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November 20, 2009

Via Hand Delivery

Ms. Renee Jenkins
Administration/Docketing
Ohio Power Siting Board
180 East Broad Street, 11th Floor
Columbus, Ohio 43215-3793

Re: Hardin Wind Energy LLC, Case No. 09-479-EL-BGN

Dear Ms. Jenkins:

Attached please find Hardin Wind Energy LLC's (Hardin) responses to Staff's Data Requests and Interrogatories submitted on November 10, 2009. These are partial responses; responses to Request Nos. 38; and 39 will be submitted November 23rd; Request Nos. 6 and 16 will be submitted November 25th; and Request No. 31 will be submitted December 10th.

If you have any questions, please call me at the number listed above.

Sincerely,

Sally W. Bloomfield

Attachment

Cc: Parties of Record

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Responses to Data Requests and Interrogatories

Hardin Wind Energy LLC

November 20, 2009

1. *Is it still possible that the turbines will have a nameplate capacity of 1.6 MW? If so, how will the turbine layout be affected (number of turbines that will move and by how much)?*

If the 1.6 MW xle wind turbine is used 15 wind turbines will be removed from the project layout in order to keep the overall project nameplate capacity at 300 MW, but the wind turbine locations will otherwise stay the same.

It should be noted that with respect to the siting of wind turbines, the Applicant has committed to the property owners that the Applicant will locate its wind facilities in such a way as to reasonably minimize impacts to the property and to the property owner's activities on the property, to the extent practical without negatively impacting the Applicant's facilities. It has also committed to the property owners that prior to construction, the locations of wind turbines, substations, access roads, cable routes and related facilities shall be determined by mutual agreement. Thus, the Applicant will provide a site plan to the property owners for their review and consent, which consent shall not be unreasonably withheld, conditioned or delayed. In addition, it was agreed by the Applicant that all access roads sited on the property owners shall be in support of a wind turbine sited on such property.

The Applicant has already shared its preliminary site plan with property owners and has received some property owner comments that were included in the layout submitted to OPSB. No later than the final iteration of the project area site plan, the Applicant will reflect the turbine and access road locations that will reasonably minimize impacts to the property and to the property owner's activities on the property, to the extent practical without negatively impacting the Applicant's facilities.

2. *Figure 05-03, "Hardin Cross Sectional Geology", is a map of the three-dimensional surficial geology of the project area, which was provided to the Applicant by the ODNr. There is no cross-section. Please provide a cross-sectional view of the geology in the project area, and a complete map legend for Figure 05-03, explaining the colored polygons and text markers.*

The Applicant has provided a cross sectional view of the geology of the project area as Hardin Cross Section.pdf (map) and Hardin Cross Section 2.pdf (graph). Additionally, the Applicant has provided a complete map legend for Figure 05-03 as Hardin Map Legend ("Unit Descriptions for Figure 05-03.")

3. *School data*

- A. *Referring to the "Geography and Topography of Project Area" map series (Figure 05-01 in the application) - A significant number of the locations denoted with the "schools" symbol did not seem to match field observation. In most cases there was no school at the location. (Specifically, see schools identified on maps 13, 21, 27, 28 and 29 as examples.) Please explain.*

This was obtained from ESRI Data & Maps 2007, the supplier of publicly available geospatial data. ESRI generated this information from United States Geological Survey (USGS) data. Some of the schools in the USGS data are listed as "historical" and thus may no longer be present.

- B. Staff noticed the term "historical" used to identify many of the schools listed in Table 3 of the "Cultural Resources Literature Review" (Attachment 08-05). Please explain what is meant by the term "historical" as used in Table 3 (e.g., no longer in existence, having some historical significance, or both).***

The Applicant has spoken to USGS to determine the definition of "historical" for schools. These were early, smaller schools which were consolidated into the current schools that are seen today.

- 4. Has the Applicant conducted any additional cultural resources work for this project that was not included in the Cultural Resources report as submitted in the application? If yes, are the results available to Staff? What additional cultural resources work does the Applicant anticipate doing? Has the Applicant received any comment and/or concurrence from the OHPO regarding planned cultural resources surveys?***

The Applicant met with OHPO in the spring of 2009 and has based its scope of work on the discussions during that meeting. The Applicant is in the process of conducting additional cultural resources work for this project. The results are not yet available but should be complete in five to six weeks. Based on comments from OHPO in the spring the level of effort for this archaeological testing task based on a schedule which allows for surface surveys after crops have been harvested rather than shovel testing prior to harvest. It is estimated that during late-spring or early-autumn (that is, before crop height obscures surface visibility, and after harvesting), as much as one-half of the project area of potential effect (APE) might be available for examination by means of pedestrian surface reconnaissance. Pedestrian surface reconnaissance is a more efficient and less labor-intensive method of archaeological testing than is subsurface shovel testing, allowing for a wider examination of the APE in an equivalent timeframe. Upon completion of this field work, the Applicant will provide a report to the OHPO of its findings.

Tetra Tech's (2009) Literature Review developed an environmental model based upon mapped units of quaternary surface geology (Ohio Division of Geological Survey 2004) and modern surface soils (Miller and Robbins 1994). Following these geological and soil units, Tetra Tech determined that the APE falls within seven environmental zones, including:

- Ground moraine (flat to undulating late-glacial surface features);
- End moraine (late-glacial knolls and ridges);
- Scioto Marsh (flat organic terrain derived from late-glacial lake, drained in late-nineteenth century and early twentieth century);
- Lake planed moraine (flat terrain formed on late-glacial lake plain adjacent to Scioto Marsh and non-marsh sections of Scioto River);
- Scioto River floodplain (non-marsh segment);
- Sand terrace (a rising terrace of sand delta, bars, and dunes along the northern edge of Scioto Marsh); and

- Kames (isolated ridges and terraces of sand and gravel deposited by glacial melt water).

The distribution of documented prehistoric archaeological sites within one mile of the project area indicates high sensitivity for the presence of archaeological resources in the **end moraine** and **sand terrace** environmental zones. The remaining environmental zones are considered to be of low sensitivity for archaeological resources. Although limited in frequency, kame sites are documented within the project area, presenting the possibility that further sites within this small environmental zone might be identified. A further factor affecting archaeological sensitivity is distance to water sources. In Hardin County, Ohio, the majority of prehistoric archaeological sites are located within 150 meters (500 feet) of a water body (Tetra Tech 2009). Areas greater than 150 meters distant from water are not considered archaeologically sensitive. The exceptions to this point are kame sites, which because they are principally ceremonial and burial sites are not dependent on proximity to water for their utility.

Review of Local Artifact Collections and Informant Interviews

A potential source of valuable information regarding prehistoric culture history and site distribution lies in artifact collections held by private individuals who reside and work in the area. It is possible that intensive cultivation of the project area has resulted in a number of sizeable artifact collections by people who have spent their lives walking and working in agricultural fields where artifacts typically are found. The examination of collections can lead to the identification of chronologically diagnostic artifacts, placing a site within a known temporal period. Knowledge of this sort is an important factor in evaluating whether an archaeological site possesses sufficient research value to be eligible for listing on the National Register of Historic Places. Ohio Historic Preservation Office (OHPO) recognizes the potential value of examining artifact collections and interviewing collectors as a “component of the background investigation” (OHPO 1994:58; Snyder 2009).

Phase I Archaeological Field Investigation

Tetra Tech is investigating a sample of the project APE applying methods in accordance with OHPO’s *Archaeology Guidelines* (1994). Field testing for prehistoric archaeological resources will focus on those project impacts that are located within the end moraine and sand terrace environmental zones, the two highest sensitivity zones crossed by the APE. All areas of project impact within the end moraine and sand terrace zones that are located within 150 meters of either a water source or from a previously documented archaeological site will be surveyed. Field testing for historic archaeological resources will include project impacts that occur within 100 feet of previously mapped-documented historic buildings and structures. Shovel testing will be undertaken at 15-meter (50-foot) intervals.

Shovel tests will be hand-excavated and will typically measure 50 x 50 centimeters as specified by OHPO guidelines. Shovel tests are normally excavated to a depth below which archaeological deposits are not likely to occur, or until an impasse is reached below which hand excavation is not possible. In settings with glacial till soils, it is anticipated that the shovel tests will reach approximately 30 to 50 centimeters (12-16 inches) deep. Soil will be

screened through 0.25-inch mesh shaker screens for standardized artifact recovery. Recovered artifacts will be retained for cleaning, identification, and inventory. Each shovel test will be assigned a unique, project-specific identifier. Results of each shovel test, including stratigraphic depths, soil color, soil textures, gravel/cobble inclusions and artifact contents will be recorded on standard forms, using standard terminology, such as United States Department of Agriculture (USDA) soil texture categories and Munsell color codes. Each shovel test will be promptly backfilled after excavation. The locations of shovel tests will be recorded on sketch maps with key positions recorded using a global positioning systems (GPS) receiver. GPS will be used to record the corners of grid blocks, or ends of linear transects. Digital photographs of typical conditions and features of notable interest will be used to document the field investigation.

Upon initiation of field investigations, Tetra Tech staff will evaluate whether field conditions are suitable for pedestrian surface survey. If conditions are appropriate, surface survey transects will be conducted at 10-meter (30-foot) intervals. Surface finds will be collected and their locations recorded by GPS. Areas where surface survey may be performed will not then be shovel tested.

As a test of the model that correlates site distribution with environmental zones, Tetra Tech will undertake controlled surface surveys of a 5-acre sample of the APE located within the Scioto Marsh, lake-planed moraine, ground moraine, and Scioto River floodplain (non-marsh) environmental zones. Walkovers of equivalent ten-acre areas will serve to document the presence or absence of archaeological resources within each environmental zone. If sites are located within these assumed low-sensitivity areas, then Tetra Tech would reconsider its model and may recommend additional or alternative fieldwork.

The APE within each environmental zone is described on the following page:

APE Acreage, Proposed Field Tests, and Surface Survey Acreage in Environmental Zones

Environmental Zones		Area of Potential Effect (acres)	Proposed Shovel Tests	Surface Survey Acres
Ground moraine				
	Turbines	164.6	-	5
	Access roads	93.7	-	-
	Cables	95.4	-	-
End moraine				
	Turbines	149.6	353	22.1
	Access roads	100.4	177	11
	Cables	45.7	111	6.9
Scioto Marsh				
	Turbines	215.4	-	5
	Access roads	120.7	-	-
	Cables	123	-	-
	Substations	8	-	-
Lake planed moraine				
	Turbines	39.9	-	5
	Access roads	21	-	-
	Cables	14.8	-	-
Scioto River floodplain (non-marsh)				
	Turbines	2.6	-	1
	Access roads	6.9	-	3
	Cables	2.5	-	1
Sand terrace				
	Turbines	7.7	10	-
	Access roads	7.8	-	-
	Cables	0.3	-	-
Kame		<0.1	-	-
Total		1,220 acres	651 shovel tests	60.0 acres

Archaeology Report

Following fieldwork, Tetra Tech will prepare a Phase I archaeological survey report. This report will conform to OHPO guidelines. The report will include, but will not be limited to: introduction; sensitivity model; field methods; survey results; results of informant interviews and review of artifact collections; recommendations and conclusions; and references cited. Tetra Tech will also submit geographic information system (GIS) data locating the boundary of all archaeologically-examined areas. Artifacts will be cleaned, analyzed, and inventoried in Tetra Tech's archaeology lab. At the conclusion of analysis, all artifacts will be placed in acid-free zipper bags and tagged with relevant provenience information. The final version of the report will be submitted both in bound format and in PDF format on CD. Artifacts recovered during the survey will be curated at a facility to be agreed upon with OHPO and individual property owners.

5. *Has the Applicant performed an architectural survey in the project area beyond the literature review of existing OHI and GIS data? If not, would architectural survey work be included in any additional evaluation that is planned?*

The Applicant met with OHPO in the spring of 2009 to discuss scope and approach to evaluating impacts to architectural resources. Based on the most recent conversation with OHPO, the Applicant will be providing a draft report upon its completion. The Applicant is in the process of performing an architectural survey in the project area beyond the literature review. Tetra Tech will perform an investigation of historic architecture with a five mile APE. At the suggestion of OHPO, Tetra Tech will pursue a tiered approach that places the greatest emphasis on those buildings closest to the project. The APE will be divided into two zones: up to .75 miles from the wind turbines and from .75 -5 miles from the wind turbines. The boundary of the zone closest to the project is based on the APE for cell towers in the Nationwide Programmatic Agreement for Review of Effects on Historic Properties for Certain Undertakings Approved by the Federal Communications Commission (the NPA). The NPA states:

the presumed APE for visual effects for construction of new Facilities is the area from which the Tower will be visible: a. Within a half mile from the tower site if the proposed Tower is 200 feet or less in overall height; b. Within ¾ of a mile from the tower site if the proposed Tower is more than 200 but no more than 400 feet in overall height; or c. Within 1 ½ miles from the proposed tower site if the proposed Tower is more than 400 feet in overall height.

The existing NPA has been used as model for establishing the area in which the intensive reconnaissance survey work will be undertaken. Tetra Tech is assuming that a GE 1.5 xle wind turbine generator with a blade tip height of 398 feet will be used. Tetra Tech notes that if a wind turbine with a tip height of greater than 400 feet is used the area in which the Intensive Reconnaissance Survey may increase as would the required level of effort.

OHPO Office File Review

All Ohio Historic Inventory forms for properties of local historic interest within .75 miles of the proposed wind turbine locations will be collected. In addition, all forms for properties from .75-5.0 miles from the project will be examined and the forms for those properties listed in or determined eligible for the National Register of Historic Places (NRHP) will be copied.

Intensive Reconnaissance Survey Up to .75 miles from the wind turbines

In the zone closest to the project, Tetra Tech proposes undertaking a comprehensive reconnaissance survey that documents all previously unrecorded historic buildings. Tetra Tech will follow the standard practice of defining historic buildings as those buildings style-dated in the field as 50 years old or older. Tetra Tech will record data about those historic resources which are located outside of nucleated population centers on the OHPO Section 106 Project Summary Form or I-Form and provide a recommendation about whether the property is potentially eligible to the NRHP. (A description of how the nucleated population centers will be addressed is below in Section 3.3.)

Sampling of Nucleated Population Centers within .75 miles of the wind turbines

In nucleated population centers -- including but not limited to Alger, McGuffey and Foraker - - Tetra Tech will photographically document and provide written architectural descriptions of two representative streetscapes as well as document any individual buildings, structures, objects or districts that are style-dated as 50 years of age or older and are determined in the field to be potentially eligible to the NRHP. Tetra Tech will record data about those individual historic resources determined in the field to be potentially eligible to the NRHP on the OHPO Section 106 Project Summary Form or I-Form.

Focused Reconnaissance Survey From .75-5.0 miles from the wind turbines

In the zone farther from the project, Tetra Tech proposes undertaking a focused reconnaissance survey that uses the OHPO Section 106 Project Summary Form or I-Form to document all parks, cemeteries, churches and schools noted in Table 3 of Tetra Tech's (2009) Literature Review that are determined in the field to be potentially eligible to the NRHP. Those that have previously been listed on, or determined eligible for the NRHP also will be observed to assess the impact of the Project on the resources. In addition, those resources not parks, cemeteries, churches or schools that are listed on, or have been determined eligible for, the NRHP will be observed to assess the impact of the Project on the resources. Additionally these areas are specifically mentioned in OPSB rules and may be part of a data request from the OPSB staff.

Historic Architecture Report

A report summarizing these findings will be prepared 4 to 5 weeks. The printed report will discuss the survey methods, background research, the survey results and an assessment of the effect of the project on those properties listed in, determined eligible for, or recommended as

potentially eligible to, the NRHP and potential mitigation of these effect. It will also include the OHPO Section 106 Project Summary Forms or I-Forms and photographs of the documented resources.

6. *How current are the records retrieved for the Cultural Resources Literature Review performed by the Applicant as depicted in Attachment 08-05?*

The Applicant is in the process of obtaining this information with the help of OHPO and anticipates providing this information to OPSB Staff by November 25th 2009.

7. *Please provide the number of residences within 100' and 1,000' of all collection lines, access roads, and the substation, separately.*

The Applicant has provided the number of residences within 100' and 1,000' of the wind farm facilities below.

	Substation	Access Roads	Collection System	Wind Turbines
100'	0	4	10	0
1,000'	1	145	122	0

8. *Please provide the latest GIS data showing participating parcels and associated property owner information, and the outline of the project area if it has changed since the filing of the application.*

The Applicant has provided this geospatial data electronically to Staff; parties may request a CD containing the data from Terry Nicole, Tetra Tech ETC at (215) 702-4100.

9. *Has the Applicant acquired any local permits for oversize and overweight vehicles, and/or the ODOT Superload Permit?*

The Applicant has had preapplication discussions with the Ohio Department of Transportation (ODOT) but has not yet applied for any oversized/overweight vehicle permits. The Applicant is in the process of determining routes for oversized loads on County and Township roads through consultation with the Hardin County Engineer. Upon completion of this determination the Applicant will meet formally with ODOT.

10. *Will the project require any temporary or new roadways or bridges, other than access roads to the turbine sites? Will construction of the project require any road closings and/or detours?*

The Applicant may need to widen roads at intersections in order to accommodate the turning radius of the larger wind turbine delivery trucks. Gravel will be added along the public right of way to accomplish this but it will not result in any temporary or new roadways or bridges. No road closings or detours are anticipated as part of this project.

11. *Will any portion of the proposed project, including new or renovated roads and/or bridges associated with this project, result in an encroachment in the designated floodway and/or an increase in the 100-year base flood elevation discharge?*

The Applicant will not be installing any new roadways or bridges will impact the floodway or increase the 100-year base flood elevation discharge.

- 12. Does the project conform to the local flood plain standard? Has the Applicant coordinated with the county flood plain administrator? If so, please provide any correspondence received.**

Hardin County does not participate in the National Flood Insurance Program and thus has no flood plain administrator or standard for the Applicant to coordinate with or conform to.

- 13. Please describe specific mitigation plans for aquatic discharges from the project area site clearing and construction activities, including mitigation for run-off and siltation (more specific than following OEPA BMPs). [4906-17-07 (C)(2)(c)]**

The Applicant will mitigate run-off and siltation by employing the use of silt fences, temporary and permanent seeding and water bars as applicable. Proper sequencing of construction activities will be followed to mitigate changes in flow patterns and erosion. The Applicant will obtain an approved SWPPP and E&S Plan as part of its NPDES General Storm Water Discharge from Small and Large Construction Activities from the Ohio EPA.

- 14. Please describe specifically any changes in flow patterns and erosion due to project area site clearing and grading activities (more specific than following OEPA BMPs). [4906-17-07 (C)(2)(d)]**

The Applicant will control erosion during construction through the use of silt fences, temporary seeding and water bars and other erosion and control measures installed as applicable. The Applicant will control stormwater runoff from the wind farm with swales and level spreaders and other stormwater control measures installed as applicable. Any streams which are crossed by access roads will be culverted, so as to not impacting flow patterns on the project area. The Applicant will follow proper sequencing of construction activities to mitigate changes in flow patterns and erosion. The Applicant will obtain an approved SWPPP and E&S Plan as part of its NPDES General Storm Water Discharge from Small and Large Construction Activities from the Ohio EPA.

- 15. Please specifically describe how the proposed facility incorporates maximum feasible water conservation practices considering available technology and the nature and economics of the various alternatives (more specific than following OEPA BMPs). [4906-17-07 (C)(3)(b)]**

Upon further discussion with OPSB Staff this Interrogatory has been deemed inapplicable.

- 16. Can the Applicant supply the following for each resource considered jurisdictional or isolated relative to the document called "Wetland Reconnaissance Survey" created by TetraTech, EC, Inc.?**

- A. Ohio Rapid Assessment Method (ORAM v 5.0) Wetland Delineation Forms (per USACE, Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (2008))**

The Applicant is in the process of obtaining this information and anticipates providing it to the OPSB Staff the week of November 23rd 2009.

B. *Qualitative Habitat Evaluation Index (QHEI), Primary Headwater Habitat Evaluation Index (HHEI), and/or Headwater Macroinvertebrate Field Evaluation Index (HMFEL), if performed*

The Applicant is in the process of obtaining this information and anticipates providing it to the OPSB Staff the week of November 23rd 2009.

C. *Post-Rapanos Jurisdictional Determination Forms (8 page forms)*

The Applicant is in the process of obtaining this information and anticipates providing it to the OPSB Staff the week of November 23rd 2009.

17. *It is the OPSB Staff's understanding that the Applicant has provided the USACE, Huntington District, North Regulatory Branch, with a document called "Wetland Reconnaissance of the Applicant Farm", prepared by TetraTech EC, Inc. Please answer the following:*

A. *Has the Applicant requested an official Jurisdictional Determination (JD) from the USACE with the submission of this document? If so, what is the date of this request? Could we get a copy of the request letter? If not, when does the Applicant anticipate making this request?*

The Applicant will be submitting a Jurisdictional Determination from USACE in the 4th Quarter of 2009 and will provide a copy to the OPSB Staff.

B. *Has the USACE provided an official JD letter to the Applicant? If so, could we get a copy of this letter? If not, has the USACE requested additional information pertaining to the surface waters present within the study area as outlined in this document? If so, what did the USACE specifically request?*

The Applicant has not yet submitted its Jurisdictional Determination, but when it is submitted a copy will be provided to the OPSB Staff.

C. *Has the USACE requested a field verification? If so, what is the date of the field verification? If a field verification date has been set, could the Applicant share this information with OPSB Staff?*

The Applicant has not yet submitted its Jurisdictional Determination, if field verification is deemed necessary the Applicant will inform the OPSB Staff.

18. *Is the project in an air quality non-attainment or maintenance area?*

The Applicant has determined that Hardin County is in attainment for all pollutants.

19. *Please provide copies of all of the following permit applications, if filed. If not filed, please describe any plans to file, with an estimated timeline.*

A. *USACE 404 Army Permit (Nationwide Permit, PCN, Individual)*

The Applicant intends to submit an application for Nationwide Permit #12 for the project in the 4th Quarter of 2009 and a copy will be provided to the OPSB Staff. The Applicant has already had an initial preapplication teleconference with USACE, OPSB Staff and USFWS.

