute procedures for rescue operations should an incident occur inside a turbine nacelle (including available on-site emergency rescue equipment).

- The Applicant also will execute an agreement with the appropriate agency addressing training and equipment related to potential high-angle rescue needs at the Project. Alternatively, the Applicant may provide this training and equipment internally through Project resources, in which case, the Applicant will submit a copy of its training regime and equipment list to the EFSEC prior to the start of Project construction.

- During both construction and operation of the Project, the Applicant will locate refuse containers in areas that will reduce the potential for uncontained on-site debris.

- With the exception of natural vegetation, no burning of debris will be allowed without written permits from issuing agencies (DNR and DOE).

- All flammable liquids will be stored according to 1997 Uniform Fire Code and inspected by the responsible agency.

Law Enforcement

The Applicant will provide on-site security (including private security patrols as necessary) in order to reduce the potential for Project-related calls to local law enforcement.

6.25 Population, Housing and Employment (County FEIS § 3.15)

No significant adverse impacts to population, housing and employment were identified, and therefore, no mitigation measures are necessary.

6.26 Fiscal Conditions (County FEIS § 3.16)

The Project will have a significant positive impact on fiscal conditions in Kittitas County. No mitigation measures are proposed.

7. DECOMMISSIONING & SITE RESTORATION

The Applicant proposes to operate the wind energy facility throughout the useful life of the Project, which is assumed to be 30 years. New technology may become available for re-powering the Project (replacing the generators and/or other major turbine components) at some time in the future.

At the time the Applicant decides to terminate operation of the Project, the Project will be decommissioned. Decommissioning the Project will involve removal of the wind turbine nacelles, blades, towers, foundations, cables, and other facilities to a depth of 4 feet below grade; regrading the areas around the Project facilities; removal of Project access roads (except for any roads that landowners wanted to remain); and final restoration of disturbed lands.

If any turbine generates electricity for fewer than 250 hours during a continuous period of twelve months, it will be decommissioned. However, if a turbine stops generating electricity due to force majeure, mechanical breakdown or malfunction, the Applicant may repair rather than decommission the turbine.

Prior to commencing construction, the Applicant will post a bond or corporate surety in favor of EFSEC, to cover decommissioning costs. The initial amount of the bond or corporate surety will be comparable, on a per turbine basis, to the security required by EFSEC for similar wind projects under its jurisdiction. The bond or corporate surety will name the Project landowners as additional beneficiaries.

8. REFERENCES

Bonneville Power Administration (BPA). 2001. Condon Wind Project Draft Environmental Impact Statement. DOE/EIS-0321. U.S. Department of Energy, Bonneville Power Administration. Portland, Oregon.

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Kittitas County Conservation District. 2003. Kittitas County Rural Living Handbook. Ellensburg, Washington.

KPFF Consulting Engineers. 2006. Hazard Zones Resulting From Certain Defined Failures of REpower MM92 Wind Turbines at the Desert Claim Project. July 2006.

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Northwest Sustainable Energy for Economic Development. 2003. Northwestern U.S. Wind Mapping Project products accessed at http://www.windpowermaps.org.

Washington Department of Ecology. 2004. Stormwater Management Manual for Eastern Washington. September 2004.

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REGULATORY MATRIX

WAC Chapter 463-60 Requirement	Location of Required Information
463-60-015 Description of Applicant	Cover Letter
463-60-025 Designation of Agent	Cover Letter
463-60-075 Assurances: Insurance, Bonding and Other Arrangements	Tab 10 Supplemental Regulatory Information
463-60-085(1) Mitigation Measure Summary	FEIS § 1.8
463-60-085(2) Fair Treatment	Tab 10 Supplemental Regulatory Information
463-60-095 Sources of Information	Citations Provided Throughout
463-60-101 Preapplication Consultation and Public Involvement	FEIS Chapter 6 Tab 10 Supplemental Regulatory Information
463-60-125 Site Description	Tab 1 Project Description
463-60-135 Legal Description and Ownership Interests	Tab 10 Supplemental Regulatory Information
463-60-145 Construction on Site	Tab 1: Project Description Chapter 4
463-60-155 Energy Transmission Systems	Tab 1 Project Description § 3.2
463-60-165 Water Supply	Tab 1 Project Description § 3.5
463-60-175 Heat Dissipation System	Not Applicable
463-60-185 Aquatic Discharge System	Not Applicable
463-60-195 Wastewater Treatment	Tab 1 Project Description § 3.5
463-60-205 Spillage Prevention and Control	FEIS § 3.3
463-60-215 Surface Water Runoff	Tab 1 Project Description § 4.4
463-60-225 Emission Control	Not Applicable

463-60-235 Construction and Operation Activities	Tab 1 Project Description Chapters 4-5
463-60-245 Construction Management	Tab 1 Project Description Chapter 4
463-60-255 Construction Methodology	Tab 1 Project Description Chapter 4
463-60-265 Protection from Natural Hazards	FEIS § 3.1
463-60-275 Security	Tab 1 Project Description §§ 5.1, 5.3
463-60-285 Study Schedules	Tab 10 Supplemental Regulatory Information
463-60-295 Potential for Future Activities at the Site	Tab 10 Supplemental Regulatory Information
463-60-296 Analysis of Alternatives	FEIS Chapter 2
463-60-297 Pertinent Federal, State and Local Requirements	Tab 10 Supplemental Regulatory Information
463-60-302 Natural Environment – Earth	FEIS § 3.1, App. A
463-60-312 Natural Environment – Air	FEIS § 3.2
463-60-322 Natural Environment – Water	FEIS § 3.3, App. B
463-60-332 Natural Environment – Habitat, Vegetation, Fish and Wildlife	FEIS § 3.4, App. C Tab 4 Supplemental Wetland and Stream Report Tab 5 Supplemental Vegetation and Wildlife Report
463-60-333 Natural Environment - Wetlands	FEIS § 3.4.1 Tab 4 Supplemental Wetland and Stream Report
463-60-342 Natural Environment – Energy and Natural Resources	FEIS § 3.5
463-60-352(1) Built Environment – Environmental Health - Noise	Tab 6 Supplemental Sound Analysis FEIS § 3.9, App. F.

463-60-352(2)-(6) Built Environment – Environmental Health – Fire, Explosion, Releases, Safety Standards, Radiation, Emergency Plans	FEIS § 3.8
463-60-362(1) Built Environment – Land Use	FEIS § 3.7
463-60-362(2) Built Environment – Light and Glare	FEIS § 3.10 Tab 8 Supplemental Shadow Flicker Analysis
463-60-362(3) Built Environment – Aesthetics	FEIS § 3.10 Tab 2 Visual Simulations
463-60-362(4) Built Environment – Recreation	FEIS § 3.10
463-60-362(5) Built Environment – Historic and Cultural Preservation	FEIS § 3.6
463-60-362(6) Built Environment – Agricultural Crops and Animals	FEIS § 3.7
463-60-372 Built Environment – Transportation	FEIS §§ 3.12, 3.13, App. H
463-60-355 Socioeconomic Impact	FEIS §§ 3.15, 3.16
463-60-536 Air emissions permits and authorizations	Not Applicable
463-60-537 Wastewater / stormwater discharge permit applications	To be supplied if needed.

SUPPLEMENTAL REGULATORY INFORMATION

WAC 463-60-075. General — Assurances.

The application shall set forth insurance, bonding or other arrangements proposed in order to mitigate for damage or loss to the physical or human environment caused by project construction, operation, abandonment, termination, or when operations cease at the completion of a project's life. The application shall describe the applicant's commitment to the requirements of chapter 463-72 WAC, Site restoration and preservation.

Insurance:

The Applicant will establish or cause to be established and maintained, policies of insurance during the development construction and operation of and for the Project. Such forms of insurance will be established and maintained as required by state, federal and local ordinance or law, customary business practice and third-party participants and lenders. The following coverage will be included:

- Commercial General Liability Insurance:

The construction contractor and subcontractors or the Applicant will be required to carry commercial general liability insurance, including products and completed operations in specified amounts to respond to liability and property damage claims arising during the construction and startup phase of the Project.

The Applicant will obtain and maintain in full force and effect, commercial general liability insurance against claims for liability and property damage arising out of the use and occupancy of the premises.

The Applicant will purchase insurance policies to cover liabilities arising from casualty and other major incidents.

Upon completion of power plant design, insurance underwriters will evaluate the design and estimate potential damages. In some cases, design changes may be implemented to mitigate the damages.

- Automobile Insurance:

The construction contractor and subcontractors will be required to carry automobile liability insurance covering all owned, leased, non-owned and hired automobiles used during the construction and startup phase of the project.

The Applicant will obtain and maintain in full force and effect automobile liability insurance covering owned, non-owned and hired autos.

- Property Insurance:

The Applicant will obtain and maintain, at all times during the term of construction and operation of the Project, physical damage insurance on the buildings and all improvements that are to be erected on the premises on an "all risk" basis, including coverage against damage or loss caused by earth movement and flood to the full insurable value of such improvements, if commercially available.

Upon completion of Project construction, the Applicant will be required by its customer(s) and lenders to maintain specific forms of business interruption coverage to ensure continued operation of the Project.

- Machinery Insurance:

The Applicant will obtain and maintain machinery insurance at all times during the term of construction, including testing, and operation of the facility. Coverage will be written on a comprehensive form for all insurable objects, including all production machinery located on or adjacent to the property in a minimum amount equal to the maximum foreseeable loss, and including expediting expenses, extra expense and business income.

- Worker's Compensation and Washington Stop Gap Liability:

The Applicant will comply with the worker's compensation and unemployment laws as required with respect to any employees performing work on the Project property and premises. The Applicant will also insure for exposure under Washington Stop Gap Liability. The Applicant will require that the construction contractor and subcontractors working on the Project similarly comply with the worker's compensation and unemployment laws with respect to their employees performing work on the subject property and premises. The Applicant also will require insurance for exposure under Washington Stop Gap Liability.

Environmental Impairment

The Applicant will be responsible, as required by law, for acts of environmental impairment related to the ownership and operation of the Project. Such losses may, in some circumstances, be covered by liability insurance, which the Applicant and/or the construction contractor will carry. In addition, the Applicant and/or its contracted operator will obtain environmental impairment liability insurance to the extent such coverage is commercially available. This insurance will cover the acts of the Applicant and its operators at the Project site, consistent with prevailing wind power industry standards for such insurance. Commercial availability is determined by reference to the norm of the industry.

Project Site Abandonment:

If the Project were to terminate operations, the Applicant would obtain necessary authorizations from the appropriate regulatory agencies to decommission the facilities. A Final Site Restoration plan would be developed and submitted to EFSEC. Experience in other regions with older wind power projects indicates that a non-operating wind power project does not present any significant threats or risks to public health and safety or environmental contamination.

Experience with older wind plants that have been decommissioned or repowered has shown that the scrap value of the materials and equipment contained in the Project infrastructure (steel towers, electric generators, steel, copper, etc.) would likely exceed the cost of dismantling the Project, based on historic and current scrap prices. The Applicant will provide adequate financial assurances to cover anticipated costs associated with decommissioning the Project.

WAC 463-60-085(2) Fair treatment.

The application shall describe how the proposal's design and mitigation measures ensure that no group of people, including any racial, ethnic, or socioeconomic group, bear a disproportionate share of the environmental or socioeconomic impacts resulting from the construction and operation of the proposed facility.

The Project has been designed so that it will not result in significant adverse impacts to any individuals or group of people. There is no reason to believe that any racial, ethnic or socioeconomic group will bear a disproportionate share of the Project's impacts. On the contrary, the FEIS describes substantial economic benefits that will be experienced by individuals throughout the County.

WAC 463-60-101 General — Consultation.

(1) Preapplication consultation. The application shall summarize all consultation that the applicant has conducted with local, state and federal agencies and governments, Indian tribes, nonprofit organizations and community citizen and interest groups prior to submittal of the application to the council.
(2) Meaningful involvement. The application shall describe all efforts made by the applicant to involve the public, regardless of race, ethnicity, or socioeconomic status, prior to submittal of the application to the council. The application shall also set forth information for contacting local interest and community groups to allow for meaningful involvement of all people, regardless of race, ethnicity or socioeconomic status. For example, such information may include contacts with local minority radio stations and news publications

The SEPA process conducted by the Kittitas County Department of Community Development Services included extensive consultation with local, state and federal agencies as well as tribal representatives. This consultation is summarized in Chapter 6 of the County FEIS.

In addition, the Applicant has involved the public, community leaders, organizations and Kittitas County officials throughout the development of the Project. The following is a summary of meetings the Applicant has had with the public and community organizations:

May 14 and 15, 2003	Open House in Ellensburg
2003 – 2004	Meetings with Kittitas County Economic Development Group
April 14, 2004	Ellensburg Rotary Club Meeting
April 20, 2004	Ellensburg Lion's Club Meeting
April 27, 2004	Ellensburg Kiwanis Club Meeting
May 19, 2004	Upper County Rotary Club Meeting
May 26, 2004	Ellensburg School Board Meeting
June 14, 2004	Ellensburg Kiwanis Club Meeting
June 23, 2004	Cle Elum Kiwanis Meeting
Dec. 2004 – Feb. 2005	Meetings with Kittitas County Fire District No. 2

The following is a summary of meetings and hearings the Applicant has had with Kittitas County officials and staff:

August 6, 2002	Pre-application meeting with County Planning Department staff
September 25, 2002	Meeting with County Planning Department staff regarding application and permit process
November 14, 2002	Meeting with County Planning Department staff regarding application
January 15, 2003	Meeting with County Planning Department Director and staff, County Director of Public Works and Building Department staff regarding application
February 19, 2003	Meeting with County Planning Department staff regarding permitting
February 27, 2003	Meeting with County Planning Department staff and WDFW staff regarding mitigation requirements

March 25, 2003	Meeting with County Planning Department Director and staff regarding EIS
April 8, 2003	Meeting with County EIS consultant regarding Draft EIS
May 7, 2003	County EIS Scoping meeting
May 14, 2003	County open house and community meeting for project
June 24, 2003	Meeting with County Planning Department regarding Draft EIS
August 12, 2003	Meeting with County Planning Department regarding Draft EIS
August 26, 2003	Meeting with County Planning Department regarding Draft EIS
September 3, 2003	Meeting with County Planning Department regarding Draft EIS
September 9, 2003	Meeting with County Planning Department regarding Draft EIS
October 29, 2003	Meeting with County Planning Department and County Attorney regarding Development Agreement
December 1, 2003	Meeting with County EIS consultant regarding Draft EIS
January 16, 2004	Meeting with County Planning Department staff and WDFW staff regarding permit and mitigation
January 20, 2004	County hearing regarding Draft EIS
February 10, 2004	Meeting with County Planning Department regarding Draft EIS
March 16, 2004	Meeting with County Planning Department and Director of Public Works regarding FAA/Smithson Road issues
May 3, 2004	Meeting with County Director of Public Works regarding Smithson Road.
May 4, 2004	Meeting with Bowers Field Airport Advisory Committee, County Planning Department staff and County Director of Public Works
May 26, 2004	Meeting with County Planning Department regarding FEIS
June 1, 2004	Meeting with County staff
June 15, 2004	Meeting with County Planning Department staff and Director of Public Works
August 10, 2004	Meeting with County Planning Department staff regarding Final EIS

September 13, 2004	Meeting with County Planning Department staff regarding Development Agreement
September 30, 2004	Meeting with County Planning Department staff regarding Development Agreement
October 11, 2004	Meeting with County EIS consultant regarding Development Agreement

During September and October 2006, the Applicant contacted property owners in the Project vicinity and met with several property owners about changes made to the Project. The Applicant also met with the Kittitas County Commissioners and the Director of Community Development Services.

WAC 463-60-135 Proposal — Legal descriptions and ownership interests.

(1) Principal facility. The application shall contain a legal description of the site to be certified and shall identify the applicants and all nonprivate ownership interests in such land.
(2) Associated and transmission facilities. For those facilities described in RCW 80.50.020 (6) and (7) the application shall contain the legal metes and bounds description of the preferred centerline of the corridor necessary to construct and operate the facility contained therein, the width of the corridor, or variations in width between survey stations if appropriate, and shall identify the applicant's and others' ownership interests in lands over which the preferred centerline is described and of those lands lying equidistant for 1/4 mile either side of such center line.

The Project Area comprises portions of Township 19N, Range 18E, Sections 4, 9, 16, 17, 18, 20, 21, 22, 27 and 29.

Of the 4,783 acres within the Project Area, 3,191 acres are privately owned by five landowners, and 1,592 acres are owned by WDNR. One parcel has a severed estate in which a private party owns the surface and WDNR controls the mineral rights.

The legal description for the WDNR land is:

> All of Section 16, Township 19 North, Range 18 East, W.M., All of Section 18, Range 19 North, Range 18 East, W.M., and the Western Half of Section 22, Range 19 North, Range 18 East, W.M.

The legal description for the Nelson property is:

> The North Half of Section 27, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington, EXCEPT:
> The Southeast Quarter of the Northeast Quarter,

1. Tracts of land conveyed to the Kittitas Reclamation District by deed dated December 16, 1927, recorded in book 46 of Deeds, page 106, and by deed dated March 4, 1929, recorded in book 47 of Deeds, page 255 and by deed dated March 5, 1929, and recorded in book 47 of Deeds, page 256;
2. Parcels 1 and 2 of that certain Survey recorded August 6, 1993, in Book 19 os Surveys, pages 120 and 121, under Auditor's File No. 562115, being a portion of the Northeast Quarter of Section 27, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington;
3. Right of way for Robbins Road (also shown of record as Evans Road);
4. Right of way for Reecer Creek Road.

The legal descriptions for the three parcels of the Wade/White property are:

PARCEL D:

The Southwest Quarter of Section 17, Township 19 North, Range 18 East, W.M., Kittitas County, State of Washington;
EXCEPT the north one rod of the Northeast Quarter of the Southwest Quarter of said section,
EXCEPT the North 5 rods of the Northwest Quarter of the Southwest Quarter of said section; and
EXCEPT the right of way of Reecer Creek Road along the East line, therof.

PARCEL E:

The West Half of Section 20, Township 19 North, Range 18 East, W.M., Kittitas County, State of Washington;
EXCEPT right of way of Reecer Creek Road along the East boundary thereof.

PARCEL F:

All of the North Half and the portion of the South Half of Section 29, Township 19 North, Range 18 East, W.M., Kittitas County, State of Washington, lying North of and above the North line of the North Branch Canal of the Kittitas Reclamation District;
EXCEPT the right of way of Reecer Creek Road along the North line thereof and right of way of Lower Green Canyon Road along the East line thereof.

The legal descriptions for the three parcels of the Frable property are:

PARCEL 1:

The Southeast Quarter of Section 4, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington.

PARCEL 2:

The East Half of Section 9, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington.

PARCEL 3:

The Northwest Quarter of Section 9, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington; EXCEPT the improvements, in any, specifically as to a manufactured home.

The legal description for the Doman property is:

The Southwest Quarter of Section 9, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington.

The legal description for the two parcels of the Roan property are:

PARCEL 1:

The Southeast Quarter of Section 17, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington;

AND

That part of the South Half of the Northeast Quarter of Section 17, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington, which is described as follows:
A tract of land bounded by a line beginning at a point on the East boundary line of the right of way of the county road 30 feet East and 16.5 feet North of the Southwest corner of said Northeast Quarter of said section and running thence North 89degrees 15' East parallel with the South line of said quarter section 1714 feet; thence North 61degrees 33' East 398.2 feet; thence South 84degrees 15' East 188 feet; thence South 23degrees 15' East 177 feet to a point on the South boundary line of said section; thence South 89degrees 15' West along said South boundary line of said section 2329.5 feet; and thence North 16.5 feet to the point of beginning;
EXCEPT a strip of land 12 feet wide lying South of a line described as follows:
Beginning at a point 30 feet East and 16.5 feet North of the Southwest corner of said section and running thence North 89degrees15' East 1714 feet; thence North 61degrees33' East 398.2 feet; thence South 84degrees15' East 188 feet; and thence South 23degrees15' East 177 feet to a point on the South boundary line of said section;

AND

The East Half of Section 20, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington.

PARCEL 2:

The South Half and that portion of the North Half of Section 21, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington, which is described as follows:
A tract of land bounded by a line beginning at a point on the West boundary line of the Northeast Quarter of said section, 4 rods North of the Southwest corner of said quarter section, and running thence East 4 rods; thence North on a line parallel with the West boundary line of said quarter section 100 rods; thence West 4 rods to the West boundary line of said quarter section; thence North to the North boundary line of said quarter section; thence West to the Northwest corner of said section; thence South on the West boundary line of said section to the Southwest corner of the Northwest Quarter of said section; thence East on the South boundary line of said Northwest ¼ of said section 60 rods; thence North 4 rods; and thence East on a line parallel with the South boundary line of said quarter section 100 rods to the point of beginning.

AND

That portion of the South Half of the Northwest Quarter of Section 21, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington, which is described as follows:
A tract of land beginning at the Southwest corner of the Northwest Quarter of said section; thence East on the South boundary line of said Northwest Quarter of said section, 60 rods to the true point of beginning; thence North 4 rods; thence East on a line parallel with the South boundary line of said quarter section, 100 rods, to the East boundary line of said Northwest Quarter of said section; thence South 4 rods to the South boundary line of said quarter section; and thence West on the South boundary line of said Northwest Quarter of said section, 100 rods to the true point of beginning.

AND

The Northeast Quarter of Section 21, Township 19 North, Range 18 East, W.M., in the County of Kittitas, State of Washington;
EXCEPT a tract of land bounded by a line beginning at a point on the West boundary line of said quarter section which is 4 rods North of the center of said section, and running thence East 4 rods; thence North on a line parallel with and 4 rods distant from the West boundary line of said quarter section 100 rods; thence West 4 rods to the West boundary line of said quarter section; and thence South along said West boundary line 100 rods to the point of beginning.

