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VIA CERTIFIED MAIL

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**Re**: **NOTICE OF INTENT TO SUE FOR VIOLATIONS OF THE ENDANGERED SPECIES ACT, BALD AND GOLDEN EAGLE PROTECTION ACT, MIGRATORY BIRD TREATY ACT, AND NATIONAL ENVIRONMENTAL POLICY ACT IN CONNECTION WITH THE CAMP PERRY AIR NATIONAL GUARD WIND ENERGY PROJECT IN OTTAWA COUNTY, OHIO**

On behalf of the American Bird Conservancy and Black Swamp Bird Observatory (collectively referred to herein as "ABC"), we hereby provide notice of intent to sue, pursuant to section 11(g) of the Endangered Species Act, 16 U.S.C. § 1540(g) ("ESA"), concerning the Ohio Air National Guard's ("ANG") installation and long-term operation of a wind turbine at Camp Perry in Ottawa County, Ohio, which is violating and will continue to violate section 7 of the ESA – because ANG has refused even to engage in consultation with the U.S. Fish and Wildlife Service ("FWS" or "Service") in the manner mandated by the ESA and its implementing regulations – and is expected to "take" federally endangered Kirtland's warblers (*Setophaga*

*kirtlandii*) and piping plovers (*Charadrius melodus*) in violation of sections 7 and 9 of the ESA. *Id.* §§ 1536, 1538(a)(1)(B).

In addition to the serious ESA violations raised in this letter, as explained below ANG's construction and operation of a wind turbine as currently proposed will violate other laws including the Bald and Golden Eagle Protection Act ("BGEPA"), 16 U.S.C. §§ 668-668d, the Migratory Bird Treaty Act ("MBTA"), 16 U.S.C. §§ 703-712, and the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321-4370f.

In light of the myriad legal violations raised in this letter, the serious threat posed to legally protected avian populations, the inadequate response to the Service's and Ohio DNR's concerns, the failure to follow necessary pre-construction safeguards, and our understanding of the imminence of construction activities, **we request to hear back from ANG by no later than January 20, 2014** regarding the concerns outlined in this letter. If we do not receive an adequate response to our concerns by that date, ABC will have no choice but to consider legal action. It is our preference, however, to work in a collaborative fashion with ANG and the Service to rectify the violations described herein and to consider alternatives other than wind power to meet ANG's renewable energy needs.

It is important to emphasize that ABC's position is that wind power can be an important tool in fighting climate change and can broadly result in benefits to birds and their habitats. As a result, we support the military's commitment (and ANG's in particular) to gradually increasing its share of energy usage from renewable sources. However, the available empirical data also demonstrate that wind energy projects, when poorly sited, can negatively impact birds – including eagles, migratory songbirds, and rare and endangered species – in significant ways through collisions with turbines and associated power lines, and through loss and degradation of essential habitat. Accordingly, any renewable energy project – or any energy project for that matter – must be sited, constructed, operated, and mitigated in a manner that is environmentally sustainable to obtain the potential benefits of that project. This includes full compliance with all federal environmental laws.[1]

As to this particular project, ABC stresses its view that the south shore of Lake Erie, as a critically important migratory bottleneck for neotropical birds on their way to the boreal forests of Canada through Point Pelee, Ontario, is an inappropriate location for the development of wind energy, as the risk it poses to federally-protected birds, such as piping plovers, Kirtland's warblers, other migrants, and bald eagles is simply too high. Many other wind projects are planned for this area and others are currently being built without appropriate federal or state oversight as to their potential impact, both individually and cumulatively, to protected birds

[1] The Service – the expert federal wildlife agency – adheres to a similar view of renewable energy. *See* Dec. 4, 2007 FWS Letter to Michael Curry at 1 (Exhibit 1) ("The Fish and Wildlife Service (Service) supports the development of wind power as an alternative energy source, however, wind developments can have negative impacts on wildlife and their habitats if not sited and designed with potential wildlife and habitat impacts in mind. Selection of the best sites for turbine placement is enhanced by ruling out sites with known, high concentrations of birds . . . .").

under the ESA, BGEPA, MBTA, and NEPA. Given the importance of this area to bird conservation, at bare minimum each project should be subject to substantial public and government scrutiny and risk assessment. At the very least, an Environmental Impact Statement ("EIS") and consultation with the Service under section 7 of the ESA should be required for every project with any federal nexus being considered for this sensitive area. The fact that a federal agency is not following required wildlife protection measures is a disturbing precedent and sends completely the wrong message to other wind developers. ABC experts will carefully study the results of those investigations and consultations to independently assess the wisdom of locating wind energy facilities in this region, regardless of the level of proposed mitigation and compensation. Having reviewed the existing data concerning the Camp Perry ANG selected turbine site, our view is that this particular site presents a very high collision risk to local bird populations – including endangered species, eagles, and MBTA-protected species – and will in turn violate several federal wildlife laws.

## STATUTORY AND REGULATORY FRAMEWORK

### A. Endangered Species Act

Congress enacted the ESA to ensure that "the ecosystems upon which endangered and threatened species depend [are] conserved, [and] to provide a program for the conservation of such endangered species and threatened species." 16 U.S.C. § 1531. The ESA reflects "an explicit congressional decision to afford first priority to the declared national policy of saving endangered species." *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 185 (1978).

Section 9 of the ESA prohibits any "person" from "taking" any member of an endangered species. 16 U.S.C. § 1538(a). The term "take" is defined broadly to include "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect." *Id.* § 1532(19). The Service has further defined "harass" to include "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, including breeding, feeding, or sheltering." 50 C.F.R. § 17.3. In addition, "harm" is defined to "include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." *Id*.

Section 7 of the ESA directs all federal agencies, in consultation with the Service, to use their existing authorities to conserve threatened or endangered species. 16 U.S.C. § 1536(a)(1); *see id.* § 1532(3) (defining "conservation"). That section further requires all agencies to "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species." *Id.* § 1536(a)(2). To carry out this obligation, an agency formally "consults" with the FWS when it undertakes an action that "may affect listed species," unless FWS concurs in writing in a finding by the action agency that "that the proposed action is not likely to adversely affect any listed species." 50 C.F.R. § 402.14. If effects are likely, the agency requesting consultation must "provide the [Service] with the best scientific and commercial data available." *Id.* Formal consultation, if commenced, results in the issuance by the Service of a Biological Opinion, which requires terms and conditions specifically designed to minimize the take of endangered and threatened species.

### B. Bald and Golden Eagle Protection Act

BGEPA prohibits "take" of any bald or golden eagle "at any time or in any manner" "without being permitted to do so" by the Service. 16 U.S.C. § 668(a) (imposing criminal penalties for unlawful take done "knowingly, or with wanton disregard"), *id.* § 668(b) (imposing civil penalties for unlawful take on a strict liability basis). BGEPA defines the term "take" broadly to include "wound, kill . . . molest or disturb." *Id.* § 668c. "Take" under BGEPA includes direct incidental take, such as electrocution of eagles from power lines or collisions with wind turbines, as well as indirect incidental take, such as habitat modification and human disturbance that adversely impact eagles.

BGEPA allows the Service to issue permits authorizing the take or disturbance of golden eagles provided that such take "is compatible with the preservation of the bald eagle or the golden eagle." 16 U.S.C. § 668a. In 2009, the Service promulgated regulations for issuing incidental take permits for both individual instances of take as well as "programmatic take" for take that is recurring. 50 C.F.R. § 22.26. The Service may issue an eagle take permit so long as the take is: (1) "compatible with the preservation" of eagles; (2) necessary to protect an interest in a particular locality; (3) associated with but not the purpose of the activity; and (4) for individual instances of take, the take cannot practicably be avoided; or for programmatic take, take is unavoidable even though advanced conservation practices are being implemented. *Id.* § 22.26(f). For purposes of these regulations, "compatible with the preservation" of eagles means "consistent with the goal of stable or increasing breeding populations." Service, Final Rule: Eagle Permits; Take Necessary To Protect Interests in Particular Localities, 74 Fed. Reg. 46,837 (Sept. 11, 2009) (codified at 50 C.F.R. pt. 22).

To avoid liability under BGEPA, a project developer that wishes to build a project in known eagle habitat must coordinate with the Service before project construction to determine whether the project is likely to disturb eagles and if so, whether such take can be avoided. During this process, the Service must evaluate several factors, including eagles' prior exposure and tolerance to similar activity in the vicinity; the availability of alternative suitable eagle nesting or feeding areas that would not be detrimentally affected by the activity; cumulative effects of other permitted take and other additional factors affecting eagle populations; and the possibility of permanent loss of an important eagle use area. *See* 50 C.F.R. § 22.26(e). If the take or disturbance of eagles cannot be avoided entirely, a permit must be acquired. However, if the Service determines that "take is not likely to occur," a permit is not required. *See* 50 C.F.R. § 22.26(g). Acquisition of a permit where there is a likelihood of eagle take ensures compliance with BGEPA by authorizing ongoing unavoidable take, as well as by promoting eagle conservation through required implementation of avoidance and mitigation measures such as compensatory mitigation. *Id.* § 22.26(c).

### C. Migratory Bird Treaty Act

The MBTA strictly prohibits killing migratory birds without authorization from the Interior Department. Enacted to fulfill the United States' treaty obligations, the MBTA provides that "[u]nless and except as permitted by regulations made as hereinafter provided in this subchapter, it shall be unlawful *at any time, by any means or in any manner,* to pursue, hunt,

take, capture, kill, attempt to take, capture, or kill . . . any migratory bird." 16 U.S.C. § 703(a) (emphasis added). The Secretary is authorized to permit the killing of birds otherwise protected by the MBTA when doing so would be compatible with migratory bird conventions. *Id.* § 704(a).[2]

Where federal agencies themselves undertake a project which will inevitably result in migratory bird mortalities – regardless of whether the mortalities are intentional – without first obtaining authorization from the Interior Department to kill migratory birds, the agency's actions are unlawful. *See Humane Soc'y of the U.S. v. Glickman*, 217 F.3d 882, 884-88 (D.C. Cir. 2000) (holding that federal agencies must obtain authorization from the Department of the Interior before they kill birds protected by the MBTA, or permit state agencies to do so); *see also City of Sausalito* v. *O'Neill*, 386 F.3d 1186, 1204 (9th Cir. 2004) (holding that "anyone who is 'adversely affected or aggrieved' by an agency action alleged to have violated the MBTA has standing to seek judicial review of that action"); *United States* v. *Moon Lake Elec. Ass'n*, 45 F. Supp. 2d 1070 (D. Colo. 1999) (holding that the MBTA prohibits the unintentional killing of protected birds by power lines); *United States* v. *Corbin Farm Serv.*, 444 F. Supp. 510, 532-36 (E.D. Cal. 1978) (holding that the MBTA prohibits the unintentional killing of protected birds by pesticide poisoning).

In particular, courts have held that activities undertaken without an MBTA permit by federal agencies (including military agencies) that are predicted to result in incidental take of migratory birds constitute violations of the MBTA. *See Ctr. for Biological Diversity v. Pirie*, 191 F. Supp. 2d 161, 174-75 (D.D.C. 2002), *vac'd as moot sub nom., Ctr. for Biological Diversity v. England*, No. 02-5163, 2003 WL 179848 (D.C. Cir. Jan. 23, 2003) (holding that Navy training exercises, which were not "directed at wildlife" but did have the predictable and "direct consequence of killing and harming migratory birds," violated the MBTA's take prohibition, and explaining that "the MBTA prohibits both intentional and unintentional killing").[3]

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[2] The Service has promulgated regulations establishing criteria for MBTA permits, including a regulation, 50 C.F.R. § 21.27, that authorizes a permit when an applicant – which can be a private entity or a federal agency – demonstrates a "compelling justification." *Id.* Last year, for example, the National Marine Fisheries Service ("NMFS") – another federal agency – applied to the Service for a permit under this regulation that would "authorize incidental take of two [species of] migratory birds . . . by NMFS in its regulation of the shallow-set longline fishery" in Hawaii. *See* Special Purpose Application: Hawaii Longline Fishery, 77 Fed. Reg. 1501, 1502 (Jan. 10, 2012). If granted, the permit would "authorize incidental take of migratory birds" that will be killed as an inevitable albeit unintended effect of the fishing lines regulated by NMFS. *Id.*

[3] Congress responded to the ruling in *Pirie* by enacting the National Defense Authorization Act for FY 2003, which expressly recognizes the Service's authority to regulate incidental take. *See* Pub. L. No. 107-314, § 315, 116 Stat. 2458. Section 315 of that Act provides that the Secretary of the Interior "shall exercise the authority of the Secretary under [Section 704(a) of the MBTA] to prescribe regulations" specifically relating to the "incidental taking of migratory birds during military readiness activitie[s]." *Id.* Notably, even in the case of such activities, Congress did not

### D. National Environmental Policy Act

Congress created NEPA more than four decades ago "[t]o declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment . . . ." 42 U.S.C. § 4321. In light of this mandate, the Supreme Court has reasoned that NEPA is "intended to reduce or eliminate environmental damage and to promote 'the understanding of the ecological systems and natural resources important to' the United States." *Dep't of Transp. v. Pub. Citizen*, 541 U.S. 752, 756 (2004) (quoting 42 U.S.C. § 4321).

In achieving NEPA's substantive goals, Congress created two specific mechanisms whereby federal agencies must evaluate the environmental and related impacts of a particular federal action – an EA and an EIS. *See* 42 U.S.C. § 4332(c). These procedural mechanisms are designed to inject environmental considerations "in the agency decisionmaking process itself," and to "'help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.'" *Pub. Citizen*, 541 U.S. at 768-69 (emphasis added) (quoting 40 C.F.R. § 1500.1(c)). Therefore, "NEPA's core focus [is] on improving agency decisionmaking," *Pub. Citizen*, 541 U.S. at 769 n.2, and specifically on ensuring that agencies take a "hard look" at potential environmental impacts and environmentally enhancing alternatives "as part of the agency's process of deciding whether to pursue a particular federal action." *Baltimore Gas and Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 100 (1983). The alternatives analysis "is the heart" of an EIS or EA. 40 C.F.R. § 1502.14. NEPA's implementing regulations require that the decisionmaking agency "present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decisionmaker and the public." *Id.*

An EIS must be prepared by an agency for every "major Federal action significantly affecting the quality of the human environment." 42 U.S.C. § 4332(c). Under the Council on Environmental Quality's ("CEQ") regulations that implement NEPA, "significance" requires consideration of both context and intensity. "Context" considerations include the affected region, interests and locality, varying with the setting of the action, and include both short and long-term effects. "Intensity" refers to the severity of impact, including impacts that may be both beneficial and adverse; unique characteristics of the geographic area, such as proximity to wetlands, wild and scenic rivers, or ecologically critical areas; the degree to which the effects on the quality of the human environment are likely to be highly controversial; the degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration; whether the action is related to other actions with individually insignificant but cumulatively significant impacts; the degree to which the action may adversely affect an endangered or threatened species or its habitat that has been

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direct the Service to exempt such operations wholesale but, rather, to ensure that they are conducted with plans approved by the Service and designed to minimize bird mortality. *See id.* § 315, 50 C.F.R. § 21.15. Thus, any notion that ANG may simply disregard the MBTA's take prohibition in operating a wind power project is impossible to reconcile with Congress's actions, as well as with the Service's repeated admonitions.

determined to be critical under the ESA; and whether the action threatens a violation of federal law imposed for the protection of the environment. *See* 40 C.F.R. § 1508.27.

Where a significant environmental impact is not expected, the agency must still prepare an EA and a Finding of No Significant Impact ("FONSI"). *Id.* §§ 1508.9, 1501.3.

## FACTUAL BACKGROUND

This is an extraordinary situation in which a federal "action agency" has repeatedly rebuffed the views of the expert federal agency with principal responsibility for ensuring compliance with the ESA, BGEPA, and MBTA. Because it is so unusual and legally problematic for a federal agency to proceed in this manner, we will detail at some length the history of the Service's communications with ANG concerning the project.

### A. The Service's 2007 Comments

In October 2007, ANG's consultant requested information from the Service concerning the existence and abundance of federally-protected species on and near the proposed Camp Perry project site. At that time, ANG anticipated constructing three wind turbines.

On December 4, 2007, the Service responded to ANG's request for information, and indicated significant concerns with ANG's proposal due to the importance of the project site for avian migration. The site is adjacent to the Ottawa National Wildlife Refuge ("NWR") which has been known to be a "major migration corridor" for various types of avian species and has been designated by non-profit bird advocacy organizations as a "Globally Important Bird Area." *See* Exhibit 1 at 2. Thus, the Service explained its expert opinion that the agency "has serious concerns that installation of a wind turbine(s) adjacent to Ottawa NWR property may have *significant impacts on birds*." *Id.* (emphasis added). As to two federally endangered bird species afforded full ESA protections – Kirtland's warbler and piping plover – the Service determined that it is "very likely" based on available evidence that both species will "pass through the project area during the spring and fall migration seasons" and that both species will be placed at risk by the project. *Id.* at 3.

As to bald eagles protected by BGEPA, the Service explained that "[t]he project area lies adjacent to a woodlot that supports a nesting pair of bald eagles," and that a total of nine bald eagle nests exist within five miles of the project site. *Id.* at 2. Indeed, as the Service explained, the project area has the "highest concentration of bald eagles in the state," and is known to "serve as [a] staging area[] for very large populations of immature bald eagles." *Id.* Based on the available evidence, the Service determined that "it is likely that eagles will be impacted if the project moves forward as proposed," and strongly recommended that "wind turbines be avoided within 5 miles of eagle nests." *Id.*

As to migratory birds protected by the MBTA, the Service opined that "[b]ecause of the significant and documented bird use of the Federal refuge adjacent to the project area, the Service believes that it is highly likely that the proposed project will result in bird mortality" in violation of the Act. *Id.* at 4. This conclusion was based on available data indicating that certain

avian species migrate along the shoreline of Lake Erie – rather than across the lake – and on the fact that "Ottawa NWR is known to provide stopover habitat for night-migrating landbirds as they travel between their summer and winter grounds," which is important considering that the project site is located less than one mile from Lake Erie. *Id.* Therefore, the Service found that the best available scientific evidence suggests "a high probability that . . . mortality of birds due to turbine strikes would occur." *Id.*

### B. The Service's 2010 Comments

In 2010, ANG reduced the scope of the project to one turbine but did not otherwise address the Service's concerns that the project site is one of exceptionally high risk for species protected by the ESA, BGEPA, and MBTA. Accordingly, on April 8, 2010, the Service sent additional eagle-related correspondence to ANG, explaining to ANG the recently promulgated BGEPA regulations concerning programmatic eagle take and the requirements for obtaining a permit under those regulations. *See* Apr. 8, 2010 FWS Letter to ANG (Exhibit 2).

In May 2010, ANG issued a Draft EA purporting to analyze the environmental effects of the proposal. Despite the Service's previous determination of risk presented by the proposed project and the agency's recommendations for minimizing such risk, the Draft EA did not adopt any meaningful modifications to address the threat of significant avian mortality. This led the Service, in a June 16, 2010 letter to ANG, to voice its continued serious concerns with the project as proposed. *See* June 16, 2010 FWS Letter to ANG (Exhibit 3). Inexplicably, ANG had prepared its Draft EA seemingly without any consideration of the Service's previous letters, "nor was any mention given to the input [the Service] ha[s] provided on multiple occasions." *Id.* at 2; *see also id.* at 6. Thus, the Service provided a litany of "substantial concerns" with the Draft EA, which the Service concluded was "inadequate," because "[t]he Draft EA does not address the potential for take of [endangered] species in any meaningful manner, nor does it sufficiently address the potential take of migratory birds or Bald Eagles." *Id.* at 6.

Specifically, as to the ESA-protected Kirtland's warbler and piping plover, the Service again explained to ANG that both species are "known to migrate through this area, with recent migratory records for both species." *Id.* The Service found ANG's effects analysis in the Draft EA with respect to those species "entirely lacking," and explained that there was "no determination of effects to these species . . . included in the Draft EA" – a determination required by the ESA in the event that effects to endangered species are likely. *Id.*

As to bald eagles, the Service again explained that under BGEPA, "take and/or disturbance of bald eagles is strictly prohibited without a permit, and permits may only be issued if take is consistent with the preservation of the species, and has been minimized as much as possible, such that any resulting take is 'unavoidable.'" *Id.* at 3-4. Based on survey data demonstrating that "bald eagles regularly flew near . . . the project area," and known high concentrations of eagle nests in the vicinity of the project site, the Service explained that "[i]f take of bald eagles occurs without a permit authorizing the take, Camp Perry would be in violation of the BGEPA." *Id.* at 4.

As to other migratory birds, the Service explained the agency's conclusion that "operation of the turbine may very well impact the migratory birds that occur in the region." *Id.* at 3. Calling ANG's Draft EA analysis "an understatement" based on "many questionable assumptions," the Service opined that it is "highly likely that many individuals of various migratory bird species regularly fly across the project area." *Id.* Thus, according to the expert federal wildlife agency, "it remains highly likely that migratory birds . . . will still be taken by the project," which "would be a violation of the MBTA." *Id.*

In addition, the Service admonished ANG for what the Service discerned as various NEPA violations. In particular, the Service explained that it would violate NEPA and its implementing regulations – namely 40 C.F.R. § 1506.1 – to "conduct flight path observations" only "*during construction and one year after construction*," which the Service deemed legally "inappropriate because this action would limit the choice of reasonable alternatives and could have an adverse environmental impact." *Id.* at 4. As the Service correctly explained to ANG, "NEPA does not allow for a 'wait and see' approach" to potential impacts. *Id.* at 5. Likewise, the Service explained that under the circumstances ANG was required to prepare an EIS, rather than a more cursory EA, because at least two NEPA "significance" factors were triggered by the project due to the degree of uncertainty with respect to potential avian mortality and the almost certain violations of federal laws in the ESA, BGEPA, and MBTA. *Id.* As a result, the Service explained that "an EIS is warranted for this project." *Id.* Moreover, the Service indicated that an EIS should be prepared "to address the unique . . . risks to migratory birds . . . that occur in the continentally significant habitat areas in close proximity (800 m) to the project area." *Id.*[4]

On July 31, 2012, the Service met with ANG officials to address the Service's bald eagle mortality concerns. According to the Service's meeting notes, the Service remained steadfast in expressing "our concerns about a nesting pair of bald eagles at the northwestern portion of the site and within 0.5 miles of the turbine site." July 31, 2012 FWS Meeting Notes (Exhibit 5). In addition, the Service recommended that ANG "consider seeking a take permit" for eagles. *Id.* The Service also requested that ANG conduct additional studies to produce "more site specific data" of migratory bird use of the site, but ANG planned "to begin construction this fall/winter" before such data could be collected and analyzed. *Id.*

[4] On June 22, 2010, the state wildlife agency – the Ohio Department of Natural Resources ("ODNR") – sent a letter to ANG in response to the Draft EA echoing many of the concerns raised by the Service. *See* June 22, 2010 ODNR Letter to ANG (Exhibit 4). ODNR explained that "[t]he Camp Perry facility falls within the highest area of concern . . . due to potential impacts to migratory songbirds and bald eagles." *Id.* at 1. ODNR further explained "the significance of the landscape and habitats surrounding this project," as "this region is nationally renowned for its bird abundance and diversity." *Id.* at 2. ODNR highlighted a recent bald eagle wind turbine strike that occurred at a site across Lake Erie in 2009, and explained that "[d]uring migration the Western Basin region of Lake Erie has the highest density of Kirtland's warbler observations in the nation." *Id.* at 3-4.

### C. The Final EA And The Service's 2012 Comments

On August 22, 2012, ANG released its Final EA, which is confusing at best. For example, the Final EA purportedly determined that "some minor environmental consequences may occur" as a result of this project. *See* August 22, 2012 ANG Final EA (Exhibit 6) at 7. Focusing on avian *populations*, ANG purportedly determined that the project "will not likely result in an adverse effect to avian . . . populations over a relatively large area," despite acknowledging that "[c]ollision impacts to avian . . . populations may result from the birds . . . that hunt, nest, or breed in the general proximity of Camp Perry." *Id.* at 8. As to ESA-protected species, the Final EA purportedly determined that "the Proposed Action will have no effect on listed avian species." *Id.*

Although the Final EA conceded that "more than 300 avian species" had been documented in the project site vicinity, *see id.* at 32, the Final EA significantly downplayed the risk posed to avian species. For example, despite the fact that many eagles have been killed by wind turbines throughout the nation, the Final EA reached the unsupported conclusion that eagles will habituate to the Camp Perry turbine and thus avoid mortality, based in part on the erroneous assertion that "[n]o eagle fatalities have been reported" from wind power. *Id.* at 56, 63. Likewise, the Final EA purportedly determined – in contradiction of the expert federal wildlife agency's view – that "the risk to Kirtland's Warblers from [the project] would be very low," by comparing the project to dissimilar projects such as communication towers in areas that are not migration bottlenecks as is the case with the Erie lakeshore. *Id.* at 57.

As to migratory birds in general, the Final EA discounted the effects of this project by instead shifting the focus to *other* types of structures and facilities that may kill birds, *see id.* at 61 – structures and facilities that are irrelevant to the environmental impacts of *this* project and the legal obligations that attach to the project. Downplaying the effects of this turbine, the Final EA focused on the fact that this project will only have one turbine, which the Final EA stated was of "critical importance," but never actually addressed the avian mortality concerns associated with the project in this vitally important bird area. *Id.* at 65. Again trying to shift the focus to *populations* rather than impacts to individual birds, the Final EA concluded by purportedly determining that "[o]peration of the single wind turbine would result in a very small incremental increase in the number of birds . . . killed by wind turbines in the region," and further that "the turbine would not result in significant impacts to the populations of any listed or common species." *Id*. at 74; *see also id.* at 77 (stating that "[a] small number of raptors maybe affected by collision, but those potential fatalities are not likely to result in biologically significant impacts").[5]

[5] As is common throughout the Final EA, the primary "evidence" upon which ANG's counterintuitive determinations – which conflict with the views of the federal (and state) wildlife agency with jurisdiction over avian species – is little more than non-peer reviewed monitoring data collected by ANG's own paid consultant (Curry & Kerlinger), which has been hired to facilitate project construction by many wind energy facilities. *See id.* at 55-77. The lack of scientific foundation underlying ANG's conclusions is deeply troubling, and even more so considering the potential conflicts of interest inherent in the process of allowing a paid consultant

On September 25, 2012, the Service sent a detailed response to the Final EA, yet again admonishing ANG's handling of its legal obligations under the ESA, BGEPA, and the MBTA. *See* Sept. 25, 2012 FWS Letter to ANG (Exhibit 7). Reiterating that the Service has "significant concerns," the Service maintained that, notwithstanding the Final EA, "we believe that siting a wind turbine at the proposed location presents a *high level of risk to migratory birds*." *Id.* at 1 (emphasis added). Providing various reasons, the Service concluded that "[t]he current site . . . does *not* reflect a site that minimizes potential effects on wildlife." *Id.* at 1-2 (emphasis added).[6]

As to endangered Kirtland's warblers and piping plovers, the Service disputed the Final EA's unsupported insistence that the turbine would not result in any mortality of those species, and explained that "the proximity of the project to Lake Erie may expose these species to risk from the turbine." *Id.* at 4-5. Therefore, because ANG had yet to make an effects determination pursuant to section 7 of the ESA, the Service "request[ed] that ANG make a determination of effects . . . [for] piping plover [and] Kirtland's warbler, and submit it to this office for concurrence." *Id.* As the Service, explained, "[t]he determination of effects should also include a rationale for why each determination is appropriate, listing any proposed avoidance and minimization measures that will be implemented to reduce the likelihood of take." *Id.*[7]

With respect to eagles, the Service reiterated its significant eagle mortality concerns, based on the fact that "Ottawa County has the highest nesting density of bald eagles in the State of Ohio," including "60 known bald eagle nests within 10 miles of the proposed project area." *Id.* at 6. The Service corrected the Final EA's erroneous assertion of no wind-related eagle mortalities, explaining that "[t]ake of bald eagles at several wind power facilities in the eastern U.S. and Canada has recently been documented, including take of a bald eagle at a single small turbine." *Id.* Because the available "data indicate the presence of a migration corridor and stopover area for bald eagles along the western basin of Lake Erie, which would include the project area," the Service determined that it is "likely that your project may overlap [a] type of eagle use area – a migration and wintering area." *Id.* at 7. As a result, the Service concluded that

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to steer ANG's NEPA and project review process in a manner that will benefit the consultant's own interest in attracting additional business from wind power companies.

[6] To the extent that ANG has asserted that migratory birds are unlikely to fly below 1,000 feet, that unfounded assertion cannot be reconciled with abundant empirical data from this region indicating that a significant number of birds fly below that height. *See, e.g.*, FWS, *Bird Radar Data*, available at http://www.fws.gov/radar/radarmap/index.html.

[7] In an effort to reduce the mortality risk to birds, including federally protected species, the Service repeatedly recommended that ANG consider various siting and operational minimization measures designed to reduce bird mortality. *See* Exhibit 1 at 4-5. In particular, the Service strongly recommended that, if ANG insisted on proceeding with the project at this extremely high risk site, that ANG at least adopt the measure of "not operating the wind turbine at night during the spring and fall migratory period for these species (combined, from April 1-June1, and from July 15-Oct. 15)," which the Service believed would at least reduce the risk to various species, including those protected under the ESA, BGEPA, and MBTA. *See, e.g.*, Exhibit 7 at 5. To date, however, ANG has refused to take even that modest step which, in ABC's view, would be inadequate to address the project's unacceptable risks to federally protected birds.

"incidental take of bald eagles may be likely over the life of this project," and recommended that ANG apply for an eagle take permit which would require ANG to "minimize impacts to eagles to the maximum degree achievable." *Id.*

With respect to migratory birds generally, the Service again explained that "the project area lies within a region that is globally significant for migratory birds." *Id.* at 10. Further, the Service stated that "[b]irds stopping over during migration would be expected to travel at lower altitudes than migrating birds, and would be more susceptible to turbines than birds in locations that do not provide migration stopover habitat." *Id.* at 11. As a result of this and other factors, the Service opined that the data "indicates a high probability of bird mortality due to turbine strikes." *Id.*

The Service also offered more general comments with respect to ANG's legal and scientific approach in the Final EA, which was at odds with the mandates that apply to ANG's evaluation of environmental impacts under governing laws. For example, the Service explained that ANG's continued reliance on population-level impacts was inappropriate as to the ESA, BGEPA, and the MBTA – all of which "prohibit take of *individual* animals protected under those respective statutes without a permit." *Id.* at 13. The Service also noted that "the Service does not agree with the analysis provided" on Kirtland's warblers in the Final EA, because population-level analysis is irrelevant under section 7 of the ESA, and instead "[t]he analysis should consider whether the project will result in take of individuals." *Id.* at 15.

In addition, the Service also discredited eagle flight path data that had been collected by ANG's consultant as it was not "sufficient to conclude that bald eagles are not flying through the proposed project area during all seasons or all times of the year." *Id.* The Service also explained that this project's siting is expected to result in "considerably higher than average bird mortality rates," thus making comparisons with nationwide or even regionwide wind turbine data inappropriate. *Id.* at 16-17. Moreover, the Service rejected the Final EA's comparison of this project to communication towers for bird mortality predictions, because those comparisons are "not appropriate in this context," nor are they "relevant to the proposed project." *Id.* at 17. The Service also raised serious concerns with the Final EA's purportedly "conclusive statements about bird risk based on radar data that ANG determined was corrupted and inadequate." *Id.* Finally, the Service corrected ANG's incorrect legal standard it was applying under the MBTA, and explained that "[u]nder the MBTA, all take of migratory birds without a permit authorizing such take is illegal" and "[t]here is not a significance threshold." *Id.* at 18.

Furthermore, the Service continued to stress its dismay that ANG – a federal agency – was refusing to site its wind project in a lower-risk location for wildlife and was insisting on ignoring the expert agency's recommended minimization measures. In particular, the Service explained, "[a]s a federal government agency, we hope to work with other Federal agencies to set good examples for siting wind turbines in areas of lower risk to wildlife," but "[w]ith no site-specific data indicating otherwise, we believe that the significant habitat features in the surrounding landscape and documented significant bird use of these areas indicates the proposed site poses a high risk to migratory birds." *Id.* The Service was especially concerned with the precedential nature of ANG's refusal to comply with laws under the Service's jurisdiction in siting and operating its wind turbine – a NEPA "significance" factor triggering the need for an

EIS – explaining that "we believe that Federal agencies should work closely with us in siting turbines to minimize the potential effect on wildlife resources, *setting a good example for the public to follow*." *Id.* at 1 (emphasis added).[8]

Echoing the Service's concerns, ODNR – the state wildlife agency – similarly reiterated its "significant concerns regarding the impacts this facility may have on local and migratory birds." September 25, 2012 ODNR Letter to ANG (Exhibit 8) at 1. ODNR explained that the project's "proposed location for this turbine falls in an area of greatest concern due to proximity to state and federal conservation areas, bald eagle nests, and the shoreline of Lake Erie." *Id.* As to the ESA-listed warbler and plover, ODNR – like the Service – concluded that "[t]he EA fails to provide an adequate evaluation of potential impacts," and "disagrees with the assessment that . . . the risk of turbines is low for th[ese] species." *Id.* at 3. Accordingly, ODNR recommended that the "[r]isk of potential impact . . . should be addressed through project siting, design, and known species distribution." *Id.*[9]

On July 10, 2013, ANG issued a Final EA "Addendum," purporting to respond to the comments received from the Service and ODNR. *See* July 10, 2013 ANG Final EA Addendum (Exhibit 9). However, rather than effectively rebut the expert agencies' comments, the Addendum presented a one-sided, result-oriented (and erroneous) view of both the science and the law. *See id.* at 2-3. For example, the Addendum refused to accept that individual birds are protected by the "take" prohibitions in the ESA, MBTA, and BGEPA, and insisted instead that "jeopardy to the continued existence of any species" was the only proper threshold for analysis, which is legally baseless. *Id.* at 2. The Addendum also erroneously asserted that only "deliberate acts" are illegal under the MBTA, and that incidental take is not treated as an MBTA violation. *Id.*

### D. The FONSI And The Service's 2013 Comments

On August 22, 2013, ANG issued a FONSI. *See* Aug. 22, 2013 ANG FONSI (Exhibit 10). Despite previously acknowledging that more than 300 avian species are known in the vicinity of the project site, the FONSI asserted that "[a] low diversity and small numbers of avian . . . species occur where the turbine will be located and in adjoining areas of Camp Perry." *Id.* at 2. While conceding that "[e]agles occur in the area year-round and nest in nearby woodlands"

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[8] As discussed below, there are several other NEPA significance factors present including predictable violations of federal environmental laws (ESA, BGEPA, and MBTA), and nearby wetlands and other ecologically critical areas for birds and other wildlife whose resources will be impacted by the project.

[9] In addition to federal and state wildlife agencies, various science-based conservation organizations submitted comments to ANG requesting that ANG site the turbine in a lower-risk location. The organizations are especially concerned that this turbine – in conjunction with other threats facing avian species – will have a negative impact on the approximately $37 million annual revenue brought to local communities directly resulting from birding activities in Ottawa County.

and that "[t]hey are observed flying over Camp Perry," the FONSI inexplicably concludes that "collision impacts to these species are not expected." *Id.* at 3. The FONSI states that "[i]t is possible, but not likely, that a small number of songbirds and a smaller number of raptors may collide with the turbine during the life of the project." *Id.* Focusing on a threshold not found in the ESA itself of "significant impacts," the FONSI purportedly determined that "[n]o impacts to endangered and threatened species are anticipated by the Proposed Action." *Id.* at 4.

On September 10, 2013, the Service responded to ANG's Final EA and FONSI. Yet again rejecting ANG's overly optimistic assertions and legally erroneous conclusions, the Service explained that "we believe operation of the turbine could result in take of bald eagles," and explained that "[i]n situations where eagle take is likely, permits are available to authorize a limited amount of take." Sept. 10, 2013 FWS Letter to ANG (Exhibit 11) at 1. The Service yet again disputed ANG's conclusion that take of bald eagles is unlikely, and explained that if ANG proceeds without a BGEPA permit it "assume[s] the risk of violating the Bald and Golden Eagle Protection Act." *Id.* at 1-2.

As to endangered warblers and plovers, contrary to ANG's assessment, the Service continued to state its "belie[f] that the proposed wind turbine presents a potential risk of take to the federally endangered Kirtland's warbler and piping plover," which was "further substantiated by two new observations of piping plover at Camp Perry this year." *Id.* at 2. Again disagreeing with ANG, the Service indicated that "***take of Kirtland's warbler and piping plover is likely due to the location of the project relative to migration paths, suitable habitat, and species occurrence data***." *Id.* (emphasis added). As to migratory birds generally, the Service also did not retreat from its position that the project as planned will violate the MBTA's take prohibition. Rather, the Service "continue[d] to recommend implementation of the avoidance and minimization measures as described in our September 25, 2012 letter to minimize the potential effects on migratory birds." Exhibit 11 at 3.

## DISCUSSION

Based on ABCs review of the project – which is consistent with more than six years of extensive analysis by the federal and state expert wildlife agencies – the selected site of the Camp Perry ANG wind turbine in Ottawa County, Ohio presents an extremely high risk of bird collision mortality (in addition to flight disturbance and other harassment) to a significant number of protected migratory bird species – including federally endangered Kirtland's warblers and piping plovers, as well as bald eagles – that are known to reside in the vicinity of the project site and routinely migrate through the project site's air space.

Indeed, it is ABC's view that it would be difficult to find a higher-risk site for a wind turbine considering that: (1) the project is adjacent to the Ottawa NWR, which the Service recognizes as a "major migration corridor" for waterfowl, shorebirds, raptors, and songbirds that stop after traversing Lake Erie before continuing their migration; (2) the adjacent refuge is vitally important to a variety of bird species which has led to numerous designations, including as an American Bird Conservancy Globally Important Bird Area, a site of regional significance in the Western Hemisphere Shorebird Reserve Network, and a Top 10 birding destination; (3) the

project site is less than a mile from the shore of Lake Erie; and (4) the project site is proximate to the Portage River and other large coastal wetland complexes.

For these and other reasons articulated by the Service and ODNR throughout the six-year review process, this project is not only biologically and ecologically unsound, but, as presently planned, it is certain to result in patent violations of the ESA, BGEPA, MBTA, and NEPA, as described in more detail below.

## A. ESA Violations

### *1. By Proceeding with the Project without Engaging in Formal Consultation or Obtaining FWS Concurrence that the Project Is Not Likely to Affect Endangered Species, ANG Is in Violation of Section 7.*

Section 7 of the ESA and its implementing regulations mandate that, where the best available scientific evidence demonstrates that an action "*may* affect listed species," "formal consultation is *required*" and the Service must prepare a biological opinion fully analyzing the effects to any such species, 50 C.F.R. § 402.14(a)-(g) (emphases added), as well as establishing mandatory terms and conditions for minimizing any "take" of the species. 16 U.S.C. § 1536(b)(4)(C)(iv). The burden to commence the consultation process falls on the action agency – here ANG – as the regulations state that "[e]ach Federal agency shall review its actions at the earliest possible time to determine whether any action may affect listed species." 50 C.F.R. § 402.13. If any impact to a listed species "may" occur, "formal consultation is required" unless "the Federal agency determines, with the written concurrence of the [Service], that the proposed action is not likely to adversely affect any listed species." *Id.* §§ 402.14(a)-(b).

As courts have explained, "'may affect' is a 'relatively low' threshold for triggering consultation," and thus "*[a]ny possible effect*, whether beneficial, benign, adverse or of an undetermined character, triggers the requirement" for formal consultation. *Karuk Tribe v. Forest Serv.*, 681 F.3d 1006, 1027 (9th Cir. 2012) (*quoting* FWS & NMFS, Establishment of ESA Section 7 Regulations, 51 Fed. Reg. 19926, 19949 (June 3, 1986)) (other citations omitted). Only if the Service concurs in writing that such an action is not likely to have *any* adverse effect on a species may formal consultation be avoided. *See* 50 C.F.R. § 402.14(b)(1).

Here, ANG has violated the ESA by failing to engage in formal consultation and by failing even to submit a "not likely to adversely affect" determination for the Service's written concurrence – which, as explained, is the *only* legal means by which formal consultation may be avoided. Moreover, ANG has compounded its violation of section 7 and the ESA's implementing regulations by refusing even to render a formal effects determination with respect to the endangered Kirtland's warbler and the endangered piping plover. Despite the Service's repeated requests for ANG to submit such a determination for the Service's evaluation, *see* Exhibit 7 at 5, 14; Exhibit 11 at 2, ANG has ignored those requests. Presumably, ANG has refused to do so because any such determination would have to acknowledge that the project obviously "may" affect the ESA-listed species that traverse the project site – thus triggering the ESA consultation process that ANG is endeavoring unlawfully to circumvent.

In any event, the fact that the Service – the federal expert wildlife agency – has expressly rejected ANG's unfounded determination that take of Kirtland's warblers and piping plovers is unlikely, *see, e.g.*, Exhibit 11 at 2, particularly because ANG has not committed to the only minimization measure (seasonal turbine curtailment during known migratory periods) urged by the Service, *see* Exhibit 11 at 2; Exhibit 7 at 5, leaves little doubt that the Service would *refuse* to concur in a "not likely to adversely affect" determination under these circumstances. The fact that the Service's position dictates the conclusion that *formal* consultation – resulting in a full Biological Opinion, including an Incidental Take Statement – is necessary here renders ANG's refusal even to submit a formal effects determination for the Service's review arbitrary, capricious, and glaringly in contravention of the process mandated by the ESA for protecting endangered and threatened species.

### *2. ANG Is Also Violating ESA Section 9 by Proceeding in the Absence of Incidental Take Authorization with a Project that Is Highly Likely to Take Endangered Species.*

ANG's proposed wind turbine, as currently sited, will almost certainly result in the incidental taking of endangered Kirtland's warblers and endangered piping plovers without incidental take authorization from the Service, which is a violation of the take prohibition in section 9 of the ESA.

The conclusion that endangered warblers and plovers are likely to be taken by ANG's wind turbine is consistent with the assessment conducted by every independent biologist or agency to review this project over the past six years. *See, e.g.*, Exhibit 1 at 3; Exhibit 7 at 5; Exhibit 8 at 3; Exhibit 11 at 2. To date, the only entity to reach a contrary conclusion is ANG's paid consultant Curry & Kerlinger – a company that almost exclusively provides consulting services to wind energy facilities and other industries. In any event, even at various points *after* ANG released its Draft EA, Final EA, Addendum, and FONSI all reaching a contrary conclusion based primarily on their own consultant's non-peer reviewed data collected for other wind energy clients, the expert federal and state wildlife agencies determined that the best available scientific evidence did not support ANG's unfounded conclusion. *See, e.g.*, Exhibit 11 at 2.

Accordingly, because take of endangered Kirtland's warblers and endangered piping plovers remains highly likely in the absence of ANG's commitment to adopt minimization measures that may potentially reduce the likelihood of take to a lower threat level, ANG is proceeding without take authorization in violation of section 9 of the ESA. *See, e.g.*, *Animal Welfare Inst. v. Beech Ridge Energy LLC*, 675 F. Supp. 2d 540 (D. Md. 2009) (finding reasonable likelihood of take of endangered Indiana bats during 20-year life of wind energy project and enjoining construction and operation pending company obtaining incidental take authorization from the Service). Therefore, unless and until ANG obtains section 7 incidental take authorization from the Service, any construction and/or operation will occur in violation of section 9 of the ESA and its implementing regulations.

Moreover, if ANG begins construction before obtaining incidental take authorization, it would also violate section 7(d) of the ESA. Since the only lawful course of action is for ANG to consult with the Service via the section 7 consultation process and obtain an incidental take

statement, the ESA explicitly prohibits ANG from "mak[ing] any irreversible or irretrievable commitment of resources . . . which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures." 16 U.S.C. § 1536(d). Thus, any construction activity, such as tree cutting, turbine site grading, or other habitat modification, that in any way forecloses a potential wildlife avoidance or mitigation alternative for the Service to consider in rendering a final decision in formal consultation (e.g., micrositing changes to the turbine location), is a separate and distinct violation of the ESA. The principle espoused by Congress in section 7(d) is the same reason that the *Beech Ridge* court enjoined the majority of turbine construction and operation at that wind energy facility, holding that the section 10 process might find certain turbine locations inappropriate because of bat impacts and also that wildlife alternatives should not be foreclosed by premature construction and operation. *Beech Ridge Energy*, 675 F. Supp. 2d at 581; *see also Fla. Key Deer v. Brown*, 386 F. Supp. 2d 1281, 1293 (S.D. Fla. 2005) (explaining that section 7(d) "prevent[s] Federal agencies [and permit applicants] from steamrolling activities in order to secure completion of projects regardless of the impacts on endangered species").

### B. BGEPA Violations

BGEPA strictly prohibits incidental "take" of any bald or golden eagle "at any time or in any manner" "without being permitted to do so" by the Service. 16 U.S.C. §§ 668(a)-668(b). BGEPA defines the term "take" broadly to include "wound, kill . . . molest or disturb." *Id.* § 668c. The only way an activity may lawfully proceed if it will incidentally take eagles is by applying for and obtaining an eagle take permit from the Service, so long as the applicant can establish that the project – along with minimization measures – results in take that is (1) "compatible with the preservation" of eagles; (2) necessary to protect an interest in a particular locality; (3) associated with but not the purpose of the activity; and (4) for individual instances of take, the take cannot practicably be avoided; or for programmatic take, take is unavoidable even though advanced conservation practices are being implemented. 50 C.F.R. § 22.26(f). The only way that a permit is not required is if the Service determines that "take is not likely to occur." *Id.* § 22.26(g).

Here, as with the ESA-listed species, all available evidence indicates that this is a high risk site for bald eagles that is highly likely to result in turbine collision-related eagle take. This conclusion is consistent with all independent biologists and agencies to review this project. *See* Exhibit 1 at 2; Exhibit 2; Exhibit 3 at 3-4; Exhibit 4; Exhibit 5; Exhibit 7 at 6-7; Exhibit 8 at 1; Exhibit 11 at 1-2. While ANG's paid consultant reached a different conclusion, that unfounded assertion simply cannot overcome the weight of the evidence that clearly indicates that this is an important eagle use area for breeding, migration, and wintering, leading to the inevitable conclusion that bald eagle collisions with ANG's turbine are highly likely.

Accordingly, by proceeding with a project that is virtually certain to take bald eagles without first obtaining a permit from the Service to do so, particularly without any commitment by ANG to adopt key minimization measures that could reduce the likelihood of eagle take, ANG is proceeding with a project "not in accordance with law" – i.e., BGEPA – and therefore is violating the Administrative Procedure Act ("APA"). 5 U.S.C. § 706(2). *See, e.g., Glickman,* 217 F.3d at 884-88 (holding that where a permit is required before killing of wildlife may

commence, federal agencies must obtain authorization from the Service before any protected wildlife dies as a result of the action at issue, because otherwise the failure to obtain the required permit violates the APA); *Pirie*, 191 F. Supp. 2d at 174-78 (holding that where a federal agency's incidental take of birds without a required permit violates a governing statute, that constitutes a violation of the APA because it is "not in accordance with law").