- B. USACE Section 10 Permit and/or SACE Notice of Navigation in Section 10 Streams (An attached document to the application called "Wetland Reconnaissance of the Hardin Wind Farm", prepared by Tetra Tech EC, Inc., indicates that there will be a direct impact to the Scioto River. The Scioto River is considered a Traditionally Navigable Water (TNW) by the Corps. Coordination with the Corps for will be required if this resource will be impacted by the project.)***

The only crossing of the Scioto River will be with buried collection system cables which will be installed under the Scioto River using directional boring thus eliminating any impact to the river itself.

- C. OEPA 401 Water Quality Certification***

The Applicant will submit this simultaneous to the USACE 404 Nationwide Permit #12 for both phases of the project in the 4th Quarter of 2009 and a copy will be provided to the OPSB Staff.

- D. OEPA Pre Application Notification (Isolated Wetland Impacts only)***

The Applicant does not anticipate filing for Isolated Wetland permits as it will not be impacting wetlands – buried collection system cables will be installed under wetlands using directional boring, thus eliminating any impact to the wetlands themselves.

- E. OEPA Permit to Install (PTI)***

The Applicant will not discharging air pollution; constructing any wastewater collection, storage or treatment system; or modifying any existing wastewater collection, storage or treatment system and thus will not be submitting a Permit to Install.

- F. OEPA Notice of Intent (NOI)***

The Applicant intends to submit their Notice of Intent in the 2nd Quarter of 2010 and a copy will be provided to the OPSB Staff.

- G. OEPA NPDES Permit***

The Applicant intends to submit an application for a NPDES General Storm Water Discharge from Small and Large Construction Activities in the 2nd Quarter of 2010 and a copy will be provided to the OPSB Staff.

- H. Stormwater Pollution Prevention Plan (SP3)***

The Applicant intends to submit their Stormwater Pollution Prevention Plan in the 2nd Quarter of 2010 and a copy will be provided to the OPSB Staff.

- 20. Please provide specific mitigation plans for direct and/or indirect impacts to all waters (streams, wetlands, potentially jurisdictional ditches, ponds, lakes, reservoirs, ground water, aquifers, etc.), in accordance with USACE and OEPA rules.***

The Applicant will restore riparian zones temporarily affected during the construction of the wind farm to pre-construction contours and revegetate the area with native (non-invasive) plant material or seeds immediately following the completion of regulated activities at each crossing. To address unavoidable impacts associated with surface waters, the Applicant will work with USACE to determine an appropriate mitigation strategy such as installing oversized

culverts with a gravel base at all surface water body crossings. Either of these compensatory actions will be determined as part of the Applicant's application for coverage under nation wide permit 12.

21. *Please provide details on the impacts (linear footage, acreages, temporary vs. permanent, etc.) to surface water, ground water, drinking water, wildlife, wildlife habitat, and state and federal listed T/E species associated with this project.*

The Applicant will not be impacting any wetlands. The Applicant has revised its access road layout based on information obtained during the wetland reconnaissance in order to avoid any wetland impacts from access roads. Some buried collection system cables will cross wetlands, but these will be directionally bored underneath the wetland so as to eliminate any impact.

The Applicant will be crossing some streams in the project area. None of the streams to be crossed are perennial and all crossings will be a permanent culverted crossing with all appropriate impact mitigations in place. The following table shows the stream, stream crossing width (not all streams are crossed perpendicular to the stream) and area of crossing.

Phase	Area of Crossing (acres)	Width of Crossing (ft)	Stream ID
1	0.015	35.0	SAR013A/B
1	0.005	35.2	SAR022A/B
1	0.013	39.3	SAR042A/B
1	0.010	35.5	SBU053A/B
1	0.002	35.6	SWALE-10
1	0.002	31.4	SWALE-102
1	0.002	35.0	SWALE-105
1	0.002	35.0	SWALE-13
1	0.003	36.5	SWALE-24
1	0.003	38.2	SWALE-27
2	0.004	35.0	SAR035
2	0.009	38.1	SAR041A/B
2	0.005	35.1	SAR105A/B
2	0.002	33.7	SWALE-12
2	0.002	35.0	SWALE-14
2	0.002	35.0	SWALE-19

In the north and north-west areas of the project - approximately 67% of the total project area - there will be no impacts to threatened or endangered species. Even though the Applicant has completed mistnet surveys for bats resulting in no captures of Indiana Bats, the south east area of the project may have enough habitat to support Indiana Bats and therefore, in that area there is a higher likelihood for take of Indiana Bats. Currently the Applicant is working with the USFWS and the USACE to address the unlikely event of take of Indiana Bats, including

potentially pursuing an Incidental Take Statement under Section 7 of the Endangered Species Act Consultation or an Incidental Take Permit under Section 10 of the Endangered Species Act.

There will be no impacts to ground water or drinking water as the wind farm is not discharging any water for power generation. The only water usage at the wind farm will be from a small well at the operations and maintenance building – using the amount of water of a typical office.

The Applicant has designed the wind farm so as to avoid impacts to woodlots – the wind farm facilities will be built entirely on intensive agriculture, mitigating any impacts to wildlife.

22. *Are any Source Water Protection Area(s) present within 5 miles of the project area? Will any be impacted by the project?*

Please see attached Hardin SWPA (Figure 2: Source Water Protection Areas).

23. *Are any Public Water System(s) present within 5 miles of the project area? Will any be impacted by the project?*

Please see attached HARDIN PWS (Figure 1: Waste Treatment Plants and Public Water Supplies).

24. *Are there any Unique or High Quality Vegetative Habitats within 5 miles of the project area?*

As per a phone discussion with OPSB Staff, the Applicant has limited its response to this Interrogatory to the disturbance corridor of the wind farm.

The OPSB Staff provided, as part of these interrogatories, a list of rare or unique habitats found in Ohio including:

- Bog Community – Sphagnum Bog
- Bog Community – Leatherleaf Bog
- Bog Community – Tall Shrub Bog
- Bog Community – Tamarack-Hardwood Bog
- Fen Community – Cinquefoil-Sedge Fen
- Fen Community – Tamarack Fen
- Fen Community – Arbor Vitae Fen
- Prairie Community – Slough Grass-Bluejoint Prairie
- Prairie Community – Big Bluestem Prairie
- Prairie Community – Little Bluestem Prairie
- Prairie Community – Post Oak Opening
- Prairie Community – Sand Barren
- Savanna Community – Oak Savanna
- Beach Community – Beach Dune
- Cliff Community – Calcareous Cliff
- Cliff Community – Non-Calcareous Cliff
- Swamp Community (Forested) – Hemlock-White Pine-Hardwood Swamp
- Upland Forest Community – Hemlock-White Pine-Hardwood Forest
- Upland Forest Community – Arborvitae –Mixed wood Forest

None of these habitats were noted during the wetland delineation or other field activities.

25. Is there a listing of all plant species found within the project area? If so, please provide.

As part of the wetland delineation efforts for the project, the Applicant had noted the dominant vegetation that occurred within, and contiguous to, the delineated features. Those dominant species are as follows:

Scientific Name	Common Name
<i>Acer negundo</i>	BOX-ELDER
<i>Acer rubrum</i>	MAPLE, RED
<i>Acer saccharum</i>	MAPLE, SUGAR
<i>Aesculus glabra</i>	BUCKEYE, OHIO
<i>Agrimonia parviflora</i>	GROOVEBUR, SMALL-FLOWER
<i>Alisma plantago-aquatica</i>	WATER-PLANTAIN, BROAD-LEAF
<i>Alliaria petiolata</i>	MUSTARD, GARLIC
<i>Ambrosia artemisiifolia</i>	RAGWEED, ANNUAL
<i>Ambrosia trifida</i>	RAGWEED, GREAT
<i>Angelica atropurpurea</i>	ANGELICA, PURPLE-STEM
<i>Apocynum cannabinum</i>	DOGBANE, CLASPING-LEAF
<i>Arctium lappa</i>	BURDOCK, GREAT
<i>Aster pilosus</i>	ASTER, WHITE HEATH
<i>Aster vimineus</i>	ASTER, SMALL WHITE
<i>Berberis thunbergii</i>	BARBERRY, JAPANESE
<i>Bidens frondosa</i>	BEGGAR-TICKS, DEVIL'S
<i>Carex crinita</i>	SEDGE, FRINGED
<i>Carex intumescens</i>	SEDGE, BLADDER
<i>Carex scoparia</i>	SEDGE, POINTED BROOM
<i>Carya ovata</i>	HICKORY, SHAG-BARK
<i>Celtis occidentalis</i>	HACKBERRY, COMMON
<i>Centaurea nigra</i>	KNAPWEED, BLACK
<i>Cephalanthus occidentalis</i>	BUTTONBUSH, COMMON
<i>Cirsium discolor</i>	THISTLE, FIELD
<i>Cornus amomum</i>	DOGWOOD, SILKY
<i>Cornus racemosa</i>	DOGWOOD, GRAY-STEMMED
<i>Crataegus sp.</i>	HAWTHORN
<i>Datura stramonium</i>	JIMSONWEED
<i>Daucus carota</i>	QUEEN ANN'S LACE
<i>Dipsacus sylvestris</i>	TEASEL
<i>Echinochloa crusgalli</i>	GRASS, BARNYARD
<i>Eleocharis sp.</i>	SPIKERUSH
<i>Eupatorium rugosum</i>	SNAKEROOT, WHITE
<i>Euthamia graminifolia</i>	FRAGRANT-GOLDEN-ROD, FLAT-TOP
<i>Fragaria virginiana</i>	STRAWBERRY, VIRGINIA
<i>Fraxinus americana</i>	ASH, WHITE
<i>Fraxinus pennsylvanica</i>	ASH, GREEN
<i>Glechoma hederacea</i>	IVY, GROUND

Scientific Name	Common Name
<i>Gleditsia triacanthos</i> ,	HONEY-LOCUST
<i>Glycine max</i>	SOYBEAN
<i>Heracleum lanatum</i> ,	COW-PARSNIP
<i>Hystrix patula</i>	GRASS, BOTTLE-BRUSH
<i>Juglans nigra</i> ,	WALNUT, BLACK
<i>Malva sp.</i>	MALLOW
<i>Melilotus alba</i> ,	SWEETCLOVER, WHITE
<i>Oenothera biennis</i> ,	EVENING-PRIMROSE, COMMON
<i>Parthenocissus quinquefolia</i> ,	CREEPER, VIRGINIA
<i>Phalaris arundinacea</i> ,	GRASS, REED CANARY
<i>Phytolacca americana</i> ,	POKEWEED, COMMON
<i>Plantago lanceolata</i> ,	PLANTAIN, ENGLISH
<i>Polygonum hydropiper</i> ,	SMARTWEED, MARSHPEPPER
<i>Populus deltoides</i> ,	COTTON-WOOD, EASTERN
<i>Prunus serotina</i> ,	CHERRY, BLACK
<i>Quercus alba</i> ,	OAK, WHITE
<i>Quercus rubra</i> ,	OAK, NORTHERN RED
<i>Ribes lacustre</i> ,	CURRENT, PRICKLY
<i>Rosa multiflora</i> ,	ROSE, MULTIFLORA
<i>Rubus occidentalis</i>	Black Raspberry
<i>Salix nigra</i> ,	WILLOW, BLACK
<i>Salix sericea</i> ,	WILLOW, SILKY
<i>Sambucus canadensis</i> ,	ELDER, AMERICAN
<i>Scirpus validus</i> ,	BULRUSH, SOFT-STEM
<i>Secale cereale</i>	GRASS, RYE
<i>Setaria sp.</i>	BRISTLY FOXTAIL
<i>Solidago altissima</i> ,	GOLDEN-ROD, TALL
<i>Solidago gigantea</i> ,	GOLDEN-ROD, GIANT
<i>Taraxacum officinale</i> ,	DANDELION, COMMON
<i>Tovara virginiana</i>	JUMPSEED
<i>Toxicodendron radicans</i> ,	IVY, POISON
<i>Trifolium pratense</i> ,	CLOVER, RED
<i>Ulmus americana</i> ,	ELM, AMERICAN
<i>Verbena urticifolia</i> ,	VERVAIN, WHITE
<i>Viburnum acerifolium</i> ,	VIBURNUM, MAPLE-LEAF
<i>Viburnum lentago</i> ,	NANNYBERRY
<i>Vitis aestivalis</i> ,	GRAPE, SUMMER
<i>Zea mays</i>	CORN

Outside of the wetland delineation effort, the following plant species were identified:

Dominant Tree Species	
Boxelder	<i>Acer negundo</i>
Green ash	<i>Fraxinus pensylvanica</i>
Northern red oak	<i>Quercus rubra</i>
Red elm	<i>Ulmus rubra</i>
Shagbark hickory	<i>Carya ovata</i>
Sugar maple	<i>Acer saccharum</i>
White oak	<i>Quercus alba</i>
Other Species	
Cottonwood	<i>Populus deltoids</i>
Silver maple	<i>Acer saccharinum</i>
Chestnut oak	<i>Quercus Montana</i>
Paw-paw	<i>Asimina triloba</i>
Post oak	<i>Quercus stellata</i>
Hackberry	<i>Celtis occidentalis</i>
Hawthorn	<i>Crataegus spp.</i>
Button bush	<i>Cephalanthus occidentalis</i>
American beech	<i>Fagus grandifolia</i>
Northern spice bush	<i>Lindera benzoin</i>
Grassland Species	
Dead nettle	<i>Lamium purpureum</i>
Queens Anne's Lace	<i>Daucus carota</i>
Creeping Thistle	<i>Cirsium arvense</i>
Comon Thistle	<i>Cirsium vulgare</i>
Tall Fescue	<i>Festuca arundinuacea</i>
Giant Goldenrod	<i>Solidago gigantea</i>
Dandelion	<i>Taraxacum officinale</i>
Red Clover	<i>Trifolium pratense</i>
Daisy Fleebane	<i>Erigeron annuus</i>
Dock	<i>Rumex spp</i>

The remaining land in the project area is intensive agriculture and contains corn, soybeans and carrots.

26. ***Can the Applicant verify that reptiles, amphibians, mussels, fish, and macroinvertebrates were searched for during field reconnaissance but were not found in the study area?***

The Applicant searched for reptiles and amphibians in the Project Area and did not find any. Mussels were observed in the Scioto River and McCoy run during the wetland delineation. The examination for mussels during the wetland delineation was only cursory and species was not determined. Each instance of locating these mussels was at a point where the proposed collection system crossed a stream. As the Applicant will be directionally boring underneath these streams there should be no impact to the mussels. None of the streams which will be crossed by access roads are perennial and none support mussel habitat.

Additionally, during the wetland delineation, field crews observed a common garter snake near southwest of wind turbine 1 and frogs were observed sporadically throughout the Project Area.

Mussels and minnows were observed in the Scioto River, Flat Branch, McCoy Run; and several Scioto River Tributaries while snails were observed in McCoy Run. Crayfish burrows were observed sporadically along the edges of the perennial and more prominent intermittent streams. Raccoon and deer tracks were common along most of the proposed surface water body crossings.

27. *Please provide a copy of the Indiana bat mist net survey and acoustic survey results.*

No Indiana bats were captured during the bat mist net surveys. The Applicant has submitted the mist net survey report to USFWS and ODNR. Consistent with ODNR and USFWS recommendations, the Applicant respectfully requests OPSB to obtain this report from USFWS and ODNR.

The Acoustic Survey should be complete by mid December and will be presented to USFWS, ODNR and the OPSB Staff at that time.

28. *Will the project impact suitable summer roosting and/or rearing habitat for the Indiana bat?*

The Applicant will not be removing any trees in woodlots as part of this project and thus will not be impacting any roosting or rearing habitat for the Indiana bat. Some individual trees may be removed along property lines – but the Applicant will do so during the winter (prior to April 1st) while bats are hibernating elsewhere.

29. *Can the Applicant provide more detailed information on any presence/absence surveys that have been conducted to determine the existence of any mussel species (alive, dead, worn dead, sub fossil) within the Scioto River? Specifically, has the Applicant conducted surveys for the Clubshell (*Pleurobema clava*, Federally Endangered) and the Rayed bean (*Villosa fabalis*, Candidate), within the Scioto River in close proximity (100 feet upstream to 400 feet downstream) of the proposed impact zone?*

Mussels were observed in the Scioto River and McCoy run during the wetland delineation. The examination for mussels during the wetland delineation was only cursory and species was not determined. Each instance of locating these mussels was at a point where the proposed collection system crossed a stream. As the Applicant will be directionally boring underneath these streams there should be no impact to the mussels and thus no impact zone to be evaluated. None of the streams which will be crossed by access roads are perennial and none support mussel habitat.

30. *Did the Applicant find any Bald Eagle(s) or nest(s) within the project area?*

The Applicant did not conduct Bald Eagle studies of the project area due to USFWS direction that no Bald Eagles were expected to be present in the project area. There was one Bald Eagle noted during the raptor migration study but, during the Applicant's raptor nest survey, no bald eagle nests were found.

31. *Have any actual (e.g., existing, day vs. night and season vs. season) ambient noise measurements been conducted? If so, what actual values were measured and when were the measurements conducted? If not, why not, and does the Applicant plan to conduct such measurements?*

The Applicant is in the process of obtaining this information and will submit it to the OPSB Staff by December 10th 2009.

32. *Please provide a more accurate reflection of winter-time (e.g., hard, frozen ground and cold temperature) sound propagation, entering the following as parameters into modeling software: Compare and contrast the sound values and distance affected, when using $G=0.5$ vs. $G=0$ (frozen ground) for ground conditions. When running the $G=0$ calculation, use a more accurate winter-time temperature and season-correct meteorological conditions.*

See attached Figure A("Comparison of Estimated Sound Levels at 1253 Residences within 1-mile of Hardin Project Boundary for Two Different Ground Condition and Air Temperature Cases [70%RH for Both Cases] for the wind farm sound estimates at each residence within the project one-mile boundary. Figure A indicates that the estimated sound levels are on average 4.1 dBA greater for $G = 0.0$ than for $G = 0.5$. The standard deviation of the differences was 0.4 dBA. Note that the variation in temperature from 10 deg. C to 0 deg C. (kept 70% RH in both cases) had little separate effect on the sound estimates in these cases.

33. *For each m/s increase in operational wind speed, from cut-in to full capacity, please provide a separate scatter plot similar to Acentech Figure 20 – Attachment 08-02.*

See Figures 2a through 2d to compare the scatter plots of turbine facility sound levels versus distance to the nearest wind turbine for the following wind conditions: 6 m/s to cut out (maximum sound operating condition), 5 m/s, 4 m/s, and 3 m/s wind speed, Wind speed is referenced at 10 m elevation.

34. *What was the averaging time used in the acoustic study?*

The sound estimates assumed steady conditions with maximum sound output of the turbines and stable atmospheric sound propagation. The estimates represent the energy average sound level (Leq) of the facility during steady conditions.

35. *What reference wind speed was used in the acoustic study?*

The reference wind speed for the sound study was 8 m/s at the standard 10 m elevation. This value is within the wind speed range of 6 m/s to the cut off wind speed of 25 m/s where the operating turbine produces the greatest sound.

36. *What reference wind speed height was used in the acoustic study?*

The reference wind speed height for the sound study was 10 m, a standard elevation for wind turbine studies.

37. *What octave bands and Hz were analyzed in the acoustic study?*

The octave bands with the standard center frequencies of 31.5, 63, 125, 250, 500, 1000, 2000, 4000, and 8000 Hz were used to develop the wind turbine sound estimates

38. *Please provide forecasted Leq noise levels, during periods of maximum output, for all residences within the project area and within one mile of the project area. Please list, in table format, the contributing turbine(s) and residence addresses.*

The Applicant is in the process of obtaining this information and anticipates providing it on November 23rd 2009.

39. *For residential receptors exceeding 40 dBA (as shown in Acentech Figure 20 – Attachment 08-02):*

The Applicant is in the process of obtaining this information and anticipates providing it on November 23rd 2009.

- A. What are their contributing turbine numbers and corresponding addresses?***
- B. What are the specific dBA values per residence (with addresses)?***
- C. What are the specific distance values per residence, for these residences (with addresses)?***

40. *What mitigation measures would you be able to implement to reduce the maximum estimated sound level to 40 dBA at the community residences within one mile of the project boundary?*

Wind turbines can be located such that no residences experience greater than a 40dBA sound level directly attributable to the wind turbine. If adverse noise impacts from wind turbine operations that result in exceedances of the USEPA acoustic thresholds are identified due to either meteorological conditions or equipment failure, a proactive noise mitigation approach will be implemented. A hotline will be setup to receive and formally document all noise complaints which will then be investigated by onsite project staff. This will be followed by a review of equipment performance to determine if sound levels fall outside normal tolerances, and wind turbines that are found to be faulty and causing or contributing to an adverse noise impact will be parked until the unit can be evaluated and fixed.

41. *Please describe the company's policies, safety precautions, rules, warnings, or trainings that will be in effect to prevent worker injury due to falling ice.*

Workers will wear hard hats at all times while working on the wind farm. When turbines have shut down due to ice accumulation on the blades (see response to #43 below) and during potential icing conditions, ice hazards and other winter weather conditions will be covered during the periodic worker safety meetings held on-site

42. *Describe the use of any warning signs that will be placed in or adjacent to the ice throw risk area.*

In Invenergy LLC's experience of operating over 2,000 megawatts of wind farms for several years, ice throw is not a serious concern and has not caused noticeable damage to its wind farms. As such, typically no warning signs will be posted near the wind turbines specifically relating to ice shedding. Rather, the Applicant posts signs at the entrance to each access road stating "Private Property" and "Do Not Approach." The sign is also posted at each access road with the wind turbine number, address (address registered with 911) and an emergency number (generally 911 but if a turbine was in an area not served by 911, the local emergency contacts would be listed). In the even that ice throw becomes an issue, procedures will be changed appropriately.

43. *Will an ice detector be used?*

Each wind turbine controller will be equipped with a controller that is programmed with an ice detection feature. During operation, the controller will monitor ambient air temperature, hub-height wind speed, and turbine power output. Potential blade icing will be assessed by the

software through a comparison of air temperature along with an evaluation of the turbine's actual power production relative to the expected production level under the actual wind conditions. If the turbine's power production is below the expected power production by a certain percentage for the actual wind conditions, the software assumes that ice or snow has built up on the blade surface and is lowering the aerodynamic efficiency of the turbine. The software interprets the drop in power production as an icing condition and triggers an Ice Sensor Alarm. This alarm automatically results in the turbine shutting down. Prior to restarting the turbine, a visual inspection of the blades will be completed by the plant operators to determine that icing is not present on the turbine blades.

