

Kittitas Valley Wind Power Project
 Project Area Zoning Designations
 Map Created August 19, 2005



KITTITAS VALLEY WIND POWER PROJECT
 DEVELOPMENT ACTIVITIES APPLICATION EXHIBIT 03a
 PROJECT AREA LEGAL DESCRIPTION UNDERLYING LANDOWNER CONTACT INFORMATION

ASSESSOR NO.	LEGAL *Detailed legal in Exhibit 3c, 'Landowner Consents to Development'	OWNER NAME	OWNER ADDRESS	ADDRESS 2	CITY	ST.	ZIP	PHONE
19-17-11000-0002	ACRES 100.32, CD. 7487-1; SEC. 11, TWP. 19, RGE. 17; PTN. NW1/4 (TRACTS 1 & 2, SURV. #501915)	ANDREW, NOEL	2701 ELK SPRINGS RD		ELLENSBURG	WA	98926	509-306-5348
19-17-11000-0003	ACRES 50.13, CD.#7487-1-1; SEC. 11; TWP. 19; RGE 17 PTN. NW1/4 (TRACT 3, SURVEY #501915)	ANDREW, NOEL	2701 ELK SPRINGS RD		ELLENSBURG	WA	98926	509-306-5348
19-17-21000-0001	ACRES 182.38, CD. 7514; SEC. 21; TWP. 19; RGE. 17; E1/2 OF SEC. E. OF HAYWARD RD. & NORTH OF KR; LESS 3.00 STATE	CASCADE FIELD & STREAM CLUB	PO BOX 424		CLE ELUM	WA	98922	509-674-9278
19-17-14000-0002	ACRES 260.84, CD. 7492-1; SEC. 14; TWP. 19; RGE. 17; PTN. W1/2 LY N STATE HWY 131 (SURVEY, B21/P197)	GENSON, MICHAEL K	101 ELK SPRINGS RD		ELLENSBURG	WA	98926	509-964-9082
19-17-14000-0003	ACRES 39.44, CD. 7492-1-1; SEC. 14; TWP. 19; RGE. 17; PTN. N1/2 NW1/4 (SURVEY B21/P197)	GENSON, MICHAEL K	101 ELK SPRINGS RD		ELLENSBURG	WA	98926	509-964-9082
19-17-14000-0004	ACRES 9.83, CD. 7492-1-2; SEC. 14; TWP. 19; RGE. 17; PTN. NW1/4 (SURVEY, B21/P197)	GENSON, MICHAEL K	101 ELK SPRINGS RD		ELLENSBURG	WA	98926	509-964-9082
19-17-11000-0005	ACRES 106.04, CD.#7487-1-3; SEC. 11; TWP. 19; RGE 17 PTN. SW1/4 (TRACTS 5 & 6, SURVEY #501915)	GENSON, MICHAEL K ETUX	101 ELK SPRINGS RD		ELLENSBURG	WA	98926	509-964-9082
19-17-23000-0014	ACRES 10.00, CD. 7535-1; SEC. 23; TWP. 19; RGE. 17; PTN. W1/2 LYING NLY OF BPA POWER LINE ROAD (SURVEY, B21/P197)	GENSON, MICHAEL K	101 ELK SPRINGS RD		ELLENSBURG	WA	98926	509-964-9082
19-17-01000-0002	ACRES 40.00, CD. 7452; SEC. 1; TWP. 19; RGE. 17; NE1/4 SW1/4	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-01000-0009	ACRES 40.00, CD.#7452-2; SEC. 1; TWP. 19; RGE. 17; NW1/4 SW1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-01000-0010	ACRES 40.00, CD.#7452-3; SEC. 1; TWP. 19; RGE. 17; SW1/4 SW1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-01000-0011	ACRES 40.00, CD.#7452-4; SEC. 1; TWP. 19; RGE. 17; SE1/4 SW1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-11000-0001	ACRES 70.00, CD. 7487; SEC. 11; TWP. 19; RGE. 17; N1/2 N1/2 NE1/4; N1/2 S1/2 N1/2 NE1/4; N1/2 S1/2 S1/2 N1/2 NE1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-11000-0006	ACRES 50.00, CD.#7487-2; SEC. 11; TWP. 19; RGE. 17; S1/2 S1/2 S1/2 N1/2 NE1/4; N1/2 S1/2 NE1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-11000-0007	ACRES 50.00, CD.#7487-3; SEC. 11; TWP. 19; RGE. 17; S1/2 S1/2 NE1/4; N1/2 N1/2 N1/2 N1/2 SE1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-11000-0008	ACRES 50.00, CD.#7487-4; SEC. 11; TWP. 19; RGE. 17; S1/2 N1/2 N1/2 N1/2 SE1/4; S1/2 N1/2 N1/2 SE1/4; N1/2 S1/2 N1/2 SE1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-11000-0009	ACRES 50.00, CD.#7487-5; SEC. 11; TWP. 19; RGE 17; S1/2 S1/2 N1/2 SE1/4; N1/2 N1/2 S1/2 SE1/4; N1/2 S1/2 N1/2 S1/2 SE1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495

Exhibit 7

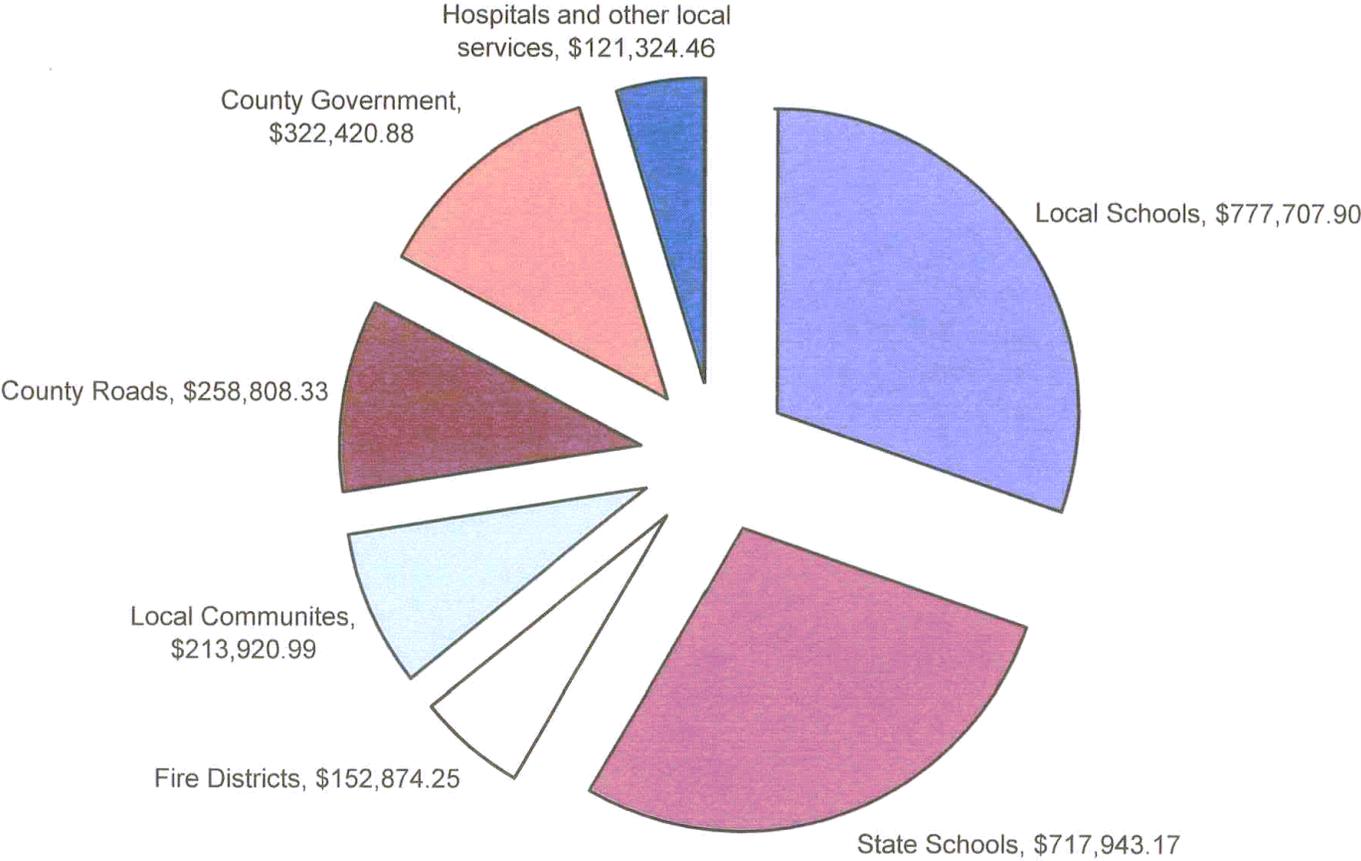
**KITTITAS VALLEY WIND POWER PROJECT
DEVELOPMENT ACTIVITIES APPLICATION EXHIBIT 03a
PROJECT AREA LEGAL DESCRIPTION UNDERLYING LANDOWNER CONTACT INFORMATION**

ASSESSOR NO.	LEGAL *Detailed legals in Exhibit 3c: *Landowner Consents to Development	OWNER NAME	OWNER ADDRESS	ADDRESS 2	CITY	ST	ZIP	PHONE
19-17-11000-0010	ACRES 50.00, CD.#7487-6; SEC. 11; TWP. 19; RGE. 17; S1/2 S1/2 N1/2 S1/2 SE1/4; S1/2 S1/2 SE1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-12000-0002	ACRES 70.00, CD. 7489; SEC. 12; TWP. 19; RGE. 17; N1/2 N1/2 NW1/4; N1/2 S1/2 N 1/2NW1/4; N1/2 S1/2 S1/2 N1/2 NW1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-12000-0006	ACRES 50.00, CD.#7489-1; SEC. 12; TWP. 19; RGE. 17; S1/2 S1/2 S1/2 N1/2 NW1/4; N1/2 S1/2 NW1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-12000-0007	ACRES 50.00, CD.#7489-2; SEC. 12; TWP. 19; RGE. 17; S1/2 S1/2 NW1/4; N1/2 N1/2 N1/2 N1/2 SW1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-12000-0008	ACRES 50.00, CD.#7489-3; SEC. 12; TWP. 19; RGE. 17; S1/2 N1/2 N1/2 N1/2 SW1/4; S1/2 N1/2 N1/2 SW1/4; N1/2 S1/2 N1/2 SW1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-12000-0009	ACRES 50.00, CD.#7489-4; SEC. 12; TWP. 19; RGE. 17; S1/2 S1/2 N1/2 SW1/4; N1/2 N1/2 S1/2 SW1/4; N1/2 S1/2 N1/2 S1/2 SW1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-12000-0010	ACRES 50.00, CD.#7489-5; SEC. 12; TWP. 19; RGE. 17; S1/2 S1/2 N1/2 S1/2 SW1/4; S1/2 S1/2 SW1/4;	GREEN, DANIEL A. ETUX	715 CARP LAKE RD		CAMANO ISLAND	WA	98282	360-387-3495
19-17-14000-0005	ACRES 50.00, CD.#7492-2; SEC. 14; TWP. 19; RGE. 17; PTN. E1/2 (LOT 2, SURVEY #505298-ROLLING ACRES)	GREEN, MARVIN ETUX	519 GOBBLER LN		HOLLADAY	TN	38341	217-553-2130
19-17-14000-0001	ACRES 54.53, CD. 7492; SEC. 14; TWP. 19; RGE. 17; PTN. E1/2 (LOT 1, SURVEY #505298-ROLLING ACRES); LESS .39 STATE; 2.63 SR 135;	KROGSTAD, KARL ETUX	PO BOX 95260		SEATTLE	WA	98145	206-323-6472
19-17-15000-0007	ACRES 69.06, CD. 7495-4; SEC. 15, TWP. 19, RGE. 17; PTN. S1/2 (PARCEL F, B29/P242-244)	LOS ABUELOS INC	361 CEDAR COVE RD		ELLENSBURG	WA	98926	509-925-3902
19-17-15000-0008	ACRES 51.49, CD. 7495-5; SEC. 15, TWP. 19, RGE. 17; PTN. SW1/4 (PARCEL G, B29/P242-244)	LOS ABUELOS INC	361 CEDAR COVE RD		ELLENSBURG	WA	98926	509-925-3902
19-17-15000-0009	ACRES 32.42, CD. 7495-6; SEC. 15, TWP. 19, RGE. 17; PTN. W1/2 W1/2 (PARCEL H, B29/P242-244)	LOS ABUELOS INC	361 CEDAR COVE RD		REDMOND	WA	98926	509-925-3902
19-17-15000-0010	ACRES 32.39, CD. 7495-7; SEC. 15, TWP. 19, RGE. 17; PTN. NW1/4; PTN. SW1/4 (PARCEL J, B29/P242-244)	LOS ABUELOS INC	361 CEDAR COVE RD		ELLENSBURG	WA	98926	509-925-3902
19-17-14000-0006	ACRES 50.00, CD.#7492-3; SEC. 14; TWP. 19; RGE. 17; PTN. E1/2 (LOT 3, SURVEY #505298-ROLLING ACRES)	MAJORS, JAMES L. ETUX	521 RUSTIC RD.		ELLENSBURG	WA	98926	509-962-4059
19-17-03000-0003	ACRES 400.00, CD. 7456-1; SEC. 3; TWP. 19; RGE. 17; NE 1/4 & PTN. S 1/2 E. SR131	PAUTZKE BAIT CO INC	PO BOX 36		ELLENSBURG	WA	98926	509-925-9365
19-17-10000-0001	ACRES 160.00, CD. 7483; SEC. 10; TWP. 19; RGE. 17; E1/2 E1/2	PAUTZKE BAIT CO INC	PO BOX 36		ELLENSBURG	WA	98926	509-925-9365
20-17-34000-0004	ACRES 80.00, CD. 7766; SEC. 34; TWP. 20; RGE. 17; S 1/2 SE 1/4	PAUTZKE BAIT CO INC	PO BOX 36		ELLENSBURG	WA	98926	509-925-9365
19-17-22000-0003	ACRES 40.00, CD. 7532; SEC. 22; TWP. 19; RGE. 17; SW1/4 NW1/4	SCHOBER, KEITH W. ETUX	PO BOX 72		CLE ELUM	WA	98922	509-674-2217