WAC 463-60-285 Proposal — Study schedules.

The application shall furnish a brief description of all present or projected schedules for additional environmental studies. The studies descriptions should outline their scope and indicate projected completion dates.

The Applicant has retained Northwest Archeological Associates to perform a cultural site survey on the WDNR property that has been added to the Project Area. Northwest Archeological Associates performed cultural resource surveys and consultations with tribes in connection with the County FEIS. The Applicant expects to receive a final report by December 31, 2006.

The Applicant has no current plans to perform other additional environmental studies.

WAC 463-60-295 Proposal — Potential for future activities at site.

The application shall describe the potential for any future additions, expansions, or further activities which might be undertaken by the applicant on or contiguous to the proposed site.

The Applicant has no plans to add to, expand or conduct additional activities on the Project Area in the future. Although there is the potential for further expansion on contiguous or adjacent lands, the Applicant has no current plans for such an expansion. Any future expansion would depend upon landowner consent, market demand, turbine pricing, and the ability to obtain required regulatory approvals.

WAC 463-60-297 Proposal — Pertinent federal, state and local requirements.

(1) Each application shall include a list of all applicable federal, state, and local statutes, ordinances, rules, permits, and required use authorizations (i.e., leases, easements, rights of way, or similar authorizations) that would apply to the project if it were not under council jurisdiction. For each federal, state, or local requirement, the applicant shall describe how the project would comply or fail to comply. If the proposed project does not comply with a specific requirement, the applicant shall discuss why such compliance should be excused.
(2) Inadvertent failure by the applicant to discover and list a pertinent requirement shall not invalidate the application, but may delay the council's processing of the application.

The following is a summary of major federal, state and local statutes, regulations, permits and approvals that would be applicable to the Project if it were not under EFSEC's jurisdiction.

Federal Statutes, Regulations, Rules and Permits

Aviation Regulations & Lighting (49 USC 44718, 14 CFR 77)

Summary: The Federal Aviation Administration (FAA) requires filing of Notice of Proposed Construction or Alteration and completion of a study for objects, such as wind turbines, that may pose a hazard to aviation (Advisory Circular No. 70/460-2H). This standard is applicable to any object over 200 feet above ground level. The FAA has also promulgated standards for the marking and lighting of such objects (Advisory Circular No. 70/7460-1K).

The proposed site is in the vicinity (within 6 nautical miles) of Bowers Field, located in Kittitas County near Ellensburg. Federal Aviation Regulation (FAR) 77.23 would require that FAA conduct a study of the proposed project.

Discussion of Compliance: The Applicant will file a Notice of Proposed Construction or Alteration with the FAA, and comply with FAA's preferred lighting system for wind turbines. The FAA will determine, based on the plan submitted by the Applicant, how many turbines should be lighted.

Endangered Species Act (16 U.S.C. 1533) (1973), Bald Eagle and Golden Eagle Protection Act (1940)

Summary: The Endangered Species Act (ESA) requires the protection and recovery of threatened and endangered species. The National Oceanic and Atmospheric Administration (NOAA) administers the ESA for species with ocean habitats or for anadromous fish species, while the US Fish and Wildlife Service (USFWS) has ESA responsibility for all other species. NOAA and USFWS designate critical habitat for species that are identified as threatened or endangered or that are listed as potentially threatened or endangered. Section 7 of the ESA requires federal agencies to assess the effect of their proposed actions on listed species and consult with NOAA and/or USFWS, as applicable. Section 9 makes it unlawful to 'take' endangered species. Take is defined to include harm, harassment, and habitat modification or degradation. Section 10 enables interested parties to obtain a regulatory certainty (i.e., a take permit) in exchange for voluntary measures that conserve protected animals. 'Incidental take' or 'enhancement of survival' permits allow lawful activities that might unintentionally harm a species to proceed under a habitat conservation plan, candidate conservation agreement, or a safe harbor agreement.

The Bald Eagle and Golden Eagle Protection Act protects the bald eagle and golden eagle and imposes its own prohibition on any taking of these species. 'Take' is defined by actions to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb these species.

Discussion of Compliance: Section 3.4 of the County FEIS addresses potential impacts to plants and wildlife that are listed, or are candidates for listing, as threatened or endangered

and that may occur on or near the Project Area. No rare plants have been identified in the Project Area. Although some federally threatened or endangered species have been identified as potentially occurring, they are not believed to be likely to use the Project Area and would not be affected. None of the streams in the Project Area are known to contain fish, although there is anecdotal information suggesting that juvenile steelhead trout (a threatened species) can be unintentionally routed into Reecer Creek from upstream trans-basin water diversions. Bald eagles are known to use the land within and around the Project Area and are listed as threatened under the ESA. Golden eagles have a moderate potential for use of the Project Area and are classified as a State Species of Concern. Mortality is expected to be very low and would not have a measurable effect on the eagle population.

Clean Water Act (42 USC 1251, 15 CFR 923-930)

Summary: The goals of the Clean Water Act are to eliminate the discharge of pollutants into surface waters and to achieve a level of water quality that provides for the protection of fish and wildlife. The major implementing elements of the Act are a prohibition on non-complying discharges (Section 301), a permit program to authorize and regulate discharges (Section 402), a system to determine the limitations to be imposed (Sections 301, 306, 307), standards and implementing provisions (Sections 401, 402), a system for preventing and responding to spills (Section 311), and enforcement mechanisms (Sections 309, 505).

The U.S. Environmental Protection Agency (EPA) and Washington Department of Ecology (Ecology) oversee most provisions of the Clean Water Act. The National Pollution Discharge Elimination System (NPDES) permit program is a primary component of the Act. An NPDES permit is required for any discharge of pollutants from a point source, including stormwater runoff, to waters of the United States. Section 404, which is administered by the U.S. Army Corps of Engineers, regulates the discharge of dredge and fill materials to waters of the United States, including associated wetlands. EFSEC has delegated authority to issue NPDES permits and Section 401 certification for projects under its jurisdiction.

Discussion of Compliance: The Project will require an NPDES permit to manage stormwater discharges during construction. The Project will not require a Section 404 permit because it does not result in any fill in or disturbance to jurisdictional wetlands.

National Historic Preservation Act (PL 90-577) (1966)

Summary: The National Historic Preservation Act protects historic sites and values (in cooperation with other nations, states, and local governments) as federal policy. It generally establishes a grant program to states for historic preservation and requires federal agencies to consider the effects of their actions on historic resources. Agencies can require private interests to pay costs of protecting archaeological and historic resources. Historic resources are identified by literature searches, sample evaluation and site surveys.

Federal criteria provide a useful way to measure the scientific or historic value of properties. Properties eligible for the National Register of Historic Places generally must be at least fifty years old, possess integrity of physical characteristics, and meet at least one of four criteria of significance. (The criteria are discussed in detail in Section 3.6 of the County FEIS.)

Discussion of Compliance: No sites within or adjacent to the Project Area are known to be listed on or proposed for listing on the National Historic Register. The Kittitas County Historical Site record indicates a homestead (the Robbins Homestead or Springfield Farm) located within the Project Area. Heritage resources identified in the field survey for the original project proposal included 13 prehistoric sites, 19 historic sites, 28 historic isolates (locations with fewer than 5 artifacts) and 48 prehistoric isolates. A preliminary assessment of resource significance for these sites identified 13 sites as likely to be significant, including 8 historic sites, 4 prehistoric resources and 1 site with both historic and prehistoric components within the original project area. Evidence of potentially significant agriculture/settlement heritage resources includes the Morrison Homestead, Springfield Farm, Roan Farm, White Ranch, Hodges Residence, the North Branch Canal and miscellaneous historic farm structures and debris. Prehistoric resources include lithic scatters that represent the manufacture and sharpening of stone tools or activities associated with short-term camps. Potential project impacts on these resources and associated mitigation measures are identified in the County FEIS, Section 3.6.

Ethnographic data indicate that three Yakama villages were located within a few miles of the Project Area. People of these villages would have utilized the land for hunting, plant gathering, and traditional activities.

State Statutes, Regulations, Rules and Permits

Indian Sites and Resources Act; Indian Graves and Records Act

Summary: The Indian Sites and Resources Act (RCW 27.53) and the Indian Graves and Records Act (RCW 27.44) address cultural resources pertaining to the Indian history within Washington. RCW 27.53 prohibits the disturbance or excavation of historic or prehistoric archaeological resources on state or private land without a permit. RCW 27.44 prohibits knowingly disturbing a Native American or historic grave.

Discussion of Compliance: The Project involves a number of ground-disturbing activities that have the potential to directly impact cultural resources within the Project Area. Ground-disturbing activities would occur at most stages of Project development, including construction of roads, tower foundations, power collection systems, substations, operations and maintenance facility, and other project features. Section 3.6 of the County FEIS analyzes existing cultural resources and potential impacts within the original project area. The Applicant has retained a consultant to provide a similar analysis of the WDNR land that

has been added to the Project Area. Protocols and procedures would be implemented to address any discovery of Indian resources.

Electrical Construction Permit

Summary: The Washington Department of Labor & Industries has adopted regulations regarding safety and installation of electric wires and equipment (WAC 296-746A). The Department reviews applicable design plans, issues construction permits for compliant systems, and enforces its regulations.

Discussion of Compliance: The Project would be designed, constructed and operated in accordance with Department of Labor & Industries' regulations.

Sound Level Regulations

Summary: The Washington Department of Ecology has established limits on sounds crossing property boundaries based on an Environmental Designation for Noise Abatement (EDNA). (WAC ch. 173-60) EDNAs are established based on the land use and/or zoning classification of the sending and receiving properties.

Discussion of Compliance: The Project will comply with WAC chapter 173-60. A sound analysis is provided as part of this Application.

Water Quality

Summary: State water quality requirements are found in RCW 90.48 (Water Pollution Control Act), WAC 173-220 (Ecology's NPDES Permit Program), WAC 173-226 (Waste water General Permits) and 173-201A (Water Quality Standards for Waters of the State). See discussion of the federal NPDES program above. The proposal would require an General NPDES Construction Stormwater Permit, which may be issued by EFSEC (per WAC 463-38).

Discussion of Compliance: The Applicant will develop and implement a Stormwater Pollution Prevention Plan (SWPPP) and comply with other requirements of the General Permit.

Fish & Wildlife Priority Species & Habitats

Summary: The Washington Department of Fish & Wildlife designates priority species and habitats and describes guidelines for management (WAC 232-12). Priority species of plants and wildlife are located in the Project Area. Detailed information on specific species is found in the County FEIS at pages 3-63 through 3-113.

Discussion of Compliance: The Applicant will follow WDFW guidelines for Wind Power Projects.

State Environmental Policy Act (RCW 43.21C & WAC 197-11)

Summary: SEPA requires state and local governments to give appropriate consideration to environmental values in decision making. SEPA requires the preparation of an Environmental Impact Statement (EIS) before state and local governments take major actions significantly affecting the quality of the environment.

Discussion of Compliance: Kittitas County published a Final EIS in August 2004, as the SEPA lead agency for the original project proposal. No appeal of the EIS was filed. EFSEC is the SEPA lead agency for the current Project application.

Pertinent Local Statutes, Regulations, Rules and Permits

Kittitas County Comprehensive Plan (1996, as amended)

In 1996, Kittitas County adopted a Comprehensive Plan that contains the County's goals for managing growth and development over a 20-year period (1996 to 2016). It includes general goals and policy statements for five major elements, including: land use, housing, transportation, capital facilities, and utilities. The land use and utility policies are the most relevant to the Project and are summarized and discussed below.

Land Use Goals & Policies

Summary: The Land Use section includes designations and policies for guiding land use in the County. Land use designations establish general locations for specific land use and development activities throughout the County. The Project Area and much of the surrounding area is designated as Rural in the Comprehensive Plan, except for areas to the north and northwest, which are designated as Commercial Forest. The Plan identifies the importance of natural resource activities, as they contribute to the County's economic base.

Chapter 8, Section 8.5, of the Comprehensive Plan states, "Rural lands in Kittitas County are now, and have historically been, a mix of resource lands, rural neighborhoods, and varied developments scattered throughout the county." The Plan's goals, policies, and objectives for land uses on rural lands are "established in an attempt to prevent sprawl, direct growth toward the Urban Growth Areas and Nodes, provide for a variety of densities and uses, respect private property rights, provide for residences, recreation, and economic development opportunities, support farming, forestry and mining activities, show concern for shorelines, critical areas, habitat, scenic areas, and open space while keeping with good governance and the wishes of the people of Kittitas County and to comply with the GMA and other planning mandates."

The Comprehensive Plan states that utilities using natural resources may be appropriate in rural areas:

> *The economy of our rural community has traditionally been based on natural resource activities and Kittitas County encourages and supports their continuation in Rural Lands.... Economically viable farming and logging may occur with or beyond the state designated areas but more and more it is necessary to supplement income from outside sources in order to support natural resource operations. Other businesses and economic growth can be realized without sacrificing our rural character.*

Discussion of Compliance: The Project is consistent with the Land Use goals and policies of the Comprehensive Plan. The Project would not directly change or replace existing agricultural uses or adversely affect the pattern of rural uses in the surrounding area. Wind farms are a relatively new and innovative type of energy or utility use that would support economic growth and generate revenues to Kittitas County and junior taxing districts.

Utilities Goals & Policies

Summary: The Utilities section of the Comprehensive Plan identifies the general location and capacity of all existing and proposed utilities, including but not limited to, electrical lines, telecommunication lines, and natural gas lines. Generally, the goals, policies, and objectives seek to promote the maintenance of current information on existing and proposed facilities; plan for expansion or improvement of utility systems; encourage coordination between jurisdictions and utility providers; and ensure the proper placement and appropriateness of utility siting.

Discussion of Compliance: The Project is consistent with the Utilities goals and policies of the Comprehensive Plan. It is located within the Comprehensive Plan's designated Rural Area and would produce electricity to meet regional energy demands. The Project will connect to an existing electric transmission line, and proximity to a transmission line is a key criterion for siting wind energy facilities. Electricity generated by wind turbines will be collected through cables that run above or below the ground in the project area or within utility rights-of-way to an on-site substation. Most of the power collection lines will be located within the Project Area.

Kittitas County Zoning Code (Title 17)

Summary: The Zoning Code regulates the use and development of all property within the unincorporated area. Most of the land within the Project Area is zoned Ag-20 (agricultural use with a 20-acre minimum parcel size). The northwestern portion of the Project Area is within a foothill-area zoned as Forest & Range (FR).

Wind farms are not a permitted use in any Kittitas County zoning district. Instead, Kittitas County has adopted an ordinance that establishes an elaborate siting process for wind projects. In order to construct a wind project, the proponent must apply for a site-specific rezone and modification of the County Comprehensive Plan to designate the project site as a Wind Farm Resource Overlay Zone, as well as obtaining a Wind Resource Development Permit and executing a development agreement (KCC, Chapter 17.61A).

Discussion of Compliance: In 2003, Desert Claim applied to Kittitas County for the approvals necessary to construct and operate an earlier version of the Project. Desert Claim submitted a draft and revised draft development agreement that included standards for wind turbines (location, number, size and setback) and other facilities; mitigation measures; and other development conditions to protect surrounding properties, communities, and the County as a whole. Desert Claim believes that the original project proposal was consistent with Kittitas County's Zoning Code and Comprehensive Plan, but the County denied its application.

Kittitas County Critical Areas Ordinance (Title 17A)

Summary: Kittitas County's Critical Areas Ordinance (CAO, KCC 17A.03.045) sets forth the requirements for protecting frequently flooded areas, aquifer recharge areas, wetlands, fish and wildlife habitat conservation areas, and geologically hazardous areas.

- ***Wetlands*:** Kittitas County has adopted a 'zero net loss' wetlands policy. "Zero" or "no" net loss does not mean that no impacts to wetlands can occur. Rather, it means that wetland impacts must be compensated for to ensure that no *net* reduction in wetland functions and values will occur; wetland subtractions may be offset by wetland additions, for example.

Discussion of Compliance: The Project has been designed to avoid impacts to wetlands.

- ***Fish and Wildlife Habitat Conservation Areas*:** These areas include wetlands, big game winter range, riparian habitat and habitats for species of local importance (based on WDFW designations). Riparian areas are prioritized according to stream type, with buffers ranging from 10 to 200 feet from the ordinary high water mark. Terrestrial habitat is protected according to State and federal direction and local importance.

Discussion of Compliance: The Applicant will review and potentially modify the location of turbines and other facilities (i.e., micro-siting) to avoid or minimize disturbance to shrub-steppe habitat and riparian communities. Disturbance to habitat will be mitigated according to the WDFW's Wind Power Guidelines.

- ***Agriculture*:** Agricultural land is defined to include livestock raising, crop cultivation and harvesting, irrigation and drainage ditches, and farm roads. The County has

adopted GMA minimum guidelines for classification and designation of agricultural lands, and has established an interim Commercial Agricultural Zone. Non-farm uses are discouraged in farm areas; incentives and support for farmers are a significant component of the designation.

Discussion of Compliance: None of the Project Area is within the Commercial Agriculture Zone. Use of the area for wind energy facilities would not displace or interfere with existing agricultural uses.

GEC
GLOBAL ENERGY CONCEPTS
THE Wind Resource

Shadow Mapping for Desert Claim Project

enXco2-002

CONFIDENTIAL

October 23, 2006

Prepared for:

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October 23, 2006
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Reviewed by

October 23, 2006
Date

Revision Block

Revision	Release Date	Summary of Changes
Original	October 2006	

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Introduction

enXco, Inc. contracted with Global Energy Concepts, LLC (GEC) to perform shadow mapping for the proposed Desert Claim wind power project located approximately 8 miles north of Ellensburg, Washington. This report summarizes the shadow impact findings for the project area and for individual residences in the project vicinity.

Shadow Impacts

The shadows cast by the wind turbines will vary with several factors including turbine size, season, time of day, surrounding terrain, cloud cover, wind speed, and wind direction. The height of the sun in the sky varies by season, as does the time and location at which it rises and sets. In the winter, the sun rises late in the southeast, travels in a low arc across the southern sky, and sets early in the southwest. Because it is so low in the sky, it casts longer shadows. In the summer, the sun arcs through the sky at its highest angle and casts the shortest midday shadows. However, in the summer, the sun also rises earliest, sets latest, and covers a wider range of directions, from the northeast around the south to the northwest. Therefore, the summer sun casts shadows that span a broader direction range than in other seasons, and its early sunrise and late sunset create shadows earlier in the morning and later in the evening than in other seasons.

Shadows become less sharp (more diffuse) as the distance between the shadow-casting object and the observer grows. When considering shadows cast by relatively small objects at a long distance from the observer, at a sufficient distance no noticeable shadow forms at all because the object does not significantly block the sun's light. Instead, light diffracts (or bends) around the edges of the object, and the object itself becomes relatively small compared to the apparent size of the sun. The object becomes something that is silhouetted in front of the sun rather than something casting a shadow.

The part of the shadow where the light source is fully blocked is called the umbra; the part where the light source is only partially blocked is called the penumbra. On a sunny day, this phenomenon can be observed with the shadow of a flag pole. At its base the shadow has sharp edges because it is an umbra and has no penumbra. The shadow of the upper part of the pole has less and less sharp edges with more and more penumbra and less umbra.[1] At a sufficient distance, there is no umbra, and the pole becomes an object visible in the foreground of the sun.

Shadow flicker caused by wind turbines is defined as alternating changes in light intensity due to the moving blade shadows cast on the ground and objects, including windows at residences. The influence of shadow flicker on residences depends on the length and direction of shadows cast by wind turbines and the relative location of wind turbines and windows at the residence.

The sun is approximately 150 million km away from the earth, and the sun has a diameter of approximately 1.4 million km. Therefore, the diameter of sun covers an arc 0.5° wide when viewed from earth. The maximum width of a wind turbine blade is approximately 4 m. (This is near the hub at the "maximum chord" position; the blade profile tapers to much less than 2 m as distance from the hub increases, and because the blade is relatively thin, from most viewpoints

[1] Source: University of Queensland, Australia. (http://www.uq.edu.au/_School_Science_Lessons/UNPh28.html).

the blade is effectively well below 2 m wide.) Assume a 2-m wide blade section cuts across the disk of the sun, and further assume the blade must obscure more than half of sun to make a clear shadow that could contribute to flicker. Given these assumptions, a blade covering more than 0.25° (half the width of the sun) can potentially cause flicker. Therefore, the outer edge of influence from this shadow can be considered as the distance at which a 2-m wide object represents 0.25°, which is approximately 458 m or about 1500 ft. In the case where smaller parts of the blade cast the shadow (such as farther "out" on the blade), the distance at which shadows become insignificant is much closer to the wind turbine. This is important to consider because the parts of the blade that reach near the overall height of the wind turbine are much slimmer than the portions of the blade located near the hub of the wind turbine, and it is the overall height that is used in the shadow analyses.

The prevailing wind direction for the project site is from the northwest. The lateral extent of the blade shadow depends on wind direction, as the wind turbines yaw to face into the wind during operation. For example, during northwesterly winds, the turbine rotor will face to the northwest, and a relatively small shadow would be cast on a receptor if the sun is in line with the plane of the rotor. This would occur early in the morning in the summer (sun from the northeast) and late in the afternoon in the winter (sun from the southwest). In these cases, the rotor shadow will be in the shape of a narrow ellipse. On other occasions, the sun will be perpendicular to the rotor plane, and cast a larger area of moving blade shadows on the ground. In these cases, the ellipse will be wider. Generally, a southern or northern wind will have minimum shadow impact because the widest shadows would be cast at midday. At midday, shadows are also the shortest (closest to the wind turbine) due to the sun's position high in the sky.