44. *Will the anemometers be heated during the winter months?*

Anemometers installed at both the wind farm's permanent met towers and upon each turbine are heated anemometers.

45. *Please provide an equation or calculation of a distance for thrown ice that can be applied to the GE 1.5 xle turbine at a hub height of 262 feet and rotor diameter of 271 feet and at the maximum rotational speed before which the turbines will shut down.*

The Applicant has not made or otherwise performed any such calculation itself, but has utilized research conducted by equipment manufacturers in the development of its internal guidelines as to siting distances. As to ice shedding, Applicant and its affiliates operate under guidelines that state that residences and other public use buildings should be 800 feet from turbines. Applicant exceeds such guidelines by 200 or more feet in this case.

46. *Please provide detailed engineering plans and specifications of one typical spread footer foundation; the plans shall include cross-sectional views and dimensions.*

The detailed engineering plans for a GE sle turbine will be available at the Applicant's attorney's office: Bricker & Eckler, 100 S. Third Street, Columbus, Ohio. The GE xle turbine foundation design is expected to be very similar to the GE sle wind turbine's design and can therefore be considered typical for the project. A preliminary geotechnical investigation of the project is underway and will provide the detailed parameters necessary to validate the foundation design against the wind farm's specific geologic and geotechnical conditions.

47. *Please provide the engineering calculations that determined the size of one typical spread footer foundation.*

The Applicant will make these calculations available at the Applicant's attorney's office: Bricker & Eckler, 100 S. Third Street, Columbus, Ohio.

48. *Please provide the results of a communications study that shows the specific effects of the project on PCS networks, AM & FM radio, television signals, and microwave transmission for the project area and vicinity. Specifically and separately, list any turbines, by turbine number, that are expected to interfere with microwave paths.*

Microwave Paths: The Applicant has already identified and mapped the licensed microwave paths that intersect the project area. The Worst Case Fresnel Zone (the swath along the microwave path where wind turbines could obstruct the path, hereinafter "WCFZ") was defined for each microwave pathway. These WCFZ pathways were avoided in the siting of the

wind turbines. The attached report ("Wind Power GeoPlanner Licensed Microwave Report") has been updated with the latest turbine coordinates and any new microwave paths, this updated report is attached. Based on this updated report, two of the proposed wind turbine locations are expected to interfere with the microwave paths. The Applicant is in the process of working with the involved parties to mitigate this impact through wind turbine relocation and will provide the results of this to the OPSB Staff.

AM & FM radio: The Applicant has attached a report on AM & FM radio interference ("Analysis of AM and FM Broadcast Station Operations in the Vicinity of Hardin Wind Energy facility in Hardin County, Ohio), no impacts are expected.

TV Signals: The Applicant has attached a report on TV signal interference ("Off-Air TV Reception Analysis at the Hardin Wind Energy Project Area in Hardin County, Ohio. The report notes that based on the location of the TV stations relative to the wind turbine area certain channels may be degraded in those communities that are on the opposite side of the wind project area from the TV stations. However, in no case should any community lose all of its now available TV channels due to the number of TV stations that presently surround the wind farm area. Based on the location of the proposed wind energy project area and the TV stations servicing the area it does not appear that there will be many communities where an extreme loss of TV coverage will occur.

- 49. *Has the Applicant conducted an NTIA study or submitted plans to the NTIA for review? If not, when does the Applicant plan to submit? If yes, please provide any correspondence received.***

Notice of the proposed project was provided to the NTIA on May 19th 2009. The NTIA provided to the Federal Agencies represented in the Interdepartment Radio Advisory Committee (IRAC) and, following a 45-day review period, the agencies did not identify any concerns regarding blockage of their radio frequency transmissions. A copy of the correspondence received from the NTIA is attached.

- 50. *What is the status of FAA review of the latest project layout provided to OPSB Staff? Is the proposed layout expected to change based on the results of the FAA review?***

The layout that was submitted to the FAA on 16 January 2009 does not conform exactly to the current proposed layout. As of 13 November 2009, 34 of the 225 locations have received responses from the FAA while 191 locations are still classified as "work in progress." Of the 34 locations that have received responses from the FAA, all of the responses have been "Determinations of No Hazard to Air Navigation."

Since the FAA reviews the specific coordinates of the proposed turbines as well as the cumulative impacts of the entire project, and not a general project area, making changes to the layout following FAA review requires the applicant to start the entire process from the beginning. For this reason, it is best to submit a final layout to the FAA once all other siting considerations have been evaluated and turbine locations modified based on those other considerations.

In the case of the Hardin Wind Farm, however, a layout based upon the formerly proposed 2.5 XL turbine was submitted for evaluation. While this layout had not been evaluated through the OPSB wind turbine siting process, the Applicant nevertheless wanted to be proactive in

determining whether or not 225 2.5 XL wind turbines would create any adverse impacts to air traffic safety or to regulated airspace. This layout is still undergoing FAA review. The submittal of an additional layout, such as the currently proposed layout, to the FAA could lead the FAA to evaluate the cumulative impact of both layouts. To avoid this potential interpretation, the locations of the 225 2.5 XL wind turbines would have to be deleted from the FAA system so that only the current proposed layout is evaluated. However, the deletion of the 225 2.5 XL locations may delay the identification of potential impacts to air traffic safety or to regulated airspace. Based on Invenergy's experience on similar projects, allowing the FAA to complete the initial review of turbine locations prior to submitting the current proposed layout will allow for a more timely identification of possible impacts to air traffic safety and regulated airspace and therefore a more timely resolution of such issues.

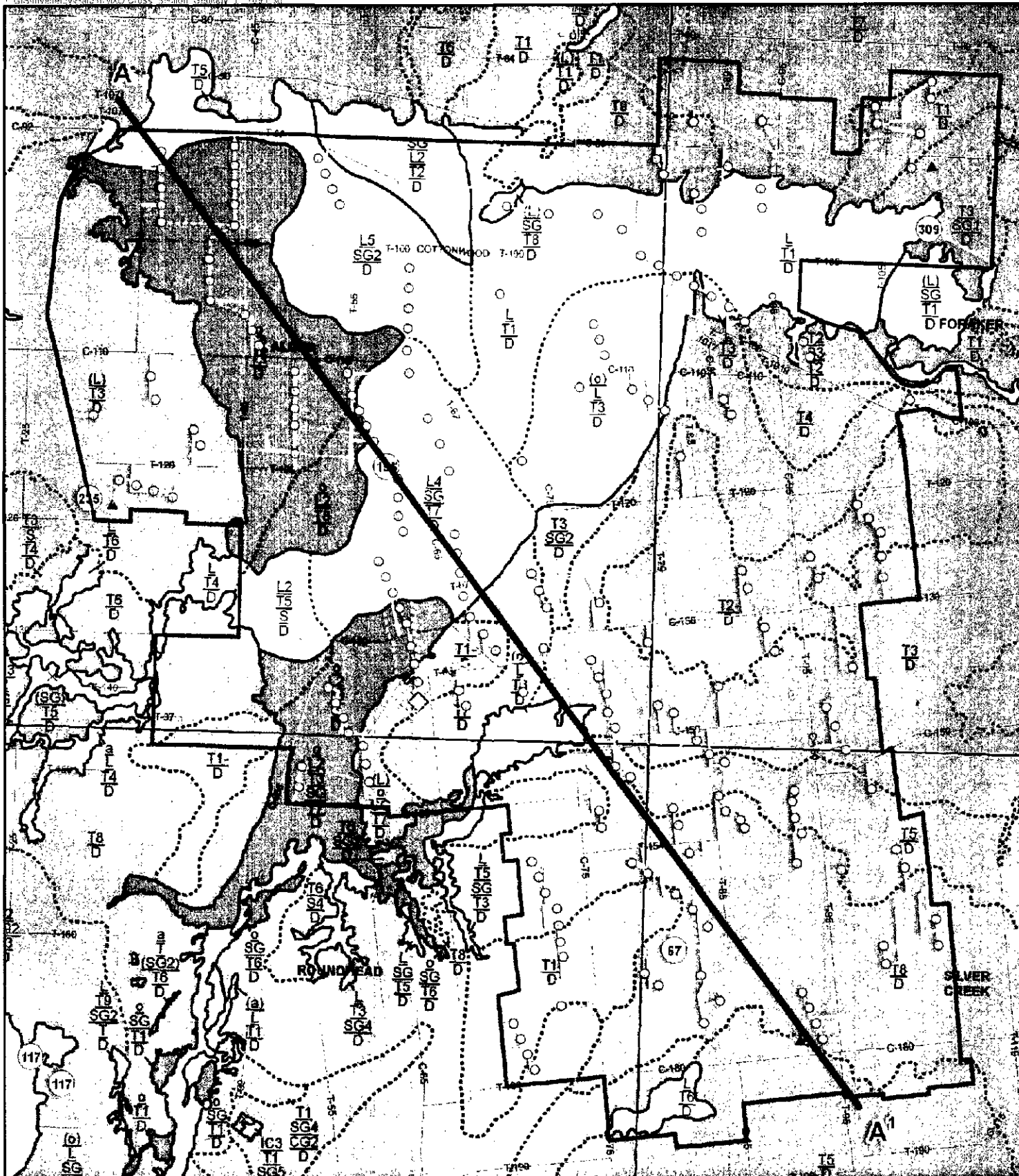
Until responses from the FAA that identify potential impacts to air traffic safety or regulated airspace are received by the Applicant, adjustments of the layout cannot be made. The Applicant is continuing discussions with the FAA regarding the timing of the issuance of the findings from the FAA review. If the forthcoming results of the FAA review indicate that a particular wind turbine would result in a potential impact to air traffic safety or regulated airspace, then modifications of the proposed layout may be required. If any turbine locations are modified, the Applicant will submit to the OPSB documentation of the impacts associated with the new location. If a location cannot receive a determination of no hazard to air navigation or similar approval from the FAA, such a location will not be constructed.

51. *When does the Applicant propose to post decommissioning funds?*

Invenergy LLC has executed several decommissioning agreements for other wind farms in the country. The Applicant will present a draft decommissioning plan during the preconstruction meeting with the OPSB staff. The decommissioning funds will be posted prior to commencement of construction.

- The decommissioning plan will contain the following areas:
 - Decommissioning Sequence
 - Post-decommissioning land use
 - Environmental impact during decommissioning
- Salvage Background
- Wind Turbine Transformers
- Access Roads
- Crane Pads
- Cables
- Meteorological Tower
- Earthwork and Topsoil Restoration
- Summary of Decommissioning Costs
- Financial Assurance

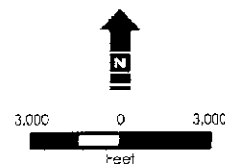
The following images were scanned as received



Legend

- Proposed XLE Turbine Location
- Proposed XLE Access Road
- ... Proposed Collection Routing To 345 KV Line
- ▭ Project Study Area
- ▲ Met Tower Locations
- Substation Location

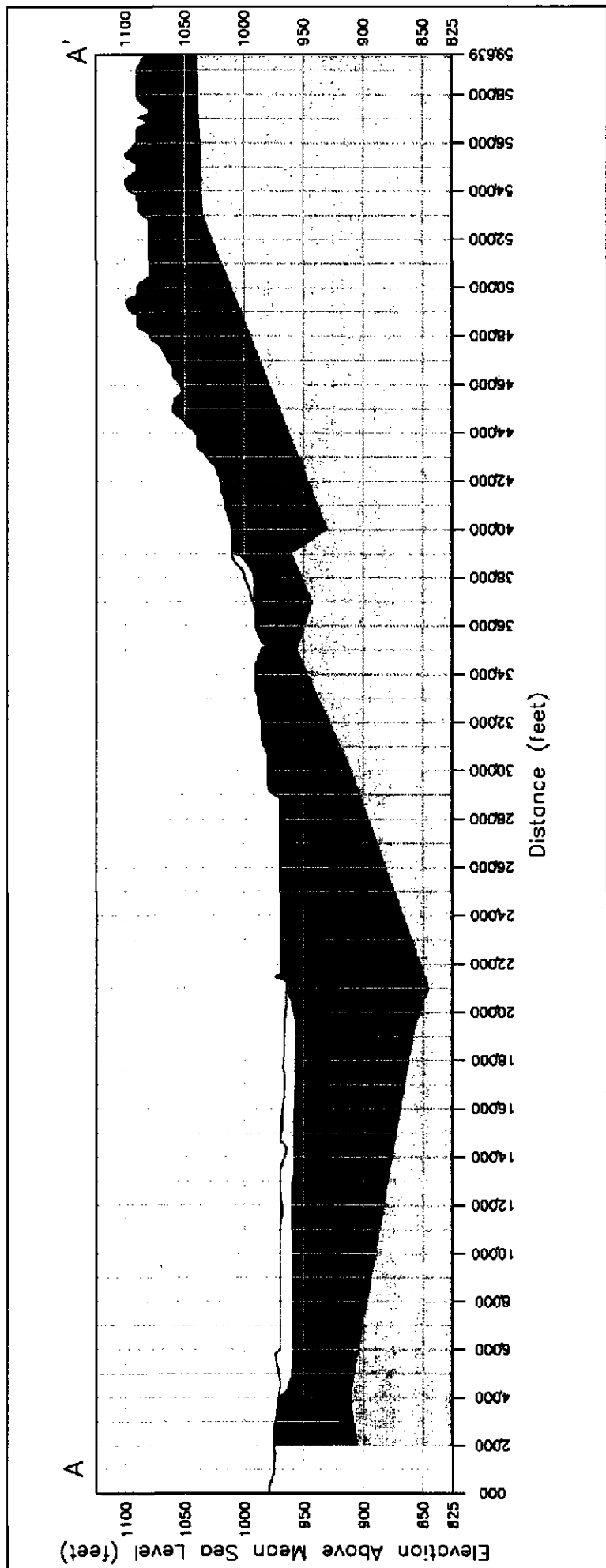
Notes
1. Ohio Department of Natural Resources
Division of Geological Survey



Hardin Cross Sectional Geology

Hardin Wind Farm, Hardin County, Ohio

November 2009



Hardin Cross Sectional Geology

Hardin Wind Farm, Hardin County, Ohio

November 19, 2009



UNIT DESCRIPTIONS FOR FIGURE 05-03

	Surficial Units
w	Water ; large lakes and reservoirs only.
m	Made land . Large areas of cut and fill, such as dams, landfills, and urban areas; may include reclaimed strip mine areas. Underlain by bedrock or other lithologic units.
o	Organic deposits (Holocene) . Muck and peat, may contain clay at depth. Generally less than 20-feet thick. Formed in undrained depressions. Organic deposits too small to map at 100K-scale indicated by an asterisk [*] and underlain by material shown in surrounding map-unit area. Occupies depressions between beach ridges, dunes, and on the lacustrine plain; throughout the map area; very prevalent in marshy areas flanking Indian Lake and in areas formally occupied by intermorainal marshes. Considered to thin to zero at contact with adjacent polygons.
a	Alluvium (Holocene) . Includes a wide variety of textures from silt and clay to boulders; commonly includes organic material; generally not compacted; rarely greater than 20-feet thick, unit considered to thin to zero at contact with adjacent polygons. Present in floodplains of modern streams throughout entire map area or in man-made water retention features. Mapped only where areal extent and thickness are significant.
At	Alluvial terraces (Wisconsinan) . Old floodplain remnants along streams that flowed into intermorainal lakes. Highly variable textures; commonly positioned tens of feet above modern floodplains. Unit considered thinning to zero at contact with adjacent polygons.
C	Clay (Wisconsinan) . Massive to laminated; may contain interbedded silt and fine sand; clay content can exceed 80%. Laminated clay commonly contains thin silt or sand partings. Carbonate-cemented concretions occur in some areas. Distributed throughout the Marion map area as lowland surface deposits, terraces, and as deposits of larger intermorainal lakes.
LC	Silt and clay (Wisconsinan) . Laminated to interbedded, may contain thin, fine sand or gravel layers. Occurs as thick lacustrine valley fill deposits of intermorainal lakes and larger fluvial valleys. Present as thick, deltaic deposits, outwash deposits in upland depressions and intermorainal lake deposits.
L	Silt (Wisconsinan) . Massive or laminated, commonly contains thin sand partings. Carbonate-cemented concretions occur in some areas. May contain localized clay, sand, or gravel layers. Present throughout the map area as lowland surface deposits, terraces, and thick, deltaic deposits in intermorainal lakes.
SL	Sandy Silt (Wisconsinan to Holocene) . Massive or laminated, commonly contains thin sand partings. Present throughout the map area in depressions, as beach deposits, drapes on flanks of beach ridges and dunes, and capping deltaic deposits.
S	Sand (Wisconsinan) . Contains minor amounts of disseminated gravel or thin lenses of silt or gravel; grains well- to moderately sorted, moderately to well-rounded; finely stratified to massive, may be cross bedded; locally may contain organics. In deep buried valleys, may be older than Wisconsinan age. Present in association with deltaic deposits or outwash throughout map area.
SG	Sand and gravel, (generally Wisconsinan) . Intermixed and interbedded sand and gravel commonly containing thin, discontinuous layers of silt and clay; grains well to moderately sorted, moderately to well rounded; finely stratified to massive, may be cross bedded; locally may contain organics. In deep buried valleys, may be older than Wisconsinan age. Present as valley wall terraces and in buried valleys throughout the map area, and as beach ridge deposits of proglacial predecessors of Lake Erie in northwest corner of map.

IC	Ice-contact deposits (Wisconsinan). Highly variable deposits of poorly sorted gravel and sand; silt, clay, and till lenses common; may be partially covered or surrounded by till. Deposited directly from stagnant ice as kame or esker landforms. Commonly associated with large, deep buried valleys.
CG	Complexly interbedded deposits of clay, silt, sand, gravel, and till (unspecified age). Unit identified from well logs; data insufficient for more detailed differentiation or age assignment. Present in deeper buried valleys throughout the area.
G	Gravel (Wisconsinan). Contains intergranular sand, some sand and silt beds or lenses; unit well to moderately sorted, subangular to well rounded; may be massive, cross-bedded, or horizontally bedded. Larger clasts and majority of gravel of variable lithology but are commonly derived from bedrock within the immediate area. In deep buried valleys, may be older than Wisconsinan age. Mapped in the corner formed with the Lorain/Put-in-Bay and Findlay maps.
GA	Basal gravel. Highly variable, poorly sorted gravel and sand with significant amounts of silt and clay. Deposited at or near the front of the ice sheet directly on bedrock. Presumably of Wisconsinan age. Mapped only in the northeast corner of map.
T	Unsorted mix of silt, clay, sand, gravel, and boulders, variable carbonate content, fractures common (Wisconsinan). May contain silt, sand, and gravel lenses. Deposited directly from several separate ice advances. Undifferentiated and non-specified age in buried valleys or where separated by intervening non-till units from an overlying, designated till. Surface may be wave-planed or modified by lacustrine erosion and deposition.

	Bedrock Units
Sh	Shale. Ohio Shale (Upper Devonian), brownish black, dark brown to black, carbonaceous. Present along the eastern edge of map area, unit not exposed, occurs beneath undifferentiated Quaternary and Neogene (?) deposits; data from core holes.
S-L	Interbedded shale and limestone, shale dominant. Mapped only in the eastern quarter of the map to indicate the Olentangy Shale. Olentangy Shale (Middle and Upper Devonian), greenish-gray, calcareous, sparsely fossiliferous, clay shale; disseminated pyrite; locally contains lenses and nodules and layers of limestone.
Ls	Limestone. Used to designate the Delaware and Columbus Limestones present in the eastern quarter of the map area. Delaware Limestone (Middle Devonian), medium brown, fine to medium crystalline, fossiliferous, cherty limestone containing shale laminae. Columbus Limestone (Middle Devonian), light to medium gray to brown, fine to coarse crystalline, fossiliferous, and cherty in the upper portion; sparsely fossiliferous and contains quartz grains in the lower portion. This unit is susceptible to dissolution and contains significant areas of well-developed karst topography.
D	Dolomite. Dominant bedrock stack unit present in the map. Stratigraphic names of the dolomites in descending stratigraphic order: Salina Group undifferentiated, Tymochtee, Greenfield, and Lockport Dolomites. Salina Group undifferentiated (Upper and Lower Silurian), comprised of dolomite shades of gray and brown; very finely crystalline; mostly in thin to medium beds and laminae; locally includes shale, anhydrite, and/or gypsum beds and laminae; Tymochtee and Greenfield Dolomites undivided (Upper and Lower Silurian), dolomite and shale. Tymochtee Dolomite shades of gray and brown; very finely crystalline; occurs in thin to massive beds with carbonaceous shale laminae and beds. Greenfield Dolomite shades of gray and brown; very finely to coarsely crystalline; occurs as massive beds to laminae; argillaceous; locally brecciated in lower portion. Lockport Dolomite (Upper and Lower Silurian), variegated white to shades of gray; finely to coarsely crystalline; mostly in

	medium to massive beds; fossiliferous; vuggy; locally cherty in lower portion of unit.
--	--

	MAP SYMBOLS
*	Small area of organic deposits.
I	Quarry, mine, or strip mine; floored in bedrock; may contain reclaimed areas.
C	Sand and gravel pit. Pit bottom generally underlain by unconsolidated lithologic units of surrounding polygon(s). May contain reclaimed areas.
—	Boundary between map-unit areas having different uppermost continuous lithologies; underlying lithologies may or may not differ.
-----	Boundary between map-unit areas having the same uppermost continuous lithology but different thickness or different underlying lithologies.

MAPPING CONVENTIONS FOR FIGURE 05-03

This map provides a three-dimensional framework of the area's surficial geology and depicts four important aspects of surficial geology:

1. Geologic deposits, indicated by letters that represent the major lithologies.
2. Thicknesses of the individual deposits, indicated by numbers and modifiers.
3. Lateral extent of the deposits, indicated by map-unit area boundaries.
4. Vertical sequence of deposits, shown by the stack of symbols within each map-unit area.

Figure 1 illustrates mapping conventions. **Letters, numbers, and modifiers** are arranged in stacks that depict the vertical sequence of lithologic units for a given map-unit area. A single stack of symbols occurs in each map-unit area and applies only to the volume of sediments within that particular map-unit area.