### C. MBTA Violations

The MBTA protects most, if not all, of the hundreds of bird species that traverse the major migration corridor in which Camp Perry is located. *See* 50 C.F.R. § 10.13 (listing the birds protected by the MBTA); Final List of Bird Species to Which the MBTA Does Not Apply, 70 Fed. Reg. 12710 (Mar. 15, 2005).

There is no legitimate dispute that some migratory birds will be killed by ANG's turbine as even ANG concedes that some deaths are possible, although the amount of migratory bird mortality predicted by federal and state wildlife agencies is much higher than the estimate arrived at by ANG's hired consultant. *See, e.g.*, Exhibit 1 at 2-5; Exhibit 3 at 3; Exhibit 6 at 74, 77; Exhibit 7 at 1, 10-11. At any rate, each death of an MBTA-protected bird will constitute a distinct violation of the MBTA in the absence of a permit – which ANG has not pursued – because it is a strict liability statute.[10]

By proceeding with this project without authorization under the MBTA and in the absence of minimization measures that reduce the likelihood of migratory bird take, ANG's project is in direct conflict with the MBTA's prohibitions, and, in turn, ANG's project is "not in accordance to law." 5 U.S.C. § 706(2).

### D. NEPA Violations

ANG's Final EA, Addendum, and FONSI have not satisfied the applicable "hard look" standard of NEPA. In particular, because of the critical importance of the project site as a highly

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[10] While ANG refers in its Final EA Addendum to ANG's erroneous understanding that only "deliberate acts" are illegal under the MBTA, and that incidental take is not treated as an MBTA violation, *see* Exhibit 9 at 2, that is simply a fundamental misunderstanding of the MBTA. As a federal district court has explained,

> [F]ederal agencies can be subject to suits for violations of the MBTA pursuant to the APA's prohibition on unlawful action regardless of whether those violations are intentional or unintentional. Whether the agency intentionally kills the birds or not, it is violating the law. And because the APA provides a cause of action to challenge unlawful agency actions, whether or not one federal agency has violated a federal law is not an issue left to the prosecutorial discretion of another federal agency.

*Pirie*, 191 F. Supp. 2d at 177.

sensitive area for hundreds of species of migratory birds – including endangered warblers and plovers, as well as bald eagles – an EA is highly inappropriate under the circumstances, and as a result an EIS is required by NEPA and its implementing regulations. This is consistent with the Service's insistence that "an EIS is warranted" by this project. Exhibit 3 at 5.

In light of the many significant environmental impacts that will result from this project as planned, an EIS must be completed here to fulfill the Service's NEPA obligations. Indeed, several of the NEPA "significance" factors are triggered by the proposed action, although the presence of only one significance factor requires preparation of an EIS. *Pub. Citizen v. Dept. of Transp.*, 316 F.3d 1002, 1023 (9th Cir. 2003) ("If the agency's action is environmentally 'significant' according to any of these criteria [set forth in 40 C.F.R. 1508.27], then DOT erred in failing to prepare an EIS."); *Humane Soc'y of the U.S.* v. *Johanns*, 520 F. Supp. 2d 8, 20 (D.D.C. 2007) (explaining that "courts have found that the presence of one or more of [the CEQ significance] factors should result in an agency decision to prepare an EIS") (citations omitted); *Fund For Animals* v. *Norton*, 281 F. Supp. 2d 209, 218 (D.D.C. 2003) (same). The following significance factors are triggered here, thus requiring preparation of an EIS:

- **40 C.F.R. § 1508.27(b)(3)** – This factor is triggered where the proposed action will affect "*[u]nique characteristics of the geographic area such* as proximity to historic or cultural resources, park lands, prime farmlands, *wetlands*, wild and scenic rivers, or *ecologically critical areas*." ANG's wind turbine is certain to affect nearby wetlands complexes and the Portage River, which are critical for migratory bird stopovers for hundreds of migratory bird species. The project will also affect what the Service has determined is a "major migration corridor" for birds. *See* Exhibit 1 at 1. In addition, this project will necessarily affect avian populations that stop in and migrate through an undoubtedly "ecologically critical area" in the Ottawa NWR that is adjacent to the project site. *See, e.g.*, *id.* at 1-2; Exhibit 3 at 5 (the Service indicating that an EIS should be prepared "to address the unique . . . risks to migratory birds . . . that occur in the continentally significant habitat areas in close proximity (800 m) to the project area."). Thus, because "wetlands" and "ecologically critical areas" – and the biological resources found therein – will be substantially impacted by the project's construction and operation, this factor is triggered.

- **40 C.F.R. § 1508.27(b)(4)** – This factor addresses "[t]he degree to which the effects on the quality of the human environment are likely to be highly controversial." Because this project will adversely affect, including by lethally taking, endangered Kirtland's warblers and piping plovers, as well as bald eagles, this project is "highly controversial" as that phrase is defined under NEPA. The project is particularly controversial considering that not only have non-profit organizations expressed concern with the wind turbine, but it has been roundly criticized by the federal and state wildlife agencies. Moreover, because ANG refuses to adopt minimization measures strongly recommended by the Service to reduce risks to birds, this project is highly controversial because it is not consistent with the best available scientific evidence or the recommendation of the expert agency.

- **40 C.F.R. § 1508.27(b)(5)** – This factor addresses "[t]he degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown

risks." As the Service explained to ANG, "[t]his project presents unique risks to migratory birds, including the bald eagle due to the proximity of the project area to significant migratory bird habitat, including the Darby Unit of the Ottawa National Wildlife Refuge," and because "[p]otential mortality and displacement from operation of the turbines has not been quantified in any meaningful way" – which is still the case – mortality numbers are "currently unknown" and thus "an EIS is warranted for the project." Exhibit 3 at 5. Because these unique risks and uncertainty still remain in the absence of seasonal migratory turbine curtailment, this factor is triggered.

- **40 C.F.R. § 1508.27(b)(6)** – This factor addresses "[t]he degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration." As planned, ANG's project will serve as one of the first-ever wind turbines to be operated by a federal agency without a BGEPA permit despite the Service's explicit determination that eagle take is likely. By not adequately considering the input of a sister federal agency – the Service – and refusing to obtain a BGEPA permit, ANG will set a precedent for other agencies and private wind energy companies to similarly act in contravention of BGEPA regardless of the Service's science-based determination of eagle take likelihood. Most concerning, as explained by the Service, is that the failure of ANG to set a good example will inevitably lead to rampant BGEPA non-compliance by other entities. *See* Exhibit 8 at 1, 18 (explaining that ANG, as a federal agency, should "set [a] good example[] for siting wind turbines in areas of lower risk to wildlife"). Therefore, by ignoring the recommendations of the Service, and thereby laying out a blueprint for other wind energy developers to violate BGEPA (not to mention the ESA and MBTA), this factor is implicated.

- **40 C.F.R. § 1508.27(b)(7)** – This factor is triggered if "the action is related to other actions with individually insignificant but cumulatively significant impacts; [s]ignificance exists if it is reasonable to anticipate a cumulatively significant impact on the environment." According to the most recent data from the Federal Aviation Administration – the federal agency from which all entities seeking to build wind turbines must request pre-construction permission to ensure that such turbines do not present a flight hazard to airplanes – there are at least 116 wind turbines proposed within ten miles of Lake Erie's shoreline. The combination of Camp Perry's wind turbine with the dozens of other planned turbines in the near vicinity, which serves as an extremely critical migratory flyway for many species of migratory birds, will result in significant bird mortality over the next several decades. However, ANG has not analyzed in its NEPA documents the serious aggregate effects of increasing wind energy capacity in this highly sensitive region, which will adversely affect local bird populations and other species that migrate through this area. Thus, there are serious cumulative impacts that must be considered in a more detailed EIS.

- **40 C.F.R. § 1508.27(b)(9)** – This factor addresses "[t]he degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973." Because, as explained above, the Service has determined that lethal take of endangered warblers and/or plovers by turbine collision is likely, this factor is triggered.

- **40 C.F.R. § 1508.27(b)(10)** – This factor is triggered if "the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment." As described in more detail above, ANG has conceded that its turbine will potentially kill migratory birds, which is consistent with the determinations by the Service and ODNR that migratory bird take is highly likely, despite the fact that ANG has not pursued MBTA authorization from the Service. That is a explicit violation of the MBTA. *See* 16 U.S.C. § 703(a) (explaining that "[u]nless and except as permitted by regulations made as hereinafter provided in this subchapter, it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill . . . any migratory bird"). Similarly, based on the Service's conclusion that eagle take is likely under the circumstances, ANG will likely violate BGEPA by operating the wind turbine without a BGEPA permit from the Service. 16 U.S.C. §§ 668(a)-668(b) (strictly prohibiting incidental "take" of any bald or golden eagle "at any time or in any manner" "without being permitted to do so" by the Service). As the Service has already explained to ANG, "the project as proposed may result in violation of the Bald and Golden Eagle Protection Act, and/or the Migratory Bird Treaty Act and these issues have not been adequately addressed," and "[t]herefore an EIS is warranted for this project." Exhibit 3 at 5. Hence, because the proposed action not only "threatens a violation of Federal . . . law," but is indeed virtually certain to violate federal law, this factor is triggered.

An EIS is required when even one of these factors is implicated. Because at least *seven* significance factors are triggered here, it is wholly inconsistent with NEPA and its regulations for ANG to have prepared only an EA under the circumstances. The inadequacy of ANG's EA and FONSI to sufficiently address the environmental impacts of this project is underscored by the FONSI's complete failure to analyze – much less mention – the NEPA significance factors as they apply to this project.

## CONCLUSION

In light of the serious legal violations raised in this letter, the serious threat posed to legally protected avian populations, the inadequate response to the Service's and ODNR's concerns, the failure to follow necessary pre-construction safeguards, and the imminence of project construction, **we request to hear back from ANG by no later than January 20, 2014** regarding the concerns outlined in this letter. If we do not receive an adequate response to our concerns by that date, ABC will have no choice but to consider legal action. It is our preference, however, to work in a collaborative fashion with ANG and the Service to rectify the violations described herein and to consider alternatives other than wind power to meet ANG's renewable energy needs.

Respectfully submitted,

William S. Eubanks II

William S. Eubanks II
Eric R. Glitzenstein

# EXHIBIT 1

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6950 Americana Parkway, Suite H
Reynoldsburg, Ohio 43068-4127
(614) 469-6923 voice
(614) 469-6919 fax

December 4, 2007

Mr. Michael Curry
Curry & Kerlinger, L.L.C.
P.O. Box 453
Cape May Point, NJ 08212

Dear Mr. Curry:

Thank you for your letter dated October 24, 2007, concerning the proposal for the Concurrent Technologies Corporation's Camp Perry ANG Renewable Energy Demonstration, Ottawa County, Ohio wind power project. Specifically, the project is located on the Camp Perry ANG Facility in Erie Township, Ottawa County, Ohio. The project lies within the Lake Erie watershed, and is within approximately 0.6 miles of Lake Erie and within 0.1 mile of Ottawa National Wildlife Refuge at its closest point (northeast corner). The proposal consists of the installation of an unspecified number of utility-scale turbines capable of producing a minimum of 1.5 megawatts of energy each. In addition to the turbines, some new access roads may also be installed. Based on aerial photographs and topographic maps from 2005, the project area is roughly 25 acres in size and is currently mowed grass or disturbed land. The surrounding areas support significant woodlots and wetlands, which will be described further below.

These comments are being provided pursuant to the Endangered Species Act (ESA), Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Fish and Wildlife Act of 1956. This information is being provided to assist you in making an informed decision regarding site selection, project design, compliance with applicable laws, and to determine whether a permit to cover anticipated take of species is appropriate under the ESA.

The Fish and Wildlife Service (Service) supports the development of wind power as an alternative energy source, however, wind farms can have negative impacts on wildlife and their habitats if not sited and designed with potential wildlife and habitat impacts in mind. Selection of the best sites for turbine placement is enhanced by ruling out sites with known, high concentrations of birds and/or bats passing within the rotoswept area of the turbines or where the effects of habitat fragmentation will be detrimental. In support of wind power generation as a wildlife-friendly, renewable source of power, development sites with comparatively low bird, bat and other wildlife values, would be preferable and would have relatively lower impacts on wildlife. Below the Service discusses a number of concerns regarding this proposal, particularly due to the location of the project in an area of documented bird concentrations.

Because of the potential for wind power projects to impact endangered bird, bat, or other Federally-listed species, they are subject to the Endangered Species Act (16 U.S.C. 1531-1544) section 9 provisions governing "take", similar to any other development project. Take incidental to a lawful activity may be

authorized through the initiation of formal consultation, if a Federal agency, is involved. If a Federal agency, Federal funding, or a Federal permit are not involved in the project, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA may be obtained upon completion of a satisfactory habitat conservation plan for the listed species. However, there is no mechanism for authorizing incidental take "after-the-fact."

OTTAWA NATIONAL WILDLIFE REFUGE COMMENTS: As noted above, the project lies within 0.1 miles of Ottawa National Wildlife Refuge (Ottawa NWR, Refuge), managed by the U.S. Fish and Wildlife Service. Ottawa NWR was established in 1961 under the authority of the Migratory Bird Conservation Act "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. 715d). According to the Ottawa NWR Comprehensive Conservation Plan (2000), the refuge "...provides critical wetland habitats for a diversity of wildlife, fish and plants. As a major migration corridor, the area is vital to migratory birds including waterfowl, shorebirds, raptors, and songbirds that need rest and food either after crossing Lake Erie on their way south or before they head back north over the water. As much as 70% of the Mississippi flyway's population of black ducks use Lake Erie marshes for migration." Furthermore, Ottawa NWR has been designated as a site of regional significance in the Western Hemisphere Shorebird Reserve Network and the American Bird Conservancy has identified the refuge as a Globally Important Bird Area. According to the Refuge's bird list brochure, "The Ottawa NWR complex is regularly recognized as one of the top birding sites in the nation, receiving recognition most recently as a Top 10 birding destination from "Birder's World" magazine." As wind turbines throughout the world are known to cause mortality of a wide variety of bird species, the Service has serious concerns that installation of a wind turbine(s) adjacent to Ottawa NWR property may have significant impacts on birds. Please see additional comments below. If this project is to move forward, further coordination with the Refuge staff will be necessary.

BALD EAGLE COMMENTS: The project area lies adjacent to a woodlot that supports a nesting pair of bald eagles (*Haliaeetus leucocephalus)*. The bald eagle has been removed from the Federal list of endangered and threatened species due to recovery, but this species continues to be afforded protection by the Bald and Golden Eagle Protection Act, Migratory Bird Protection Act, and the State of Ohio. Additionally, two more eagle nests are located within approximately 1.5 miles of the project area, and a total of 9 bald eagle nests exist within a 5 mile radius of the project site. In fact, the marsh region of the western Lake Erie basin, where the proposed project is located, has the highest concentration of bald eagles in the state. Ottawa National Wildlife Refuge, Magee Marsh State Wildlife Area, and Metzger Marsh State Wildlife area, contiguous natural areas and wetlands that stretch along the coast of Lake Erie in this region, serve as staging areas for very large populations of immature bald eagles as well (M. Shieldcastle, ODNR, pers. comm.). The proposed project location is of serious concern to the Service because multiple studies have documented the death of various species of eagles (golden eagles, white-tailed sea eagles, wedge-tailed eagles, and booted eagles) due to collisions with turbines in various locations throughout the world, including California (Thelander et. al 2003), Germany, Australia, and Spain (Lekuona, 2001). In order to minimize impacts to bald eagles as much as possible, we generally recommend that wind turbines be avoided within 5 miles of eagle nests. With such a large concentration of bald eagles within the greater project area we believe it is likely that eagles will be impacted if the project moves forward as proposed.

ENDANGERED SPECIES COMMENTS: If this project involves a Federal action (i.e., funding) or activity (i.e., permits), or if the project occurs on Federal property the lead Federal agency (e.g., Department of Energy), or its designated agent, is responsible for contacting the Service regarding that agency's determination as to whether the selected project alternative may affect Federally-listed threatened or endangered species or adversely modify designated critical habitat. Section 7 of the

Endangered Species Act of 1973, as amended (ESA), directs Federal agencies to consult with the Service on such matters. The Service would respond as to whether we concur with the determination of the Federal agency or its designated agent. If the proposed project may adversely affect Federally-listed threatened or endangered species or adversely modify designated critical habitat, the Federal action agency should initiate formal consultation with the Service in accordance with section 7 of the ESA. If adverse effects to listed species are likely, but there is no federal nexus, consultation under section 10 of the ESA should occur to ensure that adverse effects are avoided and minimized to the maximum extent practicable, and to authorize any unavoidable adverse effects. Information on the sections 7 and 10 consultation processes can be obtained by contacting the staff person identified at the end of this letter.

The proposed project lies within the range of the Indiana bat, piping plover, Kirtland's warbler, Lake Erie Watersnake, Lakeside daisy, and eastern prairie fringed orchid, Federally-listed endangered and threatened species, and the eastern massasauga, a Federally-listed candidate species. No designated critical habitat exists within the project area.

The project lies within the range of the **piping plover**, (*Charadrius melodus*), a Federally-listed endangered species. While this species is not known to nest in this region, it is known to migrate along the shore of Lake Erie, and to forage along the shoreline and in shallow wetlands near the shoreline. It is very likely that plovers pass through the project area during the spring and fall migration seasons, and as wind turbines have been documented to cause mortality of migrating birds, mortality of this species due to turbines is possible.

Similar to the piping plover, the **Kirtland's warbler** (*Dendroica kirtlandii*) is a federally listed endangered bird that migrates through this region, although suitable nesting habitat is generally found in northern Michigan. As described above, it is very likely that Kirtland's warblers pass through the project area during the spring and fall migration seasons, and as wind turbines have been documented to cause mortality of migrating birds, mortality of this species due to turbines is possible.

The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a Federally-listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. Summer habitat requirements for the species are not well defined but the following are considered important:

1. Dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas.

2. Live trees (such as shagbark hickory and oaks) which have exfoliating bark.

3. Stream corridors, riparian areas, and upland woodlots which provide forage sites.

The Service currently has no records for Indiana bats within Ottawa County, however this is due to an absence of survey data. Furthermore, we have no record of any caves, mines, or bat hibernacula within this county. Based on the Ohio Department of Natural Resources, Division of Geological Survey Ohio Karst Areas Map (www.dnr.state.oh.us/geosurvey/pdf/karstmap.pdf), this portion of Ohio does not lie within a probable karst area, and therefore the presence of caves/hibernacula is unlikely.

Because wind turbines have been documented to kill bats in Ohio, Pennsylvania, and West Virginia, we recommend that the Applicant first determine if mortality of Indiana bats is likely within the proposed project area, and therefore, if formal consultation to authorize take of the bat under section 10 or 7 of the Endangered Species Act should be initiated. In order to determine the presence or likely absence of the bat within the project area, the Service recommends that a mist net survey for the Indiana bat be performed in portions of the project area or surrounding areas that provide suitable Indiana bat habitat, as described above. The survey must be completed by a person/firm authorized to perform such surveys, and the survey protocol must be coordinated with the Endangered Species Coordinator in this office. A list of approved surveyors is attached for your use. Based on the results of the mist net survey as well as a more detailed project description, the Service will work with the Applicant to determine whether or not formal consultation relative to the Indiana bat will be necessary, and/or to identify any necessary avoidance and minimization measures that should be implemented to protect the bat and its habitat.

The project area lies within the range of the Lake Erie Watersnake, eastern prairie fringed orchid, and Lakeside daisy, federally-listed threatened species, and the eastern massasauga, a Federal candidate species. Due to the project location and onsite habitat, it is unlikely that these species would be found within the project area, or that any impacts to these species would occur.

MIGRATORY BIRD COMMENTS:

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Bald and golden eagles are afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). Unlike the Endangered Species Act, neither the MBTA nor its implementing regulations at 50 CFR Part 21, provide for permitting of "incidental take" of migratory birds.

The Service's Office of Law Enforcement serves its mission to protect Federal trust wildlife species, in part, by actively monitoring industries known to negatively impact wildlife, and assessing their compliance with Federal law. These industries include oil/gas productions sites, cyanide heap/leach mining operations, industrial waste water sites, and wind power sites. There is no threshold as to the number of birds incidentally killed by wind power sites, or other industry, past which the Service will seek to initiate enforcement action. However, the Service is less likely to prioritize enforcement action against a site operator that is cooperative in seeking and implementing measures to mitigate takes of protected wildlife.

Significant research on bird use of the Ottawa NWR adjacent to the project area has been completed over a number of years. Information on bird use of the western Lake Erie marsh region can be obtained by contacting the Ohio Department of Natural Resource's Crane Creek Wildlife Research Station and Black Swamp Bird Observatory (BSBO). Because of the significant and documented bird use of the Federal refuge adjacent to the project area, the Service believes that it is highly likely that the proposed project will result in bird mortality. Our belief is based on the concepts below.

Lake Erie serves as a migration barrier for some raptor species, which rely on thermal air drafts originating over land to fly. These raptors instead fly along the shoreline of the lake, and annual surveys by the BSBO have documented more than 10,000 raptors migrating through and around the project area each spring. These surveys are available by contacting BSBO.

As described above, Ottawa NWR is known to provide stopover habitat for night-migrating landbirds as they travel between their summer and winter grounds. According to Shieldcastle (2000), "Spring passerine migration along the [Erie] lakeshore may be unsurpassed except by the Gulf coast in eastern North America" based on bird banding effort. As daylight approaches, night-migrating landbirds search for areas to stop and rest. For those birds caught migrating across large bodies of water (eg. Lake Erie), the closest resting habitats are those natural areas closest to the shoreline. According to Ewert et. al (2005), "landbirds may be particularly concentrated at the shoreline to 0.4 km (0.25 mile) from the shoreline. Relatively high numbers occur at least 1.7-5 km (1 - 3 miles) inland from Great Lakes shorelines, particularly along wooded and brushy beach ridges, and in areas with high aquatic insect productivity." All of the proposed project area lies within 1 mile of the Lake Erie coast. Birds stopping over during migration would be expected to travel at lower altitudes than migrating birds, and would be more susceptible to turbines than birds in locations that do not provide migration stopover habitat. The sheer number of birds passing through the region during migration, coupled with the proximity of the project to the Lake, indicates a high probability that, if this project moves forward as proposed, mortality of birds due to turbine strikes would occur.

Research into the actual causes of bat and bird collisions with wind turbines is limited. To assist Service field staffs in review of wind farm proposals, as well as aid wind energy companies in developing best practices for siting and monitoring of wind farms, the Service published *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (2003). We encourage any company/licensee proposing a new wind farm to consider the following excerpted suggestions from the guidelines in an effort to minimize impacts to migratory birds and bats.

1) Pre-development evaluations of potential wind farm sites to be conducted by a team of Federal and/or State agency wildlife professions with no vested interest in potential sites;

2) Rank potential sites by risk to wildlife;

3) Avoid placing turbines in documented locations of federally-listed species;

4) Avoid locating turbines in known bird flyways or migration pathways, or near areas of high bird concentrations (i.e., rookeries, leks, **refuges, riparian corridors**, etc.);

5) Avoid locating turbines near known bat hibernation, breeding, or maternity colonies, in migration corridors, or in flight paths between colonies and feeding areas;

6) Configure turbine arrays to avoid potential avian mortality where feasible. Implement storm water management practices that do not create attractions for birds, and maintain contiguous habitat for area-sensitive species;

7) Avoid fragmenting large, contiguous tracts of wildlife habitat;

8) Use tubular supports with pointed tops rather than lattice supports to minimize bird perching and nesting opportunities;

9) If taller turbines (top of rotorswept area is greater than 199 feet above ground level) require lights for aviation safety, the minimum amount of lighting specified by the Federal Aviation Administration (FAA) should be used. Unless otherwise requested by the FAA, only white strobe lights should be used at night, and should be of the minimum intensity and frequency of flashes allowable. Red lights should not be used, as they appear to attract night-migrating birds at a higher rate than white lights;

10) Adjust tower height to reduce risk of strikes in areas of high risk for wildlife.

The full text of the guidelines is available at http://www.fws.gov/habitatconservation/wind.pdf. The Service believes that implementing these guidelines may help reduce mortality caused by wind turbines. We encourage you to consider these guidelines in the planning and design of the project. We particularly encourage placement of turbines away from any large wetland, stream corridor, or wooded areas, including the areas mentioned previously, and avoid placing turbines between nearby habitat blocks.

If this proposal is to move forward, we strongly recommend that on-the-ground surveys using radar, infrared, and/or acoustic monitoring be conducted during the peak of spring and fall bird migrations and during the breeding season over a period of several years (consistent with the Service's *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (2003)) to identify breeding and feeding areas and migration stopover sites. Observations made from greater than ¼ mile of target areas are likely to be insufficient to accurately assess bird use of the landscape, particularly if the observer is moving. Generalized ground research survey protocols, such as those followed in the Waterfowl Breeding Population and Habitat Survey (Smith 1995) and the North American Breeding Bird Survey (Pardieck 2001), among others, often do not accept observations made at greater than ¼ mile from the observer due in part to high probabilities of missed detections (R. Russell, personal communication). Furthermore, spring and fall raptor migration surveys may be necessary as will surveys to document movement patterns of bald eagles that may use the project area or surrounding habitat. We request that any on-the-ground survey protocols be consistent with the Service's Interim Guidelines (2003), and be coordinated with this office and the Ohio Department of Natural Resources prior to implementation.

Thank you for the opportunity to provide comments on this project. Please contact biologist Megan Seymour at extension 16 in this office if we can be of further assistance as your project is designed and implemented.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Supervisor

Encls: Indiana bat consultant list

Cc: Vicki Deisner, ODNR, Bldg. D-3, Columbus, OH
Mr. Doug Brewer, Ottawa National Wildlife Refuge, Oak Harbor, OH

Citations:

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# EXHIBIT 2

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

FILE COPY

April 8, 2010

Maj. Michael Hrynciw
200 RHS/DO
1200 N. Camp Perry E. Road
Port Clinton, OH 43452-9577

Dear Maj. Hrynciw:

This letter is in regards to Camp Perry Air National Guard's proposal to install a single wind turbine with an approximate capacity of 500 kW on the base, located at 1200 N. Camp Perry E. Road, Port Clinton, Ottawa County, Ohio. The Service previously outlined our concerns regarding this project in a letter dated December 4, 2007 (attached). More recently we have had a meeting onsite in December 2009, and a follow-up conference call on February 23, 2010. These discussions focused on addressing bald eagle use of the project area, and developing an appropriate monitoring protocol for the bald eagle nest at this location.

Please find below our recommendations regarding pre-construction monitoring for bald eagles at this proposed project area. We understand that some monitoring of this nest has already occurred, and we look forward to receiving more detailed information on the results of this monitoring.

BALD AND GOLDEN EAGLE COMMENTS:

Although no longer federally listed under the Endangered Species Act (ESA), bald eagles, along with their foraging and winter roosting habitat, remain protected pursuant to the Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA). As defined in these acts, any take and/or disturbance of bald and golden eagles is strictly prohibited. As such, the Service recommends taking all practical measures to reduce any detrimental effects on eagles.

Recent amendments to the BGEPA outlined the limited issuance of permits that authorize the take of eagles when such take is associated with otherwise lawful activities, cannot practicably be avoided, and is compatible with the goal of stable or increasing eagle breeding populations. Additional criteria for permit issuance are outlined in the BGEPA (*50 CFR 22.26 and 22.27*). Wind developers should note several of the criteria (outlined below), as these will likely be the most difficult for wind projects to achieve.

1) The proposed take must be consistent with the preservation of the species. In general, the ongoing and, so far, unpredictable take that wind developments may cause makes it difficult for the Service to determine that a wind development will not violate this criterion.

2) In the case of programmatic take under the BGEPA (the type of take wind developments are likely to cause), permit applicants must minimize potential disturbance and mortality to eagles as much as possible so that any resulting take is "unavoidable." In many cases, the Service's current recommendations for wind siting and operation that may meet the above criterion may also

reduce the productivity of a wind development. As a result, few current developments or proposals have been, or have been willing to, site and operate their projects sufficiently. Additionally, many project siting measures and minimization technologies chosen by wind developments have, in most cases, not been scientifically validated and may also be insufficient. The Service eventually plans to issue updated guidelines for siting, constructing, and operating wind developments.

At this time, we continue to encourage existing and proposed wind developments to follow current Service recommendations on wind power siting and construction (*Interim Guidelines to Avoid and Minimize Impacts from Wind Turbines – 2003).* The Service also encourages developers to coordinate with Service biologists regarding their projects. Proper coordination will help developers make informed decisions in siting, constructing, and operating their facilities as well as ensure awareness of the potential liability associated with unpermitted take of eagles and their habitat. Additionally, the Service hopes to work cooperatively with wind developers to advance the state of the art of wind power siting, construction, and operation. Advancements in these areas will represent great strides towards the environmentally safe development of this otherwise renewable and clean source of energy.

**Pre-construction eagle monitoring for the proposed installation of one wind turbine at Camp Perry, Ohio**

***Note:*** The US Fish and Wildlife Service (Service) does not currently have any "final" eagle monitoring recommendations for the proper sting and operation of wind developments. At this time, the Service continues to recommend siting and operating wind turbines within the guidelines outlined in our published *Interim Guidelines to Avoid and Minimize Impacts from Wind Turbines – 2003.* Some of the monitoring recommendations provided below have been take from the internal *Draft Implementation Guidance for Eagle Take Permits Under 50 DFR 22.26 and 50 CFR 22.27,* dated March 2010. As better information and data become available on this topic, the Service hopes to further enhance these guidelines to be in the best interests of our nation's wildlife and the environmentally safe development of this otherwise renewable and clean source of energy.

***The following should be done for one year prior to development for the nest onsite:***

Document the location of the bald eagle nest(s), and their important foraging and roosting areas.

1) Document the productivity of the eagle nest.
2) In addition to habitat that is documented to be used by eagles, identify any potentially important local eagle habitat (nest trees, roost sites, undeveloped shoreline, bodies of water with abundant foraging opportunities, etc).
3) Record daily movements and habitat use patterns of breeding and wintering eagles (adults and juveniles) in relation to the proposed turbine location and to differing weather conditions.
4) Identify any eagle migration events that may occur within or near the project area.
5) If any other eagles are observed within the project area, they should also be monitored as described above and below.

***Objectives of monitoring:***

1) Knowledge of eagle nest, foraging area, and roosting area locations, will allow the developer to site any wind turbine away from these areas. Specifically, developers should avoid siting turbines anywhere **near** or **between** any nest, foraging site, and/or roosting site, as eagles likely travel and hunt around, within, and between these locations with a high frequency.
2) Additionally, knowledge of the daily movements of eagles will allow the developer to avoid siting turbines **within** or **near** common flight paths (aka flight corridors).
3) Knowledge of habitat use and movements in differing weather conditions is important because, as weather conditions change, eagle habits and movements may also change. This information will be important for the developer to know both in siting and operation of turbines.
4) Knowledge of potentially important habitat (suitable nest trees, roost site, good foraging habitat, etc.) will not only allow the developer to site wind turbines away from these resources, but also to ensure they are conserved during the physical construction of the development *(see recommendations in the Bald Eagle Management Guidelines)*.

***Tips to appropriately gather the above information:***

1) Spend no less than 20 days during each breeding season and 20 days during each winter collecting this information (more if necessary to gather sufficient data and in all weather conditions). This will give you the best chance at documenting all important areas and habitat usage.
2) Breeding season movement and habitat use information should be gathered throughout the breeding season (early March to late August)to document any habitat use changes between different stages of breeding – incubation, hatching/rearing, and fledging.
3) Winter movement and habitat use information should be gathered between the end of the breeding season and mid-February, when breeding season begins again.

These recommendations are intended to be a "starting point" for a developer in their pre-construction monitoring for bald and golden eagles. Ultimately, it is the responsibility of the developer to conduct their own **sufficient** monitoring for eagles and to site any wind turbines at the most appropriate location to avoid take of eagles. Additionally, if a turbine(s) is constructed, it is the responsibility of the developer to operate it in a manner that is safe for eagles and all wildlife, and, thus, consistent with the laws and guidelines that protect these wildlife species. We will consider the information collected, as suggested above, in conjunction with the eagle use information that has already been collected at this location. If, based on the monitoring conducted, it is determined that take of eagles is likely from construction or operation of the turbine, we may request an additional year of monitoring, and further coordination with the U.S. Fish and Wildlife Service will be necessary.

Preliminary discussions with staff at Ottawa National Wildlife Refuge indicated that they may be interested in assisting with this monitoring, depending on the availability of staff and volunteers to conduct the work. If Camp Perry is interested in pursuing this partnership, please notify us.

Thank you for the opportunity to provide comments on this proposed project. Please contact biologist Megan Seymour at extension 16 in this office for further information.

Sincerely,

Mary Knapp, Ph.D.
for Supervisor

Cc: Mr. Keith Lott, ODNR, Old Woman Creek, 2514 Cleveland Road East, Huron, OH 44839
Mr. Matt Stuber, USFWS, East Lansing, MI
Mr. Ron Huffman, Ottawa NWR, Oak Harbor, OH

# EXHIBIT 3

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
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June 16, 2010

Michael P. Skomrock, Col, OHANG
Department of the Army and Air Force
National Guard Bureau
200th Red Horse Squadron
Camp Perry ANG Station
Port Clinton, OH 43452-9577

RE: DRAFT Environmental Assessment for the Proposed Implementation of Phase IV Renewable Energy Wind Generation at 200th RHS Camp Perry ANG Station

Dear Colonel Skomrock:

This letter is in regards to the DRAFT Environmental Assessment for the Proposed Implementation of Phase IV Renewable Energy Wind Generation at 200th RHS Camp Perry ANG Station (Draft EA), received by this office on May 17, 2010. This Draft EA has been submitted to satisfy the requirements of the National Environmental Policy Act (NEPA, 40 CFR §§1500-1508). The proposed project involves the installation of a single wind turbine with a capacity of 500-600 kW, and a maximum height of 198 feet, on the Camp Perry Air National Guard (ANG) property , located at 1200 N. Camp Perry E. Road, Port Clinton, Ottawa County, Ohio. The Service previously outlined our concerns regarding this project in letters dated December 4, 2007 and April 8, 2010. Additionally we had a meeting onsite in December 2009, and a follow-up conference call on February 23, 2010.

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft EA and we are providing the following substantial comments and concerns for your review and consideration:

1. The Service supports the development of wind power as an alternative energy source, however, wind farms can have negative impacts on wildlife and their habitats if not sited and designed with potential wildlife and habitat impacts in mind. Selection of the best sites for turbine placement is enhanced by ruling out sites with known, high concentrations of birds and/or bats passing within the rotoswept area of the turbines or where the effects of habitat fragmentation will be detrimental. As described further below, the Service believes this site presents a high risk to migratory birds, and potentially bats, from turbine placement.

2. As noted above the Service has provided two letters and has attended meetings and conference calls to address potentially significant wildlife issues associated with the proposed project. In these letters we have provided substantial information on wildlife and habitat issues in and near the project area and made specific pre-construction monitoring recommendations to aid in our assessment of potential impacts to wildlife from the proposed project. Neither of our letters was included in the Draft EA or its appendices, nor was any mention given to the input we have provided on multiple occasions.

3. Our letter of December 4, 2007 addressed endangered and threatened species including the piping plover (*Charadrius melodus*), Kirtland's warbler (*Dendroica kirtlandii*) and Indiana bat (*Myotis sodalis*). Piping plover and Kirtland's warbler are both known to migrate through this area, with recent migratory records for both species in Ottawa County. The analysis of effects to these species within the Draft EA was entirely lacking, and no determination of effects to these species was included in the Draft EA. The analysis of effects to the Indiana bat within the Draft EA indicated that because no suitable habitat was found within the project area, there would be no effect on the bat. This analysis fails to consider the possibility that Indiana bats could be struck by the turbine blades while flying across the project area—Indiana bat mortality from a wind turbine blade strike was recently confirmed in Indiana. Further, both our December 4, 2007 letter and the Pre-Construction Impact Assessment of Wind Development on Bats for the Camp Perry Wind Project, included as an appendix to the Draft EA, recommended mist net surveys to document the presence or likely absence of Indiana bats within the vicinity of the project. These surveys were not completed, therefore we have no knowledge of Indiana bat use of the project area or surrounding suitable habitat areas. At this time the Service believes that an appropriate effects analysis for impacts to federally listed species has not occurred, and should occur prior to conclusion of the NEPA process.

4. The 5-acre project area is accurately characterized as being composed of maintained grassy areas with little value to wildlife, however not enough attention is given to the landscape setting of the project. The project area lies within the western Lake Erie marsh region, a continentally significant area for congregations of migratory birds, a Federal trust resource managed by the Service and protected by the Migratory Bird Treaty Act (MBTA, 16 USC 703-712). Camp Perry is bordered to the east by the Darby Unit of the Ottawa National Wildlife Refuge, to the north by Lake Erie, and lies in close proximity to the Portage River and other large coastal wetland complexes. The proximity of the project area to these expansive high quality wildlife habitat areas is significant in that wind power projects may have both construction and operational impacts; while construction of the project may not affect high quality wildlife habitat, operation of the turbine may very well impact the migratory birds that occur in the region.

   The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for allowing unauthorized

take, the Service recognizes that some birds may be taken during activities such as wind turbine operation even if all reasonable measures to avoid take are implemented. The Service's Office of Law Enforcement carries out its mission to protect migratory birds not only through investigation and enforcement, but also through fostering relationships with individuals and industries that proactively seeks to eliminate their impacts on migratory birds. Although it is not possible under the MBTA to absolve individuals, companies, or agencies from liability (even if they implement avian mortality avoidance or similar conservation measures), the Office of Law Enforcement focuses on those individuals, companies, or agencies that take migratory birds with disregard for their actions and the law, especially when conservation measures have been developed but are not properly implemented.

The statement on page 22 of the Draft EA, "it is possible that some migratory, transient and resident avian species fly across the project area" is entirely an understatement. It is highly likely that many individuals of various migratory bird species regularly fly across the project area. Potential impacts to migratory birds were discussed in the Phase I Avian Risk Assessment (found in the appendices), however many questionable assumptions were made regarding flight height, flight paths, and exposure based on non-site specific information. The Service strongly advocates for a more thorough evaluation of the potential impacts to migratory birds within the Draft EA.

For example, the habitat use study recommended on page 67 of the Phase I Avian Risk Assessment was not sufficiently completed—one day of survey data was used to evaluate "significant concentrations of waterfowl" at one location east of the project area. Substantial information on waterfowl use of the marsh areas adjacent to the Camp Perry property is available by contacting the land management agencies for the various parcels—additional coordination with these agencies/organizations would likely provide substantive information on bird use of the area, movements of birds, and potentially flight heights, which would aid in exposure analysis when compared with the location and height of the proposed turbine. Please see our additional comments on bald eagle (*Haliaeetus leucocephalus*) studies below. Further, while implementation of the recommended setbacks and other measures included in the Phase I Avian Risk Assessment and on page 47 of the Draft EA may decrease potential exposure of some birds, due to the project setting it remains highly likely that migratory birds (potentially including state-listed species and the federally protected bald eagle) will still be taken by the project. This take would be a violation of the MBTA and could be subject to enforcement action. Enforcement action may become more likely if comments, concerns, and recommendations from wildlife agencies (such as the Service or ODNR) could reasonably be, but are not, considered in project planning and/or implementation.

5. Our recent letter of April 8, 2010 provided detailed information on the Service's implementation of the Bald and Golden Eagle Protection Act (BGEPA, 50 CFR 22.26 and 22.27), including the issuance of take permits under BGEPA. In short, take and/or disturbance of bald eagles is strictly prohibited without a permit, and permits may only be issued if take is consistent with the preservation of the species, and has been minimized

as much as possible, such that any resulting take is "unavoidable." The Draft EA provides very limited information on eagle use of the project area that is not sufficient to discern the likelihood of take.

Contrary to the information contained in the Draft EA, there is a bald eagle nest approximately ½ mile northwest of the proposed project area (see Draft EA Figure 5, page 45). The eagle flight path study conducted by Camp Perry occurred over only 8 days during the nesting season, and indicates that during these 8 days, bald eagles regularly flew near (within several hundred feet of) the project area. No information was provided on movement of eagles during the spring or summer, movement of juvenile eagles, eagle roosting locations, or typical eagle behavior patterns, as suggested in our April 8, 2010 letter and the Phase I Avian Risk Assessment. Without this information it is difficult, if not impossible to determine whether or not take of eagles is likely to occur from placement of the turbine at the proposed location. If take of bald eagles occurs without a permit authorizing the take, Camp Perry would be in violation of the BGEPA, and could be subject to enforcement action. Enforcement action may become more likely if comments, concerns, and recommendations from wildlife agencies (such as the Service or ODNR) could reasonably be, but are not, considered in project planning and/or implementation.

The Service strongly advocates for collection of additional eagle use information in and near the project area, as specified in our April 8, 2010 letter, to document the potential risk to eagles from operation of the project, prior to concluding the NEPA process. Camp Perry's proposal on page 46 to "conduct flight path observations during construction and one year after construction" is entirely inappropriate because this would preclude siting options, should the observations indicate that the proposed site does pose a risk to eagles.

6. NEPA addresses the irretrievable commitment of resources prior to completing the environmental analysis in §1506.1:

(a) Until an agency issues a record of decision as provided in Sec. 1505.2 (except as provided in paragraph (c) of this section), no action concerning the proposal shall be taken which would:

1. Have an adverse environmental impact; or
2. Limit the choice of reasonable alternatives.

The Service believes that Camp Perry's proposal on page 46 to "conduct flight path observations during construction and one year after construction" is entirely inappropriate because this action would limit the choice of reasonable alternatives and could have an adverse environmental impact. Further, Camp Perry's proposal on page 46-47 to use the last 5 years of data and post-construction monitoring to determine if waterfowl displacement occurs is also in opposition to NEPA's requirements to assess the environmental effects of the action prior to implementing it. NEPA requires analysis of the suspected effects of the action on the human environment prior to project

implementation. NEPA does not allow for a "wait and see" approach to potential impacts. The Draft EA must analyze the potential effect of the proposed project on migratory birds and bats. As mentioned above, substantial bird use information is available from the agencies and organizations that manage habitat areas near the project area. Additional site-specific bald eagle use information has been requested on several occasions. This information must be analyzed to evaluate the potential risk to migratory birds (including bald eagles) and bats prior to making a NEPA decision and prior to committing any resources to the project.

Finally, an EIS is required for any project subject to Federal control and responsibility that significantly affects the quality of the human environment (42 U.S.C. § 4332(C); 43 C.F.R. § 46.100(a)). According to the CEQ NEPA regulations, the following are some of the issues that should be considered when evaluating whether a project's effect on the environment is significant:

a) *The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks (40 C.F.R. § 1508.27(b)(5)).* This project presents unique risks to migratory birds, including the bald eagle due to the proximity of the project area to significant migratory bird habitat, including the Darby Unit of Ottawa National Wildlife Refuge. Potential mortality and displacement from operation of the turbines has not been quantified in any meaningful way, and is presently unknown. Therefore, an EIS is warranted for this project.

b) *Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment (40 C.F.R. § 1508.27(b)(10)).* As described above, the project as proposed may result in violation of the Bald and Golden Eagle Protection Act, and/or the Migratory Bird Treaty Act and these issues have not been adequately addressed in the Draft EA. Therefore an EIS is warranted for this project.

In summary, the Service has a number of substantial concerns regarding the Draft EA for the proposed Camp Perry Wind Energy project. We have provided input on this project on multiple occasions over the past two and a half years, and this input does not appear to have been considered in the Draft EA. The Draft EA does not address the potential for take of Federal and State listed endangered and threatened species in any meaningful manner, nor does it sufficiently address the potential take of migratory birds or Bald Eagles. The Draft EA advocates construction of the project prior to assessing the potential impacts, which is in contrast to the intent of NEPA. Therefore the Service believes this Draft EA to be inadequate. We recommend an EIS be prepared to address the unique, uncertain, and currently unquantified potential risks to migratory birds (including bald eagles and Federal and State listed species) that occur in the continentally significant habitat areas in close proximity (800 m) to the project area. Further, the EIS should address the potential violations of the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act that could result from implementation of the proposed project.

Thank you for the opportunity to provide comments on this proposed project. Please contact biologist Megan Seymour at extension 16 in this office for further information.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Supervisor

Cc: Mr. Dwayne Groll, Floyd Browne Group, 450 Grant St., Akron, OH 44311-1183
Mr. Keith Lott, ODNR, Old Woman Creek, 2514 Cleveland Road East, Huron, OH 44839
Mr. Matt Stuber, USFWS, East Lansing, MI
Mr. Ron Huffman, Ottawa NWR, Oak Harbor, OH
Special Agent Erryl Wolgemuth, USFWS, Delaware, OH

# EXHIBIT 4

# Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR — SEAN D. LOGAN, DIRECTOR

Division of Wildlife
*James A. Marshall, Acting Chief*
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
*Phone: (614) 265-6300*

June 22, 2010

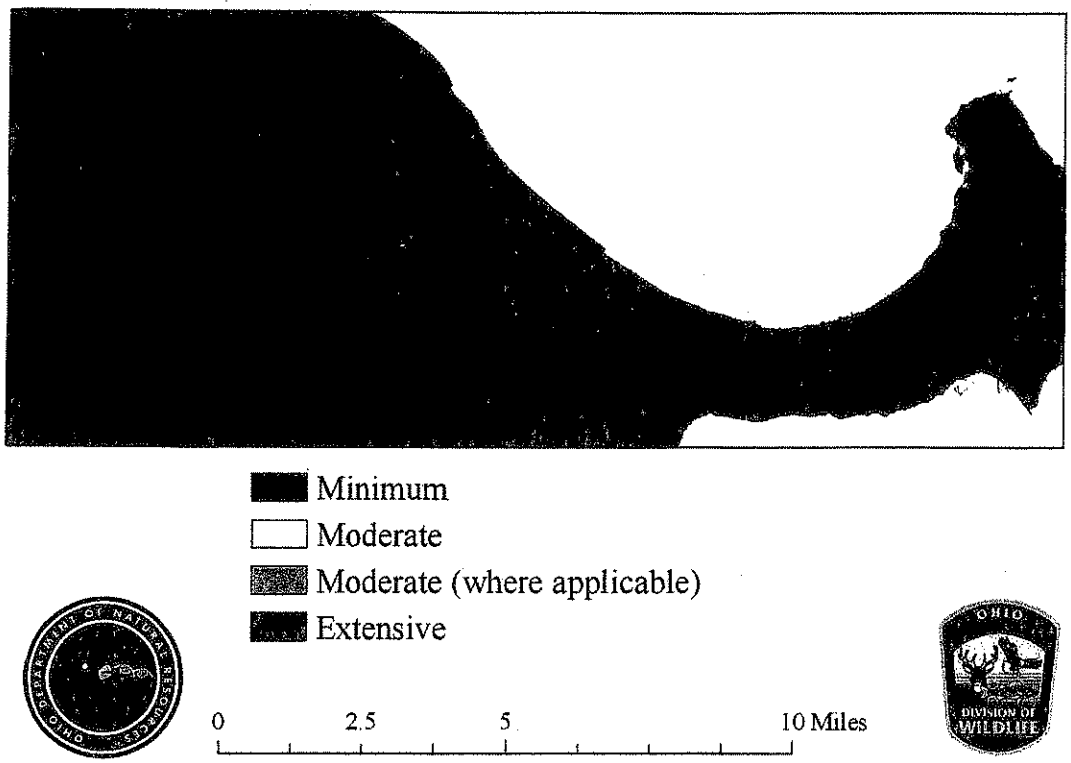
Michael P. Skomrock, Col, OHANG
Department of the Army and Air Force
National Guard Bureau
200th Red Horse Squadron
Camp Perry ANG Station
Port Clinton, OH 43452-9577

Dear Colonel Skomrock:

The Ohio Department of Natural Resources, Division of Wildlife (DOW) has provided these comments regarding the DRAFT Environmental Assessment for the Proposed Implementation of Phase IV Renewable Energy Wind Generation at the 200th Red Horse Squadron Camp Perry (EA). The proposal calls for the installation of one turbine capable of producing between 500-600 kW. The total height of this turbine would be approximately 200 feet, with blades approximately 135-feet long. The DOW has met with staff from the Air National Guard (ANG) on several occasions to express concerns regarding installing turbines on Camp Perry and had previously encouraged the conversion of this project from wind generation to photovoltaic due to potential wildlife take. Although the DOW supports the development of wind energy resources when properly sited to avoid or minimize risk to wildlife resources, the DOW has significant concerns regarding the impacts this facility may have on local and migratory birds and bats.