Shadow flicker impacts were calculated for the Desert Claim project area using WindPRO software. This model generates site-specific results, taking site location (latitude/longitude), elevation, and monthly average cloud cover into account. The model also takes wind direction into account by modeling the average amount of time per year the turbine is yawed in various directions. Obstruction objects such as trees or buildings are not accounted for in the model. As the sun approaches the horizon, it is less intense and therefore the shadow influence is reduced. The model did not calculate shadow influence when the sun is at or below an angle of 4° above the horizon. This 4° assumption corresponds to approximately 30 minutes after sunrise and 30 minutes before sunset.

The assumptions applied in the WindPRO model are generally conservative, and err on the side of over-predicting shadow impacts. Cloud cover tends to be greater in the mornings and evenings than it is midday. Similarly, shadows are longer (although more diffuse) when the sun is lower in the sky. Since cloud cover data were available as monthly averages rather than by time of day, the model results will be conservative. The model assumes that the turbines are always operating. In reality, no flickering effect occurs in calm or very low winds, when the rotor is stationary or turning too slowly to cause flicker. Obstructing objects such as trees, silos, or buildings may block shadow impacts on some receptors; these factors are not reflected in the model results.

To address shadow flicker generally, theoretical houses have been assumed to be located at eight compass points around a representative turbine, as illustrated in Figure 1. A model was built with houses at distances of 750 ft (230 m), 1000 ft (305 m), and 1500 ft (458 m) from the turbine,

representing the approximate setback distances to the project boundary, an intermediate distance, and the approximate maximum distance at which shadow flicker is expected to have impacts. Each house is assumed to have a generic 1 m by 1 m square window located 1 m above ground level and facing the turbine. It is likely that many houses will have windows that are not perpendicular to turbines, which will decrease the shadow impact on these houses. The model was run with an 80-m hub height and an approximately 92-m rotor diameter, which is representative of the REpower MM92. The results assume the turbine is yawed to various directions according to the annual direction distribution of the wind regime at the Desert Claim site. The results also take elevation differences, but not other structures or vegetation into account.

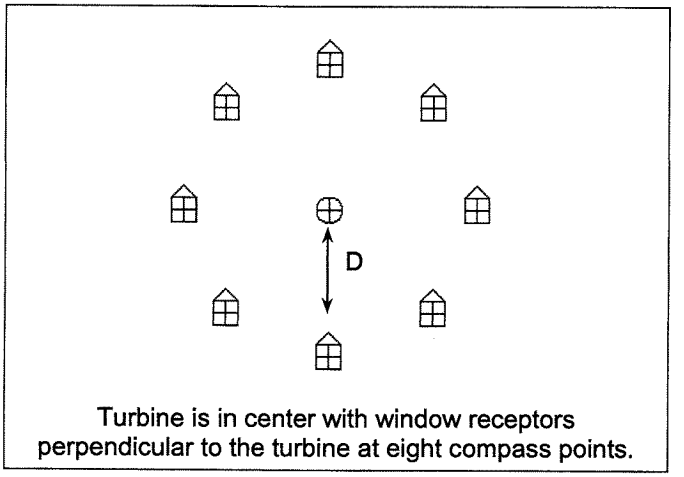


Figure 1. Sample Layout for Shadow Flicker (D=750, 1000, and 1500 ft)

A review of Washington cloud cover data from the National Climatic Data Center yielded long-term data from Stampede Pass and Yakima. Stampede Pass is approximately 40 miles west of the project site, in the Cascade Mountains. Stampede Pass data are likely to be influenced by mountain weather that is not representative of the project site. Yakima is 28 miles south of Ellensburg, and approximately 36 miles south of the project site (see Figure 2). The cloud cover in Yakima is expected to be slightly less than the cloud cover in Ellensburg; however, it is the most representative site available. These data include mean monthly cloud cover data averaged over a 50-year period. Monthly data are presented as mean days per month characterized as "Clear," "Partly Cloudy," and "Cloudy" between sunrise and sunset. "Clear" is defined as 0-2 eighths of the sky being obstructed by cloud cover, "Partly Cloudy" specifies clouds in 3-6 eighths of the sky, and "Cloudy" represents 7-8 eighths of the sky being cloud covered. From these data, monthly sunshine probabilities were derived (as 100% minus percent cloud cover) and applied in the model (see Table 1).

Table 1. Cloud Cover Data for Yakima, Washington

	Sunrise to Sunset, Mean Cloud Cover (Eighths of Sky Covered)	% Sunshine During Daylight Hours
January	6.3	21%
February	5.9	26%
March	5.4	33%
April	5.2	35%
May	4.7	41%
June	4.2	48%
July	2.5	69%
August	2.7	66%
September	3.1	61%
October	4.5	44%
November	5.8	28%
December	6.2	23%
Average	**4.7**	**41%**

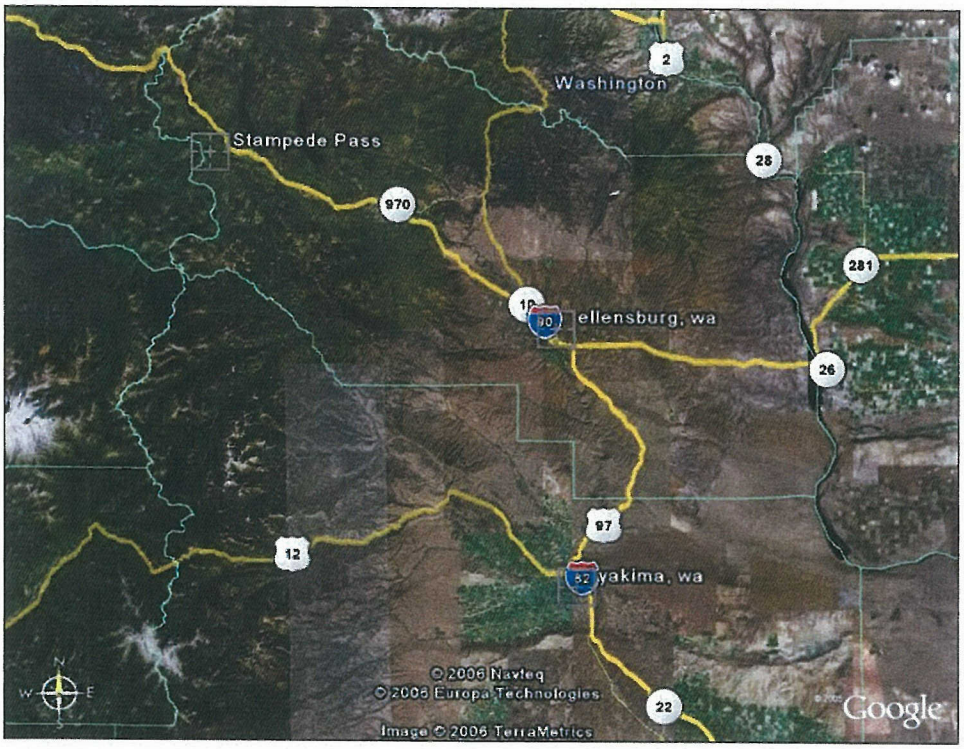


Figure 2. Cloud Cover Data Locations Relative to Ellensburg

For those receptors that have potential shadow flicker impacts, Exhibit A graphically indicates the days of the year and hours of the day in which shadow flicker impacts could occur. The shaded area on each plot illustrates the time of shadow impact. Generally, the results show that houses to the south of a turbine do not have impacts, and that houses farther away from a turbine would have fewer hours of impact. Also, with the exception of short midday impacts in the

winter due to low sun angles, the results show that houses 1000 ft away have impacts limited to mornings and evenings, when the sun angle is low and shadows tend to be more diffuse.

Table 2, Table 3, and Table 4 provide a summary of shadow flicker impacts for houses 750 ft (230 m), 1000 ft (305 m), and 1500 ft (458 m) from a turbine, respectively.

Figure 3 shows shadow flicker contours for a typical turbine (Turbine 22) on typical project terrain. Lines represent equal number of hours per year of shadow flicker. Almost all of the area with 50 annual hours or greater of shadow flicker falls within 1000 ft of a turbine. Generally, the potential shadow flicker impacts at a distance of 1000 ft or greater from a turbine are limited to receptors located to the east to east-southeast or west to west-southwest of a turbine. Figure 4 shows a map of the entire project area with shadow flicker contours. There are very few potential shadow impacts predicted outside the project boundary to the north or south. Some areas within about 1000 ft to the east or west of the project boundary have impacts exceeding 25 hours per year.

Table 2. Potential Shadow Flicker Summary, 750 ft from a Turbine

Direction from Turbine	Days of Potential Impact per Year	Max Hours per Day[1]	Mean Hours per Day[2]	Total Annual Hours
North	92	1.6	0.1	14
Northeast	167	1.5	0.2	29
East	165	1.5	0.5	84
Southeast	0	0	0	0
South	0	0	0	0
Southwest	0	0	0	0
West	178	1.5	0.4	75
Northwest	158	1.6	0.3	41

1. Not reduced to account for cloud cover or turbine yaw direction; assumes sky is always clear and turbine is facing the sun.
2. Mean hours per day calculated only on days with potential impact. Days without impact are not factored into the average. Mean hours per day would be much lower if days with no potential impact were factored in.

Table 3. Potential Shadow Flicker Summary, 1000 ft from a Turbine

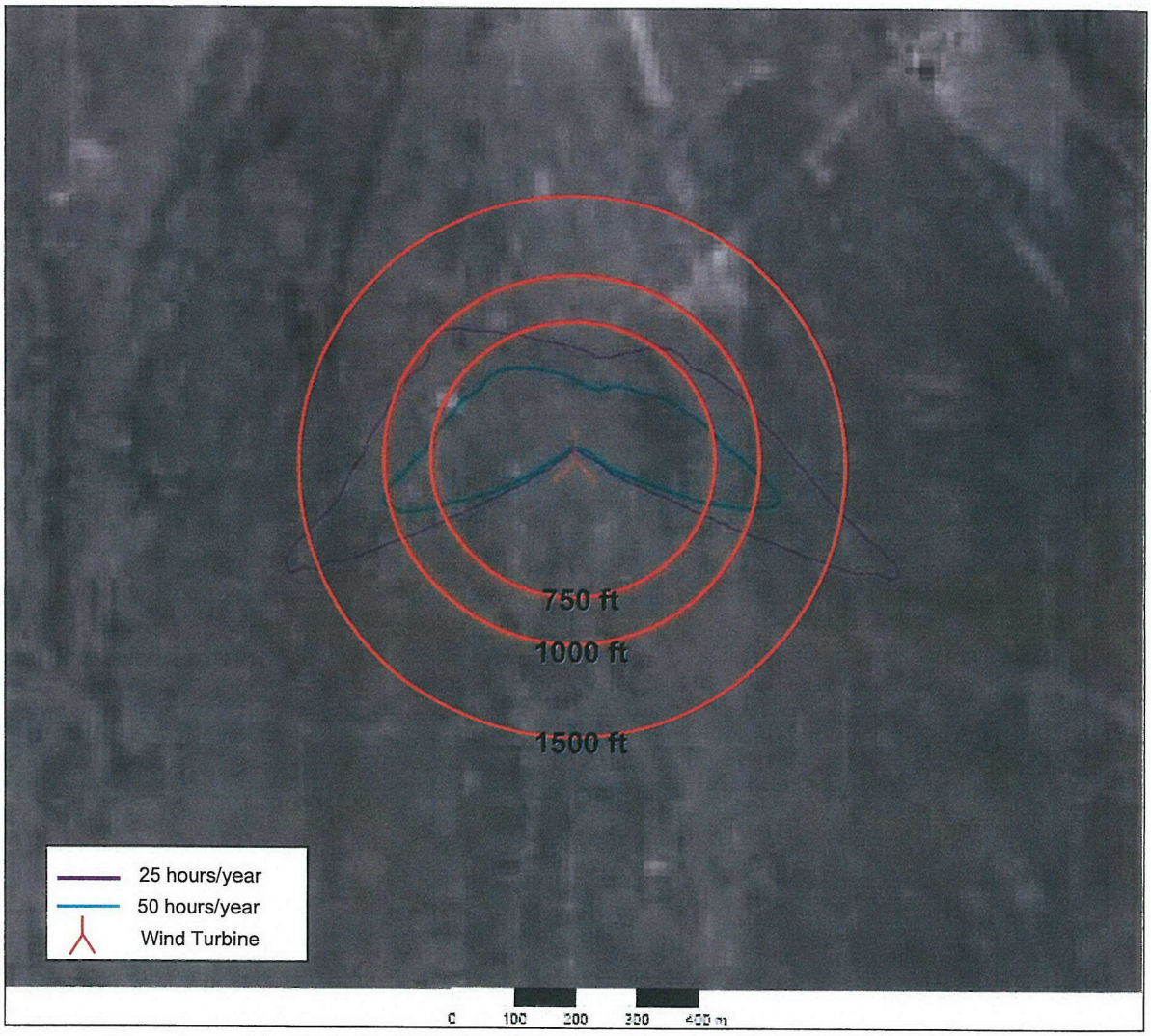
Direction from Turbine	Days of Potential Impact per Year	Max Hours per Day[1]	Mean Hours per Day[2]	Total Annual Hours
North	34	0.7	0.1	2
Northeast	134	1.2	0.1	18
East	106	1.2	0.4	39
Southeast	0	0	0	0
South	0	0	0	0
Southwest	0	0	0	0
West	99	1.1	0.4	35
Northwest	125	1.2	0.2	25

1. Not reduced to account for cloud cover or turbine yaw direction; assumes sky is always clear and turbine is facing the sun.
2. Mean hours per day calculated only on days with potential impact. Days without impact are not factored into the average. Mean hours per day would be much lower if days with no potential impact were factored in.

Table 4. Potential Shadow Flicker Summary, 1500 ft from a Turbine

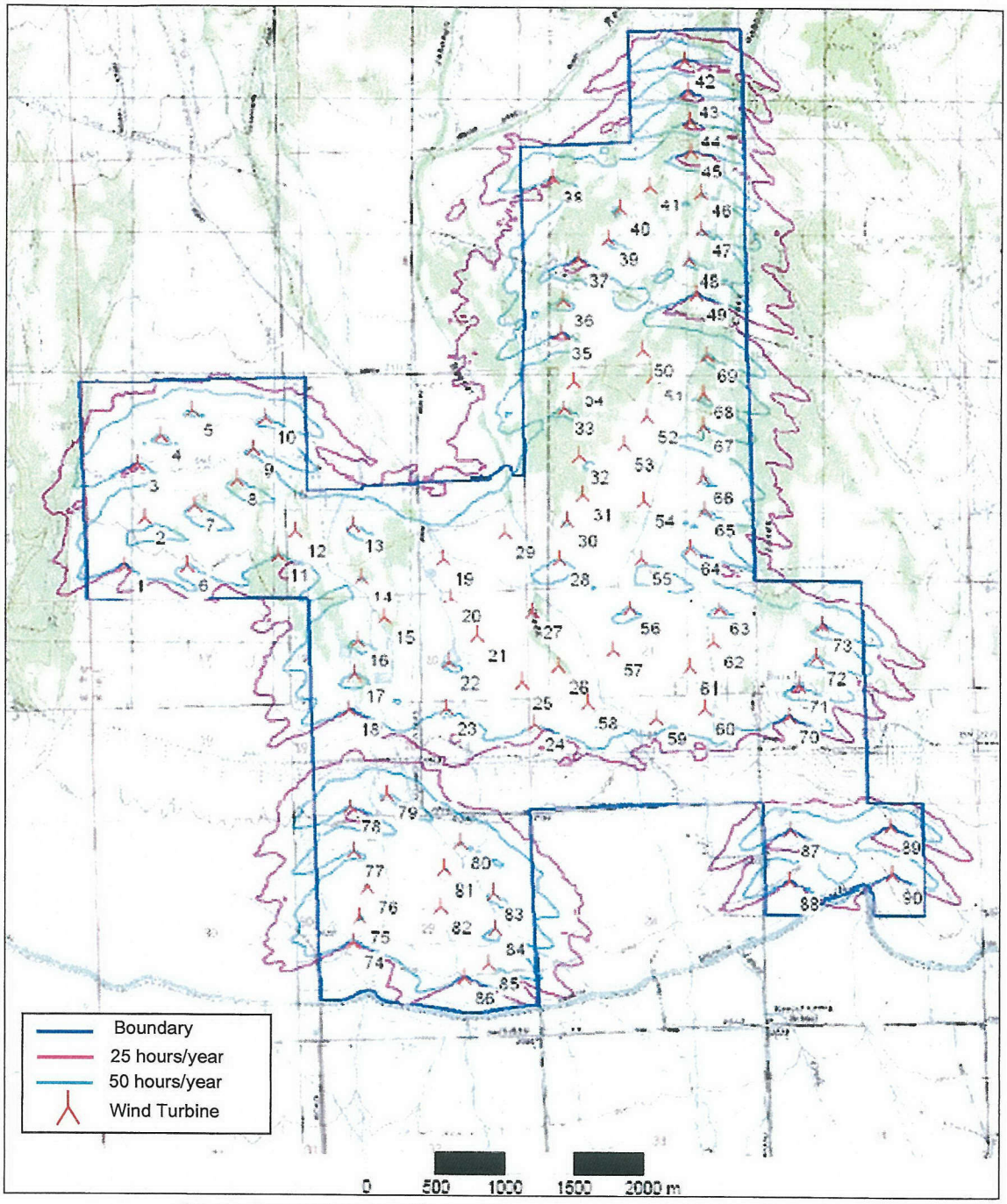
Direction from Turbine	Days of Potential Impact per Year	Max Hours per Day[1]	Mean Hours per Day[2]	Total Annual Hours
North	0	0	0	0
Northeast	94	0.8	0.1	8
East	64	0.8	0.2	15
Southeast	0	0	0	0
South	0	0	0	0
Southwest	0	0	0	0
West	62	0.8	0.2	15
Northwest	88	0.9	0.1	11

1. Not reduced to account for cloud cover or turbine yaw direction; assumes sky is always clear and turbine is facing the sun.
2. Mean hours per day calculated only on days with potential impact. Days without impact are not factored into the average. Mean hours per day would be much lower if days with no potential impact were factored in.



(lines represent equal number of hours per year of shadow flicker)

Figure 3. Shadow Flicker Around a Typical Turbine (#22)



(lines represent area with equal hours per year of shadow flicker)

Figure 4. Shadow Contour Map of Desert Claim Project Area

Impacts on Identified Receptors

Next, GEC calculated the theoretical duration of shadow flicker at 36 residences in the project area using WindPRO software. The residences are shown on a map in Figure 5. Shadows beyond about 1500 ft are not expected to cause shadow flicker because they will diffuse at that distance or greater, but the model did calculate a theoretical duration of shadow flicker. The results with the 1500-ft shadow distance limit represent GEC's best approximation.

Greenhouse-style windows are assumed, that is, the receptors are assumed to have windows facing each turbine. This is a conservative approximation and will tend to over-estimate impacts. Each set of results assumes the cloud cover data presented in Table 1, and assumes the turbine is yawed to various directions according to the annual direction distribution of the wind regime at the Desert Claim site. The results also take into account elevation differences, but not other structures or vegetation, and assume the turbines are always operating.

There are nine residences within 1500 ft of a turbine. One of these residences is not affected by shadow flicker, and two of those residences belong to participating landowners. The predicted shadow flicker impacts on the eight potentially affected residences are shown in Table 5. Only five of the eight residences with expected impacts (Receptors 1, 2, 5, 16, and 19) are expected to experience shadow flicker for more than 25 hours per year. Exhibit A shows a calendar graph of time of day and day of year of expected impacts. The legend in Exhibit A indicates which turbine causes the impact, and there are lines indicating sunrise and sunset on each graph. Receptors 1, 4, 5, 9, and 16 have evening impacts in the spring and fall, and Receptors 1, 5, 16, 18, and 19 have evening impacts in the summer. Receptor 2 has evening impacts in the spring and late summer to early fall, as well as throughout the winter. These seven receptors will experience somewhat dampened impacts due to the occurrence late in the day, when shadows are more diffuse.

Table 6 shows the theoretical maximum shadow flicker effect, assuming perceptible flicker occurs beyond 1500 ft from a turbine. Exhibit B shows the corresponding calendar graphs for each receptor. Compared to Table 5, Table 6 reflects additional shadow flicker hours from turbines farther than 1500 ft away on the residences shown in Table 5, and includes additional residences not shown in Table 5. At distances 1500 ft and greater, the shadow flicker hours are limited to early and late in the day, when shadows are diffuse, and the turbine will generally appear as a distant object in front of the rising or setting sun, not an object casting a noticeable shadow. The resulting shadow flicker hours are due to the cumulative effect of shadow flicker from one or more turbines on a specific residence.