KITTITAS VALLEY WIND POWER PROJECT
 DEVELOPMENT ACTIVITIES APPLICATION EXHIBIT 03a
 PROJECT AREA LEGAL DESCRIPTION UNDERLYING LANDOWNER CONTACT INFORMATION

ASSESSOR NO.	LEGAL *Detailed legals in Exhibit 3c, Landowner Consents to Development	OWNER NAME	OWNER ADDRESS	ADDRESS 2	CITY	ST	ZIP	PHONE
19-17-22000-0008	ACRES 80.00, CD. 7532-1; SEC. 22; TWP. 19; RGE. 17; N1/2 SW1/4	SCHOBER, KEITH W. ETUX	PO BOX 72		CLE ELUM	WA	98922	509-674-2217
19-17-22000-0009	ACRES 40.00, CD. 7532-2; SEC. 22; TWP. 19; RGE. 17; SE1/4 SW1/4	SCHOBER, KEITH W. ETUX	PO BOX 72		CLE ELUM	WA	98922	509-674-2217
19-17-27000-0001	ACRES 506.50, CD. 7563; SEC. 27, TWP. 19, RGE. 17 TAX NO. 1	SCHOBER, KEITH W. ETUX	PO BOX 72		CLE ELUM	WA	98922	509-674-2217
19-17-28010-0001	ACRES 27.70, CD. 7564; SEC. 28, TWP. 19, RGE. 17 NE1/4 NE1/4 TAX NO'S. 8 & 9	SCHOBER, KEITH W. ETUX	PO BOX 72		CLE ELUM	WA	98922	509-674-2217
19-17-02000-0001	ACRES 155.33, SEC. 2; TWP. 19; RGE. 17 NE 1/4 LOTS 1 & 2	STATE OF WASH (DNR)	1111 WASHINGTON ST SE	PO BOX 47016	OLYMPIA	WA	98504-7016	509-925-8510
19-17-02000-0003	ACRES 40.00, SEC. 2; TWP. 19; RGE. 17 SW 1/4 NW 1/4	STATE OF WASH (DNR)	1111 WASHINGTON ST SE	PO BOX 47016	OLYMPIA	WA	98504-7016	509-925-8510
19-17-02000-0005	ACRES 280.00, SEC. 2; TWP. 19; RGE. 17 ALL S 1/2 EXCEPT NE 1/4 SW 1/4	STATE OF WASH (DNR)	1111 WASHINGTON ST SE	PO BOX 47016	OLYMPIA	WA	98504-7016	509-925-8510
19-17-10000-0002	ACRES 80.00, SEC. 10; TWP. 19; RGE. 17 W 1/2 NE 1/4	STATE OF WASH (DNR)	1111 WASHINGTON ST SE	PO BOX 47016	OLYMPIA	WA	98504-7016	509-925-8510
19-17-10000-0005	ACRES 80.00, SEC. 10; TWP. 19; RGE. 17 W 1/2 SE 1/4	STATE OF WASH (DNR)	1111 WASHINGTON ST SE	PO BOX 47016	OLYMPIA	WA	98504-7016	509-925-8510
19-17-10000-0006	ACRES 320.00, SEC. 10; TWP. 19; RGE. 17 ALL W 1/2	STATE OF WASH (DNR)	1111 WASHINGTON ST SE	PO BOX 47016	OLYMPIA	WA	98504-7016	509-925-8510
19-17-16000-0001	ACRES 640.00, SEC. 16; TWP. 19; RGE. 17 ALL SECTION	STATE OF WASH (DNR)	1111 WASHINGTON ST SE	PO BOX 47016	OLYMPIA	WA	98504-7016	509-925-8510
19-17-22000-0001	ACRES 240.00, SEC. 22; TWP. 19; RGE. 17 ALL NE 1/4; N 1/2 NW 1/4	STATE OF WASH (DNR)	1111 WASHINGTON ST SE	PO BOX 47016	OLYMPIA	WA	98504-7016	509-925-8510
19-17-22000-0002	ACRES 40.00, SEC. 22; TWP. 19; RGE. 17 SE 1/4 NW 1/4	STATE OF WASH (DNR)	1111 WASHINGTON ST SE	PO BOX 47016	OLYMPIA	WA	98504-7016	509-925-8510
19-17-22000-0005	ACRES 40.00, SEC. 22; TWP. 19; RGE. 17 SW 1/4 SW 1/4	STATE OF WASH (DNR)	1111 WASHINGTON ST SE	PO BOX 47016	OLYMPIA	WA	98504-7016	509-925-8510
19-17-22000-0007	ACRES 160.00, SEC. 22; TWP. 19; RGE. 17 ALL SE 1/4	STATE OF WASH (DNR)	1111 WASHINGTON ST SE	PO BOX 47016	OLYMPIA	WA	98504-7016	509-925-8510
19-17-14000-0010	ACRES 20.20, CD.#7492-7; SEC. 14; TWP. 19; RGE. 17; PTN. E1/2 (LOT 7, SURVEY #505298 ROLLING ACRES)	STEINMAN, ANDREA A	19822 28TH AVE W		LYNNWOOD	WA	98036	425-774-0790
19-17-14000-0009	ACRES 50.08, CD.#7492-6; SEC. 14; TWP. 19; RGE. 17; PTN. E1/2 (LOT 6, SURVEY #505298 ROLLING ACRES)	STEINMAN, MERLE JR	19822 28TH AVE W		LYNNWOOD	WA	98036	425-774-0790
19-17-09010-0003	ACRES 60.00, CD. 7480; SEC. 9; TWP. 19; RGE. 17; S1/2 NE1/4 E. OF CO. RD.	THOMAS, CARLA L.	911 ROBBINS RD		ELLENSBURG	WA	98926	509-962-8572
19-17-09040-0003	ACRES 105.00, CD. 7480-1; SEC. 09, TWP. 19, RGE. 17; SE1/4 E OF CO. RD.	THOMAS, CARLA L.	911 ROBBINS RD		ELLENSBURG	WA	98926	509-962-8572
19-17-15000-0001	ACRES 268.00, CD. 7494; SEC. 15; TWP. 19; RGE. 17; ALL NO. CO. RD. EX. PTN. LYING E. SR 131 ROAD @ 24.07	THOMAS, CARLA L.	911 ROBBINS RD		ELLENSBURG	WA	98926	509-962-8572
19-17-11000-0004	ACRES 50.18, CD.#7487-1-2; SEC. 11; TWP. 19; RGE 17 PTN. W1/2 (TRACT 4, SURVEY #501915)	TRITT, LARRY L ETUX	PO BOX 725		ROSLYN	WA	98941	509-649-3611

Estimated Tax Revenues



Economic Impacts of Wind Power in Kittitas County

Final Report

A Report for the

**Phoenix Economic Development
Group**

by

ECONorthwest

888 SW Fifth Ave, Suite 1460
Portland, OR 97204
(503) 222-6060

October 2002

Acknowledgements

This report was prepared by ECONorthwest's Portland office and was paid for by the Phoenix Economic Development Group of Ellensburg, WA. Dr. Stephen Grover was the ECONorthwest project manager for this analysis and was the primary author of this report. Questions regarding this report should be directed to him at grover@portland.econw.com or by phoning the Portland office at (503) 222-6060. Dr. Grover was assisted in this project by Anne Fifield, Alec Josephson, and Bob Whelan.

The Economic Impacts of A Proposed Wind Power Plant in Kittitas County, WA

An Evaluation of Potential Impacts on Property Values, Tax Revenues, and the Local Economy

I. Introduction and Summary

Two different wind energy companies are currently developing plans for constructing and operating wind power turbines in Kittitas County. The energy company Zilkha Renewable Energy has proposed a project with 110 wind turbines that have the combined potential to generate approximately 165 megawatts of electricity during peak wind periods. A second company enXco is proposing building 150 additional wind turbines with a total of 225 megawatts of generation potential. These two project combined would involve the construction and operation of 265 wind turbines with a potential generating capacity of 390 megawatts of electricity.

As part of the planning process for these projects, the Phoenix Economic Development Group has hired ECONorthwest to evaluate the potential economic impacts of constructing and operating the wind plants in Kittitas County. Specifically, ECONorthwest was asked to analyze and help quantify impacts in three key areas of interest:

- **Property Values.** Local residents have voiced concern that constructing numerous wind turbines in the valley will detract from views and ultimately reduce property values.
- **Economic Impacts.** The wind plants will create jobs and increase spending in the economy during the construction phase and during plant operations.
- **Tax Revenues.** The increase in jobs and local spending will also increase tax revenues for Kittitas County.

To research these issues, we utilized several different analysis techniques. We surveyed tax assessors in other counties with wind projects to determine the potential effects of wind farms on property values. We also conducted a review of the available academic literature for additional information on property value effects. Local economic impacts were estimated using an input-output model based on construction and operations data obtained from the two companies proposing wind projects in Kittitas County. Tax revenues were estimated from the input-output model results based on tax rate and spending information obtained from Kittitas County.

Our analysis in these areas has resulted in the following key findings:

- *Views of wind turbines will not negatively impact property values.* Based on a nation-wide survey conducted of tax assessors in other areas with wind power projects, we found no evidence supporting the claim that views of wind farms decrease property values.