1. With respect to potential impacts from wind energy development to the state's wildlife resources, the DOW has categorized the Ohio landscape based upon habitat type, areas of bird or bat concentrations (e.g., Audubon Important Bird Areas, potential migratory corridors or stop-over habitat), or distance to known locations of protected species of birds or bats. Pre-construction wildlife assessments of proposed commercial-scale wind energy projects are commensurate with the level of potential risk to wildlife resources. The Camp Perry facility falls within the highest area of concern (see Figure 1) due to potential impacts to migratory songbirds and bald eagles (state threatened and federally protected).

Figure 1.



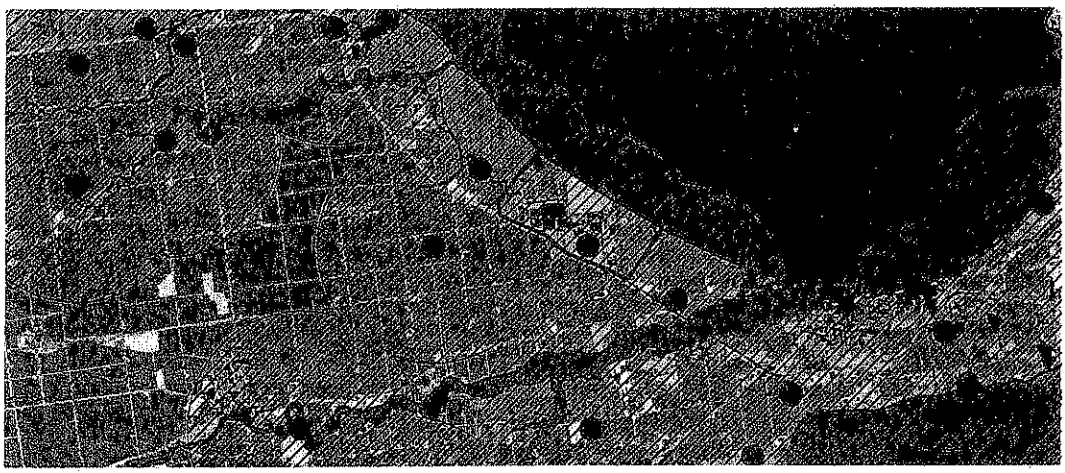

2. As the DOW noted during a site visit on April 24, 2008, and in subsequent conference calls and meetings (e.g., February 23, 2009 and December 17, 2009), the Western Basin of Lake Erie is an important stopover location for many species of migratory birds. The EA suggests that since the area directly under the proposed turbine is mowed grass that the project is less likely to impact birds due to the lack of suitable stopover habitat. The EA fails to note the significance of the landscape and habitats surrounding this project (e.g. Magee Marsh, Ottawa National Wildlife Refuge, and East Harbor State Park); this region is nationally renowned for its bird abundance and diversity. During migration, nocturnally migrating songbirds are moving in broad fronts, meaning that the density of birds flying over Camp Perry is likely to be similar to these nationally recognized birding hot spots. Additionally, due to the proximity to the shoreline of Lake Erie, which serves as a migratory barrier, even small patches of forest such as the one on Camp Perry may attract large numbers of songbirds.

3. The EA states that most birds will migrate above the turbine but does not address how birds may be impacted during periods of poor weather when reduced flight heights may result in birds passing through the rotor swept zone of the proposed turbine. While most turbines in the Midwest are situated within agricultural regions, far from light sources, the Camp Perry turbine would be adjacent to the ANG station whose lights may attract birds during periods of poor

weather. The EA should address potential minimization measures since birds are known to be attracted to lighted structures during periods of reduced visibility during migration. In addition, bird use of adjacent stopover habitats along the shoreline of Lake Erie may impact flight heights as migratory birds descend or take off. This issue should be more thoroughly addressed within the EA.

4. Although the EA mentions that bald eagles will nest within 900 meters of an existing turbine, it fails to mention that bald eagles have also been struck at wind turbine facilities, specifically at a site across Lake Erie in Ontario in 2009. The region where this bald eagle was struck has a considerably lower density of nesting eagles than Ottawa County, which has 28 eagle nests (Figure 2) as well as significant concentrations of eagles during the winter. Ten of these nests are within 5 miles of the proposed site, one being within the property boundaries of Camp Perry. The EA also fails to address potential winter use of the site by bald eagles. Typically during winter bald eagles will congregate close to the lake's edge when inland waters freeze over, potentially making this site of even higher risk.

Figure 2. Bald eagle nest locations near the Camp Perry facility.




5. The EA also suggests that the turbine is "relatively small" and therefore less likely to cause impacts. It should be noted that the turbine at the Great Lakes Science Center in Cleveland, Ohio is smaller than the proposed Camp Perry project, and within a region that is considered to have significantly less bird activity (downtown Cleveland lakeshore area), yet has been shown to impact both birds and bats (Davey, personal communication; 2009).

6. The DOW recommends that the EA include more information regarding potential impacts to federally listed birds. During migration the Western Basin region of Lake Erie has the highest

density of Kirtland's warbler observations in the nation. Within the last year, Kirtland's warblers were observed at both Magee Marsh Wildlife Area and East Harbor State Park, and are likely to migrate through the Camp Perry facility.

7. Under Biological Resource section of the EA, relevant sections of Ohio Revised Code 1531 and 1533 that pertain to the protection of wildlife should be listed as well.

8. The EA references two papers, Janss (2000) and de Lucas et al. (2004) (neither of which is listed within the references section on pages 59-60), as examples of birds actively avoiding wind turbines. The Janss (2000) paper deals with transmission lines, not wind turbines, and the de Lucas et al. (2004) paper deals with migratory raptors and nesting songbirds. These papers do not address the primary concerns of the DOW for the proposed Camp Perry turbine which are migrating songbirds and bats, neither of which has been shown to avoid regions with wind turbines.

9. While many bat mortalities are caused by direct strikes from the turbine blade, barotrauma (the hemorrhaging of lung tissue due to the rapid change in air pressure following the passage of the blade) should be listed as a potential threat to bats as well.

10. Although there are currently no observations of Indiana bats within Ottawa County, this may be more related to a lack of surveying effort, rather than this endangered species being absent. Wind turbines are a documented source of mortality for Indiana bats, and there is the potential that Indiana bats may use the area. More justification should be given as to why this site does not pose a threat to local and/or migratory individuals.

Given the location of this proposed wind turbine, the high concentration of bald eagles in the area including a nest nearby, the potential for use of the area by several federally protected species, the high use of the area by migratory birds in general, and the potential for take of a number of bird and bat species should the turbine become operational, the DOW feels that an Environmental Impact Statement is warranted to fully address these concerns which have been inadequately covered in the EA. The DOW appreciates the opportunity to comment on this EA and questions should be directed to Keith Lott, Wind Energy Wildlife Biologist, at 419-433-4601.

Sincerely,

David P. Scott, Executive Administrator
Wildlife Management & Research Section

# EXHIBIT 5

From Megan Seymour dated

**Summary of Meeting with Congresswoman Marcy Kaptur (9th District)**

**Concerning Wind Turbine installation at Camp Perry**

(Toledo Office) Meeting lasted 1.5 hours

Attendees: Air National Guard (Project Proponents)

Consulting Firms (including Paul Kerlinger from Curry & Kerlinger, LLC)

Researchers from University of Toledo

Researchers from Bowling Green State University

USFWS

Congresswoman Kaptur's comments emphasized that there was a solar component to the energy already in place at Camp Perry and she was interested in seeing a wind element as the next research element. Cong. Kaptur had secured funding to make this happen.

At one point, Major Hrynciw of the Ohio Air National Guard led the discussion of the project and of the resource information that had been collected for the project. He indicated that no feedback from the public had been received on the 2010 Draft EA however the Ohio Field Office had submitted extensive comments on the DEA at that time and 4 other agencies provided comment. He indicated that the Final EA was complete and would be distributed in the next week or so.

During the meeting the Ohio Field Office discussed our concerns about a nesting pair of bald eagles at the northwestern portion of the site and within 0.5 of the turbine site. We recommended monitoring of the pair and other bald eagles, or if no monitoring then to consider seeking a take permit. The Ohio Field Office discussed monitoring and surveys for the Indiana bat and migratory birds in general that were recommended in our previous letters.

The Ohio Air National Guard indicated that they had completed Indiana bat surveys at the site. There has been a radar purchased and put into operation at the site and some data on migratory birds may come from the radar installation, though they indicated the data was still preliminary. Instead of performing the Service-recommended bald eagle surveys on the property, they looked at eagle mortality at sites across the U.S. and Canada, and determined that mortality at this site was unlikely. Similarly, relative to migratory birds they gathered data from other wind facilities across the US. They used these data, averaged the information and applied these averages to the Camp Perry site even though Camp Perry is very dissimilar, being on the edge of a large body of water and near a National Wildlife Refuge. The Service has not seen any results of surveys completed to date, but Camp Perry staff will provide them along with the Final EA.

We discussed the need to have more site specific data. However, there are plans to begin construction this fall/winter, so time is short to be able to develop a good understanding of the resources at Camp Perry and how best to avoid and minimize the impacts from the wind turbine.

Camp Perry staff indicated they would conduct post-construction mortality monitoring, and based on those results may be willing to implement turbine shut-downs during environmentally sensitive periods of time.

Major Hrynciw, his consultants and the Ohio Field Office made plans to meet soon to make progress on understanding resource concerns.

# EXHIBIT 6

# Table of Contents

**FIGURES**

# EXECUTIVE SUMMARY

This Environmental Assessment for a Proposed Wind Turbine for the 200th RED HORSE Squadron at Camp Perry addresses the potential environmental consequence that may result from the implementation of this project. The environmental assessment process ensures the public is involved in the process and becomes informed of the potential environmental effects of the proposed action; and helps decision makers consider environmental factors when making decisions related to the proposed action.

Floyd Browne Group on behalf of Woolpert Construction and the Air National Guard has prepared this Environmental Assessment (EA). This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council of Environmental Quality regulations implementing NEPA and 7 CFR 799.

**Proposed Activity**
Woolpert Construction, under the authority of the Air National Guard, proposes to construct one wind turbine for providing energy to the 200th RED HORSE Squadron Facility located at Camp Perry Air National Guard Station (ANGS) in Port Clinton, Ohio.

The project involves the erection of a steel tubular tower on a concrete pad and interconnecting electrical components. Although the final specifications for the proposed wind turbine system are not yet available, the selected system will likely be a 500kW to 600kW generating turbine that stands 40 meters (131 feet), with a three-blade rotor with an overall diameter of approximately 41 meters (135 feet). The maximum height of the rotor tip at a 12 o'clock position will be an estimated 60.5 meters (198 feet) above ground level (agl). The rotor tip in the 6 o'clock position could be as low as 26 meters (85 feet) agl. These dimensions may differ by as much as 10%. However, the general platform, tower, and wiring will be similar regardless of which brand is selected.

**Purpose and Need**
The purpose of the proposed wind turbine project is to reduce electrical consumption and utilize wind resources that reduce emissions and greenhouse gas from fossil fuel generated systems. The wind turbine will offset a portion of the electrical consumption at the Camp Perry Air National Guard Station in order to meet the directives of Executive Order (EO) 13123, Greening The Government Through Efficient Energy Management, EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management, EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance and the Energy Policy Act of 2005 (EPAct 2005).

In 2008 with the passage of Senate Bill 221, Ohio became the 27th state to adopt a Renewable Portfolio Standard (RPS). This regulation mandates that at least 12.5% of Ohio's energy must come from renewable sources, such as hydroelectric, solar, and/or wind energy by the year 2025. Currently, all sources of renewable energy combined provide approximately 1% of Ohio's total energy production and hydroelectric is the dominant source.

The Camp Perry ANGS has adopted the usage of advanced technologies (such as radar) and environmentally responsible siting of a single 500kW to 600kW Research & Development wind turbine to encourage the growth of green industries and renewable energy in Ohio while protecting our wildlife resources.

**Environmental Consequences**

Although the proposed project will provide an environmental benefit, some minor environmental consequences may occur. Based on the selection of Location #1 as the preferred location, below is a table summarizing the potential environmental consequences of the proposed action:

| Resource | | Proposed Action | Affect |
|---|---|---|---|
| Safety | | There are no potential safety impacts involved in the implementation of the proposed project. A short-term minor impact will be increased vehicular traffic associated with construction activities. The increase in traffic is not a major impact, but requires coordination to maintain a safe environment. | No affect |
| Air Quality | | The Proposed Action will have no significant impact. Ambient air quality would not change from existing conditions. The Proposed Action will generate air pollutant emissions as a result of grading and filling operations, but these emissions will be temporary and will not generate any off-site impacts. | No affect |
| Noise | | The Proposed Action will not result in any significant noise increases. The proposed wind turbine produces only a minor noise during rotation. State Route 2 traffic will likely mask this noise. | No affect |
| Land Use | | The Proposed Action will not result in any major land use impact. Construction of the wind turbine will occur in an area that is not utilized for any other purpose. Some short-term disruptions to land-use with other parts of Camp Perry will occur during construction activities due to traffic. | No affect |
| Geological Resource | | The Proposed Action will not have any effect on Geological Resources. | No affect |
| Water Resource | | The Proposed Action will not have an effect on Water Resources. | No affect |
| Biological Resources | Vegetation and Habitat | Under the Proposed Action, mowed vegetation and landscaped areas would be disturbed around the area requiring construction. Affected areas would be reseeded or replanted immediately following the construction period. Therefore, the Proposed Action would have a minimal impact on vegetative communities. | Minor affect |

| | | | |
|---|---|---|---|
| | Wetlands | Wetland surveys conducted at Camp Perry ANGS have determined that no wetlands are present in the proposed project location; therefore, the Proposed Action will not affect any wetlands. | No affect |
| | Wildlife | Due to the lack of habitat in the area of the Proposed Action, no impacts to any terrestrial, amphibian, or aquatic federal or state listed species will occur due to the Proposed Action. | No affect |
| | Avian and Bat | Camp Perry is located within the vicinity of an Avian Concern Zone and Important Bird Areas (IBA). The Ottawa National Wildlife Refuge – Darby Unit is located approximately 0.8-miles northwest of the Proposed Action area. The predominant types of birds expected in the Proposed Action area are raptors, migrating songbirds, and waterfowl. Four Bald Eagle nests are located within a three-mile radius of Camp Perry. None of the nests are located within ½-mile of the Location #1.<br>Wind turbines present two major types of potential impact to avian and bat populations including: 1) disturbance/displacement and 2) collision. Waterfowl and shore birds are more likely to be affected by disturbance or displacement, whereas, raptors are most likely to be affected by collision. Studies show that migrating nocturnal songbirds, waterfowl and shore birds typically travel at altitudes higher than the proposed turbine. Therefore, collision impacts are less likely to be a concern for these species. Eagles observed flying over Camp Perry tend to have fixed flight paths north of the Proposed Action at Location #1. Therefore, collision impacts to these species are not expected. As with avian species, some minor affects to bat species may result from the Proposed Action. However, we found no Indiana Bat species or habitat (federally endangered) in the Proposed Action area. Therefore, no impact to the Indiana Bat will result as part of this Proposed Action.<br>The placement of a single relatively small wind turbine on the Camp Perry property will not likely result in an adverse effect to avian and bat populations over a relatively large area. Collision impacts to avian and bat populations may result from the birds and bats that hunt, nest, or breed in the general proximity of Camp Perry. The area of the Proposed Action is absent of natural vegetation and wildlife habitat. The location is near State Route 2 and State Route 358.<br>The Camp Perry ANGS will authorize and hire a qualified third party to conduct one year of post construction monitoring. This study will be prepared and coordinated with other governmental agencies as appropriate. Information obtained from the study will indicate the effect that the wind turbine has on avian and bat species. If necessary, ANGS will evaluate adaptive management techniques measures at that time, if necessary. | Minor to No Affect |
| | Federal or State Listed Species | No impacts to any terrestrial, amphibian, or aquatic federal or state listed species will result from this Proposed Action. Due to the expected flight altitudes of most migrating avian species and the conditions observed within the area of the Proposed Action, the Proposed Action will have no effect on listed avian species. | No affect |

| | | |
|---|---|---|
| Transportation | No transportation impact will occur from the Proposed Action. | No affect |
| Visual | No visual impact will occur from the Proposed Action. | No affect |
| Cultural Resources | None of the Proposed Action involves a known cultural resource. No impacts to archeological and/or historical resources will occur due to the Proposed Action | No affect |
| Socioeconomics | Implementation of the Proposed Action would not alter or change the number of personnel or operations onsite. Short-term beneficial impacts on regional socioeconomics would occur during construction activities in the areas of Camp Perry ANGS due to the purchase of materials and use of labor from the regional work force. No long-term benefits would occur, and there would be no changes in socioeconomic patterns or trends. However, this project will publicize and promote the usage of renewable energy sources for individual, corporate and industrial energy independence. This project will promote the use of renewable energy technologies in the local area. The Proposed Action will provide a positive impact to the overall socioeconomic pattern and trend in Ottawa County. | No affect |
| Hazardous Materials | No impact to potential hazardous materials will occur as part of this Proposed Action. | No affect |

# 1.0 INTRODUCTION

The Congressional Act of 1903 gave federal funding assistance to establish Camp Perry. Ohio legislation officially established Camp Perry in 1906 and it became a permanent camp by 1909. The National Matches, first held in 1907, have been a tradition at Camp Perry every year since 1907. During World War II, the State of Ohio purchased nearly 200 acres from private owners and enlarged Camp Perry. Camp Perry became an induction center for new draftees in 1941, and resulted in construction of numerous buildings during this time. In 1942, the .State of Ohio transferred ownership of Camp Perry to the Federal Government. From 1943 to 1946, Camp Perry was a Prisoner of War camp (Air National Guard, Environmental Division 2004a).

Creation of the Rapid Engineer Deployable Heavy Operational Repair Squadron Engineering (RED HORSE) units occurred in 1965, and resulted in mobile civil engineering units. The 200 RED HORSE Squadron (RHS) was activated in 1971, and was the first Air National Guard Station (ANGS) RHS. On the federal level, the mission of the 200 RHS is to provide the Air Force with a highly mobile civil engineering response force to support contingency and special operations worldwide. At the state level, the station's mission is to assist local authorities in the event of a disaster, disturbance, or other emergency (Air National Guard, Environmental Division 2004a).

In 2007, the House of Representatives passed a defense appropriations bill that included $3.2 million for a singular wind turbine technologies project at Camp Perry and Plum Brook. The 200 RHS of the Ohio Air National Guard Station (ANGS) proposed a Research, Development, Test, and Evaluation (RDTE) renewable energy, wind-power project for the Camp Perry ANGS to correctly apply the appropriate funds. The proposed project was scheduled to begin between fiscal years (FYs) 2008 and 2009. Additional time was required to conduct studies and evaluate alternatives. The current schedule sets project initiation in FY 2011.

In accordance with the appropriation document, 200 RHS has developed the project to meet goals of reducing local utility costs to the Federal Government, reducing emissions and greenhouse gasses, and reducing the need for fossil fuels. Beyond those goals, the 200 RHS specifically developed goals to provide a source of continual wind turbine data, obtained in a federally secure, controlled site, for use in the applications of wind energy related to the coastal water region. Future decisions regarding renewable wind power will be enhanced by the availability of this data. Data such as avian mortality rates need to be further evaluated as the pressure generated from rising economic and environmental costs of electricity production from fossil fuels are creating a need for even greater understanding of the use of wind power in and near the lakeshore zone. The evaluations of alternative renewable energy sources is of particular

importance to the regions environment, given Ohio's coal based electricity and the current impacts of this fossil fuel industry and its subsequent emissions affecting avian species and their ecoysytems.

This document has been prepared to assist in the scoping process in accordance with the National Environmental Policy Act (NEPA) of 1969. It addresses the ANGS's Proposed Action and reasonable alternatives to the Proposed Action.

## 1.1 Purpose and Need

### 1.1.2 Purpose

Installation of one wind turbine will occur on the ANGS property. The primary purpose is to provide a Research, Development Test and Evaluation (RDTE) project using wind technology and a small-scale system. The project is not part of any existing or future wind farm plan is is meant soley for the design and construction of 1 singular wind turbine. This will directly offset the total electrical consumption at Camp Perry in order to meet the directives of Executive Order (EO) 13123, Greening The Government Through Efficient Energy Management, EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management, EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance and the Energy Policy Act of 2005 (EPAct 2005). By utilizing electricity produced from the installation of one wind turbine, the facility will be able to reduce local utility cost to the Federal Government and increase the use of a resource that helps reduce emissions and greenhouse gases by decreasing the need for fossil-fuel generated electricity.

In 2008 with the passage of Senate Bill 221, Ohio became the 27th state to adopt a Renewable Portfolio Standard (RPS). This regulation mandates that at least 12.5% of Ohio's energy must come from renewable sources, such as hydroelectric, solar, and/or wind energy by the year 2025. At least half of this electricity must be generated within the state. Currently, all sources of renewable energy combined provide approximately 1% of Ohio's total energy production and hydroelectric is the dominant source.

Ohio lags behind in the mandates as outlined in Senate Bill 221. Ohio must produce up to 6.25% of renewable energy within the boundaries of the State. As of 2011, Ohio produces less than 2% of renewable energy as part of their Renewable Portfolio Standard (RPS). The Camp Perry ANGS has adopted the usage of advanced technologies (such as radar) and environmentally responsible siting of a single 500kW to 600kW Research & Development wind turbine to encourage the growth of green industries in Ohio while protecting our wildlife resources.

### 1.1.3 Need

The Camp Perry ANGS needs to demonstrate the environmental and cost benefits realized by installation of wind energy at federal facilities. This project

will help them fulfill that goal. The Camp Perry ANGS facility is included in the federal directive to reduce reliance on fossil fuels and to reduce overall energy consumption. This project will successfully demonstrate reductions in energy dependence on fossil fuels, air pollutant emissions and greenhouse gases at the Camp Perry site due to the exceptional wind resources available at this location.

In general, for large-scale wind power plants, average wind speeds should be greater than approximately 13 miles per hour (mph) (American Wind Energy Association 2007; www.awea.org/faq/basicwr.html). Average wind speeds of 16.4 mph occur off the Cleveland, Ohio shore, and at Bowling Green, Ohio, winds average 12.9 mph (Breckenridge, 2007). It is reasonable to assume that wind speeds at Camp Perry would be equivalent to those in other areas of Ohio near the Lake Erie shore.

Several other criteria are required for a site to adequately demonstrate the benefits of wind power at DoD facilities, and to ensure the best utilization of wind energy produced

Electrical consumer demand (load) must be available at the site chosen for wind turbine installation to utilize directly the energy produced by the turbines. The local electrical utility must support commercial net metering to enable the Department of Defense (DoD) facility to shed excess power.

An adequate electrical distribution system capable of supporting the planned on-site electrical generation must be locally available. Finally, the location for a wind turbine installation should have as minimal adverse effect on the environment as possible.

The proposed location for the installation of the wind turbine at Camp Perry ANGS meets all of the above criteria: potential high average wind speeds, existing electrical distribution system that can support on-site electrical generation and will support commercial net metering. In order to provide electrical generation adequate to the Camp Perry ANGS needs, and not exceed the capacity of the existing distribution system, the total kilowatt (kW) output of a RDTE project at Camp Perry ANGS must be between 500 kW to 1.8 megawatts (MW).

## 1.2 Location

The 200 RHS Camp Perry ANGS is located north of State Route 2 in the Erie Township portion of unincorporated Ottawa County, Ohio. ANGS lies approximately three miles west of the city of Port Clinton, near the mouth of the Portage River, along the southern shore of Lake Erie (Figure 1).


# FIGURE 1

## PROPOSED PROJECT AREA
## CAMP PERRY FACILITY
## PORT CLINTON, OH

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The Federal Government, via the U.S. Air Force (USAF), leases the land occupied by Camp Perry from the State of Ohio. The USAF further licenses the property to the Ohio National Guard for their use and training activities. The current lease expires on 30 June 2085.

Camp Perry ANGS consists of 21 permanent facilities located on 59 acres adjacent to the southern boundary of the Ohio Army National Guard (ARNG) Camp Perry Joint Training Center (CPJTC) (more than 579 acres). The elevation at ANGS is 576 feet above mean sea level (MSL), approximately 6 feet above the shoreline of Lake Erie. The topography is very level to slightly sloping. The proposed RDTE installation will be located on an approximately 20-acre flat grassy area in the southern portion of the Camp Perry ANGS.

## 1.3 Summary of Environmental Study Requirements

### 1.3.1 NEPA

Requirements issued under the National Environmental Policy Act (NEPA) stipulate that Federal agencies must consider environmental consequences of their Proposed Actions in the decision-making process. Environmental consequences include potential impacts to the natural, cultural (historical/archeological), and socioeconomic environment. Environmental Assessments (EAs) are prepared to fulfill requirements under NEPA when an agency is uncertain whether there will be significant impacts or no adverse impacts to the environment from the Proposed Action (US EPA 2008; http://www.epa.gov/ ).

The process includes obtaining comments from any Federal agency, which has jurisdiction by law, or special expertise with respect to any environmental impact involved, or authorization to develop and enforce environmental standards, in order to comply with NEPA. The process includes requesting comments from appropriate state and local agencies with authorization to develop and enforce environmental standards, and from the public. A 30-day commenting period is required for agency and public review of this EA. To comply with this requirement, a 30-day public comment period commenced in June, 2010, from which no comments from the public were received. (See Appendix E)

To comply with NEPA, this EA contains descriptions of the Proposed Action, alternatives, affected environment, and the potential environmental consequences of the Proposed Action and alternatives. The EA will lead to one of three possible courses of action:

- When the impacts from the Proposed Action are judged to be insignificant, issue a Finding of No Significant Impact (FONSI). The ANGS may then proceed with the Proposed Action. The ANGS plans to issue a "Mitigating

FONSI" upon completion of the EA in accordance with the newly published guidance established by the Council on Environmental Quality (CEQ) (Federal Register, Vol.76, No.14, Page 3843). NEPA requires Federal Agencies to perform environmental analyses to determine the environmental consequences of their proposed actions. Mitigation and monitoring are important tools agencies use to avoid, minimize, or compensate for potential adverse environmental impacts associated with their actions. When Federal Agencies conduct environmental Assessments (EA) and Environmental Impact Statements (EIS), they often commit to mitigating the environmental impacts of a proposed action.

- If the impacts are deemed to be significant, an Environmental Impact Statement (EIS) will be prepared prior to implementation of the Proposed Action, in accordance with the CEQ regulations; or

- The Proposed Action will not be pursued.

### 1.3.2 Interagency and Intergovernmental Coordination for Environmental Planning

NEPA regulations require intergovernmental notifications prior to making any detailed statement of environmental impacts. Through the process of Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), Floyd Browne Group acting on behalf of Woolpert Construction notified concerned federal, state, and local agencies and allowed them sufficient time to evaluate potential environmental impacts of the Proposed Action. Floyd Browne Group will incorporated comments from these agencies into the EA.

The IICEP distribution list and agency responses are included in Appendix D.

### 1.3.3 Air Conformity Requirements

Federal agencies are required to determine if Proposed Actions comply with State Implementation Plans (SIPs) for the attainment of air quality goals. Under the Clean Air Act (CAA) Amendments of 1990, the United States Environmental Protection Agency (US EPA) has promulgated regulations as 40 Code of Federal Regulation (CFR) Part 51, Subpart W, Determining Conformity of General Federal Actions to State or Federal Implementation Plans, which require the proponent of a Proposed Action to perform analysis to determine if the Proposed Action conforms to the SIP. Camp Perry is located in attainment areas for all criteria pollutants. In addition to the Ohio SIP, Camp Perry will also comply with the Prevention of Significant Deterioration (PSD) regulations.

# 2.0 DESCRIPTION OF PROPOSED ACTIONS AND ALTERNATIVES

## 2.1 Proposed Actions

### 2.1.1 Introduction

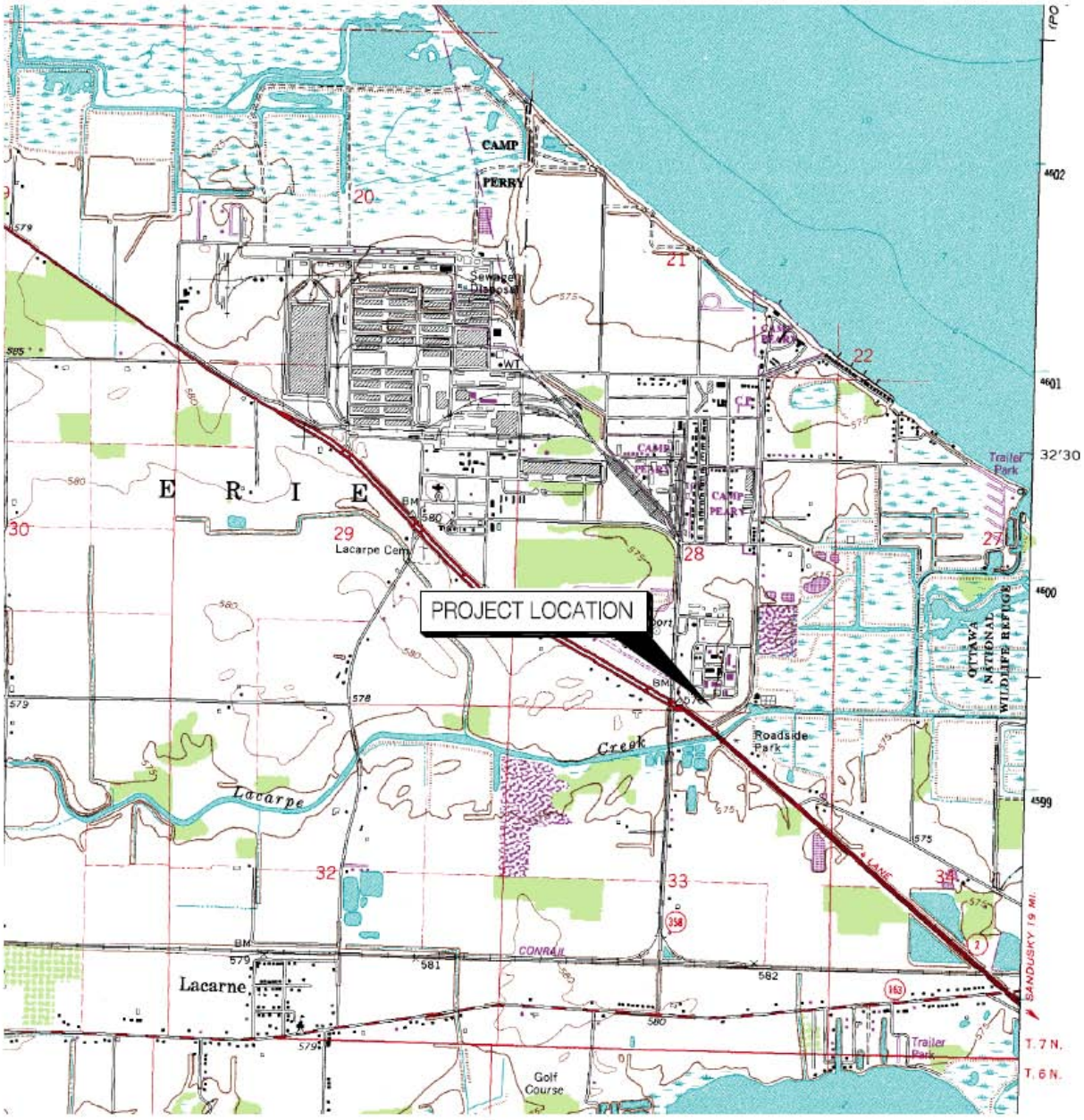
The Proposed Action will provide a portion of the total electrical consumption at the Camp Perry ANGS by producing electricity from wind energy, and will directly reduce the local utility cost to the Federal Government by reducing energy consumption from the local utility. The RDTE installation will also reduce emissions and greenhouse gases by decreasing the need for utility generated electricity typically produced by coal generation. The Proposed Action will help Camp Perry meet the DoD mandated reduction of fossil fuel reliance and overall energy consumption on federal sites. This project is proposed to occur during FYs 2010 and 2011; no personnel changes are anticipated because of the Proposed Action.

### 2.1.2 Proposed Action

Woolpert Construction, under the authority of the Air National Guard, proposes to construct and operate a Research, Development, Test, and Evaluation (RDTE) renewable energy wind-power project for an operating DoD facility in the Lake Erie shore region of Ohio (Figure 1), located in eastern Ottawa County. The facility is approximately 0.6 miles (1.0 km) southwest of Lake Erie (Figure 2). The ANGS facility encompasses approximately 59 acres.

The project consists of one wind turbine unit producing up to 500-kW. The proposed tower height of the wind turbines would be 40 meters (131 feet), and the three-blade rotor diameter would be 41 m (135 feet). Maximum height of the rotor tip when in the 12 o'clock position would be 60.5 m (198 feet) above ground level (agl). In the 6 o'clock position, the rotor tip could be as low as 26 m (85 feet) agl.

The turbine will mount on a steel tubular tower. Lighting of all or a subset of the tower will adhere to Federal Aviation Administration (FAA) guidelines. As with most modern wind farms, FAA lighting would likely consist of red strobe-like lights or newer LED's (FAA type L-864) on the turbine nacelle (i.e., the exterior motor housing) at about 42 m (138 feet) above the ground. Most electrical interconnection lines within the turbine will be placed underground. The wind turbine as proposed will connect to an existing on-site electric substation for Camp Perry ANGS, thereby tying the system to the existing electrical grid. Suitable electrical tie-in for additional turbines, or larger turbines than the one currently proposed, would require additional review.




# FIGURE 2

## TOPOGRAPHIC MAP
## PROPOSED PROJECT AREA
## CAMP PERRY FACILITY
## PORT CLINTON, OH

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The connections between the turbine, substation and existing transmission lines will be below ground.

In accordance with USAF Sustainable Design Policy 2007, this project will utilize the Leadership in Energy and Environmental Design (LEED) principles as is applicable for a utility project, which does not fit the traditional LEED model. The proposed turbine is a refurbished unit, installed with minimal impact to the existing site. The design includes restoration of impacted surrounding habitat. The design will incorporate recycled and regional materials with financial constraints considered. Benchmark level goals of 6-7 points can be met and it is the goal to achieve 8-9 LEED points.

Based on recommendations from the *Phase I Avian Risk Assessment* prepared by Curry & Kerlinger, LLC, the project incorporates design modifications to reduce impacts to wildlife:

a) Place Electrical lines below ground.

b) Erect freestanding structures (no guy-wires) to prevent potential for avian impacts.

c) Minimize the size of the access roads, turbine pads, etc., to reduce habitat impacts. Re-grade and seed disturbed soils to reduce potential habitat impacts.

d) Specify lighting for the project to meet the recommendations of the Curry & Kerlinger LLC report. As stated, use red LED flashing or strobe-like lights. These lights should reduce potential for attraction of night migrating songbirds and similar species.

e) ANGS installed an Avian Radar System utilized for collecting migratory bird and bat data for the site during 2011. The radar is adjacent to the preferred turbine installation location and is able to generate data that is much more accurate and applicable than other study methods, which require a great deal of interpretation and interpolation. Use of this data and that of the post-construction one-year surveys will be shared with the appropriate agencies to review and work with the RHS to devise an appropriate, site-specific, standard operating procedure for the turbine to ensure migratory bird and bat impact minimization resulting from the Proposed Action.

### 2.1.3 Proposed Mission Changes

The Proposed Action would not cause a change in mission or an adverse impact upon the mission of the 200 RHS.

### 2.1.4 Proposed Personnel Changes

The Proposed Action will not facilitate personnel changes.

## 2.2 Alternatives

Floyd Browne Group considered three alternatives, excluding the No-Action Alternative for placement of wind turbines at Camp Perry (Figure 3). The alternatives included two other locations and one alternative involving a smaller turbine.

The Preferred Location (Location #1) is located on approximately five acres in the southeast portion of Camp Perry ANGS east of an existing 188kW solar field. The second location (Location #2) is located on approximately 11-acres to the north of the main station area (Figure 3). The third location (Location #3) is the northern most location consisting of an approximately 20 acre mowed lawn area. There is a public roadway buffer requirement of 1.1 times the turbine hub height, which dictates the available space required for the turbine installation. Photographs of the preferred and alternative locations are included in Appendix A.


FIGURE 3

ALTERNATIVES LOCATION MAP
CAMP PERRY FACILITY
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### 2.2.1 Location #1 – Preferred Area

Location #1 consists of approximately five acres of land bound by Ohio State Route 2 to the south; North Camp Perry East Road (County Road-171) to the east; Ohio State Route 358 to the west; and the RED HORSE Squadron Facility to the north (Figure 3).

Location #1 is a grassy landscaped area used as a standoff zone between the station and the main highway (Photos 1 and 2). This parcel has varying terrain as it approaches State Route 2 to the south, has miscellaneous utilities crossing the parcel, and has structures within 100-feet of the parcel boundary to the north. This parcel also has an outdoor training area with electrical utility distribution poles nearby. Based upon research and review, Location #1 is the most suitable for demonstration of wind energy production at Camp Perry ANGS.

### 2.2.2 Location #2 – North Outdoor Training Area

Location #2 is an 11-acre rectangular area used for mission preparation and training, and for the storage of fill dirt (Photo 5). This area is roughly bound by State Route 358 to the west; North Camp Perry Road East to the east; a paved driveway to the south; and a chain link fence to the north.

Abiding by the manufacturer's setbacks, this area could support one turbine with a maximum hub height of 135 feet. This parcel is less than 25 feet from an occupied structure on the south side, and the main entrance to Camp Perry ANGS is within its confines. Installation of a wind turbine in this area would require reallocating and reconfiguring the mission training area, and relocating the main entrance to the base. Analysis of the location yielded a lower value compared to Location #1, utilizing the developed screening criteria and would not meet the mission of the 200 RHS.

### 2.2.3 Location #3 – Vacant Field

Location #3 is an approximately 20 acre field encompassing a grass covered field and small L-shaped pond. This location is roughly bound by State Route 358 to the west; North Camp Perry Road East to the east; a chain link fence to the south; and Caledonia Drive to the north.

Although this area is relatively flat and unrestricted by structures and vegetation, it is the farthest location from the RED HORSE Squadron Facility; therefore, it would require the longest distance of infrastructure to complete the installation. Analysis of the location yielded a lower value compared to Location #1, utilizing the developed screening criteria and would not meet the mission of the 200 RHS.

### 2.2.4 Smaller Turbines

Camp Perry needs approximately 500 kW of total wind generation to supply current energy requirements. The smallest wind turbine system analyzed for this project was a 100 kW system with a 135 foot (41 m) hub height and a 69 foot (21 m) rotor diameter. Floyd Browne Group did not review smaller residential-type turbines in the five to 10kW range as part of this analysis due to the energy requirements of the ANGS. Based upon the energy needs of Camp Perry, smaller turbines than those proposed would not meet the needs of the ANGS.

### 2.2.5 No Action Alternative

The No Action Alternative involves consideration of not installing wind turbines at Camp Perry. This alternative would not meet the purpose and need, including the House of Representatives Appropriations, DoD's directive by EO 13123, EO 13423, EO 13514, and the Energy Policy Act of 2005 (EPAct 2005), to reduce energy consumption, emissions, and greenhouse gases at federal sites. The No Action Alternative also does not execute the Research, Development, Test and Evaluation (RDTE) appropriation as outlined by Congress. The RDTE appropriation specifically outlines analysis of wind technologies in the area of the Camp Perry ANGS. The No Action Alternative will negate the requirement by Congress to perform this Research & Development action.

## 2.3 Screening Criteria

### 2.3.1 Introduction

Screening criteria to evaluate each location and its impacts are briefly described for each criterion developed in Section 3. The resource is defined and the existing conditions described in detail in Section 3. Section 4 defines the impact for each criterion.

- Safety
- Air Quality
- Noise
- Land Use
- Geological Resources
- Water Resources
- Biological Resources
- Transportation and Circulation
- Visual Resources
- Cultural Resources
- Socioeconomics

# 3.0 AFFECTED ENVIRONMENT

The affected environment of the study area serves as the basis for evaluating potential environmental impacts of the Proposed Action or alternatives to the Proposed Action. Key participants conducted a site visit on December 17, 2009 at the Proposed Action location at the Camp Perry ANGS in order to evaluate the environmental conditions at the site. The site description reflects the conditions at the time of the site visit. In accordance with NEPA, and 40 CFR 1501.7(a) (3), all environmental resources that could potentially be affected by the Proposed Action, including those that maybe of public concern, are discussed below.

## 3.1 Safety

### 3.1.1 Definition of Resource

A safe environment is an environment in which there is little or no potential for death, serious bodily injury, illness, or property damage. Human health and safety addresses both the safety of workers and the public during construction activities and during subsequent operations of constructed facilities.

As a safety precaution, the proposed wind turbine will be equipped with a fail-safe mechanical braking gear that will shut the turbine down in the event of high winds or in the case of ice build-up, which causes irregular rotation. This braking system will prevent catastrophic damage to the turbine, local environment, and/or surrounding area.

Construction worker site safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. Numerous DoD and Air Force regulations designed to comply with standards issued by the Occupational Safety and Health Administration (OSHA) and the USEPA safeguard the health and safety of onsite military and civilian workers. These standards specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits for workplace stressors (Air National Guard, Environmental Division, 2004a).

### 3.1.2 Existing Conditions at Camp Perry ANGS

All contractors performing construction activities at ANGS are responsible for following safety regulations and occupational health and worker safety programs, and are required to conduct construction and demolition activities in a manner that minimizes risk to its workers or personnel (Air National Guard, Environmental Division, 2004a).

Camp Perry currently has an Asbestos Management Plan (1998) in place, which is a permanent record of the status and condition of all asbestos-containing

material (ACM) in the installation's facility inventory. The plan also describes procedures to manage and dispose of ACM. In addition, two Radiation Protection Program (RPP; 2002) documents exist for the 200 RHS. The first is for general use, written by the USAF. The second is site-specific for the 200 RHS. Each RPP outlines procedures for fire or explosion, leak testing, personnel monitoring, and waste management (Air National Guard, Environmental Division, 2004).

## 3.2 Air Quality

### 3.2.1 Definition of Resource

Concentration of various pollutants in the atmosphere determines air quality in a given location. The USEPA establishes National Ambient Air Quality Standards (NAAQS) for criteria pollutants, including ozone ($O_3$), carbon monoxide (CO), nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$), particulate matter equal to or less than 10 microns in diameter ($PM_{10}$), and lead (Pb). NAAQS represent maximum levels of background pollution considered safe, with an adequate margin of safety to protect public health and welfare.

The CAA Amendments of 1990 place most of the responsibility to achieve compliance with the NAAQS on the individual SIPs. The SIPs are a compilation of goals, strategies, schedules, and enforcement actions that lead a state into compliance with all NAAQS. Incorporate changes to the compliance schedule or plan into the SIP. The USEPA or the appropriate state or local agency can declare areas not in compliance with a standard as "non-attainment" areas. Areas designated by the USEPA as being "non-attainment" for one or more of the six NAAQS parameters may petition the USEPA for redesignation as a "maintenance" area if they are able to demonstrate they have met the national standard for the three years preceding redesignation. At the time the state petitions the USEPA for redesignation, it will also submit a revision of its SIP to provide for the maintenance of the applicable NAAQS for at least 10 years after redesignation ("maintenance plan") pursuant to CAA §175(A).

The CAA prohibits Federal agencies from implementing projects that do not conform to a USEPA-approved SIP. In 1993, the USEPA developed final rules for determining air quality conformity. Under these rules, certain actions are exempted from conformity determinations, while others are assumed to be in conformity if total project emissions are below *de minimis* levels established under 40 CFR Part 93.153. Total project emissions include both direct and indirect emissions caused by the Federal action (Air National Guard, Environmental Division, 2004a).

The CAA Amendments of 1990 also require states to permit major stationary sources of emissions. A major stationary source is a facility (i.e., plant, base, or activity) that emits more than 100 tons per year of any one criteria air pollutant, 10 tons per year of a hazardous air pollutant, or 25 tons per year of any

combination of hazardous air pollutants. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and to monitor their impact upon air quality (Air National Guard, Environmental Division, 2004a).

### 3.2.2 Existing Conditions at Camp Perry ANGS

#### 3.2.2.1 Climate

Lake Erie's close proximity greatly influences the climate at Camp Perry. Summers in Port Clinton are generally warm and humid, with temperatures occasionally exceeding 90 degrees Fahrenheit (°F), and winters are relatively cold and cloudy, with temperatures falling below 0°F. The average annual temperature in Port Clinton, Ohio is 53.9°F. The average annual precipitation, evenly distributed throughout the year, is 34.88 inches. The predominant wind direction is from the southwest; however, in spring and summer there are also northerly and northeasterly breezes from Lake Erie (City of Port Clinton: http://www.portclintonohio.com).

#### 3.2.2.2 Local Air Quality

The Ohio EPA Northwest District Office conducts air monitoring for the district. Pollutants monitored include CO, NOx, $SO_2$, Particulate Matter ($PM_{10}$), total suspended particulates, $O_3$, and toxic air pollutants. The Ohio EPA does not currently monitor air quality in Ottawa County, and therefore no data was available (J. Liebriecht, personal communication). USEPA has designated Ottawa County as an attainment area for all criteria pollutants by the USEPA.

#### 3.2.2.3 Emissions at Camp Perry ANGS

ANGS is located in an area classified by the USEPA as an attainment area for all criteria pollutants. Currently, there are no air emission sources at ANGS.

## 3.3 Noise

### 3.3.1 Definition of Resource

Noise is generally defined as unwanted sound. Noise can be any sound that is undesirable because it interferes with communications, has enough intensity to damage hearing, or is otherwise annoying. Human response to noise varies, depending on the type and characteristics of the noise, the distance between the noise source and receptor, receptor sensitivity, prevailing winds, and time of day (Air National Guard, Environmental Division, 2004a).

### 3.3.2 Existing Conditions at Camp Perry ANGS

Noise levels within the region of Camp Perry ANGS have not been evaluated; current noise at ANGS consists primarily of diesel-fueled vehicle traffic, diesel-

fueled generators, power lawn mower, passenger vehicle traffic, air conditioning equipment, powered chain saw, and other insignificant sources of noise.