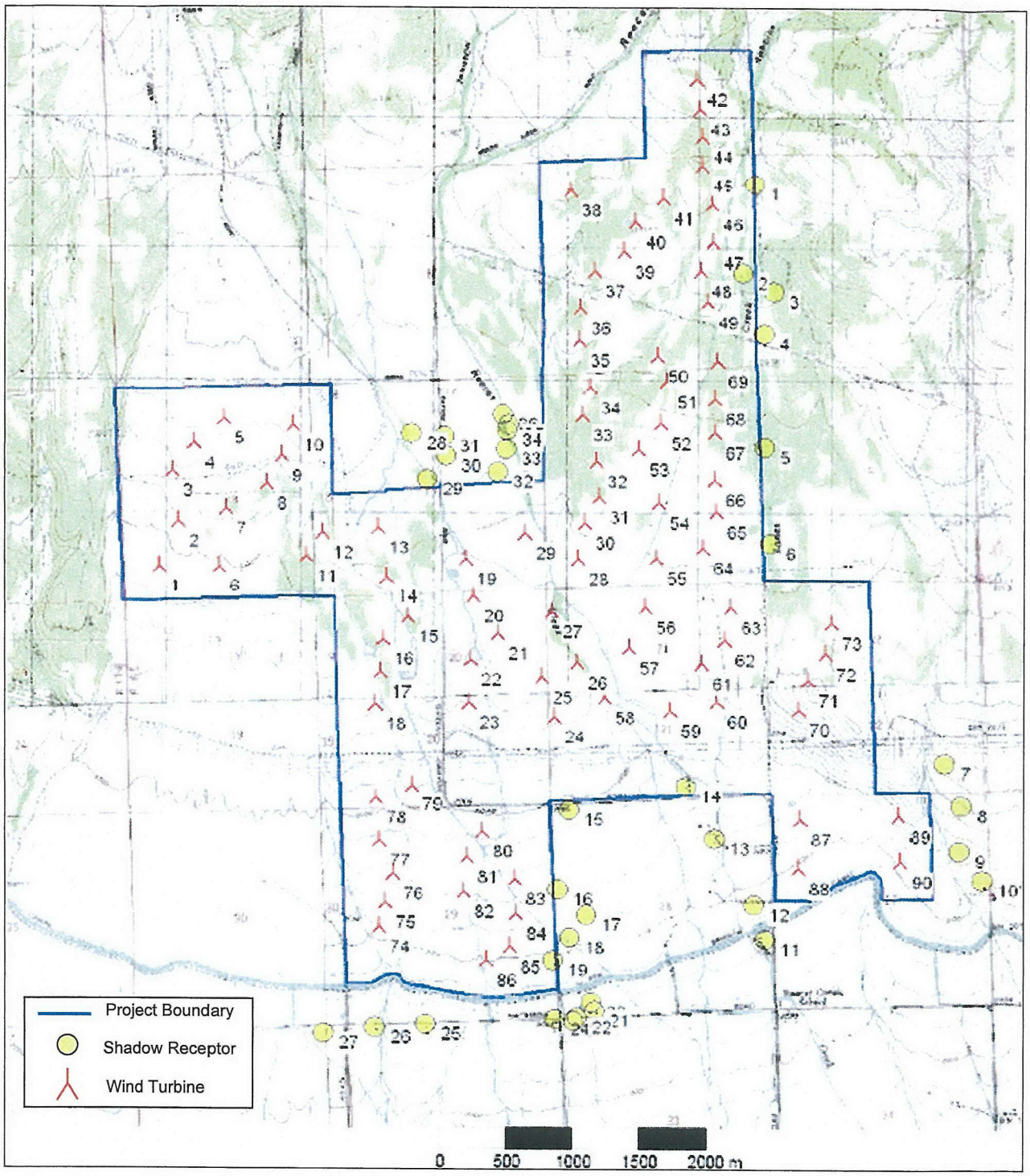


Figure 5. Desert Claim Shadow Receptors

Table 5. Potential Shadow Flicker Summary for Receptors, 1500-ft Distance Impact Limit

Receptor	Days of Potential Impact per Year	Max Hours per Day[1]	Mean Hours per Day[2]	Total Annual Hours
1	132	1.0	0.2	28
2[3]	246	1.1	0.2	51
4	77	0.9	0.1	10
5	179	0.9	0.3	46
9	61	0.8	0.2	13
16	197	1.1	0.3	63
18	66	0.8	0.3	19
19[3]	96	1.1	0.4	41

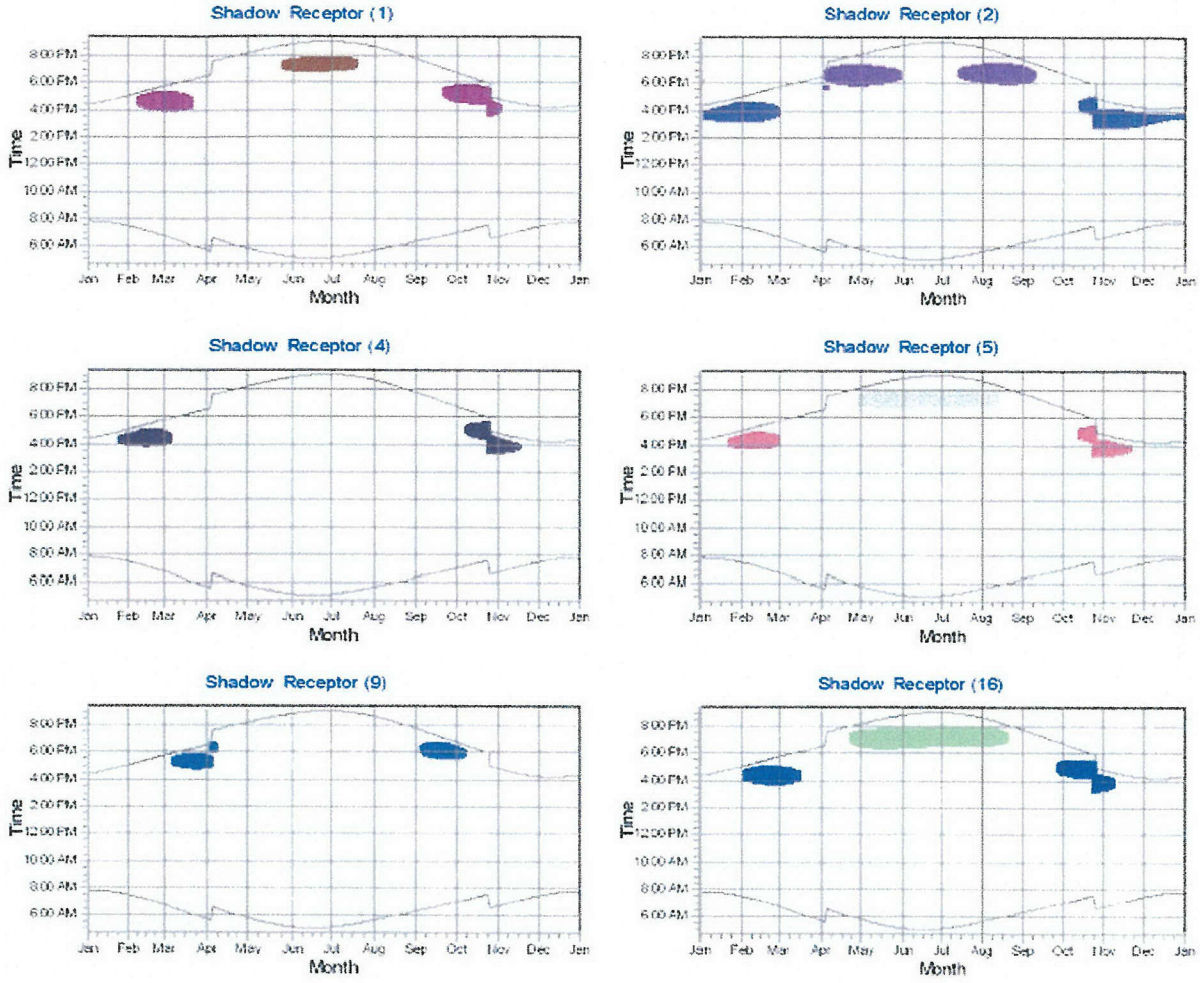
1. Not reduced to account for cloud cover or turbine yaw direction; assumes sky is always clear and turbine is facing the sun.
2. Mean hours per day calculated only on days with potential impact. Days without impact are not factored into the average. Mean hours per day would be much lower if days with no potential impact were factored in.
3. Project Participant Residence located within Project area.

Table 6. Theoretical Shadow Flicker Duration, No Distance Diffusion Limit

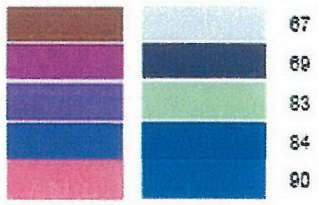
Receptor	Days per Year	Max Hours per Day[1]	Mean Hours per Day[2]	Total Annual Hours
1	156	1.2	0.2	34
2[3]	305	1.4	0.2	66
3	191	0.7	0.2	35
4	165	1.0	0.1	16
5	260	1.0	0.2	52
6	161	0.7	0.1	20
7	137	0.7	0.1	8
8	134	0.9	0.1	16
9	79	0.9	0.2	14
10	73	0.7	0.2	12
11	72	0.3	0.1	5
12	81	0.3	0.1	4
13	141	0.6	0.1	13
14[3]	148	0.3	< 0.1	7
15	248	0.6	0.1	12
16	311	1.5	0.3	86
17	203	0.8	0.2	33
18	194	0.9	0.2	42
19[3]	158	1.3	0.4	57
20	91	0.5	0.1	11
21	81	0.5	0.1	11
22	23	0.1	< 0.1	1
23	27	0.1	< 0.1	1
24	45	0.2	< 0.1	2
25	0	0	0	0
26	49	0.3	0.1	4
27	64	0.2	< 0.1	3
28	210	0.5	0.1	14
29	325	0.9	0.1	28
30	310	0.7	0.1	18
31	238	0.5	< 0.1	12
32	299	0.6	0.1	24
33	302	0.8	0.1	41
34	320	0.9	0.1	41
35	332	0.9	0.1	41
36	327	0.8	0.1	35

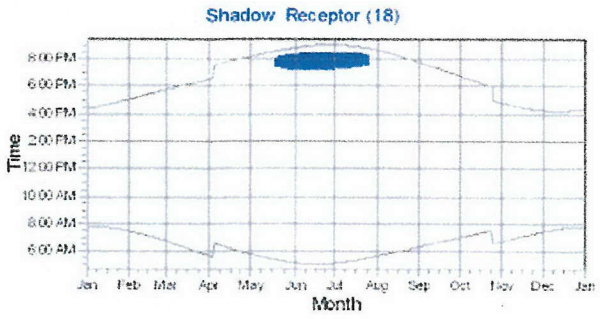
1. Not reduced to account for cloud cover or turbine yaw direction; assumes sky is always clear and turbine is facing the sun.
2. Mean hours per day calculated only for days identified in column titled "Days per Year." Other days are not factored into the result. Mean hours per day would be much lower if other days were factored into the result.
3. Project Participant Residence located within Project area.

Exhibit A: Shadow Calendar Maps for Desert Claim, 1500-ft Impact Distance Limit



WTGs

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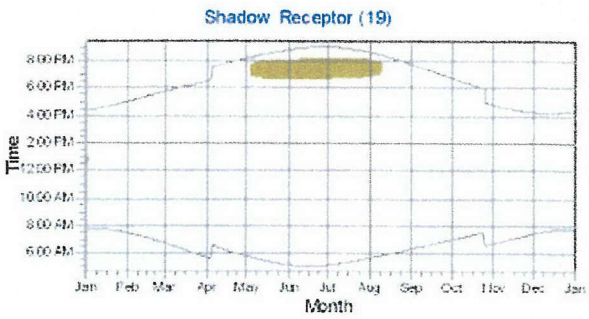
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Month


WTGs
84
85

Exhibit B: Shadow Calendar Maps for Desert Claim, No Distance Diffusion Limit

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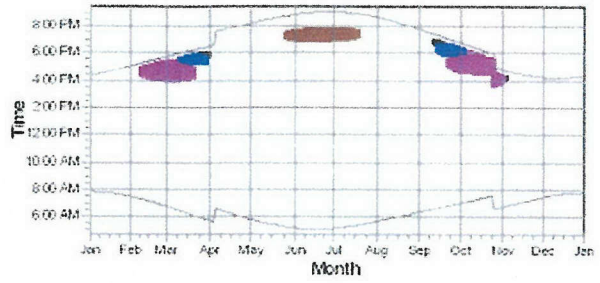

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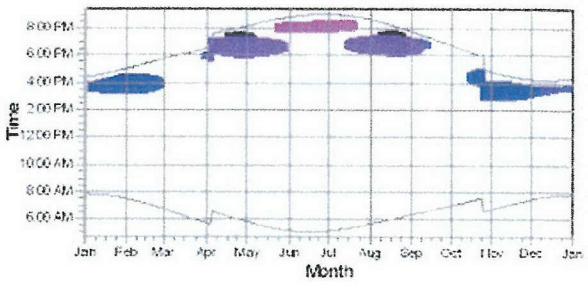

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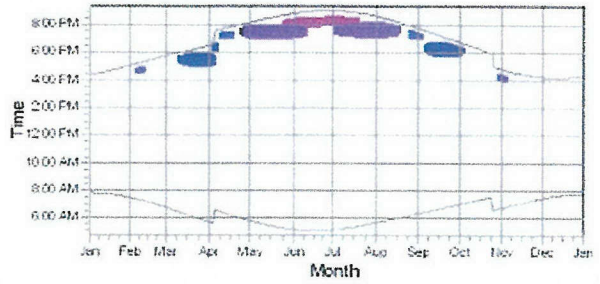

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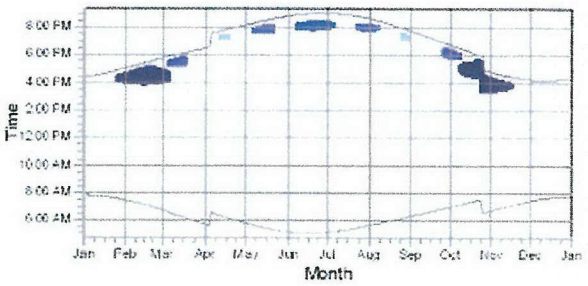

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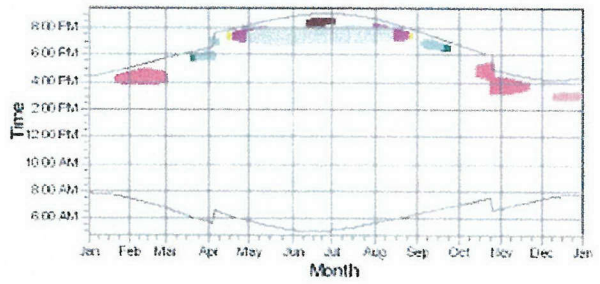

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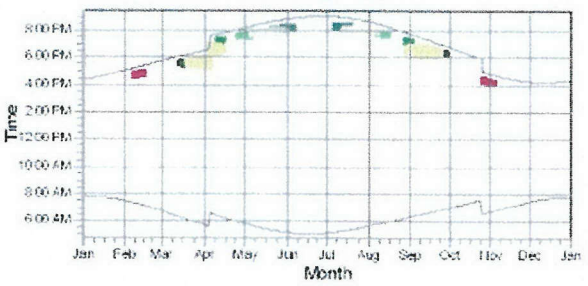