- *Wind plant construction will have significant economic benefits.* The construction of over 250 turbines will create approximately 185 full and part time jobs in Kittitas County and will increase total income to the county by over \$12 million during the construction period.
- *Wind plant operation will provide additional annual economic benefits.* The wind farm operations will require 53 additional jobs and will increase income to the county from salaries and operations expenses by over \$4 million annually.
- *Property tax revenues will increase.* The construction of the wind farm will increase property tax revenues collected in the Kittitas County by approximately \$2.8 million dollars annually -- an increase of 11 percent over current property tax revenues. The majority of this increase is due to the property tax paid on the wind turbines.
- *Tax revenues to Kittitas County Government will also increase.* Tax revenues accruing directly to Kittitas County Government will be approximately \$693,000 annually. This increase results from the County's share of new property tax revenue and from increases in other taxes.

Details on the analysis underlying each of these results are presented in the remainder of this report.

II. Property Value Impacts

One of the biggest concerns of the community is that the installation of numerous wind turbines will detract from the current viewscape in the Kittitas Valley and that the destruction of this view will ultimately reduce residential property values.

We conducted two separate analysis tasks to address this issue. First, we conducted a phone survey of tax assessors for counties that recently had wind turbines installed in their areas. In addition to interviewing tax assessors, we also reviewed the current literature for statistical studies that quantified the impact of wind turbines on property values. For comparison purposes, we also reviewed the literature on the impact that transmission lines have on property values.

A. Tax Assessor Interviews

The first step in our survey of tax assessors was to develop an appropriate sample of sites for the analysis. These sites were chosen using the following criteria:

- *Projects constructed within the last 10 years.* Recently completed projects were used to ensure that reliable information was obtained from the assessor. Recent sites are also more likely to have the same turbine technology that is planned for Kittitas County.
- *View locations.* As much as possible, we attempted to find wind farms that could be seen from residences rather than focusing only on sites in remote or very rural locations.

- *Multiple turbines.* We focused on those areas where multiple turbines were installed to be comparable with the projects proposed for Kittitas County.

We applied these criteria to information obtained from the American Wind Energy Association website to locate candidate wind projects in areas throughout the U.S. Table 1 shows descriptive information on 19 projects we located using this method.

Table 1: Location and Size of Wind Farms Used In Analysis

State	Location	County	Project Name	Year	MW	Turbine Manufact	# of Turbines
WY	Carbon County	Carbon	Foote Creek Rim 4	2000	16.80	NEG Micon	28
CA	San Geronio Pass	Riverside	Cabazon	1999	39.75	Zond Z-750	53
CA	San Geronio Pass	Riverside	Westwind	1999	46.50	NEG Micon	65*
CA	Tehachapi	Kern	Oak Creek Phase 2	1999	23.10	NEG Micon-700	33
CA	Tehachapi	Kern	Cameron Ridge	1999	56.00	NEG Micon	80
CA	Tehachapi	Kern	Pacific Crest	1999	45.54	Vestas V-47	69
WY	Carbon County	Carbon	Foote Creek Rim 1	1999	41.40	Mitsubishi	69
WY	Carbon County	Carbon	Foote Creek Rim 3	1999	24.75	NEG Micon	33
TX	Culberson County	Culberson	American Nat. Wind Power/ Orion Energy	1999	30.00	Zond	40
TX	Big Spring I	Howard	Howard County	1999	27.72	Vestas V-47	42
TX	Crockett County	Crockett	Southwest Mesa Wind Farm	1999	74.90	NEG Micon (107)	107
MN	Pipestone County	Lincoln	Lake Benton - 2	1999	103.50	Zond	138
IA	Storm Lake	Buena Vista	Storm Lake	1999	112.50	Zond - 50 (150)	150
IA	Storm Lake	Buena Vista	Storm Lake	1999	80.25	Zond - 50 (150)	107*
OR	Helix	Umatilla	1. Vansycle Ridge	1998	25.10	Vestas V-47	38
MN	Pipestone County	Lincoln	Lake Benton - 1	1998	107.25	Zond	143
TX	Culberson County	Culberson	Lower Colorado River Authority	1995	35.00	Kenetech	112
MN	Buffalo Ridge	Nobles	Kenetech Windpower	1994	25.00	Kenetech	73
CA	Tehachapi	Kern	Sky River	1993	76.95	Vestas V-27	342

Note: * Number of turbines estimated by ECONorthwest based on reported MW capacity.

In addition to the sites shown in Table 1, we also added projects in Alameda County, California, Walla Walla County, Washington, and the Town of Lincoln, Wisconsin as they all contain wind projects that are similar to that proposed for Kittitas County. The final sample included 22 wind projects located in 13 different counties throughout the country.

Once the sample was determined, the next step was to interview tax assessors within each county to determine the effect these projects had on residential property values. We chose to interview assessors as they are required to provide objective assessments of property values. If assessments are perceived to be too high by the landowners, the assessed value may be challenged in court. Unlike real estate agents, who have a financial stake in the market values of properties they sell, tax assessors do not have an incentive to inflate property values or to exaggerate the possible effects of wind turbines. For these reasons, we chose to interview tax assessors as they are the best available source for unbiased information on the effects of wind turbines on property values.

From our initial target sample, we were able to interview assessors from all thirteen counties. Based on these interviews, we found no evidence indicating that views of wind turbines decreased property values. Of the counties we interviewed, six contain residential properties with views of the wind turbines, and six counties lack residences with a view of the turbines. One county reported that the wind farm is too new for the assessor's office to know if nearby property values have been affected.

Six counties reported that residential properties have views of the wind turbines, but the turbines have not altered the value of those properties. Responses from assessors in these counties were similar:

- Kern, California—Residents are able to see the turbines from many locations within the town of Tehachapi. The views of the wind turbines have not affected the assessed values of these residences.
- Lincoln, Minnesota—The turbines are located about two miles outside of town. The turbines do not block the view of any particular feature, but residents can see them if they look for them. The assessor hasn't heard anyone complain about the turbines' appearance. Some residences located in the rural parts of the county have closer views of the turbines, but the turbines have not impacted their land values.
- Buena Vista, Iowa—Many residences in the towns of Alta and Storm Lake have views of the turbines. The turbines are easily seen from town, they are located a couple of miles outside of town, and sit on a high ridge. There has been no impact on land values.
- Howard, Texas—There are no homes within two miles of the wind turbines, but because the terrain is so flat, the turbines are visible from as far as 25 miles away. Appraised land values have not declined because of views of the turbines. The appraiser reported that their office expected property owners to complain about lowered property values caused by a diminished view, but so far they have received no complaints.
- Walla Walla County, WA—The turbines are on a high cliff that has a lot of wind and low land values. The unincorporated town of Touchet lies about 8 miles from the turbines and some residents do not like the views of the turbines as it affects their view of the sunset. This factor has not translated into lower land values according to the assessor. Touchet's tax base rose from just over \$100 million to \$265 million with the addition of the wind farm and resulted in the addition of 20 to 25 permanent local jobs according to the assessor.
- Town of Lincoln, Wisconsin—The assessor reported that when the turbines were first installed, residents complained about the diminished view. However, in the three years since installation, residents have become used to them, and no one complains now. One homeowner had claimed that the assessed value of his property should be reduced because of the wind turbines. The County asked him to show that the value of sales of properties near the turbines had diminished, and he was unable to do so.

To investigate further the potential impacts on property values, Lincoln's assessor compared the 2001 assessed value to actual sales (for arms-length transactions of residential properties) and found that the ratio of assessed values to actual sales prices for properties less than one mile from the wind turbines was no greater than for properties more than a mile from the wind turbines. The assessor noted that the wind turbines had negatively impacted television reception for nearby properties, but the utility company provided the impacted homes with better antennas or a satellite dish to bring reception back to previous levels.

The wind farms have had no impact on neighboring property values in five counties as neighboring properties are in agricultural production. Assessors' offices in Alameda, California, Carbon, Wyoming, Crockett and Culberson in Texas, and Umatilla, Oregon reported that no residential properties have views of the wind farms. The neighboring properties are grazing land, and the value of the land is determined by its productivity, not its views. For Riverside County, California, the wind farm was built along the freeway with a buffer zone to separate it from residences. Consequently, very few homes have a view of the turbines in that county and the assessor reports that there has been no impact on property values. Nobles County, Minnesota reported that the wind farm in the county was installed in the past year, and it is too early to determine if they have affected neighboring property values.

One county reported that land parcels with wind turbines located on them have changed in value. Kern County, California reported that property eligible for a wind turbine greatly increases in value. The first step to siting a wind turbine is to change the land from a grazing zone to a "wind-energy" zone. By changing the zone, the land value increases from about \$300 to about \$1000 per acre. No other county reported such an impact to land values.

Wind farms in two counties, Howard in Texas and Umatilla in Oregon, have added to the tax base. The assessors' offices reported that the wind turbines are large capital improvements, and they have contributed to the tax base. This was not a specific question in the interview, and these two counties volunteered the information. The same is likely true in other counties, but the issue was not pursued during the assessor interviews.

Representatives from three assessors' offices reported that community members like the appearance of the wind turbines. The appraiser in Kern County speculated that residents like the appearance of the wind turbines as long as the turbines are functioning. The turbines that were built in the early 1980s had a high failure rate, and many of the turbines just sat on the property in disrepair. That experience led many to feel that wind farms are an eyesore. The newer turbines have a very low failure rate, and residents can see the turbines are operating and creating an economic good, which positively impacts their perceptions of the turbines.

In Kern County, some residents located on rural properties complained about the plan to locate wind turbines near their properties. They argued that they had bought their properties with the expectation of a view of grazing land, not a wind farm. To solve the problem, the wind developer paid them for the property and the people moved. The wind developer then sold the property, although the property values did not decrease.

B. Literature Review

The results of the tax assessor interview show that views of wind turbines do not negatively impact property values. In addition to these interviews, we also conducted a literature review to determine if other studies had found credible evidence of a negative impact on property values. We restricted our literature review to academic journals that only publish articles that have been subjected to a peer review process. References for the articles we reviewed are included in Appendix B of this report.

We found only one study that specifically addressed the potential impact of wind turbines on property values and this study was based on residential property in Denmark. The hedonic study showed that house values were 94 Danish kroners (about \$17 per home in 1995 U.S. dollars) lower close to wind farms than other houses located further away but with otherwise similar characteristics. This result was based on a small sample of homes, however, and was not statistically significant.

One of the likely reasons that wind turbines do not diminish property values is that not all people agree that views of wind turbine are undesirable. As reported by the tax assessors, some residents find views the wind turbines attractive. If a homeowner dislikes having a view of the wind farm, they may move and sell their house to someone who likes the view. In this case, property values would not be diminished.

We also reviewed the academic literature addressing transmission lines and their impact on property values. Unlike wind turbines, transmission lines are almost universally considered unattractive. There is also widespread belief that living near transmission lines is a health hazard. For these reasons, there is a much clearer case that transmission lines will negatively affect property values.

Legal cases have agreed that the public perception of danger or health risk can impact property value, regardless of the reasonableness of the public's fear (Rikon 1996).

It is important to emphasize the purpose of reviewing the literature on transmission lines for this analysis. Our review of the literature on transmission lines was done solely to provide an indication of the maximum negative effect views of wind turbines might have on property values *if such a negative impact exists*. As we have indicated from our assessor interviews and literature review, we have not found any evidence that views of wind turbines have any effect on property values. Nevertheless, the information from the literature on power lines is informative.