Letters represent geologic deposits (lithologic units) and are described in detail below. Lithologic units may be a single lithology, such as sand (S) or clay (C), or a combination of related lithologies that are found in specific depositional environments, such as sand and gravel (SG) or ice-contact deposits (IC). The bottom symbol in each stack indicates the bedrock lithologies that underlie the surficial deposits. The detailed lithologic unit descriptions below summarize:

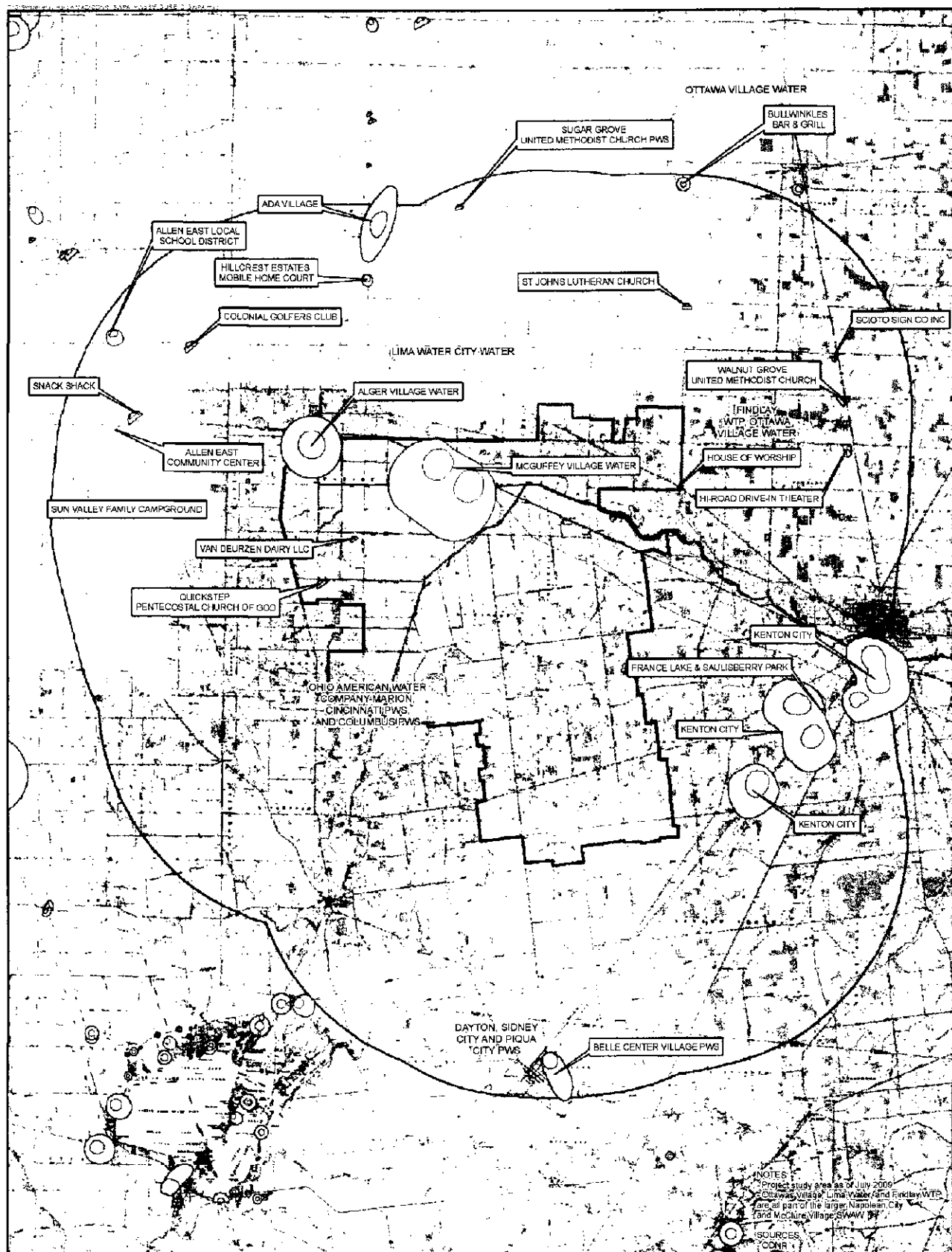
1. Geologic characteristics such as range of textures, bedding, and age.
2. Engineering properties or concerns attributed to the unit.
3. Depositional environment.
4. Geomorphology or geomorphic location.
5. Geographic location within the map area, if pertinent.

Numbers (without modifiers) that follow the lithology designator represent the average thickness of a lithologic unit in tens of feet (for example, 3 represents 30 feet). If no number is present, the average thickness is implied as 1 (10 feet). These unmodified numbers correspond to a thickness range centered on the specified value but may vary up to 50 percent. For example, T4 indicates the average thickness of till in a map-unit area is 40 feet, but thickness may vary from 20 to 60 feet.

Modifiers provide additional thickness and distribution information:

1. Parentheses indicate that a unit has a patchy or discontinuous distribution and is missing in portions of that map-unit area. For example, (T2) indicates that till with an average thickness of 20 feet is present in only part of that map-unit area.
2. A minus sign following a number indicates the maximum thickness for that unit in areas such as a buried valley or ridge. Thickness decreases from the specified value, commonly near the center of the map-unit area, to the thickness of the same lithologic unit and vertical position specified in an adjacent map-unit area. For example, a SG9- map-unit area adjacent to a SG3 area indicates a sand and gravel unit having a maximum thickness of 90 feet that thins to an average of 30 feet at the edge of the map-unit area. If the material is not present in an adjacent area, it decreases to zero at that boundary.

The small scale of this reconnaissance map generalizes the great local variability within surficial deposits. That variability is explained in the lithologic unit descriptions and by the use of thickness ranges. Some areas and lithologies are too small to delineate at 1:100,000 scale and have been included in adjacent areas. This map should serve only as a regional predictive guide to the area's surficial geology and not as a replacement for subsurface borings and geophysical studies required for site-specific characterization.



Legend

- Inner Management Zone (1-year time of travel)
- Drinking Water Source Protection Area (5-year time of travel)
- 5 Mile Buffer of Project Study Area
- Project Study Area

Source Water Area Watershed

- DAYTON, SIDNEY CITY AND PIQUA CITY PWS
- FINDLAY WTP, OTTAWA VILLAGE WATER
- LIMA WATER CITY WATER
- OHIO AMERICAN WATER COMPANY-MARION CINCINNATI PWS AND COLUMBUS PWS
- OTTAWA VILLAGE WATER



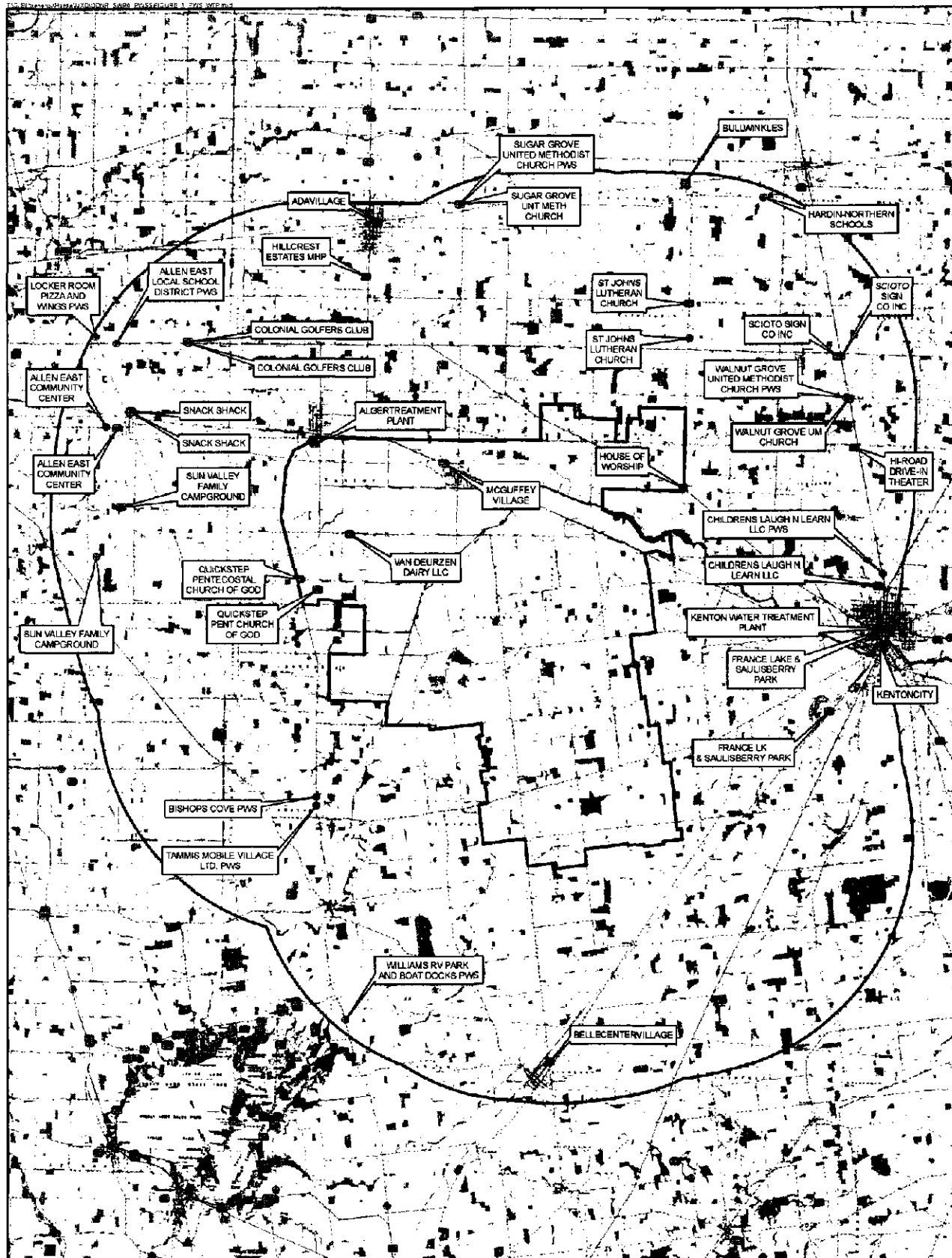
1,000 0 1,000 2,000 3,000
Meters

FIGURE 2: Source Water Protection Areas

Hardin Wind Farm, Hardin County, Ohio

November 2009





Legend

- Public Water Supplies
- Waste Treatment Plants
- 5 Mile Buffer of Project Study Area
- Project Study Area

NOTES:
- Project study area as of July 2009

SOURCES:
- ODIR

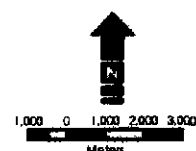


FIGURE 1: Waste Treatment Plants and Public Water Supplies

Hardin Wind Farm, Hardin County, Ohio

November 2009



Figure A.
Comparison of Estimated Sound Levels at 1253 Residences within
1-mile of Hardin Project Boundary for Two Different Ground Condition and
Air Temperature Cases (70%RH for Both Cases).

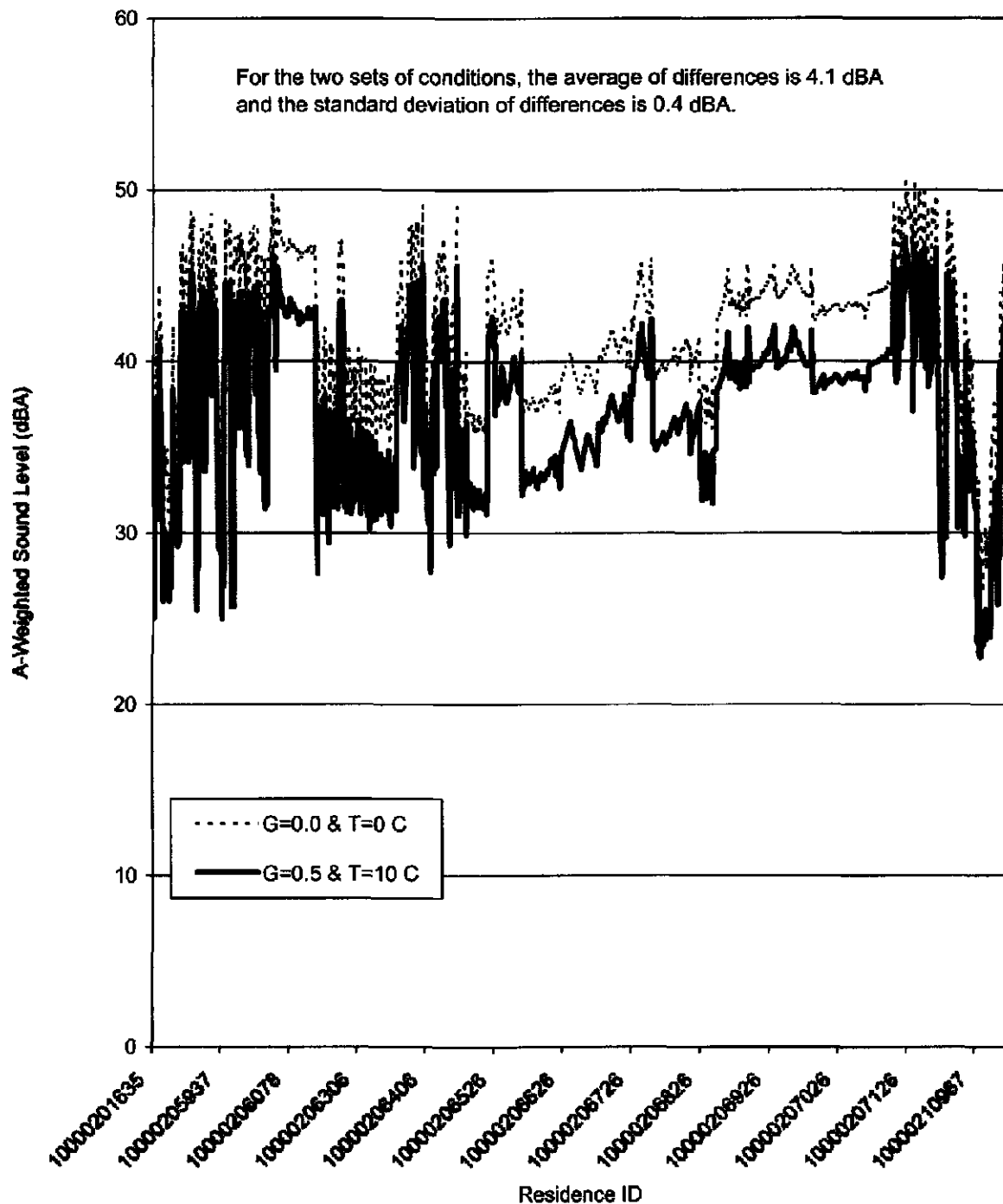


Figure 2a.
Scatter Plot of Estimated Overall Turbine Facility Sound Levels (dBA) vs. Distances (ft) to Nearest
Turbine for Residences within One Mile Boundary of Project Site.
(Operating condition at maximum sound output for each GE 1.5xle turbine - wind speed of 6m/s to cut
out at 10m height.)

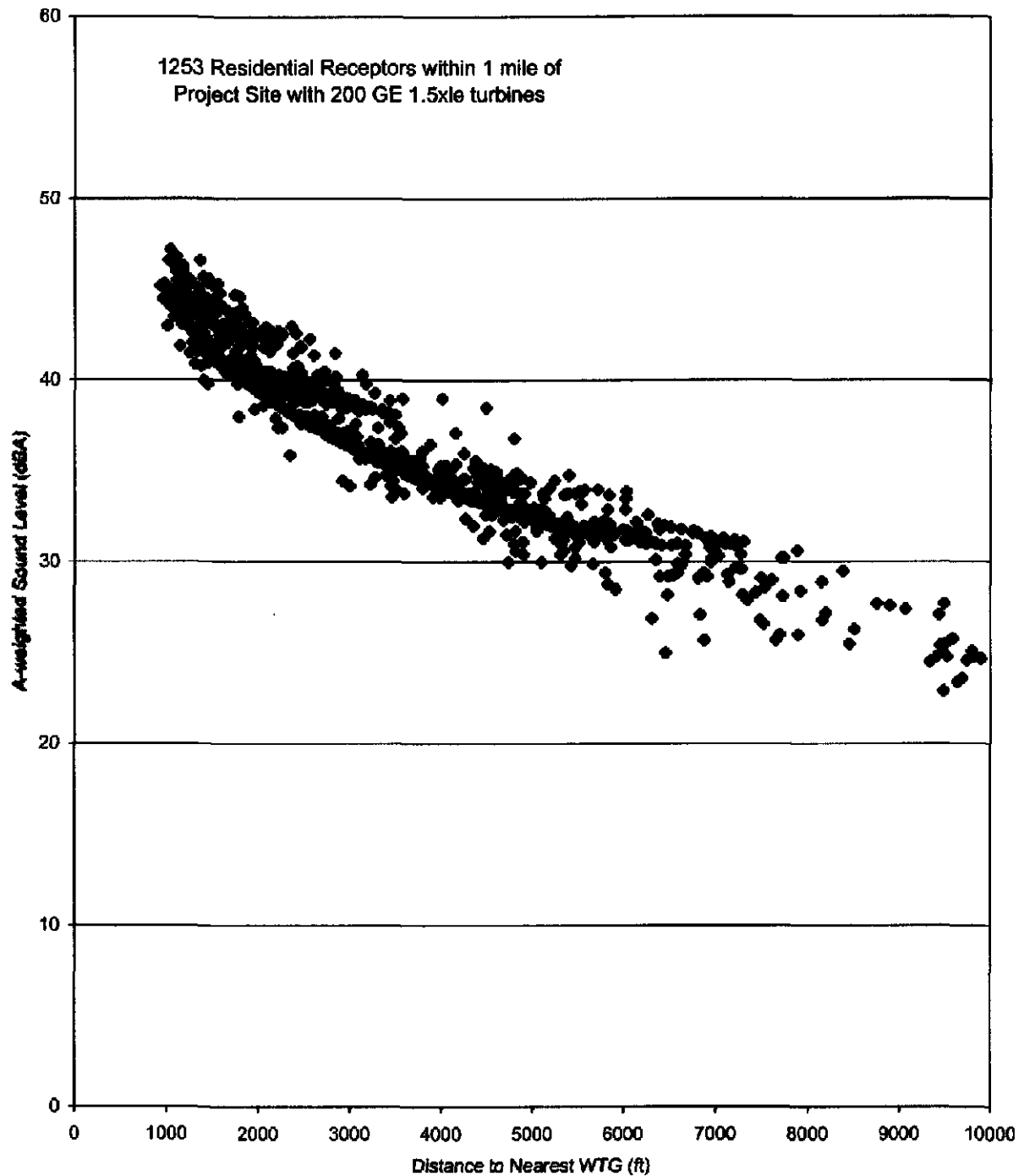


Figure 2b.
Scatter Plot of Estimated Overall Turbine Facility Sound Levels (dBA) vs. Distances (ft) to Nearest
Turbine for Residences within One Mile Boundary of Project Site.
(Operating condition for each GE 1.5xle turbine - wind speed of 5m/s at 10m height.)

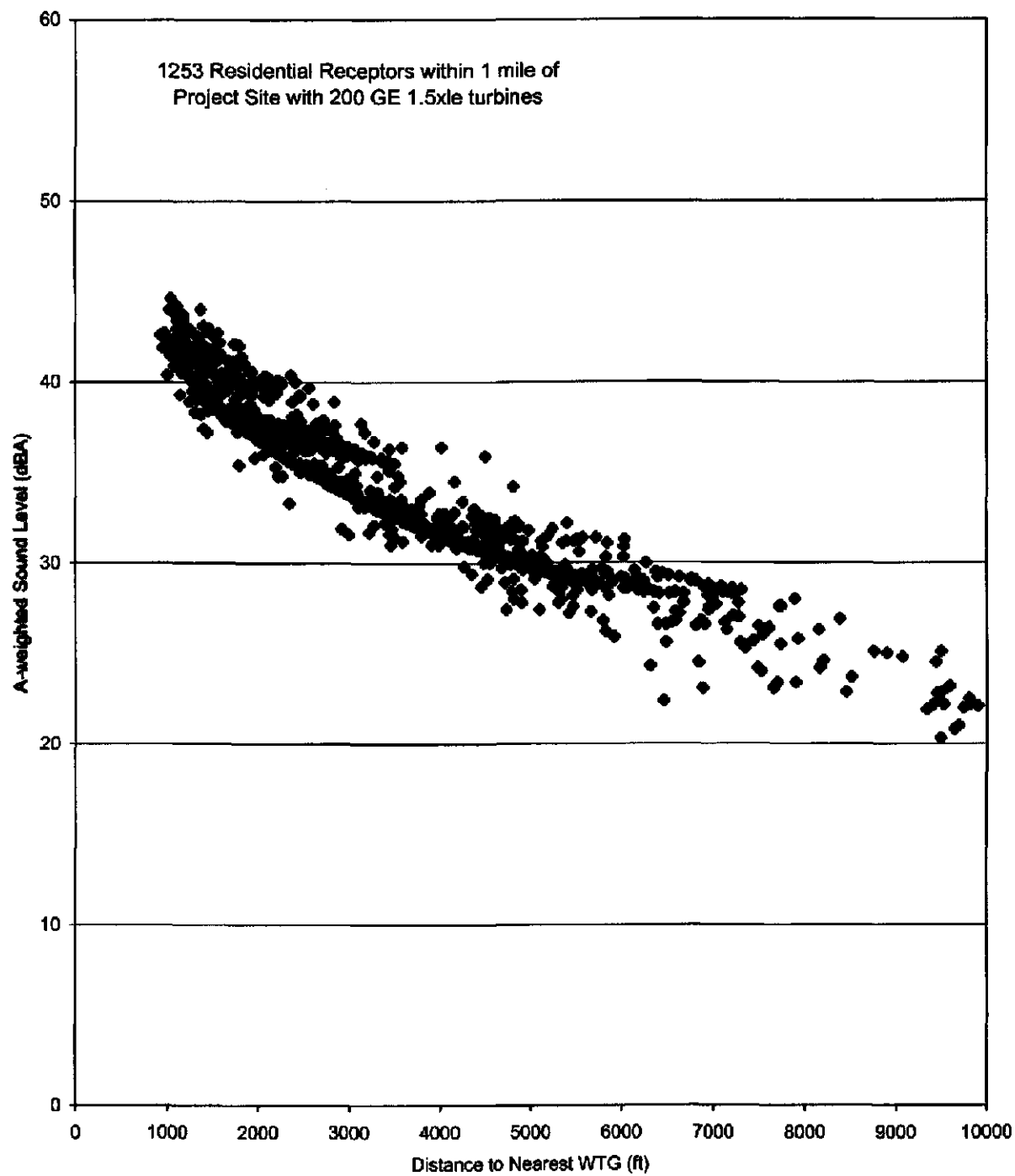


Figure 2c.
Scatter Plot of Estimated Overall Turbine Facility Sound Levels (dBA) vs. Distances (ft) to Nearest
Turbine for Residences within One Mile Boundary of Project Site.
(Operating condition for each GE 1.5xle turbine - wind speed of 4m/s at 10m height.)