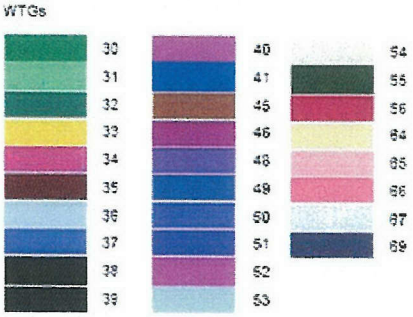

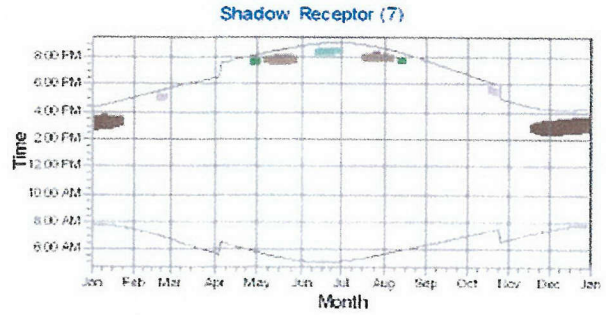
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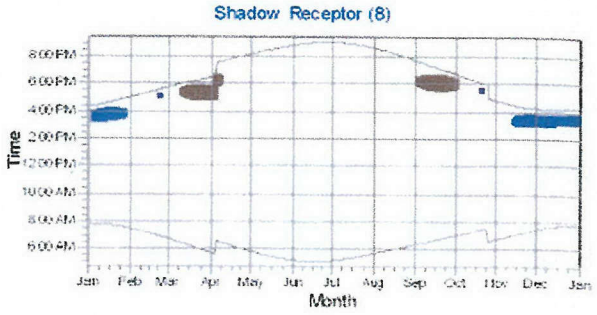
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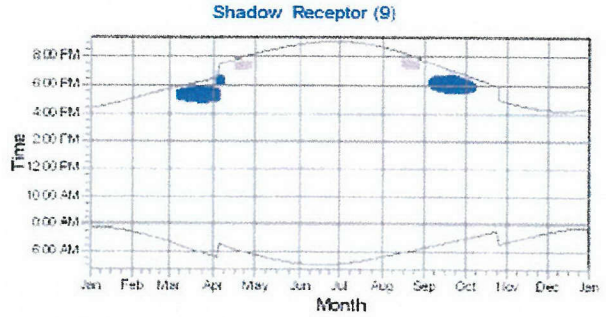
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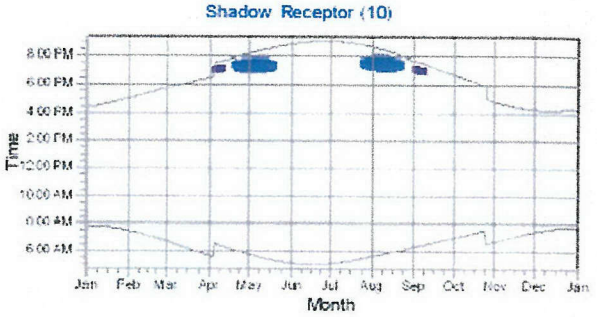
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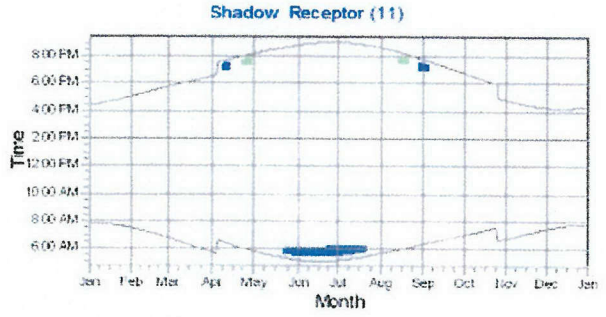
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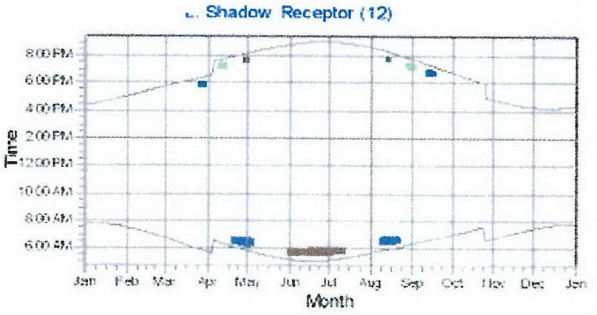
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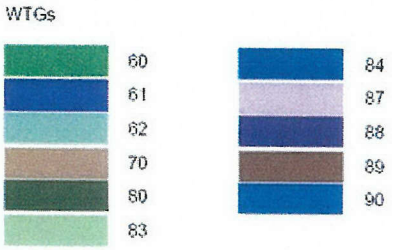
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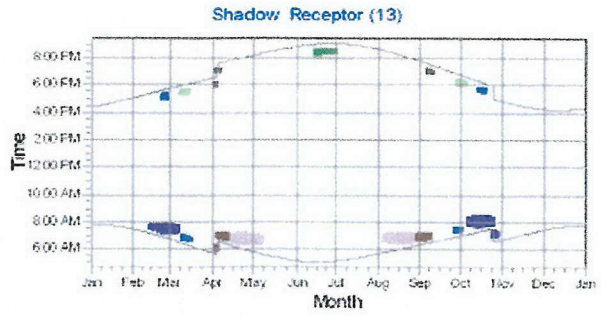
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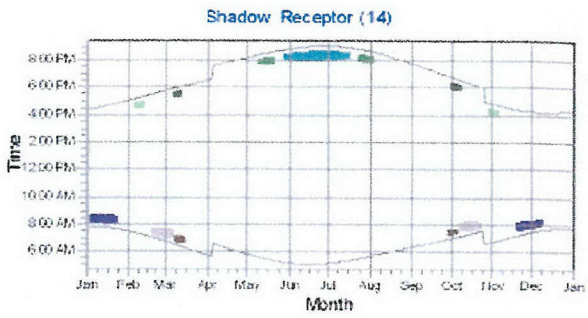
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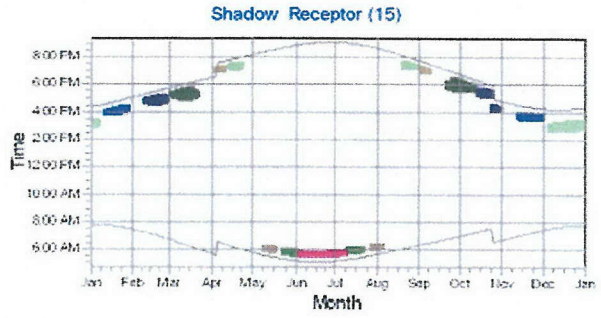
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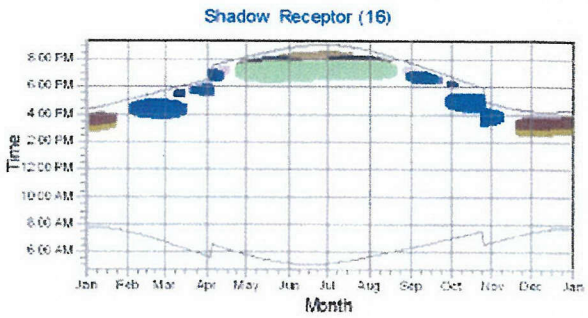
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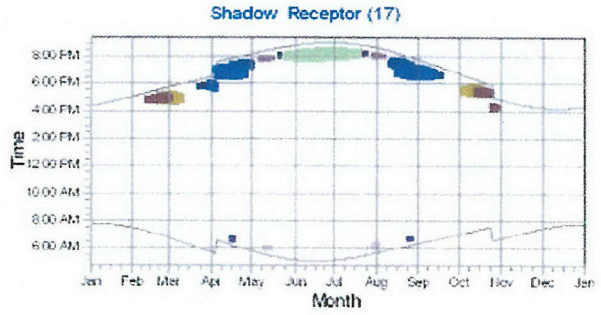
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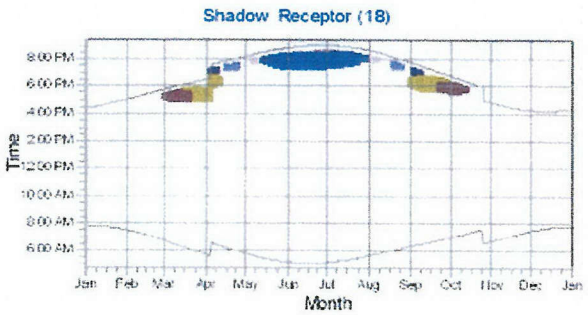
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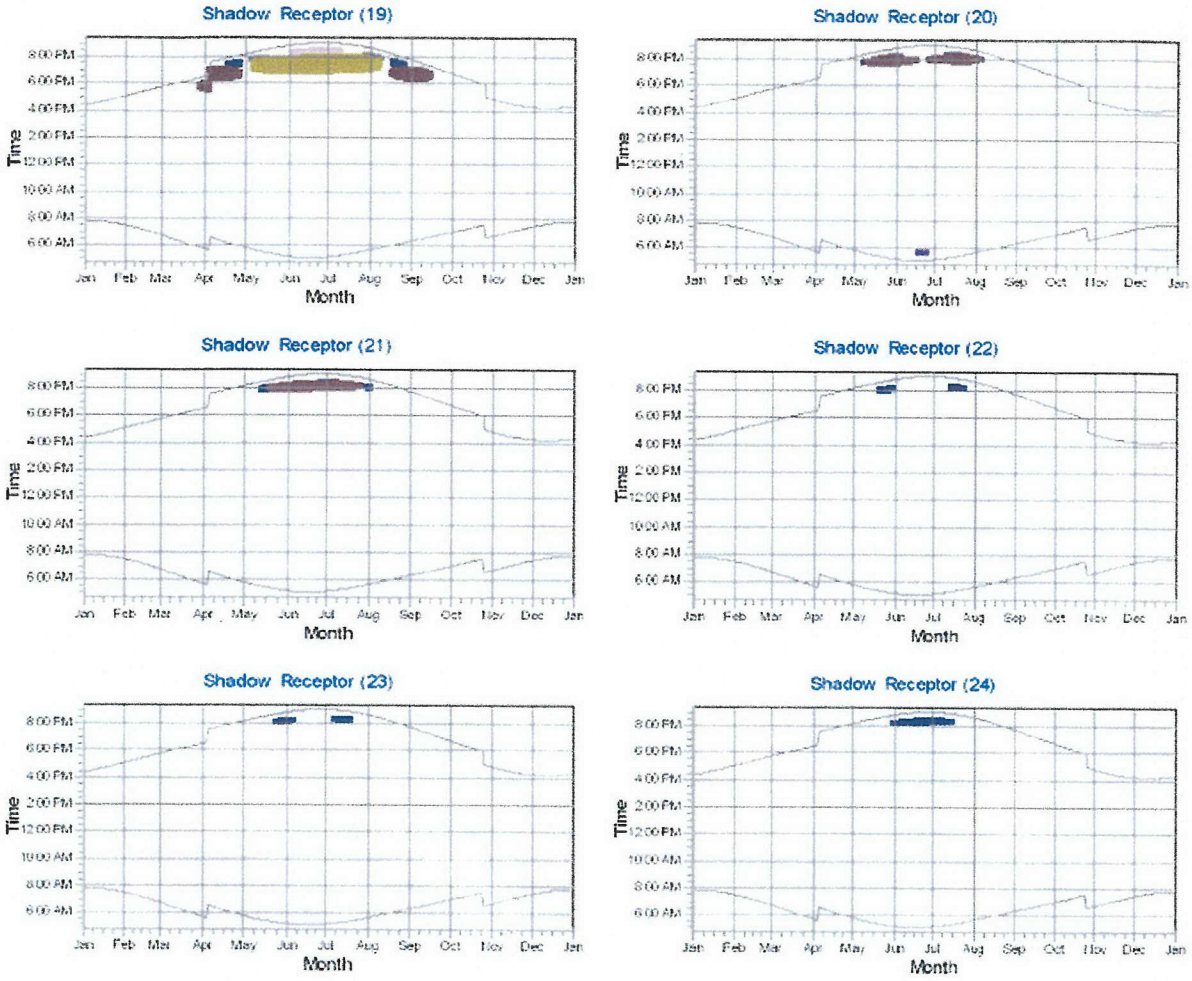
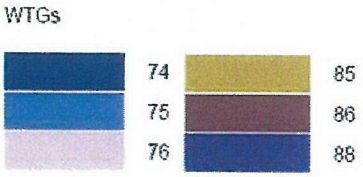
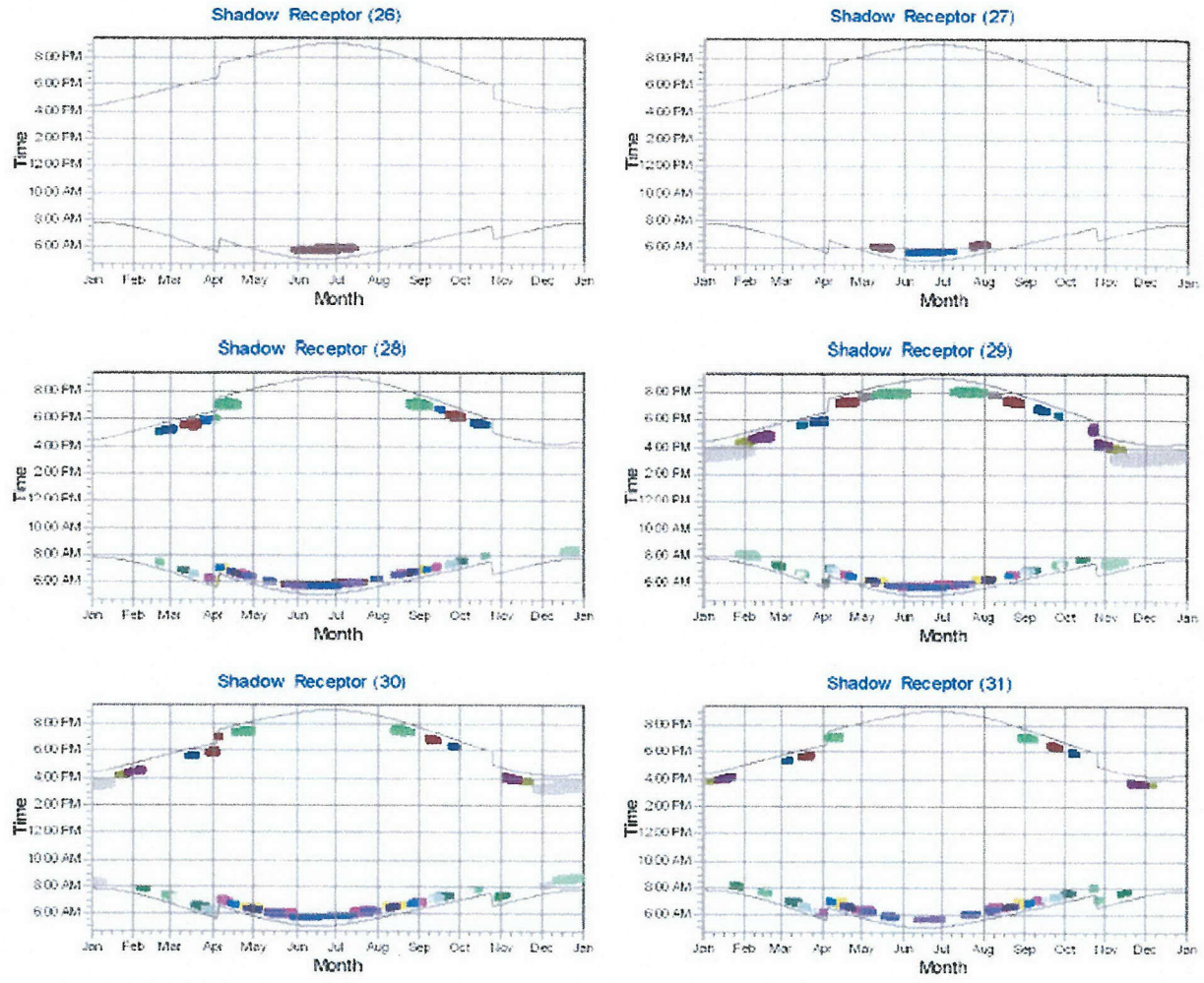


Note: Shadow Receptor 25 has no potential shadow flicker and has therefore been intentionally omitted.

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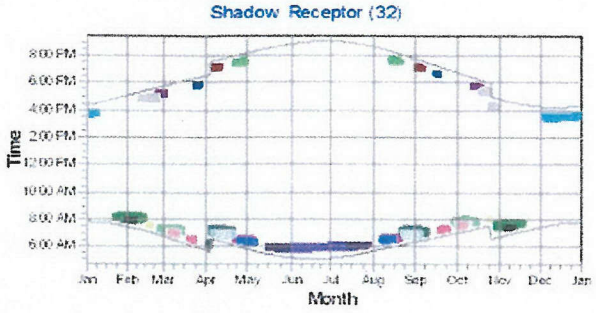
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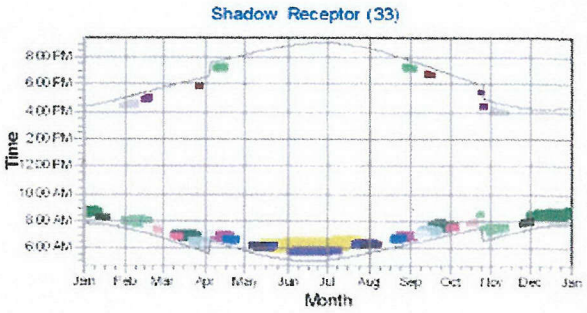
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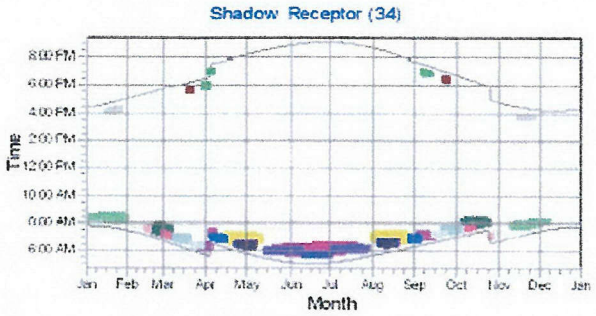
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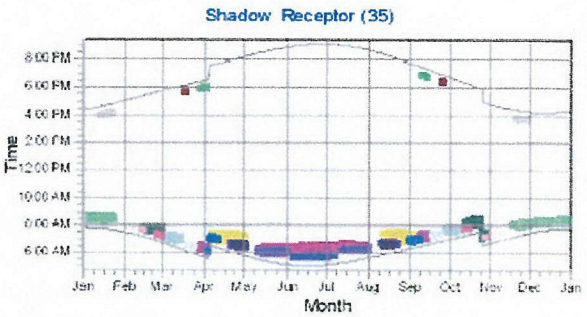
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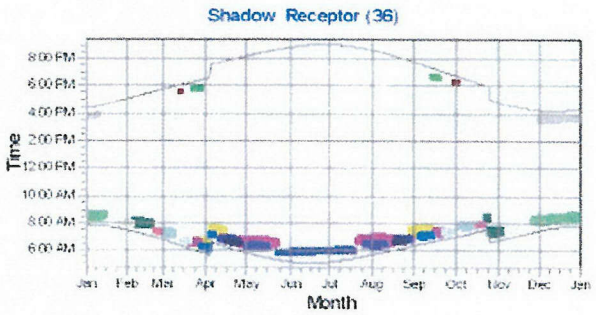
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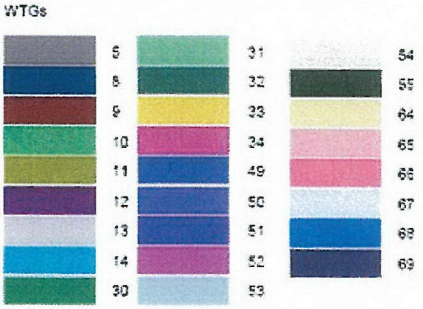
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GEC
GLOBAL ENERGY CONCEPTS
THE Wind Resource

Sound Mapping for Desert Claim Project

enXco2-001

CONFIDENTIAL

October 23, 2006

Prepared for:

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Prepared by

October 23, 2006
Date

Reviewed by

October 23, 2006
Date

Revision Block

Revision	Release Date	Summary of Changes
Original	October 2006	

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Overview

enXco, Inc. contracted with Global Energy Concepts, LLC (GEC) to perform sound mapping for the proposed Desert Claim wind power project located approximately 8 miles north of Ellensburg, Washington. This report summarizes findings for the project area and for individual residences in the project vicinity.

The findings indicate that the wind turbines will produce sound levels of no more than 50 decibels on the A-weighed scale (dBA) at the project boundaries. The study also evaluated expected changes in sound level at nearby residences, and concluded that at the residences the change to the background sound levels would be minimal.

Sound Impacts

Sound moves through air as waves of pressure fluctuations caused by vibrations. As sounds move away from their source, the sound pressures decrease because the sound is spread over an increasing area and attenuated (dissipated) by obstructions, obstacles, and the atmosphere. The most common unit of measure used to describe the magnitude of sound levels is the decibel (dB). Sound levels are often stated in terms of decibels on the A-weighted decibel scale (dBA), which is weighted to reflect the response of the human ear by attenuating, or discounting, some of the noise in the low- and high-frequency ranges to which the human ear is less responsive. Sound pressure levels differ from sound power levels. Sound power levels are characteristic of a sound source. Sound pressure levels are what is perceived by the human ear and vary with distance from the source. Wind turbines are often rated at a particular sound power level which is calculated from measurements performed according to a standard (such as International Electrotechnical Commission Standard IEC 61400-11). This sound power rating is a property of the equipment and is not dependent on distance from the source or environmental factors.

The dBA scale is logarithmic, so individual dBA ratings for different sources cannot be added directly to calculate the sound level for combined sources. For example, two sources, each producing 50 dBA will, when added together logarithmically, produce a combined sound level of 53 dBA. In typical situations, a 3 dBA change in sound levels is considered a just-perceivable difference, while a 10 dBA change is considered an approximate doubling of perceived loudness. Typical sound levels include about 110 dBA for construction noise, 90 dBA for a heavy truck accelerating, 60 dBA for a conversation, and 50 dBA for a quiet office. (Additional background information on sound measurements can be found at www.jimprice.com/prosound/db.htm).

When operating, wind turbines produce a "swishing" or "whooshing" sound as their rotating blades encounter turbulence in the passing air, as well as some sounds from the mechanical parts such as the gearbox, generator, and cooling fans. At a distance of several hundred meters (approximately 600 to 900 feet), the sounds generated by a wind turbine are frequently masked by the "background noise" of winds blowing through trees or moving around obstacles. Wind turbines are typically quiet enough for people to hold a normal conversation while standing at the base of the tower. If mechanical sounds are significant, it usually means something in the nacelle needs maintenance or repair.

Project Area Impacts

A sound contour map was generated using WindFarm software assuming the REpower MM92 turbine specifications and using the IEC 61400-11 acoustic reference wind speed of 8.0 meters per second (m/s) (18 miles per hour (mph)) wind speed measured at a reference height of 10 m (33 ft) above ground level. Figure 1 represents a sound contour map of the project area, calculated at the reference conditions. The sound power rating used to produce the reference condition map is 105.0 dBA as described in *Sound Power Level of REpower MM92.*[1] This rating would produce a sound pressure level of about 50 dBA at about 185 m (600 ft) away from the base of an isolated turbine under the acoustic reference condition (8.0 m/s measured at 10 m above ground level[2]).

Sound Power Level of REpower MM92 also indicates that the maximum sound power rating of 105.0 dBA is not exceeded at wind speeds above the 8.0 m/s reference wind speed. At higher wind speeds, sounds from the wind turbine become less noticeable because background noise associated with the wind itself increases and tends to cover or mask that being generated by the turbine.

In the model, the generated sound is represented as a point source at the wind turbine's hub, which is consistent with how the turbine sound power level ratings are typically defined. This approximates the sound pressure waves produced by the blades over their entire path of travel. Sound will decrease over distance due to other factors such as atmospheric damping, terrain absorption, and interference of obstacles; however, the primary mechanism for the decrease of sound is distance attenuation. There is no assumed change of sound due to vegetation, obstacles, or sound being propagated by the wind. Background noise is not taken into account in the model. The model assumes an attenuation coefficient of 0.005 dBA/m. This is equivalent to typical sound attenuation with distance due to the divergence of sound energy (about 6-8 dBA per doubling of distance) up to a distance of 400 m (1300 ft) from a turbine.

The sound level at the project boundary was investigated. For the acoustic reference wind condition producing the maximum hub-height sound power level of 105.0 dBA, the maximum calculated sound pressure level along the project boundary is 50 dBA or less. Under site wind conditions of less than 8.0 m/s, the sound pressure level along the project boundary would be lower.

[1] *Sound Power Level of REpower MM92*, Document: SD-2.9-WT.SL-1-A-EN, March 5, 2005.
[2] For this reference, a site average vertical shear coefficient of 0.14 is assumed.

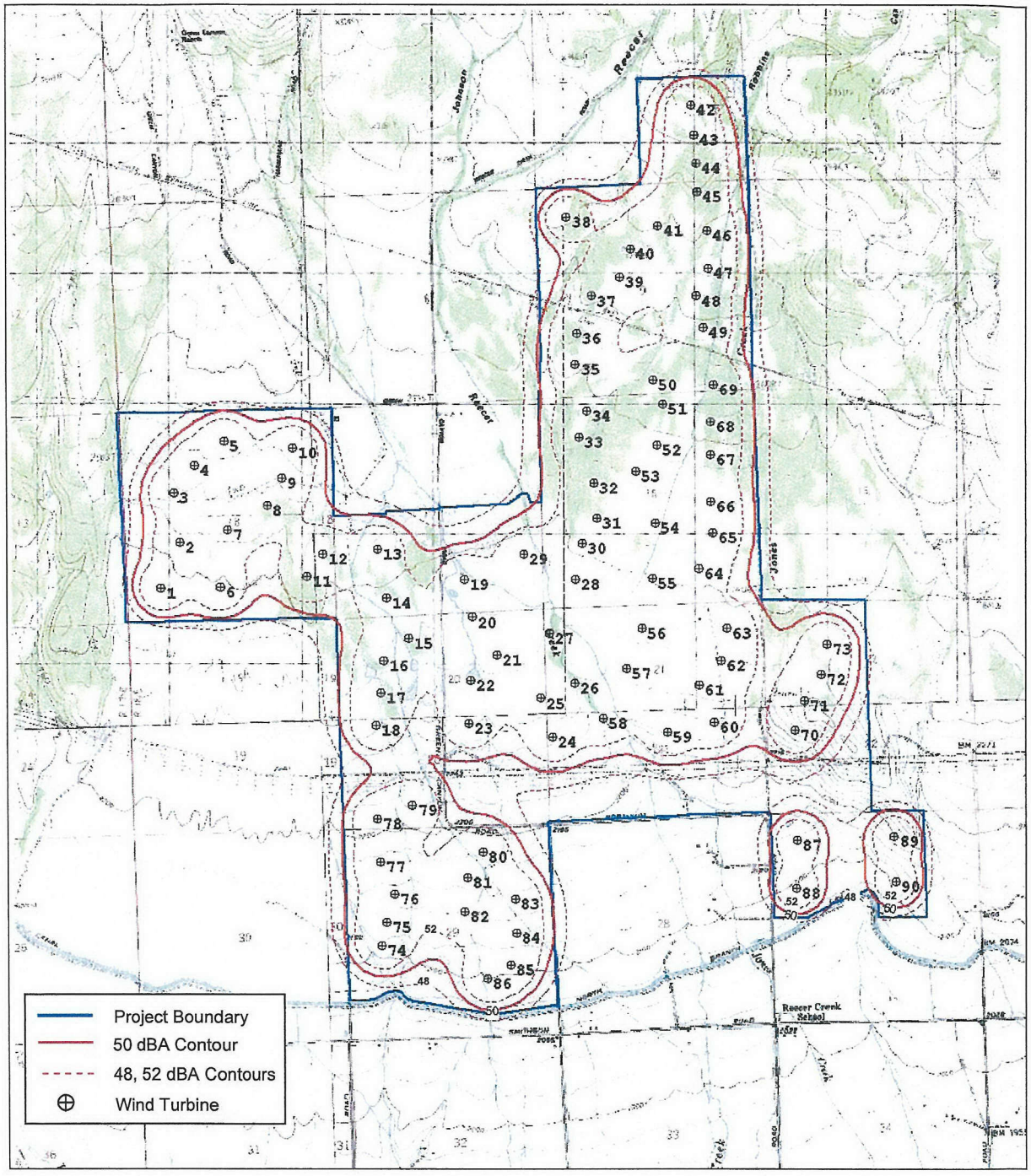

Figure 1. Sound Contour Map for Desert Claim Project Area at Reference Conditions: 8 m/s Wind Speed at 10-m Height

Impacts on Identified Receptors

In addition to modeling the expected sound levels from the turbines, GEC analyzed the incremental change in sound levels that is expected to be perceived by observers at nearby residences. Sound impacts for residences in the project area were modeled using WindFarm software assuming the REpower MM92 turbine specifications and the IEC 61400-11 acoustic reference wind speed of 8.0 m/s (18 mph) wind speed measured at a height of 10 m (33 ft). Both background noise and turbine noise will vary with wind speed. Both low wind speed and high wind speed impacts were modeled using wind speeds of 4.0 m/s (9 mph) and 8.0 m/s (18 mph), respectively, at a height of 10 m (33 ft). Figure 2 shows the identified receptor locations for nearby residences provided by enXco. The sound impact results for turbines on each receptor were then combined with background noise levels to provide an estimate of the total sound level at each residence for both 4 m/s and 8 m/s wind speeds. The resulting impacts are shown in Table 1.