The evidence from the literature on transmission lines shows that their effect on property values is small and relatively short-lived. The maximum impact on adjacent properties due to transmission lines is about a 10 percent reduction in value. Many studies use hedonic estimation techniques to measure the impact transmission lines have on property values while controlling for other features of the homes. The most recent study (Des Rosiers 2002) found a severe visual encumbrance due to a direct view on a transmission line pylon does exert a negative impact on property prices. Overall, the price reduction stands at roughly 10 percent of average house value. However, being adjacent to the easement will not necessarily cause a house to depreciate. It may even increase its value where proximity advantages (enlarged visual field, increased privacy) exceed drawbacks. Additionally, findings for the non-adjacent properties that have views of the power lines translates in most cases into higher values, due to the improved visual clearance.

Some earlier studies agree that transmission lines have a slight negative impact on property values. Hamilton (1995) found that properties adjacent to a line lose 6.3 percent of their value due to proximity and the visual impact. Properties more distant from transmission lines are scarcely affected, losing roughly 1 percent of their value. Delaney and Timmons (1992) found that, generally, real estate appraisers believe that transmission lines reduce the value of nearby residential properties by 10 percent. The authors' survey found that 84 percent of the surveyed appraisers believed transmission line have a negative impact, 10 percent believed that there is no impact, and 6 percent

believed that there was a positive impact on property values. Colwell (1990) found that properties within 50 feet of an HTVL have a 6 percent to 9 percent lower value than comparable properties, but that drop in value lessens over time and tends to fade away.

As the literature indicates, the negative effect on property values due to transmission lines is 10 percent or less, with this effect diminishing over time. This is reported only for comparison purposes for the case of wind turbines. Again, information from tax assessors and the literature indicate that views of wind turbines do not negatively affect property values.

III. Local Economy

A second component of our analysis addressed the economic impact of the wind turbines on the Kittitas County economy. We interviewed representatives from both Zilkha and enXco to determine the amount of spending and employment for the proposed projects. Using this information, we used a regional ‘input-output’ model with data specific to Kittitas County to estimate the economic impacts of the project. We used our model to estimate the economic impacts for both the construction phase and the operations phase of this project. Details on both these phases are reported below.

A. Construction

The construction of 265 individual wind turbines will involve a significant amount of employment and spending during the construction period. We have talked to representatives from both Zilkha and enXco to determine the likely employment and construction spending. Based on these conversations and our experience analyzing similar projects we developed estimates for use in our model. Our input parameters for the construction phase included:

- 85 full and part time local construction jobs
- 10 full and part time jobs for wind company and utility personnel to manage the plant construction phase
- \$6,400,000 in local spending on construction materials (i.e., gravel, concrete)
- \$886,000 in spending on food and lodging for non-local labor brought to Kittitas County for the construction period

Based on these and other input parameters, we estimated the impacts to the local economy for a construction period predicted to last approximately one year.

For the input-output model, economic impacts are grouped into three different categories:

- **Direct economic impacts.** Businesses directly purchase goods and services in their local economies. An increase in spending, therefore, affects the economy directly through increased purchases.
- **Indirect economic impacts.** Businesses also indirectly affect local economies, as those firms that provide direct services to the wind project must also purchase materials and supplies themselves. For instance, a construction contractor working on this project will lease some equipment or purchase supplies locally. Increased purchases of “intermediate” goods and services will also promote additional economic activity.

- **Induced economic impacts.** The direct and indirect effects of employment and income affect overall economy purchasing power, thereby affecting further consumption spending. For instance, wind plant employees who use their income to buy groceries or take their family to the movies generate economic impacts for workers and businesses in those sectors. These individuals will, in turn, spend their income much like the wind plant employees do. This cycle continues until the spending eventually leaks out of the local economy as a result of taxes, savings, or purchases of non-locally produced goods and services or “imports.”

In addition to these categories, economic impacts are also divided into different income effects. In the following tables, the impact on *Wages* reflects the increase in wage income for all workers as a result of the project. Similarly, *Business Income* is the increase in income to local business as a result of spending associated with the wind plant. *Personal Income* is the sum of wages and business income. The *Other Income* category is used to capture additional income that results from other sources due to the project, such as rents to land owners leasing land for wind turbines. Finally, *Jobs* reflects the number of full and part time jobs that result directly from the project and from the increase in spending in other sectors of the economy.

Additional technical detail on the input-output model is included in Appendix A of this report.

The following tables show the economic impacts for the construction period.

Table 2: Construction Phase Economic Impacts for Kittitas County

Impact type	Wages	Business Income	Personal Income	Other Income	Jobs
Direct	\$8,420,000	\$1,027,000	\$9,447,000	\$388,000	95.2
Indirect	732,000	139,000	871,000	242,000	30.3
Induced	1,050,000	225,000	1,275,000	234,000	60.0
Total	\$10,202,000	\$1,391,000	\$11,593,000	\$864,000	185.5

As shown in Table 2, the construction phase of the project will result in approximately 95 full and part time jobs. Spending from this project on labor and materials will result in an additional 90 jobs for a total of approximately 185 full and part time jobs during the construction period. Wages during this period will be \$10,202,000 due to the hiring of local construction workers and the increases in services needed to support the construction work. Similarly, business incomes will increase by \$1,391,000 due to spending on local materials and other items such as food and lodging for non-local labor hired for the project. Taken together, personal income is estimated to increase by \$11,593,000 in Kittitas County due to spending during the construction phase. When the income of \$864,000 from other sources is considered, the increase in income to the county totals \$12,457,000.

Table 3 provides the same information broken out by industry sector. Most of the spending during this phase occurs in the Construction sector. Sectors that will support this sector such as the Wholesale and Retail Trade and Services sectors will also see a significant increase in spending.

Table 3: Construction Phase Economic Impacts by Industry

Industry	Wages	Business Income	Personal Income	Other Income	Jobs
Agriculture, Forestry, and Fisheries	\$37,000	\$7,000	\$44,000	\$15,000	1.7
Construction	7,978,000	\$1,044,000	\$9,022,000	\$389,000	90.4
Manufacturing	42,000	\$4,000	\$46,000	\$16,000	1.4
Trans., Comm., & Utilities	778,000	\$34,000	\$812,000	\$57,000	9.7
Wholesale and Retail Trade	611,000	\$56,000	\$667,000	\$90,000	36.2
Finance, Insurance, & Real Estate	66,000	\$29,000	\$95,000	\$120,000	3.5
Services	618,000	\$218,000	\$836,000	\$146,000	41.2
Government	71,000	\$0	71,000	\$31,000	1.3
Total	\$10,202,000	\$1,391,000	\$11,593,000	\$864,000	185.5

B. Operations

Spending will continue in the local economy during the operation of the wind turbines once the construction phase has ended. During the operations phase, spending will consist of primarily:

- 22 employees hired to operate and manage the wind power plants
- Spending on equipment, maintenance and materials to operate the wind turbines
- Income to property owners that rent land for the wind turbines (\$4,500 per turbine.)

The impact to the local economy due to the wind plant operations was modeled based on these factors. As during the construction phase, there is a direct effect from these factors as well as an indirect effect that results from the spending due to the increases in income from the new jobs and from the rental income. These impacts are summarized in Table 4 and Table 5.

Table 4 shows the effect on incomes due to continued operations of the wind turbines. The operations will require 22 full and part time jobs, and the spending on these jobs and plant equipment will create approximately 31 additional jobs in businesses that support the wind plants. The combined effect of direct and indirect spending will result in approximately 53 additional new and part time jobs in Kittitas County. Similarly, spending on these jobs will increase annual wages by \$2,728,000 and yearly business income by \$351,000. Income from other sources is estimated at \$1,188,000 annually and will consist primarily of rental fees paid to land owners where the wind turbines are situated. Taken together, the wind turbines operations will increase income to the county by \$4,267,000 annually.

Table 4: Wind Plant Operations Annual Economic Impacts for Kittitas County

Impact type	Wages	Business Income	Personal Income	Other Income	Jobs
Direct	\$2,165,000	\$216,000	\$2,381,000	\$819,000	22.0
Indirect	77,000	30,000	107,000	22,000	3.1
Induced	486,000	105,000	591,000	347,000	28.2
Total	\$2,728,000	\$351,000	\$3,079,000	\$1,188,000	53.3

Table 5 shows the economic impacts resulting from wind turbine operations broken out by industry sector. Most of the impacts will be in the Transportation, Communications, and Utilities sector. The Real Estate and Service sectors will also see increased economic activity due to the continued operation of the wind farm.

Table 5: Annual Wind Plant Operation Impacts by Industry

Industry	Wages	Business Income	Personal Income	Other Income	Jobs
Agriculture, Forestry, and Fisheries	\$10,000	\$1,000	\$11,000	\$4,000	0.5
Construction	63,000	29,000	92,000	4,000	2.6
Manufacturing	11,000	1,000	12,000	5,000	0.4
Trans., Comm., & Utilities	2,190,000	226,000	2,416,000	27,000	22.7
Wholesale and Retail Trade	211,000	19,000	230,000	76,000	13.3
Finance, Insurance, & Real Estate	29,000	12,000	41,000	1,012,000	1.5
Services	185,000	64,000	249,000	35,000	11.8
Government	29,000	0	29,000	25,000	0.5
Total	\$2,728,000	\$351,000	\$3,079,000	\$1,188,000	53.3

IV. Tax Revenues

The overall increase in economic activity from the wind power plant will increase tax revenues for Kittitas County. ECONorthwest was asked to estimate the impact on tax revenues for the major sources of tax income for the county. Note that we did not attempt to estimate the increases in costs or the provision of county services (i.e., fire, sheriff) that the wind power plant might require.

Based on our review of Kittitas County budgets and spending and our evaluation of the proposed wind power facility, we have estimated the potential revenue impacts for the Kittitas County. Table 6 shows the estimated increases in revenue for the major tax revenue sources.

As shown in Table 6, the primary increase in tax revenues is from property taxes on the wind turbines themselves. For this calculation, we have used the value of \$750,000 per turbine, which is consistent with our experience in other wind projects and with the information provided to us by the wind companies involved with the Kittitas County project. The property tax rate used for the calculation is the 1.35 percent for Kittitas County. Using this tax rate and property value for the 265 turbines results in new property tax revenues of \$2,683,125 annually.

The development of this project will also have an effect of increasing the value of other properties due to the increase in wages and overall economic activity in Kittitas County. This results in an additional \$201,971 in property tax revenues annually due to increases in other property values.

When the property tax revenues from both sources are combined, the additional tax revenue collected within Kittitas County totals \$2,885,096 annually.¹ For comparison, property tax revenues from all sources in Kittitas County totaled \$25,223,948 for the 2001-02 budget year.² The increase in property tax revenues due to the wind farm amounts to an increase of 11 percent over these levels.

Table 6: Increases in Annual Property Tax Revenues in Kittitas County

Revenue Source	Amount
Property taxes on wind farms	\$2,683,125
Taxes from higher values on other properties	201,971
Total	\$2,885,096

A complicating factor in these revenue estimates is the recently passed Initiative 747 (I-747) in Washington State, which limits increases in tax levies to 1 percent a year. From our conversations with the Kittitas County assessor and from information provided by Washington State, it appears that most of the value of a wind turbine (\$500,000) would be considered personal property and as such would be subjected to this limit. For Kittitas County, total personal property is assessed at \$2,355.4 million. The addition of 265 windmills with a personal property value of \$500,000 each would add \$132.5 million to the total property value of the county - an increase of 5.6 percent. Since this increase is greater than 1 percent, it is possible that taxes in other areas would need to be reduced in order to comply with I-747. This might involve decreases in personal property tax rates and/or bond levies. It should be stressed that ECONorthwest is not an accounting firm, and the implication of I-747 is discussed here only as one possible scenario based on preliminary tax estimates. However, the tax revenue estimates provided here should be viewed with I-747 in mind, as actual revenues may ultimately be reduced in the County in order to comply with the initiative.

Table 7 shows the likely distribution of the new tax revenues based on the spending allocations reported in the 2002 Kittitas County Budget. This information is also presented graphically in Figure 1.