## 3.4 Land Use

### 3.4.1 Definition of Resource

Land use is the classification of either natural or human-modified activities occurring at a given location. Human-modified land use categories include residential, commercial, industrial, transportation, communications and utilities, agricultural, institutional, recreational, and other developed use areas. Management plans and zoning regulations determine the type and extent of land use allowable in specific areas and intend to protect specially designated or environmentally sensitive areas.

### 3.4.2 Existing Conditions

#### 3.4.2.1 Regional Land Use

Northwest Ohio is primarily rural in nature. Suburban areas of "urban fringe" surround the large towns of the region, such as Sandusky, Ohio. The rural northwest Ohio region is used predominantly for agricultural and residential purposes (Air National Guard, Environmental Division, 2004a).

#### 3.4.2.2 Local Land Use

Erie Township in Ottawa County is mostly rural in nature. Portions of the ARNG property surround Camp Perry ANGS on the north and west. These areas include a grenade launcher, shotgun ranges, and defunct hutments. Various manufacturing facilities are also located to the west of Camp Perry ANGS in the Lake Erie Business Park (LEBP), and Waste Management Inc. (a licensed landfill) is located to the south.

The areas to the east and south of Camp Perry ANGS are primarily residential and agricultural. Special land uses within the general vicinity of Camp Perry ANGS include the Ottawa National Wildlife Refuge – Darby Unit to the northeast, and various other private wetlands, which are also located to the east of ANGS and west of the LEBP.

#### 3.4.2.3 Land Use within the Alternative Locations Project Area

The ANGS facility encompasses approximately 59 acres; State Route 358 (Niagra Rd.) borders the RDTE alternative locations to the west, to the north by the Camp Perry Joint Training Center to the east by North Camp Perry Road East (CR 171), and on the south Ohio State Route 2. The Alternative #1 location is a currently undeveloped grass covered field with a 188kW solar field in the western portion.

## 3.5 Geological Resources

### 3.5.1 Definition of Resource

Surface and subsurface materials and their inherent properties make up and influence an area's geologic resources. Principal factors influencing the ability of geological resources to support structural development are seismic properties (i.e., potential for subsurface shifting, faulting, or crustal disturbance), soil stability, and topography. Another property of the geologic material that is important to consider is its ability to store, transport, and yield groundwater. Surficial deposits also play a role in development and location of surface water systems. Climate, topography, parent materials, and time are the largest influences to a geologic system.

Soil generally includes the unconsolidated materials overlying bedrock or other parent material, and its physical properties can play a critical role in both the natural and human environment. Soil depth, structure, elasticity, strength, shrink-swell potential, and erosion influence the ability of the soil structure to support human-made facilities. Soils typically are described in terms of their series or association, slope, physical characteristics, and relative compatibility or constraints in regard to particular construction activities and types of land use.

Topography is the relative position and elevations of the natural and/or human-made features of an area that describe the configuration of its surface. Many factors influence an area's topography, including human activity, seismic activity of the underlying geological material, climatic conditions; Information about an area's topography typically encompasses surface elevations, slope, physiographic features (i.e., mountains, ravines, or depressions) and their influence on human activities.

### 3.5.2 Existing Conditions

#### 3.5.2.1 Regional Setting

The "Black Swamp" was once the name for the entire region of northwest Ohio. The area was drained and cleared for agriculture, which resulted in the rich, wet soils that exist in the region today. The Toledo series and the Hoytville series, typically found along waterways, are the primary soils within the region. These soils are post-glacial in origin, represent marshlands and bogs, and typically have deep, nearly level, and very poor to somewhat poor drainage (Woolpert LLP, 2000).

#### 3.5.2.2 Alternative Locations Project Area

The topography in the area of ANGS is very level to slightly sloping, with an elevation of 575.5 feet above MSL. There are no major topographic obstructions or restrictions that will affect the Proposed Action.

Approximately 56% of the project area consists of Toledo silty clay (To), which is a deep, nearly level, very poorly drained soil. Typically, the surface layer is silty clay about seven inches thick with a high content of organic matter. The soil is not flooded but may be briefly ponded and the soil is hydric. This soil characteristically has very slow infiltration rates, and is wet at the surface most of the time. Depth to the water table is usually less than one foot. Bedrock is greater than 60 inches below ground surface (bgs).

Approximately 35% of the project area consists of Nappanee silty clay loam, zero to three perrcent slopes (NpA), which is a deep, nearly level, very poorly drained soil. Typically, the surface layer is silty clay about eight inches thick with a moderately low content of organic matter. The soil is not flooded but may be briefly ponded. This soil is not hydric, but may contain inclusions of the Toledo, Lenawee, Latty and Hoytville hydric soil units in flat depressions and drainageways. Bedrock is greater than 60 inches bgs (Musgrave and Derringer 1985).

## 3.6 Water Resources

### 3.6.1 Definition of Resource

Water resources encompass surface water, groundwater, and floodplains. Surface water resources consist of lakes, rivers, and streams and are important for its contributions to the economic, ecological, recreational, and human health of a community or locale. Storm water flows, occasionally exacerbated by high proportions of impervious surfaces associated with buildings, roads, and parking lots are important to management of surface water. Storm water is important to surface water quality also because of its potential to introduce sediments and other contaminants into lakes, rivers, and streams.

Groundwater consists of the subsurface hydrologic resources. It is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications.

Depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate are factors that characterize groundwater.

Floodplains are areas of low-level ground present along a river or stream channel. Such lands may be subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events and the size of the watershed above the floodplain. The Federal Emergency Management Agency (FEMA) evaluates flood potential. FEMA evaluates floodplain areas for 100-year and 500-year flood events, and provides guidance for management and mapping of floodplain areas. Federal, state, and local regulations often limit floodplain development to passive

uses such as recreational and preservation activities in order to reduce the risks to human health and safety (Air National Guard, Environmental Division, 2004a).

Wetlands are an important natural system and habitat because of the diverse biologic and hydrologic functions they perform. These functions can include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat provision, unique flora and fauna niche provision, storm water attenuation and storage, sediment detention, and erosion protection. A subset of the "waters of the United States" under Section 404 of the Clean Water Act (CWA) protects Wetlands. The term "waters of the United States" has a broad meaning under the CWA and incorporates deep-water aquatic habitats and special aquatic habitats (including wetlands). The United States Army Corps of Engineers (USACE) defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328).

### 3.6.2 Existing Conditions

#### 3.6.2.1 Regional Conditions, Surface and Ground Water, and Floodplains

Lake Erie is the most significant surface water body located in the region. The fluctuation in lake levels greatly influences the drainage of other smaller surface water bodies (rivers and streams) and groundwater. Surface water bodies in the region characteristically flow toward Lake Erie.

Regional groundwater flow is to the north-northwest toward Lake Erie, although local flow may vary due to topography. Most residents of the region receive water from public utilities from surface water sources. Ottawa County's primary groundwater source is from the limestone and dolomite aquifer found in the region (Air National Guard, Environmental Division, 2004a).

#### 3.6.2.2 Surface Water, Ground Water, and Floodplains at ANGS

ANGS is located in the Lower Portage River basin. Three major surface water bodies are located in the vicinity, including Lake Erie, the Portage River, and LaCarpe Creek. Lake Erie is the most significant of these surface water bodies, and influences the site with its fluctuating lake level. The Portage River is located approximately one mile south of ANGS, and flows to the northeast to discharge along the southwestern edge of Lake Erie. LaCarpe Creek is located on the southeastern edge of the facility, and discharges into Lake Erie (200 RHS, 2001).

Due to its close proximity to Lake Erie, there are many floodplains and wetlands located in this region. Groundwater in the area of ANGS lies in shallow buried

valleys near the Portage River, and within limestone and dolomite bedrock. Due to the clays found in the area, this area is not a good source of groundwater. A buried valley occurs underlying the Portage and Little Portage River, located south of the station. Groundwater in this area is readily accessible (Air National Guard, Environmental Division, 2004a).

ANGS is located in the Lower Portage River basin, which is not located in a 100-year floodplain. All industrial operations, wash racks, facilities, and dining facilities are equipped with oil/water separators and/or grease traps and directly connect to the sanitary sewer system. The storm water sewers and lift station only discharge collected surface waters from throughout the installation. A National Pollutant Discharge Elimination System (NPDES) permit is not required for this lift station, which discharges to LaCarpe Creek.

A wetlands delineation (United States Army Engineer Research and Development Center, 2000) conducted on the Camp Perry Military Installation identified 10.04 acres of wetlands at the Camp Perry Joint Training Center; however, there are no wetlands on ANGS property (Figure 4). A visual inspection of the alternative locations project area in 2010 indicated no elements present that would establish wetlands utilizing state or federal criteria, either jurisdictional or isolated.

#### 3.6.2.3 Surface Water, Ground Water, and Floodplains in the Alternative Locations Project Area

The nearest source of surface water to the alternative locations project area is a small, detention pond located along the east side of Location #1. This detention pond functions as a storm water system for the southern portion of the RED HORSE Squadron facility. Surface water from roads, building roofs, other surfaces, and catch basins enters the detention pond and then it discharges to a storm lift station, which pumps the water to LaCarpe Creek. Water levels in the detention pond fluctuate depending on daily precipitation rates. There is no apparent existing wildlife or habitat within the detention pond.

The alternative location project area is not within a 100-year floodplain, nor are there any wetlands in the alternative locations project area (United States Army Engineer Research and Development Center, 2000).

## 3.7 Biological Resources

### 3.7.1 Definition of Resource

Biological resources include native or naturalized plants and animals, and the habitats in which they exist (e.g. wetlands, forests, grasslands). Sensitive and protected biological resources include plant and animal species listed as threatened or endangered by the United States Fish and Wildlife Service

(USFWS) and the Ohio Department of Natural Resources (ONDR). Below are laws that pertain to affects to biological resources that may be applicable to the Proposed Action:

The Migratory Bird Act of 1918 (16 USC 703) is the legislation implementing the protection of birds migrating between the US and Canada. The act establishes a federal prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, killing, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention for the protection of migratory birds or any part (feathers, eggs, nests, etc.) from such property. The Migratory Bird Act covers more than 800 species of birds.

The Bald and Golden Eagle Protection Act of 1940 (16 USC 668-668d) provides for the protection of the bald eagle and golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures.

The Endangered Species Act of 1973 (16 USC 1536) provides a means whereby the ecosystems upon which endangered and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species. The Endangered Species Act defines an "endangered species" as any species in danger of extinction throughout all or a significant portion of its range. The Act defines a "threatened species" as any species likely to become an endangered species in the foreseeable future. The USFWS maintains an updated list of species considered as candidates for possible listing under the ESA. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and may warrant protection under the ESA.

The Clean Water Act of 1977 (33 USC 1251) governs the discharges to "navigable waters" including wetlands and streams. The act establishes a permit system for regulating point source pollution and the filling and dredging of regulated waters. The Army Corps of Engineers is responsible for administering the permits for dredge and fill of jurisdictional water. The Ohio EPA has developed water quality standards under Section 401 of the Clean Water Act. The Ohio EPA must permit dredge and fill of isolated waters per the water quality standards.

The Ohio Revised Code contains legislation passed by the Ohio General Assembly. Title XV of the Code includes legislation to conserve and protect Ohio's natural resources. Chapter 1531 and Chapter 1533 contains laws for the Division of Wildlife to protect and preserve Ohio's wildlife. The chief of the Division of Wildlife has been established as the executive officer who initiates and concurs on all statutory responsibilities, which are either mandatory or directory in nature. The ownership and title to all wild animals are held in trust by the Division of Wildlife. The management of these wild animals is to be for the benefit of all the people, and is based upon the premise that wildlife is a usable, renewable resource.

### 3.7.2 Existing Conditions

#### 3.7.2.1 Vegetation and Forestry at Camp Perry ANGS

The areas in the vicinity of ANGS are primarily rural in nature, and are predominantly vegetated with minor wooded areas. Most plant species found at ANGS are onsite due to landscaping activities, and are largely cultivated in nature. Grasses, shade trees, shrubs, and cultivated flowers make up the majority of the vegetation of the area (Air National Guard, Environmental Division, 2004a).

#### 3.7.2.2 Wildlife

Minimal wildlife habitat is present within the alternative locations project area.

The most common mammalian species documented in the habitats surrounding ANGS are white-tailed deer, rabbit, raccoon, woodchuck, muskrat, mink, squirrel, skunk, and numerous other rodent species (Air National Guard, Environmental Division, 2004a). Use of this area by mammalian species is probably very low. There are no significant or unique habitats occurring within this area that are make it attractive for wildlife species.

Avian species are the most prevalent wildlife species that use the area proposed for the wind turbine. Curry and Kerlinger, (2007a), documented more than 300 avian species in the wildlife areas around ANGS and it is possible that some migratory, transient and resident avian species fly across the alternative locations project area. It is unlikely that they stop to feed or rest here, but it is possible that Canada geese use the detention pond within location #1 to some extent, due to their high populations in the region and documented use of other small ponds within Camp Perry.

ODNR has identified four Bald Eagle (*Haliaeetus leucocephalus)* nests within a three-mile radius of Camp Perry ANGS (Correspondence w/ Keith Lott, ODNR Biologist). Portions of alternative locations #2 and #3 are located within ½-mile of one of the nests, while all of alternative location #1 is beyond ½ -mile of the nests.

### 3.7.2.3 Threatened and Endangered Species

The referenced species information in Appendix B was obtained from the Ohio Department of Natural Resources (ODNR) Natural Heritage Database and the U.S. Fish and Wildlife Service. Camp Perry lies within the range of the following listed species; the Eastern Mississauga (*Sistrurus catenatus*; state endangered and a federal candidate snake species), Piping plover (*Charadrius melodus*: a state and federally endangered bird species), Northern Harrier (*Circus cyaneus*: a state endangered bird species), Loggerhead shrike (*Lanius ludovicianus*: state endangered bird), Snowy egret (*Egretta thula*: a state endangered bird species), American bittern (*Botaurus lentiginosus*: state endangered bird species), Cattle egret (*Bubulus ibis*: state endangered bird species), Trumpeter swan (*Cygnus buccinators*: state endangered bird species), Black tern (*Chlidonias niger*: state endangered bird), Common tern (*Sterna hirundo*: state endangered bird), King rail (*Rallus elegans*: state endangered bird species), Spotted gar (*Leisosteus oculatus*: state endangered fish) and Blacknose shiner (*Notropis heterolepis*: state endangered fish species).

The project is also within the range of the Indiana Bat (*Myotis sodalis*: state and federally endangered species). Indiana bat habitat consists of suitable trees that include dead and dying trees (i.e. Shagbark hickory: *Carya ovata*, Bitternut hickory: *Carya cordiformis*, White ash: *Fraxinus Americana*) with exfoliating bark, crevices, or cavities, or hollow areas formed from broken branches or tops. No suitable trees were identified within the project area; therefore, no impacts to these species are anticipated, from the degradation of habitat.

The Ohio Department of Natural Resources (ODNR) Natural Heritage Database indicates the three species of concern including; eastern fox snake (*Elaphe vulpine gloydi*: state species of concern), Blanding's turtle (*Emydoidea blandingii*: a state species of concern), and Melanistic garter snake (*Thamnophis sirtalis*: state species of concern) were identified in the Ottawa National Wildlife Refuge, Darby Unit.

The complete list of threatened, endangered, proposed and candidate species is included in Appendix B.

### 3.7.2.4 Wetlands

There are no wetlands within the project area, but there are numerous wetland areas within a one-mile radius of the station, including Ottawa National Wildlife Refuge and those on private land. A Wetlands Delineation (United States Army Engineer Research and Development Center, 2000) conducted on the Camp Perry Military Installation identified 10.04 acres of wetlands at Camp Perry Joint Training Center; however there are no wetlands located on ANGS property. A USFWS National Wetlands Inventory map is included in Figure 4. A visual inspection of the alternative locations project area in 2010 indicated no elements

present that would establish the presence of wetlands utilizing state or federal criteria, either jurisdictional or isolated.

## 3.8 Transportation and Circulation

### 3.8.1 Definition of Resource

Transportation and circulation refer to the movement of vehicles throughout a road and highway network. Primary roads, such as major interstates, are principal arterials designed to move traffic and not necessarily to provide access to all adjacent areas. Secondary roads are feeder arterials that collect traffic from common areas and transfer it to primary roads.

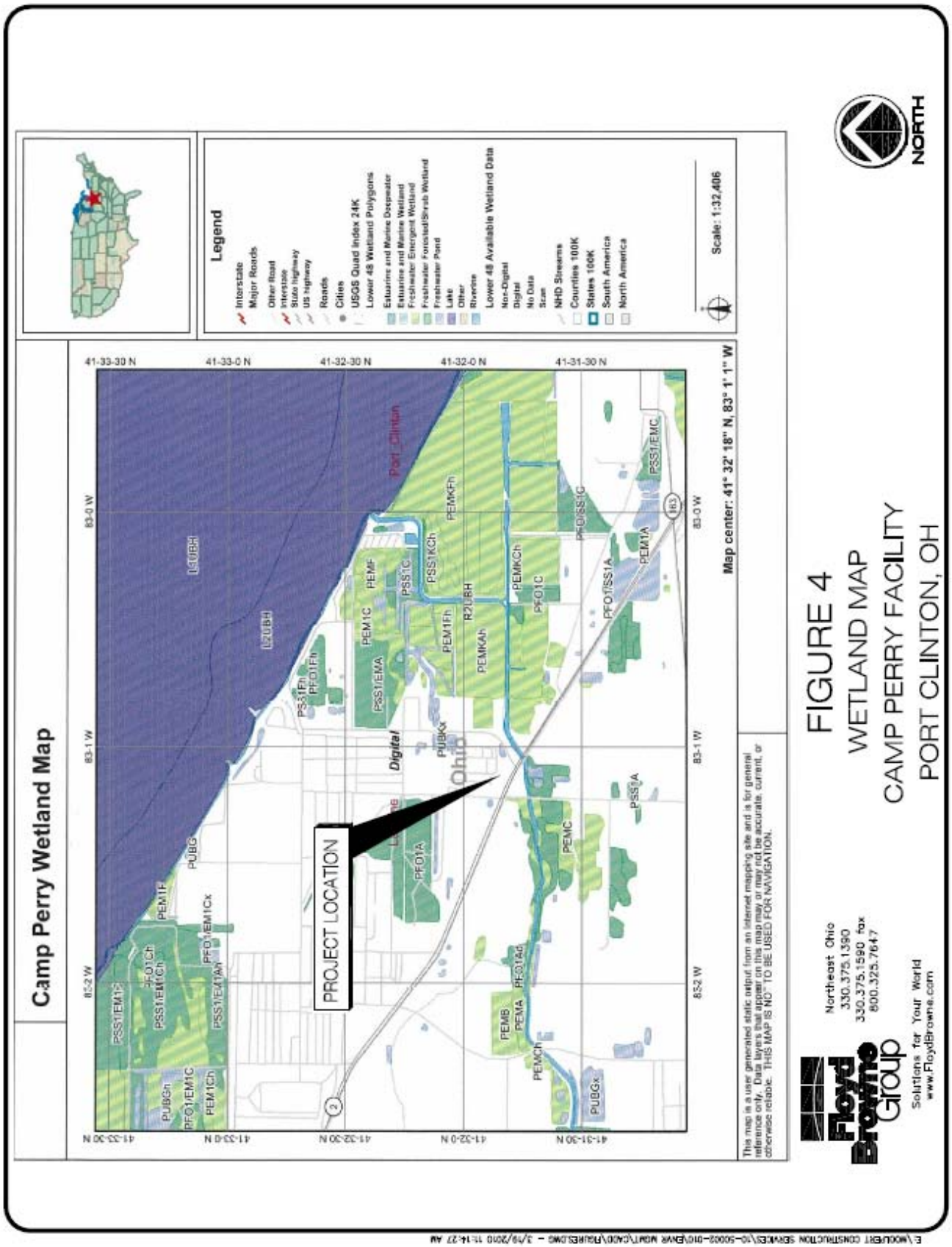
### 3.8.2 Existing Conditions

#### 3.8.2.1 Regional and Local Circulation

Airline, rail, and motor transportation systems provide mass transit to the region. The major airport serving the area is Hopkins International Airport in Cleveland, Ohio, located approximately 80 miles from Camp Perry. The major roadways in the area are US Route 80/90 (Ohio Turnpike), State Route 2, State Route 358 (Niagra Road adjacent to Camp Perry ANGS), and State Route 163. The roadways of the region and local areas near Camp Perry are currently adequate for the traffic volumes found therein.

#### 3.8.2.2 Base Circulation

The mission of the 200 RHS is dependent upon the ability to provide quick response times in crisis situations. State Route 2 and County Road 171 (Camp Perry East Road) form the southern and eastern borders of Camp Perry, respectively. The main access to ANGS is off State Route 2, although State Route 163, Niagra Road, and State Route 53, which connect to State Route 2, also offer access. Roads in the vicinity of ANGS adequately support existing traffic volumes. Traffic volumes fluctuate during the year, and are generally light during the winter and heavy during the summer months. There are currently no roadway construction/repair projects in the area to cause any delay in traffic (Ohio Department of Transportation, 2009 www.dot.state.oh.us). The closest interstate to Camp Perry ANGS is the US Route 80/90 (Ohio Turnpike), which is located approximately 12 miles to the south.


Camp Perry Wetland Map
Legend
Interstate
Major Roads
Other Road
Interstate
State Highway
US Highway
Roads
Cities
USGS Quad Index 24K
Lower 48 Wetland Polygons
Estuarine and Marine Deepwater
Estuarine and Marine Wetland
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Other
Riverine
Lower 48 Available Wetland Data
Non-Digital
Digital
No Data
Scan
NHD Streams
Counties 100K
States 100K
South America
North America
Scale: 1:32,406
Map center: 41° 32' 18" N, 83° 1' 1" W
PROJECT LOCATION
Port Clinton
Digital
Ohio
NORTH
This map is a user generated static output from an internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.
FIGURE 4
WETLAND MAP
CAMP PERRY FACILITY
PORT CLINTON, OH
Floyd Browne Group
Northeast Ohio
330.375.1390
330.375.1590 fax
800.325.7647
Solutions for Your World
www.FloydBrowne.com
E:\MOOLFERT CONSTRUCTION SERVICES\10-50002-010\ENVR MGMT\CAD\FIGURES.DWG - 3/19/2010 11:14:27 AM

#### 3.8.2.3 On-Base Parking

On-base parking at ANGS consists of both non-organizational and organizational vehicle parking, and is currently adequate for the installation's needs.

## 3.9 Visual Resources

### 3.9.1 Definition of Resource

Areas of unique beauty that are a result of the combined characteristics of the natural aspects of land and human aspects of land use are examples of visual resources. Examples of natural aspects of land include wild and scenic rivers, topography, and geologic landforms. Examples of human aspects of land use include scenic highways and historic districts. The assessment of visual and aesthetic value involves a characterization of existing resources in the study areas.

Social considerations, including public value placed on the resource, public awareness of the area, and general community concern for visual resources in the area influence changes in visual character. The degree of public interest in a visual resource and concern over adverse changes in the quality of that resource affect social considerations and visual sensitivity of a resource.

Landforms, water surfaces, vegetation, and manufactured features are characteristic of an area if they are inherent to the structure and function of the landscape. These features form the overall impression that an observer receives of an area or its landscape character (Air National Guard, Environmental Division, 2004a).

### 3.9.2 Existing Conditions

#### 3.9.2.1 Regional Visual Character

ANGS is located three miles west of the City of Port Clinton, Ohio. The City of Port Clinton covers a total land area of 2.1 square miles within Ottawa County (City of Port Clinton: http//www.portclinton.com). The topography of the area is very level to slightly sloping. Agricultural and residential land uses dominate the regional visual character.

#### 3.9.2.2 Camp Perry ANGS and the Alternative Locations Project Area

The visual environment at ANGS is characteristic of military activities. The area surrounding the installation is primarily rural in nature. The visual environment within the alternative locations is characteristic of large, open, maintained areas interspersed with prominent vertical elements of buildings, utilities and a water tower.

## 3.10 Cultural Resources

### 3.10.1 Definition of Resource

Some social, ethnic, cultural, or occupational groups consider landscapes, archaeological sites, structures, artifacts, flora and fauna, and geological features to be important cultural resources. This importance affects their shared identity, existence as a community, or the continuation of traditional lifeways. Archaeological resources comprise areas where prehistoric or historic activity measurably altered the earth or where deposits of physical remains (e.g., arrowheads and pottery) have been discovered.

Architectural resources include standing buildings, districts, bridges, dams, and other structures of historic or aesthetic significance. The National Register of Historic Places (NRHP), an inventory of culturally significant resources identified in the United States considers architectural resources generally older than 50 years for inclusion into the Register. However, more recent structures, such as Cold War-era resources, may warrant protection if they have the potential to gain significance in the future and are extraordinary in nature.

Traditional cultural properties can include archaeological resources, structures, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that Native Americans or other groups consider essential for the preservation of traditional culture. Several Federal laws and regulations have been established to manage and protect cultural resources, including the National Historic Preservation Act (NHPA), Archeological and Historic Preservation Act (AHPA) of 1974, American Indian Religious Freedom Act of 1978 (AIRFA), Archaeological Resource Protection Act of 1979 (ARPA), and Native American Graves Protection and Repatriation Act of 1990 (NAGPRA).

In addition to establishing management and protection requirements, several Federal laws address consultation with Native American tribes. Section 106 of the NHPA requires that if an undertaking may affect properties having historic value to a federally recognized Indian tribe, such tribe shall be afforded the opportunity to participate as interested persons during the consultation process. NAGPRA details consultation with Indian tribes for intentional excavation of or inadvertent discovery of any Native American cultural item as defined by NAGPRA. AIRFA and Executive Order (EO) 13007, Indian Sacred Sites, include

guidance on rights of access to sacred sites and the use and possession of sacred objects. EO 13175, Consultation and Coordination with Indian Tribal Governments, directs agencies to consult with tribes in developing and implementing policies that have tribal implications. This executive order supplements the 1994 Executive Memorandum "Government-to-Government Relations with Native American Tribal Governments," which states that Federal agencies are to recognize the right of self-governance and the sovereignty of Indian tribes (Air National Guard, Environmental Division, 2004a).

### 3.10.2 Historical Context

#### 3.10.2.1 Regional History

The entire area encompassing Camp Perry was once a lakebed that formed during the postglacial period as a series of larger lakes receded to become modern Lake Erie. Native Americans, including Wyandot, Shawnee, Delaware, Miami, and Ottawa began settling in northwest Ohio in response to British enticements and activity near Detroit. European settlement in northern Ohio did not begin until after the War of 1812, when pioneers clustered along the region's rivers and ridges. Few ventured into the "Black Swamp," where Camp Perry is currently located. During the agricultural boom of the late 1800's workers ditched and drained the "Black Swamp". A series of treaties with the remaining Native American groups in the early 19th Century ceded Ohio to the United States. The population gradually moved out of rural areas and into cities, leaving the region as mostly rural land with some larger cities, as it remains today (Air National Guard, Environmental Division, 2004a).

#### 3.10.2.2 Camp Perry

The Congressional Act of 1903 gave federal funding assistance to establish Camp Perry. Ohio legislation officially established Camp Perry in 1906 and it became a permanent camp by 1909. During World War II, the State of Ohio purchased nearly 200 acres from private owners and enlarged Camp Perry. Camp Perry became an induction center for new draftees in 1941, and resulted in construction of numerous buildings during this time. In 1942, the .State of Ohio transferred ownership of Camp Perry to the Federal Government. From 1943 to 1946, Camp Perry was a Prisoner of War camp (Air National Guard, Environmental Division 2004a).

In 1946, the Federal Government transferred Camp Perry back to the State of Ohio, and many buildings were donated or sold and moved offsite. Creation of Rapid Engineer Deployable Heavy Operational Repair Squadron Engineering (RED HORSE) units occurred in 1965, resulted in mobile civil engineering units. The 200 RED HORSE Squadron (RHS) was activated in 1971, and was the first Air National Guard Station (ANGS) RHS.

Numerous buildings at Camp Perry have been constructed and demolished since 1971. The ANGS currently leases a portion of the original ARNG Camp Perry site from the State of Ohio (Air National Guard, Environmental Division, 2004a).

### 3.10.2.3 Alternative Locations Project Area

The alternative locations are large open areas. Location #1 is an open grass field used for military exercises and a baseball field for morale activities. No buildings have ever been constructed here (Air National Guard, Environmental Division, 2004b). Location #2 is a large open field and Location #3 is a large open mowed area.

## 3.10.3 Existing Conditions

### 3.10.3.1 Regional Conditions

Native American and European settlement, and the involvement of military operations in World War II have created many archaeological and historical resources in the region One of Ohio's best quality prehistoric chert (a type of flint; Fox 1980) sources, Pipe Creek chert, is also located in this region, with many prehistoric sites having been identified here (Fox, W.A.1980 Nettling Points).

### 3.10.3.2 Camp Perry

The ANGS conducted a reconnaissance level survey in 2001 (Cultural Resources Assessment, Engineering Environmental Management [e2M], 2001). A single archaeologically site, recorded during the evaluation, consists of the foundations of seven structures located on a recently acquired 11-acre parcel. These buildings were support structures for the Induction Center, serving as a storehouse, a shop, a wash rack, a grease rack, and related services. Deconstruction and removal from the site of most of the building foundations has occurred. The foundations are not historically significant and not considered eligible for listing on the National Register of Historic Places.

As outlined in the 2001 Cultural Resources Assessment, historically significant structures found at Camp Perry include two tall stone towers resembling lighthouses on either side of the main entrance that date to 1937. In addition, brick light fixtures from the same period line roadsides at the base, and were an important component of the emerging cultural landscape symbolizing the government's commitment to the permanency of Camp Perry. Buildings 9, 41, and 43 were "temporary" World War II-era buildings designed to function adequately for 10 to 15 years, but are more than 60 years old. Research has not established that any significant wartime event occurred at these temporary wartime buildings; also, the buildings extensive alteration occurred through the application of synthetic siding (Environmental Planning Branch ANGS/CEVP, 2004).

In 2000, FEMA and the Ohio State Historic Preservation Office (OHPO) negotiated a Memorandum of Agreement (MOA) for the "Camp Perry Military Reservation." The MOA designates Camp Perry as a historic district eligible for the National Register, and requires consultation with OHPO and documentation before repairs or demolitions to any building (Air National Guard, Environmental Division, 2004a). The Camp Perry Historic District does not include the ANGS facilities.

In 2004, Camp Perry completed an Archaeological Resource Assessment Report and Historic Resource Assessment Report. The objective of these investigations was to examine the character and context of recorded resources and determine potential for undiscovered resources. It was determined that no Camp Perry archaeological sites meet National Register of Historic Places eligibility and no further archaeological research was necessary. OHPO concurred with this determination on November 10, 2005.

In regards to historic properties, it was determined that Camp Perry, although not officially on the National Register, may be eligible due to its military significance during World War II. The eligible historic district located in the northern portion of the Camp Perry property contains structures that are eligible for the National Register. The eligible historic district boundaries are defined to the north by Lake Erie, to the east by Scorpion Road, to the west by the former Erie Proving Grounds, and straddling Niagara Road south to the stone entrance gates at State Route 2. None of the items identified to have potential historic significance are located in the alternative locations project area.

## 3.11 Socioeconomics

### 3.11.1 Definition of Resource

Basic attributes and resources associated with the human environment, particularly population and economic activity create socioeconomics. Regional birth and death rates, and net inward or outward migration trends affect human population. Economic activity typically comprises personal income, employment, and industrial growth. Impacts to personal income and employment rates also can influence other components, such as housing availability and the provision of public services.

Previously published documents issued by the Ohio Department of Development (2006) and the US Census Bureau (2000) are presented in this section. When available, the data represents county, state, and US baseline levels of socioeconomic conditions in the context of regional, state, and national trends.

### 3.11.2 Existing Conditions

#### 3.11.2.1 Population

Camp Perry ANGS is located in Ottawa County, which has 255.1 square miles of land area in northwest Ohio along the southern edge of Lake Erie. The US Census of Ottawa County shows a total population of 40,985 in the year 2000, with a projected increase to 41,331 by 2006. The Ohio Department of Development predicts the population of Ottawa County will decrease to 40,800 by the year 2010, and to 38,520 by 2030. The median age of the population of Ottawa County is 41 years, and the largest age group is from 45 to 64 years old, comprising 27 percent of the county's population.

#### 3.11.2.2 Job Growth and Unemployment, Employment, Job Composition, and Earnings

The unemployment rate in Ottawa County rose from 7.2% in 2002 to 8.1% in 2004. Since that time, the rate has increased, with the level of unemployment in the county at 14.6 % in 2009. According to the Ohio Job and Family Services (http://jfs.ohio.gov/releases/), the majority of employment in Ottawa County comes from the manufacturing, accommodation and food services, and local government sectors. The median household income in Ottawa County in 2007 was $51,067 (US Census:http://quickfacts.census.gov).

#### 3.11.2.3 Installation

The daily workforce at Camp Perry includes between 25 and 30 full-time personnel including Acting Guard and Reserve (AGRs), civilian technicians, and state employees.

### 3.11.3 Environmental Justice

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, focuses the attention of Federal agencies onto human health and environmental conditions in minority and low-income communities. The EO directs Federal agencies to identify and analyze the potential effects of Proposed Actions on these communities, ensuring that agencies identify and address any disproportionately high or adverse human health or environmental effects.

The EO mandates invitation of potentially affected minority or low-income communities to participate in the NEPA process for the Proposed Action.

The table below summarizes the environmental justice indicators based on data from the 2000 US Census and 2006 data from the Ohio Department of Development.

Table 1. US Census Information Summary Table

| Indicator | Ottawa County[1] | Ohio[1] | United States[2] |
|---|---|---|---|
| Non-White | 5.5% | 15.1% | 24.8% |
| Median Household Income | $44,224 | $43,371 | $41,994 |
| Persons Below Poverty Income | 7.5% | 11.7% | 12.4% |
| Children under 18 | 20.7% | 24.1% | 25.7% |

[1]Ohio Department of Development 2006
[2]US Census 2000

### 3.11.4 Protection of Children from Environmental Health Risks and Safety Risks

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, states that all Federal agencies are to identify and assess environmental health and safety risks that may unduly affect children. This is important because scientific evidence indicates that children may suffer disproportionately the effects of environmental health and safety impacts. Children are at a higher risk because of several factors, including:

- A child's body system is not yet fully developed, often continuing its development through exposure time.
- The amount of fluid and food intake, and the amount of air a child breathes, is in greater proportion to their body weight than adults are.
- Due to smaller body size and weight, the protection afforded children through standard safety features may be diminished.
- A child's behavior patterns may cause them to have a greater frequency of accidental injury.

Floyd Browne evaluated the potential for exposure and risk to children resulting from implementation of the Proposed Action. Children may be potentially exposed due to their presence near the Proposed Action location, as either residents or visitors to the area. Precautions are necessary to limit the exposure to children, through safety restraints, site fencing, access limitations, adult supervision of their activities, and restricting their access to the proposed site. The information provided below describes the site access and potential exposure situations specific to children for the locations considered in the alternatives for the Proposed Action.

Camp Perry ANGS is located in the City of Port Clinton School District, which includes Erie Elementary, Bataan Elementary, Jefferson Elementary, Portage Elementary, Port Clinton Junior High, and Port Clinton High Schools. The nearest school is Erie Elementary, which is located four miles southwest of the installation. Camp Perry does not have onsite housing or facilities for children; only members of the military lodge in onsite housing (Air National Guard, Environmental Division, 2004a).

### 3.11.5 Consultation and Coordination with Indian Tribal Governments and DoD American Indian and Alaska Native Policy

Federal policy requires that agencies, including the ANGS, recognize tribal sovereignty and self-determination. In development of ANGS policies that have tribal implications, EO 13175, Consultation and Coordination with Indian Tribal Governments (November 6, 2000), directs the federal government to contact Federally recognized Indian tribes and Alaska Native entities on a government-to-government basis. The Presidential Memorandum to the Heads of Executive Departments and Agencies, issued on April 29, 1994, requires the ANGS to assess the impact of federal government plans, projects, programs and activities on tribal trust resources and ensure that tribal government rights and concerns are considered during the development of such plans, projects, programs, and activities.

In applicable instances, the ANGS will initiate consultation with tribal governments whose interests would be affected by a proponent's proposal. The threshold determination of whether an action might affect such tribal interests rests with the proponent (Air Nation Guard, Environmental Division, 2004a). The Proposed Action at Camp Perry ANGS is in an area with no known Native American resources (Mannik and Smith, 2003).

Consultation with Indian Tribal Governments occurred with no impacts identified by the Tribal Governments.

## 3.12 Hazardous Materials and Wastes

Any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that may cause an increase in mortality, a serious irreversible illness, incapacitating reversible illness, or pose a substantial threat to human health or the environment is a hazardous material. The Resource Conservation and Recovery Act (RCRA) further defines hazardous waste as a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may: (1) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or the environment when properly treated, stored,

transported, or disposed of, or otherwise managed (Air National Guard, Environmental Division, 2004a).

Environmental contamination at ANGS locations typically center around underground storage tanks (USTs); aboveground storage tanks (ASTs); and the storage, transport, and use of pesticides, fuels, and petroleum, oils, and lubricants (POL) materials. Improper use of these, in any way, threatens the health and well-being of wildlife species, botanical habitats, soil systems, water resources, and humans (Air National Guard, Environmental Division, 2004a).

To protect habitats and people from inadvertent and potentially harmful releases of hazardous substances, the DoD has dictated that all facilities develop and implement *Hazardous Material Emergency Planning and Response (HAZMAT) Plans or Spill Prevention, Control, and Countermeasure (SPCC) Plans*. The DoD also developed the Environmental Restoration Program (ERP), which facilitates thorough investigation and cleanup of contaminated sites located on military installations. These plans and programs, in addition to established legislation (e.g., the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] and RCRA), effectively form the intended protection to the ecosystems on which most living organisms depend (Air National Guard, Environmental Division, 2004a).

### 3.12.2 Existing Conditions at Camp Perry

Hazardous materials typical to ANGS use at Camp Perry include fuels, solvents, oils, and other small quantities of POL. The 200 RHS is a RCRA small quantity generator (SQG) of hazardous wastes. Regulations of the USAF, USEPA, and State of Ohio control handling, storage, and disposal of these products. Specifically, Camp Perry ANGS operates under the guidelines of the Hazardous Waste Management Plan, dated September 2007. Hazardous waste generated at Camp Perry ANGS is collected, stored temporarily, and shipped offsite for disposal. As required, the 200 RHS maintains a *Spill Prevention and Response Plan* (SPRP), which delineates procedures to follow in the event of an illicit or uncontrolled discharge of fuels, oils, hazardous materials, or hazardous waste.

Hazardous Material facilities located in close proximity to the Camp Perry ANGS have the potential to impact the soil and groundwater on the ANGS property. A cursory review of hazardous material and petroleum sites within a reasonable distance from Camp Perry was conducted by accessing available records from the US EPA (Enviromapper: http://www.enviromapper.com). This program identifies sites listed as emitters of regulated air toxins, produce hazardous waste, and/or identified for spills, releases, or special environmental investigations. The sites listed below are in this database:

- BFI Ottawa County Landfill at 530 North Camp Road, Port Clinton, Ohio
- Bio-Energy (OHIO), LLC at 530 North Camp Road, Port Clinton, Ohio

- Civilian Marksmanship, Erie Industrial Park Building 650, Port Clinton, Ohio
- FMS #17 at 1000 Lawrence Road Bldg. 2008 CPT, Port Clinton, Ohio
- Silgan Plastics Corp at Erie Industrial Park Bldg. 460 Drive 7, Port Clinton, Ohio
- Superior Mfg. at Erie Industrial Park Bldg. 460 Drive 7, Port Clinton, Ohio
- US Coast Guard Reserve at Erie Industrial Park Bldg. 360 Port Clinton, Ohio

Based on the types of facilities; the reported status; and distance from the project area, it is not likely that any of these sites would have a potential impact on the subject property. Summary reports for each of these sites are included in Appendix C.

#### 3.12.2.1 Storage Tanks and Oil-Water Separators

There are currently three ASTs onsite at Camp Perry near Building 4: one 250-gallon used oil AST, one 18,000-gallon propane AST, and one 10,000-gallon dual-compartment AST (8,000 gallons diesel fuel and 2,000 gallons unleaded gasoline). Each of the petroleum ASTs is double walled. There are six Oil-Water Separators (OWSs) located at Camp Perry: two 20-gallon OWSs (Building 6), one 208-gallon grease trap (Building 200), and three 1,000-gallon OWSs (Buildings 4, 14, and 16). Each of the OWSs is double-walled except for the two 20-gallon OWSs located inside Building 6.

#### 3.12.2.2 Environmental Restoration Program

There are three former ERP sites at Camp Perry: ERP Sites 1 and 2 are located north-northeast of Buildings 2 and 4. Site 1 is the 2,000-gallon Leaded Gasoline UST Area, which was removed in 1990. Two soil samples were collected from the tank excavation at the time of tank removal. No contamination was found. A No Further Response Action Planned (NFRAP) Decision Document was issued for Site 1, which is closed. Site 2 is the Paving Equipment Washing Area. This site includes the fuel pump dispenser island and the surrounding refueling area of the 2,000-gallon leaded gasoline UST discussed for former ERP Site 1. This area was reportedly used for routine washing of paving equipment with diesel fuel until 1989. A soil sample was collected from around the piping and fuel dispenser when they were removed in 1998, in which no contamination was found. A NFRAP Decision Document was issued and approved for Site 2, which is closed (Air National Guard, Environmental Division 2004b).

Site 3 exists on the 11-acre parcel that the 200 RHS recently acquired from the ARNG. Site 3 is one 12,000-gallon diesel fuel UST which was located on the 11-

acre parcel, until its removal in1996 (G&T Associates, 1997). The area was over-excavated to remove petroleum contaminated soil, which was disposed of offsite. The Bureau of Underground Storage Tank Regulations (BUSTR) issued a No Further Action Status in 1998, closing the site. Following the No Further Action letter, the ARNG voluntarily agreed to perform a Site Investigation (SI) at the site after further telephone communication with BUSTR (Air National Guard, Environmental Division 2004b).

A cursory review of BUSTR's database (http://www.comapps.ohio.gov) was conducted in order to determine if any outstanding environmental issues related to USTs were available. According to the information in the database, six No Further Actions (NFAs) were issued to Camp Perry. No outstanding compliance issues were identified during the database review. The reports are included in Appendix C.

### 3.12.2.3 Herbicides and Pesticides

According to facility personnel, limited amounts of household herbicides and pesticides have been used and stored onsite at Camp Perry, and currently none are being used on site.

### 3.12.2.4 Alternative Locations Project Area

No hazardous materials and/or suspect conditions were observed during the site inspection on December 17, 2009. During the 2004 Environmental Baseline Survey (EBS), no evidence of hazardous material storage or spills (staining, stressed vegetation, etc.) was observed within the project area (Air National Guard, Environmental Division, 2004b).

# 4.0 ENVIRONMENTAL CONSEQUENCES

In accordance with 40 CFR 1501.7(a) (3), all potential environmental impacts related to the Proposed Action and alternatives are identified and discussed below. This assessment examines both the long-term and short-term consequences of the proposed RDTE project and the No Action Alternative. Safety, air quality, noise, land use, geological and water resources, biological resources, transportation and circulation, visual resources, cultural resources, socioeconomics, and hazardous materials and wastes are key potential consequence considerations. Criteria outlining what constitutes an impact to that resource, followed by impacts resulting from the construction and operation of the RDTE project at ANGS follow below.

## 4.1 Safety

### 4.1.1 Significance Criteria

If implementation of the Proposed Action were to substantially increase risks associated with the safety of ANGS personnel, contractors, or the local community, or substantially hinder the ability to respond to an emergency, it would represent a significant impact. Ice throw and shadow flicker are possible impacts to safety once the wind turbine is installed. Unrealistic assumptions regarding ice throw from operating wind turbines include high-speed blade rotation, optimal wind speed and direction, and aerodynamically ideal ice shape. In operation, rotor blades coated in ice cannot achieve top speed because the ice coating changes the shape of the blade, reducing the lift-drag ratio, and greatly slowing the blades' speed. Seifert et al (2003) estimated the probable risk of being struck by ice as 6-10 strikes/m2/year, which is the typical probability of being struck by lightning in the United Kingdom. However, ice can drop when the turbines are still, but this risk is the same as any other structure such as utility poles, communications towers, and tall buildings.

### 4.1.2 Construction Related Impacts

The Proposed Action does not require the demolition of any existing structures; therefore, there will be no impact to safety from asbestos or lead paint contamination. Construction activities associated with the installation of wind turbines may require use of certain hazardous materials such as paints, welding gases, solvents, preservatives, and sealants. Dispose of any of the waste from these materials, which are used, and/or other hazardous materials in accordance with local, state, and federal law.

Adherence to Air Force safety standards at a construction site should lead to no major adverse safety impacts due to use of these materials. Under the No Action Alternative, existing conditions would remain as is and the Proposed Action

would not occur. Each of the alternative locations bore no significant difference in safety for the proposed action. If the No Action Alternative was carried forward and the Proposed Action was not implemented, there would be no change in current safety conditions at Camp Perry ANGS.

### 4.1.3 Operational Impacts

Impacts to safety as a result of the operation of a wind turbine at ANGS will be negligible. To minimize these risks, follow setback requirements; operators can shut down the wind turbines during icing conditions, and advise personnel not to stand under the turbines when there is a chance that ice could fall from them. Likewise, shadow flicker is not a concern for the ANGS site, because at US latitudes (except Alaska), the sun is not at a low enough angle to create shadow flicker. Nevertheless, follow noise setback parameters to eliminate this risk. (American Wind Energy Association: www.awea.org).

As an added safety precaution, the proposed wind turbine will be equipped with a fail-safe mechanical braking gear that will shut the turbine down in the event of high winds or in the case of ice build-up, which causes irregular rotation. This braking system will prevent catastrophic damage to the turbine, local environment, and/or surrounding area.

Each of the alternative locations bore no significant difference in operational impacts for the proposed action.

## 4.2 Air Quality

### 4.2.1 Significance Criteria

National Ambient Air Quality Standards (NAAQS) represent maximum levels of background pollution considered safe, with an adequate margin of safety to protect public health and welfare. These de minimis thresholds are similar, in most cases, to the definitions for major stationary sources of criteria and precursors to criteria pollutants under the CAA's New Source Review Program, and vary by the severity of the nonattainment area. A Conformity Determination is required when the total annual direct and indirect emissions from a Federal action equal or exceed the de minimis thresholds within a non-attainment or maintenance area. A Conformity Determination is also required if the total annual direct and indirect emissions are regionally significant by representing 10 percent or more of the region's total emissions for the particular pollutant in a non-attainment of maintenance area. A Conformity Analysis quantifies emissions and shows whether a full Conformity Determination is needed (USAF 1995).

In addition to the de minimis emission thresholds, Federal Prevention of Significant Deterioration (PSD) regulations define air pollutant emissions to be significant if the source is within 10 kilometers of any Class I area, and emissions would cause in increase in the concentration of any regulated pollutant in the Class I area of 1 µg/m3 or more (40 CFR 52.21(b)(23)(iii)). Camp Perry ANGS is

located in an attainment area for all criteria pollutants. In addition to the Ohio SIP, the sites also comply with the Federal PSD regulations.