Table 1 compares background sounds at each group of residences with the sounds produced by the wind turbines at low and high wind speeds. These results show that the change to the background noise levels at the residences would be minimal or non-significant across the range of operating wind speeds.

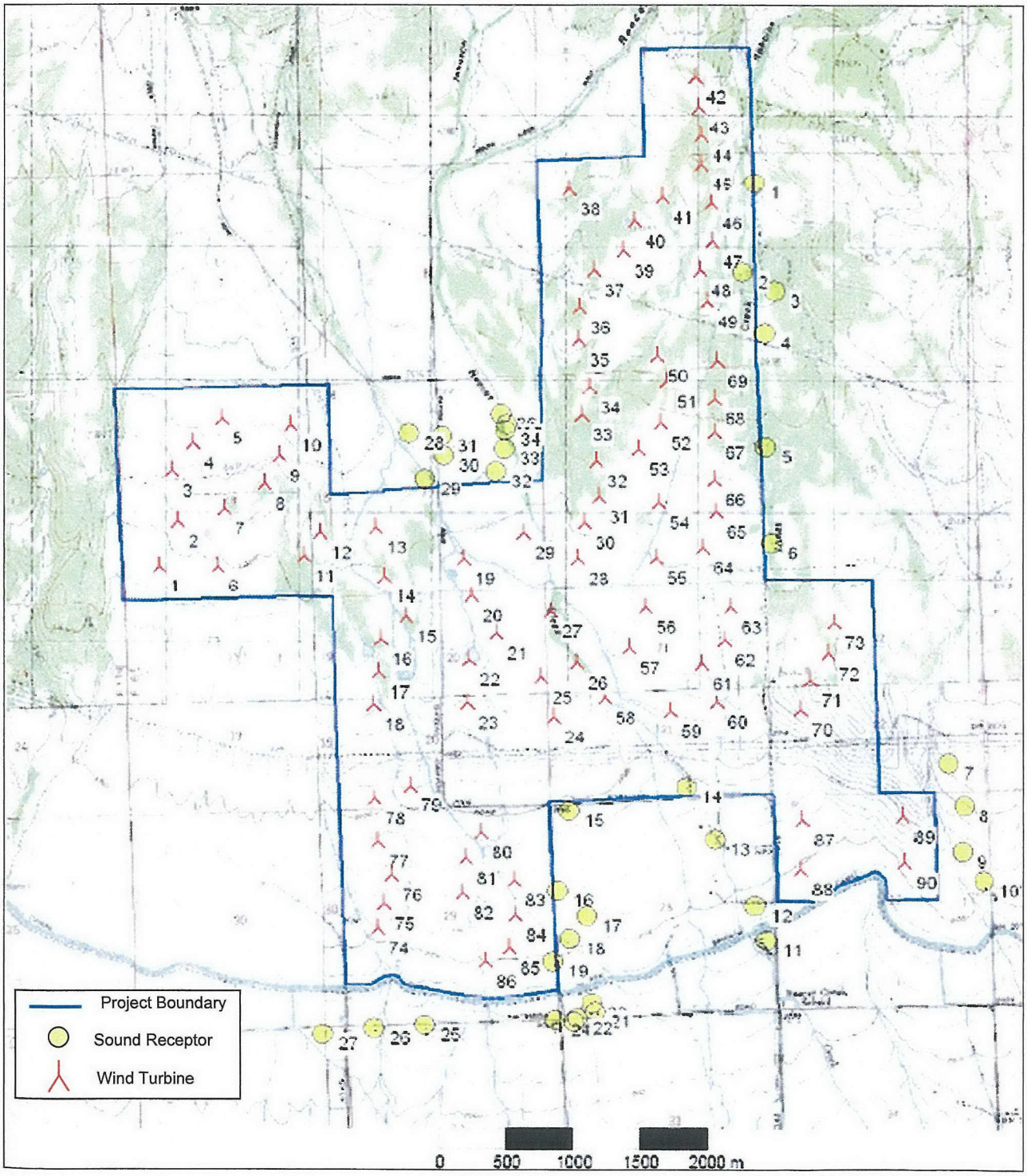

Figure 2. Identified Residential Sound Receptors

Table 1. Sound Impacts for Varying Background Noise Levels and Wind Speeds

Residence ID	4 m/s Wind Speed			8 m/s Wind Speed		
	Background Sound Levels* (dBA)	Turbine Sound Impact (dBA)	Total Turbine and Background Combined (dBA)	Background Sound Levels* (dBA)	Turbine Sound Impact (dBA)	Total Turbine and Background Combined (dBA)
1	39	38	42	47	49	51
2	39	40	43	47	51	52
3	39	36	41	47	47	50
4	39	38	41	47	48	51
5	39	38	42	47	49	51
6	39	38	41	47	48	51
7	34	32	36	42	43	45
8	34	33	37	42	44	46
9	34	34	37	42	44	46
10	34	30	35	42	41	44
11	40	30	40	57	41	57
12	40	33	41	57	44	57
13	40	33	41	57	43	57
14	40	35	41	57	45	57
15	40	35	41	57	46	57
16	40	39	42	57	49	58
17	40	35	41	57	45	57
18	40	36	42	57	47	57
19	40	38	42	57	48	58
20	40	31	40	57	41	57
21	40	30	40	57	40	57
22	40	31	40	57	41	57
23	40	31	40	57	41	57
24	40	32	41	57	43	57
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27	40	28	40	57	39	57
28	44	33	44	58	44	58
29	44	36	45	58	46	58
30	44	34	44	58	45	58
31	44	34	44	58	44	58
32	44	37	45	58	47	58
33	44	36	45	58	47	58
34	44	36	45	58	47	58
35	44	36	45	58	47	58
36	44	36	45	58	46	58

* From Section 3.9, Desert Claim Wind Power Project Final EIS, August 2004.

Update on Vegetation and Wildlife Impacts from the New Desert Claim Project Area

October 31, 2006

Technical Report

Prepared for:

Enxco

Prepared by:

David Young
Wallace Erickson
Victoria Poulton

WEST Inc.
2003 Central Ave
Cheyenne, WY 82009

INTRODUCTION

enXco, Inc. is submitting an Application for Site Certification ("ASC") to the Washington State Energy Facility Site Evaluation Counsel (" EFSEC") for the Desert Claim Wind Power Project (the "Project"). The Project is a renewable wind energy generation facility that will consist of up to 90 wind turbines and have a nameplate capacity of up to 180 megawatts (MW). The Project will be located within a project area of 4,783 acres in unincorporated Kittitas County, approximately 8 miles northwest of Ellensburg, Washington. The current proposal is a modified version of the Project considered by the Kittitas County Board of County Commissioners and evaluated in the County's August 2004 Final Environmental Impact Statement. Desert Claim, the applicant, modified the Project to further reduce potential impacts and to respond to concerns expressed during the County process.

This report provides details on how the changes in the Project may affect the potential for impacts to vegetation and wildlife.

PROJECT DESCRIPTION

The new Project area is now a contiguous block of land that significantly overlaps the previous western portions of the project area (Figure 1). The most significant change in location of the Project is that the areas in the southeast of the original project area have been omitted.

The turbine mostly likely used for the new project is slightly larger than the ones previously considered. The REpower MM92, a 2.0 MW nameplate capacity turbine, is now being considered for this Project, with a rotor diameter of 92.5 m (303 ft) and hub height of 80 m (262.5 ft), resulting in a maximum blade reach of 126.25 m (414 ft.). In the DEIS, a maximum turbine envelope with a resulting maximum blade reach of 120 m (393ft) was considered into which each of the considered wind turbine manufacturers and models would fit. The maximum blade reach of the turbine now being considered is slightly taller (414 ft) than the reach considered (393 ft) in the DEIS. Otherwise, the total number of MW (180 MW) for the revised project of 90 turbines is the same as previously considered. While this particular turbine was not discussed in the DEIS, another 2-MW turbine (Vestas) was considered in the DEIS.

PROJECT AREA VEGETATION

Vegetation in the Project area was mapped according to vegetation types (Young et al. 2003a). This mapping was updated in fall 2006 based on the new Project area, the results of vegetation mapping in the surrounding areas, and aerial photography. This mapping was updated in fall 2006 based on the new Project area. The new Project area includes parcels totaling 4,783 acres on which Desert Claim has landowner permission to develop the Project. Based on the new project area and updated vegetation mapping, habitat acreages in the Project area were revised and included in **Table 1**.

Table 1
Vegetation Types in the Project Area

Vegetation Type	Approx. Acres	Percent of Project Area	General Habitat Description
Agricultural	249	5.2	Agricultural areas are sites used for irrigated hay meadows that are periodically mowed.
Developed	10	0.2	Areas where human activity has removed or altered natural vegetation, such as residential homes and farm buildings and yards.
Grassland	2291	47.9	Areas dominated by grass species, primarily bunchgrasses bluebunch wheatgrass, Sandberg's bluegrass, cheatgrass, and bulbous bluegrass.
Grassland/ Lithosol	201	4.2	A subset of the grassland habitat type found on exposed ridges in shallow soils (lithosol) in the northern-most parcel. Sparse grasses (Sandberg's bluegrass) dominate, along with scattered forbs and occasional shrubs.
Open Water	8	0.2	Areas of open water including natural ponds, stock ponds, and the irrigation canal.
Pine Forest	30	0.6	Pine forest dominated by Ponderosa pine found in the higher elevations of the northern most parcel.
Riparian Forest	30	0.6	Riparian zones dominated by trees and tall shrubs, located in drainages with perennial or intermittent streams. The dominant species include cottonwoods and various willows. In some locations, the shrub understory is very dense, limiting herbaceous growth.
Riparian Shrub	110	2.3	Riparian areas adjacent to streams or irrigation ditches where shrubs are common, but often scattered. Common shrub species include black hawthorn and coyote willow. Various herbaceous species are present in the understory. Weedy species, including and knapweed were often observed.
Shrub Steppe	1768	37.0	Upland areas dominated by shrubs, primarily bitterbrush and rigid sagebrush, with an understory of mixed grasses and forbs. A few weedy species, such as cheatgrass and knapweed, were observed, but weedy species in general were not found over large extents of the area.
Wet Meadow	87	1.8	Areas dominated by hydrophytic vegetation, including various sedges, grasses, and rushes and other herbaceous species. These areas appear to be saturated or inundated most of the year, either from leakage from the irrigation canal or stockponds, or due to high groundwater in low spots and swales. Weeds were observed in some of the wet meadows, primarily chicory.
Total[1]	4783	100	

[1] Acreage total based on GIS mapping and tabulation.

Vegetation in the Project area was mapped and classified into ten types (**Table 1, Figure 2**). The primary vegetation type is grassland, composing nearly half of the Project area (47.9 percent), primarily in the eastern and central parcels. Shrub-steppe is the second most common vegetation type (37.0 percent of the Project area), followed by agricultural areas (5.2 percent). For the

purposes of the vegetation map, the agricultural areas consisted of those areas where the vegetation is actively managed (e.g., irrigated and/or mowed) for agricultural purposes; however, the shrub-steppe and grassland types are also used for agriculture (i.e., cattle grazing). Other vegetation types mapped in the Project area include grassland/lithosol (4.2%), riparian shrub (2.3%), wet meadow (1.8%), riparian forest (0.6%), pine forest (0.6%), open water (0.2%), and developed (0.2%).

The Project area has been decreased by approximately 450 acres from the previous project area identified in the DEIS. The descriptions of the different types of vegetation found in the EIS have not changed.

IMPACTS TO VEGETATION AND WILDLIFE

The following sections describe impacts to vegetation and wildlife from the revised Project, focusing on anticipated changes to impacts from the previous layout. In addition, new approaches to the estimation of impacts are described, especially for predicting bird and bat mortality. Because of large differences in turbine sizes, a different approach than using a per turbine estimate has been advocated at a national level since the 2003 DEIS was written. The approach is to standardize data on a per MW nameplate capacity for predicting fatality impacts. This approach assumes that the mortality rates are proportional to the MW capacity of the turbine, which is nearly equivalent to assuming the mortality is proportional to the rotor-swept area of the turbine. This report will use the MW nameplate capacity.

Vegetation

Based on GIS analysis of the latest proposed Project layout, an estimated 76.5 acres of vegetation in the Project area would be permanently occupied by Project facilities and an additional 280.5 acres would be temporarily disturbed (**Table 2**). These calculations do not account for Project facilities that have not yet been sited, including the O&M facility and the construction staging/storage areas, which would add no more than 5 acres of disturbed area. Of the disturbed areas, the access roads account for most of the permanent impacts to vegetation (58.2 acres). Most facilities would be located in shrub-steppe and grassland habitat types. An estimated 29.9 acres of shrub-steppe would be permanently impacted. An estimated 42.8 acres of grassland (including the grassland/lithosol type) would be permanently impacted. In addition, an estimated 1.5 acres of agricultural lands would be permanently impacted, as well as 1 acre of pine forest, 0.5 acres of riparian forest, 0.3 acres of riparian shrub, 0.3 acres of open water, and 0.2 acres of wet meadow. Desert Claim working with their wetlands consultant have adjusted the layout in the areas of the potential wetlands to avoid all impacts to this resource.

The total acres of temporary and permanent impact are less with the new layout than the previous layout (see Table 3.4-2, page 3-65 of DEIS). Approximately 30 less acres of temporary impacts and 2 less acres of permanent impact occur with the new project layout.

Rare Plants

Due to the absence of known populations within the previous project area, the overlap of the previous project area with the new Project area, and similarity between the unsurveyed areas of the new Project area with the old project area, no Project-related impacts are anticipated to rare plant species. These rare species include federally listed endangered, threatened, proposed, or candidate plant species and Washington State endangered, threatened, sensitive, or review plant species. However, rare plant surveys may be required in the new areas prior to construction.

Table 2. Approximate acres of impact by facility type.

FACILITY	VEGETATION TYPE	APPROXIMATE AREA OF IMPACT (ACRES) TEMPORARY	PERMANENT
Turbines[a]	Agricultural	1.149	0.110
	Grassland	62.220	5.607
	Grassland/Lithosol	5.871	0.580
	Open Water[g]	1.098	0.110
	Pine Forest	0.200	0
	Riparian Forest	1.438	0.186
	Riparian Shrub	0.121	0
	Shrub Steppe	35.910	3.191
	Shrub Steppe – Dense	0.987	0.079
	Wet Meadow[g]	0.639	0.004
Access Roads[b]	Agricultural	3.216	1.278
	Grassland	75.380	30.080
	Grassland/Lithosol	6.291	2.492
	Open Water	0.444	0.172
	Pine Forest	2.576	1.050
	Riparian Forest	0.591	0.227
	Riparian Shrub	0.462	0.183
	Shrub Steppe	55.820	22.360
	Shrub Steppe – Dense	0.508	0.194
	Wet Meadow	0.408	0.160
Collection System Buried Along Project Roads[c]	Agricultural	0.511	0.128
	Grassland	11.830	2.954
	Grassland/Lithosol	0.640	0.160
	Open Water	0.068	0.017
	Riparian Forest	0.089	0.022
	Riparian Shrub	0.073	0.018
	Shrub Steppe	8.433	2.107
	Shrub Steppe – Dense	0.076	0.019
	Wet Meadow	0.064	0.016
Buried Cross-Country[d]	Agricultural	0.050	0.013
	Grassland	2.244	0.559
	Riparian Forest	0.068	0.017
	Riparian Shrub	0.331	0.083
	Shrub Steppe	0.735	0.183
	Shrub Steppe – Dense	0.022	0.005
	Wet Meadow	0.025	0.006
Potential Directional Boring[e] (Could reduce impacts of cross-country collection system)	Grassland	0.330	0.081
	Riparian Forest	0.021	0.005
	Shrub Steppe	0.013	0.003
	Wet Meadow	0.0001	0
Substation[f]	Grassland		0.292
	Shrub Steppe		1.742
Total		280.5	76.5

[a] Assumes construction disturbance for each turbine pad and transformer will temporarily affect a 130-ft radius around the tower (1.25 acres); area of permanent impact based on a 39-ft radius tower pad (0.11 acre).

[b] Assumes a 50-ft wide temporary disturbance corridor and a 20-ft wide permanent disturbance corridor.

[c] For buried collection system we assume an 8-ft wide temporary disturbance corridor and a 2-ft wide permanent disturbance corridor. A 20% factor is applied for temporary disturbance, and a 5% factor is applied for permanent disturbance where the collection system is buried within the access roads.

[d] Assume an 8-ft wide temporary disturbance corridor and a 2-ft wide permanent disturbance corridor.

[e] If directional boring is used, the impacts of the buried cross-country collection system may be reduced. These values represent the maximum impact reduction if all directional boring possibilities are used.

[f] Based on the footprint of the substation.

[g] Desert Claim has worked with their wetland consultants to adjust the facilities in and near the wetlands so that the no actual temporary or permanent impacts will occur to any wetlands from any of the project facilities

Birds

Wind plant construction could affect birds through loss of habitat, potential fatalities from construction equipment, and disturbance/displacement effects from construction and human occupation of the area. The change in these potential impacts from the previous proposal is difficult to determine but due to the overall decrease in size of the project the potential for these impacts to occur would also decrease.

Potential mortality from construction equipment on site is expected to be quite low and similar to other wind projects. The risk of mortality from construction to avian species is most likely limited to potential destruction of a nest with eggs or young for ground- and shrub-nesting species when equipment initially disturbs the habitat. Because less vegetation will be disturbed with the new Project, the risk of destruction of a nest with eggs or young will be lower. Disturbance-type impacts can be expected to occur if construction activity occurs near an active nest or primary foraging area. Disturbance-type impacts are also expected to decrease with the smaller proposed Project.

Raptor Nesting

Based on the previous avian studies, raptor nest density in the original project area and within a 2-mile buffer of the site for buteos was 0.28 nest/mi^2 (0.11 nest/km^2) and for all raptors was 0.34 nest/mi^2 (0.13 nest/km^2). Raptor nest density around the new proposal, including a 2-mile buffer, for buteos is 0.19 nest/mi^2 (0.07 nest/km^2) and for all raptors is 0.31 nest/mi^2 (0.12 nest/km^2). The best raptor nesting habitat in the Project vicinity is located along the Wilson creek riparian corridor east of the site and along the numerous transmission lines within the project area. Nests closer to proposed turbines within the site are more likely to be affected by Project activities and may experience disturbance or displacement effects to the point that raptors do not return and use those nests. This potential impact will decrease with the new proposal due to the lower nest density in this area. There were only 3 active nests, based on the 2003 survey, within ½ mile of the new Project boundary (3 red-tailed hawks, Figure 3). Some of the higher nest densities occurred in the south east area of the original project and that area has been dropped. Also,

Wilson Creek falls outside the 2-mile buffer of the new site. It is unlikely that construction of the new Project will result in significant disturbance or displacement impacts on nesting raptors.

Mortality

Impacts of the proposed Project are projected primarily based on data collected at existing regional wind power facilities: the Vansycle Wind Plant, Oregon (Erickson et al. 2000); the Stateline Wind Project, Washington and Oregon (Erickson et al. 2003a); the Klondike I project, Oregon (Johnson et al. 2003); Nine Canyon Wind Project, Washington, (Erickson et al. 2003b); and the Combine Hills project, Oregon (Young et al. 2005); where mortality estimates adjusted for carcass removal and searcher efficiency biases have been made for birds and bats.

Based on the avian studies, use by birds of the Project area is similar to other wind plants studied. Species diversity of the site was higher than some other studies, but overall avian use estimates were similar. Collision-related impacts (fatalities) would not be expected to exceed what has been observed at other wind plants in the northwest. In general, because of the smaller proposed Project size with fewer turbines, total mortality impacts are expected to be less.

Passerines

Passerines have been the most abundant fatalities at other wind plants studied, often composing more than 80 percent of total avian mortality. Both migrant and resident passerine fatalities have been observed. Given that passerines make up the vast majority of avian observations on-site, it is expected that passerines would make up the largest proportion of fatalities. Average passerine and small bird mortality for the five wind projects listed above in Washington and Oregon has been 1.70 fatalities per turbine per year (**Table 3**). Because of large differences in turbine sizes, a different approach than using a per turbine estimate has been advocated at a national level since the 2003 DEIS was written. The approach is to standardize data on a per MW nameplate capacity for predicting fatality impacts. This approach assumes that the mortality rates are proportional to the MW capacity of the turbine, which is nearly equivalent to assuming the mortality is proportional to the rotor-swept area of the turbine. Considering these mortality results and passerine use estimates at these wind plants, it is estimated that potential passerine (all small bird) mortality at the proposed Project would be similar to the average or approximately 1.68 small birds per MW per year (**Table 3**). This would result in approximately 300 small bird fatalities per year at the Project if 180 MW are constructed. This estimate would be the same under the previous proposal, since the total MW of the project are the same (180 MW). A more conservative approach is to use the range of mortality, and in that case, approximately 100 to 500 passerine fatalities are predicted.

Table 3
Mean bird mortality estimates based on fatality studies at regional wind projects.