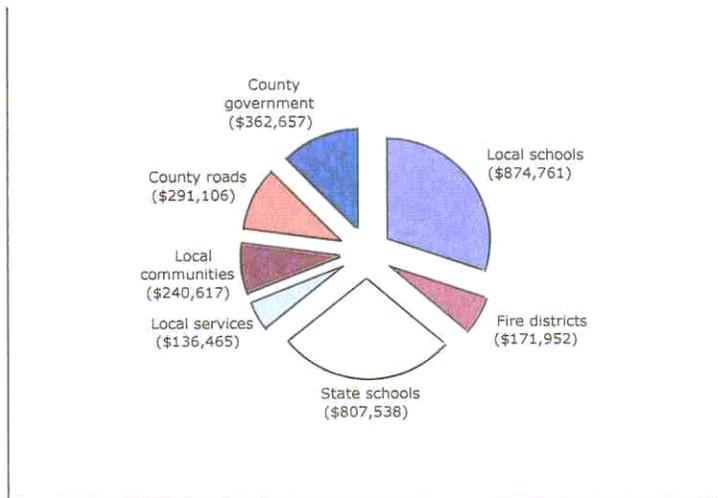
¹ Approximately 30 percent of the turbines are to be built on land managed by the Washington Department of Natural Resources rather than on private land. For these turbines, the rental fee for land will be paid to the State, which then returns these funds to schools throughout the state based on district need. At the annual rental rate of \$4,500 per turbine, this amounts to an additional \$351,000.

² *Kittitas County Assessor's Report 2001 Assessed Valuations Levies and Taxes to be Collected 2002*, page 4.

Table 7: Allocation of Property Tax Revenues

Spending Category	Amount
Local schools	\$874,761
State schools	\$807,538
Fire districts	\$171,952
Local communities	\$240,617
County roads	\$291,106
County government	\$362,657
Hospitals and other local services	\$136,465
Total	\$2,885,096

Figure 1: Allocation of Property Tax Revenues



Based on current spending patterns, local schools receive the largest share of the tax revenue increase at \$874,761 annually. Following the local schools, state schools would receive the next largest share of revenues at \$807,538 annually. The local county government budget would receive \$362,657 annually, local county roads revenues would increase by \$291,106 annually, and annual funds going to

local communities from the county would increase by \$240,617. Finally, annual spending for local fire districts would increase by \$171,952 and funds allocated to hospitals and other services in the county would increase by \$136,465.

The property tax revenue estimates reflect funds that are spent in a variety of sectors, both inside and outside Kittitas County. In addition to these property taxes, we estimated the tax revenue that will accrue to the Kittitas County Government. This was done by comparing the current tax revenues as a fraction of total economic output for Kittitas County with and without the wind farm. Using the results from our input-output model, we estimated the total increase in economic output from the proposed wind plant. Given the increase of output with the project, we estimated the increase in tax revenues assuming that tax rates remained constant. For each individual tax, the increases were generally on the order of 0.2 percent annually.

The estimated increase in annual revenue for the Kittitas County Government from these taxes is shown in Table 8. The majority of these additional tax revenues are the property taxes collected for county government and roads. Other sources include smaller taxes such as those collected for fees and services as well as revenue returned to the county by the State. Together, these tax revenues total \$693,777. Given the Kittitas County Government expenditures of \$44,312,102 planned for 2002, the additional revenue generated by the wind farm represents an increase of almost 2 percent over the budgeted amount.³

Table 8: Additional Kittitas County Government Tax Revenues

Spending Category	Amount
Property taxes – County government and roads	\$653,763
Sales and use taxes	\$7,103
All other taxes	\$2,927
Licenses and permits	\$2,094
Charges for services	\$8,509
Fines and forfeits	\$2,138
State collected taxes distributed to County	\$17,244
Total	\$693,777

³ *Kittitas County 2002 Annual Budget*, page 15.

V. Alternative Uses

A final analysis issue was to assess the types of additional costs Kittitas County would likely occur with a new residential development. Our understanding is that a residential development as has been suggested as an alternative to building the wind farm, although it is unlikely that such a development would utilize all the land that is currently being considered for the wind project.

For this task, we did not attempt to estimate these costs or the amount of tax revenue that might be generated from such a development. Rather, we are listing areas of increased costs to the County based on our experiences conducting fiscal impact analyses for other jurisdictions.

With a new residential development, additional costs will be incurred for extending utilities and roads to the development, with road construction likely comprising the highest share of costs. Utility-related costs include extending water lines, sewer, phone lines, and power lines to the new development. The utility-related costs are usually paid for by system development charges and if the charges are properly constructed, these services will be cost neutral to the County as they will be paid for entirely by the fees collected. Maintenance of items such as roads, however, will likely increase costs for the County.

Additional cost considerations for Kittitas County will be the extension of all county services to a new development. Affected service areas include fire, sheriff, hospital, libraries, and other community services funded by the County. In order to maintain current levels of service to the new county residences in these areas, additional staff may need to be hired.

If the new residential development is large enough, it may also require that additional Kittitas County government officials be hired to handle the increased workloads in all government areas. For example, the addition of a large residential development may require hiring more staff in the assessor's office or possibly additional teachers for that particular school district.

Appendix A: Modeling Process

Expenditure in the utility sectors and construction sectors affect the Washington economy *directly*, through the purchases of goods and services in this state, and *indirectly*, as those purchases, in turn, generate purchases of intermediate goods and services from other, related sectors of the economy. In addition, the direct and indirect increases in employment and income enhance overall economy purchasing power, thereby *inducing* further consumption- and investment- driven stimulus.

The economic modeling framework that best captures these direct, indirect, and induced effects is called input-output modeling. Input-output models provide an empirical representation of the economy and its inter-sectoral relationships, enabling the user to trace out the effects (economic impacts) of a change in the demand for commodities (goods and services).

Because input-output models generally are not available for state and regional economies, special data techniques have been developed to estimate the necessary empirical relationships from a combination of national technological relationships and county-level measures of economic activity. This modeling framework, called IMPLAN (for IMpact Analysis for PLANning), is the technique that ECONorthwest has applied to the estimation of impacts.⁴

The IMPLAN model reports the following economic impacts:

- Total Industrial Output (output) is the value of production by industries for a specified period of time. Output can be also thought of as the value of sales including reductions or increases in business inventories.
- Personal income consists of the wages and salaries received by households (employee compensation) and the payments received by small-business owners or self-employed individuals (proprietary income). Employee compensation includes workers' wages and salaries, as well as other benefits such as health and life insurance, and retirement payments. Proprietary income, for example, would include income received by private business owners, doctors, accountants, lawyers, etc.

⁴ IMPLAN was developed by the Forest Service of the US Department of Agriculture in cooperation with the Federal Emergency Management Agency and the Bureau of Land Management of the US Department of the Interior to assist federal agencies in their land and resource management planning. Applications of IMPLAN by the US Government, public agencies and private firms span a wide range of projects, from broad, resource management strategies to individual projects, such as proposals for developing ski areas, coal mines, and transportation facilities, and harvesting timber or other resources. ECONorthwest has applied the model to a variety of public and private sector energy projects including a major US/Canada gas pipeline project and the proposed purchase of Portland General Electric by local counties.

- Other property type income (other income) in the IMPLAN model includes payments to individuals in the form of rents received on properties, royalties from contracts, dividends paid by corporations, and corporate profits earned by corporations.
- Job impacts include both full and part time employment.
- Tax revenues for various federal, state and local taxing jurisdictions.

Ideally, expenditures for the proposed wind farm would be available and specific enough to allocate to each of the 528 industry sectors contained in the IMPLAN model. In addition, the expenditures should be delineated between local and non-local providers, as purchases of goods and services from out-of-state vendors will have no economic impact on Washington employees and businesses.

In absence of this detailed information, ECONorthwest opted to use the production function data for the utility and government sectors contained in the IMPLAN modeling software. From an input-output modeling perspective, this is a standard modeling approach in the absence of detailed primary source data. Indeed, IMPLAN's production function data contains information, called regional purchase coefficients that describe the proportion of a given commodity that will be provided by Washington producers. Our previous modeling experience has shown that the data contained in the IMPLAN modeling system for the various sectors is sufficient to permit an accurate rendering of impacts.

VI. Appendix B: References

Colwell, Peter F. 1990. "Power Lines and Land Value." *Journal of Real Estate Research*. Volume 5(1): 117-127.

Delaney, Charles J. and Douglas Timmons. 1992. "High Voltage Power Lines: Do They Affect Residential Property Value?" *Journal of Real Estate Research*. Volume 7(2): 315-329.

Des Rosiers, Francois. 2002. "Power Lines, Visual Encumbrance and House Values: A Microspatial Approach to Impact Measurement." *Journal of Real Estate Research*. Volume 23(3): 275-301.

Hamilton, Stanley W. 1995. "Do High Voltage Electric Transmission Lines Affect Property Value?" *Land Economics*. Volume 71(4): 436-444.

Jordal-Jorgensen, J. 1995. "Social Costs of Wind Power: Partial Report of Visual Impacts and Noise from Windturbines." Institute of Local Government Studies, Copenhagen, Denmark.

Kung, Hsiang-te and Charles F. Seagle. 1992. "Impact of Power Transmission Lines on Property Values: A Case Study." *The Appraisal Journal*. Volume 64(3): 413-418. July.

Rikon, Michael. 1996. "Electromagnetic Radiation Field Property Devaluation." *The Appraisal Journal*. Volume 64(1): 87-90. January.

Ohio State University Fact Sheet

Community Development

700 Ackerman Road, Columbus, OH 43202-1578

Costs of Community Services

CDFS-1260-98

Land Use Series

Allen M. Prindle
Thomas W. Blaine

The term, costs of community services (COCS), usually refers to a growing body of literature which focuses upon how various types of land use affect local government taxation and spending. This body of literature generally summarizes studies that use fiscal impact analysis as their primary method of determining whether various forms of land use contribute to or detract from local government budgets.

During the period immediately following World War II, many communities sought to attract business, industrial, and residential growth for a number of reasons. Among these was that economic growth would raise the property tax base and generate increased revenues for local infrastructure, including schools, roads, and fire/police protection. During the 1980s however, many skeptics began to question whether economic development in rural areas "paid its own way" in terms of local taxation. When farmland, open space and woodlands are converted to residential development, for example, local tax revenues increase substantially, since property values increase. But the local government and school district are also required to provide added services to the new residents. Does the increased revenue balance the increased demand for services? That is the question the COCS studies set out to answer.

The COCS Ratio

It has become conventional in COCS studies to divide land use into three categories: residential, commercial/industrial, and farmland/open space. One of the most common procedures used is the calculation of a COCS ratio for each land use category. The ratio compares how many dollars worth of local government services are demanded per dollar collected. A ratio greater than 1.0 suggests that for every dollar of revenue collected from a given category of land, more than one dollar is spent in association with it.

Many of the early studies providing estimates of COCS ratios were either sponsored or conducted by the American Farmland Trust. But in recent years a great number of other researchers from a variety of backgrounds have undertaken such studies. The results seem to corroborate each other. Virtually all of the studies show that for residential land, the COCS ratio is substantially above 1. That is, residential land is a net drain on local government budgets. The average estimate ranges from about 1.15 to 1.50, which means that for every dollar collected in taxes and non-tax revenue, between \$1.15 and \$1.50 gets returned in the form of services by the local government and school district.

On the other hand, the COCS ratios for the other two land use categories are both substantially below 1. For commercial/industrial, the ratio usually ranges from 0.35 to 0.65, indicating that for every dollar collected, only about 35 to 65 cents worth of services are provided by the local government. For agriculture and open space, the ratios are only slightly smaller, usually ranging from 0.30 to 0.50.