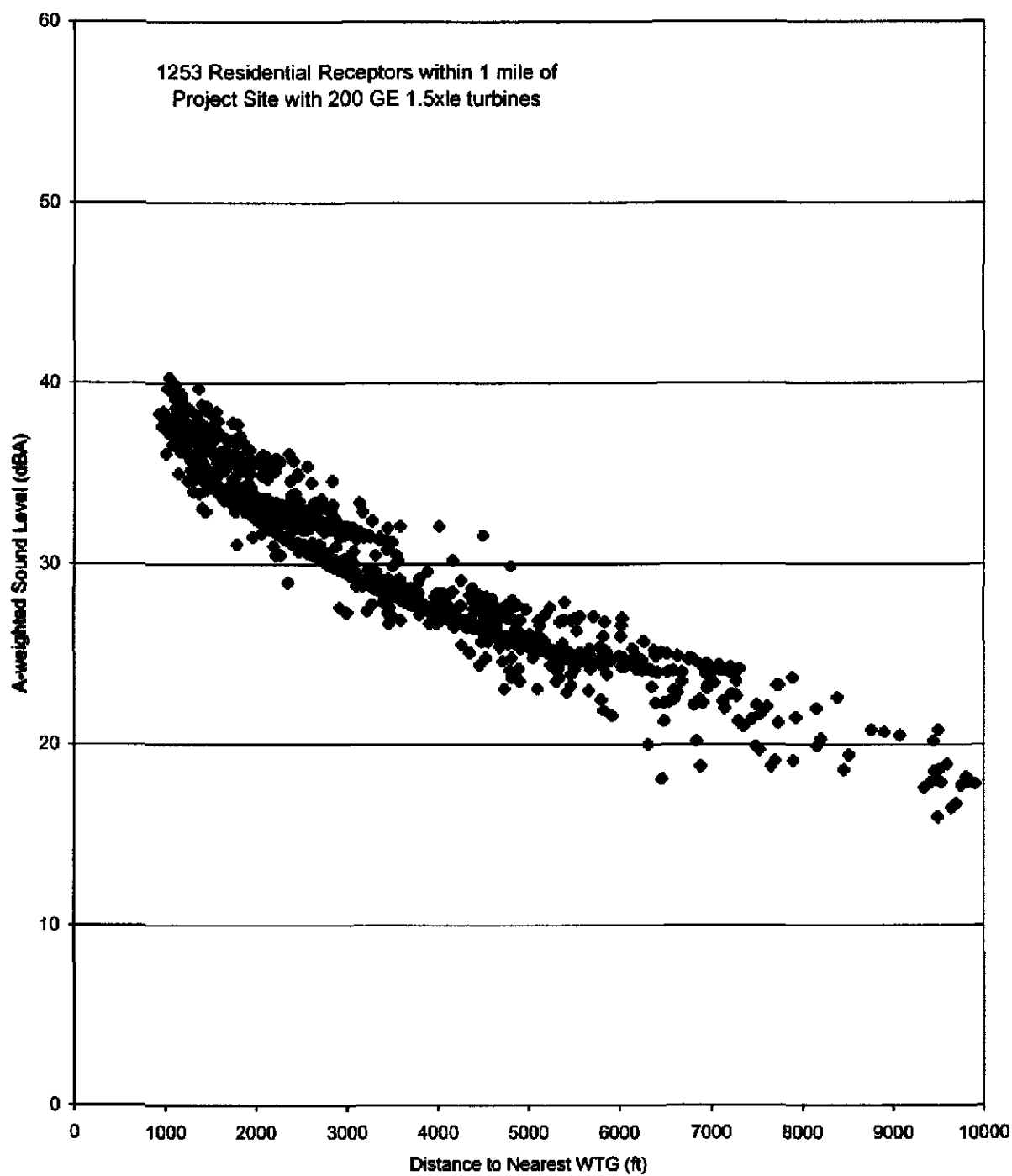
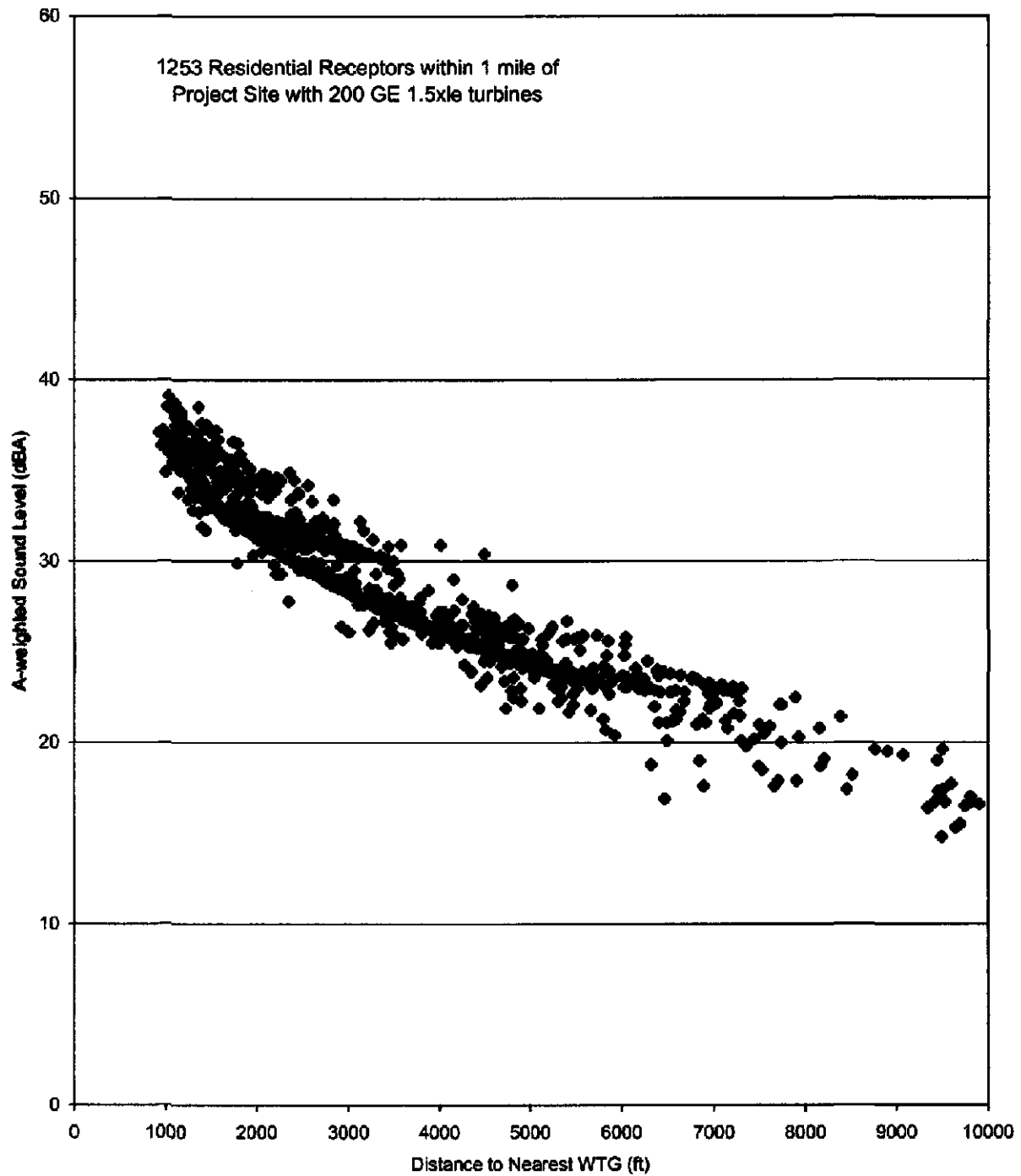


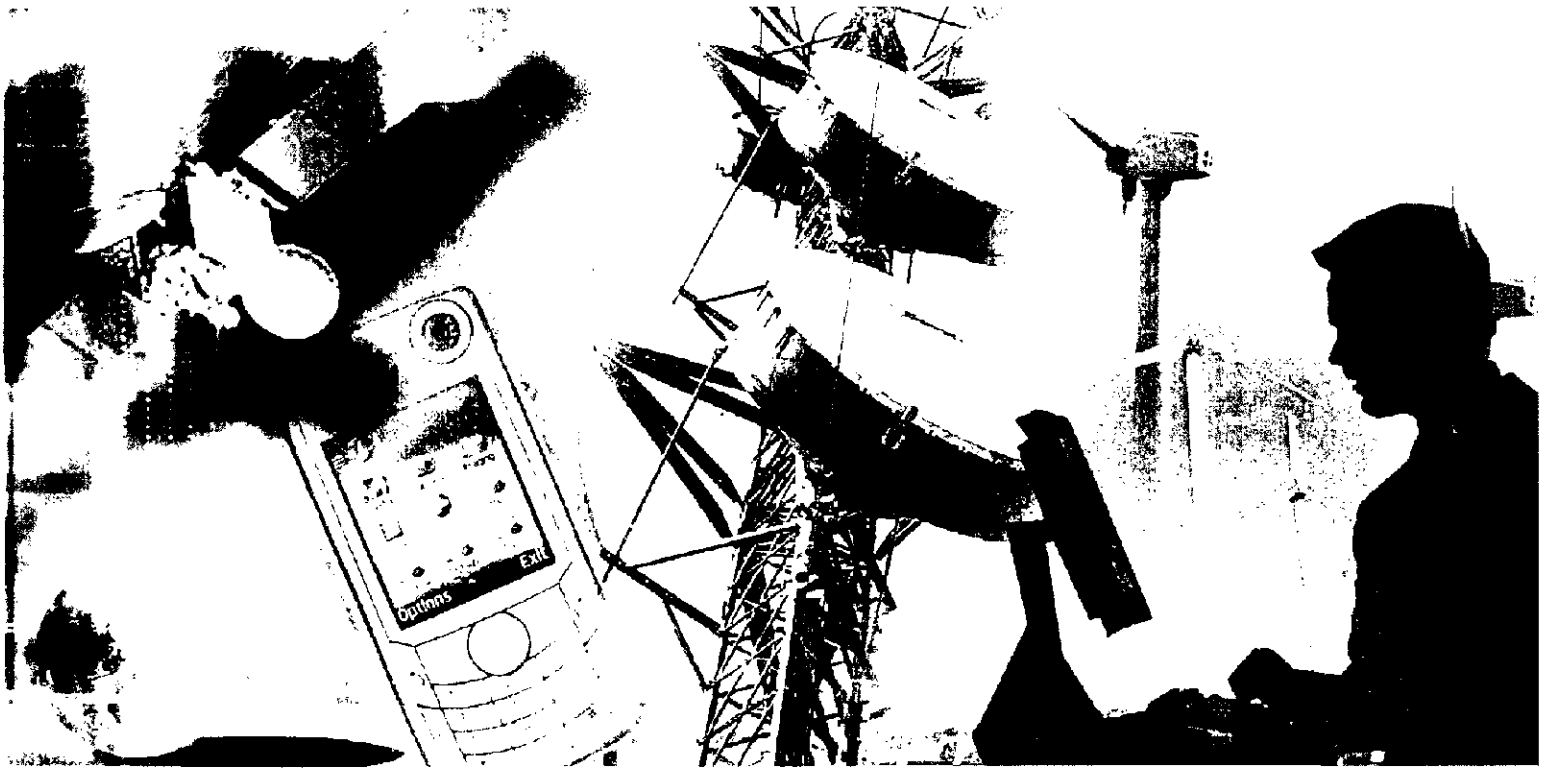
Figure 2d.
Scatter Plot of Estimated Overall Turbine Facility Sound Levels (dBA) vs. Distances (ft) to Nearest
Turbine for Residences within One Mile Boundary of Project Site.
(Operating condition for each GE 1.5xle turbine - wind speed of 3m/s at 10m height.)



Wind Power GeoPlanner™

Licensed Microwave Report

Hardin



Prepared on Behalf of
Invenergy LLC

November 13, 2009



Table of Contents

1. Introduction	- 1 -
2. Summary of Results	- 2 -
3. Tables and Figures	- 4 -
4. Contact Us	- 11 -

1. Introduction

The use of wind energy, one of the oldest forms of harnessing a natural energy source, is now one of the world's fastest growing alternative energy sources. The United States is committed to the use of wind energy, and over the next several years billions of dollars will be spent on wind power projects. However, as new wind turbine generators are installed around the country, it is important to note that they may pose an interference threat to existing microwave systems and broadcast stations licensed to operate in the United States.

Wind turbines can interfere with microwave paths by physically blocking the line-of-sight between two microwave transmitters. Additionally, wind turbines have the potential to cause blockage and reflections ("ghosting") to television reception. Blockage is caused by the physical presence of the turbines between the television station and the reception points. Ghosting is caused by multipath interference that occurs when a broadcast signal reflects off of a large reflective object—in this case a wind turbine—and arrives at a television receiver delayed in time from the signal that arrives via direct path.

Many states and other jurisdictions recognize the need for regulations addressing interference to radio signal transmissions from the wind turbine installations. Specifically, local planning authorities typically require project developers to ensure wind turbines will not cause interference. In some cases they require developers to notify the telecommunication operators in the area of the proposed wind turbine installation. Other factors prompting developers to undertake proactive investigation into potential interference include the need to prevent legal and regulatory problems and the desire to promote goodwill within the community—a good neighbor approach.

Comsearch has developed and maintains comprehensive technical databases containing information on licensed microwave networks throughout the United States. Microwave bands that may be affected by the installation of wind turbine facilities operate over a wide frequency range (900 MHz – 23 GHz). These systems are the telecommunication backbone of the country, providing long-distance and local telephone service, backhaul for cellular and personal communication service, data interconnects for mainframe computers and the Internet, network controls for utilities and railroads, and various video services.

This report focuses on the potential impact of wind turbines on licensed non-federal government microwave systems. Comsearch provides additional wind energy services, a description of which is available upon request.

2. Summary of Results

An overall summary of results appears below.

Project Information

Name: Hardin

County: Hardin

State: Ohio

Number of Microwave Paths Analyzed	Number of Turbines	Number of Potential Obstructions
8	203	2

Methodology

Our obstruction analysis was performed using Comsearch's proprietary microwave database, which contains all non-government licensed paths from 0.9 - 23 GHz¹. First, we determined all microwave paths that intersect the area of interest². The area of interest was defined by the client and encompasses the planned turbine locations. Next, for each microwave path that intersected the project area, we calculated a Worst Case Fresnel Zone (WCFZ). The mid-point of a full microwave path is the location where the widest (or worst case) Fresnel zone occurs. Fresnel zones were calculated for each path using the following formula.

$$R_n \cong 17.3 \sqrt{\frac{n}{F_{GHz}} \left(\frac{d_1 d_2}{d_1 + d_2} \right)}$$

Where,

- R_n = Fresnel Zone radius at a specific point in the microwave path, meters
- n = Fresnel Zone number, 1
- F_{GHz} = Frequency of microwave system, GHz
- d_1 = Distance from antenna 1 to a specific point in the microwave path, kilometers
- d_2 = Distance from antenna 2 to a specific point in the microwave path, kilometers

For worst case Fresnel zone calculations, $d_1 = d_2$

¹ Please note that this analysis does not include unlicensed microwave paths or federal government paths that are not registered with the FCC.

² We use FCC-licensed coordinates to determine which paths intersect the area of interest. It is possible that as-built coordinates may differ slightly from those on the FCC license.

The calculated WCFZ radius, giving the linear path an area or swath, buffers each microwave path in the project area. See the Tables and Figures section for a summary of paths and WCFZ distances. In general, this is the two-dimensional area where the planned wind turbines should be avoided, if possible. A depiction of the WCFZ overlaid on topographic basemaps can be found in the Tables and Figures section, and is also included on the enclosed CD³.

Discussion of Potential Obstructions

For this project, 203 turbines were considered in the analysis, each with a blade diameter of 82.5 meters and turbine height of 80 meters. Of those turbines, 2 were found to have a potential conflict with one microwave path. The next section contains a detailed depiction of the potential obstruction scenarios and a tabular summary of the affected turbines and microwave paths.

When turbines fall within the two-dimensional WCFZ, Comsearch offers and recommends a detailed clearance study, which considers the vertical Z-height clearance objectives. The results of the detailed study may clear the potential conflict without requiring turbine relocation. Please contact Denise Finney at (703) 726 - 5650 to request a detailed study.

³ The ESRI® shapefiles contained on the enclosed CD are in NAD 83 UTM Zone 17 projected coordinate system.

3. Tables and Figures

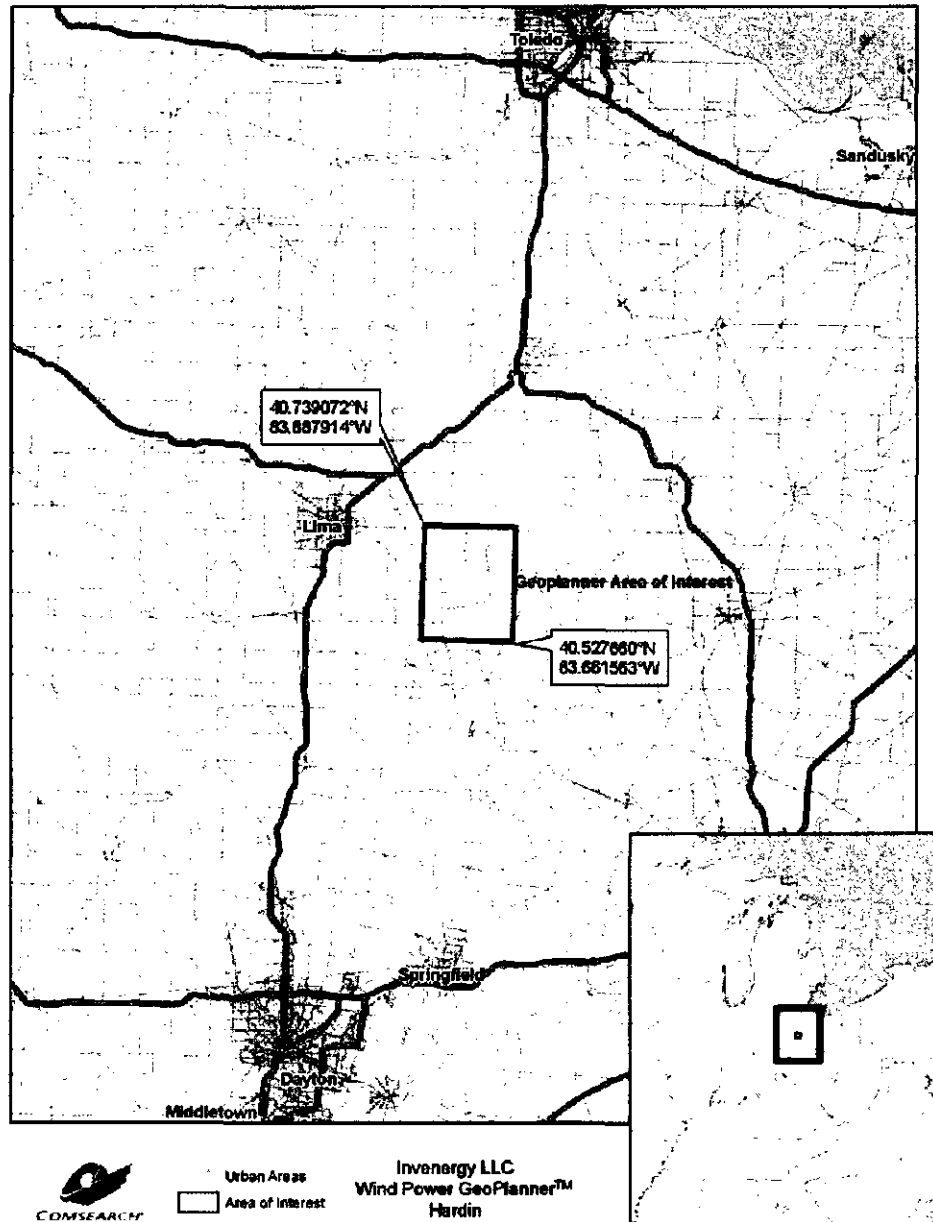
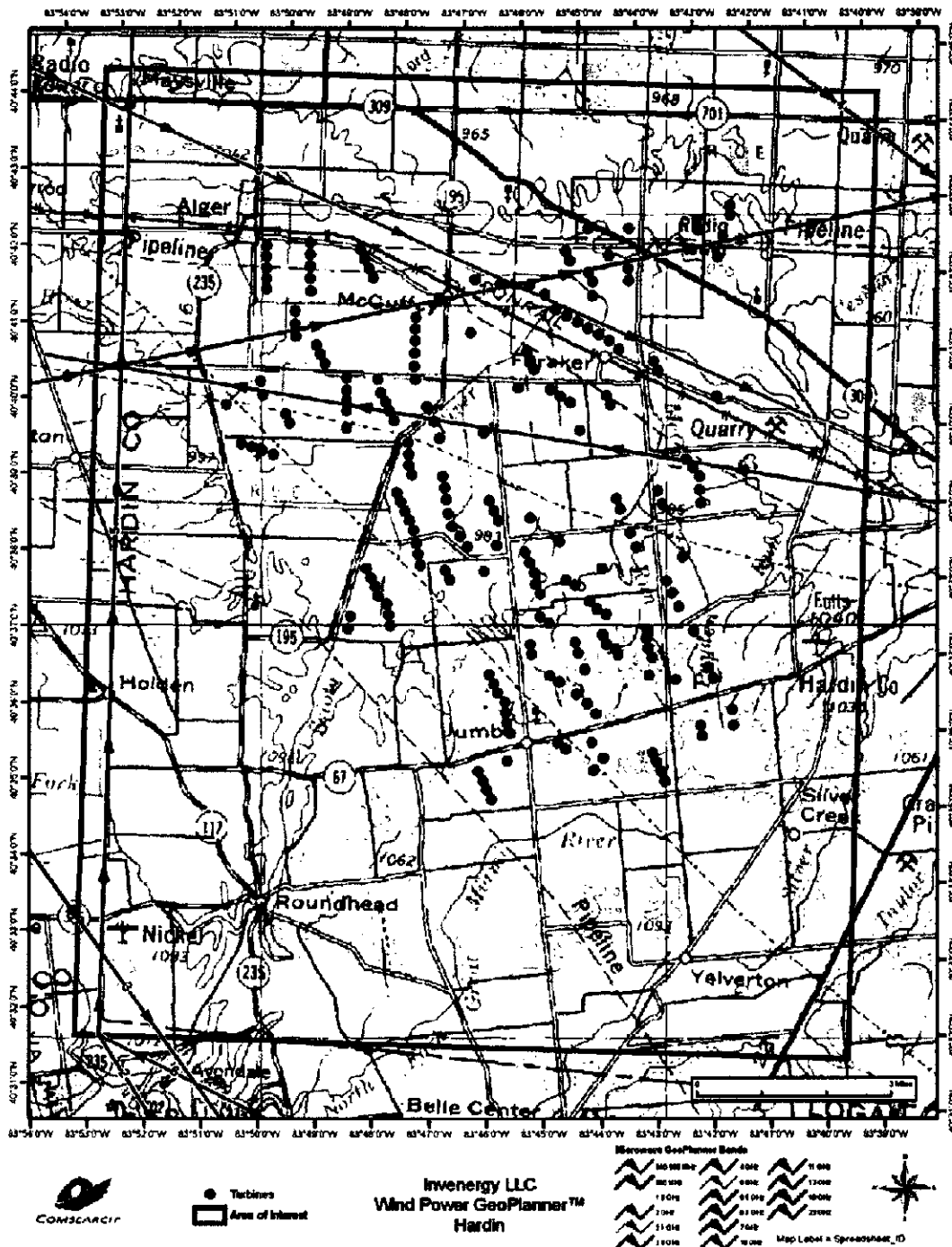