		Bird Mortality (#/turbine/year)			Bird Mortality (#/MW/year)		
Project	size of turbine (MW)	All Birds	Passerines1	Raptors	All Birds	Passerines1	Raptors
Vansycle, OR	0.66	0.63	0.42	0	0.95	0.64	0.00
Klondike I, OR	1.5	1.42	1.16	0	0.95	0.77	0.00
Combine Hills, OR	1	2.56	1.89	0	2.56	1.89	0.00
Nine Canyon, WA	1.3	3.59	3.31	0.07	2.76	2.55	0.05
Stateline, WA/OR	0.66	1.93	1.7	0.05	2.92	2.58	0.08

Average	1.02	2.03	1.7	0.02	2.03	1.68	0.03

[1] Passerines and other small bird estimates are lumped together

Raptors

Compared to other wind plants studied in the region, raptor use for the Desert Claim site was above average, with slightly more than one raptor (1.15) observed each survey. The majority of the raptor sightings were red-tailed hawks during the spring, summer, and fall, and rough-legged hawks during the winter. Average raptor mortality for the five wind projects listed above in Washington and Oregon has been 0.03 fatalities per MW per year (**Table 3**). Considering these mortality results and raptor use estimates at these wind plants, it is estimated that potential raptor mortality at the proposed Project would be higher than the average. Using the highest raptor mortality estimate in the region (0.08 raptors per MW per year), potential raptor mortality would 14 raptors per year and the range of potential raptor mortality would likely be from 5-14 per year.

Another recent analysis suggests a correlation between raptor use and raptor mortality. This analysis was conducted using several studies that were only recently completed. Figure 1 shows the relationship between raptor use (standardized to 20-minute surveys) and raptor mortality adjusted for site-specific estimates of scavenging and searcher efficiency, and raptor use using 360-degree viewshed surveys from the following projects:

Study Area	Reference
Combine Hills, OR	Young et al. 2005
Diablo Winds, CA	WEST 2006
Vansycle, OR	Erickson et al. 2000
Stateline, WA/OR	Erickson et al. 2004
Nine Canyon WA	Erickson et al. 2003b
Klondike, OR	Johnson et al. 2003
Buffalo Ridge, MN	Johnson et al. 2000
High Winds, CA	Kerlinger et al. 2006
Foote Creek Rim, WY	Young et al. 2003

A strong relationship is apparent in this analysis. The two California projects (High Winds and Diablo Winds) have very high raptor use, and much higher raptor mortality than Pacific Northwest and Mid-west projects (**Figure 4**).

Estimated raptor use for Desert Claim (1.15/survey) yields a prediction of 0.15 raptor fatalities/MW/year from this regression model, or 27 raptors for the entire project. Since the project size in terms of MW has not changed from the project described in the DEIS, the estimates of mortality using these two new models would be the same for both projects. These estimates using the new models and approaches are higher than predicted in the DEIS. However, these estimates (or significantly higher estimates) would not result in any population level consequences (e.g., within the Kittitas Valley, within the Columbia Basin, or some larger population) for the species likely to be impacted. For example, most fatalities are likely to be red-tailed hawks and American kestrels, and these two species are the most common raptor in the Kittitas Valley, as well as in the Columbia Basin and nationally.

All Avian Mortality

The range of bird mortality for the five regional wind projects listed above is approximately 1 to 3 birds per MW per year for all birds with an average of 2.03 birds per MW per year (**Table 3**). Using this range, avian mortality at the proposed Project would be approximately 180 to 540 birds per year if 180 MW are built. Since the total MW has not changed, this approach would yield the same avian mortality for both the previously proposed Project and the new Project.

Carcass searches at other wind projects have found avian fatalities associated with guyed met towers but not with un-guyed towers. As currently planned, the proposed Project would have 5 permanent un-guyed met towers. Based on the result of the above studies, no avian fatalities are expected that would be associated with the met towers.

Waterfowl

Little waterfowl mortality has been documented at other wind plants. The most common waterfowl species observed in the Project area were mallard, Canada goose, and northern pintail, and were seen mainly in winter. A variety of other waterfowl species were seen incidentally in the study area. Waterfowl mortality could be expected, likely composed mostly of mallards, however the total number of anticipated fatalities is low. While mallards were seen year round, the majority of waterfowl use was during winter and in the western portions of the original project area. Potential impacts to waterfowl would not be expected to change based on the new proposal because the portion of the original project not included in the current proposal was primarily shrub-steppe vegetation which had little waterfowl use.

Small Mammals

Impacts to ground-dwelling mammals occurring on site would include fatalities from construction activities, loss of habitat, and disturbance or displacement. The incremental change in these types of impacts from the new proposal over the previous proposal is difficult to estimate; however, it is expected that the overall impacts would be less due to the smaller project size. Small mammals are expected to repopulate impact areas after construction activities cease and reclamation is complete, and they may re-colonize areas quicker due to the smaller project. Some small mammal fatalities can be expected from O&M vehicle traffic, but because the Project would be smaller overall, these impacts would be less.

A comment submitted during scoping for the original EIS expressed concern that the project might result in declines in the raptor population that would lead to an increase in the population of rodents that are prey species for raptors. Because certain rodents such as deer mice are carriers of hantavirus, which is an airborne pathogen that can be contracted by humans, the concern was that this indirect impact on rodents could result in increased risk of human exposure to hantavirus. Overall, the total rodent population in the area is likely a function of environmental conditions and not controlled by predators. The small impacts to raptors anticipated from the project would not have a noticeable or measurable affect the rodent population.

Bats

Research at other wind plants indicates that the primary impact to bats appears to be risk of collision for fall migratory bat species with hoary and silver-haired bats being the most prevalent Pacific Northwest fatalities (see Johnson 2005). Sparse information exists regarding bat populations in the region; however, non-migratory and resident bat populations do not appear to be negatively impacted by wind turbines (see Johnson 2005). During construction, impacts to bats and bat habitat on the project site will be minimal. There will be some loss of riparian vegetation where bats may forage but this is not expected to have a measurable effect on resident bats. Hoary and silver-haired bats, the two species most at risk, may use forested habitats to the

north but there is little forest habitat on the site and loss of habitat or disturbance impacts from construction on these species is not expected to occur.

Most bat fatalities found at wind projects have been tree (forest) dwelling fall migratory species, with hoary and silver-haired bats being the most prevalent Pacific Northwest fatalities. Fatality estimates for the five regional wind projects studied have ranged from 0.77 to 2.47 bats per MW per year with an average of 1.59 bats per MW per year (**Table 4**). In these studies more than 90% of the bat fatalities have been hoary and silver-haired bats. Some projects in other parts of the country have shown that risk to bats may be greater in forested environments (e.g. Kerns and Kerlinger 2004; Nicholson 2003). Bat mortality at the Desert Claim Project is not expected to greatly exceed the other regional wind projects studied; however, it may be higher due to the proximity of forests to the north and west. Using a per MW basis, bat mortality at the site may be approximately 1.0 - 3.0 bats per MW per year or between 180 and 540 total bats per year if 180 MW are constructed and would be similar to the previous proposed project.

Table 4
Mean bat mortality estimates based on fatality studies at regional wind projects.

Project	size of turbine (MW)	Bat Mortality (#/turbine/year)		References
Vansycle, OR	0.66	0.74	1.12	Erickson et al. 2000
Klondike I, OR	1.5	1.16	0.77	Johnson et al. 2003
Combine Hills, OR	1	1.88	1.88	Young et al. 2005
Nine Canyon, WA	1.3	3.21	2.47	Erickson et al. 2003b
Stateline, WA/OR	0.66	1.12	1.70	Erickson et al. 2004
Average	1.02	1.62	1.59	

Reptiles and Amphibians

Aquatic or moist habitats for amphibians and reptiles are generally restricted to the riparian, wetland, and pond areas within the study area. Substantial impacts to these areas are not anticipated due to regulatory requirements to minimize impacts, and erosion and sedimentation prevention methods are expected in adjacent upland construction areas. Due to the overall reduction in the project size, impacts to these habitats will decrease and thus the potential for impacts to aquatic wildlife will decrease.

As with ground-dwelling mammals, snakes and lizards that occupy upland areas may experience fatalities due to construction activity. Due to the overall reduction in project size, the potential for and magnitude of this impact will be less than the previous proposal. Some reptile fatalities can be expected from O&M vehicle traffic, but again, because the project would be smaller overall with fewer roads, these impacts would be less.

Big Game

The new Project area is within the Ellensburg mule deer winter range and two high-density deer wintering areas occur within 1.5 miles of the project. Also, the Quilomene elk migration corridor is an important spring pathway that encroaches upon the project's north section. Project construction and operation could result in disturbance or displacement impacts to big game, including deer wintering in the area, which, during very severe winters, could result in mortality impacts due to animals being forced into marginal habitat that does not sustain them over winter. Overall these types of impacts from the new proposal are expected to be less because of the smaller project area. There will be less overall road and turbine strings that could fragment habitat or create barriers to movement. Also the new Project area is concentrated more around existing infrastructure (e.g., transmission lines, local roads) than the previous proposal, which reduces the amount of additional habitat fragmentation that would occur from the project. The smaller Project should result in less displacement or less potential for displacement to adjoining cropland, reducing the possibility that crop damage claims in the project vicinity may change.

The northernmost section of the Project area overlaps approximately 320 acres of the southern edge of the Quilomene elk migration corridor. It is unknown to what extent this area is used by elk, or if all of the new Project is within view of the migration corridor. If this area of the Project influences spring elk movement, it is expected that elk will shift their path to the north without migratory hindrance due to the large size of the corridor. There is no change in this potential impact from the previous proposal, as the same northern project section was included in both project layouts.

Temporary loss of habitat from Project construction is a relatively minor impact due to expected vegetation reclamation and the large expanse of suitable habitat for mule deer in the region. Once construction is complete, it is expected that deer would become habituated to wind turbines and occupy areas within the wind plant. There will also be intermittent disturbances from vehicle and human traffic during regular O&M activities, and also from turbine noise and shadow flicker of moving blades. If deer tolerance thresholds are exceeded by these disturbances, it is expected that mule deer will seek remote areas of nearby ravines or forests. Should the facility eventually result in a sanctuary for big game due to reduced hunting pressure, seasonal use of the wind plant by big game may increase. However, the new proposal is smaller and would not create as large of a sanctuary area.

Threatened and Endangered Species

The previous environmental impact analysis determined that the original project would have no effect on the majority of the State or Federally listed threatened or endangered species potentially occurring in or near the Project area. Two federally threatened species, bald eagle and steelhead, could occur in the Project area and therefore may be at risk of adverse impacts from the Project

Bald eagles occur in the Project area during the winter from approximately late December to early April. There is no evidence that bald eagles breed in the Project area or nearby although the Yakima River riparian corridor provides suitable breeding habitat. Potential impacts to bald eagles identified in the previous analysis included disturbance or displacement during the winter season, potential loss of roosting and foraging habitat, and potential mortality due to turbine collisions. The new proposal which is smaller in size and with fewer turbines generally will have less potential impact to bald eagles than the original proposal. The Project will not affect the Yakima River riparian corridor or bald eagle roost sites and habitat along the Yakima River.

Temporary loss of potential isolated roosting habitat (scattered patches of trees) due to construction disturbance would be for the short duration of the construction period (9-12 months), most of which will be outside the winter season and would affect even less of the available roosting habitat than the original proposal. During avian studies at the site, bald eagles were observed using the Wilson Creek riparian corridor and Wilson Creek Canyon to the northeast of the original project area. While no roosts were found in this area, the current proposal is greater than 3 miles from this area, further reducing the possibility of disturbance impacts at roost sites. Wintering bald eagles forage throughout the surrounding area on carrion, livestock by-products, and fish in the Yakima River. To the extent that carrion or livestock by-products occur on site, bald eagles may forage on the site. Cattle operations in the Project area are considered independent of the wind project and the Project is not expected to reduce foraging opportunities for bald eagles unless this is used as a mitigation measure to minimize bald eagle occurrence in the wind project. Bald eagles flying within the Project area would have some exposure to turbine-caused mortality; however, there have been no documented bald eagle fatalities at wind plants and the number of turbines proposed is less resulting in less over all collision risk. The Project also occupies a smaller overall area resulting in less potential to disrupt normal movement patterns of wintering eagles in the valley. Any mortality that might occur over the Project life would be at a very low level and would not have a measurable effect on the bald eagle population. Operation of the Project should have minimal disturbance effect on bald eagles, based primarily on their relatively low use of the Project area (see Young et al. 2003a) and the fact that the bald eagle occupation period overlaps the least windy time of year.

For steelhead trout, the WDFW provided information indicating that due to diversion of water from First Creek into Green Canyon and eventually to the Reecer Creek subbasin, steelhead could possibly occur in Reecer Creek which flows through the western half of the Project area. Also, the Columbia River district population segment of bull trout is listed as a threatened species under the Endangered Species Act and potentially occurs downstream in the Yakima River. Due to steelhead occurring within the Project area, and the potential for downstream impacts (see **Section 3.4.3 of the DEIS**) the Project has the potential to adversely affect these species. The Reecer creek drainage where steelhead potentially occur is within the new proposal Project area. Potential impacts to steelhead from the new proposal are not expected to change over the original proposal. In essence, the portion of the original proposal that could potentially affect steelhead was the western most sections around Reecer Creek. These sections are still included in the new proposed Project so potential impacts to steelhead remain.

State listed wildlife that may occur in the Project area include golden eagle, northern goshawk, sage thrasher, and loggerhead shrike. The initial environmental impact analysis determined that potential impacts to these species would be minimal and include the basic impacts discussed for birds (mortality, disturbance/displacement, and possible loss of habitat). The current proposal, which has fewer turbines and occupies a smaller area, may further reduce the potential for these impacts. For example, loggerhead shrike and sage thrasher are possible breeding residents in the study area and would occupy shrub-steppe vegetation. The new proposal reduces impact to shrub-steppe by approximately 8 acres thus reducing the potential for impacts to these species.

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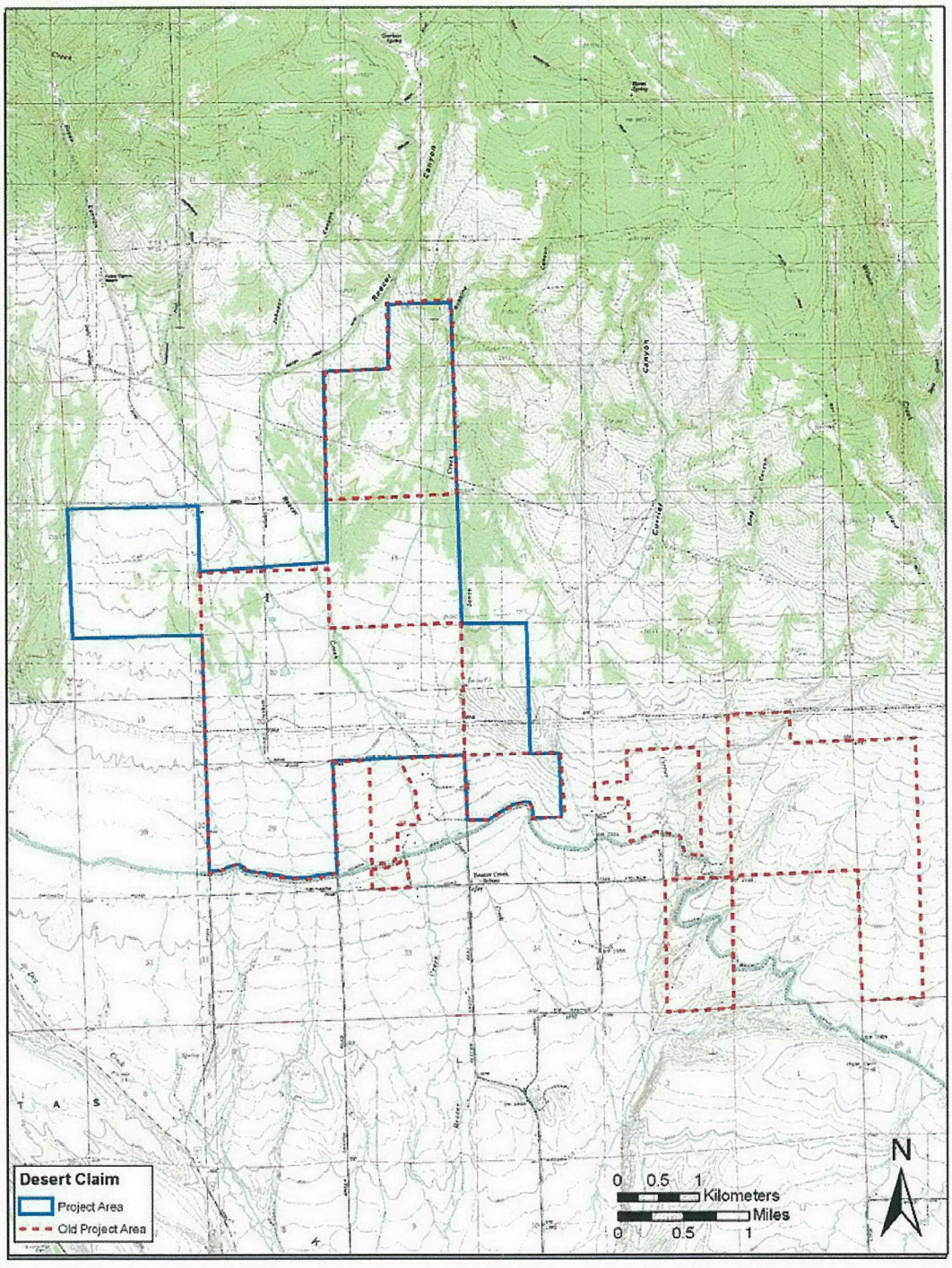


Figure 1. Comparison of the previous Desert Claim project area considered in the DEIS and the new project area.

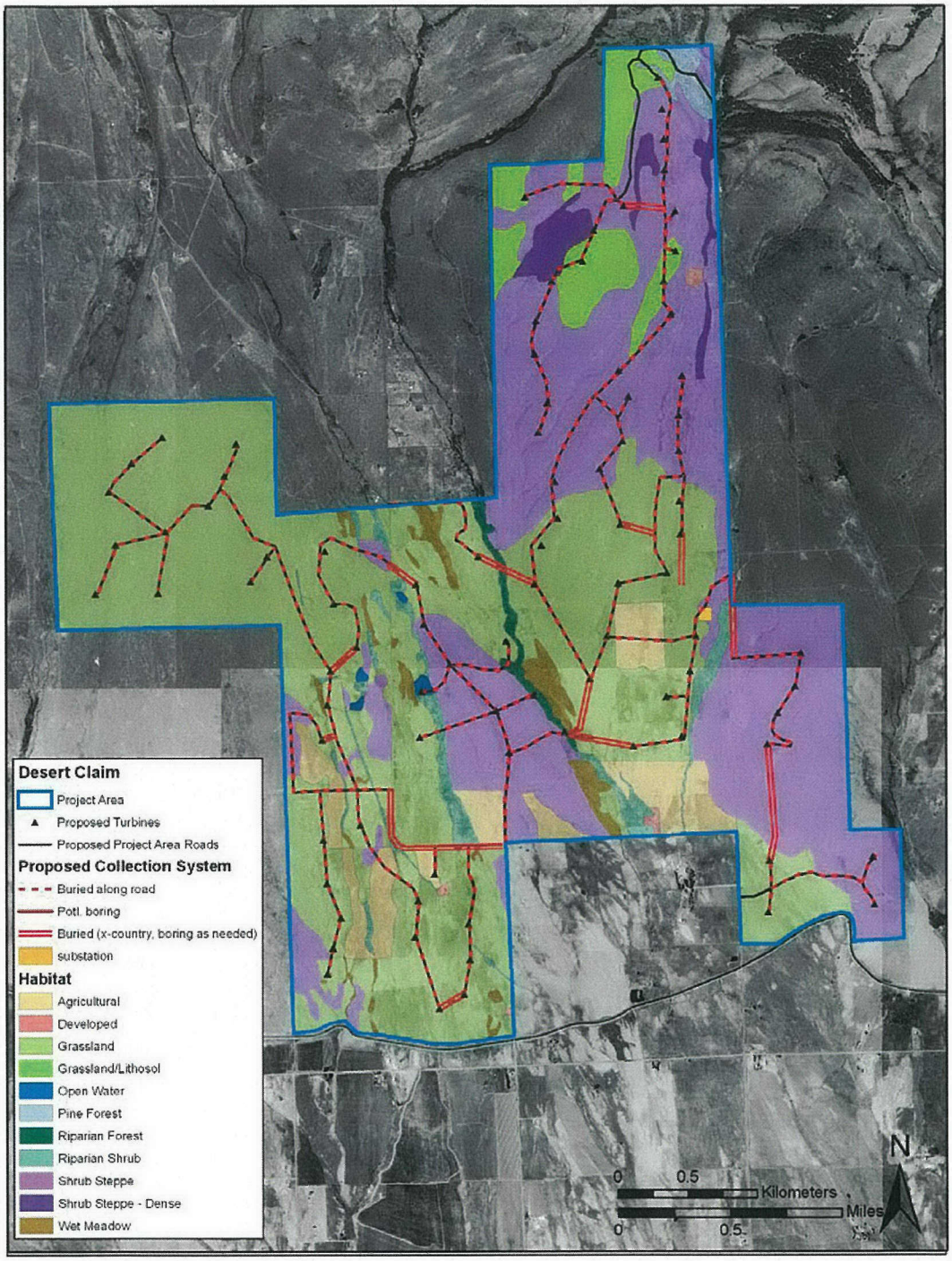


Figure 2. New Desert Claim Project Area Layout and Vegetation. Some of the new areas added require additional ground-truthing.