The largest single expenditure category for communities, according to the studies, is the public school system, accounting for 60 to 70 percent of spending. Since open space and commercial development in themselves do not place any burden on the schools, it should not be surprising that their ratios are less than the residential category.

Several questions emerge from these results. These include the following: are these studies reliable, and why do the numbers vary?

The studies do appear to be reliable because of the way in which taxes and service expenditures are calculated and imputed. The methods used in the studies have been laid out clearly. Regarding the variation in COCS ratios, it should be noted that they do not vary in any profound manner. The studies are unanimous in showing that residential land use ratios are above 1 and that the other types of land uses are below 1. The primary reason that the ratios do have some variation is that all communities are not identical. If, for example, many homes in a community are in an extremely high price range, and occupied by "empty nesters," the COCS ratio should be expected to be relatively low. On the other hand, low or middle income property occupied by families with numerous children would produce a higher ratio. Some communities have gone beyond simply calculating a COCS ratio and have actually calculated the "break even" home value for their community. Not surprisingly, these values tend to be substantially higher than the median (average) home value.

Another Approach

Other researchers have attempted to measure the costs of growth simply by statistically measuring the relationship between population growth rates and per capita local government spending. Most of these results have shown that for very small growth rates (in the area of 1-2 percent per year), costs do not escalate rapidly. For communities with higher growth rates, however (above 3 percent per year) per capita spending begins to increase very dramatically.

The findings of the various types of studies on costs of services seem to be in agreement that, as farmland and open space are converted to residential development, local public per capita spending increases.

Criticisms of the COCS Literature

Initially, critics of the COCS studies argued that it may be difficult to generalize from these studies. This criticism has lost some credibility, however, because so many studies have been conducted in a wide range of communities nationally. The results seem to be unambiguous.

More recently, critics have developed the argument that only looking at the fiscal impacts on local governments and school districts is too limited in scope. They maintain that new residents do much more than simply pay taxes and demand services. Residents work, earn money, and spend much of it locally, and therefore contribute to the economic base of the community in a substantial way that is not captured in the COCS studies. The critics argue that future work should include these impacts.

But if COCS studies do not include these "multiplier" effects, it also must be said that they do not include non-economic costs to the community, such as the loss of scenic landscape, increased traffic congestion, and other variables associated with quality of life either.

Another argument against COCS studies is that they are based on a "cost theory of taxation" and do not consider how growth, even with increased taxation, increases the values of properties. The rival "benefit theory of taxation" states that as new taxes pay for better infrastructure such as schools and roads, property values (and thus the net worth of property owners) increase. Considerations such as this have not been measured within the context of COCS.

Implications

One of the most important implications of the COCS literature is that proponents of farmland and open space preservation now have an important economic argument on their side. Some proponents of economic development have argued that a system that allows land to go to the highest bidder provides the most efficient economic results. The COCS findings, however, indicate that residential development often brings costs to the community that are not fully borne by the new residents, but instead are distributed throughout the community. Local leaders should be aware that efforts to "promote growth" in their communities will have substantial impacts on revenues and expenditures. They should be able to estimate these impacts when planning for the future.

Two things emerge when reflecting on the COCS issue. The first is that residential development in any area invariably leads to increased per capita demand for publicly provided services, placing increased burdens on local infrastructure and public agencies. As a result, increases in local tax rates to provide additional services tend to follow

growth. Second is that members of each community should ask themselves the broader question, "How do we manage growth in our community, along with all of the impacts (both positive and negative) that it brings?"

References

American Farmland Trust, 1993. *Is Farmland Protection a Community Investment? How to do a Cost of Community Services Study*. Washington, DC.

Bunnell, Gene, 1997. "Fiscal Impact Studies as Advocacy and Story Telling." *Journal of Planning Literature*, 12/2, pp. 136-151.

Burchell, R.W. and D. Listokin, 1995. *Land, Infrastructure, Housing Costs and Fiscal Impacts Associated with Growth: The Literature on the Impacts of Sprawl vs. Managed Growth*. Cambridge, MA: Lincoln Institute of Land Policy.

Kelsey, T.W., 1996. "The Fiscal Impacts of Alternative Land Uses: What do Cost of Community Services Studies Really Tell Us?" *Journal of the Community Development Society*, 27/1, pp. 78-89.

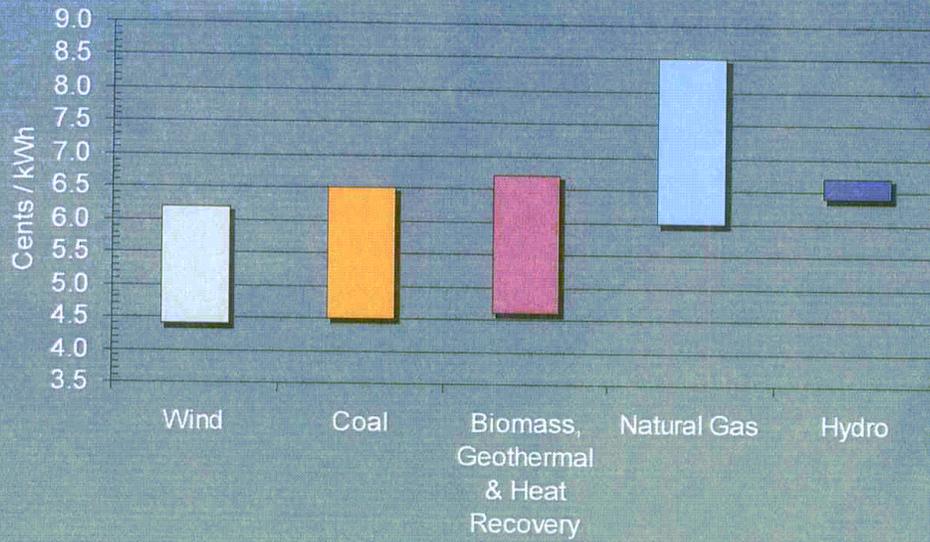
Ladd, H., 1992. *Effects of Population Growth on Local Spending and Taxes*. Cambridge, MA: Lincoln Institute of Land Policy.

All educational programs conducted by Ohio State University Extension are available to clientele on a nondiscriminatory basis without regard to race, color, creed, religion, sexual orientation, national origin, gender, age, disability or Vietnam-era veteran status.

Keith L. Smith, Associate Vice President for Ag. Adm. and Director, OSU Extension.

TDD No. 800-589-8292 (Ohio only) or 614-292-1868

RFP Evaluation Results



Notes:

- 1. Acquisition Screening Model (ASM8) 20-yr Levelized Costs*
- 2. Transmission solutions are not mature for coal generation resources*
- 3. All costs are exclusive of credit impacts*
- 4. All delivered to PSE System*



P. Barton DeLacy, MAI, CRE
Director
Litigation Support & Dispute Analysis

Cushman & Wakefield of
Oregon, Inc.
200 SW Market Street, Suite 200
Portland, OR 97201-5730
(503) 279-1795 Tel
(503) 279-1791 Fax

Technical Memorandum

Impacts of The Kittitas Valley Wind Power Project on Local Property Values

Prepared for: Sagebrush Power Partners, LLC
Prepared by: P. Barton DeLacy, MURP, MAI, CRE, Cushman & Wakefield of Oregon, Inc.
Date: December 29, 2005
File No.: 06-34001-9012

Statement of Qualifications

I am a real estate appraiser and consultant. I am presently Director of Valuation Services at Cushman & Wakefield of Oregon, Inc. I perform and review fee engagements relating to the evaluation of real property. I also prepare analyses to support litigation regarding real estate values, land uses impacts and for eminent domain proceedings. Attached to this report as **Exhibit A** is a résumé of my educational background and employment experience.

My personal experience with the siting of obtrusive structures or controversial land uses in rural areas spans over 25 years. This experience includes evaluations of property value impacts for the placement of transmission towers, power lines, substations, underground pipelines, the extension of gravel mines, siting of prisons, power plants, land fills and evaluation of air emissions from a cement kiln. I recently chaired a Committee of the Consulting Corps of the Counselors of Real Estate to help advise the City of Orlando, Florida on whether or not to re-site a homeless shelter, also considered an undesirable land use in its location.

In 2004, a peer-reviewed article I authored, "A LULU of a case: Gauging Property Value Impacts in Rural Areas" was published in *Real Estate Issues*, published by the Counselors of Real Estate.

I have been a licensed or certified appraiser since 1979 and am certified in the State of Washington, as well as Oregon, Montana, Idaho, California, Colorado and Kansas. My professional credentials include the MAI designation (Appraisal Institute), the CRE designation (awarded by the Counselors of Real Estate) and a Masters Degree in Urban and Regional Planning (see my accompanying CV). I was recently elected a Fellow in the Royal Institution of Chartered

Surveyors, an international professional society of valuers and real estate professionals who advise governments and global organizations. One of their studies is reviewed here.

I previously served five years on a city planning commission and was appointed to a statewide emergency siting authority to site four youth prisons in 1995.

I have qualified as an expert witness before the State of Washington Energy Facility Site Evaluation Council ("EFSEC") giving written and oral testimony regarding the Wild Horse Wind Power Project. I have also qualified as an expert witness for real estate valuation and land use impacts in both State and Federal Courts in Oregon and California.

Purpose of Report and Testimony

I am providing this report as a summary of my testimony relating to an analysis completed by my company to address whether the proposed Kittitas Valley (KV) Wind Power Project might affect property values in the vicinity of the wind turbine generators.

The contents of this analysis are based upon my own knowledge, or upon evidence, such as studies and reports as persons in my field and expertise are accustomed to rely on in conducting the type of analysis included in this report.

Information and Data Collected for this Report; Methodology of Analysis

The scope of our analysis included field inspections of the affected areas in Kittitas County in 2004 and late 2005. I also investigated property impacts for the proposed Wild Horse Wind Project, located about 20 miles to east, north of the Vantage Highway. In this case, I have analyzed a comprehensive compilation of properties which abut, or may be in sight of, the proposed KV project.

I have reviewed available literature regarding land use impacts of energy facilities, and studied carefully a May 2003 analytical report, *The Effect of Wind Development on Local Property Values*, by George Sterzinger for the Renewable Energy Policy Project ("REPP"). We have collected, updated and analyzed multiple listing and county assessor records on property sales in the area, and have undertaken several interviews with local Kittitas County real estate brokers and appraisers regarding specific transactions and the anticipated effect of the Project on the area.

I also reviewed additional technical memoranda prepared by Dr. Tom Priestley of CH2M Hill, a modeling study on shadow-flicker, and a survey of valuers published by the RICS in England which suggested wind farm developments had adverse impacts in England.

In 2005, Horizon Wind Energy, the successor to Zilkha, reconfigured the KV project, eliminating nearly half the turbines originally planned. I had prepared a study in 2004 based on a 150 turbine layout and have now updated my research in light of the proposed reconfiguration with a maximum of 80 turbines.

Our work included an analysis of the transactional data we compiled for Kittitas County, going back over ten years. Since the Project was announced almost four years ago, we were able to track paired sales where the rate of appreciation could be calculated between a transaction made after the announcement and one some time before. These statistics have been incorporated in our analysis. Further, we collected anecdotal observations from local brokers regarding property-specific reactions, reflected in sale price, when parties were informed about the proposed wind turbines.

Since the turbines have yet to be constructed, actual impacts may be difficult to assess. However, a field poll taken by Evergreen Research Corp. between September 5-9, 2002 on behalf of enXco (another wind power development company) showed that 92% of all respondents (from a statistically significant random sampling of Kittitas County residents) were aware of the wind farm issue in the county.