Figure 1: Area of Interest



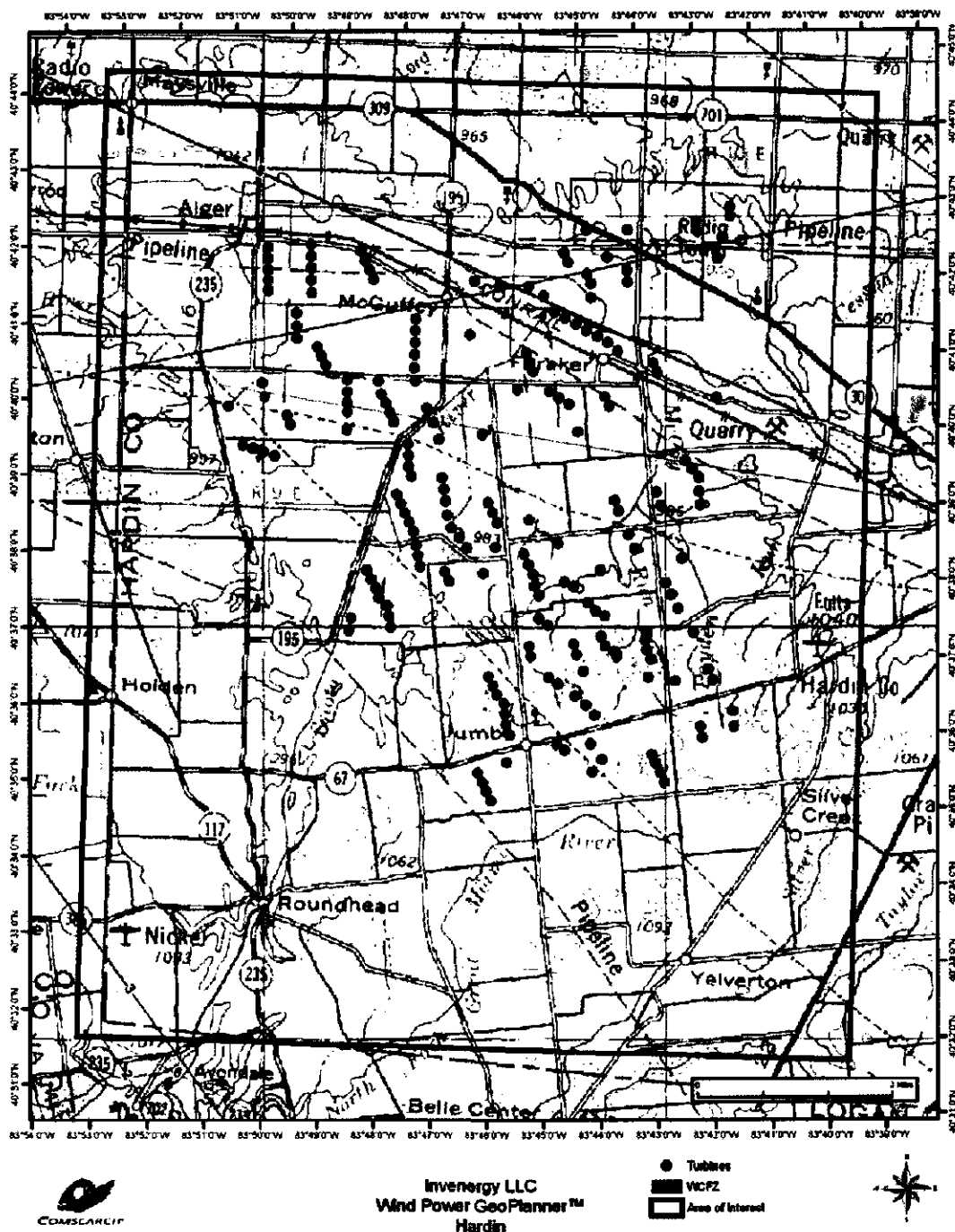


Figure 3: Microwave Paths with WCFZ Buffers

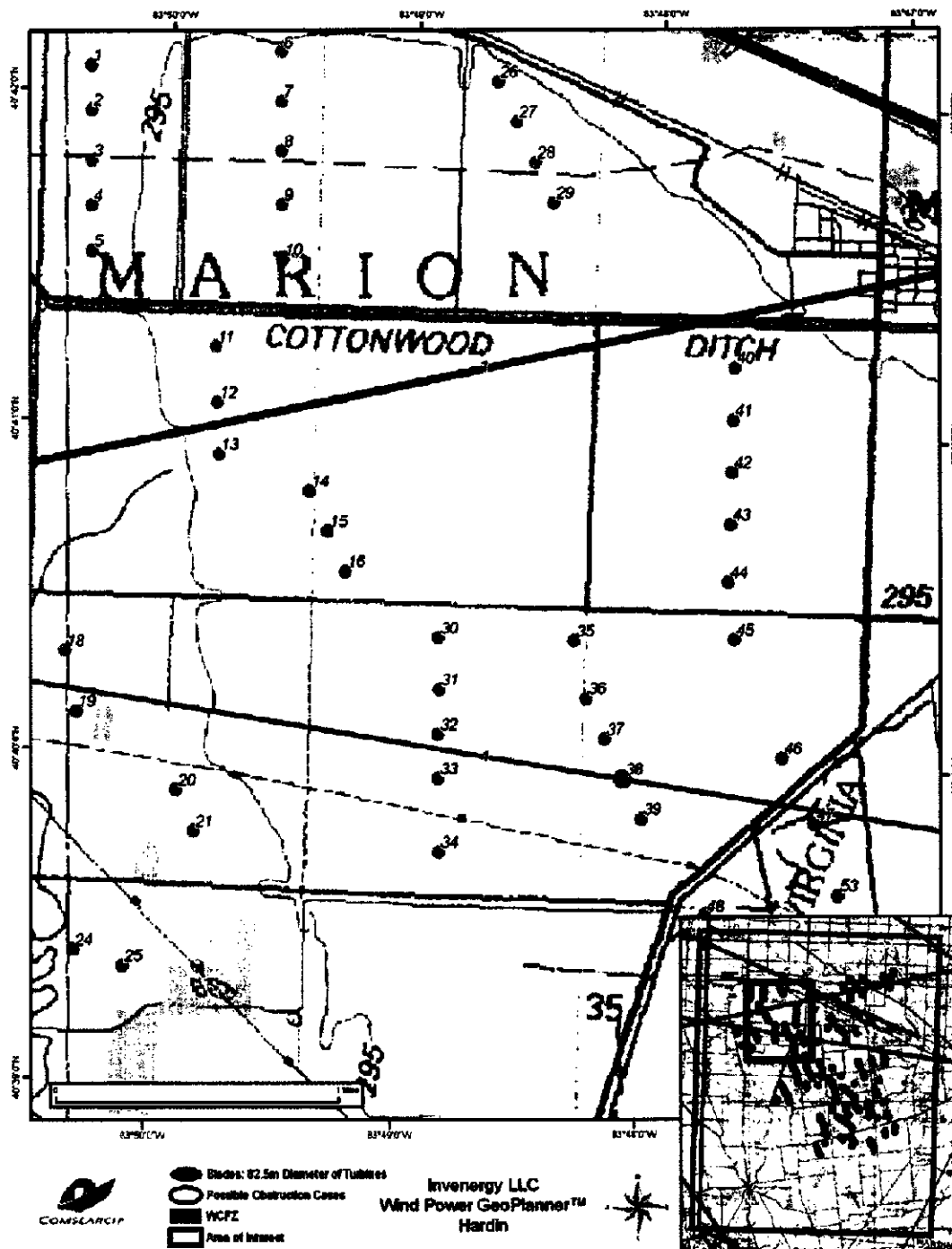


Figure 4: Potential Obstruction Scenario (Turbine 38)

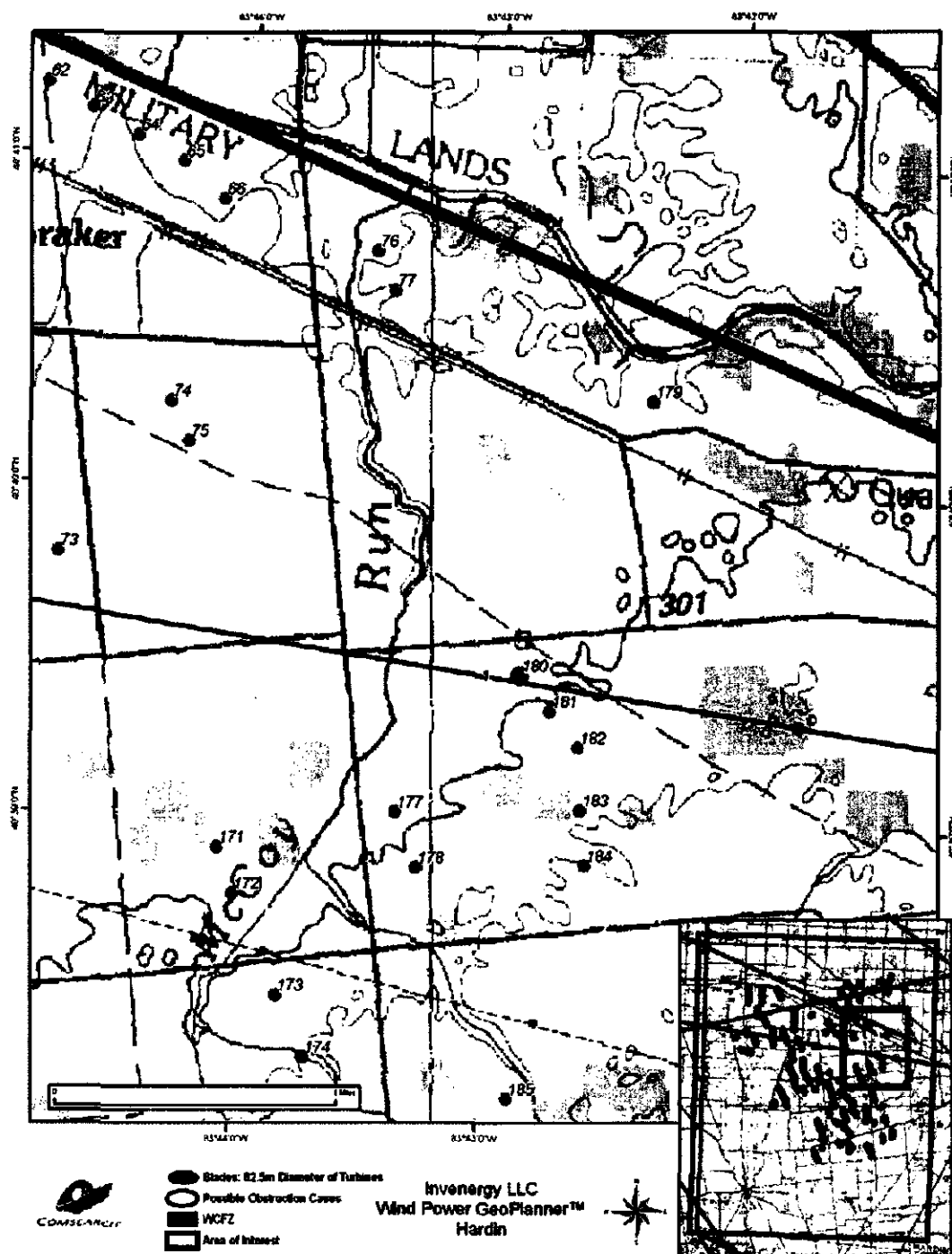


Figure 5: Potential Obstruction Scenario (Turbine 180)

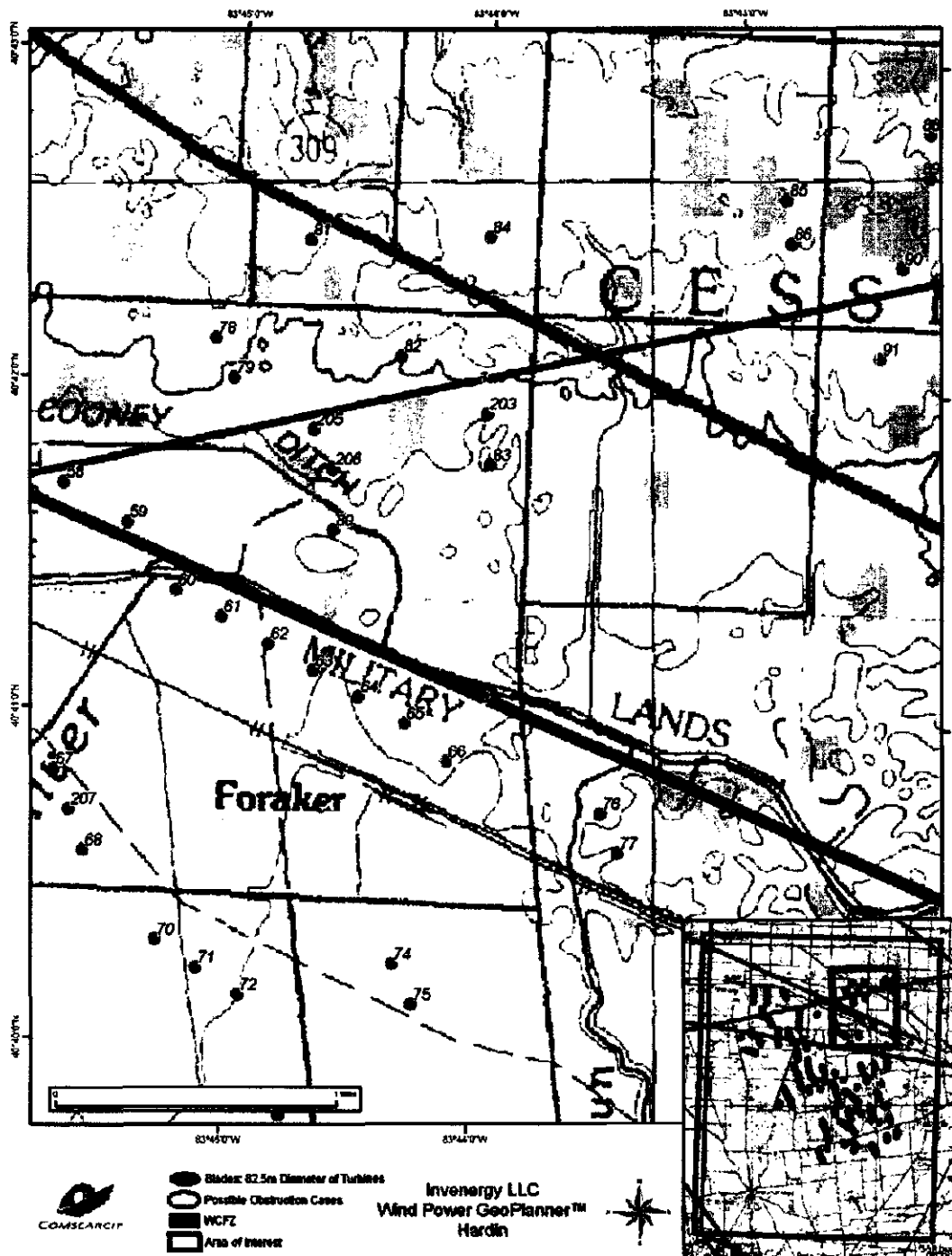


Figure 6: North Turbines (No Potential Obstructions)



COMSEARCH

Invenenergy LLC
Wind Power GeoPlanner™
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Hardin

ID	Site Name 1	Site Name 2	Callsign 1	Callsign 2	Band	Licensee	WCFZ (m)
1	KNETON TWR	W NEWTON TWR	KNETONTW	WNEWTONT	11 GHz	Mid Ohio Energy Cooperative Inc.	12.78
2	BELLFONTAINE	INDIAN LAKE	WML561	WPTB397	Lower 6 GHz	New Par	17.41
3	LIMA	BELLEFONTAI	WNTS208	KQJ89	Upper 6 GHz	AMERICAN ELECTRIC POWER SERVICE CORP.	24.27
4	ADA	KENTON	WPSJ364	WPNN226	Lower 6 GHz	Ohio RSA 5 Limited Partnership	13.31
5	INDIAN LAKE	LIMA EAST	WPTB397	WPSK794	Lower 6 GHz	New Par	18.15
6	RUSHYLVANIA	INDIAN LAKE	WPTQ901	WPTB397	11 GHz	New Par	10.83
7	LIMA	KENTON	WPUG339	WPUG341	Lower 6 GHz	Watch TV Company, Inc.	20.53
8	ALLEN	HARDIN	WQET481	RXONLY	2.4 GHz	Allen County Office of Homeland Security	33.57

Table 1: Microwave Paths that Intersect the Area of Interest

(See enclosed mw_geopl.xls for more information and
GP_dict_matrix_description.xls for detailed field descriptions)

Turbine ID	Turbine Elevation (meters)	Latitude (NAD83)	Longitude (NAD83)	Affected Microwave Link IDs
38	293	40.66599127	-83.80137919	1
180	298	40.65752202	-83.71443710	1

Table 2: Turbines that Cause Potential Obstructions



Invenergy LLC
Wind Power GeoPlanner™
Licensed Microwave Report
Hardin

4. Contact Us

For questions or information regarding the Licensed Microwave Report, contact:

Contact person:	Denise Finney
Title:	Account Manager
Company:	Comsearch
Address:	19700 Janelia Farm Blvd., Ashburn, VA 20147
Telephone:	703-726-5650
Fax:	703-726-5595
Email:	dfinney@comsearch.com
Web site:	www.comsearch.com



19700 Janelia Farms Blvd
Ashburn, VA 20147
703-726-5500

Analysis of AM and FM Broadcast Station Operations in the Vicinity of the Hardin Wind Energy facility in Hardin County, Ohio

Comsearch was contracted by Invenergy, LLC to determine if there would be any degradation to the operational coverage of AM and FM Radio Broadcast Stations located in the vicinity of their proposed Hardin Wind Energy Project (the Project) in Ohio.

Comsearch determined that there were eight database records for AM stations within a search radius (30-miles) of the Project site. In this area there are eight database records representing four stations that are licensed to operate at two transmit power levels. For certain stations the FCC requires a lower transmit power after sundown. Station WIMA is allowed to operate at the same transmit power during daytime and night time hours. The closest separation distance of an AM station antenna from the planned center of the Project site is approximately 17.70 miles. Table 1 lists the AM stations in the vicinity of the Project site. No degradation of AM broadcast coverage will occur due to the presence of the wind turbines as long as the separation distance to the nearest wind turbine is greater than 2 miles. Potential problems with broadcast coverage are only anticipated when AM broadcast stations with directive antennas are within 2 miles of turbine towers and AM broadcast stations with non-directive antennas are within 0.5 miles. Figure 1 is a map that shows the location of the AM transmit antennas with respect to the Project site.

Table 1 Location of AM Radio Stations in Vicinity of the Hardin Wind Energy Project

Location	St	Call Sign	Status	Tx-Erp	Frequency	Distance
LIMA	OH	WCIT	LIC	0.25 kW	940 kHz	17.70 mi
LIMA	OH	WCIT	LIC	0.006 kW	940 kHz	17.70 mi
LIMA	OH	WIMA	LIC	1.0 kW	1150 kHz	18.22 mi
LIMA	OH	WIMA	LIC	1.0 kW	1150 kHz	18.22 mi
FINDLAY	OH	WFIN	LIC	1.0 kW	1330 kHz	26.65 mi
FINDLAY	OH	WFIN	LIC	0.079 kW	1330 kHz	26.65 mi
BELLEFONTAINE	OH	WBLL	LIC	0.5 kW	1390 kHz	18.56 mi
BELLEFONTAINE	OH	WBLL	LIC	0.081 kW	1390 kHz	18.56 mi

OH = Ohio
kHz = kilohertz
kW = kilowatt
mi = mile
Tx-ERP= transmit effective radiated power

Comsearch determined that there were 61 FM station records within a 30 mile radius of the Project site center point. Of the 61 station records 34 are licensed and operational. The station records are listed in Table 2 of this report. All of the stations are located outside of the Project area-of-interest with the closest station being 9.52 miles from the center of the project. FM stations' coverage when they are at distances greater than 2.5 miles from wind turbines are not subject to degradation.