### 4.2.2 Construction Related Impacts

There are currently no air emissions associated with the area for proposed wind turbine installation at ANGS. The most significant impacts from construction would be fugitive dust and equipment emissions, but these are not likely to cause impacts beyond the properties adjacent to the ANGS. Prevailing southwesterly winds carry any emissions from Camp Perry ANGS over Lake Erie, resulting in minimal impacts to local populations.

Ambient air quality would not change from existing conditions. The Proposed Action could generate air pollutant emissions because of grading, filling, compacting, or paving operations generate air pollutant emissions, but these emissions are temporary and would not generate any off-site impacts. There would be no changes regarding air permitting. Potential construction emissions would not generate emissions expected to cause or contribute to a NAAQS PSD violation. *De Minimis* air emissions threshold levels for existing NAAQS pollutants are listed in Table 2.

Table 2. Conformity *De Minimis* Emission Thresholds

| Pollutant | Status | Classification | ***De minimis* Limit (tons/year)** |
|---|---|---|---|
| Ozone (measured as Nitrogen Oxides [NOx] or Volatile Organic Compounds [VOCs]) | Non-attainment | Extreme<br>Severe<br>Serious<br>Moderate/marginal<br>(inside ozone transport region)<br>All others | 10<br>25<br>50<br>50 (VOCs)/100 (NOx) |
| | Maintenance | Inside ozone transport region<br>Outside ozone transport region | 100<br>50 (VOCs)/100 (NOx)<br>100 |
| Carbon Monoxide (CO) | Non-attainment/ maintenance | All | 100 |
| Particulate Matter (PM10) | Non-attainment/ maintenance | Serious<br>Moderate<br>Not Applicable | 70<br>100<br>100 |
| Sulfur Dioxides (SO2) | Non-attainment/ maintenance | Not Applicable | 100 |
| Nitrogen Oxides (NOx) | Non-attainment/ maintenance | Not Applicable | 100 |

Source: USAF, 1995

Camp Perry ANGS would not undergo any permanent changes that would affect air quality, such as increases in sanitary emission sources or increased personnel. Any air emissions associated with the construction involved in the Proposed Action would be minor and temporary.

No effects would occur under the No Action Alternative because conditions would remain the same as current conditions. In each of the three alternative locations, no significant impacts effects are expected.

### 4.2.3 Operational Impacts

Wind turbines are clean sources of energy and produce no emissions; therefore, there will be no impacts to air quality because of the operation of a wind turbine at Camp Perry ANGS. Locations #1, #2 or #3 would have no bearing on operational impacts.

## 4.3 Noise

### 4.3.1 Significance Criteria

Noise impact analyses typically evaluate potential changes to existing noise environments that would result from implementation of the Proposed Action. Potential changes in the noise environment can be beneficial (e.g.; if the number of sensitive receptors exposed to unacceptable noise levels is reduced), negligible (e.g.; if the total area exposed to unacceptable noise levels is essentially unchanged), or adverse (e.g.; if there is an increase in exposure to unacceptable noise levels). Wind turbines may produce some broadband noise (usually described as “swishing” or “whooshing”) as their revolving rotor blades encounter turbulence in the passing air. Older turbines can also produce a tonal sound (a “hum” or “whine” at a steady pitch). This can be caused by mechanical components or, less commonly, by unusual wind currents interacting with turbine parts, but this has been nearly eliminated in modern wind turbine design (American Wind Energy Association: www.awea.org).

Wind plants are always located where wind speed is higher than average, and the background noise of the wind tends to mask any noise generated by the turbines. The occasional exceptions to this are when a wind plant is sited in hilly terrain, and nearby residences are located in dips or hollows that are sheltered from the wind. In this instance, turbine noise may carry further than on flat terrain. A modern, operating wind farm at a distance of 750 to 1,000 feet is no noisier than a kitchen refrigerator or a moderately quiet room (The Scottish Office, Environment Department, 1994).

### 4.3.2 Construction Related Impacts

Implementation of the Proposed Action would have minor, short-term, adverse effects on the noise environment in the vicinity of the proposed project site. Use of large trucks to transport rotor blades, tower sections, and other large components, use of a large crane to install the nacelle and rotor atop the turbine tower, and cement mixing for foundation installation would generate noise exposure above typical ambient levels at ANGS. However, such noise generation would be typical of construction activities, would last only for the duration of the construction, and would be reduced through the use of equipment sound mufflers and the restriction of construction activities to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Therefore, noise produced by construction

activities associated with the Proposed Action would not significantly impact sensitive receptors. Under the No Action Alternative, existing conditions would remain as is and the installation of wind turbines would not occur. There would be no change in the current noise environment, thus no impact would occur because of this alternative. Each of the alternative locations bore no significant difference in construction related impacts for the proposed action.

### 4.3.3 Operational Impacts

Overall, noise impacts associated with the wind turbines are expected to be negligible. The proposed area for installation as well as the surrounding region is generally flat in nature, and there are no private residences located within 1,000 feet of the alternative locations project area. The Proposed Action for each alternative location would not significantly influence the existing environment.

## 4.4 Land Use

### 4.4.1 Significance Criteria

The significance of potential land use impacts is based on the level of land use sensitivity in areas affected by a Proposed Action and compatibility of Proposed Actions with existing conditions. In general, a land use impact would be significant if it were to: (1) be inconsistent or in noncompliance with existing land use plans or policies, (2) preclude the viability of existing land use, (3) be incompatible with adjacent land use to the extent that public health or safety is threatened, or (4) conflict with planning criteria established to ensure the safety and protection of human life and property.

### 4.4.2 Construction Related Impacts

Each component of the Proposed Action is consistent with base planning policies and guidelines and has been designed and sited to be compatible with existing and projected land use. Therefore, there would be no impact on Camp Perry ANGS property, and no impact on local or regional land use. Under the No Action Alternative, existing conditions would remain as is and the Proposed Action would not occur. If the No Action Alternative was carried forward and the Proposed Action was not implemented, there would be no change in land use at Camp Perry, and no significant impact would occur. Locations #1, #2 or #3 do not deviate from the projected land use policies.

### 4.4.3 Operational Impacts

Operationally, alternative locations #2 and #3 do not deviate, nor negatively influence the land use plan. Location #1 provides a compatible land use, in an area where another renewable energy source is located (188kW solar field). The setting of similar activities near each other is desirable and is compliant with local land planning and impact the mission positively. Because of the compatible land use in location #1, this would be the preferred location for this criterion.

The operation of a wind turbine at ANGS would not affect the existing or projected land use as described in base planning policies, creating no impacts to land use as a result of the Proposed Action.

## 4.5 Geological Resources

### 4.5.1 Significance Criteria

Evaluation of potential impacts of a proposed project on a geological resource includes consideration of unique geological features, minimization of soil erosion, and the siting of facilities. It is the intent of the ANGS to avoid or minimize impacts with proper construction techniques, erosion control measures, and structural engineering design in project development.

### 4.5.2 Construction Related Impacts

Implementation of best management practices during construction would limit potential impacts resulting from construction activities. Watering and soil stockpiling minimize fugitive dust from construction activities thereby reducing to negligible levels the total amount of soil exposed. In addition, standard erosion prevention measures (e.g., silt fencing, sediment traps, application of water sprays, and revegetation of disturbed areas) would also reduce potential impacts. Therefore, impacts on soils at ANGS would not be significant. The Proposed Action would not cause or create significant changes to the topography of Camp Perry ANGS. Therefore, no significant impact on regional or local topography or physiographic features would result from implementation of the Proposed Action. Under the No Action Alternative, existing conditions would remain as is and the proposed project would not occur. If the No Action Alternative was selected, there would be no changes in geological resources at Camp Perry ANGS, and no significant impact would occur. Both alternative locations #2 and #3 would have slightly larger disturbed earth footprints, due to the additional length of underground infrastructure required over location #1. While not deemed significant, location #1 would be preferred for this criterion.

### 4.5.3 Operational Impacts

There will be no impacts to geological resources as the result of the operation of wind turbines at Camp Perry ANGS.

## 4.6 Water Resources

### 4.6.1 Significance Criteria

Water resources impacts use significant criteria such as, water availability, quality, and use; existence of floodplains; and associated regulations. A potential impact on water resources would be significant if it were to: reduce water availability to existing users or interfere with the supply; create or contribute to overdraft of groundwater basins or exceed safe annual yield of water supply

sources; adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions; threaten or damage unique hydrologic characteristics; or violate established laws or regulations that have been adopted to protect or manage water resources of an area. The impact of flood hazards on a Proposed Action is significant if such an action is proposed in an area with a high probability of flooding.

### 4.6.2 Construction Related Impacts

Implementation of the Proposed Action will have no adverse effects on water quality. Adherence to proper engineering practices and applicable codes and ordinances would reduce storm water runoff-related impacts to a level of insignificance. Erosion and sedimentation controls will be in place during construction activities to reduce and control siltation or erosion impacts to areas outside of the construction site. The 200 RHS will apply for a NPDES General Construction Permit prior to commencement of construction activities.

The area for the Proposed Action at Camp Perry ANGS is not located within a 100-year floodplain. According to surveys performed at Camp Perry, there are no onsite wetlands (United States Army Engineer Research and Development Center, 2000).

It is the intent of the ANGS to take precautions to minimize impact to the surrounding properties. No significant adverse impacts on the proposed facilities or the floodplains are expected. No significant adverse impacts are associated with the No Action Alternative, as conditions will remain the same. No significant impacts are expected, for any of the alternative locations..

### 4.6.3 Operational Impacts

There will be no impacts to water resources because of the operation of wind turbines at ANGS, for any of the alternative locations.

## 4.7 Biological Resources

### 4.7.1 Significance Criteria

The importance (i.e., legal, commercial, recreational, ecological, or scientific) of the biological resource; the percentage of the resource that would be affected relative to its occurrence in the region; the sensitivity of the resource to proposed activities; and the duration of ecological ramifications determine the significance of potential impact. Impacts on biological resources are significant if species or their habitats are adversely affected over relatively large areas, or if disturbances cause reductions in population size or adversely affect the distribution of a species.

### 4.7.2 Vegetation and Habitat Impacts

#### 4.7.2.1 Disturbance from Construction

Under the Proposed Action, potential impacts on vegetation will be minimal, in part because construction areas have been previously degraded and cannot be considered significant or important wildlife habitat. Mowed vegetation and landscaped areas would be disturbed around the areas requiring construction. Affected areas would be reseeded or replanted immediately following the construction period. Most of the vegetated areas that would be disturbed are maintained under ongoing land management practices. In addition, the footprint of turbine pads required for the installation of a wind turbine at Camp Perry is a very small percentage of the project site. Therefore, the Proposed Action would have a minimal impact on plant communities and no impact on native plant communities. Alternative location #1 has the smallest disturbance footprint followed sequentially and by magnitude of footprint by location #2 and location #3.

Wildlife habitat extent and quality within the alternative locations project area is limited due to fragmentation by the existing facilities, roads, and impervious surfaces at ANGS. Furthermore, the majority of the project area consists of mowed lands.

Construction activities would not impact habitat available to birds and mammals (including bats) that occur at Camp Perry ANGS, other than common or alien species that thrive on previously degraded landscapes. This assessment is based on the limited extent of bird and bat habitat areas that would be affected by the installation of the wind turbines. The Proposed Action calls for construction activities in areas that have been previously disturbed and do not currently provide habitat for most native species other than the most common and least sensitive species. Therefore, impacts on wildlife habitat as a result of the Proposed Action are expected to be negligible.

Curry and Kerlinger (2007a) recommended minimizing the size of roads and turbine pads to disturb as little habitat as possible. These recommendations are similar to those provided in the 2011 U.S. Fish and Wildlife Service guidance document (DOI 2011) for wind development and information provided by the National Research Council (National Research Council 2007). It is the intent of the ANGS after construction, to permit or encourage natural habitat to regenerate as close to the turbines and roads as possible to minimize habitat fragmentation and disturbance and displacement impacts. It is also the intent to accelerate post-construction recovery by replacing topsoil removed during construction, to accelerate and encourage plant growth.

#### 4.7.2.2 Wetland Impacts

A wetlands delineation conducted on the Camp Perry Military Installation identified 10.04 acres of wetlands at Camp Perry (United States Army Engineer

Research and Development Center, 2000); however, these wetlands are located entirely on ARNG property. There are no wetlands located on ANGS property; therefore, there will be no impacts to wetlands or other surface waters as a result of the installation of wind turbines at Camp Perry ANGS, regardless of location.

### 4.7.3 Wildlife Impacts

Impacts to terrestrial wildlife are not expected due to the lack of significant or native habitat in the area of the Proposed Action, regardless of location. No impacts to aquatic species are expected due to the Proposed Action, regardless of location. Minor impacts to avian and bat populations may occur.

#### 4.7.3.1 Operational Impacts

Two general types of operational impacts to avian populations may occur based on review of documentation available from existing wind power facilities:

- Disturbance and displacement of birds as a result of the construction and operation of a wind turbine and related infrastructure, and

- Fatalities resulting from collisions with turbines, or other infrastructure.

Below is a discussion of these two types of impacts:

**Avian Displacement and Disturbance**

Based on observation of habitat types within the vicinity of Camp Perry and bird species observed at the project site, the most common types of birds found at Camp Perry include raptors, migrating songbirds, and waterfowl. For a complete list of species, including rare, threatened and endangered (RTE) species, see *Phase I Avian Risk Assessment*, Camp Perry ANGS Renewable Energy Demonstration (Curry and Kerlinger, LLC, 2007a).

According to Curry and Kerlinger, available data suggests that raptors may not be significantly displaced or disturbed by wind turbines. Red-tailed hawks at the Altamont Pass Wind Resource Area of California (APWRA) habituated to turbines within a few weeks in a manner similar to resident red-tailed hawks (Curry and Kerlinger, LLC, 2007b). At Erie Shores Wind Farm, an installation of sixty-six 1.5 MW wind turbines along 18 miles of Lake Erie shore to the east and west of Port Burwell, Ontario, 135 miles (216 km) northeast of Port Clinton, a pair of bald eagles raised young in a nest 900 m (2,950 feet) from the turbines, and both adults and juveniles were observed perching within 200 m (660 feet) of active turbines. Occasionally, these eagles flew within 100 m (330 feet) of active turbines (Curry and Kerlinger, LLC, 2007b).

In contrast, studies of waterfowl and shorebirds have shown that these species may be displaced by up to 800 meters (2,600 feet) by wind turbines (Ihde and Vauk-Henzelt 1990; Winkleman 1990). Other studies in Denmark have shown

species-specific differences in avian avoidance patterns. For example, pink-footed geese would not forage within 50 meters (160 feet) and white-fronted geese would not forage within 400-600 meters (1300 to 1950 feet) of wind turbines (Kruckenber and Jaene 1999; Larsen and Madsen 2000; Percival 1999). However, in New York State, anecdotal information suggests that Canada geese forage in close proximity to wind turbines (Curry and Kerlinger, LLC, 2007b).

Thus, different species may react differently to wind turbines. However, studies have not yet been conducted to examine if particular species will habituate to wind turbines or how long habituation might take. Based on observation of flight behavior, studies in Spain (Curry and Kerlinger, LLC, 2007b) suggest that migrating birds avoid flying in close proximity to wind turbines. Changes in flight direction were recorded more often over, or close to wind turbines, than in areas without wind turbines; however, no comparable data were collected prior to the operation of wind turbines in the area. In Vermont, during autumn hawk migration, the numbers of hawks that flew close to a hill with newly constructed turbines was less than in the year prior to turbine construction and operation (Kerlinger 2000).

At Erie Shores Wind Farm, migrating raptors, including osprey, bald eagle, Northern harrier, sharp-shinned hawk, Cooper's hawk, Northern goshawk, red-tailed hawk, golden eagle, American kestrel, merlin, and peregrine falcon, appeared to negotiate the turbines easily. Sharp-shinned hawks flew relatively close to turbines in order to follow a fencerow with trees (Curry and Kerlinger, LLC, 2007b).

Research on bird disturbance and displacement by wind turbines suggests that some grassland and other open-country nesting birds are displaced to a greater extent than forest species. There is also evidence of species-specific differences, with some species displacing to a greater degree than others do, and some species habituating to the presence of wind turbines.

Preliminary results from the Lake Erie Wind Farm indicate that the same types of birds that occur at Camp Perry (e.g.; waterfowl, raptors, and passerines) have habituated to wind turbines relatively quickly, with ample evidence of nesting, feeding, and flying near the turbines. It is important to note that the Lake Erie Wind Farm is an installation of sixty-six 1.5 MW turbines that are up to 80 meters (262 feet) tall (American Wind Energy Association, 2008; www.awea.org). Thus, that site has many more turbines and the turbines are larger. In addition, the turbines were constructed in habitat that is more suitable for nesting, foraging, and resting by birds than the habitat where a single turbine is proposed to be constructed at Camp Perry.

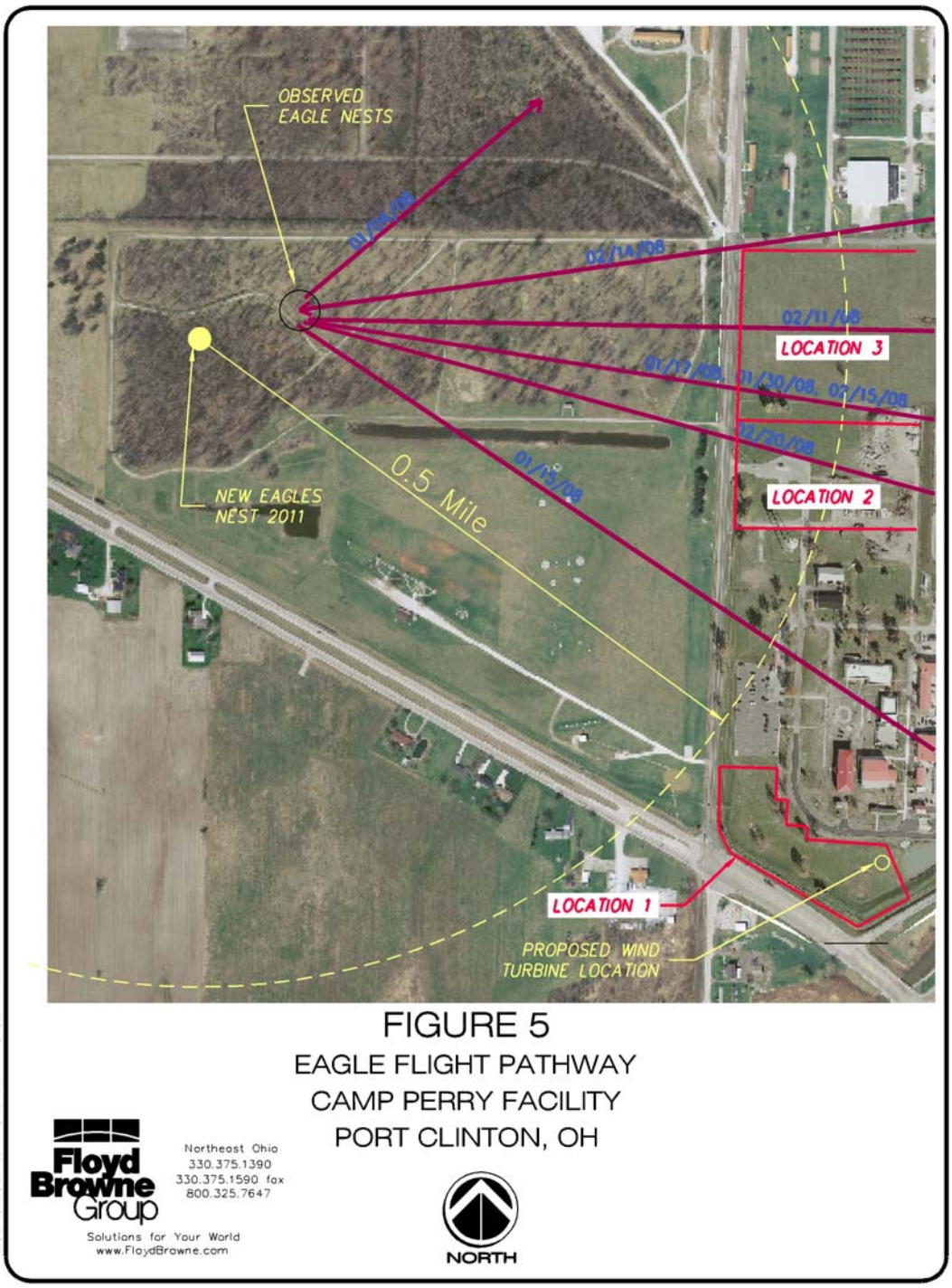
Concern for the federally endangered Kirtland's Warbler has been voiced but the probability of collision is extremely low, given that the bird has such a small population and that wind turbines do not have the collision risk factors of tall

communication towers, of which there are many in the western Ohio lakeshore region. There have been thousands of communication towers erected within the migration path of Kirtland's Warblers between Michigan and the Bahamas without a single documented fatality of this species. It is important to note that all of these towers were federally licensed by the FCC through the NEPA process, suggesting that tall structures are not an issue with Kirtland's Warblers.

Most importantly, Kirtland's Warblers have increased at a rate of about 5% per year (U.S. Fish and Wildlife Service data) for more than 20 years, a time when communication towers have increased at the same or faster rate (see the FCC tower database online). Therefore, it is not likely that tall structures influence the population of this or other endangered or threatened species.

Gehring, Manville and Kerlinger (2009, 2011) conducted nearly 2,000 searches of guyed and unguyed communication towers between about 475 and 1,000 feet in height within the migration and nesting range of Kirtland Warblers in Michigan. Searches were conducted in 2003, 2004, and 2005, yet none of these birds were found dead. A biological assessment for this species done for approximately 170 towers within the Michigan Public Safety Communication System (Michigan State Police and Michigan Attorney General's office) did not suggest impacts to this species.

This further suggests that the risk to Kirtland's Warblers from a demonstration turbine at the Project site would be very low.


OBSERVED
EAGLE NESTS
01/04/08
02/14/08
02/11/08
LOCATION 3
01/12/08, 01/30/08, 02/15/08
02/20/08
01/19/08
LOCATION 2
NEW EAGLES
NEST 2011
0.5 Mile
LOCATION 1
PROPOSED WIND
TURBINE LOCATION
E:\TEMP\DAG\PORT CLINTON\FIGURES.DWG — 10/10/2011 3:03:51 PM
FIGURE 5
EAGLE FLIGHT PATHWAY
CAMP PERRY FACILITY
PORT CLINTON, OH
Floyd Browne Group
Solutions for Your World
www.FloydBrowne.com
Northeast Ohio
330.375.1390
330.375.1590 fax
800.325.7647
NORTH

There is also a concern for the endangered piping plover, which habitat includes sandy or pebble beaches along Lake Erie. Currently piping plovers are not nesting in Ohio. The nearest Critical Habitat designated for plovers is approximately 20 miles away from the proposed site.

Recommendations by Curry and Kerlinger (2007a) to avoid displacing birds at Camp Perry ANGS include:

- Conducting a flight use study to determine the flight use of the project site by the bald eagle, and to determine if the project site is in a well-defined and heavily used migration corridor or travel corridor between feeding and roosting sites where birds are prone to fly at rotor height.

- Conducting a habitat use study to determine if the marshland area to the east of the site is of high enough quality to concentrate waterfowl in such numbers that significant displacement would result.

In response to the recommendations of the Curry and Kerlinger (2007a) report, the RED HORSE Squadron conducted an Eagle Flight Path Study during the period of 3 January 2008 to 25 February 2008. During this study, an eagle nest was located west of Camp Perry ANGS. Eagles transected ANGS property near the water tower and wastewater treatment plant (see Figure 5). The flight lines observed during this study transected alternative Locations #2 and #3. Therefore, indicating that there is a higher potential for impact in these locations. None of the observed flight lines crossed over Location #1. Nature destroyed the nest in the spring of 2010, and in 2011 a new nest, approximately 1066 meters to the west has been located. All areas of alternative location #1 is outside of a ½-mile radius of the nest.

It is the intention of the Camp Perry ANGS to continue flight path observations during construction of the wind turbine and for a period of one year following construction. A qualified third party will conduct the study. Camp Perry ANGS will prepare and provide a post-construction study to other governmental agencies for review and coordination. Camp Perry ANGS is also performing a pre and post-construction flight path study using the Merlin Detect Avian Radar system for migration patterns. Fall and Spring migration data will be provided in 2 separate reports as part of the Research and Development information for this appropriation. The radar and analytical techniques (Detect Marine radar and software) being used are the same as those now being used by U.S. Fish and Wildlife Service biologists in Wisconsin and Michigan (Matt Stuber, U.S. Fish and Wildlife Service, Lansing, Michigan office).

Based on the findings from this study Adaptive Management techniques and/or operational procedures may be implemented, if necessary, to reduce and/or eliminate the impact to avian species. The Adaptive Management techniques could include techniques such as continued monitoring, mitigation steps,

alternative operation procedures and non-operation during certain time events. Such adaptive management would be contingent on the significance of impacts documented during post-construction studies.

The Ottawa National Wildlife Refuge – Darby Unit located approximately 0.8-miles northeast of the Proposed Action area is sufficient for concentrating water fowl, shore birds, raptors and migrating song birds. ODNR Division of Wildlife conducts bi-weekly regular monitoring of the Ottawa National Wildlife Refuge – Darby Unit with Bi-Weekly Aerial Waterfowl Surveys, conducted from September 1 to January 1 each year. The results of the ODNR monitoring and evaluation are available on their website http://www.dnr.state.oh.us. The most current monitoring was conducted on 4 October 2011. During this period, 56 mallards, 25 gadwalls, 15 wigeon and 2050 cormorants were observed. Compare these statistics to the hunting harvests of these species in Ohio each year (Mallard – ~75,000, Gadwall - ~5,000, and Wigeon - ~600 – from U.S. Fish and Wildlife Service reports) and it is clear that the numbers observed and potential impact to these species from the turbines is nil. This survey also helps identify habitat types critical to waterfowl and helps document waterfowl use of restored wetland projects over time. The survey is flown over 7 selected water areas distributed in the Lake Erie marsh region in northwestern Ohio. This survey is conducted on or near the 1st and 15th of each month, weather permitting. The survey crew identifies and estimates the number of each species of waterfowl encountered on the survey sites. Survey transects are flown at an altitude and route to optimize waterfowl identification and minimize disturbance. ODNR currently has decided to only survey the Lake Erie marsh region because 95% of the waterfowl counted on the survey occur in this part of the state. Waterfowl numbers can fluctuate from day to day in a given location; weather, forage availability and hunting pressure all play a role in waterfowl migration and habitat utilization.

The RED HORSE Squadron has obtained the last five years of historical data to be used as a baseline in determining if any displacement occurs subsequent to the installation of the wind turbine. In addition, the waterfowl will continue to be monitored by ODNR and the future data may be used to substantiate an argument for the displacement or non-displacement of waterfowl in the area.

Although this monitoring data does not take into consideration such factors as abnormal climatic conditions, man-made disturbances and abnormal hunting harvests, the results may be used to provide cursory information relating to the potential displacement of wildlife, as recommended in the Curry and Kerlinger (2007a) report.

Given the closely mowed field in which the turbine would be constructed if location #1 is selected, the lower height of the proposed turbine compared to larger turbines, and raptor migration occurring at heights above the sweep of wind-turbine rotors, significant displacement effects are unlikely (Curry and Kerlinger (2007a). There is no high quality habitat for grassland, forest- interior,

and wetland related species located at or adjacent to location #1. It is clear from a displacement and disturbance perspective that alternative location #1 is the preferred location for the Proposed Action.

**Avian Collision Impacts**

Studies demonstrate a vast majority of nocturnal migration of song birds, waterfowl and shore birds occur at altitudes greater than the height of most modern utility scale wind turbines (122 meters (400 feet)). Note that the proposed wind turbine will less than one-half the height of most utility scale turbines. A small percentage of these species are recorded below this altitude during migration. Post-construction fatality studies, especially those that take into account searcher efficiency and carcass removal by scavengers, indicate that fatalities are relatively infrequent events at US wind farms, averaging 2.51 birds per turbine per year, and 3.19 birds per MW per year. (National Research Council 2007, Erickson et al. 2005). In the eastern US, most (70-80%) of these fatalities are among nocturnally migrating songbirds. Only occasional raptor, waterfowl, or shorebird fatalities have been documented, and no federally listed endangered or threatened species have been recorded (Curry and Kerlinger, LLC, 2007a).

Erickson et al. (2005) has attempted to put this mortality in context. They estimated that collisions from wind turbines resulted in fatalities of 0.01% of the annual bird mortality from human-caused sources (not including hunting). The major mortality sources were buildings (58.2%), power lines (13.7%), cats (10.6%), automobiles (8.5%), pesticides (7.1%) and communication towers (0.5%).

To date, there are more than 25 post-construction fatality studies from wind energy facilities east of the Camp Perry site. Together, these studies have undertaken more than 42,000 individual turbine searches in habitats that vary from farm fields, coastal marshes, Appalachian mountain ridges, Appalachian mountains, forests, and other habitats. Studies have now been undertaken in Maine, Vermont, New York, New Jersey, Pennsylvania, Maryland, West Virginia, Tennessee, and Ontario, and there are ongoing studies in New Hampshire and Massachusetts. Although there is no formal review prepared for these studies, Kerlinger and Guarnaccia (personal communication) have found that at 26 of those sites for a single bird fatality to be detected at these turbines a total of 50 searches would be required. Thus, fatalities of birds are rare events. Fatalities at these sites demonstrate no significant impacts to birds and fatality rates on a per turbine basis are relatively low, ranging from about 2-10+ birds per turbine per year. No eagle fatalities have yet been reported, even on Appalachian Ridges where thousands of eagles migrate each spring and fall. All of these studies have been made available to both state and federal wildlife agencies, including U.S. Fish and Wildlife Service, and most were reviewed by these agencies prior to initiating field work, as well as after final reports were prepared.

There have been numerous studies relating to avian impacts and those of communications towers. Recently, there was an avian impact study in Michigan for the Michigan Public Safety Communication System towers, for which there are about 170 towers (Gehring, Manville, and Kerlinger 2009, 2011). Many of these towers are slightly taller than the proposed turbines at Camp Perry. Results of that study, where searcher efficiency and carcass removal by scavengers is included, suggests an avian mortality of 10,000+ birds per year. This project was approved for construction through the NEPA process via review by federal and state agencies.

A similar set of towers, the MARCS (Multi-Agency Radio Communication System), in Ohio has roughly 200 towers, which are used for public safety. These towers were all subjected to federal environmental review via the NEPA process and all were permitted. This is relevant to the Camp Perry turbine project because the MARCS towers may kill as many as 10,000 birds per year, based on the empirical findings of Gehring, Manville, and Kerlinger for similar towers in Michigan. However, no reliable or valid pre- or post-construction studies of these towers have ever been conducted by U.S. Fish and Wildlife or Ohio Department of Natural Resources biologists, or independent researchers.

It is also important to note that public safety towers like those studied in Michigan and the MARCS towers are also used by the U.S. Fish and Wildlife Service and the Ohio Department of Natural Resources. The latter would also apply to public broadcast towers, such as the WGTE (Toledo public television and radio), which is 965 feet in height and equipped with FAA obstruction lighting and guy wires. The data presented in Gehring, Manville, and Kerlinger 2009, strongly suggest that this tower alone would likely kill 300-400+ birds per year as compared to wind turbines, which kill on the order of about 1% of this number of birds per year. Based on this specific data and actions, it can only be concluded that the impacts of a single small turbine planned for Camp Perry ANG are not significant, in comparison to that of already approved communications and broadcast towers in an adjacent state.

Avian studies at 30 wind farms across North America suggests that fatalities of night migratory birds are minimal at wind turbines especially when compared to tall communication towers with guy wires. No evidence was found of large-scale fatality events at wind turbines or that the flashing red lights normally used on wind turbines cause a large number of fatalities of night migrants. (Kerlinger, et al. 2010)

A study in Michigan of 23 towers indicated that bird fatalities may be significantly reduced by constructing towers without the use of guy wires and constructing shorter towers (116m-146m AGL). (Gehring, Manville and Kerlinger, et al. 2011) This study indicates unguyed communication towers impact species to the magnitude of only about 5% of what guyed towers of the same height impact species.

Preliminary radar system data collected at the Location 1 during the fall 2011 season (August 15-December 15, 2011), indicated avian flight pattern heights significantly above the proposed maximum height of the turbine rotor (60.5m). Mean height was greatest during the nights, averaging 332.4m AGL, 271 m above the tallest point on the proposed turbine's rotor. Daylight flights tended to be lower, but 91.1% of all avian elevations recorded were well above the rotor sweep of the proposed turbine. Thus, the altitude of flight for night migrants is similar to that found during dozens of other radar studies conducted in the eastern United States, so there is no reason to suspect that greater numbers of fatalities of night migrants would likely occur at the Camp Perry turbine.

The avian radar studied during the fall 2011 season also indicated an infrequent occurrence of low visibility events (4.9%) during the nighttime periods. Avian risk collision at night is generally associated with migration at night.

Raptor mortality is even lower at U.S. wind farms. The combined average mortality reported in fourteen U.S. studies analyzed by the National Research Council (NRC 2007) was 0.03 birds per turbine/year and 0.04 MW/year. Overall, risk to raptors from a demonstration wind farm is not likely to be biologically significant (Curry and Kerlinger, LLC, 2007a).

Curry and Kerlinger state that while the construction of a wind turbine does add to the challenges that lakeshore Ohio's birds already negotiate in the regions' airspace, this addition will be negligible. Wind turbines lack the attributes that are implicated in high bird-mortality events.

Impacts to bird populations, which are expected to be low, can be minimized by following recommended siting criteria based on what is known about the effect of wind energy development on birds, and on research and analysis specific to the study area performed by Curry and Kerlinger, LLC (2007b).

Curry and Kerlinger, LLC (2007b) recommend that wind power projects be located:

- in cropland or at an existing industrial site
- at least 800 meters from National Wildlife Refuges (NWR) and bald eagle nests
- 600 meters from wetlands that are >1 ha (2.5 acres) and that concentrate waterfowl populations
- 200 m from high-diversity grassland bird areas

- 400 m from Lake Erie, 200 m from woodlands >1 ha that are >400 meters from Lake Erie

- 200 meters from woodlands along river systems.

Camp Perry ANGS location #1 meets the criteria for the six parameters as identified above.

Camp Perry ANGS is located within the vicinity of an Avian Concern Zone designated by the USFWS and ODNR, is in the Lake Erie Western Basin Important Bird Area (IBA) designated by Audubon Ohio, and is located near three IBAs designated by the American Bird Conservancy (ABC) as of continental importance (Curry and Kerlinger, LLC, 2007a). A unit of one of these IBAs, Ottawa National Wildlife Refuge, is located about 0.8 miles (0.8 km) from Location #1. However, given the mowed lawn on which the turbines would be constructed at Camp Perry ANGS, assuming location #1 is the preferred location, and the low height of the turbine (40 meters (131 feet)) relative to larger commercially available turbines (122 meters (400 feet)), significant impacts due to collision are unlikely. The proposed turbine would be mounted on steel tubular towers rather than flat steel lattice in order to discourage perching and nesting by birds, and raptor migration is likely to occur above the sweep of wind turbine rotors.

Recommendations to minimize collision fatalities at the Camp Perry RDTE project site include:

- Installation of electrical lines within the project site be underground between the turbines. Any new aboveground lines from the site and substations to transmission lines should follow Avian Power Line Interaction Committee (APLIC) guidelines for installation and spacing.

- Installation of free standing vertical structures with no guy wires

- Minimize the size of the access roads, turbine pads, etc., to reduce habitat impacts. Re-grade and seed disturbed soils to reduce potential habitat impacts

- Lighting of turbines and other infrastructure should be minimal to reduce the potential for attraction of night migrating songbirds and similar species. Federal Aviation Administration (FAA) night obstruction lighting should be limited to flashing beacons (L-864 red or white strobe) with the longest permissible off cycle. Steady burning (L-810) red FAA lights should not be used. Sodium vapor lamps and spotlights should not be used at any facility (e.g., lay-down areas or substations) at night except when emergency maintenance is needed.

- Installing an Avian Radar System specifically designed for collecting migratory bird and bat data to collect quantitative data. The Merlin Detect system proposed by the ODOW and USFWS is fully remote viewable and controllable and operates continuously. The software program generates data in both tabular and graphical formats quantifying the number of birds passing through the proposed rotor sweep area. The radar utilizes a dual marine radar configuration that scans in both the vertical and horizontal planes simultaneously, and is able to generate data that claims to be much more accurate and applicable than other study methods. It should be noted that there has been only one study (New York State Energy Research & Development Authority) that has compared radar with actual fatalities and it failed to show any correlation between the two study methodologies. By adopting a mortality survey and a radar survey at this site, the ANG is collecting data for a second comparison of the two commonly used methods to determine pre and post-construction impacts.

  Use of the radar data and that of the post-construction one-year mortality survey will be shared with the appropriate agencies to review and work with the ANGS to devise an appropriate, site-specific, standard operating procedure for the turbine to ensure migratory bird and bat impact minimization resulting from the Proposed Action.

Camp Perry ANGS removed all overhead electrical lines in an effort to reduce avian collision impacts and perching. The program restricts any future installation of over-head utility lines. Therefore, the wind turbine project will not include any overhead utilities.

As stated in the description of the project, the proposed turbine will be lit with FAA approved lighting consisting of red strobe-like lights or newer LED's (FAA type L-864) on the turbine nacelle at about 42 meters (138 feet) above the ground.

The ANGS will have one fall and one spring series of data obtained using the installed radar system prior to the turbine becoming operational as well as continuous data once the turbine is operational that will be utilized by the ANGS to compare to the proposed ground study.

The most significant risk factor for birds at wind turbine facilities is the number of turbines in the project. The fact that the Camp Perry project is proposing only a single, demonstration turbine, is of critical importance. With only a single turbine, potential risk would likely be much, much smaller than at any wind project in eastern North America. And, because fatalities at wind turbines to date, have been randomly distributed, there is no reason to believe that the Camp Perry project could result in significant mortality to birds.

Based on the extensive research available and the physical characteristics of the single proposed turbine, a negligible impact is expected as a result of the single turbine within location #1.

**Impacts to Bats**

The largest threat to bats from wind turbines is collision fatalities. Data collected by North East Ecological Services (2007) from 17 wind projects in 13 different states and Canadian provinces showed estimated annual mortality rates between 0.3 to 47.5 bats per turbine. Migratory bats accounted for 50-100% of these fatalities. These data show that bat mortality is likely to occur at the project site, although there is no existing data to suggest that any state or federal listed bat species, including the endangered Indiana bat, will be significantly adversely affected by the project. Because the number of bat fatalities varies so widely among existing wind projects, an understanding of the baseline migratory activity across the project site during both the fall and spring migratory period is critical in understanding the potential impact of the installation of wind turbines at Camp Perry (North East Ecological Services, 2007).

Bat habitat identified the area around the facility rating is low to medium for adequate habitat for migratory bats according to an initial survey. The nearest potential site for bat habitat is approximately 0.6-miles northwest of Location #1.

The Camp Perry ANGS had a concern regarding the Indiana bat species, and authorized and conducted mist net surveys and acoustical monitoring in the spring and fall of 2011 that yielded no Indiana bat species at the facility.

A one-year post-construction study conducted by a qualified third party will evaluate the impact to bats. Based on the findings from this study, Adaptive Specific Management techniques and/or operational procedures may be implemented to reduce and/or eliminate the impact to migrating bats, if impacts are deemed to be unacceptable or biologically significant. Similar to avian fatality risks previously defined, the Adaptive Specific Management techniques could include techniques such as continued monitoring, mitigation steps, alternative operation procedures and non-operation during certain time events. Although such mitigation has never been demonstrated to be necessary or able to reduce mortality for birds, Arnett et al. (2009) have demonstrated that seasonally focused curtailment of turbines at sites where mortality has been demonstrated to be high, effectively reduced fatalities.

As with birds, the fact that the Camp Perry demonstration project will consist of only a single, small turbine strongly suggests that risk to bats will be minimal.

In summary, location #1 is the best location in the context of minimizing both bat and eagle impacts.

## 4.8 Transportation and Circulation

### 4.8.1 Significance Criteria

Potential impacts on transportation and circulation include disruption or improvement of current transportation patterns and systems, deterioration or improvement of traffic volume, and changes in existing levels of transportation safety. Physical changes to circulation (e.g., closing, rerouting, or creating roads), construction activity, introduction of construction-related traffic on local roads, or changes in daily or peak-hour traffic volumes, which could be increased by either direct or indirect work force and population changes related to facility activities will cause impacts to occur. Impacts on roadway capacities would be significant if roads operate at or above their full design capacity.

### 4.8.2 Construction Related Impacts

The installation of wind turbines at Camp Perry ANGS would require the delivery of materials and turbine components to Camp Perry ANGS, as well as the use of a large crane to install the nacelle and rotor atop the turbine tower. Construction traffic comprises a small percentage of the total existing traffic and many of the vehicles will drive to and stay onsite for the duration of construction, resulting in relatively few additional trips. Furthermore, potential increases in traffic volume associated with proposed construction would be temporary. No explosive materials or munitions will be transported. No long-term changes or adverse impacts on transportation systems are expected. No significant impacts are expected and the criterion does not affect the preferred location selection. Under the No Action Alternative, existing conditions would remain as is and the installation of a wind turbine at Camp Perry ANGS would not occur.

### 4.8.3 Operational Impacts

There will be no impacts to transportation and circulation as a result of the operation of a wind turbine at Camp Perry ANGS.

## 4.9 Visual Resources

### 4.9.1 Significance Criteria

Determination of the significance of the impact on visual resources is based on the level of visual sensitivity in the area. Visual sensitivity is defined as the degree of public interest in a visual resource and concern over adverse changes in the quality of the resource. In general, a potential impact on a visual resource is significant if implementation of the Proposed Action would result in substantial alteration to an existing sensitive visual setting.

### 4.9.2 Construction Related Impacts

Any impacts to visual resources due to the use of a large crane to install wind turbines at Camp Perry would only be temporary; no significant impacts to visual resources as a result of the construction of wind turbines at Camp Perry ANGS are anticipated. Under the No Action Alternative, existing conditions would remain as is and the installation of a wind turbine at Camp Perry ANGS would not occur.

### 4.9.3 Operational Impacts

Erie Township in Ottawa County is mostly rural in nature, and portions of the ARNG property surrounds Camp Perry ANGS to the north and west. These areas include a grenade launcher, shotgun ranges, and abandoned WWII era 5-man hutments. Various manufacturing facilities are also located to the west of Camp Perry in the Erie Industrial Park, and Waste Management, Inc. (a licensed landfill) is located to the south. A nearby residential area lies to the northeast and southwest of the project area at Camp Perry ANGS. Follow setback requirements to avoid significant impact by the wind turbine on visual resources at ANGS.

## 4.10 Cultural Resources

### 4.10.1 Significance Criteria

Analysis of potential impacts on cultural resources considers both direct and indirect impacts.

Direct impacts may occur by the following:

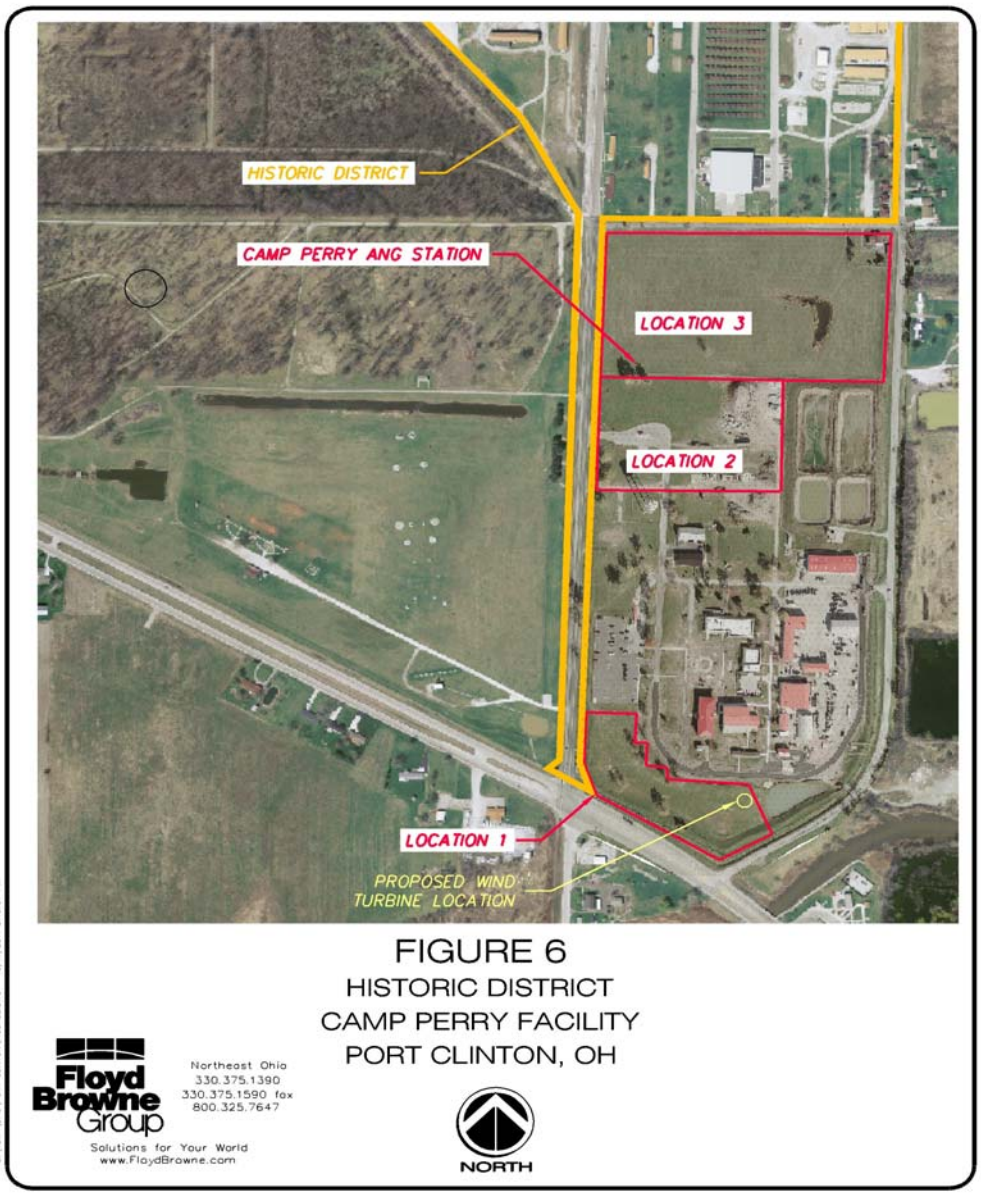
- Physically altering, damaging, or destroying all or part of a resource;
- Altering characteristics of the surrounding environment that contribute to the resource's significance;
- Introducing visual or audible elements that are out of character with the property or alter its setting; or
- Neglecting the resource to the extent that it deteriorates or is destroyed.

Identification of the types and locations of proposed activities and determination of the exact locations of cultural resources affected by such activities forms the basis of assessment of direct impacts. Indirect impacts primarily result from the effects of project-induced population increases and the resultant need to develop new housing areas, utility services, and other support functions necessary to accommodate population growth. These activities and the subsequent use of the facilities may impact cultural resources.