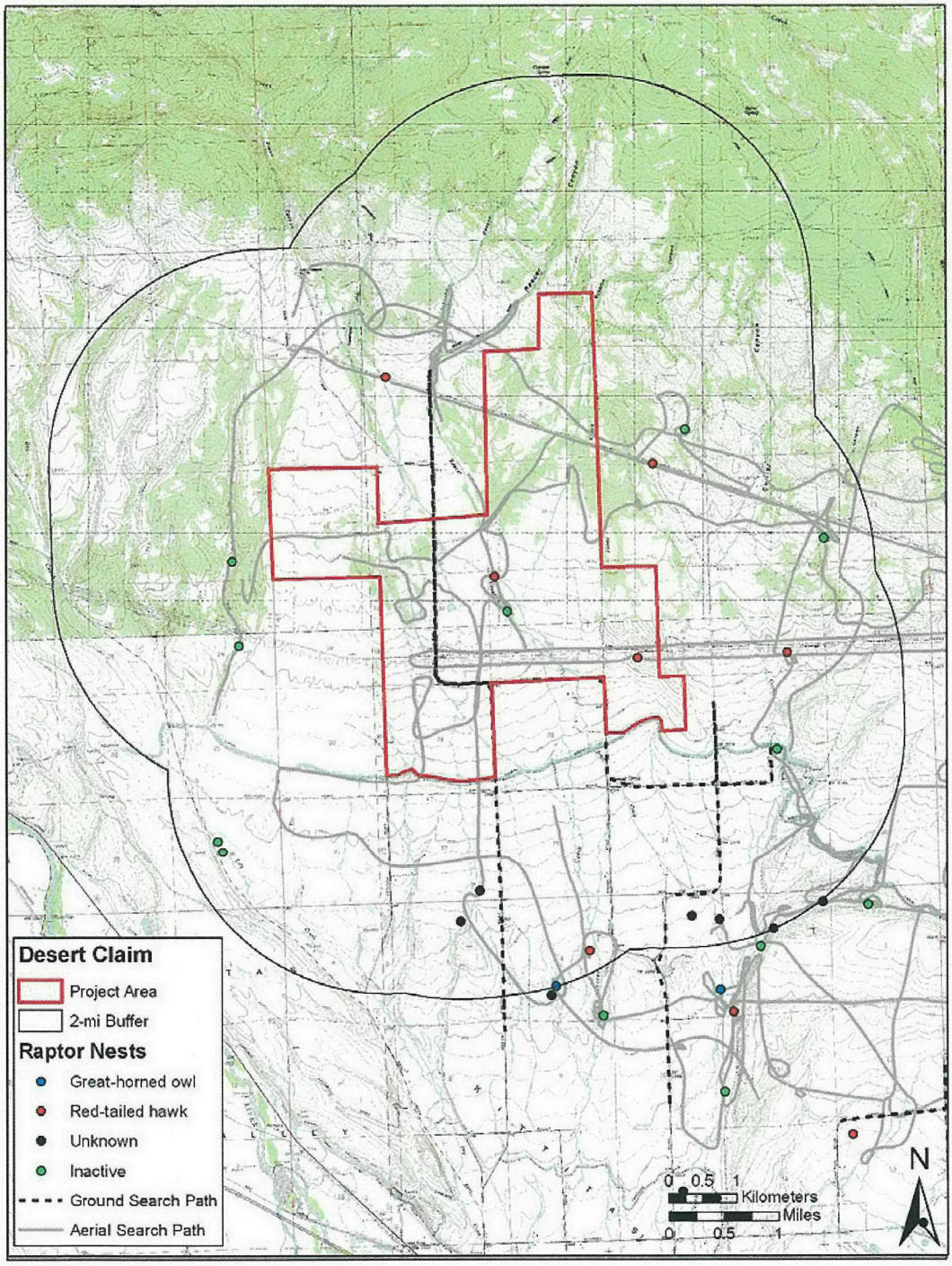


Figure 3. Raptor nest survey in relation to new project area.

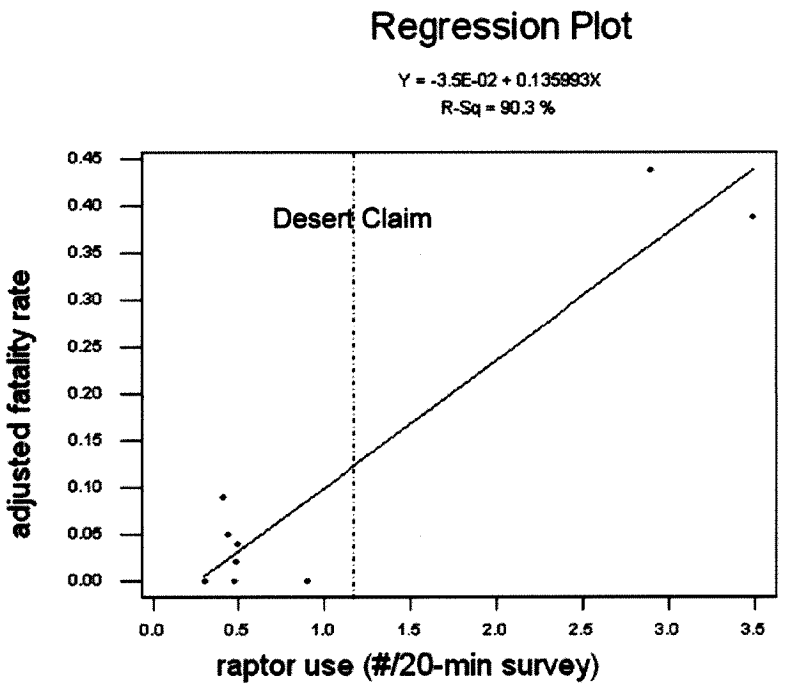
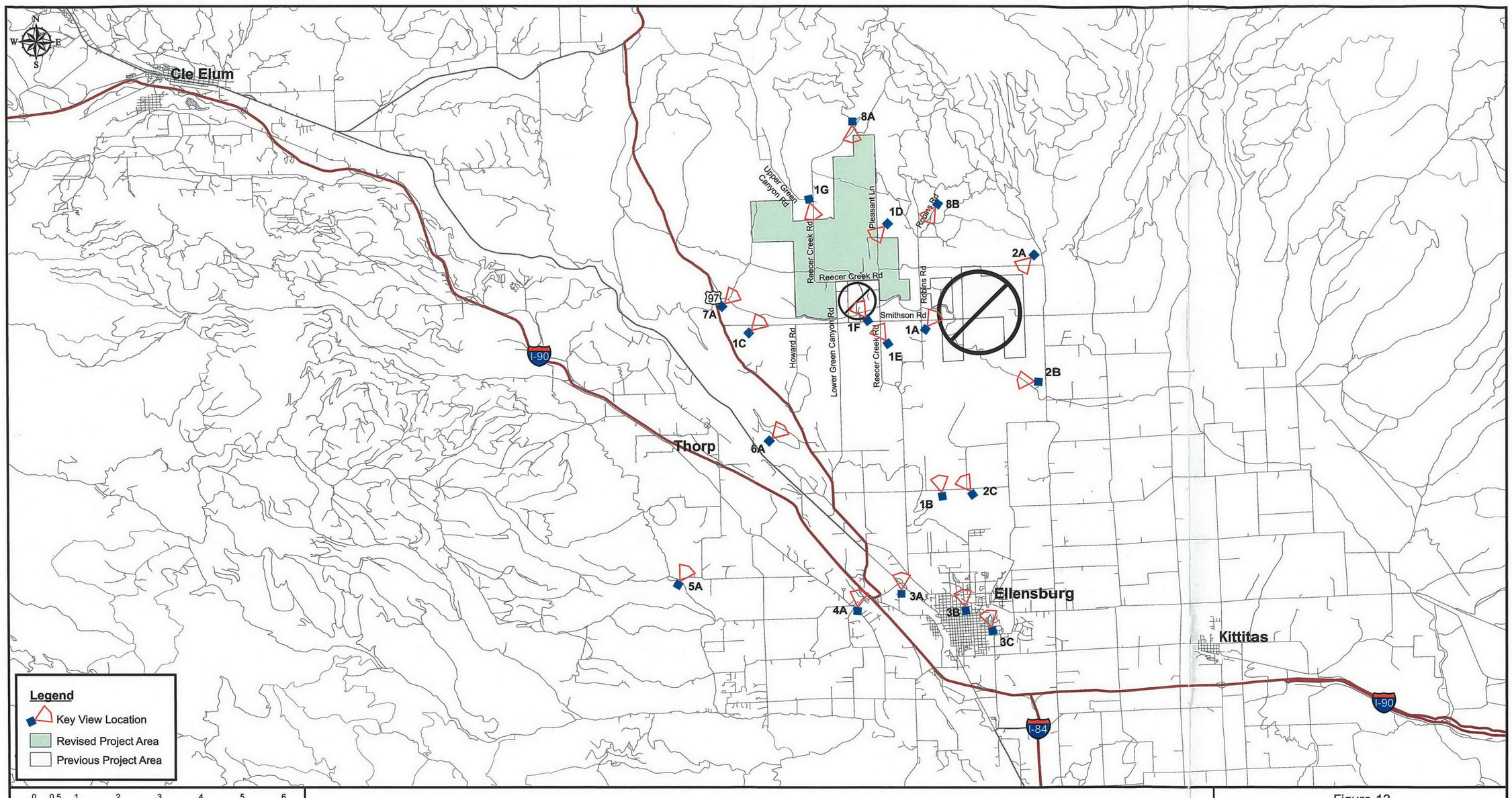


Figure 4. Relationship between raptor use and adjusted fatality rates for 9 newer wind projects.

VISUAL SIMULATIONS

The Applicant has prepared simulated views of the current Project proposal using the REpower MM92 turbines presented in this Application from the same locations in the County FEIS that where used to simulate views of the original project proposal during the County process. **Figure 13** shows the locations and direction of the view points.



0 0.5 1 2 3 4 5 6
Miles
Scale 1:150,000

Desert Claim Wind Power
Kittitas County, Washington

DESERT CLAIM WIND POWER

Kittitas County, Washington

Figure 13
SIMULATION LOCATIONS AND DIRECTIONS

Date: 10/2/2006	GIS Analyst: avh
Map Source Information:	

Desert Claim Wind Power

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Key View 1A

SIMULATED VIEW LOOKING NORTHEAST ACROSS THE NORTHWEST VALLEY FROM THE INTERSECTION OF SMITHSON ROAD AND ROBBINS ROAD

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 1B

SIMULATED VIEW LOOKING NORTHEAST ACROSS THE NORTHWEST VALLEY FROM THE INTERSECTION OF HUNGRY JUNCTION AND LOOKABOUT LANE

Date:	GIS Analyst:
10/17/06	avh

File Location:
r:\edms-projects\desert claim

Desert Claim Wind Power

Kittitas County, Washington

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Kittitas County, Washington

Key View 1C

EXISTING VIEW LOOKING NORTHEAST ACROSS THE NORTHWEST VALLEY ALONG SMITHSON ROAD NEAR U.S. HIGHWAY 97

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 1D

SIMULATED VIEW LOOKING SOUTHWEST ACROSS THE NORTHWEST VALLEY FROM IMMEDIATELY NORTH OF THE PROJECT AREA

Date:	GIS Analyst:
10/17/06	avh

File Location:
r:\edms-projects\desert claim

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 1E

SIMULATED VIEW LOOKING NORTHWEST ACROSS THE NORTHWEST VALLEY FROM REECER CREEK ROAD

Date:	GIS Analyst:
10/17/06	avh

File Location:
r:\edms-projects\desert claim

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 1F

SIMULATED VIEW LOOKING NORTHWEST ACROSS THE NORTHWEST VALLEY FROM SMITHSON ROAD NEAR CTC FARM

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 1G

SIMULATED VIEW LOOKING SOUTHEAST ACROSS THE NORTHWEST VALLEY FROM REECER CREEK ROAD IMMEDIATELY NORTH OF THE PROJECT BOUNDARY

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 2A

SIMULATED VIEW LOOKING SOUTHWEST ACROSS THE NORTHWEST VALLEY FROM WILSON CREEK ROAD

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 2B

SIMULATED VIEW LOOKING WEST ACROSS THE NORTHWEST VALLEY FROM WILSON CREEK ROAD ON RABBIT HILL

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 2C

SIMULATED VIEW LOOKING NORTHWEST ACROSS THE NORTHWEST VALLEY FROM THE NORTH END OF BOWERS AIRFIELD AT HUNGRY JUNCTION ROAD

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 3A

SIMULATED VIEW LOOKING NORTH ACROSS THE GREATER ELLENSBURG AREA OVER THE BURLINGTON RAILROAD NEAR U.S. HIGHWAY 97 AND CASCADE WAY

Date:	GIS Analyst:
10/17/06	avh

File Location:
r:\edms-projects\desert claim

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 3B

SIMULATED VIEW LOOKING NORTHWEST FROM THE CENTRAL UNIVERSITY CAMPUS

Date:	GIS Analyst:
10/17/06	avh

File Location:
r:\edms-projects\desert claim

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 3C

SIMULATED VIEW LOOKING NORTHWEST ACROSS GREATER ELLENSBURG FROM REED PARK IN ELLENSBURG

Date:	GIS Analyst:
10/17/06	avh

File Location:
r:\edms-projects\desert claim

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 4A

SIMULATED VIEW LOOKING NORTH ACROSS THE YAKIMA RIVER FROM THE INTERSECTION OF THE THORN HIGHWAY AND WEAVER ROAD

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 5A

SIMULATED VIEW LOOKING NORTH FROM THE SOUTHWEST VALLEY AT THE INTERSECTION OF KILLMORE ROAD AND ROBINSON ROAD

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 6A

SIMULATED VIEW LOOKING EAST FROM HAYWARD HILL AT THE TOP OF THE HILL

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 7A

SIMULATED VIEW LOOKING NORTHWEST FROM DRY CREEK SLOPE OFF U.S. HIGHWAY 97

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 8A

SIMULATED VIEW LOOKING SOUTH FROM TABLE MOUNTAIN SLOPE OVER THE KITTITAS BASIN

Date: 10/17/06	GIS Analyst: avh
File Location: r:\edms-projects\desert claim	

Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WINDPOWER

Kittitas County, Washington

Key View 8B

SIMULATED VIEW LOOKING SOUTHWEST ACROSS THE NORTHWEST VALLEY

Date:	GIS Analyst:
10/17/06	avh

File Location:
r:\edms-projects\desert claim

ecology and environment, inc.
International Specialists in the Environment

Portland Office
333 SW Fifth Avenue, Suite 808
Portland, Oregon 97204
Tel: (503) 248-5600. Fax: (503) 248-5577

October 31, 2006

Mr. David Steeb
Desert Claim Wind Power LLC
P.O. Box 4
Woodinville, WA 98072

RE: Impact Analysis to Wetlands and Streams
Desert Claim Wind Power Project, Ellensburg, Washington

Dear Mr. Steeb,

Ecology and Environment (E & E) have reviewed the Desert Claim Wind Power (Desert Claim) project layout maps to determine the potential impacts the turbine foundations, access roads, power collection system, and substation/maintenance building may have on wetlands, streams, and their respective buffers. A map prepared by E & E showing the project layout and project area water features is attached. E & E reviewed the portions of the proposed project that are in sections 4, 9, 16 – 18, 20 – 22, 27, and 29, in Township 19 North, Range 18 East. Field studies were performed by E & E during the County FEIS process while the recently added WDNR land was surveyed this past summer. Based on E & E's field work, Desert Claim Wind Power has carefully micro-sited the proposed locations of the project infrastructure to avoid any impacts to wetlands, streams, and their respective buffers. Our analysis shows there are no impacts to those areas.

The surrounding region is comprised predominately of upland environment and can be described as open country with shrub-steppe-covered rolling hills and flats. Typically, the dry environment of eastern Washington limits wetland areas to the immediate vicinity of perennial streams, seeps, and springs.

Within the project area, a total of 67 wetlands were identified. Of these wetlands, 2 were classified as Category IV according to the classification defined in the Kittitas County Critical Areas Ordinance (KCCAO). Category IV wetlands are: i) hydrologically isolated wetlands that are less than or equal to one acre in size, have only one wetland class, and are dominated (greater than 80 percent areal cover) by a single non-native plant species; or ii) hydrologically isolated wetlands that are less than or equal to two acres in size, have only one wetland class, and greater than 90 percent areal cover of non-native plant species. According to the KCCAO, Category IV wetlands have a buffer width of 25 feet.

Of the 67 wetlands, 65 were classified as Category III wetlands. These wetlands are those that do not satisfy categories I, II, or IV criteria, and have a habitat value rating of 21 points or less.

According to the KCCAO, these wetlands have a buffer of 80 feet. There are no permanent or temporary impacts to any wetlands or wetland buffers within the project area from the project infrastructure.

Also identified within the project area were 19 streams. Of these streams, 7 were classified as Type 3 streams (segments of natural waters which are not classified as Type 1 or 2 and have a moderate to slight fish, wildlife, or human use). The remaining 12 streams were classified as Type 4 (segments of natural waters within Kittitas County which are not classified as Type 1, 2, or 3 waters, and have a channel width of two feet or more between the ordinary high water marks) and Type 5 (segments of natural water within Kittitas County which are not classified as Type 1, 2, 3, or 4 waters, and have a channel width of two feet between the ordinary high water marks, including streams with or without well-defined channels). Type 4 and 5 streams are not truly waters, but are waterways which are intermittent in nature and may be dry beds at any time of the year. According to the KCCAO, the buffer width for Type 3 streams is 50 feet, and 15 feet for Type 4 and 5 streams.

There are no permanent or temporary impacts to streams or stream buffers within the project area. To avoid these impacts, Desert Claim proposes to permanently bridge project access roads across the three stream crossings and their associated buffers. Additionally, project access roads will span over irrigation ditches within the project area.

In locations where the power collection system intersects streams or irrigation ditches, Desert Claim proposes to either bore under or cross over, via on a bridge or by power poles, to avoid impacts to streams and their buffers.

E & E performed field studies and prepared the attached map. Based on our analysis of the Desert Claim Project as configured, we conclude that there will be no impact to wetlands or streams.

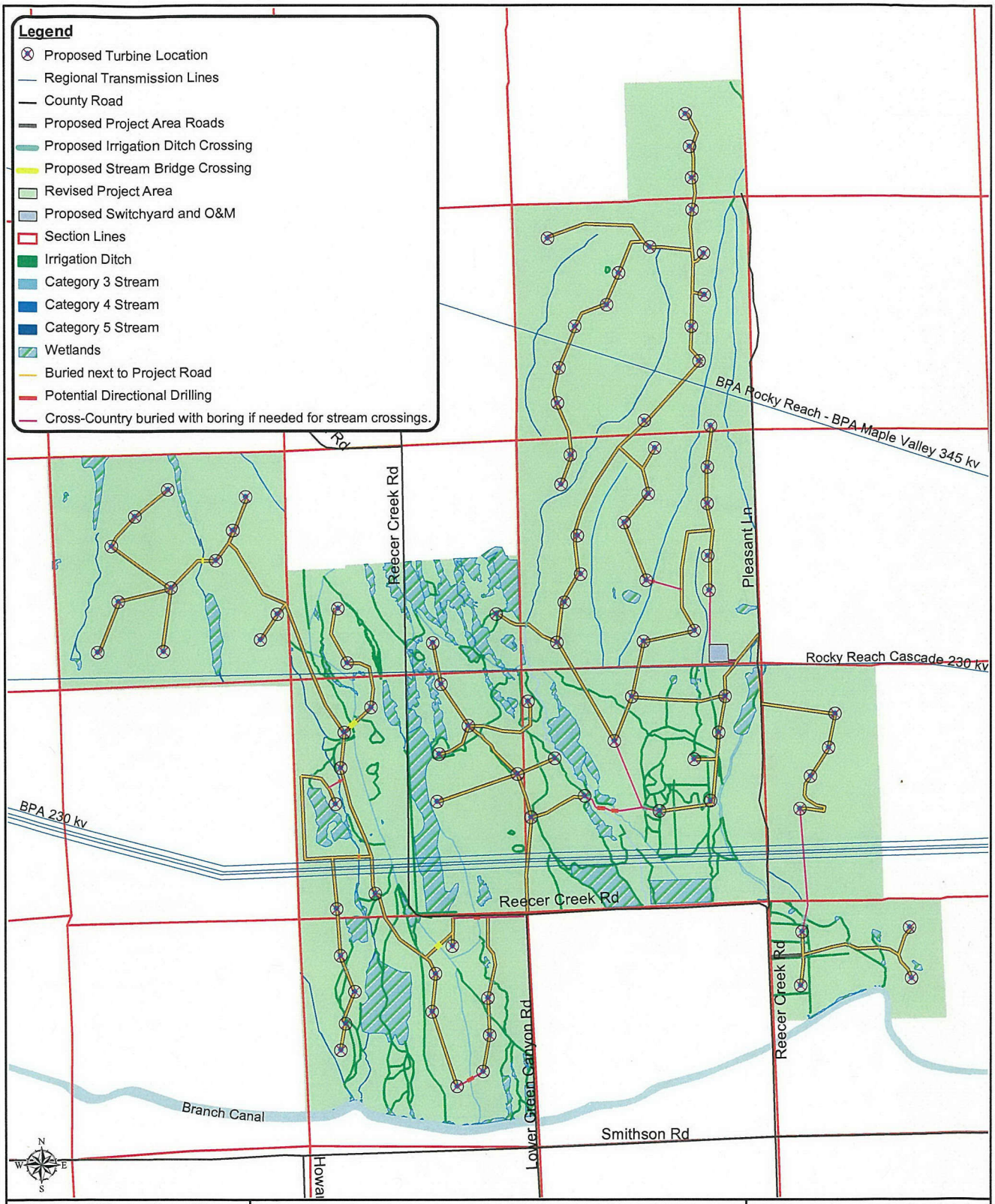
Sincerely,
ECOLOGY AND ENVIRONMENT, INC.

Noreen Roster

Noreen Roster, Senior Biologist
E & E Portland

Attachment

CC: Desert Claim Project File



Desert Claim Wind Power

Kittitas County, Washington

DESERT CLAIM WIND POWER

Kittitas County, Washington

PROJECT AREA WITH STREAMS, IRRIGATION and WETLANDS

Date:	GIS Analyst:
10/31/2006	avh

Map Source Information: USGS Topographic Map, 1:24,000 scale.