Personal preference, it should be noted, does not necessarily affect property values. In addition to evidence of the potential property owner preferences (i.e. perceptions and biases regarding the impacts of wind power projects on daily life and property ownership in the county), this survey indicated a very high level of awareness of the pending projects. This awareness could tend to influence property purchase decisions in areas with views of the wind power project sites. However, as described below, the analysis we conducted showed no negative impacts on property values and sales based upon knowledge of the pending Kittitas Valley Wind Power project.

The RICS survey, for instance, did not test transactional data, but merely queried professional valuers on their preferences. It was little better than an opinion poll. Notwithstanding reported apprehensions that people may have regarding how nearby wind farms may impact property values, this poll lacks any statistical data demonstrating such an effect.

Our statistical analysis of the Kittitas Valley view shed closely paralleled the methodology used by the REPP. We selected as comparable areas lower Kittitas County, which includes affected areas of the Valley, and the City of Ellensburg, the nearby community, which lies beyond the view shed. We looked at changes in property values over a 6 year period; 4 years before the announcement, and the two years hence. If property values were to be adversely impacted by the wind farm, then value trends post announcement of the Project should have been negative compared with comparable areas unaffected by the turbine placement. The REPP study showed that in most communities tested, property values increased post installation at the same rate or at faster rates than the control community. We found the same trends to be true here in the Kittitas Valley.

We obtained historical sales data for both the City of Ellensburg and Lower Kittitas County. These two data sets could be considered “control” communities, in that, in aggregate, they were unaffected by the wind power project.

This home sale information has been compiled and published on a monthly basis in the “REAL REVIEW” since 1988 by Betsy Billeter of Central Washington Real Estate Services. Similar information for the Upper County area, centered around Cle Elum, had not been similarly collected. However, the upper county would be less useful as a control area because of the

influence from Bellevue and the pending development of the Suncadia (formerly Trend West) resort.

Our data shows that residential property values appreciated within the affected area (where we tabulated 21 sets of paired sales) at significantly higher annual appreciation rates compared with the two control data sets. In fact, property values appreciated across the board. While the pace of appreciation slowed somewhat in 2001, before the announcement, we attribute the apparent slowdown to the impact of the dot.com bust which affected much of Northwest Washington State and the Eastside of Seattle. By 2002 it appeared markets had recovered.

The REPP study showed that in most communities tested, property values increased post installation at the same rate or at faster rates than the control community. Our analysis confirmed this premise at the local Kittitas County level.

Local Land Use Patterns and Attributes Affecting Property Values Analysis

The overall population density in the Project area is low. There are approximately 65 dwellings within one mile of the proposed Project. Many of these are little more than seasonal cabins. However, in the two years the area has been under study, at least two new residences have been built.

As set forth in the Applicant's application materials, a summary of land uses and structures in the area include:

- A commercial gravel quarry on Highway 97 just south of the northern junction with Bettas Road operated by Ellensburg Cement Products;
- An inactive gravel quarry on Bettas Road north of the junction with Hayward Road owned by the Washington Department of Transportation;
- Five sets of BPA electric transmission lines running east to west across the Project area, divided into one group of four near the middle of the Project and one to the north;
- One set of Puget Sound Energy electric transmission lines running east to west across the Project area just north of the southern set of BPA lines;
- Three communication towers;
- Two state highways: Highway 97, running through the middle of the Project area, and Highway 10 south of the Project area;
- Two county roads: Bettas Road, a paved, two lane road near the western edge of the Project area and Hayward Road, an unpaved road toward the south of the Project area;

- Five parcels of land are owned by the Washington Department of Natural Resources, located in T 19 N R 17 E, Sections 2, 10, 16 and 22; and
- Agricultural lands are located south of Highway 10 along the Yakima River. The Project would be located on privately owned land except for the parcels owned by the DNR.

We first noted that the proposed Project will be located in a well established energy transmission corridor. In the 3 mile by 5 mile area where the project is proposed, 170 foot tall transmission towers already dominate the skyline, traversing a wide corridor running from northwest to southeast through the valley. While there are some sites within the wind project affected area that have unobstructed views, the hand of man is very evident and long established. Most of the affected sites already have views of transmission towers.

The exception to this observation is Highway 97 corridor which parallels Bettas Road. Here, some potential homesites will have their views impacted by turbine placement. However, Horizon no longer plans to extend towers as far north as had been originally planned. Further, we found that land sale and subdivision activity in this location continues notwithstanding knowledge that the KV siting procedure is moving forward.

Whereas, two years ago the Henley Group assembled 152 acres at a cost of about \$7,000 per acre (according to County Assessor records) for future homesite development, The Ranch on Swauk Creek, a 620 acre tract, immediately north, has been acquired for over \$9,100 per acre. Meanwhile, the Henley Group resold 30 acres, facing the proposed F and G strings for over \$10,000 per acre, a 45% increase in value per acre realized in just over two years.

The general study area includes central Kittitas County, northwest of the City of Ellensburg. The surrounding landscape is characterized by hills barren of trees and rangeland with some scattered residences. Forest cover exists to the north of the Project but we did not observe any commercial forestry operations taking place in the immediate vicinity of the Project. Aside from tracts which might be best described as suburban sprawl emanating from Ellensburg, one finds more intensive rural settlement further north within wooded areas lying to the northwest toward Cle Elum. Those residences have no views of this transmission corridor, either because of orientation or tree cover.

Ultimately, after creating an inventory of all properties which would have a view of the Project, we found only a handful of sites that might be construed to have unobstructed views that will be impaired when the turbines are constructed. This analysis addresses indirect impacts to properties merely affected within the view shed.

Potential Impacts of the Kittitas Valley Wind Power Project on Property Values for Undeveloped Properties

Many of the sites near the proposed project that might be affected are vacant and undeveloped. Some appear to be used for livestock grazing. We have found that mere orientation of improvements constructed on undeveloped properties can mitigate or improve views. In other words, where property is vacant, future residential development, including home design and orientation, can and will be based upon subjective personal preferences for views. One builder may choose a view which excludes the wind turbines from primary viewpoints in a home, while another builder may choose to orient the home so as to face the turbines.

Another related issue is the availability of access and utilities to some of the now vacant parcels that might someday be improved with homes. Particularly in this location, costs are high to extend electricity, dig domestic wells, create septic systems and build roads suitable for year round access. These costs tend to reduce the likelihood of imminent or near-term development of many of the properties in the vicinity of the project. If a site is selected for home construction, the parcels are large enough (generally 20 to 40 acres or more) to provide a builder great flexibility in siting and orienting the improvements so as to be unaffected by a view of the turbines, if so desired.

Therefore, it is my professional opinion that it cannot be said that future utility of given sites will be adversely affected by the Project.

It should be noted that every property is unique and fixed in place. Many human factors involving personal preferences come in to play when property is purchased, particularly for residential use. And, of all types of property use, residential properties are most sensitive to personal preference. Thus the fact that one party likes shade and another sun does not mean that a particular parcel without trees is worth more or less. We found that some people like the idea of wind turbines, and some do not. However, we did not find that there is empirical support for the claim that wind turbines will adversely affect property values.

Other studies, including a seminal analysis of how a closed lead smelter (and designated EPA Superfund site) affected property values in the Dallas area, suggest that value impacts become negligible outside a two mile radius from the “undesirable” land use. Further, since no contamination or emission concerns are at issue with wind turbines, only potential impacts on the view shed itself can have a value impact. Other studies underscore the relative resiliency of property values to indirect impacts when offsetting amenities or macro-economic factors are present.

Potential Impacts of the Kittitas Valley Wind Power Project on Property Values for Developed Properties

We analyzed appreciation rates extracted from paired sales and multiple listing records reporting the average prices for homes sold. A paired sale is an observation of the sale and re-sale of the same property, over time. So long as there have been no changes in the property during the interim, the difference between the sale prices can be extracted as an indicator of passive appreciation. Ultimately each pair must be analyzed for site specific changes or the circumstances

of the parties involved. However, with a high frequency of transactions, aggregated trends become more reliable.

What was remarkable about the study area was the relative high number of paired sales which were reported since announcement of the Project (12, or nearly 20% of the parcel inventory, a very high rate for a rural area). In virtually every case, robust appreciation rates were indicated. This suggests that the marketability of the sites was unaffected by the proposed Project and that land values were unaffected as indicated by the rates of value appreciation.

We found that paired sales in the area surrounding the KV Project were appreciating at rates well above that of the county in general and the city of Ellensburg. This holds true for the four-year PRE-Announcement period and the 2-year POST-Announcement period with rates above the 10% range in the vicinity of the Project versus rates below 10% in Ellensburg and Lower Kittitas County.

Earlier this year, I interviewed Charles Bugni, the broker for Town and Country Properties in Cle Elum. He reported that as of March, 9 of 12 parcels on Bettas Road, ranging in size from 3 to 20 acres had sold out within a year of subdivision at asking prices with full disclosure of the pending placement of turbines in close proximity to these parcels. He described the rolling hills as windswept treeless and full of sage brush. Lot prices have ranged from \$20,000 up to \$47,000. He anticipated modest site built or modular homes to be located here. As broker, he simply did not think the Project would affect values one way or the other.

Overall we find that the influence of the Seattle-Bellevue area, only 90 minutes to the west, may have much to do with evident demand for homesites in Kittitas County, including the Project vicinity. Second, the local economy is influenced by agricultural activities to the east and the emergence of Central Washington University as a regional center for research and culture. Third, the Kittitas Valley must be recognized as a major power transmission corridor which is why the confluence of access to the power grid coupled with presence of the wind resource makes this an attractive site for wind turbines. Given these factors and considering more general trends in real estate prices, post announcement of the Project, we find no evidence that the Project will adversely affect local property values.

Summary of Property Value Impacts

As indicated above, we would expect that most impacts on property values and sales would occur within two miles of the Project site. However, our analysis extended beyond this area. For both undeveloped and developed properties, the visual landscape of the Project area is dominated by substantial electric transmission corridors. Undeveloped properties tend to be large parcels, which will typically be very costly to develop due to the absence of utilities and services, including electricity. Orientation of future improvements on these properties will mitigate impacts, if any. The Project will have no impact upon property values for undeveloped properties. Developed properties, on the aggregate, have appreciated in value since the announcement of the Project. We find that the Project will have no impact upon the future sales or values of developed properties.

CERTIFICATION OF CONSULTING ENGAGEMENT

I certify that, to the best of my knowledge and belief:

1. The statements of fact contained in this report are true and correct.
2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, impartial, and unbiased professional analyses, opinions, and conclusions.
3. I have no present or prospective interest in the property that is the subject of this report, and no personal interest with respect to the parties involved.
4. I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
5. My engagement in this assignment was not contingent upon developing or reporting predetermined results.
6. My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
7. The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of professional Ethics and Standards of Professional Practice of the Appraisal Institute which include the *Uniform Standards of Professional Appraisal Practice*.
8. I have made a personal inspection of the property that is the subject of this report. No one provided significant consulting assistance to the persons signing this report.
9. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
10. As of the date of this report, I have completed the continuing education program for the Appraisal Institute.



P. Barton DeLacy, MAI, CRE
Director
Washington Certified General Real Estate
Appraiser
License No. 1100107

References- Bibliography

Appraisal Institute, The Appraisal of Real Estate, Twelfth Edition, (Chicago: Appraisal Institute, 2003)

Appraisal Institute, The Dictionary of Real Estate Appraisal, Third Edition, (Chicago: Appraisal Institute, 1993)

Blomquist, Glenn, "The Effect of Electric Utility Power Plant Location on Area Property Value," Land Economics, Vol.50, pp 97-101 (1974)

Bottemiller, Steven C. and Wolverton, Marvin L., "Further Analysis of Transmission Line Impact on Residential Property Values," The Appraisal Journal (July 2003), pp. 244-252

Dale, Larry, Murdoch, James C., Thayer, Mark A. and Waddell, Paul A., "Do Property Values Rebound From Environmental Stigmas?" Land Economics, May 1999, Vol. 75, No. 2 pages 311-326

DeLacy, P. Barton, "A LULU of a case: Gauging Property Value Impacts in Rural Areas," Real Estate Issues, Fall 2004, Volume 29, No. 3.