### 4.10.2 Construction Related Impacts

The ANGS conducted a reconnaissance level survey in 2004 (Archaeological Resources Assessment, Environmental Planning Branch ANGS/CEVP, 2004). The results of the Archaeological Resources Assessment suggested that Camp Perry has a low potential for archaeological sites. No impacts to the archeological resources of the Proposed Action area are expected.

There is a historic district (See Figure 6) at Camp Perry, but it does not include the ANGS facilities. The installation of a wind turbine at Camp Perry ANGS is not expected to have any impacts to cultural, historic, or archeological resources. Under the No Action Alternative, existing conditions would remain as is and the Proposed Action would not occur.



### 4.10.3 Operational Impacts

There will be no impacts to cultural resources as a result of the operation of a wind turbine at Camp Perry ANGS. Due to the adjacent historical district, visual impacts from and to the historical districts were analyzed. Due to the water tower, the ANGS building, and the significant utilitarian presence of the ANGS station there is a visual affect, however minimal. See Figure 7.

FIGURE 7
LOCATION #1 - WIND TURBINE ELEVATION
CAMP PERRY FACILITY
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Floyd Browne Group
Solutions for Your World
www.FloydBrowne.com
Northeast Ohio
330.375.1390
330.375.1590 fax
800.325.7647

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## 4.11 Socioeconomics

### 4.11.1 Significance Criteria

The significance of construction expenditure impacts is assessed in terms of direct effects on the local economy and related effects on other socioeconomic resources (e.g., housing). The magnitude of potential impacts can vary greatly, depending on the location of a Proposed Action. For example, implementation of an action that creates ten employment positions may be unnoticed in an urban area but may have significant impacts in a rural region. If potential socioeconomic changes were to result in substantial shifts in population trends or in adverse effects on regional spending and earning patterns, they would be considered significant.

### 4.11.2 Construction Related Impacts

Implementation of the Proposed Action at Camp Perry ANGS would not alter or change the number or personnel or operations on site. Short-term beneficial impacts would occur during construction activities in the area of Camp Perry ANGS due to the purchase of materials and use of labor from the regional work force. However, no long-term benefits would occur, and there would be no changes in socioeconomic patterns or trends. Therefore, socioeconomic impacts would be negligible under the Proposed Action. Under the No Action Alternative, existing conditions would remain as is and the proposed project would not occur. No significant impacts would be expected. Locations #1, #2 and #3 have no measurable difference in this criterion.

### 4.11.3 Environmental Justice

To comply with EO 12898, minority and low-income populations in the study area has been examined and compared to state and national statistics to determine if minority or low-income groups could be disproportionately affected by the Proposed Action. This review indicates that the number of low-income and minority residents in Ottawa County is lower than the state and national averages; however, 94.5 percent of Ottawa County is white, and the average household income for both counties is substantially higher than the US poverty threshold (Ohio Department of Development, 2006). Therefore, the percentage of the population in the study area to be potentially impacted in relation to environmental justice concerns is considered low. In addition, the short-term socioeconomic benefits of increased jobs associated with construction of the Proposed Action would be beneficial. Therefore, no minority or low-income populations would be adversely or disproportionately impacted, in any of the alternative locations.

### 4.11.4 Protection of Children from Environmental Health Risks and Safety Risks

EO 13045 requires that Federal agencies identify and assess environmental health and safety risks that might disproportionately affect children. The Proposed Action would not pose any adverse or disproportionate environmental health risks or safety risks to children living in the vicinity of Camp Perry ANGS. The likelihood of the presence of children at the sites where the Proposed Action would occur is considered minimal, which further limits the potential for any impacts. There would be no significant impacts associated with environmental justice under the Proposed Action, in any of the alternative locations.

### 4.11.5 Consultation and Coordination with Indian Tribal Governments and DoD American Indian and Alaska Native Policy

Federal agencies are required to assess the impact of federal government plans, projects, programs, and activities on tribal trust resources and ensure that tribal government rights and concerns are considered during the development of such plans, projects, programs, and activities. The Proposed Action at Camp Perry is in an area with no known Native American resources. If any Native American artifacts or resources surface during construction, the ANGS will cease construction activities as required by Federal and USAF regulations. The ANGS will not resume work until an archaeological investigation is completed, and Native American tribes consulted, if appropriate. The likelihood of Native American resources being present in the area of the Proposed Action is considered minimal, and therefore no impacts are expected, in any of the alternative locations.

### 4.11.6 Operational Impacts

There would be no impacts to socioeconomic resources as a result of the operation of wind turbines at Camp Perry ANGS, in any of the alternative locations.

## 4.12 Hazardous Materials and Waste

### 4.12.1 Significance Criteria

Numerous local, state, and Federal laws regulate the storage, handling, disposal, and transportation of hazardous material and waste. The primary purpose of these laws is to protect public health and the environment. Potential impacts associated with hazardous material and waste would be significant if the storage, use, transportation, or disposal of these substances were to substantially increase the risk to human health or exposure to the environment.

### 4.12.2 Construction Related Impacts

None of the three former ERP sites at Camp Perry have the potential to be impacted by the Proposed Action. The ERP process has been completed at these former ERP sites, each of which has state-approved closure. A base-wide polychlorinated biphenyl (PCB) survey was previously conducted at Camp Perry. No PCB-containing equipment was located and no evidence of PCB contamination was observed on the property (Air National Guard, Environmental Division, 2004a).

Use of additional hazardous materials is not expected during the implementation of the Proposed Action. The ANGS Hazardous Waste Management plan controls use, storage, and disposal of these materials. Therefore, the Proposed Action would not result in any significant impacts. Under the No Action Alternative, existing conditions would remain as is and the installation of wind turbines would not occur. No significant impacts would be expected in any of the alternative locations.

### 4.12.3 Operational Impacts

No hazardous waste or hazardous materials will be generated as the result of the operation of wind turbine at Camp Perry ANGS. No significant impacts would be expected in any of the alternative locations.

## 5.0 CUMULATIVE IMPACTS

### 5.1 Introduction

The Council on Environmental Quality regulations stipulates that the cumulative impacts analysis within an EA consider whether the potential environmental impacts resulting from the “incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions.” Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

### 5.2 Reasonably Foreseeable Actions

For the next five years, no additional Camp Perry ANGS construction or demolition projects are scheduled. In addition, there are no construction or demolition projects identified in the immediate vicinity of Camp Perry ANGS, including State or Federal level projects. The Ohio Department of Transportation indicated no future construction projects within the immediate vicinity as did the Lake Erie Business Park. No other future wind projects were identified in the area.

## 5.3 Summary of Cumulative Impacts

### 5.3.1 Greenhouse Gas Impacts

The proposed wind turbine would displace fossil fuel electricity ultimately reducing net emissions of carbon dioxide. This installation, coupled with the reduction of 46 tons of carbon dioxide and the production of approximately one third of the electricity of Camp Perry ANGS station from the solar array installed previously, reduces Camp Perry ANGS's carbon footprint and provides guidelines for other facilities in Ohio.

### 5.3.2 Visual Resources

The proposed action would affect the viewshed in the project area. The wind turbine would be a vertical component in the landscape due to its height. The water tower and building would be in the viewshed of the proposed project and therefore, there would be a small cumulative visual impact. See Figure 7.

### 5.3.3 Biological Resources

Operation of the single wind turbine would result in a very small incremental increase in the number of birds and bats killed by wind turbines in the region. Because existing wind energy projects in Ohio are scattered throughout the state, and there are no known plans for construction of wind turbines in the immediate area around Camp Perry, the project, in combination with these other wind energy projects, would not result in a concentration of bird or bat mortalities in the Ottawa County area. Certainly, the turbine would not result in significant impacts to the populations of any listed or common species.

# 6.0 SUMMARY OF FINDINGS

A summary of the potential environmental impacts for the proposed construction activity (Proposed Action) are included in the following section. A written summary for each potential impact was included in Section 4. During the development of the assessment, 3 field studies, an avian risk assessment study, two independent bat surveys, a fall & spring bat mist netting study, a fall migration avian radar study (DeTect MERLIN radar system), record review of ODOW migratory bird survey data, were completed to fully understand and author a comprehensive comparative analysis of potential impacts associated with this Research & Development project.

From analysis of the criteria, alternative location #1 is the preferred location, providing the smallest disturbed earth footprint, providing a similar land use, located adjacent to a renewable energy resource and providing a location the greatest distance away from an existing eagle's nest and a location away from flight paths from the nest. Photographs of location #1 are included in the Appendix.

**Safety.** There are no potential safety impacts involved in the implementation of the proposed project. A short-term minor impact would be anticipated due to increased vehicular traffic associated with construction activities. The increase in traffic is not considered a major impact, but would require coordination to ensure a safe environment is maintained.

The proposed wind turbine will be equipped with a fail-safe mechanical braking gear that will shut the turbine down in the event of high winds or in the case of ice build-up that causes irregular rotation. This braking system will prevent catastrophic damage to the turbine, local environment, and/or surrounding area.

**Air Quality**. No significant effects would be expected as a result of the Proposed Action. Ambient air quality would not be changed by the Proposed Action. Minor air pollutant emissions may result from grading and filling operations during construction, but these emissions will be temporary and would not be expected to generate any off-site impacts.

**Noise**. Implementation of the Proposed Action would have minor, short-term, adverse effects on the noise levels in the vicinity of the proposed construction site. After completion of proposed construction activities, the project would not significantly change existing noise levels. Overall, noise impacts associated with the Proposed Action would be negligible.

**Land Use**. The Proposed Action would result in a beneficial impact on land use since each Proposed Action has been sited to consolidate activities, facilitate

functionality, and correct current operational inefficiencies based on short term and long term land use plans as outlined in the station Master Plan. Therefore, there would be a beneficial impact on Camp Perry ANGS.

**Geological Resources**. The Proposed Action would not cause or create significant changes to the topography of Camp Perry ANGS. Therefore, no significant impact on regional or local topography or physiographic features would result from implementation of the Proposed Action. Implementation of best management practices during construction would limit potential impacts resulting from construction activities.

**Water Resources**. Implementation of the Proposed Action is expected to have no adverse effects on water quality. Adherence to proper engineering practices and applicable codes and ordinances would reduce storm water runoff-related impacts to a level of insignificance. Camp Perry ANGS does not lie within a 100-year floodplain. A wetlands delineation (United States Army Engineer Research and Development Center, 2000) conducted on Camp Perry Military Reservation identified 10.04 acres of wetlands at Camp Perry Joint Training Center; however, these are entirely on ARNG property. There are no wetlands located at Camp Perry ANGS. Therefore, no significant adverse impacts on the proposed facilities or floodplains would be expected.

**Biological Resources**. Implementation of the Proposed Action is expected to have limited and minor effects to Biological Resources.

Vegetation and Habitat – Under the Proposed Action, mowed vegetation and landscaped areas would be disturbed around the area requiring construction. Such habitats do not support endangered or threatened species, so loss of such habitat would not impact endangered or threatened species. Affected areas would be reseeded or replanted immediately following the construction period. Additionally, the size of the roads, turbine pads, and ancillary structures will be reduced to the most practical dimensions to reduce disturbance to vegetation and soil as much as possible. Therefore, the Proposed Action would have a minimal impact on vegetative communities.

Wetlands - Wetland surveys conducted at Camp Perry ANGS have determined that no wetlands are present in the Proposed Project Location; therefore, the Proposed Action is not expected to impact any wetlands.

Wildlife – Due to the lack of habitat in the area of the Proposed Action, no impacts to any terrestrial, amphibian, or aquatic federal or state listed species are anticipated due to the Proposed Action.

Avian and Bat Species – Camp Perry is located within the vicinity of an Avian Concern Zone and Important Bird Areas (IBA). Such zones do not

have legal protection and are not legally binding regarding development and use of land. There has also been no peer review of the IBA process, nor was one done by those designated the Camp Perry or private properties nearby as part of that process. The Ottawa National Wildlife Refuge – Darby Unit is located approximately 0.8-miles northwest of the Proposed Action area. The predominant types of birds expected in the Proposed Action area are songbirds, with lesser number of raptors, and water birds flying over or near the site. Four bald eagle nests were identified within a three-mile radius of Camp Perry. None of the nests were located within ½-mile of alternative location #1.

Wind turbines present two major types of potential impact to avian and bat populations including; 1) disturbance/displacement and 2) collision. Water fowl and shore birds are more likely to be affected by disturbance or displacement, although these species will be very rarely on site because of the absence of suitable habitat for them. A small number of raptors may be affected by collision, but those potential fatalities are not likely to result in biologically significant impacts. Studies show that migrating nocturnal song birds, water fowl and shore birds typically travel at altitudes higher than the proposed turbine. Therefore, collision impacts are less likely to be a concern for these species. Eagles observed flying over Camp Perry ANGS primarily flew along fixed or regular flight paths north of location #1. Therefore, collision impacts to these species are not expected. As with avian species, some minor affects to bat species may result from the Proposed Action. No Indiana Bat (federally endangered) habitats or Indiana bats in misting surveys were observed in location #1. Therefore, no affects to the Indiana Bat is anticipated as part of this Proposed Action.

The placement of a single, small demonstration wind turbine on the Camp Perry property will not likely result in significant adverse effects to local or regional avian and bat populations. The collision impacts to birds and bats will likely be localized, most resulting from the birds and bats that hunt, nest, or breed in the general proximity of Camp Perry. Some night migrating birds may also be affected. Thus, the impact to any particular species is likely to be nil. Location #1 is absent of natural vegetation and wildlife habitat. It is positioned near State Route 2 and State Route 358.

Camp Perry ANGS will authorize a qualified third party to conduct one year of post construction monitoring. This study will be prepared and submitted to other governmental agencies for review. Following the one-year monitoring period and based on the results of the study, an evaluation will be made to determine the effect that the wind turbine has on avian and bat species.

Contingent upon the results of the 1-year post-construction data collection for this Research and Development project, Camp Perry ANGS will evaluate the need to implement Adaptive Management techniques to reduce the impact to associated receptors. The primary criterion for this evaluation will be whether impacts to birds and bats are proving to be biologically significant and impacting populations of any species. The Adaptive Management could include such things as continued monitoring, mitigation steps, and alternate operational procedures such as curtailment during defined hours and, or seasons. The Camp Perry ANGS will consult with other government agencies, peer reviewed literature and industry experts to determine the best adaptive management approach for further Research and Development of wind technologies in accordance with the appropriation.

Federal or State Listed Species - No impacts to any terrestrial, amphibian, or aquatic federal or state listed species are anticipated as a result of this Proposed Action. Due to the expected flight altitudes of most migrating avian species and the conditions observed within the area of the Proposed Action, no listed avian species are anticipated to be affected by the Proposed Action.

**Transportation and Circulation**. The construction of the Proposed Action would require delivery of materials to and removal of debris from construction sites at Camp Perry ANGS. Potential increases in traffic volume associated with proposed construction activities would be temporary. No long-term changes or adverse impacts on transportation systems are expected.

**Visual Resources**. The Proposed Action will be designed and constructed to be visually consistent with the existing environs and compatible with existing facilities and structures. No impact to visual resources is anticipated as part of the Proposed Action.

**Cultural Resources**. Based on previous archaeological and historic assessments conducted at Camp Perry, it is not likely that the Proposed Action will involve sensitive cultural resources.

**Socioeconomics**. Implementation of the Proposed Action at Camp Perry ANGS would not alter or change the number of personnel or operations onsite. Short-term beneficial impacts on regional socioeconomics would occur during construction activities in the areas of Camp Perry ANGS due to the purchase of materials and use of labor from the regional work force. No long-term benefits would occur, and there would be no changes in socioeconomic patterns or trends. However, this project publicizes and promotes the usage of renewable energy sources for individual; corporate and industrial energy independence. This project will promote the use of renewable energy technologies in the local

area. The Proposed Action will provide a positive impact to the overall socioeconomic pattern and trend in Ottawa County.

The percentage of the population in the study areas to be potentially impacted in relation to environmental justice concerns is considered low. Therefore, no minority or low-income populations would be adversely or disproportionately impacted. The likelihood of the presence of children at the sites where the Proposed Action would occur is considered minimal, which further limits the potential for any impacts. The likelihood of Native American resources being present in the areas of the Proposed Action is considered minimal, and therefore no impacts are expected.

**Hazardous Materials and Wastes**. No ERP sites have the potential to be impacted by the Proposed Action. Temporary use of additional hazardous materials is expected during implementation of the construction project. As new facilities are constructed, the 200 RHS would revise and update the 200 RHS Interim Hazardous Waste Management Plan to reflect current hazardous waste accumulation locations. The Proposed Action includes construction in areas that are already developed. Therefore, the Proposed Action would not result in significant impacts.

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# APPENDIX A

Photographs

# APPENDIX B

Biological Resources

# APPENDIX C

Hazardous Materials

# APPENDIX D

Distribution List & Errata Sheets

**IICEP CORRESPONDENCE**
**EA FOR PROPOSED WIND TURBINE CONSTRUCTION**
**AT THE 200 RHS**
**CAMP PERRY ANGS STATION**

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Division of Soil and Water Conservation
Ohio Department of Natural Resources
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# APPENDIX E

Public Advertisement

# APPENDIX F

Indian Tribal Consultation Record

# EXHIBIT 7

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

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September 25, 2012

Environmental Engineer, 1st Lt Roger Nienberg
Department of the Air Force
200th Red Horse Squadron
Camp Perry ANG Station
Port Clinton, OH 43452-9577

TAILS # 31420-2010-CPA-0306

RE: Final Environmental Assessment, Phase IV Renewable Energy Wind Demonstration at 200th RHS Camp Perry Air National Guard Station, Ohio

Dear Lt. Nienberg:

This letter is in regards to the Final Environmental Assessment (EA) for the Phase IV Renewable Energy Wind Demonstration at 200th RHS Camp Perry Air National Guard Station, received by this office on August 28, 2012. This EA has been submitted to satisfy the requirements of the National Environmental Policy Act (NEPA, 40 CFR §§1500-1508). The proposed project involves the installation of a single wind turbine with a capacity of 500-600 kW, and a maximum height of 198 feet, on the Camp Perry Air National Guard (ANG) property, located at 1200 N. Camp Perry E. Road, Port Clinton, Ottawa County, Ohio. The turbine would be installed on the ANG property, which is leased by the ANG, and is a small portion Camp Perry overall.

The Service previously outlined our significant concerns regarding this project in letters dated December 4, 2007, April 8, 2010, and June 16, 2010. Additionally we had a meeting onsite in December 2009, and a follow-up conference call on February 23, 2010. We recently met on July 31 and September 5, 2012 to discuss the EA.

Prior coordination documented that the proposed project is located within the western Lake Erie region, an area that supports significant populations and diversity of migratory birds, a Federal trust resource managed by the U.S. Fish and Wildlife Service (Service). This is reflected in the designation of both Federal and State wildlife refuges nearby, the designation of Western Lake Erie as an Important Bird Area by Audubon Ohio, and the proximity of the site to the shoreline of Lake Erie. Because of the density and diversity of migratory birds within the region, and the behavior of these birds during migration, we believe that siting a wind turbine at the proposed location presents a high level of risk to migratory birds. Further, we believe that Federal agencies should work closely with us in siting turbines to minimize the potential effect on wildlife resources, setting a good example for the public to follow. The current site, due to its proximity to state and Federal areas designated for the protection of wildlife, the shoreline of

Lake Erie, and wildlife resources including bald eagles and migratory birds, does not reflect a site that is minimizes potential effect on wildlife. However, ANG has indicated that because this is a "demonstration project" there is flexibility in the operation of the turbine, and has requested that the Service provide recommendations for how the project could be operated to reduce the potential risk to migratory birds. This letter responds to that request, and addresses other issues as well.

Our June 16, 2010 letter recommended that an Environmental Impact Statement (EIS) should be completed for the following reasons: the analysis in the draft EA failed to fully analyze the effects of the action prior to project implementation; the action would present uncertain risks to migratory birds and bald eagles that were not fully evaluated, minimized or mitigated within the EA; and the EA did not consider the potential for violation of the Bald and Golden Eagle Protection Act (BGEPA, 16 U.S.C. 668-668d) or Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) from project operation. In some instances we still believe that the final EA does not adequately address these issues. This letter lays out the Service's recommendations for addressing each of these potential EIS triggers. The Service recommends that the NEPA decision document identify measures that ANG will implement to ensure that none of these EIS triggers are met.

The Service has reviewed the EA and we are providing the following comments and concerns for your review and consideration. These comments are being provided pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.,* ESA), MBTA, BGEPA, and NEPA.

ENDANGERED SPECIES COMMENTS:

The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a federally listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. During winter, Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

(1) dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas;
(2) live trees (such as shagbark hickory and oaks) which have exfoliating bark;
(3) stream corridors, riparian areas, and upland woodlots which provide forage sites.

Summer Period

Suitable habitat for the Indiana bat exists within the Camp Perry property and surrounding area, but not within the project area. As requested in our December 2007 and June 2010 letters, mist net surveys to detect the presence or likely absence of Indiana bats were conducted at Camp Perry on June 7-8, and August 25-26, 2011. Surveys were conducted by John Timpone, a

Service permitted Indiana bat surveyor (Permit #TE120231-1). Mist nets were deployed at four locations per night for a total of 16 net nights. In total, 29 bats of four species were captured during the surveys. Species captured included big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), little brown bat (*Myotis lucifugus*), and northern bat (*Myotis septentrionalis*). No Indiana bats were captured during the survey.

The results of the mist net survey indicate that it is unlikely that Indiana bats are using the forested areas at Camp Perry during the summer maternity period.

Winter (and Fall Swarming) Period

In fall just before entering caves for hibernation, Indiana bats use the surrounding forested area to forage and build up fat reserves for their 6-7 month hibernation period. Data available suggest that Indiana bats will forage up to 10 to 20 miles from their hibernacula. Turbines placed within this fall swarming range may take Indiana bats. As the location of your proposed wind turbine is not within 20 miles of any known or suspected Indiana bat hibernacula, we believe it is unlikely that your project will take Indiana bats during the fall swarming and hibernation periods.

Migration Period

The majority of all documented bat fatalities across U.S. and Canada have occurred during the fall migratory season (Arnett et al. 2008). Most of these mortalities were long-distance migratory tree bats, which are a group of bats that exhibit substantially different behaviors during migration than species like Indiana bat. It is currently suspected that these differences make the long-distance migratory tree bats more susceptible to exposure to wind turbines than other guilds of bats. Although not as frequently recorded, there have been a notable number of fatalities for other species of bats as well, with several Indiana bat mortality incidents detected at wind power facilities in Indiana, Pennsylvania, and West Virginia. These observations confirm that other bats, including Indiana bats, are also susceptible to mortality from wind turbines during the migration period.

Interactions between bats and wind turbines, particularly small-size, single turbines, are poorly understood, and therefore appropriate siting and operation of wind power facilities to avoid and minimize take remains our most effective tool. Generally speaking, we expect that Indiana bats are less vulnerable to take at small wind facilities. However, there is a confounding factor of height of the rotorswept area with the smaller-sized turbines. Data on the height at which Indiana bats fly while migrating is lacking. Mortality of little brown bats at wind facilities across the range indicate that this closely related species migrates within the rotorswept area of commercial turbines. This coupled with the record of Indiana bats fatalities at several commercial wind facilities during fall migration suggests that Indiana bats may often fly at heights that intersect commercial sized turbines during migration. Furthermore, the Indiana bat fatalities occurred in an agricultural area suggesting that unlike the summer period, Indiana bats may migrate through open areas during fall migration. For these reasons, we believe that Indiana bats are susceptible to wind turbine mortality anywhere within the range of Indiana bats during migration. However, we expect the area of exposure (rotorswept area) to be substantially less at

single wind turbines than the cumulative rotorswept area of commercial sized facilities, so too should be the likelihood of an Indiana bat intersecting a turbine.

No Indiana bats were detected during summer mist net surveys at Camp Perry, indicating that it is unlikely that a maternity colony of Indiana bats exists at Camp Perry. Further, the area to the north of the project is primarily developed or mowed grass associated with the larger Camp Perry parcel, and north of that is Lake Erie. It is unlikely that Indiana bats would persist north of the project area where suitable habitat is very limited, and with Lake Erie north of Camp Perry it is unlikely that any maternity colonies of Indiana bats occur north of the project site at all. Therefore it is unlikely migrating Indiana bats would be crossing over the project area when moving between summer habitat and hibernation habitat.

Although we believe there is risk of exposure anywhere throughout the range of Indiana bat, in areas where suitable habitat is nearby, the risk of mortality likely is substantially higher. Data from migration studies elsewhere in the range indicate that Indiana bats will fly at or above the tree canopy level during the migration period (Gumbert et al. 2011). While there is a paucity of data on Indiana bat landscape use during spring migration in the Midwest Recovery Unit (which includes Ohio), there is some evidence that during spring migration Indiana bats go out of their way to follow tree lines, including riparian buffers along streams through otherwise developed areas, and avoid open areas (Sanders and Chenger 2001, Turner 2006, Sailor, Service, pers. Comm. 2011, Gumbert et al. 2011). Information on fall migratory patterns are lacking, though Indiana bats may be more likely to cross open areas as evidenced by the two fatalities at the Fowler Ridge facility which is in a primarily agricultural landscape.

Given the above, we believe in order to sufficiently minimize the risk of taking of Indiana bats during the summer and migratory periods, single wind turbines should be located greater than 1,000 ft. from woodlots and forested stream corridors. Further, any associated construction activity should avoid potentially suitable roosting, foraging or commuting habitats. These measures will, we believe, substantially minimize the potential exposure of Indiana bats to your wind turbine and harm from habitat modification. As your proposed project involves a single turbine, is located greater than 1,000 feet from forested habitat, is situated such that it is unlikely any maternity colonies exist north of the project area, and no habitat will be impacted by construction of the project, we believe it is extremely unlikely that Indiana bats would be taken by the proposed project during the migratory period.

The proposed project lies within the range of the federally listed endangered **piping plover** (*Charadrius melodus*). Piping plover habitat includes sand or pebble beaches with sparse vegetation along the shore of Lake Erie. While piping plovers do not currently nest in Ohio, they migrate through Ohio during spring and fall as they travel between their breeding and wintering grounds. Multiple records for this species occur in Ottawa County, Ohio (Figure 1). Plovers can be expected to stop-over along the shore of Lake Erie during the period of time between April 1-May 31 (spring migration) and July 15-Aug. 31 (fall migration).

The proposed project lies within the range of the **Kirtland's warbler** (*Setophaga kirtlandii*), a federally listed endangered species. The Kirtland's warbler is a small blue-gray songbird with a bright yellow breast. This species migrates through Ohio in the spring and fall, traveling

between its breeding grounds in Michigan, Wisconsin, and Ontario and its wintering grounds in the Bahamas. While migration occurs in a broad front across the entire state, approximately half of all observations in Ohio have occurred within 3 miles of the shore of Lake Erie (Figure 1). During migration, individual birds usually forage in shrub/scrub or forested habitat and may stay in one area for a few days. Migrating Kirtland's warblers can be expected to stop-over along the shore of Lake Erie during the period of time between April 22 – June 1 (spring migration), and Aug. 15 – Oct. 15 (fall migration). During migration, the Western basin of Lake Erie has the highest concentration of Kirtland's warbler observation of any place in the nation, outside of Michigan, where it breeds.

Little is known about how either the piping plover or Kirtland's warbler respond to wind turbine operation, and little is known about their migratory behavior. We do know that both species migrate at night and rest during the day. It is possible that these species could pass through the project area during the spring and fall migration seasons, and as wind turbines have been documented to cause mortality of migrating birds, mortality of these species due to turbine operation is possible. The small rotor-swept area of the turbine may help to minimize the exposure of these species, however the proposed location of the project relative to known stop over locations and the proximity of the project to Lake Erie may expose these species to risk from the turbine.

At this time, due to a lack of site-specific information on the presence or likely absence of these species within the project area, and lack of site-specific radar information regarding general bird flight heights, timing, and angles of ascent and descent relative to stopover sites, we cannot rule out the potential that take of either of these species could occur. However, because we know that these species migrate at night and would only be likely to occur within the project area during spring and fall, risk to these species could be minimized by not operating the wind turbine at night during the spring and fall migratory period for these species (combined, from April 1-June 1, and from July 15-Oct. 15).

We request that ANG make a determination of effects under Section 7 of the ESA, for Indiana bat, piping plover, and Kirtland's warbler, and submit it to this office for concurrence. The determination of effects should also include a rationale for why each determination is appropriate, listing any proposed avoidance and minimization measures that will be implemented to reduce the likelihood of take.

The proposed project lies within the range of the **rayed bean** *(Villosa fabalis)*, **Lakeside daisy** *(Tetraneuris herbacea),* **eastern prairie fringed orchid** *(Platanthera leucophaea),* and **eastern massasauga** *(Sistrurus catenatus catenatus),* federally listed endangered, threatened, and candidate species, and the **Lake Erie Watersnake** (*Nerodia sipedon insularum),* a Federal species of concern. Due to the project type, size, and location, the project, these species would not be expected to occur within the project area, and no impacts to these species are anticipated. Relative to these species, this precludes the need for further action under the ESA. Should, during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be initiated to assess any potential

impacts.

BALD EAGLE COMMENTS:

**Bald eagles** (*Haliaeetus leucocephalus*) are protected under the MBTA, but are afforded additional legal protection under BGEPA. The Service published Draft Eagle Conservation Plan Guidance (ECPG) for public review and comment in January 2011 (Service 2011). Although this document was intended to guide actions relative to large scale wind developments, the ECPG suggests several ways of assessing risk and effects to eagles that are valid to apply to smaller-scale wind developments, such as this one. One of these is to identify "important eagle-use areas" that overlap project areas. Important eagle-use areas are defined as, "an eagle nest, foraging area, or communal roost site that eagles rely on for breeding, sheltering, or feeding, and the landscape features surrounding such nest, foraging area, or roost site that are essential for the continued viability of the site for breeding, feeding or sheltering eagles." The ECPG further defines important eagle-use areas to include migration corridors and migration stop-over sites. The ECPG suggests that project proponents should identify all important eagle-use areas within a 10-mile perimeter of a project footprint.

Ottawa County has the highest nesting density of bald eagles in the State of Ohio. There are **60** known bald eagle nests within 10 miles of the proposed project area; the nearest nest is located approximately 0.58 miles northwest of the project area. Take of bald eagles at several wind power facilities in the eastern U.S. and Canada has recently been documented, including take of a bald eagle at a single small turbine.

Detailed recommendations regarding pre-construction monitoring for bald eagles at the ANG site were provided in our April 2010 letter. We understand that due to funding constraints, no monitoring was carried out. Therefore, we have very limited site specific information to use in quantifying potential eagle risk at the project site. Instead, we must consider the information we have for the greater project area and make a qualitative analysis of eagle risk.

Breeding Season Analysis

Presence of nests and breeding areas indicates an important eagle-use area. There are 60 bald eagle nests within 10 miles of the project footprint (Figure 2). One of these nests is within the woodlot on Camp Perry property, and is located approximately 0.58 miles northwest of the project footprint. Due to a lack of site-specific information, we are unable to describe the home range of this pair (the area traveled by the individual in its normal activities of food gathering, mating, and caring for the young). In the absence of this information, it may be appropriate, as outline in the ECPG, to use known nests in the project vicinity to estimate home range. The mean value of distances between nests within a 10-mile radius is known as the inter-nest distance. The inter-nest distance for eagle nests within 10 miles of ANG is 0.96 mi. One-half of this distance, the distance that represents a coarse approximation of territory size and boundary according to the ECPG, is 0.48 miles. There are no nests within this ½ inter-nest distance from the project. As such, according to this method of territory size estimation, your project may not overlap an eagle breeding territory (eagle use area). You should note, however, that the eagle

nest at 0.58 miles northwest of the project is very close to overlapping the project based on the aforementioned ½ inter-nest distance. Since territory size may vary, perhaps substantially, among territories in this area, we recommend additional information be acquired to determine that there is no overlap between this territory and the proposed project.

Migration and Winter Season Analysis

As mentioned above, migration corridors and stopover sites are included in the definition of an important eagle-use area. Newton (1979) documented that bald eagles avoid large water bodies during migration and funnel along the shoreline, often becoming concentrated in situations where movement requires water crossings. The southwest shore of Lake Erie is known to concentrate raptors, including bald eagles, during migration and during the winter months.

Point Moulee State Game Area in Michigan is the closest Hawk Migration Association of North America monitoring site to the project area. They report bald eagle migration along the shoreline during fall (Sept.-Oct) migration over 26 years (1983-2010) (http://hawkcount.org/month_summary.php?rsite=631&ryear=2010&rmonth=10&sec=prevm). Fall migration in Sept. and Oct., from 1983-2010 (excluding 1985, 1989, and 1990 when no surveys were done) average 0.43 bald eagles per hour of observation. Observations range from 0 (1988) to 1.1 (2010 and 2007) bald eagles per hour of observation, with a generally increasing trend in more recent years.

Black Swamp Bird Observatory completed the 18th year of a comprehensive, long-term study to monitor the movement and dynamics of raptor migration along the southwest shore of Lake Erie in 2009. The study involves daily raptor migration counts at a series of sites within the western Lake Erie basin. Over the 18 year study an average of 0.21 bald eagles per hour of observation within the region have been observed during spring migration (http://www.bsbo.org/research/pdf/BSBO_2009_Raptor_PR.pdf). Observations range from 0.02 (1991) to 0.61 (2008) bald eagles per hour of observation, with a generally increasing trend in more recent years. The six most recent years have the highest observation rates.

A query of the Avian Knowledge Network (avianknowledge.net) database documents multiple observations of bald eagles within Ottawa County during the months of Dec. – Feb. from 1991-2011, demonstrating that large concentrations of eagles winter in the region as well.

Overall, these migration and wintering data indicate the presence of a migration corridor and stopover area for bald eagles along the western basin of Lake Erie, which would include the project area. As such, it seems likely that your project may overlap another type of eagle use area – a migration and wintering area.

Recent amendments to the BGEPA outlined the limited issuance of permits that authorize the take of eagles when such take is associated with otherwise lawful activities, cannot practicably be avoided, and is compatible with the goal of stable or increasing eagle breeding populations. Additional criteria for permit issuance are outlined in the BGEPA (*50 CFR 22.26 and 22.27*).

The application package for bald eagle permits and guidance on the permit application process is available at:
http://www.fws.gov/midwest/MidwestBird/EaglePermits/baeatake/application.html.

Given the above breeding season and migration/winter season risk analysis, we believe incidental take of bald eagles may be likely over the life of this project. According to the eagle permit regulations, (50 C.F.R. Part 22), incidental take of bald eagles can be permitted if certain conditions are met. Without a permit, any eagle take resulting from the construction or operation of the turbine would be unlawful and the ANG may be liable.

You should note that, to obtain a programmatic eagle take permit, the developer must commit to minimize impacts to eagles to the maximum degree achievable. Additionally, any anticipated take must be deemed by the Service to be compatible with stable or increasing breeding populations. To better evaluate impacts to eagles from this project, we recommend pre-construction monitoring be implemented consistent with the methods and goals outline in the ECPG (adapted appropriately for a single turbine) and the recommendations included in our April 2010 letter. We recommend this monitoring be followed up with rigorous post-construction monitoring consistent with the methods and goals outline in the ECPG (again, adapted appropriately for a single turbine project) and consistent with ODNR's single turbine monitoring protocol, in order to validate predictions made from pre-construction monitoring data.

Prior to issuing an eagle take permit, the Service must analyze all effects to the human environment from this action as prescribed by NEPA. If a NEPA analysis for the project has already been completed by another Federal agency, the Service may choose to adopt some or all of that analysis, which can streamline the eagle take permit issuance process. Because ANG has completed a NEPA analysis (EA) for this project, if the Service agrees with the findings of the EA we could simply reference some or all of those findings to streamline our NEPA analysis should ANG apply for an eagle take permit. In the "EA COMMENT" section below, we provide detailed comments on the EA such that it could be updated and used in a Service NEPA analysis to streamline permit issuance.

The following avoidance and minimization measures have been recommended by the Service to reduce impacts of wind turbines to eagles. However you should note that, in situations where eagle risk may be relatively high, these measures may not be sufficient to meet aforementioned criteria for permit issuance.

- Land management practices that may attract potential eagle prey to within the turbine footprint will be avoided. Examples of activities to avoid in the vicinity of the turbine site:
  - Seeding forbs or other vegetation that attracts small mammals
  - Piling rocks or other debris that may provide shelter for small mammals
  - Storing parts and farm equipment that may provide shelter for small mammals
  - Establishing new water sources, such as ponds and drainage-ways without consulting with FWS.

- Non-avian carcasses (deer, raccoons, farm animals, etc.) found within 100 meters of the turbine will be immediately removed and disposed of properly.
- As measured from the base of the turbine support structure, gravel at least 2-inches deep shall be placed all the way around the turbine for a distance of at least 5 feet to minimize the chance of mammals burrowing.
- The turbine support structure will be monopole with no guy wires or lattice components.

MIGRATORY BIRD COMMENTS:

The MBTA implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for allowing unauthorized take, the Service recognizes that some birds may be taken during activities such as wind turbine operation even if all reasonable measures to avoid take are implemented.

The Service published *Land-Based Wind Energy Guidelines* in March 2012 (Service 2012) to aid developers in selecting sites with comparatively low risk to wildlife. We encourage any company, including small wind developers, proposing a new wind project to consider the Guidelines and Best Management Practices (Attachment 1) to minimize impacts to migratory birds and bats. The full text of the guidelines is available at http://www.fws.gov/windenergy. While take of all migratory birds protected under MBTA is prohibited, the Service will regard a developer's or operator's adherence to the Guidelines as appropriate means of identifying and implementing reasonable and effective measures to avoid the take of protected species. The Service will take adherence to the Guidelines into account when exercising discretion with respect to referring take of migratory birds at wind projects for prosecution.

Limited site-specific migratory bird data is available to evaluate the potential effects to birds within the project area. ANG installed an avian radar system on-site in 2011 to collect data on bird (and bat) migration within the project area. Data were collected during fall 2011 and spring 2012 migration periods, but it is our understanding that upon analysis, much of the data was corrupted and unusable.

The larger Camp Perry parcel developed an Integrated Natural Resources Management Plan (INRMP), which was finalized in 2007 (Ohio Army National Guard 2007). As part of the INRMP development, planning level surveys for birds were conducted in 2005, and 114 bird species were recorded (INRMP Appendix C). Nine of these species were state-listed as endangered, threatened, species of concern, or special interest at that time. Nine out of the 114 species are listed on the Service's Birds of Conservation Concern List (Service 2008): Pied-billed Grebe (*Podilymbus podicpes*), Bald eagle, Hudsonian godwit (*Limosa haemastica*), Short-billed dowitcher (*Limnodromus griseus*), Common tern (*Sterna hirundo*), Black-billed cuckoo (*Coccyzus erythropthalmus*), Red-headed woodpecker (*Melanerpes erythrocephalus*), Wood thrush (*Hylocichla mustelina*), and Rusty blackbird (*Euphagus carolinus*).

With only limited site-specific information to quantitatively inform potential collision risk to migratory birds, we must use consider the information we have for the greater project area and make a qualitative analysis of migratory bird risk. The presence of large State and Federal wildlife refuges along the southwestern Lake Erie shoreline concentrate waterfowl/waterbirds, raptors, and neotropical songbirds during various portions of the year. Of these bird groups, songbirds and raptors are among the most likely to be killed at wind turbines.

Lake Erie serves as a migration barrier for some raptor species, which rely on thermal air drafts originating over land to fly. These raptors instead fly along the shoreline of the lake, and annual surveys by Black Swamp Bird Observatory (http://www.bsbo.org/raptor/current_year_raptor_migration_survey.htm) have documented more than 10,000 raptors migrating through and around the project area each spring.

As described in detail in our Dec. 4, 2007 letter, the project area lies within a region that is globally significant for migratory birds:

> The project lies within 0.6 miles of Ottawa National Wildlife Refuge (Ottawa NWR, Refuge), managed by the U.S. Fish and Wildlife Service. Ottawa NWR was established in 1961 under the authority of the Migratory Bird Conservation Act "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 U.S.C. 715d). According to the Ottawa NWR Comprehensive Conservation Plan (Service 2000), the refuge "...provides critical wetland habitats for a diversity of wildlife, fish and plants. As a major migration corridor, the area is vital to migratory birds including waterfowl, shorebirds, raptors, and songbirds that need rest and food either after crossing Lake Erie on their way south or before they head back north over the water. As much as 70% of the Mississippi flyway's population of black ducks use Lake Erie marshes for migration." Furthermore, Ottawa NWR has been designated as a site of regional significance in the Western Hemisphere Shorebird Reserve Network and the American Bird Conservancy has identified the refuge as a Globally Important Bird Area. According to the Refuge's bird list brochure (http://www.fws.gov/midwest/Ottawa/wildlife_wildlands.htm), "The Ottawa NWR complex is regularly recognized as one of the top birding sites in the nation, receiving recognition most recently as a Top 10 birding destination from "Birder's World" magazine."

A total of 308 bird species have been documented at Ottawa National Wildlife Refuge between 1969-2004 (http://www.fws.gov/midwest/Ottawa/wildlife_wildlands.htm).

Ottawa National Wildlife Refuge and the surrounding state wildlife areas are known to provide stopover habitat for night-migrating landbirds as they travel between their summer and winter grounds. As daylight approaches, night-migrating landbirds search for areas to stop and rest. For those birds caught migrating across large bodies of water such as Lake Erie, the closest resting habitats are those natural areas closest to the shoreline. According to Ewert et. al (2005), "landbirds may be particularly concentrated at the shoreline to 0.4 km (0.25 mile) from the shoreline. Relatively high numbers occur at least 1.7-5 km (1 - 3 miles) inland from Great Lakes

shorelines, particularly along wooded and brushy beach ridges, and in areas with high aquatic insect productivity." The proposed project area lies within 1 mile of the Lake Erie coast. Birds stopping over during migration would be expected to travel at lower altitudes than migrating birds, and would be more susceptible to turbines than birds in locations that do not provide migration stopover habitat. The sheer number of birds passing through the region during migration, coupled with the proximity of the project to the Lake, indicates a high probability of bird mortality due to turbine strikes.

Avoidance and Minimization Measures for Migratory Birds

On pages 16, 18, and 64-65, the EA documents a suite of measures that will be implemented onsite to reduce potential impacts to migratory birds. These include:

1. Installation of all electrical lines for the project underground;
2. Use of FAA approved lighting, to include red strobe-like lights or newer LEDs (but no steady-burning lights);
3. Reduction in number of turbines from original project design to just one turbine in current project design;
4. No guy wires will be used;
5. Footprint of impacts has been minimized, and only impacts are to mowed grass areas; and
6. Installation of an avian radar system to assist in post-construction monitoring.

The Service notes and appreciates inclusion of these measures to protect migratory birds. We agree that these are standard best-management practices that have been documented to reduce risk to migratory birds in various situations. However, because this project represents a high risk to migratory birds based on the overall project setting, we recommend additional measures be implemented to further reduce risk. These are described below:

1. As discussed at our meeting on September 5, 2012, shutting off the turbine during times of highest risk to migratory birds is one way to reduce the potential for take. ANG indicated that because this was a "demonstration project," it would be possible to shut turbines down at various times when protected species were most at risk. Service migratory bird biologists identified dates and times when birds might be most at risk from collisions with turbines. Based on bird banding data and general information on migration patterns for various groups of birds, dates for peak migration within western Lake Erie were determined to include: spring migration, 15 March-30 May; and fall migration, 15 Aug-31 Oct.

   When considering when most bird flights would be occurring within the rotor-swept zone (during dawn when birds land, and during dusk when they take off), the following timeframes were determined to be highest risk: Dusk: 1 hour before sunset -1 hour after sunset. Dawn: 2 hours before sunrise-1 hour after sunrise. Use of curtailment during these dates and times may help to minimize risk to migratory birds in general from operation of the wind turbine. However, note that migration dates and suggested curtailment timeframes for Kirtland's warblers and piping plovers provided under "ENDANGERED

SPECIES COMMENTS" above are somewhat different than the generalized dates and timeframes for all migratory birds. Following the suggested curtailment protocol for Kirtland's warbler and piping plover would be protective of these federally-listed species and would also reduce collision risk to other migratory birds.

2. As discussed at our meeting on September 5, 2012, minimizing and down-shielding lighting at ANG or the larger Camp Perry parcel that is near the proposed turbine location may also help to minimize potential risk to migratory birds. The Service recommends that ANG evaluate the current lighting near the turbine and identify any opportunities to extinguish unnecessary night lights, or down-shield any lights that are necessary.

3. As discussed at our meeting on September 5, 2012, and in multiple places in the EA, ANG has purchased an avian radar unit to monitor pre- and post-construction bird and bat use of the project area. We understand that the pre-construction data was corrupted and unusable, but that the radar is still available for post-construction data collection. The Service would like to work with ANG to devise an appropriate post-construction monitoring protocol (for example, ODNR's single turbine monitoring protocol), in conjunction with use of the radar. Further, if ANG partners with Universities to study bird and bat use of the project area in subsequent years or decides to purchase and operate a "SCADA" unit for the radar to help minimize bird and/or bat mortality, the Service would like to be a partner in these efforts.

4. Several areas of the EA address use of an adaptive management strategy to respond to post-construction monitoring results. As discussed during our September 5, 2012 meeting, the Service believes that creation of an adaptive management plan is appropriate for this project area, considering the high bird use in the greater project area. We would like to assist ANG in developing this plan. We strongly recommend that the adaptive management plan identify triggers for adaptive management and potential responses, considering the number, species, and status of individual birds or bats impacted.

5. Finally, ANG should document all appropriate avoidance and minimization measures that will be taken to reduce risk to migratory birds and describe how that fits within the Service's *Land-Based Wind Energy Guidelines* framework to demonstrate an intent to comply with MBTA.

EA COMMENTS:

The following comments are specific to the content of the EA, and page numbers are noted where appropriate.

1. The summary table of Environmental Consequences, Avian and Bat section and Federal or State Listed Species sections on page 8 should be updated, consistent with our recommendations on content in other portions of the document described below.

2. Page 18 lists a series of measures to be implemented to reduce impacts to wildlife. Item e) includes use of an avian radar system and the results of one year of post-construction mortality monitoring "to devise an appropriate, site-specific, standard operating procedure for the turbine to ensure migratory bird and bat impact minimization resulting from the Proposed Action." We note and appreciate inclusion of this commitment. As discussed during our September 5, 2012 meeting, the Service and ODNR would like to work collaboratively with ANG to devise an appropriate post-construction monitoring protocol (for example, ODNR's single turbine monitoring protocol), and to interpret the avian radar survey results to devise this operating procedure.

3. Page 32 documents that "Curry and Kerlinger, (2007a), documented more than 300 avian species in the wildlife areas around ANGS and it is possible that some migratory, transient and resident avian species fly across the alternative locations project area. It is unlikely that they stop to feed or rest here, but it is possible that Canada geese use the detention pond within location #1 to some extent, due to their high populations in the region and documented use of other small ponds within Camp Perry." We are unclear if these statements are in reference to the alternatives locations, or to the project area. Regardless, these statements imply that only Canada geese would use the project area, but fail to consider that the project area includes not only the turbine footprint on the ground, but also the airspace occupied by the turbine. Any bird species flying through the project area could be considered to be using the project area.

4. Page 32 identifies four bald eagle nests within a three mile radius of Camp Perry ANG. The Service and ODNR continue to monitor eagle nests within Ohio, and updated numbers of bald eagles nests are provided in the "BALD EAGLE COMMENTS" section of this letter, and in Figure 2.