Table 2 Location of FM Radio Stations in Vicinity of the Hardin Wind Energy Project

Location	St	Call Sign	Status	Tx-Erp	Frequency	Distance
FINDLAY	OH	WLFC	LIC	0.155 kW	88.3 MHz	29.41 mi
ZANESFIELD	OH	NEW	CP	0. kW	88.5 MHz	22.43 mi
ANNA	OH	WHJM	LIC	0. kW	88.7 MHz	25.13 mi
ANNA	OH	WHJM	CP	0. kW	88.7 MHz	25.13 mi
KENTON	OH	NEW	CP	0. kW	88.9 MHz	12.11 mi
LIMA	OH	WYSM	LIC	3. kW	89.3 MHz	18.09 mi
FINDLAY	OH	WTKC	LIC	0.125 kW	89.7 MHz	28.92 mi
LIMA	OH	WGLE	LIC	50. kW	90.7 MHz	18.09 mi
MARION	OH	WOSB	LIC	2.5 kW	91.1 MHz	27.01 mi
DE GRAFF	OH	WDEQ-FM	LIC	0.1 kW	91.7 MHz	23.60 mi
MARION	OH	WXMF	LIC	6. kW	91.9 MHz	29.01 mi
WAPAKONETA	OH	WFGF	LIC	3. kW	92.1 MHz	18.36 mi
WAPAKONETA	OH	WFGF	USE	NL	92.1 MHz	18.36 mi
RICHWOOD	OH	WQEL	APP	6. kW	92.7 MHz	27.56 mi
RICHWOOD	OH	WQEL	RSV	#NAME?	92.7 MHz	20.73 mi
LIMA	OH	WWSR	LIC	3. kW	93.1 MHz	23.57 mi
LIMA	OH	880407ME	USE	#NAME?	93.1 MHz	19.36 mi
RUSSELLS POINT	OH	WRPO-LP	LIC	0.1 kW	93.5 MHz	13.32 mi
COLUMBUS GROVE	OH	-	RSV	#NAME?	93.9 MHz	29.60 mi
COLUMBUS GROVE	OH	WLWD	LIC	14. kW	93.9 MHz	29.30 mi
FINDLAY	OH	W231AJ	LIC	0.05 kW	94.1 MHz	27.36 mi
SIDNEY	OH	W231AZ	LIC	0.027 kW	94.1 MHz	28.14 mi
BELLEFONTAINE	OH	W231BY	LIC	0.01 kW	94.1 MHz	18.48 mi
MARION	OH	WMRN-FM	USE	#NAME?	94.3 MHz	27.90 mi
MARION	OH	WMRN-FM	LIC	3. kW	94.3 MHz	27.90 mi
ADA	OH	WONB	LIC	3. kW	94.9 MHz	9.74 mi
ADA	OH	880615MG	USE	#NAME?	94.9 MHz	10.84 mi
KENTON	OH	WKTN	LIC	3.5 kW	95.3 MHz	10.55 mi
KENTON	OH	WKTN	USE	#NAME?	95.3 MHz	10.55 mi
BAIRD	OH	NEW	APP	0.12 kW	95.5 MHz	28.35 mi
BAIRD	OH	NEW	APP	0.12 kW	95.5 MHz	28.35 mi
FINDLAY	OH	NEW	APP	0.08 kW	97.5 MHz	28.10 mi
VAN BUREN	OH	NEW	APP	0.08 kW	97.5 MHz	28.35 mi
LIMA	OH	WTGN	LIC	6. kW	97.7 MHz	20.98 mi
LIMA	OH	WTGN	USE	#NAME?	97.7 MHz	21.17 mi
BELLEFONTAINE	OH	WPKO-FM	USE	#NAME?	98.3 MHz	18.54 mi
BELLEFONTAINE	OH	WPKO-FM	LIC	1.75 kW	98.3 MHz	18.54 mi
ELIDA	OH	W253AJ	LIC	0.038 kW	98.5 MHz	20.81 mi
FINDLAY	OH	W254CD	LIC	0.049 kW	98.7 MHz	30.60 mi
CRIDERSVILLE	OH	-	VAC	#NAME?	99.3 MHz	19.88 mi
BLUFFTON	OH	WBWH-LP	LIC	0.066 kW	99.3 MHz	19.40 mi
FINDLAY	OH	NEW	APP	0.12 kW	99.5 MHz	28.35 mi
FINDLAY	OH	NEW	APP	0.055 kW	99.5 MHz	28.85 mi
FINDLAY	OH	WKXA-FM	LIC	20. kW	100.5 MHz	21.37 mi
FINDLAY	OH	WKXA-FM	USE	#NAME?	100.5 MHz	21.37 mi
FINDLAY	OH	WKXA-FM	CP	20. kW	100.5 MHz	21.36 mi
LIMA	OH	WMT	USE	#NAME?	102.1 MHz	23.20 mi
LIMA	OH	WMT	LIC	11. kW	102.1 MHz	23.20 mi
LIMA	OH	WMT	LIC	13. kW	102.1 MHz	16.86 mi

ST. MARYS	OH	WMLX	LIC	1.95 kW	103.3 MHz	23.20 mi
LIMA	OH	WNHC-LP	LIC	0.09 kW	104.1 MHz	23.81 mi
RICHWOOD	OH	WODB	USE	#NAME?	104.3 MHz	19.39 mi
LIMA	OH	WEGE	LIC	3. kW	104.9 MHz	17.74 mi
LIMA	OH	WEGE	USE	#NAME?	104.9 MHz	17.74 mi
KENTON	OH	W286AB	LIC	0.05 kW	105.1 MHz	9.52 mi
LIMA	OH	WCBV-LP	LIC	0.093 kW	105.9 MHz	21.94 mi
OTTAWA	OH	WBUK	LIC	1.4 kW	106.3 MHz	23.37 mi
OTTAWA	OH	WBUK	USE	#NAME?	106.3 MHz	23.37 mi
FORT SHAWNEE	OH	WZRX-FM	USE	#NAME?	107.5 MHz	18.21 mi
FORT SHAWNEE	OH	WZRX-FM	LIC	1.35 kW	107.5 MHz	16.86 mi
LIMA	OH	W300BB	LIC	0.01 kW	107.9 MHz	23.20 mi

OH = Ohio

Tx-ERP= transmit effective radiated power

MHz = kilohertz

kW = kilowatt

mi = mile

LIC = Licensed and Operational

APP = License Applied for but station is Not Yet Operational

USE = Frequency Assigned Awaiting License

NEW = New Station Call Sign Not Assigned

#NAME = Transmit Power not defined

RSV = Station not operational, frequency is reserved

VAC = Station vacated, no longer operational

Since all of the AM and FM Stations are outside of the Project's area-of-interest it is not likely that any of the wind turbines planned for this project will affect the coverage of the stations.

The following images were scanned as received

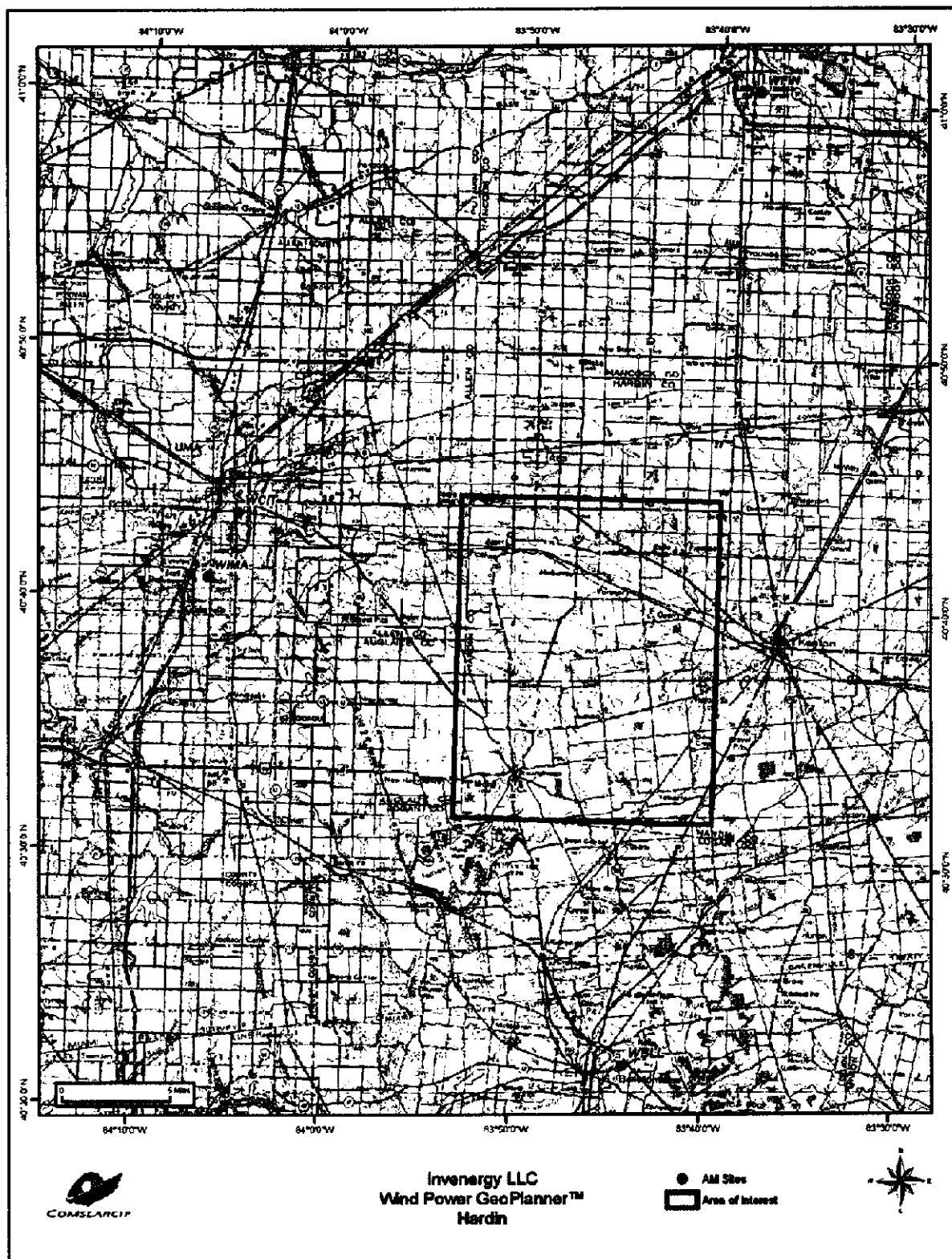


Figure 1 AM Stations in the Vicinity of the Hardin Wind Energy Project



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703-726-5500

Off-Air TV Reception Analysis at the Hardin Wind Energy Project Area in Hardin County, Ohio

Comsearch was contracted by Invenenergy Energy, LLC to identify all of the off-air television stations within 100-mile radius of the center point of the proposed Hardin Wind Energy project area in Hardin County, Ohio. Off-air stations are television broadcasters that transmit signals that can be received directly on a television receiver from terrestrially located broadcast facilities. Comsearch examined the coverage of the off-air TV stations and the communities in the area that could potentially have degraded television reception because of the location of the wind turbines. The proposed wind energy turbine area boundaries and local communities are plotted in the map shown in Figure 1 of this memorandum. Table 1 lists the off-air television stations within 100 miles of the center point of the turbine area site. Table 2 lists all of the off-air television stations within 40 miles of the center point of the turbine area site. Figure 2 is a map overlay showing the location of the off-air television stations with respect to the wind energy turbine area.

Table 1 Off-Air TV Channels within 100 Miles of the Hardin Wind Energy Project Area

Location	St	Call Sign	Channel	Status	Service	Distance*
FORT WAYNE	IN	NEW	2	APP	LD	78.97 mi
TOLEDO	OH	WLMB	5	LIC	DT	77.66 mi
COLUMBIA	IN	NEW	6	APP	LD	95.72 mi
COLUMBIA	IN	W27CT	6	APP	LD	95.72 mi
AUBURN	IN	W07CL	7	LIC	TX	82.70 mi
COLUMBUS	OH	WGCT-CA	8	LIC	CA	60.21 mi
LIMA	OH	WLJO-DR	8	GRANT	DR	20.70 mi
LIMA	OH	WLJO	8	STA	DS	20.70 mi
LIMA	OH	WLJO	8	STA	DS	20.67 mi
COLUMBUS	OH	WGCT-CA	8	APP	CA	57.58 mi
LIMA	OH	WLJO	8	CP MOD	DT	20.88 mi
LIMA	OH	WLJO	8	APP	DS	20.88 mi
COLUMBUS	OH	WGCT-CA	8	CP	DC	57.58 mi
COLUMBUS	OH	WGCT-CA	8	APP	DC	59.05 mi
FINDLAY	OH	W09CG	9	LIC	TX	33.40 mi
FORT WAYNE	IN	WFWC-LD	10	CP	LD	78.97 mi
TOLEDO	OH	WTOL	11	CP MOD	DT	74.37 mi
ANGOLA	IN	WINM	12	LIC	DT	78.24 mi
ANGOLA	IN	WINM	12	APP	DT	78.24 mi
MANSFIELD	OH	WMFD-TV	12	LIC	DT	60.98 mi
COLUMBUS	OH	WSYX	13	STA	DS	62.24 mi
COLUMBUS	OH	WSYX	13	LIC	DT	62.24 mi
TOLEDO	OH	WTVG	13	CP MOD	DT	74.61 mi
FORT WAYNE	IN	NEW	14	APP	LD	80.51 mi
COLUMBUS	OH	WCMH-TV	14	STA	DS	60.21 mi
COLUMBUS	OH	WCMH-TV	14	STA	DS	60.21 mi

COLUMBUS	OH	WCMH-TV	14	LIC	DT	60.21 mi
FORT WAYNE	IN	NEW	15	APP	LD	80.51 mi
FORT WAYNE	IN	NEW	16	APP	LD	67.16 mi
DAYTON	OH	WPTD	16	APP	DS	68.08 mi
DAYTON	OH	WPTD	16	CP	DT	68.08 mi
DAYTON	OH	WPTD	16	APP	DS	68.08 mi
COLUMBUS	OH	WDEM-CD	17	LIC	CA	60.21 mi
CELINA	OH	W17AA	17	LIC	TX	39.66 mi
LIMA	OH	-	17	-	TA	35.14 mi
TOLEDO	OH	WTOL	17	STA	DS	74.37 mi
TOLEDO	OH	WTOL	17	LIC	DT	74.37 mi
COLUMBUS	OH	WDEM-CD	17	LIC	DC	60.21 mi
CELINA	OH	W17AA	17	CP MOD	LD	39.89 mi
CELINA	OH	W17AA	17	APP	TX	39.89 mi
FORT WAYNE	IN	WISE-DR	18	APP	DR	80.96 mi
FORT WAYNE	IN	WISE-TV	18	CP	DT	80.96 mi
LIMA	OH	WLQP-LP	18	LIC	TX	23.20 mi
SPRINGFIELD	OH	WBDT	18	LIC	DT	67.97 mi
LEXINGTON	OH	W32AR	18	APP	LD	60.98 mi
LIMA	OH	WLQP-LP	18	APP	LD	18.87 mi
FORT WAYNE	IN	WISE-TV	19	STA	DS	80.36 mi
FORT WAYNE	IN	WISE-TV	19	APP	DS	80.36 mi
FORT WAYNE	IN	WISE-TV	19	LIC	DT	80.36 mi
FORT WAYNE	IN	WISE-TV	19	APP	DS	80.36 mi
FORT WAYNE	IN	NEW	19	APP	LD	80.51 mi
COLUMBUS	OH	WCLL-CA	19	LIC	CA	61.56 mi
TOLEDO	OH	WTVG	19	LIC	DT	74.61 mi
FORT WAYNE	IN	NEW	20	APP	LD	78.97 mi
SPRINGFIELD	OH	W20CL	20	LIC	TX	46.74 mi
FINDLAY	OH	NEW	20	APP	LD	18.87 mi
COLUMBUS	OH	WBNS-TV	21	STA	DS	60.21 mi
COLUMBUS	OH	WBNS-TV	21	LIC	DT	60.21 mi
COLUMBUS	OH	WBNS-TV	21	APP	DT	60.21 mi
BUCYRUS	OH	WMNO-CA	22	LIC	CA	47.30 mi
FINDLAY	OH	WFND-LP	22	LIC	TX	33.40 mi
BUCYRUS	OH	WMNO-CA	22	APP	DC	34.11 mi
FINDLAY	OH	WFND-LP	22	APP	LD	33.40 mi
MUNCIE	IN	WIPB	23	CP MOD	DT	93.59 mi
MUNCIE	IN	WIPB	23	APP	DS	93.59 mi
COLUMBUS	OH	W23BZ	23	LIC	TX	63.92 mi
COLUMBUS	OH	W23BZ	23	CP	LD	63.92 mi
LIMA	OH	W23DE-D	23	LIC	LD	23.20 mi
LIMA	OH	W23DE-D	23	APP	LD	23.20 mi
FORT WAYNE	IN	WPTA	24	LIC	DT	80.96 mi
HILLSBORO	OH	-	24	-	TA	99.16 mi
NEWARK	OH	WSFJ-TV	24	STA	DS	85.99 mi
NEWARK	OH	WSFJ-TV	24	STA	DS	68.37 mi
NEWARK	OH	WSFJ-TV	24	LIC	DT	68.37 mi

SPRINGFIELD	OH	W24DG-D	24	CP	LD	46.74 mi
MARION	IN	WSOT-LP	25	LIC	TX	99.37 mi
LIMA	OH	WOHL-CD	25	LIC	CA	23.20 mi
LIMA	OH	WOHL-CD	25	CP	DC	23.20 mi
COLUMBUS	OH	WCPX-LP	25	CP	LD	58.10 mi
COLUMBUS	OH	WCPX-LP	25	APP	LD	58.10 mi
MUNCIE	IN	WMUN-LP	26	LIC	TX	97.15 mi
MUNCIE	IN	WMUN-LP	26	APP	LD	97.15 mi
AUBURN	IN	W26DH-D	26	LIC	LD	82.70 mi
FORT WAYNE	IN	NEW	26	APP	LD	67.16 mi
DEFIANCE	OH	WDFM-LP	26	STA	TX	60.61 mi
DEFIANCE	OH	WDFM-LP	26	LIC	TX	60.61 mi
SPRINGFIELD	OH	WBDT	26	CP MOD	DT	67.97 mi
MARION	IN	WSOT-LP	27	CP	LD	97.58 mi
BOWLING GREEN	OH	WBGU-TV	27	CP MOD	DT	35.35 mi
MIILLERSBURG	OH	W69AO	27	APP	LD	82.56 mi
BOWLING GREEN	OH	WBGU-TV	27	APP	DS	35.35 mi
DEFIANCE	OH	W52CO	28	APP	TX	60.61 mi
TOLEDO	OH	W28DH-D	28	CP	LD	70.35 mi
FORT WAYNE	IN	NEW	29	APP	LD	67.16 mi
TOLEDO	OH	WGTE-TV	29	LIC	DT	72.63 mi
DAYTON	OH	WRGT-TV	30	CP	DT	67.97 mi
DAYTON	OH	WRGT-TV	30	STA	DS	67.97 mi
FORT WAYNE	IN	WANE-DR	31	GRANT	DR	80.51 mi
FORT WAYNE	IN	WANE-TV	31	STA	DS	80.51 mi
FORT WAYNE	IN	WANE-TV	31	APP	DS	80.51 mi
FORT WAYNE	IN	WANE-TV	31	APP	DS	80.51 mi
FORT WAYNE	IN	WANE-TV	31	CP MOD	DT	80.51 mi
FORT WAYNE	IN	WANE-TV	31	APP	DS	80.51 mi
NEWARK	OH	DW31AA	31	-	TA	82.17 mi
TOLEDO	OH	W59DC	32	APP	TX	71.15 mi
LEXINGTON	OH	W32AR	32	LIC	TX	60.98 mi
XENIA	OH	960722KP	32	APP	TV	63.53 mi
XENIA	OH	960722KP	32	-	TA	62.97 mi
COLUMBUS	OH	WCSN-LP	32	LIC	TX	58.10 mi
DAYTON	OH	WVRD-LP	32	LIC	TX	68.01 mi
CENTERVILLE	OH	WVRD-LP	32	APP	TX	68.01 mi
MAPLEWOOD	OH	W63AH	32	CP	LD	22.96 mi
FORT WAYNE	IN	NEW	33	APP	LD	80.51 mi
LIMA	OH	W55CH	33	APP	TX	23.20 mi
ASHLAND	OH	W33BW	33	LIC	TX	76.64 mi
COLUMBUS	OH	WCSN-LD	33	CP	LD	58.10 mi
FORT WAYNE	IN	NEW	34	APP	LD	80.51 mi
FORT WAYNE	IN	NEW	34	APP	LD	73.10 mi
COLUMBUS	OH	WCLL-LD	35	CP	LD	61.56 mi
LIMA	OH	WOHL-CD	35	APP	LD	20.68 mi
LIMA	OH	WOHL-CD	35	LIC	DC	20.68 mi
FORT WAYNE	IN	WFFT-TV	36	STA	DS	81.64 mi