Despite toxic history, residents return to Love Canal, CNN.com., August 7, 1998
<http://www.cnn.com/US/9808/07/love.canal/>

Ellis, Sherman R., "Effects of effluent from a coal-fired, electric-generating powerplant on local ground water near Hayden, Colorado", prepared for the U.S. Environmental Protection Agency, Doc# I 19.76:81-1196, 1982

Fahys, Judy, "Sigurd residents are Fighting Construction of a Coal-Fired Power Plant", The Salt Lake Tribune, March 15, 2004

Gamble, H. B., Downing, R. H., "Effects of the Accident at Three Mile Island on Residential Property Values and Sales", Pennsylvania State University for Division of Safeguards, Fuel Cycle and Environmental Research, Office of Nuclear Regulatory Research, U. S. Nuclear regulatory Commission, April 1981

Grover, Stephen. "Economic Impacts of Wind Power in Kittitas County" report for Phoenix Economic Development Group/ ECO Northwest. October 2002. report available electronically at www.kvalley.com/phoenix

Harris, John D., U. S. Environmental Protection Agency, "Property Values, Stigma and Superfund", Superfund Redevelopment Program, 1999; online at <http://www.epa.gov/superfund/programs/recycle/property.htm>

Jackson, Thomas O., "Case Studies Analysis: Environmental stigma and Monitored Natural Attenuation", The Appraisal Journal, 2004, Vol. 72, Number 2, 111-118

Jordal-Jorgensen, Jorgen. "Social Assessment of Wind Power: Visual Effect and Noise from Windmills-Quantifying and Valuation" AKF- Institute of Local Government Studies, Denmark, April 1996. <http://www.akf.dk/eng/wind0.htm>

Kroll, Cynthia A., and Priestley, Thomas. "The Effects of Overhead Transmission Lines on Property Values. A Review and Analysis of the Literature." Prepared for Edison Electric Institute Siting and Environmental Task Force. July 1992

Love Canal History; <http://www.globalserve.net/~spinc/atomcc/history.htm>

McCluskey, Jill J. and Gordon C. Rausser, 2001. "Estimation of Perceived Risk and Its Effect on Property Values," *Land Economics*, Vol. 77(2001):42-55

McCluskey, Jill J. and Gordon C. Rausser, 2003. "Hazardous Waste Sites and Housing Appreciation Rates," *Journal of Environmental Economics and Management* 45(1): 166-176.

McCluskey, Jill J. and Gordon C. Rausser, 2003. "Stigmatized Asset Value: Is it Temporary or Long-term?" *The Review of Economics and Statistics* 85(2): 276-285.

McCluskey, Jill J., Ray G. Huffaker, and Gordon C. Rausser, 2002. "Neighborhood Effects and Compensation for Property Value Diminution," *Law & Policy* 24(1): 37-50.

Mundy, Bill, "The Impact of Hazardous Material on Property Value", *The Appraisal Journal*, Vol. 60, April 1992, 155-162

Royal Institution of Chartered Surveyors, "Impact of Wind Farms on the Value of Residential Property and Agricultural Land", *An RICS Survey*; November 2004

Sterzinger, George, et al., "The Effect of Wind Development on Local Property Values", *Renewable Energy Policy Project*, Washington, D. C., 2003

Strathman, James G., DeLacy, P. Barton, Dueker, Kenneth J., "Creative Financing "Concessions in Residential Sales: Effects and Implications," *Housing Finance Review*, Federal Home Loan Mortgage Corp., April 1984, pp 149-163

Urban Environmental Research, LLC, "Clark County Property value report on the Effects of DOE's Proposal to Ship High Level Nuclear waste to a Repository at Yucca Mountain, Scottsdale, AZ, December 2001

Walters, A. A., *Noise and Prices*, Clarendon Press, Oxford, 1975

Wilson, Albert R., "Proximity Stigma: Testing the Hypothesis", *The Appraisal Journal*, Vol. 72, no. 3, Summer 2004, 253-261

Parties Interviewed

Jill McCluskey, PhD, Associate Professor, School of Economic Sciences, Washington State University, Pullman, WA (509) 335-2835; mccluskey@wsu.edu

James Strathman, PhD, Director, Center for Urban Studies, College of Urban and Public Affairs, Portland State University, PO Box 751, Portland, OR (503) 725-4069; strathmanj@pdx.edu

Gordy Ford, Permit Technician, Kittitas Community Development Services, 411 N. Ruby St., Ellensburg, WA (509) 962-7506; fordg@co.kittitas.wa.us

Larry Sharp, Kittitas Valley Realty-Coldwell Banker, (509) 925-8700

Betsy Billeter, Central Washington Real Estate Services, "REAL REVIEW,"
www.comparablesales.net

Thomas Priestley, PhD, CH2M Hill, 155 Grand Avenue, Oakland, CA 94612, (510) 587-7653;
Analysis of the Visual Resources Impacts of the Revised KV Wind Power Project, internal technical memorandum prepared for Horizon Energy, November 7, 2005.

Arne Nielsen, Wind Engineers, Inc., Shadow Flicker Briefing re: KV Wind Power Project, November 23, 2005.

Charles Bugni, Broker for Town and Country Properties, Cle Elum, WA

PROFESSIONAL QUALIFICATIONS

P. BARTON DELACY, MUP, MAI, CRE

Director, Cushman & Wakefield

Mr. DeLacy began appraising real estate in 1977. Before joining Cushman & Wakefield, Inc., he spent over 18 years as a partner or principal of fee appraisal and consulting firms based in Portland, Oregon. From 1998-2002 he led the real estate consulting practice in the Pacific Northwest (Oregon, Washington and Idaho) for Arthur Andersen LLP.

Mr. DeLacy is currently Director and senior team member of the Dispute Resolution and Litigation Support Services group at Cushman & Wakefield. His professional contributions include teaching, writing and service on local non-profit boards and public commissions.

In addition to conventional appraisal assignments, Mr. DeLacy's practice centers on problem solving engagements where valuation is incidental to the solution. This includes advising on highest and best use opportunities for portfolios, determining value impacts in land use cases, arbitration, eminent domain consulting, litigation strategy, land use planning and site selection.

Specialized Land Use and Rural Properties Experience

Mr. DeLacy has developed extensive valuation and consulting experience with rural properties transitioning from resource to recreational uses. He has analyzed rural land use impacts for siting energy facilities including wind turbine "farms" and power generating plants. He has prepared testimony for Federal and state energy siting councils and the Environmental Protection Agency in Oregon, Washington and Montana.

Select farm and ranch engagements included appraisals of the 11,000 acre Dangberg Ranch in Alpine County, California and Douglas County, Nevada; the 9,500 acre Bullis Creek Ranch in Park County Montana; Brand S holdings also in Park County; the 3,300 acre Hudspeth Ranch in Crook County, Oregon; a 200 acre Elk Refuge on the Umpqua River near Reedsport, Oregon as well as orchards, vineyards, poultry farms and the Glenn Walters Nursery portfolio (20 properties) in Washington County, Oregon.

Land and timber portfolios have been appraised for mortgage financing and for financial reporting in complex buy-outs and mergers. These projects included:

- 2 sections of land and timber in Potlatch Canyon near Orofino, Idaho for Three Rivers Timber.
- 3,000,000 acres of timberland for Plum Creek Timber Co. in Washington, Idaho, Montana, Maine and the Southeast U. S.
- 700,000 acres of McMillan-Bloedel timberland on Vancouver Island, and in Alabama for Weyerhaeuser.
- 670,000 acres of managed timberland for Consolidated Paper in Wisconsin, Minnesota and Ontario, Canada.

Valuation consulting engagements on recreational properties or sites to be converted from resource to recreational use include 9,000 acres of open space at the Yellowstone Club in Big Sky, Montana; a 750 acre mill site conversion on the South Santiam River in Linn County, Oregon and Salishan Lodge and Golf Course on the Oregon Coast.

Academic Credentials

Master of Urban and Regional Planning (MUP), Portland State University – with emphasis in regional economics and geographic information systems (GIS) 1988

Bachelor of Arts (BA), Willamette University, Salem, Oregon 1975

School of Irish Studies, Dublin, Ireland 1974

University of Oregon School of Law, Eugene, Oregon 1976-7

Appraisal Education

Successfully completed all courses and experience requirements to qualify for the MAI designation. Also, he has completed the requirements of the continuing education program of the Appraisal Institute.

Professional Designations and Licenses

- Fellow, the Royal Institution of Royal Chartered Surveyors (FRICS)- 2005
- CRE Member, Counselors of Real Estate- 2003
- MAI Member, Appraisal Institute- 1983
- SRA Member, Appraisal Institute- 1980
- ASA Member, Urban Properties, American Society of Appraisers- 2002

Mr. DeLacy is a duly Certified General Real Estate Appraiser in the following states:

- Oregon, license number C000089
- Washington, license number 1100107
- Idaho, license number CGA-255
- Montana, license number 445
- California, license number AG034219
- Kansas, license number G-2235
- Colorado (pending)

Teaching

Adjunct Instructor, Portland State University teaching land use planning and appraisal courses

National Business Institute, Lorman Education Services, Clackamas Community College, Lane Community College

Guest Lecturer: University of Portland, past instructor at Marylhurst University

Articles Published, Major Presentations:

- “A LULU of a Case: Gauging Property Value Impacts in Rural Areas,” *Real Estate Issues*, Counselors of Real Estate, Fall 2004.

- “Shall We Hallow Fallow Ground?” *Daily Journal of Commerce* column with Bob Stacey of 1000 Friends of Oregon, March 4, May 28, 2004.
- “Open Spaces, Empty Vistas”, *Brainstorm NW*, July 2003.
- “Seattle Creek Initiative Has Profound Implications”, *Puget Sound Business Journal*, Vol. 23, No. 49, April 10, 2003.
- “Real Estate Strategies: Using Technology to Help Convert Secondary Lands to Highest and Best Use”, presented at 2002 OSCPA Forest Products Conference, Eugene, OR, June 2002.
- “Health Care Clients Rely on GIS and Web Portal to Manage Real Estate”, white paper presented in Washington DC at ESRI Global Healthcare Conference November 2001, published on website, Feb. 2002.
- “Highest and Best Use Should Guide Prison Siting” *Corrections Compendium*, American Correctional Association, February 1998.
- “The Emerging role of GIS in Real Estate Development Planning” with Kenneth J. Dueker, *Journal of the American Planning Association*, American Planning Association. 1990.
- “Creative Financing Concessions in Residential Sales: Effects and Implications,” James Strathman, Barton DeLacy, and Kenneth J. Dueker, *Housing Finance Review*, Vol. 3, No. 2, Spring 1984, pp. 149 - 163. PSU Catalog Number R006.
- “Cash Equivalency for Residential Appraising,” *The Appraisal Journal*, American Institute of Real Estate Appraisers, January 1983.

Community Service:*Current Activities:*

- Mt. Angel Abbey Foundation Trustee
- Appraisal Standards Council of the Appraisal Institute

Select Past Activities:

- Emergency Siting Authority: Juvenile Corrections Facilities (1995, 1998), appointed by then Oregon Senate President, now U.S. Sen. Gordon Smith.
- Planning Commissioner, City of Lake Oswego, Oregon two terms (1989-1993)
- Board of Trustees, Willamette University (1991-1994), and President Alumni Association (1992-1993), Alumni Board (1986-93)
- Panel Member, Regional Advisory Board to the Oversight Board, Resolution Trust Corporation (RTC) – oversaw disposition of real estate assets in six state western region (1990-1991); appointed by then HUD Secretary Jack Kemp