5. Page 33 addresses potential impacts to Indiana bat from habitat loss or degradation, but does not address potential take associated with barotrauma or collision with the turbine blades. See our comments in the "ENDANGERED SPECIES COMMENTS" section of this letter. Further, this section addresses "existing conditions" so it would seem more appropriate to include the assessment of impacts in the "Impacts to bats" section on page 66.

6. Page 53 discusses the Significance criteria for biological resources: "Impacts on biological resources are significant if species or their habitats are adversely affected over relatively large areas, or if disturbances cause reductions in population size or adversely affect the distribution of a species." This section goes on to describe impacts to all wildlife, including ESA-listed animals, bald eagles, and migratory birds. While this definition of significance may be appropriate from a NEPA standpoint, this is not consistent with impacts to species protected by the ESA, BGEPA, or MBTA. Both ESA and BGEPA prohibit take of *individual* animals protected under the respective statutes without a permit. Take is broadly defined to include actions such as harming, harassing, injuring, and killing. Take that is incidental to otherwise lawful activities can be permitted under both ESA and BGEPA, if the criteria for issuance of a take permit

described under the statute is met. Any take of *individuals* protected by ESA or BGEPA that occurs outside of a permit is unlawful. MBTA is a strict liability statute that prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for allowing incidental take, the Service published *Land-Based Wind Energy Guidelines* in March 2012 to aid wind power developers in minimizing potential impacts to migratory birds from wind turbines. The Service will regard a developer's or operator's adherence to the Guidelines as appropriate means of identifying and implementing reasonable and effective measures to avoid the take of protected species. The Service will take adherence to the Guidelines into account when exercising discretion with respect to referring take of migratory birds at wind projects for prosecution. While making a determination of significance under NEPA is appropriate to do within the EA, the EA should also discuss each of these laws in their own context, including the thresholds for evaluating impacts to individual animals. Separate from the EA, ANG should make a determination of effects under Section 7 of the ESA, and submit it to the Service for concurrence (see "ENDANGERED SPECIES COMMENTS"). Further, ANG should determine whether or not take of individual bald eagles is likely to occur, and if take is likely, apply for a take permit under BGEPA. Finally, ANG should document all appropriate avoidance and minimization measures that will be taken to reduce risk to migratory birds and describe how that fits within the Service's *Land-Based Wind Energy Guidelines* framework to demonstrate an intent to comply with MBTA.

7. Page 55, section 4.7.3. states that "minor impacts to avian and bat populations may occur." This statement broadly characterizes bird and bat impacts but later subsections describe impacts in detail. It seems inappropriate to include this conclusion at the beginning of the section. Further, this is not the standard under MBTA. Please see comment number 6 above.

8. Page 55, section 4.7.3.1, second bullet, should read "...*barotrauma or* collision with turbines or other infrastructure."

9. Section 4.7.3.1 addresses operational impacts to wildlife in three subsections: a) Avian Displacement and Disturbance; b) Avian Collision Impacts; and c) Impacts to Bats. Throughout the "Avian Displacement and Disturbance section, discussion of collision impacts to birds (specifically Kirtland's warbler) are included. This discussion should instead be included in the "Avian Collision Impacts" section.

10. Multiple references to Erie Shores Windfarm, in Ontario, Canada, occur throughout the document (see pg. 55, 56). It should be noted that a juvenile bald eagle mortality occurred at this site in 2009, and the mortality was confirmed by Bird Studies Canada (pers. comm. Debbie Badzinski, Bird Studies Canada, 2010).

11. Page 56 discusses "the Lake Erie Wind Farm." We are unclear as to which installation this is referring to and where it is located.

12. The discussion of Kirtland's warbler occurs on pages 56-57. Overall, the Service does not agree with the analysis provided in this section. Simply because a Kirtland's warbler mortality has not been documented at a communication tower does not mean that collision risk at all communication towers is non-existent. Similarly, because a Kirtland's warbler mortality has not been documented at communications tower or wind turbine does not mean that the risk at this particular turbine is zero. Risk of take is a combination of the design of the project, the location of the project, the known distribution of the species relative to the project location, and a number of other factors. Further, just because a communication tower (or other project) has been built and has completed the NEPA process, this does not mean that the project has no effect on ESA-listed species. Consultation and/or permits addressing the effects may have occurred. The statement that "It is not likely that tall structures influence the population of this [Kirtland's warbler] or other endangered or threatened species" in inaccurate because an analysis of impacts to all "other endangered or threatened species" from "tall structures" has never been completed. Whether or not the "population" of Kirtland's warblers will impacted is not the appropriate threshold for analysis. The analysis should consider whether the project will result in take of individuals. The Service's recommendations relative to Kirtland's warbler are found in the "ENDANGERED SPECIES COMMENTS" section of this letter.

13. The discussion of impacts to piping plover is addressed on page 59. This analysis is inadequate. The Service's recommendations relative to piping plover are found in the "ENDANGERED SPECIES COMMENTS" section of this letter.

14. Page 59 lists two actions intended to avoid displacing birds at the ANG, however the two actions involve pre-construction studies, which would not avoid displacement.

15. Page 59 describes an eagle flight path study that was conducted from 3 January 2008-25 February 2008, where eagles were observed flying near alternative locations 2 and 3. The EA concludes that "none of the observed flight lines crossed over Location #1" (proposed project location). The Service does not believe that the eagle flight path study that was conducted was sufficient to conclude that bald eagles are not flying through the proposed project area during all seasons or all times of year. As outlined in our letter of April 2010, additional eagle monitoring was recommended to document eagle use of the project area. ANG commits "to continue flight path observations during construction of the wind turbine and for a period of one year following construction." The Service recommends starting this monitoring as soon as possible to help in assessing risk to eagles from the proposed project. Further recommendations relative to bald eagles are included in the "BALD EAGLE COMMENTS" section of this letter.

16. Pages 59 and 65 discuss a proposed "pre-and post-construction flight path study using the Merlin Detect Avian Radar system for migration patterns." We are uncertain if this is proposed for bald eagles, or for all birds. Please provide clarification. We do not know if the radar unit can be used to specifically detect and monitor bald eagle (as distinguished from other raptors) flights through the project area. Further, we understand from our recent meeting that most of the pre-construction radar flight data was corrupted and is not

usable. Therefore it is not clear what data would be used for pre-construction comparison.

17. Pages 59-60 discuss adaptive management in limited detail. As discussed during our September 2012 meeting, we do believe it would be appropriate to establish an adaptive management plan for the proposed project, but this plan should be much more detailed than what is currently laid out in the EA. The adaptive management plan should include some thresholds or triggers and a suite of potential responses. The Service is willing to assist ANG in developing the adaptive management plan for the project (also see Comment 32 below).

18. Page 60 describes the quantity of waterfowl observed during one survey event to the total harvest of waterfowl state-wide in Ohio per year to assess potential impacts to waterfowl. This comparison of one survey date with state-wide annual harvest numbers is inappropriate. At a minimum, season-long survey data (available from ODNR and/or Ottawa National Wildlife Refuge) for the region should be considered to gain a better idea of movement patterns of waterfowl over an annual period. Further, the comparison of waterfowl harvest (a managed and permitted activity) to mortality from wind turbines is not appropriate. The conclusion that, "it is clear that the numbers observed and potential impact to these species from the turbines is nil" is inaccurate. Individual birds may be taken by the proposed turbine, if they fly within the project area.

19. Page 60 discusses the potential for displacement of waterfowl from installation of the turbine, and states that ODNR's waterfowl monitoring data will be used to determine if waterfowl are displaced because of the project. The Service believes it is unlikely that displacement of waterfowl will occur from installation of a single turbine at the proposed location.

20. Page 61 addresses avian collision impacts, and states that, "fatalities are relative infrequent events at US wind farms, averaging 2.51 birds per turbine per year, and 3.19 birds per MW per year" and cites documents from 2007 and 2005. The Service has recently compiled bird mortality data for 43 studies at 30 wind facilities in the Atlantic and Mississippi Flyways (Attachment 2). Unfortunately, none of these studies are from Ohio or Michigan, and only one is from Indiana, because very little data is available for mortality at wind projects in this area. These studies resulted in an average of 4.2 birds per MW per year, but results varied considerably depending on the project location. The Service strongly believes that the likelihood of bird mortality is strongly related to the siting of the project (as described within the Service's *Land-Based Wind Energy Guidelines)*, and therefore, using averages to determine the likelihood of bird mortality may only be relevant if the project area is also "average" in terms of bird habitat and use. As documented extensively in our letter of December 2007, the greater project area is globally significant for migratory birds, and therefore application of an "average" mortality rate in this instance is not appropriate. There are few wind power projects along the shoreline of the Great Lakes for which post-construction bird mortality data is available. Wolfe Island, Canada is one utility-scale project located on the shoreline with publicly available, rigorous, post-construction monitoring that reported considerably

higher than average bird mortality rates (6.99 birds per turbine at Wolfe Island in 2009). Post-construction monitoring data is currently being collected at several single turbine projects in Ohio. Data collection for a full year is only complete for one site, a single turbine in an urban area near Cleveland. This site reported 10 bird fatalities and 4 bat fatalities (pers. comm., Jennifer Norris, ODNR 2012).

21. Page 61 discusses bald eagle mortality from wind turbines. To date, the Service is aware of four bald eagle mortalities in the eastern U.S. and Canada from wind projects (1 in Ontario, 2 in Iowa, and 1 in Maryland). Further, 1 bald eagle mortality was reported from Montana, and 2 have been reported from Wyoming.

22. Page 62 discusses studies of collision impacts to migratory birds from communication towers, and concludes that towers kill more birds than wind turbines therefore the impacts of a wind turbine project at ANG are not significant. While the discussion of impacts to birds from communication towers may be relevant in some ways to wind turbines impacts (e.g., it may inform a lighting protocol that is more protective of migratory birds), the direct comparison between impacts of communication towers vs. impacts of turbines is not appropriate in this context. Further the site-specific location of the wind project is thought to strongly influence the risk to migratory birds, therefore the studies of communication towers at inland locations may not be relevant to the proposed project. The total impacts resulting from the proposed action should be the focus of the EA.

23. Page 62 states "no evidence was found of large-scale [migratory bird] fatality events at wind turbines..." This is not accurate. Episodic bird mortality events primarily associated with lighting at or near wind turbines have been documented on several instances. In September 2011 at the Mount Storm Wind Energy Facility in WV, 59 bird carcasses were found on one day, 31 of which were found at one turbine whose internal nacelle light had been inadvertently left on overnight (WEST, Inc. 2011). The previous night's weather had been foggy, and the nacelle light was thought to have attracted the birds to the turbine. Another episodic mortality event at a wind facility occurred in heavy fog during spring migration at Mountaineer Wind Energy Center in West Virginia and consisted of 33 passerine fatalities. After the event was recorded in the vicinity of a substation and three turbines which were brightly lit, the lights were extinguished and no other episodic events have been recorded since (Kerns and Kerlinger as cited in NRC 2007).

24. Page 63 discusses that an avian radar system was installed onsite to collect bird migration data in fall 2011. The EA provides conclusions about flight heights and bird risk based on this radar data. However, during the September 2012 meeting the Service requested access to the radar data, and ANG indicated that nearly all of the data had been corrupted and was unusable and that the final report submitted by the consulting firm that summarized the data had been rejected by ANG because they were not comfortable with the findings. The Service questions how the EA can make conclusive statements about bird risk based on radar data that ANG determined was corrupted and inadequate? The Service recommends that these statements be removed from the document.

25. Page 63 concludes that "risk to raptors from a demonstration wind farm is not likely to be biological significant." This is not the standard under MBTA. Service recommendations on addressing risk to all migratory birds are addressed in "MIGRATORY BIRD COMMENTS" section of this letter.

26. Page 63 provides a bulleted list of recommendations for wind power siting, provided by Curry and Kerlinger, LLC, however it is not clear how these siting recommendations were arrived at, and what the biological basis for the recommendations is. No reference is made to the Service's Land-Based Wind Energy Guidelines which describe siting recommendations in detail. We recommend careful consideration of the Service's Land-Based Wind Energy Guidelines when assessing potential siting of the proposed project.

27. Page 64 indicates that ANG "is located within the vicinity of an Avian Concern Zone designated by the [Service] and ODNR." Neither ODNR nor the Service has formally designated "Avian Concern Zones." ODNR's pre-construction monitoring protocol identifies that the project area falls within "extensive" survey effort. The Service has expressed concerns that wind projects within 3 miles of the Great Lakes shoreline may impact migratory birds more so than wind projects located further inland.

28. Page 64 states, "However, given the mowed lawn on which the turbines would be constructed at Camp Perry ANGS, assuming location #1 is the preferred location, and the low height of the turbine… relative to larger commercially available turbines…, significant impacts due to collision are unlikely." Under the MBTA, all take of migratory birds without a permit authorizing such take is illegal. There is not a significance threshold. Instead, according the Service's *Land-Based Wind Energy Guidelines,* "Developers of distributed or community scale wind projects …should consider the presence of habitats or species of concern before siting projects." Service recommendations on addressing risk to all migratory birds are addressed in "MIGRATORY BIRD COMMENTS" section of this letter.

29. Page 65 discusses that because the ANG proposal is for only one turbine, risk to birds will be small. While the Service agrees that, in general, a single turbine is likely to have less impact on birds than multiple turbines, our concern is that the site selected for the single turbine is within an area used by large numbers and diversity of birds. The Service's *Land-Based Wind Energy Guidelines* directs wind turbines to be sited within areas that do not present high risks to wildlife. As a Federal government agency, we hope to work with other Federal agencies to set good examples for siting wind turbines in areas of lower risk to wildlife. With no site-specific data indicating otherwise, we believe that the significant habitat features in the surrounding landscape and documented significant bird use of these areas indicates the proposed site poses a high risk to migratory birds.

30. Page 77 summarizes the project impact on avian and bat species as described in earlier sections of the document. As described in detail in the comments above, the Service disagrees with some of these conclusions. Changes made to the body of the EA should be carried through into this Summary section.

31. Pages 77-78 (also 66, 65, 59) discuss a one-year post-construction monitoring effort to document bird and bat mortality levels at the project site. Various portions of the document indicate that the study will involve radar data, and imply use of carcass collection as well. We note and appreciate inclusion of this commitment. As discussed during our September 5, 2012 meeting, the Service and ODNR would like to work collaboratively with ANG to devise an appropriate, detailed, post-construction monitoring protocol (for example, ODNR's single turbine monitoring protocol).

32. Page 78 describes criteria for implementing adaptive management. We do not believe it is appropriate to conclude that, "The primary criterion for this evaluation [of need to implement adaptive management] will be whether impacts to birds and bats are proving to be biologically significant and impacting populations of any species." Instead, we recommend evaluating species impacted, status of impacted species (endangered or threatened at Federal or State level, Bird of Conservation Concern), number of individuals taken, etc. The triggers for adaptive management should be laid out ahead of time in an adaptive management plan. The Service is willing to assist ANG in developing the adaptive management plan for the project.

Thank you for the opportunity to provide comments on this proposed project. Please contact biologist Megan Seymour at extension 16 in this office for further information.

Sincerely,

Megan Seymour

for Mary Knapp, Ph.D.
Supervisor

Cc: Mr. Dwayne Groll, Floyd Browne Group, 450 Grant St., Akron, OH 44311-1183
Ms. Jenny Norris, ODNR, Bld. G, Columbus, OH
Mr. Matt Stuber, USFWS, East Lansing, MI
Mr. Ron Huffman, Ottawa NWR, Oak Harbor, OH
Mr. Sean Marsan, USFWS, Bloomington, MN
Mr. Steve Katich, Chief of Staff for Rep. Marcy Kaptur, 1 Maritime Plaza, 6th Fl., Toledo, OH 43604-1853

Enclosures:

Figure 1. Kirtland's warbler and piping plover migration records in proximity to the project area.

Figure 2. Bald eagle nests within a 10-mile radius of ANG.

Attachment 1: U.S. Fish and Wildlife Service Land-based Wind Energy Guidelines (2012), Chapter 7, Best Management Practices

Attachment 2: Results and Estimates of Annual Avian Mortality Based on Publicly Available Data from 43 Studies at 30 Different Wind Power Facilities that Fall Within the Eastern Flyways. Table 5.15-3 in: Draft Environmental Impact Statement for the Proposed Habitat Conservation Plan and Incidental Take Permit for the Indiana Bat (*Myotis sodalis*) for the Buckeye Wind Power Project, Champaign County, Ohio.

Citations:

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[Service] U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp.

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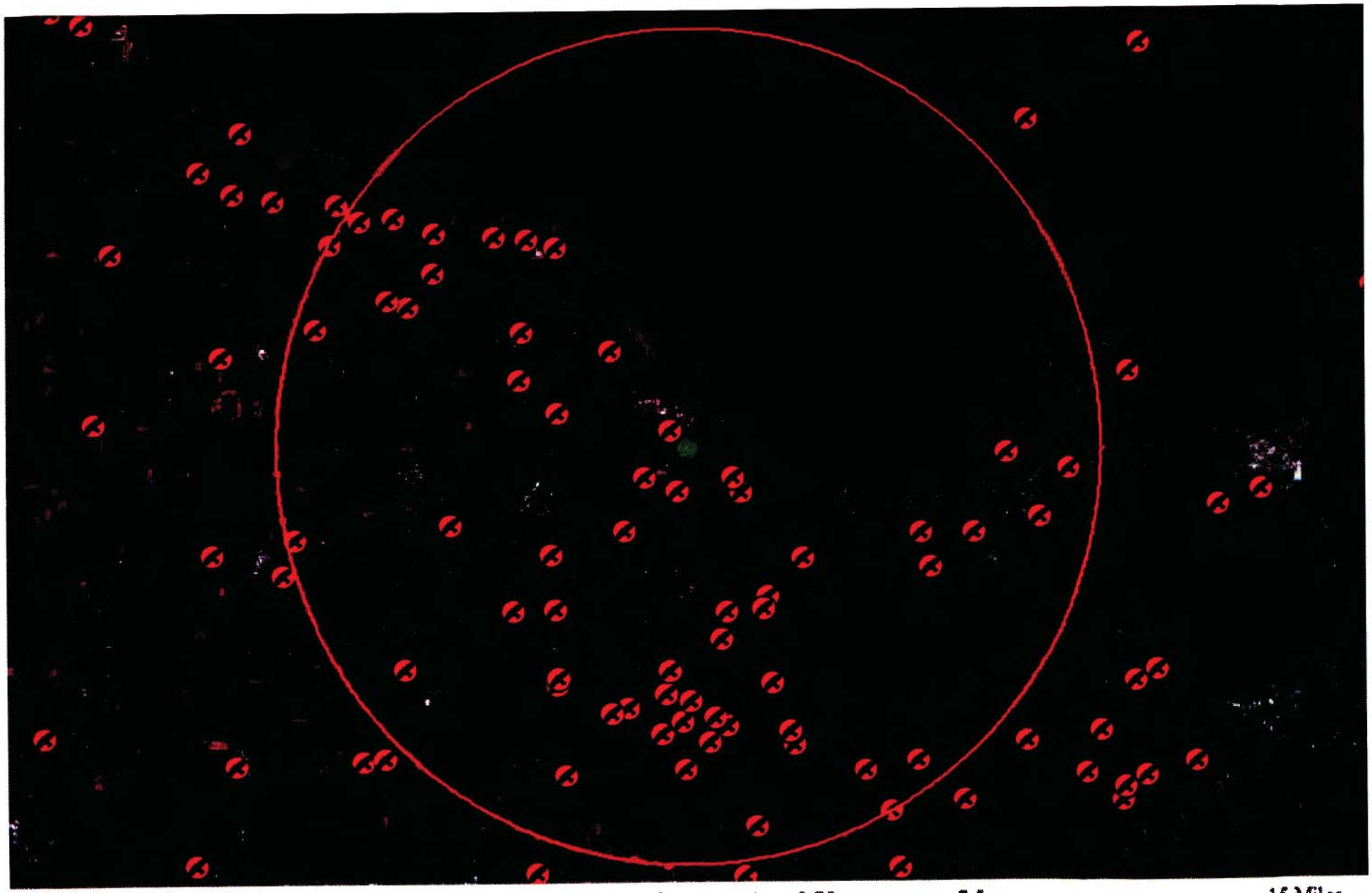
WEST, Inc. 2011. Memo Re: Avian/Bat Monitoring Sept. 25, 2011 at the NedPower Mount Storm LLC Wind Energy Facility. 2 pp.

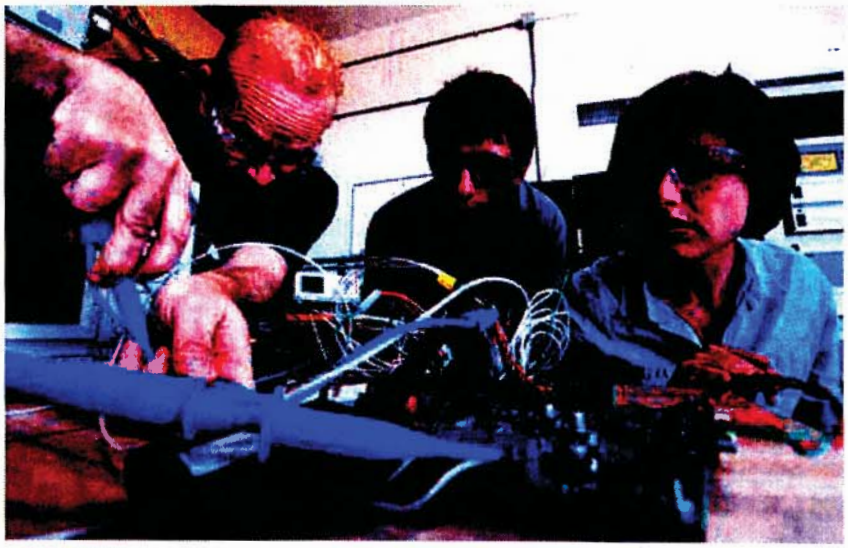

0
4.75
9.5
19 Miles
Kirtland's warbler observation
Piping plover observation
Proposed Camp Perry turbine location


0
3.75
7.5
15 Miles
Bald eagle nest
Proposed Camp Perry turbine location
10 mile buffer of turbine location

# Chapter 7: Best Management Practices

### Site Construction and Operation

During site planning and development, careful attention to reducing risk of adverse impacts to species of concern from wind energy projects, through careful site selection and facility design, is recommended. The following BMPs can assist a developer in the planning process to reduce potential impacts to species of concern. Use of these BMPs should ensure that the potentially adverse impacts to most species of concern and their habitats present at many project sites would be reduced, although compensatory mitigation may be appropriate at a project level to address significant site-specific concerns and pre-construction study results.



*Wind electronic developers. Credit: NREL*

These BMPs will evolve over time as additional experience, learning, monitoring and research becomes available on how to best minimize wildlife and habitat impacts from wind energy projects. Service should work with the industry, stakeholders and states to evaluate, revise and update these BMPs on a periodic basis, and the Service should maintain a readily available publication of recommended, generally accepted best practices.

1. Minimize, to the extent practicable, the area disturbed by pre-construction site monitoring and testing activities and installations.

2. Avoid locating wind energy facilities in areas identified as having a demonstrated and unmitigatable high risk to birds and bats.

3. Use available data from state and federal agencies, and other sources (which could include maps or databases), that show the location of sensitive resources and the results of Tier 2 and/or 3 studies to establish the layout of roads, power lines, fences, and other infrastructure.

4. Minimize, to the maximum extent practicable, roads, power lines, fences, and other infrastructure associated with a wind development project. When fencing is necessary, construction should use wildlife compatible design standards.

5. Use native species when seeding or planting during restoration. Consult with appropriate state and federal agencies regarding native species to use for restoration.

6. To reduce avian collisions, place low and medium voltage connecting power lines associated with the wind energy development underground to the extent possible, unless burial of the lines is prohibitively expensive (e.g., where shallow bedrock exists) or where greater adverse impacts to biological resources would result:

   a. Overhead lines may be acceptable if sited away from high bird crossing locations, to the extent practicable, such as between roosting and feeding areas or between lakes, rivers, prairie grouse and sage grouse leks, and nesting habitats. To the extent practicable, the lines should be marked in accordance with Avian Power Line Interaction Committee (APLIC) collision guidelines.

   b. Overhead lines may be used when the lines parallel tree lines, employ bird flight diverters, or are otherwise screened so that collision risk is reduced.

   c. Above-ground low and medium voltage lines, transformers and conductors should follow the 2006 or most recent APLIC "Suggested Practices for Avian Protection on Power Lines."

7. Avoid guyed communication towers and permanent met towers at wind energy project sites. If guy wires are necessary,

bird flight diverters or high visibility marking devices should be used.

8. Where permanent meteorological towers must be maintained on a project site, use the minimum number necessary.

9. Use construction and management practices to minimize activities that may attract prey and predators to the wind energy facility.

10. Employ only red, or dual red and white strobe, strobe-like, or flashing lights, not steady burning lights, to meet Federal Aviation Administration (FAA) requirements for visibility lighting of wind turbines, permanent met towers, and communication towers. Only a portion of the turbines within the wind project should be lighted, and all pilot warning lights should fire synchronously.

11. Keep lighting at both operation and maintenance facilities and substations located within half a mile of the turbines to the minimum required:

    a. Use lights with motion or heat sensors and switches to keep lights off when not required.

    b. Lights should be hooded downward and directed to minimize horizontal and skyward illumination.

    c. Minimize use of high-intensity lighting, steady-burning, or bright lights such as sodium vapor, quartz, halogen, or other bright spotlights.

    d. All internal turbine nacelle and tower lighting should be extinguished when unoccupied.

12. Establish non-disturbance buffer zones to protect sensitive habitats or areas of high risk for species of concern identified in pre-construction studies. Determine the extent of the buffer zone in consultation with the Service and state, local and tribal wildlife biologists, and land management agencies (e.g., U.S. Bureau of Land Management (BLM) and U.S. Forest Service (USFS)), or other credible experts as appropriate.

13. Locate turbines to avoid separating bird and bat species of concern from their daily roosting, feeding, or nesting sites if documented that the turbines' presence poses a risk to species.

14. Avoid impacts to hydrology and stream morphology, especially where federal or state-listed aquatic or riparian species may be involved. Use appropriate erosion control measures in construction and operation to eliminate or minimize runoff into water bodies.

15. When practical use tubular towers or best available technology to reduce ability of birds to perch and to reduce risk of collision.

16. After project construction, close roads not needed for site operations and restore these roadbeds to native vegetation, consistent with landowner agreements.

17. Minimize the number and length of access roads; use existing roads when feasible.

18. Minimize impacts to wetlands and water resources by following all applicable provisions of the Clean Water Act (33 USC 1251-1387) and the Rivers and Harbors Act (33 USC 301 et seq.); for instance, by developing and implementing a storm water management plan and taking measures to reduce erosion and avoid delivery of road-generated sediment into streams and waters.

19. Reduce vehicle collision risk to wildlife by instructing project personnel to drive at appropriate speeds, be alert for wildlife, and use additional caution in low visibility conditions.

20. Instruct employees, contractors, and site visitors to avoid harassing or disturbing wildlife, particularly during reproductive seasons.

21. Reduce fire hazard from vehicles and human activities (instruct employees to use spark arrestors on power equipment, ensure that no metal parts are dragging from vehicles, use caution with open flame, cigarettes, etc.). Site development and operation plans should specifically address the risk of wildfire and provide appropriate cautions and measures to be taken in the event of a wildfire.

22. Follow federal and state measures for handling toxic substances to minimize danger to water and wildlife resources from spills. Facility operators should maintain Hazardous Materials Spill Kits on site and train personnel in the use of these.

23. Reduce the introduction and spread of invasive species by following applicable local policies for invasive species prevention, containment, and control, such as cleaning vehicles and equipment arriving from areas with known invasive species issues, using locally sourced topsoil, and monitoring for and rapidly removing invasive species at least annually.

24. Use invasive species prevention and control measures as specified by county or state requirements, or by applicable federal agency requirements (such as Integrated Pest Management) when federal policies apply.

25. Properly manage garbage and waste disposal on project sites to avoid creating attractive nuisances for wildlife by providing them with supplemental food.

26. Promptly remove large animal carcasses (e.g., big game,

domestic livestock, or feral animal).

27. Wildlife habitat enhancements or improvements such as ponds, guzzlers, rock or brush piles for small mammals, bird nest boxes, nesting platforms, wildlife food plots, etc. should not be created or added to wind energy facilities. These wildlife habitat enhancements are often desirable but when added to a wind energy facility result in increased wildlife use of the facility which may result in increased levels of injury or mortality to them.

### Retrofitting, Repowering, and Decommissioning

As with project construction, these Guidelines offer BMPs for the retrofitting, repowering, and decommissioning phases of wind energy projects.

#### *Retrofitting*

Retrofitting is defined as replacing portions of existing wind turbines or project facilities so that at least part of the original turbine, tower, electrical infrastructure or foundation is being utilized. Retrofitting BMPs include:

1. Retrofitting of turbines should use installation techniques that minimize new site disturbance, soil erosion, and removal of vegetation of habitat value.

2. Retrofits should employ shielded, separated or insulated electrical conductors that minimize electrocution risk to avian wildlife per APLIC (2006).

3. Retrofit designs should prevent nests or bird perches from being established in or on the wind turbine or tower.

4. FAA visibility lighting of wind turbines should employ only red, or dual red and white strobe, strobe-like, or flashing lights, not steady burning lights.

5. Lighting at both operation and maintenance facilities and substations located within half a mile of the turbines should be kept to the minimum required:

   a. Use lights with motion or heat sensors and switches to keep lights off when not required.

   b. Lights should be hooded downward and directed to minimize horizontal and skyward illumination.

   c. Minimize use of high intensity lighting, steady-burning, or bright lights such as sodium vapor, quartz, halogen, or other bright spotlights.

6. Remove wind turbines when they are no longer cost effective to retrofit.

#### *Repowering*

Repowering may include removal and replacement of turbines and associated infrastructure. BMPs include:

1. To the greatest extent practicable, existing roads, disturbed areas and turbine strings should be re-used in repower layouts.

2. Roads and facilities that are no longer needed should be demolished, removed, and their footprint stabilized and re-seeded with native plants appropriate for the soil conditions and adjacent habitat and of local seed sources where feasible, per landowner requirements and commitments.

3. Existing substations and ancillary facilities should be re-used in repowering projects to the extent practicable.

4. Existing overhead lines may be acceptable if located away from high bird crossing locations, such as between roosting and feeding areas, or between lakes, rivers and nesting areas. Overhead lines may be used when they parallel tree lines, employ bird flight diverters, or are otherwise screened so that collision risk is reduced.

5. Above-ground low and medium voltage lines, transformers and conductors should follow the 2006 or most recent APLIC "Suggested Practices for Avian Protection on Power Lines."

6. Guyed structures should be avoided. If use of guy wires is absolutely necessary, they should be treated with bird flight diverters or high visibility marking devices, or are located where known low bird use will occur.

7. FAA visibility lighting of wind turbines should employ only red, or dual red and white strobe, strobe-like, or flashing lights, not steady burning lights.

8. Lighting at both operation and maintenance facilities and substations located within ½ mile of the turbines should be kept to the minimum required.

   a. Use lights with motion or heat sensors and switches to keep lights off when not required.

   b. Lights should be hooded downward and directed to minimize horizontal and skyward illumination.

*Towers are being lifted as work continues on the 2 MW Gamesa wind turbine that is being installed at the NWTC. Credit: NREL*

c. Minimize use of high intensity lighting, steady-burning, or bright lights such as sodium vapor, quartz, halogen, or other bright spotlights.

***Decommissioning***

Decommissioning is the cessation of wind energy operations and removal of all associated equipment, roads, and other infrastructure. The land is then used for another activity. During decommissioning, contractors and facility operators should apply BMPs for road grading and native plant re-establishment to ensure that erosion and overland flows are managed to restore pre-construction landscape conditions. The facility operator, in conjunction with the landowner and state and federal wildlife agencies, should restore the natural hydrology and plant community to the greatest extent practical.

1. Decommissioning methods should minimize new site disturbance and removal of native vegetation, to the greatest extent practicable.

2. Foundations should be removed to a minimum of three feet below surrounding grade, and covered with soil to allow adequate root penetration for native plants, and so that subsurface structures do not substantially disrupt ground water movements. Three feet is typically adequate for agricultural lands.

3. If topsoils are removed during decommissioning, they should be stockpiled and used as topsoil when restoring plant communities. Once decommissioning activity is complete, topsoils should be restored to assist in establishing and maintaining pre-construction native plant communities to the extent possible, consistent with landowner objectives.

4. Soil should be stabilized and re-vegetated with native plants appropriate for the soil conditions and adjacent habitat, and of local seed sources where feasible, consistent with landowner objectives.

5. Surface water flows should be restored to pre-disturbance conditions, including removal of stream crossings, roads, and pads, consistent with storm water management objectives and requirements.

6. Surveys should be conducted by qualified experts to detect populations of invasive species, and comprehensive approaches to preventing and controlling invasive species should be implemented and maintained as long as necessary.

7. Overhead pole lines that are no longer needed should be removed.

8. After decommissioning, erosion control measures should be installed in all disturbance areas where potential for erosion exists, consistent with storm water management objectives and requirements.

9. Fencing should be removed unless the landowner will be utilizing the fence.

10. Petroleum product leaks and chemical releases should be remediated prior to completion of decommissioning.

**Table 5.15-3. Results and Estimates of Annual Avian Mortality Based on Publicly Available Data from 43 Studies at 30 Different Wind Power Facilities that Fall Within in the Eastern Flyways**

| Site | Habitat type | Total # turbines / Total MW | Study Periods | Corrected for SESR? [4] | Estimated total bird fatalities per year (min – max) [1] | Estimated bird fatalities per MW per year (min – max) [1] | Reference |
|---|---|---|---|---|---|---|---|
| Mars Hill, ME | forested ridgeline | 28 / 42 | April 23 – June 3, 2007; July 15 - Sept 23 2007 | Yes | 12.32 - 69.2 | 0.29 - 1.65 | Stantec 2008 |
| Mars Hill, ME | forested ridgeline | 28 / 42 | April 19 - June 6, 2008; July 15 - Oct 8, 2008 | Unknown | 67.2 - 74.2 | 1.36 - 1.76 | Stantec 2009a |
| Stetson I, ME | forested ridgeline | 38 / 57 | April 20 – Oct 21, 2009 | Yes | 153 | 2.68 | Stantec 2009b |
| Massachusetts Maritime Academy, MA | coastal | 1 / 0.66 | April 24 – Nov 30, 2006 | Unknown | 1 | 2.1 | Vlietstra 2008 |
| Massachusetts Maritime Academy, MA | coastal | 1 / 0.66 | April 15 – Nov 30, 2007 | Unknown | 3 | 4.15 | Vlietstra 2008 |
| Jersey Atlantic, NJ | wetland wastewater treatment | 5 / 7.5 | Jan 1 - August 31, 2009 | No | 150 [3] | 20 [3] | NJ Audubon Society 2009 |
| Maple Ridge, NY | woodland, grassland, agriculture | 120 / 198 | June 17 - Nov 15, 2006 | Yes | 372 -1138 | 1.88 - 5.75 | Jain *et al.* 2007 |
| Maple Ridge, NY | woodland, grassland, agriculture | 195 / 321.75 | April 30 - Nov 14, 2007 | Yes | 1106 - 1230 | 3.44 - 3.82 | Jain *et al.* 2008 |

| Site | Habitat type | Total # turbines / Total MW | Study Periods | Corrected for SESR? [4] | Estimated total bird fatalities per year (min – max) [1] | Estimated bird fatalities per MW per year (min – max) [1] | Reference |
|---|---|---|---|---|---|---|---|
| Maple Ridge, NY | woodland, grassland, agriculture | 195 / 321.75 | April 15 - Nov 9, 2008 | Yes | 667 - 733 | 2.07 - 2.28 | Jain *et al.* 2009b |
| Munnsville, NY | agriculture, forested uplands | 23 / 34.5 | April 15-Nov 15, 2008 | Unknown | 39 - 51 | 1.13 - 1.48 | Stantec 2009c |
| Noble Clinton Windpark, NY | agriculture, woodland | 67 / 100.5 | April 26 to Oct 13, 2008 | Yes | 96 - 166 small birds; 59 med-large birds | 0.96 - 1.65 small birds; 0.59 med-large birds | Jain *et al.* 2009d |
| Noble Ellenburg Windpark, NY | agriculture, woodland | 54 / 81 | April 28 to Oct 13, 2008 | Yes | 62 - 74 small birds; 51med-large birds | 0.77 - 0.91 small birds; 0.63 med-large birds | Jain *et al.* 2009e |
| Noble Bliss Windpark, NY | agriculture, woodland | 67 / 100.5 | April 21 - Nov 14, 2008 | Yes | 50 - 271 small birds; 17-44 med-large birds | 0.50 - 2.70 small birds; 0.17 - 0.44 med-large birds | Jain *et al.* 2009c |
| Cohocton / Dutch Hill, NY | agriculture | 50 / 125 | April 15 - Nov 15, 2009 | Yes | 147 - 235 | 1.18 - 1.88 | Stantec 2009 |
| Cohocton / Dutch Hill, NY | agriculture | 50 / 125 | April 26 - October 22, 2010 | Yes | 41-58 | 0.55 to 1.37 | Stantec 2011 |
| Casselman, PA | forested ridge, agriculture, reclaimed mine | 23 / 34.5 | April 19 - Nov 15, 2008 | Unknown | 9 - 108 | 0.24 - 3.13 | Arnett *et al.* 2009b |

| Site | Habitat type | Total # turbines / Total MW | Study Periods | Corrected for SESR? [4] | Estimated total bird fatalities per year (min – max) [1] | Estimated bird fatalities per MW per year (min – max) [1] | Reference |
|---|---|---|---|---|---|---|---|
| Mountaineer, WV | forested ridgeline | 44 / 66 | April 4- Nov 11, 2003 | Unknown | 178 + 33 due to substation lighting | 2.69 | Kerns and Kerlinger 2004 |
| Mount Storm, WV | forested ridgeline | 82 /164 | July 18 - Oct 17, 2008 | Unknown | 198 - 312 | 1.21 - 1.90 | Young *et al.* 2009 |
| Buffalo Mountain, TN | reclaimed mine on ridge | 18 / 29 | April - Dec, 2005 | Yes | 32 | 1.1 | Fiedler *et al.* 2007 |
| Top of Iowa, IA | agriculture | 89 / 189.8 | April 15 - Dec 15, 2003 | Unknown | 961 | 5.06 | Koford *et al.* 2004 |
| Top of Iowa, IA | agriculture | 89 / 189.8 | March 24 – Dec 10, 2004 | Unknown | 80 | 0.42 | Koford *et al.* 2005 |
| Buffalo Ridge (Phase I), MN | agriculture, grassland | 73 / 25 | April, 1994 – Dec, 1995 | Unknown | 24 - 48 | 0.96 - 1.92 | Osborn *et al.* 2000 |
| Buffalo Ridge (Phase II), MN | agriculture, grassland | 138 /103.5 | March 15 – Nov 15, 1996 - 1999 | Yes | 72 | 1.3 | Johnson *et al.* 2000 2002 |
| Buffalo Ridge (Phase II), MN | agriculture, grassland | 138 /103.5 | March 15 – Nov 15, 1999 | Yes | 614 | 5.93 | Johnson *et al.* 2000 2002 |
| Buffalo Ridge (Phase III), MN | agriculture | 143 / 107.25 | March 15 - Nov 15, 1998-1999 | Yes | 325 | 3.03 | Johnson *et al.* 2000 2002 |
| Blue Sky Green Field, WI | agricultural | 88 / 145 | July 21 - Oct 3, 2008 | Yes | 1041 | 7.18 | Gruver *et al.* 2009 |

| Site | Habitat type | Total # turbines / Total MW | Study Periods | Corrected for SESR? [4] | Estimated total bird fatalities per year (min – max) [1] | Estimated bird fatalities per MW per year (min – max) [1] | Reference |
|---|---|---|---|---|---|---|---|
| Blue Sky Green Field, WI | agriculture | 88 / 145 | March 17 - June 4, 2009 | Yes | 631 | 4.35 | Gruver *et al.* 2009 |
| Kewaunee County, WI | agriculture | 31 / 20.4 | 1999 - 2001 | Yes | 40 | 1.96 | Howe 2002 |
| Oklahoma Wind Energy Center, OK | agriculture, wooded riparian | 68 / 102 | May - July, 2004 - 2005 | Yes | 3 - 8 | 0.03 - 0.08 | Piorkowski 2006 |
| NPPD Ainsworth Wind Farm, NE | sandhills, grassland pastoral | 36 / 59.4 | March 13 - November 4, 2007 | Unknown | 97 | 1.62 | Derby *et al.* 2007 |
| Forward Energy Center, WI | agriculture, deciduous woodlands | 86 / 129 | July 15 - November 15, 2008; April 15 - May 31, 2009 and 2010; July 15 - Oct 15, 2009 | Yes | N/A | 1.17 | Drake *et al.* 2010; Grodsky and Drake 2011 |
| Fowler Ridge Wind Farm, IN | agriculture, pastoral, grassland, wooded | 355 / 600 | April 13 - May 15, 2010 and July 30 – October 15, 2010 | No | 60 | 0.1 | Good *et al.* 2011 |
| 6-3, PA | N/A | N/A | May 1 – November 15, 2007 | Yes | N/A | 0.9 | Mumma and Capouillez 2011 |

| Site | Habitat type | Total # turbines / Total MW | Study Periods | Corrected for SESR? [4] | Estimated total bird fatalities per year (min – max) [1] | Estimated bird fatalities per MW per year (min – max) [1] | Reference |
|---|---|---|---|---|---|---|---|
| 6-3, PA | N/A | N/A | April 1 – November 15, 2008 | Yes | N/A | 1.2 | Mumma and Capouillez 2011 |
| 2-2, PA | N/A | N/A | April 1 – November 15, 2008 | Yes | N/A | 1.5 | Mumma and Capouillez 2011 |
| 2-2, PA | N/A | N/A | April 1 – November 15, 2009 | Yes | N/A | 3.0 | Mumma and Capouillez 2011 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 2-14, PA | N/A | N/A | April 1 – November 15, 2009 | Yes | N/A | 2.4 | Mumma and Capouillez 2011 |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 2-4, PA | N/A | N/A | April 1 – November 15, 2009 | Yes | N/A | 9.8 | Mumma and Capouillez 2011 |

| Site | Habitat type | Total # turbines / Total MW | Study Periods | Corrected for SESR? [4] | Estimated total bird fatalities per year (min – max) [1] | Estimated bird fatalities per MW per year (min – max) [1] | Reference |
|---|---|---|---|---|---|---|---|
| [illegible] [7] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] [7] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| 6-1, PA | N/A | N/A | April 1 – November 15, 2009 | Yes | N/A | 1.7 | Mumma and Capouillez 2011 |
| **Average** [6] | N/A | N/A | N/A | N/A | N/A | **4.2** | N/A |

[1] *Unless otherwise indicated, for reported fatality estimates, 'year' represents 'study year' or the study period.*

[2] Author corrected number to estimate fatality on a year round basis.

[4] Searcher efficiency and scavenger removal.

[5] The site has an approved monitoring plan with the Pennsylvania Game Commission (PGC) that was not adhered to, resulting in inaccurate mortality estimates (Mumma and Capouillez 2011).

[6] Average calculated using maximum number if a range given. The studies that did not follow PGC protocol (Mumma and Capouillez 2011) were not included in the calculations to estimate average fatalities of birds.

[7] Studies colored in gray did not follow PGC protocol (Mumma and Capouillez 2011), so were not included in average mortality estimates.

| Site | Habitat type | Total # turbines / Total MW | Study Periods | Corrected for SESR? [4] | Estimated total bird fatalities per year (min – max) [1] | Estimated bird fatalities per MW per year (min – max) [1] | Reference |
|---|---|---|---|---|---|---|---|
| [redacted] [5] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] [5] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| 6-1, PA | N/A | N/A | April 1 – November 15, 2009 | Yes | N/A | 1.7 | Mumma and Capouillez 2011 |
| **Average** [6] | N/A | N/A | N/A | N/A | N/A | **4.2** | N/A |

[1] *Unless otherwise indicated, for reported fatality estimates, 'year' represents 'study year' or the study period.*

[2] Author corrected number to estimate fatality on a year round basis.

[4] Searcher efficiency and scavenger removal.

[5] The site has an approved monitoring plan with the Pennsylvania Game Commission (PGC) that was not adhered to, resulting in inaccurate mortality estimates (Mumma and Capouillez 2011).

[6] Average calculated using maximum number if a range given. The studies that did not follow PGC protocol (Mumma and Capouillez 2011) were not included in the calculations to estimate average fatalities of birds.

[7] Studies colored in gray did not follow PGC protocol (Mumma and Capouillez 2011), so were not included in average mortality estimates.

# EXHIBIT 8

Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

**Ohio Division of Wildlife**

Scott Zody, Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693

September 25, 2012

Michael A. Hrynciw II, P.E. Maj
Supervisory Civil Engineer
200th Red Horse Squadron
Camp Perry Air National Guard Station
Port Clinton, OH 43452-9577

Dear Major Hrynciw,

The Ohio Department of Natural Resources, Division of Wildlife (DOW) provides the following comments regarding the Final Environmental Assessment (EA) for the Phase IV Renewable Energy Wind Demonstration at the 200th RHS Camp Perry Air National Guard (ANG) Station, received in my office on August 28, 2012. The proposed project involves the installation of a single wind turbine with a capacity of 500-600 kW, and a maximum height of 198 feet, on the Camp Perry ANG Station property, located at 1200 N, Camp Perry Road, Port Clinton, Ottawa County, Ohio. The DOW has met with staff from ANG on several occasions (April 24, 2008, February 23, 2009, December 17, 2009, and September 5, 2012), as well as provided correspondences (e.g., June 22, 2010 letter from Dave Scott) that provide the DOW concerns regarding installing a turbine on Camp Perry. The DOW supports the development of wind energy resources when properly sited to avoid or minimize risk to wildlife resources. With that said, the DOW still has significant concerns regarding the impacts this facility may have on local and migratory birds and bats. Many of our prior concerns expressed two-years ago after a review of the Draft EA, are consistent and repeated here after our review of the Final EA.

The DOW believes that the Camp Perry's proposed location for this turbine falls in an area of greatest concern due to proximity to state and federal conservation areas, bald eagle nests, and the shoreline of Lake Erie thus potential impacts to migratory birds (and potentially bats). ANG has requested that the DOW provide comments on the EA.