FORT WAYNE	IN	WFFT-TV	36	CP MOD	DT	81.64 mi
COLUMBUS	OH	WTTE	36	CP	DT	62.24 mi
COLUMBUS	OH	WTTE	36	STA	DS	62.24 mi
COLUMBUS	OH	WTTE	36	STA	DS	62.24 mi
FORT WAYNE	IN	W38EA-D	38	LIC	LD	81.31 mi
COLUMBUS	OH	WOSU-TV	38	LIC	DT	55.33 mi
LIMA	OH	WLMO-LP	38	LIC	TX	23.20 mi
TOLEDO	OH	W38DH	38	LIC	TX	70.30 mi
LIMA	OH	WLMO-LP	38	APP	LD	18.87 mi
COLUMBUS	OH	WOSU-TV	38	CP	DT	55.33 mi
RICHMOND	IN	WKOI-TV	39	STA	DS	90.16 mi
RICHMOND	IN	WKOI-TV	39	LIC	DT	90.16 mi
RICHMOND	IN	WKOI-TV	39	CP	DT	90.16 mi
FORT WAYNE	IN	NEW	39	APP	LD	73.10 mi
MARION	OH	WOCB-CD	39	LIC	CA	33.42 mi
MARION	OH	WOCB-CD	39	LIC	DC	33.51 mi
FORT WAYNE	IN	WFWA	40	LIC	DT	81.31 mi
FORT WAYNE	IN	WFWA	40	APP	DT	81.31 mi
DAYTON	OH	WRCX-LP	40	LIC	TX	67.97 mi
DAYTON	OH	WRCX-LP	40	CP	LD	67.97 mi
FORT WAYNE	IN	NEW	41	APP	LD	67.16 mi
SANDUSKY	OH	W41AP	41	LIC	TX	78.91 mi
DAYTON	OH	WHIO-TV	41	STA	DS	67.22 mi
DAYTON	OH	WHIO-TV	41	LIC	DT	67.22 mi
DAYTON	OH	WHIO-TV	41	CP	DT	67.22 mi
DAYTON	OH	WHIO-TV	41	APP	DS	67.22 mi
DELAWARE	OH	WXCB-CD	42	LIC	CA	44.52 mi
SANDUSKY	OH	WGGN-TV	42	STA	DS	73.17 mi
SANDUSKY	OH	WGGN-TV	42	APP	DS	75.25 mi
DELAWARE	OH	WXCB-CD	42	APP	CA	43.79 mi
DELAWARE	OH	WXCB-CD	42	CP	DC	43.78 mi
SANDUSKY	OH	WGGN-TV	42	CP MOD	DT	75.29 mi
DELAWARE	OH	WXCB-CD	42	LIC	DC	43.79 mi
DAYTON	OH	WWRD-LP	42	APP	LD	68.01 mi
FORT WAYNE	IN	NEW	43	APP	LD	67.16 mi
COLUMBUS	OH	W43BZ	43	LIC	TX	60.21 mi
MANSFIELD	OH	W47AB	43	APP	LD	67.46 mi
LIMA	OH	W23DE-D	43	APP	LD	23.20 mi
LIMA	OH	WTLW	44	CP MOD	DT	23.57 mi
LIMA	OH	WTLW	44	APP	DS	23.57 mi
FORT WAYNE	IN	WFWC-CA	45	LIC	CA	78.99 mi
LIMA	OH	WLQP-LP	45	APP	LD	20.68 mi
DELAWARE	OH	WXCB-CD	45	APP	DC	43.78 mi
LIMA	OH	WLQP-LP	45	APP	LD	20.68 mi
CHILLICOTHE	OH	WWHO	46	LIC	DT	80.10 mi
TOLEDO	OH	WUPW	46	LIC	DT	72.40 mi
TOLEDO	OH	WUPW	46	APP	DT	72.40 mi
MANSFIELD	OH	W47AB	47	-	TA	66.14 mi

LIMA	OH	WTLW	47	STA	DS	23.57 mi
MANSFIELD	OH	W47AB	47	LIC	TX	67.44 mi
LIMA	OH	WTLW	47	LIC	DT	23.57 mi
MANSFIELD	OH	W47AB	47	CP	LD	67.44 mi
COLUMBUS	OH	W47DI-D	47	CP	LD	57.33 mi
MANSFIELD	OH	W47AB	47	APP	LD	67.46 mi
LIMA	OH	WLMO-LP	47	APP	LD	20.68 mi
LIMA	OH	WLMO-LP	47	APP	LD	20.68 mi
BOWLING GREEN	OH	W50CD	48	APP	TX	35.35 mi
TOLEDO	OH	WMNT-CA	48	LIC	CA	71.33 mi
COLUMBUS	OH	WCPX-LP	48	APP	LD	55.33 mi
COLUMBUS	OH	WCPX-LP	48	LIC	TX	58.10 mi
COLUMBUS	OH	WSYX-DR	48	APP	DR	62.24 mi
COLUMBUS	OH	WCPX-LP	48	CP	LD	58.10 mi
MARION	OH	WOCB-CD	48	APP	DC	8.78 mi
FORT WAYNE	IN	NEW	49	APP	LD	67.16 mi
TOLEDO	OH	WNWO-TV	49	LIC	DT	74.36 mi
FORT WAYNE	IN	NEW	50	APP	LD	78.97 mi
MANSFIELD	OH	WOHZ-CA	50	LIC	TX	60.98 mi
DAYTON	OH	WDTN	50	STA	DS	68.36 mi
DAYTON	OH	WDTN	50	LIC	DT	68.36 mi
TOLEDO	OH	NEW	50	APP	LD	71.13 mi
MARION	IN	WVWU-CD	51	LIC	CA	98.84 mi
MARION	IN	WVWU-CD	51	LIC	DC	98.84 mi
DAYTON	OH	WKEF	51	STA	DS	67.97 mi
DAYTON	OH	WKEF	51	LIC	DT	67.97 mi
FINDLAY	OH	W09CG	51	APP	LD	33.40 mi
LOUDONVILLE	OH	WIVX-LP	51	CP	LD	82.56 mi
OXFORD	OH	NEW	51	APP	LD	89.89 mi
DAYTON	OH	WKEF	51	APP	DT	67.97 mi
MUNCIE	IN	MPB	52	STA	DS	93.59 mi
DEFIANCE	OH	NEW	56	APP	DN	35.35 mi
BOWLING GREEN	OH	WBGU-TV	56	STA	DS	35.35 mi
BOWLING GREEN	OH	WBGU-TV	56	LIC	DT	35.35 mi
DAYTON	OH	WPTD	58	LIC	DT	68.08 mi
CHILLICOTHE	OH	W59DL	59	LIC	TX	98.84 mi
MAPLEWOOD, ETC.	OH	W63AH	63	LIC	TX	22.96 mi
LOUDONVILLE	OH	WIVX-LP	65	LIC	TX	82.58 mi
SPRINGFIELD	OH	-	66	-	TA	48.92 mi
DAYTON	OH	W66AQ	66	APP	TX	68.32 mi
DAYTON	OH	W66AQ	66	LIC	TX	68.32 mi
TOLEDO	OH	W22CO	68	LIC	TX	71.15 mi
MILLERSBURG	OH	W69AO	69	LIC	TX	96.23 mi
MILLERSBURG	OH	W69AO	69	APP	TX	94.49 mi

IN-Indiana
OH-Ohio
MI-Michigan

Distance*-Measured from center point of wind turbine area

DS-Digital Service Television, Temporary Operation, STA Operation
 DT-Digital Television Broadcast Station
 DC-Class A Digital Station
 DR- Indicates Station has Applied for FCC Rule Making
 DX- Digital Auxiliary Facility
 GRANT-Indicates Rule Making was granted by FCC
 LP-Low Power Television Broadcast Station
 TX-Translator Television Broadcast Station
 CA-Low Power Full Service Channel
 TA- Analog Allotment
 TS-Analog Auxiliary Allotment
 LIC – Licensed and operational station
 CP – License approved construction permit granted
 CP MOD – Approval for construction of station Modification
 APP – License application, not yet operational
 STA – Special transmit authorization, usually granted by FCC for temporary operation

The most likely TV stations that will produce off-air television coverage to the Hardin County, Ohio area will be those stations at a distance of 40 miles or less from the turbine area center point. These TV stations are listed in Table 2. There are 45 license records for television stations within 40 miles. Of these license records there are 17 that are providing television programming to the area. Two are full-power stations, one is a low-power digital channel, two are Class A Stations operating with digital modulation and two are Class A Stations operating with analog modulation. Class A stations are full-service low power stations. There are 4 full-power digital channels that are operating on a special transmit authority granted by the FCC providing programming. There are also 6 low power translators providing programming to the area. Translators are stations that re-broadcast TV signals from distant stations at low-power to a very limited local area. From the location of the TV stations relative to the wind turbine area certain channels may be degraded in those communities that are on the opposite side of the wind project area from the TV stations. But in no case should any community lose all of its now available TV channels because of the number of TV stations that presently surround the wind turbine area. If an area does suffer from an extreme loss of TV coverage two mitigation strategies to offset this is to offer either, cable television hookups, where a cable system is available, or direct broadcast satellite (DBS) TV reception systems. Based on the location of the proposed wind energy project area and the TV stations servicing the area it does not appear that there will be many communities where an extreme loss of TV coverage will occur.

Table 2 Off-Air TV Stations within 40 Miles of the Hardin Wind Energy Project Area

Location		Call sign	Channel	Status	Service	Distance*
LIMA	OH	WLQP-LP	18	APP	LD	18.87 mi
FINDLAY	OH	NEW	20	APP	LD	18.87 mi
LIMA	OH	WLMO-LP	38	APP	LD	18.87 mi
LIMA	OH	WLIO	8	STA	DS	20.67 mi
LIMA	OH	WLIO	8	CP MOD	DT	20.68 mi
LIMA	OH	WLIO	8	APP	DS	20.68 mi
LIMA	OH	WOHL-CD	35	APP	LD	20.68 mi
LIMA	OH	WOHL-CD	35	LIC	DC	20.68 mi
LIMA	OH	WLQP-LP	45	APP	LD	20.68 mi

LIMA	OH	WLQP-LP	45	APP	LD	20.68 mi
LIMA	OH	WLMO-LP	47	APP	LD	20.68 mi
LIMA	OH	WLMO-LP	47	APP	LD	20.68 mi
LIMA	OH	WLIO-DR	8	GRANT	DR	20.70 mi
LIMA	OH	WLIO	8	STA	DS	20.70 mi
MAPLEWOOD	OH	W63AH	32	CP	LD	22.96 mi
MAPLEWOOD, ETC.	OH	W63AH	63	LIC	TX	22.96 mi
LIMA	OH	WLQP-LP	18	LIC	TX	23.20 mi
LIMA	OH	W23DE-D	23	LIC	LD	23.20 mi
LIMA	OH	W23DE-D	23	APP	LD	23.20 mi
LIMA	OH	WOHL-CD	25	LIC	CA	23.20 mi
LIMA	OH	WOHL-CD	25	CP	DC	23.20 mi
LIMA	OH	W55CH	33	APP	TX	23.20 mi
LIMA	OH	WLMO-LP	38	LIC	TX	23.20 mi
LIMA	OH	W23DE-D	43	APP	LD	23.20 mi
LIMA	OH	WTLW	44	CP MOD	DT	23.57 mi
LIMA	OH	WTLW	44	APP	DS	23.57 mi
LIMA	OH	WTLW	47	STA	DS	23.57 mi
LIMA	OH	WTLW	47	LIC	DT	23.57 mi
FINDLAY	OH	W09CG	9	LIC	TX	33.40 mi
FINDLAY	OH	WFND-LP	22	LIC	TX	33.40 mi
FINDLAY	OH	WFND-LP	22	APP	LD	33.40 mi
FINDLAY	OH	W09CG	51	APP	LD	33.40 mi
MARION	OH	WOCB-CD	39	LIC	CA	33.42 mi
MARION	OH	WOCB-CD	39	LIC	DC	33.51 mi
BUCYRUS	OH	WMNO-CA	22	APP	DC	34.11 mi
LIMA	OH	-	17	-	TA	35.14 mi
BOWLING GREEN	OH	WBGU-TV	27	CP MOD	DT	35.35 mi
BOWLING GREEN	OH	WBGU-TV	27	APP	DS	35.35 mi
BOWLING GREEN	OH	W50CD	48	APP	TX	35.35 mi
DEFIANCE	OH	NEW	56	APP	DN	35.35 mi
BOWLING GREEN	OH	WBGU-TV	56	STA	DS	35.35 mi
BOWLING GREEN	OH	WBGU-TV	56	LIC	DT	35.35 mi
CELINA	OH	W17AA	17	LIC	TX	39.66 mi
CELINA	OH	W17AA	17	CP MOD	LD	39.89 mi
CELINA	OH	W17AA	17	APP	TX	39.89 mi

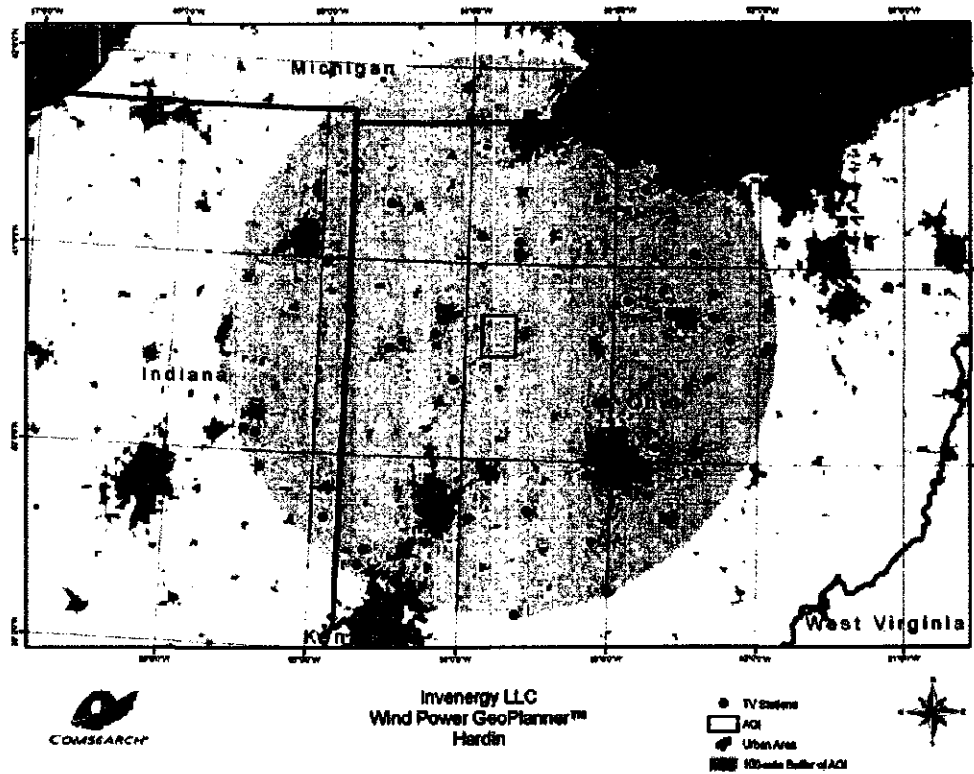


Figure 2 TV Stations within 100 Miles of the Hardin Wind Energy Project Area Center Point

Invenergy
Invenergy LLC
1 South Wacker, Suite 1900
Chicago, IL 60606

May 19, 2009

Mr. Edward Davison
U.S. Department of Commerce
1401 Constitution Avenue N.W. Room 4099A
Washington D.C., 20230

Via Electronic Mail

RE: Notification of the Hardin Wind Energy LLC Wind Project in Hardin County, Ohio

Dear Mr. Davison,

This letter and its attachments will serve as notification to the government that Invenergy plans to install a Wind Energy Facility in Hardin County, Ohio. The installation will be called Hardin Wind Energy, LLC.

Enclosed are maps and tables that describe the general location of the project.

- Table 1 is a list of the coordinates of the project boundaries
- Figure 1 is a map of the general area showing the outline of the wind energy project boundaries
- Figure 2 is a local map of the wind energy facility boundaries.

The dimensions of the Wind turbines to be installed at this facility are

Turbine Hub Heights Above Ground Level (AGL):	100-meters
Turbine Blade Diameter:	100-meters
Blade Tip Height AGL:	150-meters

If you have any questions regarding this notification, please call.

Sincerely,

James Molholm
Project Engineer

(312) 582-1506 direct dial
(312) 504-9017 cell
jmolholm@invenergylc.com

Table 1: General Location of Hardin Wind Energy, LLC (NAD 83)

Location	Latitude	Longitude
NW Corner	40.727658	-83.874411
NE Corner	40.732357	-83.679245
SW Corner	40.528920	-83.866889
SE Corner	40.538061	-83.672232

Figure 2: Hardin Wind Energy, LLC Local Map

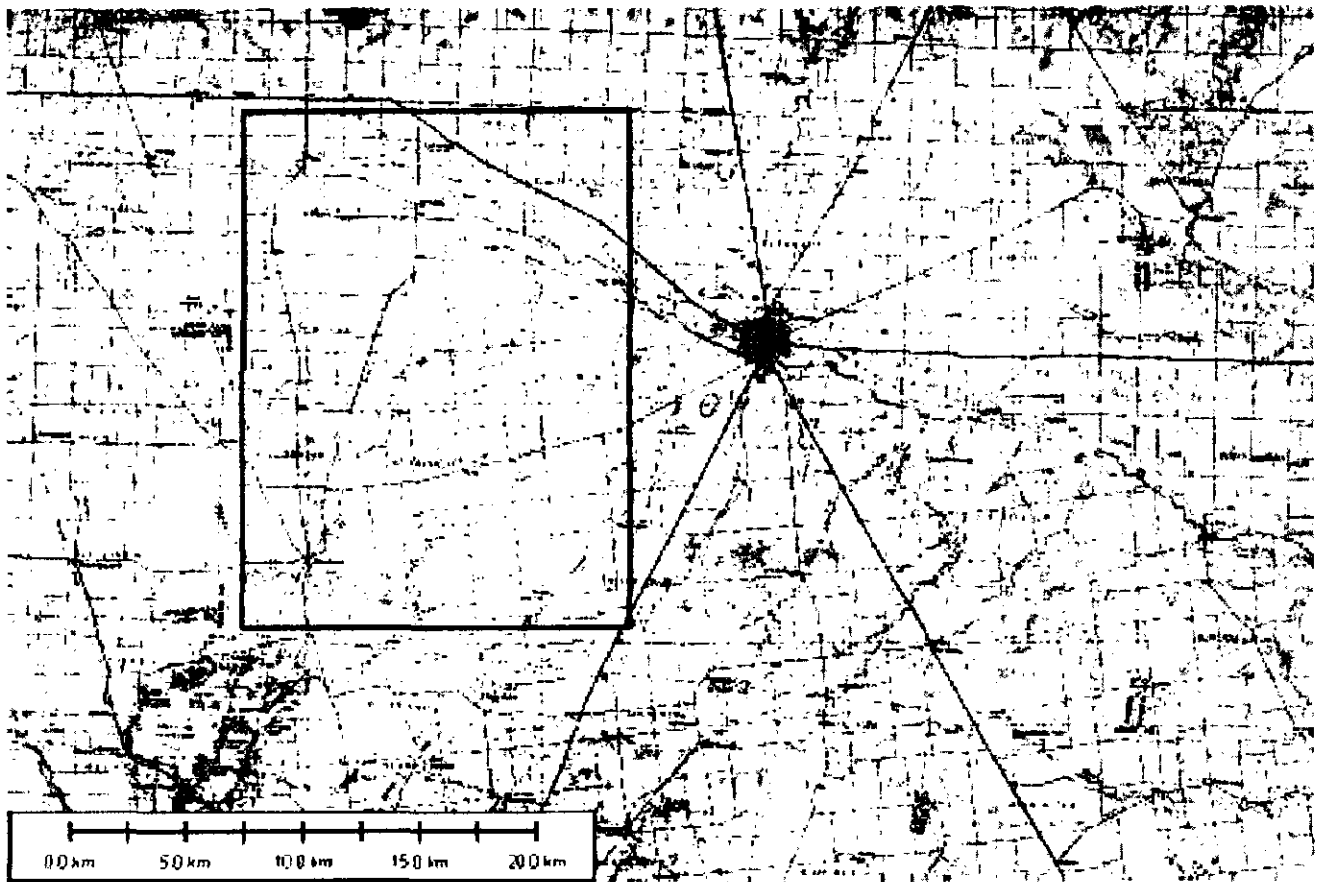
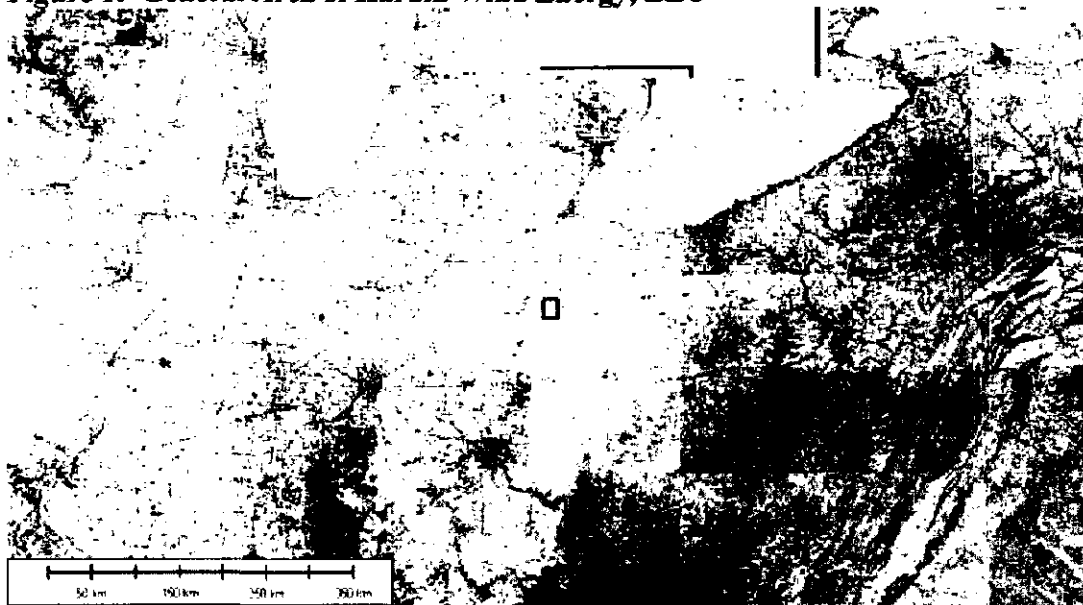


Figure 1: General Area of Hardin Wind Energy, LLC





UNITED STATES DEPARTMENT OF COMMERCE
National Telecommunications and
Information Administration
Washington, D.C. 20230

JUL - 9 2009

Mr. James Molholm
Project Engineer
Invenergy LLC
1 South Wacker Drive, Suite 1900
Chicago, IL 60606

Re: Hardin Wind Energy LLC Project, in Hardin County, OH

Dear Mr. Molholm:

In response to your request on May 19, 2009, the National Telecommunications and Information Administration provided to the federal agencies represented in the Interdepartment Radio Advisory Committee (IRAC) the plans for the Hardin Wind Energy LLC Project, in Hardin County, Ohio.

After a 45 day period of review, the agencies have not identified any concerns regarding blockage of their radio frequency transmissions.

While the IRAC agencies did not identify any concerns regarding radio frequency blockage, this does not eliminate the need for the wind energy facilities to meet any other requirements specified by law related to these agencies. For example, this review by the IRAC does not eliminate any need that may exist to coordinate with the Federal Aviation Administration concerning flight obstruction.

Thank you for the opportunity to review these proposals.

Sincerely,

Edward M. Davison
Deputy Associate Administrator
Office of Spectrum Management