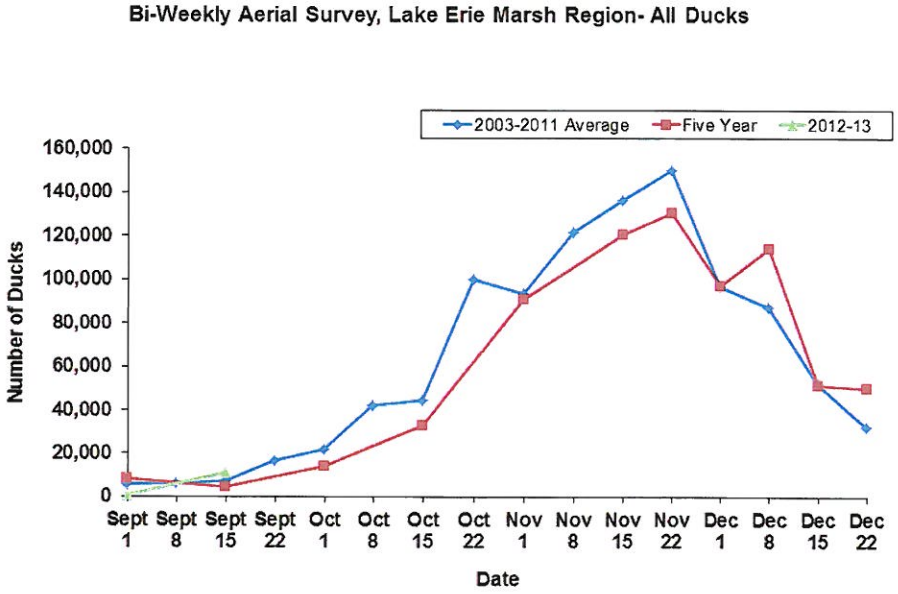
1. Page 8: The summary table evaluating the Environmental Consequences in the Wildlife column stated "no impacts to any terrestrial, amphibian, or aquatic federal or state listed species with occur…". Additionally, the EA stated that "Minor to No Affect" on birds and bats. Although the DOW believes that minimal to no impacts could occur to amphibian or aquatic listed species if no aquatic resources are disturbed during construction, terrestrial species (birds and bats) will likely be adversely affected.

2. Page 18: Modifications to reduce the impact of the proposed turbine included post-construction monitoring or the use of radar. Although neither of these will reduce the impact of a poorly sited turbine, if the project proceeds both post-construction monitoring and radar can (and should) be used as tools to assess the impact. DOW would work cooperatively with ANG and U.S. Fish and Wildlife Service (USFWS) to develop and recommend appropriate post-construction monitoring protocols, as well as further minimization strategies.
3. Page 32: The EA suggests that there is minimal wildlife habitat within the project area, but then proceeds to reference Curry and Kerlinger (2007a) who documented over 300 species of birds around the ANG, and a Bald Eagle nest such over half a mile from the proposed turbine within the property boundaries. Failure to recognize the significance of the surrounding habitats (e.g., Magee Marsh, Ottawa National Wildlife Refuge, East Harbor State Park, and Lake Erie), the close proximity to an eagle nest, as well as the density of eagle nests within 10 miles of the project (60 nests), is a failure to recognize the potential impacts this proposed turbine may have on wildlife. It is unclear if Curry and Kerlinger (2007a) was provided in the references. The only Curry and Kerlinger reference was noted as 2007 (not 2007a) and was subtitled "Preliminary MERLIN..". The DOW has requested that all pre-construction wildlife survey data and reports to be provided to the current Wind Energy Biologist for review, to date not all have been.
4. Page 32: DOW acknowledges and appreciates the inclusion of Ohio Revised Code Chapters 1531 and 1533 (suggested in our June 2010 letter).
5. Page 33: The EA suggests that no impacts to Indiana bats from degradation of habitat, but fails to address potential impacts during migration from collision with the turbine blades or barotrauma.
6. Page 54: In Section 4.7.3 states that "minor impacts to avian and bat populations", but later provides potential and significant impacts to both birds and bats. The first statement in the EA indicating minor impacts, is likely incorrect.
7. Page 55: Curry and Kerlinger (2007a) was referenced as having a complete list of species for the ANG, please provide this report to DOW for review. Without having this list, the DOW cannot evaluate if there may be any additional impacts to state-listed species.

8. Pages 55 and 56: Although the EA stated that a pair of Bald Eagles successfully raised eaglets within 900m of the Erie Shores Wind Farm in Ontario, Canada, the EA fails to note that this site had Bald Eagle mortality from collision with a turbine in 2009. Additionally, it should be noted that from 2010 to 2011 there have been at least 5 Bald Eagle mortalities at wind facilities in United States (*Taber Allison. 2012. Eagles and Wind Energy: Identifying Research Priorities. AWWI*). Furthermore, it should also be noted that this past June (2012), an adult male eagle was unfortunately killed from blunt force trauma caused by collision with a small turbine (10 kW) located on Eastern Neck National Wildlife Refuge in Maryland. Since this event the

turbine was removed. The EA provides that the Erie Shores Wind Farm had several raptors flying amongst the turbines, but the EA fails to provide any information regarding the mortality of raptors at this site.

9. Pages 56 and 57: The DOW disagrees with the assessment that because Kirtland Warblers are low in numbers and have never been documented at communication and/or wind turbines the risk of turbines is low for this species. Risk of potential impact to this species and others should be addressed through project siting, design, and known species distribution.
10. Pages 58 and 59: The very limited data collected during one month of surveys during January to February 2008 assessing eagle movements from the nest was not sufficient to evaluate neither the movements of these birds nor the potential impacts of the proposed turbine. The limited data provided, does indicate the birds movements in very close proximity to the proposed turbine.
11. Page 59: The EA fails to provide an adequate evaluation of potential impacts the proposed turbine would have on Piping Plover.
12. Page 60: The EA referenced results from the ODNR waterfowl surveys conducted annually, however the EA inappropriately only provided one day's worth of data in 2011 for a 5 month survey (conducted every other week). Furthermore, the day of data provided was early in the migration (October 4, 2011) and had some of the lowest numbers for the entire season. Below is the final figure generated from the ODNR 2011 waterfowl surveys referenced in the EA. The over 140,000 birds detected at the peak of the 2011 survey, is likely a more appropriate comparison to the hunter harvested birds in Ohio, than the 2146 birds the EA suggested as a comparison. Additionally, these DOW surveys provide relative indices of the number of waterfowl that migrate through, as well as the stop-over habitat within this area of the state which includes the proposed turbine location.



13. Page 61: The EA provides an estimate of 2.51 birds per turbine per year, which was obtained from nationally available data. It is more appropriate to evaluate sites of similar composition and locality. The DOW believes (as stated previously) that siting a project in area that has significant bird-use will likely result in significant morality. Although we currently do not have sufficient data for Ohio sites, DOW is working with several single turbine owners to conduct post-construction mortality monitoring. To date, data from this monitoring is limited, but there has been birds and bats detected at these single turbine sites.
14. Page 61: The EA states that "no Bald Eagle fatalities have been reported." This is incorrect, please see comment #8.
15. Page 62: The EA states "no evidence was found of large-scale fatality events at wind turbines…" This is incorrect. There have been reports from a couple of West Virginia wind facilities, that significant numbers (>30) of bird carcasses detected in one day. On both of these occasions these mortalities were contributed to issues with lighting (West, Inc. 2011 and Kerns and Kerlinger as cited in NRC 2007).
16. Page 63: The EA provides recommendations and conclusions based on a fall 2011 radar study, however during the September 2012 meeting the USFWS and DOW requested the relevant radar data and ANG suggested that it was useless and corrupted, therefore they were not comfortable dispersing the data. However ANG did indicate that they will be continuing the radar data for another year, since the first fall did not provide any information.
17. Pages 63 and 64: Curry and Kerlinger, LLC provide a list of recommendations in the EA for siting wind projects, however it is unclear what data supports these recommendations.
18. Page 64: The EA states the Camp Perry ANG Station is within an ODNR and USFWS designated an "Avian Concern Zone", the ODNR and the USFWS does not have an "Avian Concern Zone" designation. The EA without supportive data suggests that take will not be significant at this proposed location.
19. Page 64: The first bullet under the recommendations to minimize collision states "Installation of electrical lines within the project site be underground between the turbines."—this statement suggests multiple turbines at the proposed project.
20. Page 65: Both post-construction surveys, as well as use of radar are not minimization techniques to avoid potential impacts to birds and bats.
21. Page 66: In the section describing the potential impacts to bats, the EA fails to mention that the mist-net surveys caught four species and although no Indiana bats were caught the four species that were caught are state-listed as Species of Concern. The relatively small numbers of bats caught (n = 29) indicates a perceived lower risk.
22. Pages 76 and 77: As stated throughout, many of these summarized statements DOW disagrees with.

23. Appendix B: The title of this suggests it is a complete list of federal and state –listed species. It is not comprehensive and should be updated to include the most recent state listing which can be found on the DOW website.

The DOW appreciates the Camp Perry ANG Station's cooperation and willingness to work with our agency and USFWS. Furthermore, we appreciate the opportunity to provide comments on this EA. Please feel free to contact me if you have any further questions.

Sincerely,

Jennifer L. Norris

Jennifer L. Norris
Wildlife Research Biologist
ODNR Wind Energy Biologist
ODNR, Division of Wildlife
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Email: jennifer.norris@dnr.state.oh.us

cc: Megan Seymour, USFWS, Columbus, OH

# EXHIBIT 9

**DEPARTMENT OF THE AIR FORCE**
HEADQUARTERS 200TH RED HORSE SQUADRON
CAMP PERRY ANG STATION PORT CLINTON, OHIO

10 July 2013

MEMORANDUM FOR RECORD

FROM: 200 RHS/EM
1200 JN. Camp Perry E. Road
Port Clinton, OH 43452-9577

SUBJECT: Addendum to Final Environmental Assessment dated 22 August 2012

1. The attached document is an Addendum to the Final Environmental Assessment that was dated 22 August 2012. The Addendum captures additional information related to the Research, Development, Test and Evaluation project at Camp Perry Air National Guard Station, Port Clinton, Ohio. The additional information will be used to move into the next step of the NEPA process. The Addendum provides detailed information and analyses pertaining to questions and statements provided by the U.S. Fish and Wildlife Service and the Ohio Department of Natural Resources in letters to the proponent. It addresses issues such as endangered species, mitigation, best management practices as outlined in the U.S. Fish and Wildlife Service land-based guidance for wind power projects, post-construction study design (per the Ohio Department of Natural Resources land-based guidance), and answers/responses to a few specific comments made by the wildlife agencies. We believe that questions and issues raised by those agencies have now been addressed adequately, providing more information for a final EA determination.

2. If there are any questions or comments, please contact the undersigned at (419)635-2787 or via email at roger.nienberg@ang.af.mil

ROGER W. NIENBERG, CEM, Capt
Environmental, Manager

cc: 200 RHS/CC

**ADDENDUM**

**To**

**Final Environmental Assessment**
**Dated 20 July 2012**

# One Wind Turbine Demonstration Project

# Renewable Energy Demonstration Phase IV

Prepared by:

200th RED HORSE Squadron
1200 North Camp Perry East Road
Port Clinton, Ohio

And

Paul Kerlinger, Ph.D.
Curry and Kerlinger, LLC
1734 Susquehannock Drive
McLean, VA 22101

**31 July 2013**

## Introduction

Following the completion of the Draft Final Environmental Assessment for the Phase IV Renewable Energy Wind Demonstration project for Camp Perry ANG, the U.S. Fish and Wildlife (FWS – 25 September 2012) and the Ohio Department of Natural Resources (Division of Wildlife – ODNR – 25 September 2012) sent letters to the ANG commenting and making recommendations for the EA and the project in general.

This addendum addresses the last round of questions and comments made by the wildlife agencies by focusing upon the issues most important to the NEPA process. Nearly all the comments from the wildlife agencies fall into one of five categories.

This addendum is divided into the following sections, each addressing a major issue and responding to comments and questions from the wildlife agencies regarding those issues.

- Response to comments and questions posed in letters from the FWS and ODNR,
- Federally Endangered and Threatened Species – Kirtland's Warbler (endangered), Piping Plover (endangered), and Indiana bat (endangered), as well as Bald Eagles, which are not federally endangered or threatened,
- How the project is addressing the Best Management Practices for wind energy facilities (Chapter 7 from FWS 2013 guidance document),
- Post-construction Fatality Study Protocol, and
- Marine Radar Study at Camp Perry ANG – 2012 to present.

**Response to Wildlife Agency Comment and Recommendation Letters For Final EA**

U.S. Fish and Wildlife Service (FWS) – Letter from Megan Seymour for Mary Knapp, Supervisor, and Ohio Department of Natural Resources (ODNR) letter from Jennifer Norris.

Much of the content of these letters was unsupported by detailed data. However, the ANG has chosen to address many of the comments in the letters and to adopt best management practices recommended by the FWS in its 2013 land-based guidance document (U.S. Fish and Wildlife Service 2012). Responses to all the important comments of FWS and ODNR are posted below and we address many of the issues and questions these agencies raise elsewhere in this Addendum comprising a revised Environmental Assessment (EA).

FWS Page 1. "we believe that siting a wind turbine at the proposed location presents a high level of risk to migratory birds." This comment does not describe jeopardy to the continued existence of any species. The FWS never defines "high level of risk" and as further discussed below, the ANG doesn't think the project presents a significant level of risk. Nowhere does the FWS quantify whether the single turbine proposed by ANG will kill one bird per year or 100 birds per year, nor does it describe a project site with high annual per turbine or per megawatt fatalities that would or have caused biologically significant impacts to migratory birds. This is likely because we are aware of no wind energy sites that may be considered "high risk" in North America from a per turbine or per megawatt basis. The failure of the FWS to identify or document such a site or to cite numbers of fatalities that would be biologically significant renders the comment speculative at most. As further discussed below, the ANG believes that the impacts to birds on a per turbine or per megawatt basis will not result in fatalities that would jeopardize individual species. No such fatalities, then are biologically significant from a NEPA perspective.

FWS Page 2. The FWS cites two bird protection laws, the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. These laws prohibit takings of such birds., but takings are deliberate acts. Although takings under these Acts are crimes, if takings were defined so loosely as the FWS suggests, towers owned and operated by the State of Ohio for public safety and used by the FWS, undoubtedly would warrant prosecution or other enforcement action. The discharge of spent lead ammunition also takes a toll and could loosely be described as a taking. Although we could not find any articles or papers regarding how many Bald Eagles die of lead poisoning in Ohio, a recent article by Kerlinger (2013) demonstrated that more than 10, and likely many more, Bald Eagles per year are poisoned via ingestion of lead from legally sanctioned hunting (which incidentally is partially funded by federal excise tax dollars). This incidental taking of eagles via lead (or highways or trains, etc.) does not appear to be treated as a violation of the Bald and Golden Eagle Protection Act, despite the lack of attempts to minimize and reduce such mortality by those who license or regulate those activities.

Although the EA states that fatalities of migratory birds will be neither large in number, nor biologically significant, there is no way to completely prevent such mortality. To insure that fatalities of birds at the Camp Perry ANG turbine will be minimized and avoided, the next section outlines how the best practices recommended by the FWS in their land-based guidance

document (2012) have been adhered to by the Camp Perry ANG project. These same best practices will minimize potential impacts to Bald Eagles.

With respect to the Endangered Species Act, there is a section in this Addendum that focuses on those species and demonstrates quantitatively why this law will not be violated.

ODNR Page 1. "terrestrial species (birds and bats) will likely be adversely affected." ODNR does not define what the term "adversely affected" means, perhaps because there is no pertinent definition in the Revised Code. Almost any and all human activity will "adversely affect" birds. However, such effects do not stop projects from going forward through the NEPA process. The travel of vehicles on, public highways, such as Route 2 adjacent to the Camp Perry ANG project undoubtedly kill birds, thereby adversely affecting them. Route 2 likely kills more birds than will the Camp Perry ANG turbine. Similarly, the WGTE public television tower also kills birds as do the more than 200 MARCS towers that have been constructed by the State of Ohio (and used by the FWS and ODNR). Without a clear definition, "adversely affected" simply is not a basis for opposing the ANG turbine.

ODNR Page 2. Although about five or six Bald Eagle fatalities have occurred at wind plants in the U.S. and Canada, the ODNR letter does not even suggest that there is any biological significance to these impacts. It is also important to note that there are more than 40,000 utility scale wind turbines in the U.S., many of which have been operating without incident for more than a decade in areas where there are eagles. Thus, it is reasonable to think that a single turbine, especially a small turbine situated in a locale like that of the Camp Perry ANG turbine, is highly unlikely to kill a Bald Eagle. In the next section we outline how the best practices are being implemented for the Camp Perry ANG turbine to avoid impacting birds, including Bald Eagles.

ODNR Page 3. It seems that the ODNR stops short of predicting that mortality and other impacts to waterfowl at the Camp Perry ANG site will be biologically significant or that numbers would be larger than at other wind energy facilities. After more than $30 million of post-construction research at more than 75 wind power projects in North America, nowhere have large numbers of waterfowl been impacted. There has been no suggestion from this vast body of research that waterfowl have been impacted significantly or that they are at major risk from wind energy facilities. The ODNR has not provided any data that suggests this to be the case. Nor does ODNR provide any information that suggests that impacts to these birds are will result in population decline or other adverse impacts to populations. The evidence instead suggests that it is highly improbable that, on average, even one duck or goose per year will be killed at the Camp Perry ANG project. Waterfowl impacts are not an issue at wind energy projects.

FWS Page 4 and ODNR Page 3. The FWS states that the ANG project is within the "range" of both Piping Plover and Kirtland's Warbler, but does not quantify the risk that is posed by the Camp Perry ANG turbine. Elsewhere in this Addendum to the EA, the ANG has provided quantitative analyses to address the degree of risk to these species. These analyses are based on the methodologies developed by FWS for these species. A similar analysis is provided for Indiana bats. These analyses, especially when combined with the best practices that are being adopted by ANG for the Camp Perry ANG turbine, justify a Finding Of No Significant Impact (FONSI).

FWS Page 10. The letter suggests that "we must use (sic) consider the information we have for the greater project area and make a qualitative analysis of migratory bird risk." The FWS has not defined "qualitative analysis of migratory bird risk." The burden is on the FWS to present such an analytical methodology, to differentiate between what the FWS calls a site that "presents a high level of risk" site from other sites. Without more, the FWS comment cannot be said to rebut the information available from documented studies across North America referenced herein.

FWS Page 11. With no apparent factual or scholarly basis, the FWS recommends "shutting off the turbine during times of highest risk to migratory birds". The FWS comment assumes that the there are "times of highest risk." However the FWS has presented no methodology for making such determinations; and the ANG is aware of no research suggesting that there is a need to turn off turbines to reduce the risk to migratory birds. As the studies referenced herein suggest, fatality rates of migrating birds due to turbines have been so low as to refute the suggestion that curtailment is needed. The ANG's research suggests that there have been no sites where such a curtailment has been implemented for birds.

FWS Page 12. The FWS suggests that radar could be used "to help minimize bird and/or bat mortality" and that "the Service would like to be a partner in these efforts." The ANG's experience with radar undoubtedly exceeds that of the FWS; and the ANG is unaware that there has ever been documentation of radar being used to reduce fatalities of birds or bats at wind plants or any other structure. Nor is the ANG aware of any studies demonstrating a correlation between what is detected with radar and fatalities of birds or bats. Interestingly, the ODNR letter at number 20 states that radar "is not a minimization" technique "to avoid potential impacts to birds and bats," thereby expressing disagreement with the FWS. Certainly it is a prerequisite to insistence upon such measures that the insistence be predicated upon the weight of scientific opinion.

FWS Page 19. The FWS letter mentions post-construction studies at the Camp Perry ANG project as a means of determining actual impacts. These comments are addressed elsewhere in this Addendum to the EA. The ANG relied on the ODNR 2009 fatality monitoring protocol, which was part of its guidelines for land-based turbines, for our proposed design and current project.

**Federally Endangered and Threatened Species**

Two federally endangered bird species are known to be extant in Ottawa County, Ohio (http://www.fws.gov/midwest/endangered/lists/ohio-spp.html): Kirtland's Warbler and the Indiana Bat. Both species are listed on the U.S. Fish and Wildlife Service website as occurring within Ottawa County or within all counties of the state. A third, the Piping Plover, is not listed as being in Ottawa County on that website. However, because the letter from FWS suggests the Piping Plover might be present in the project area, we consider it along with the two previous species. Accounts of these species, including their known occurrence in Cuyahoga County are provided below.

Kirtland's Warbler. Kirtland's Warbler has recovered dramatically from near extinction, when very few nesting pairs existed in the jack pine forests of the northern portion of the Lower Peninsula of Michigan. The number of singing males, an index of the population of this species, grew to about 2,090 in 2012. This number is more than two times greater than the original 1,000 singing male recovery target number for the species, established in the U.S. Fish and Wildlife Service recovery plan. Thus, the species has been recovering at a rate of roughly 4-5% per year for over 20 years.

The Kirtland's Warbler has a nesting distribution that includes the northern portion of the Lower Peninsula of Michigan, parts of the Upper Peninsula, and some limited areas in northern Wisconsin, as well as a very small area at the Canadian Forces Base at Petewawa, Ontario. There are no nesting records of this species from Ottawa County or any other place in Ohio. In Ohio they are rarely seen, although much of the population that nests in Michigan in all likelihood flies over parts of Ohio during spring and fall migration. The few individuals seen in Ottawa County are generally seen along the coastline, although from the map sent by FWS to ANG, no such birds have been sited within a mile of the Camp Perry ANG turbine site. The habitat at and surrounding the site for many hundreds of meters does not suggest stopovers by these birds close to the turbine site. However, with the population increasing so rapidly and many more individuals on the landscape, more sitings of this species can be expected in Ohio.

Kirtland's Warblers winter mostly in the Bahamas, as well as other islands in that vicinity. These birds migrate at night and their migration proceeds over the Lower Peninsula of Michigan as well as the western one-half of Lake Erie and Ohio to the south. The very few birds nesting at Petewawa, ON, likely migrate much farther east of the migration pathway of the Michigan and Wisconsin nesting birds. Thus, Ottawa County is within the migration pathway of some Kirtland's Warblers.

Although Kirtland's Warblers undoubtedly pass over Ottawa County and adjoining Lucas County, individuals migrating through the area likely fly at altitudes greater than 1,000 feet above ground or lake level, the height at which a majority of songbirds migrate. Migrants making stopovers must ascend and descend as they land in coastal areas. It is not known how rapidly these birds climb and descend.

Piping Plover. The Piping Plover is a beach nesting species found irregularly around the Great Lakes. There are fewer than 80 pairs in the Great Lakes population, most of which nest in

Michigan on the sandy shores of Lake Michigan. Primary nesting areas on the Great Lakes include the northern shore of Lake Michigan and the eastern shore of Lake Michigan, mostly in the northern one-half of that Lake. There are also smaller numbers nesting along the south shore of Lake Superior, the south shore of Georgian Bay/Lake Huron, and there has even been a nesting pair on the west shore of Lake Michigan in northern Illinois. Historically, these birds nested along the north and south shores of Lake Erie, but have not done so for many years. None are known to nest in Ottawa or adjacent Counties.

Great Lakes Piping Plovers migrate mostly to the Gulf Coast, although some may fly more easterly to the Atlantic Coast, before heading farther south. All birds from the Great Lakes winter along Gulf Coast and south Atlantic beaches in the U.S. During migration to these areas, these birds make few stopovers, although detecting birds at these stopover locations might be difficult. Some stopovers are known to occur, but they are few and scattered geographically. Altitude of migration is mostly unknown, but Piping Plovers are likely to migrate at high altitudes, like other shorebirds. Their migration over the western Atlantic from beaches in the U.S. and Canada to the Bahamas likely proceeds at many thousands of feet above sea and ground level to utilize favorable winds on their long, non-stop flights. This is likely to be the case for overland flights between the Great Lakes and the Gulf of Mexico/southern Atlantic coast.

Speculation that some individual Piping Plovers make the flight from the Great Lakes to the Gulf Coast in a single flight, is strongly supported by the absence of sightings between these locales, which also supports migration at very high altitudes. Shorebirds are known to fly at up to and higher than 4,000-5,000 feet above ground and sea level, especially during long, nonstop flights. Fall and spring migration of some Piping Plovers may occur over the west end of Lake Erie, and some may even fly over Ottawa County and the project site. Thus, their presence during migration over the project site is likely to occur in very small numbers, if they fly over the site at all. These birds likely frequent higher altitudes over the waters of western Lake Erie, but rarely descend along the shoreline to rest or forage near Camp Perry ANGS. This statement is consistent with the fact that the FWS website does not list Ottawa County as one of the counties where Piping Plovers are found.

Indiana Bat. The Indiana Bat is an endangered bat that winters in caves throughout much of the Midwest and eastern U.S. It was declared endangered in 1967 and as of about 2009 the population was down to 387,000 individuals. Since then, the population has continued to decline, mostly as a result of the spread of white nose syndrome, a disease that has also impacted other cave dwelling bat species. In Ohio, Indiana bats are known throughout most of the state, although no known bat caves are within about 50 miles of Camp Perry ANG and the turbine site. There are no known bat caves in Ottawa or adjoining counties.

After emergence from caves, mostly in April, Indiana Bats migrate in varying directions, spending the summer in varying habitats. Female bats prefer forests with large trees having exfoliating bark where they can have their young and leave them in a protected place while they forage. Males wander through more diverse habitat because they are not constrained by protecting and carrying for the young. Foraging habitats for Indiana Bats vary with some summering individuals using riparian corridors, agricultural fields, and even upland forests.

In mid-late summer, Indiana Bats move back to their caves, but do not settle in for the winter for a few weeks after arrival. Swarming flights around the cave are commonplace; and copulation also occurs during this pre-hibernation period. Hibernation follows in October-November and through the winter.

At the Camp Perry ANG site, potential risk to Indiana Bats occurs during the late spring through summer when bats are away from their caves. Foraging and migrating bats might be at risk during these periods if they were present near the turbine site. The geographic range of Indiana bats includes the Camp Perry ANG project site. However the habitat at the Camp Perry ANG turbine site does not suggest that it hosts Indiana Bats other than bats randomly flying by or over during dispersal or migration. Because the turbine is between Route 2 and buildings on the Camp Perry ANG base, in an area largely denuded of trees, the evidence suggests that these bats do not frequent the project site. There are no large trees nearby that females could use for raising their young. Thus, it is highly unlikely that females will spend time at or near the project site. While it is more likely that males could pass by or even forage nearby, that is still unlikely.

Collision Estimation for Endangered Kirtland's Warbler, Piping Plover and Indiana Bats at the Camp Perry ANG Turbine.

The FWS and others have developed risk estimation procedures for several species of birds for use in wind energy development decision making and permitting. For the one-turbine Camp Perry ANG project, the FWS Service has identified three endangered species, Kirtland's Warbler, Piping Plover, and Indiana Bat, that potentially migrate over either western Lake Erie or Ottawa County. Although none of the species has been seen at the Camp Perry ANG site and they are exceedingly rare in the Camp Perry ANG area, they must be considered under the NEPA process. To accomplish this, the FWS collision prediction methodology (Dingledine and Czarnecki 2007), developed for the Michigan Public Safety Communication System (MPSCS) towers, was used to estimate the number of Kirtland's Warblers and Piping Plovers that may collide with the turbine proposed for Camp Perry ANGS. The outcome of these estimations may be used for jeopardy decisions and whether incidental take permits are necessary.

The collision prediction methodology developed by the FWS was done for 49 MPSCS communication towers that were built **within the breeding range** of Kirtland's Warblers, potentially putting these birds at risk of colliding with the towers. The FWS did not include an additional ~125 towers in the MPSCS that were not within the nesting range, but were within the migration range of that species. Thus, for the FWS, breeding Kirtland's Warblers were the primary focus and migrants were **not** considered to be at a material risk of colliding with the towers. (Note that these towers ranged in height from 118-148 meters; most were equipped with guy wires; and all had FAA obstruction lighting which consisted of red steady burning (L-810) and red flashing strobes (L-864). Thus, the towers were more than twice as tall as the proposed wind turbine at Camp Perry ANGS and had two additional risk factors that are absent for the proposed Camp Perry turbine.)

Kirtland's Warbler. The FWS collision estimation method was accomplished by using the following parameters in a multiplicative model:

- % population killed per tower (0.0000099%)
- Total number of towers (N = 49)
- Years of project life (N = 30)
- Total population of Kirtland's Warblers = 5,000

Thus, the total number of Kirtland's Warblers thought likely to be killed during the 30 year life of the project by the 49 towers was: 0.0000099 x 5,000 x 49 x 30 = 73
The annual fatality rate would then be 73/30 years or roughly 2-2.5 Kirtland's Warblers per year.

The Biological Opinion explanation of the estimation reads as follows:

"The estimate of the proportion of the Kirtland's Warbler population expected to be found per tower was derived from data on the number of blackpoll warblers (BPW) found at 12 towers over 2 years in the Michigan study (11); the number of BPWs found per tower per year (0.458); an estimate of the total North American BPW population (21,000,000); and an estimate of the proportion of BPW potentially migrating through Michigan (0.1). This resulted in the fraction of BPWs found dead per tower per year (0.000000218). To calculate the fraction of Kirtland's Warblers expected to be found dead per tower per year, an increased exposure factor was applied which resulted in a value of 0.00000196. The fraction of Kirtland's Warblers expected to actually be killed per tower per year was calculated by applying an adjustment multiplier (5.0). The multiplier was based on the upper range of values from observer detection and carcass removal trials conducted by Gehring and Kerlinger." Blackpoll Warbler was used as a surrogate because it is a relative of Kirtland's Warbler and because no Kirtland's Warblers had been killed in the Gehring and Kerlinger (2009) study.

The same estimation model for the Camp Perry ANG turbine site results in the following calculation:
0.000000495 x 7,000 x 1 x 25 = 0.0087 Kirtland's Warblers

Where 0.000000495 was the percentage of the Kirtland's Warbler population likely to be killed by a single turbine, 7,000 is the number of Kirtland's Warblers in the population as of 2012, one turbine is proposed for the Camp Perry ANG project and 25 years is the life expectancy of the project. The percentage of Kirtland's Warbler population likely to be killed by a single turbine is lower because communication towers of the size and structure that were the focus of the Biological Opinion kill about 20 times more night migrants per structure than do turbines of equal height. So, for this analysis with a turbine that is one-half the height of utility scale turbines and the MPSCS towers, the risk should be even lower. However, we used the same risk factor as would be the case for 120 m tall wind turbines. These parameters were derived from the data presented by Gehring et al. (2009, 2011) who worked with the U.S. Fish and Wildlife Service (Dr. Albert Manville) and Central Michigan University for the MPSCS tower research and by Kerlinger et al. (2010) for wind turbines. There is additional information available for wind turbines in various papers and volumes (NRC 2007). Thus, the 0.0000099 statistic used in the Biological Opinion was 20 times the number of fatalities known for utility scale wind turbines.

The 7,000 population number for Kirtland's Warblers was derived from estimates of the numbers of breeding pairs as of 2012 (2,090) and extrapolated upward as was done in the Biological Opinion, which was based on numbers of Kirtland's Warblers in 2006.

The FWS estimation procedure results in less than one (0.0087) Kirtland's Warbler killed during the 25 year life of the Camp Perry ANG project and about 0.0003 killed per year. Thus, one fatality would occur every several hundred years. This number is functionally equal to zero for the Camp Perry ANG project.

Piping Plover. With respect to Piping Plovers, the model was modified by using values for shorebirds. As with Kirtland's Warblers, there are no known collisions of Piping Plovers with communication towers or wind turbines. This suggests that the models are conservative in that they are likely to overestimate the fatalities. For population numbers of Piping Plovers, an estimate of about 400 has been suggested for the Great Lakes population of which less than about 10% migrate over the project site, which is likely higher than the actual percentage based on the distribution of these birds around the Great Lakes. For the percentage of the population of this species killed per turbine, a figure of 0.0000012 was used. This value comes from the literature on wind turbine fatalities of shorebirds, which account for roughly 2% of all birds killed at these structures. Thus, 2% of the roughly 6 birds killed per turbine per year amounts to 0.12 birds per turbine per year, which is roughly equivalent to 0.0000012 of a population of 100,000 birds. The latter number comes from a number that is typical for several species of shorebirds as published in the North American Shorebird Management Plan (of which FWS was a coauthor).

Thus, fatalities for Piping Plovers during the life of the Camp Perry ANGS project are equal to:
0.0000012 x 400 x 1 x 25 = 0.012

This means that during the 25 years of operation at the Camp Perry ANGS project, less than one Piping Plover (0.012) will likely collide with the turbine, which is an annual fatality rate of 0.0005. Thus, a single fatality might occur over hundreds of years, which is equivalent to zero for this project.

This model is dependent upon Piping Plovers being equally likely to fly into a turbine as other shorebirds, which rarely collide with turbines (or other vertical structures).

The FWS has also used a different means of calculating or estimating collision risk, specifically for Piping Plover. For the Cape Wind project in Nantucket Sound, MA, a Biological Opinion regarding Piping Plover risk at that project estimated that the 130 turbines that would be constructed might kill about 0.5 or fewer Piping Plovers per year. This number is much greater than the estimate provided above for several reasons. Those reasons are as follows:

- Cape Wind will host 130 turbines, 130 times more than the Camp Perry ANGS project,
- Cape Wind turbines will be more than twice as tall (140 m vs. 60.5 m) as the Camp Perry ANGS turbine and the rotors will be much longer,
- Each Cape Wind turbine will have a rotor swept area of about 9,677 $m^2$ vs. 1,521 $m^2$ for the Camp Perry ANGS turbines (6.4 times larger than the Camp Perry ANG turbine),

- Piping Plovers nest as close as about 6 km of the Cape Wind turbines, whereas none nest within 100 km of the lone Camp Perry ANGS turbine,
- Piping Plover population in Massachusetts, New Hampshire, Maine and Atlantic Canada was 4,300 individuals (in 2007), all of which migrate by the Massachusetts's coast. Therefore, the number of Piping Plovers potentially at risk at Cape Wind is more than 10 times greater than for Camp Perry ANGS.

The data for Cape Wind was provided in the FWS Biological Opinion (2008). Determining potential risk for Camp Perry ANGS using the FWS Biological Opinion indicates that risk at Camp Perry ANGS is far less than for Cape Wind. If the numbers for Cape Wind in the bullets above were used to determine how many Piping Plover might be killed at Camp Perry ANGS, the number of fatalities at Camp Perry ANGS would likely be less than about 1% that for Cape Wind. This translates to less than 0.00012 Piping Plover fatalities per year at Camp Perry ANG, which is equal to about 0.003 possibly killed in 25 years. This estimate does not account for the much larger numbers of Piping Plovers in the north Atlantic population, nor does it account for the much larger rotor swept area and height of turbines at Cape Wind. Inclusion of those factors strongly suggests that the risk at Camp Perry ANG for Piping Plovers is close to nil when calculated using the estimation method and risk factors used by the FWS in their Biological Opinion.

Note also that even with 0.5 Piping Plovers killed per year at Cape Wind, the Service states on page 71 of the Biological Opinion that "it is the Service's biological opinion that the project is not likely to jeopardize the continued existence of these species." ("these species" includes a second endangered species, which is not present in the Great Lakes – Roseate Tern.) They went on to say on page 71 that "the Service also determines that mortality of piping plovers due to collisions is extremely unlikely to be more than 0.5 piping plovers per year on average" and that "these losses will not appreciably reduce the likelihood of survival and recovery of either species." Finally, the Service states on page 72 "Notwithstanding, the duration of the potential exposure over 20 years or more, the Service determines that the proposed project will not appreciably reduce the likelihood of survival and recovery of the Atlantic Coast piping plover population breeding in New England and Atlantic Canada recovery units." In other words, with 130 turbines that are more than twice the size of the Camp Perry ANG turbines and plovers nesting within about 6 km of the Cape Wind turbines as opposed to 100+ km from the Camp Perry ANG turbine, the risk to plovers at Camp Perry ANGs is nearly infinitely smaller than at Cape Wind, which was judged acceptably small by the FWS. Thus the inconsistency between the FWS positions on the two projects must fairly be explained not by the ANG but by the FWS.

Most importantly, the model used for estimating Piping Plover risk at Camp Perry ANGS yields similar results to the method developed by the FWS Cape Wind Project after risk factors are appropriately scaled to account for the size of the project, the size of turbines, and the number of plovers that could potentially be at risk. Finally, the fact that the Service used only 20 years of projects vs. the 30 years of projections for Camp Perry ANGS herein, reinforces the ANG's contention that there will be no impact to Piping Plovers from the Camp Perry ANGS project.

Indiana Bat. Thousands of wind turbines now operate throughout the Indiana Bat's range and to date, about three individual bats have been found dead. These fatalities occurred at wind plants

in West Virginia (2012 – Laurel Mountain Wind), Pennsylvania (Northern Allegheny Wind), and Indiana (2009 – Fowler Ridge Wind). These incidents occurred in northern hardwood forest on mountain ridges at the sites in West Virginia and Pennsylvania; and a tilled agricultural field in Indiana. There is no similarity to the Camp Perry ANGS site.

Risk to Indiana Bats at each of these sites is demonstrably small. For example, in three years of post-construction studies at the North Allegheny wind project (40 turbines) site in Pennsylvania, only one Indiana bat was killed. At the Laurel Wind project (61 turbines), a single Indiana bat was found dead during two years of study. At several other wind plants near these two Appalachian mountain sites, no dead Indiana Bats have been found despite intensive searches commencing in 2003. At the Fowler Ridge Wind Farm in Indiana, a total of 162 wind turbines was built over tens of thousands of acres of farmland. At least two years of post-construction study were conducted at the project with only one Indiana Bat found dead.

Estimating the risk to Indiana Bats is extremely difficult. However, looking at the probability of a collision of an Indiana Bat with a wind turbine can be approximated, assuming other aspects of wind projects are comparable. Let us assume that all projects have a similar number of Indiana Bats using the sites and that each turbine has an equal probability of killing an Indiana Bat. So, with 263 turbines in aggregate at the Laurel Mountain, North Allegheny, and Fowler Ridge wind plants, each of which is more than twice as tall as the Camp Perry ANGS project and has a rotor swept area many times larger, one might calculate that with three Indiana bats being taken, the rate of take at these three plants would be 3/263 or 0.011 Indiana bats killed per turbine per year. (Note that at all three of these sites, only one Indiana Bat was known to be killed in multiple years of post-construction study, strongly suggesting that the fatality rate is far lower than the 0.011 bats per turbine used for this analysis.) If this rate is equal to the rate at Camp Perry ANGS, one Indiana Bat could be taken in 100 years of operation.

This probability model only examined those wind plants where Indiana Bats have been killed and only examines the years in which they were killed. If one examines all of the wind plants within the Indiana Bat's range, but which have no records of killing Indiana Bats, the rate dwindles astronomically. For example, if the three bats known to be killed by the 1,000 or 2,000 turbines located within the Indiana Bat's range, that would mean that 1 Indiana Bat may be expected to be killed by the Camp Perry ANGS wind turbine every 300 years. That number assumes that larger turbines kill equal numbers of bats as smaller turbines, which is unlikely to be the case. Since no Indiana Bats were found during the 2010 study at Camp Perry ANGS, the risk is likely even lower at that site.

Overall, the likelihood of an Indiana Bat fatality at the single turbine at Camp Perry ANG is de minimis. Certainly, the turbine at Camp Perry ANGS does not jeopardize the population of Indiana Bats and, in all likelihood; will not take a single Indiana Bat. Thus there is no basis for finding that there will an adverse impact to Indiana Bats caused by the Camp Perry ANGS turbine.

Note. As pointed out by the FWS in the Biological Opinions for the MPSCS for Kirtland's Warblers and the Cape Wind project for Piping Plovers, there is some uncertainty in the models.

However, the calculations used above are identical to those used by the FWS and thus cannot be regarded as other than practices and methods accepted by the FWS.

Bald Eagle

Bald Eagles were removed from the list of threatened species in 2007 and are now protected by the Bald and Golden Eagle Protection Act. The recovery of Bald Eagles continues with annual average increases of roughly 3-6+% for many eastern and Midwestern states. Numbers have increased dramatically to about 210 nesting pairs in 2012 in Ohio, up from slightly more than 50 in 1999 and only 4 nesting pairs in 1979. Thus, the "population" in Ohio is increasing at a very rapid rate, demonstrating that this species is resilient when substances like DDT are not spread over the landscape.

Existing threats to Bald Eagles today in the Midwest and beyond include collisions with vehicles, lead poisoning from hunting ammunition, electrocution and collision with transmission lines, fur trapping, collision with trains, and gunshot wounds. For example, in adjacent Michigan about 22 Bald Eagles were killed per year between 2008 and 2012 after colliding with automobiles on roadways and roughly 12 per year were killed in that state by lead ammunition during the same time period. These impacts are reported from most Midwestern and some Eastern states.

With respect to impacts from wind turbines, fewer than 10 Bald Eagles (likely N = 6 or 7) have been killed by all the wind turbines in North America since wind energy commenced development. Those birds were killed in Wyoming (N = 2), Iowa (N = 3), Ontario (N = 1), and Maryland (N = 1). The latter fatality was at a very small wind turbine owned and operated on a National Wildlife Refuge by the U.S. Fish and Wildlife Service. It is not known if the turbine at the Refuge was even operating at the time of the collision. The small turbine at the Refuge could have been used as a perch by raptors, unlike modern wind turbines that do not offer perching opportunities. These birds were killed during the past few years and represent all the known mortality of Bald Eagles at wind turbines in the history of wind power development and operation. Thus, of all the human-induced mortality, wind turbines appear to take the least toll on Bald Eagles (Kerlinger 2013). If even five Bald Eagles are killed per year by wind turbines in North America, that amounts to one Bald Eagle fatality per 10,000 turbines. Rates this low are, by their nature, not biologically significant or predictable.

Determining potential risk at the Camp Perry ANGS turbine is not easy for various reasons. Most importantly, collisions of Bald Eagles with wind turbines are rare events. Statistically predicting rare events is exceedingly difficult, especially when there are many different variables. For example, the Camp Perry ANGS turbine is a single turbine as opposed to facilities where six of the seven known Bald Eagles have been killed. Only at the FWS's own turbine has there been a fatality at a single turbine. All of the other sites where Bald Eagles were killed have been projects with dozens of turbines. Thus, risk created by the Camp Perry ANG turbine is much less than at the other multi-turbine sites where eagles were killed. Second, the Camp Perry ANG turbine is not as large as the six utility scale turbines in Wyoming, Iowa, and Ontario that killed small numbers of eagles. The one anomaly again is the FWS turbine in Maryland, which was smaller than the proposed Camp Perry ANG turbine. Since the Camp Perry ANG turbine is

much less than one-half the rotor diameter and height of the utility scale turbines, the taking risk is likely to be much smaller.

Third, the physical condition of Bald Eagles likely influences the probability of collision. Eagles with elevated lead levels are becoming increasingly more common because wildlife agencies, including the Ohio Division of Wildlife, permit use of lead bullets, shot, and slugs to shoot deer and other game animals. Lead poisoning kills perhaps 100 Bald Eagles each year outright in the United States. Many other animals are sickened, so a bird with lead poisoning has a much greater risk of colliding with various objects. It is not known if any of the eagles killed at utility scale wind projects suffered from elevated levels of lead.

Fourth, the abundance and behavior of Bald Eagles in a given area may influence the potential for collisions with wind turbines, although this has yet to be demonstrated empirically. The numbers of Bald Eagles present in Ottawa County is high and there are nests within several miles of the Camp Perry ANG turbine site. Thus, the risk is elevated to some degree, as outlined in the FWS letter to the ANG.

Fifth, the actual site where a turbine is located may also influence the potential for a collision. A turbine situated in a transit area is not as likely to present collision risk as one in an area where eagles interact with each other or forage. The Camp Perry ANGS site is not a foraging area, although Bald Eagles do fly over the base as they move, apparently, between nesting and foraging areas. The turbine site is between a building and a highway, a site that is not friendly to foraging or nesting eagles (and most other birds).

Combining the above variables, the probability of a Bald Eagle colliding with the single wind turbine is quite low. An eagle impaired by lead poisoning is the most likely candidate for a collision with the Camp Perry ANGS turbine. While the ANG has no desire to diminish the numbers of Bald Eagles, such a collision with the wind turbine by a poisoned bird might be a better outcome for that bird than a slower death due to lead poisoning.

**U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines**

Although the ANG project commenced prior to the finalization of the 2013 Guidelines, the ANG fully intends to adopt best management practices as a means of minimizing impacts to birds and bats. The list below provides a number-by-number description of how the ANG has adopted practices complying with the 2013 guidelines. Numbers correspond to the numbers on pages 49-52 of the Land-Based Wind Energy Guidelines.

1. Area to be disturbed is minimal and away from wildlife habitat. Originally, three turbines were planned for the Camp Perry ANG project. After receiving initial letters from the agencies and early discussions, the project was cut by 67% from three turbines to one turbine. In addition, that turbine would be farther south and farther from Lake Erie and better wildlife habitat. – In addition, the "habitat" to be "disturbed" by the installation of the turbine has been previously disturbed. It is a mowed lawn between large buildings and Ohio Route 2, a four-lane highway. In addition, the, ANG chose the site that is farthest from the shore of Lake Erie. The two turbines that were originally planned but since eliminated from the project were located about 0.6-0.7 miles from the Lake Erie shoreline, whereas the one turbine that is now being proposed is about 1.0 miles from the shoreline. This moves the turbine farther from a potentially higher risk area closer to the shoreline.
2. By reducing the number of turbines and moving the location inland, a large mitigation has been achieved. Risk is clearly related to number of turbines; and one turbine does not constitute a "high risk" to birds, especially if it is located on a grass lawn adjacent to buildings and highways.
3. There will be no roads, power lines, fences, and other infrastructure other than the turbine. A gravel pad and driveway will be put down through a small portion of the lawn on which the turbine will be placed.
4. Not applicable as there will be no roads, power lines, or fences.
5. Because the site is already a mowed lawn and there is no native wildlife, this is not applicable.
6. As there will be no new power line corridors, this is not applicable. All connecting lines from the turbine to the substation onsite will be buried underground.
7. There will be no met tower or communication tower and no guy wires.
8. There will be no permanent met tower.
9. Because construction of the turbine will be minimal and will be done in a mowed lawn between buildings and a highway, it is improbable that prey and predators will be attracted.
10. A red flashing, L-864 aviation obstruction lighting will be mounted on the nacelle in keeping with current U.S. Fish and Wildlife Service guidelines. This lighting has been demonstrated repeatedly to not attract night migrating birds (Kerlinger et al. 2010).
11. There will be no maintenance area/building and the existing substation at the project site is away from the turbine, so there will be no lights for those facilities close to the turbine.

As part of the safety practices at the turbine, all workers who enter the nacelle will be instructed to turn the lights off when they complete their work.

12. Non-disturbance buffer zones are not needed at this project because there are no "sensitive habitats or areas of high risk for species of concern."
13. By moving the turbine to a site that is on a grass lawn, between a road and buildings, it is improbable that the turbine is between daily roosting, feeding or nesting sites. Also, because there is only one turbine, the area occupied is very small.
14. There will be no impacts to stream morphology or hydrology because almost no grading is needed and the site is already a disturbed lawn on an industrial site. Erosion control will be controlled by standard construction practices used on U.S. military bases.
15. Tubular towers will be used per the guidance recommendation.
16. This has been achieved by having no roads for access to the turbine site. Only a very short driveway to the turbine from the ANG perimeter road will be built. There is also no need to restore such roadbeds to native vegetation because the area is already a disturbed lawn.
17. This was achieved by having only one, very short temporary gravel driveway to the turbine during construction. No access roads were needed because existing perimeter roads for the ANG base will be used.
18. No wetland areas will be disturbed per the guidance document. The turbine will be setback from wetlands.
19. Vehicle collisions will not likely increase onsite because existing roads will be used. Those roads have low vehicular speeds. The driveway to the turbine is very short and speeds will not likely exceed 10 mph.
20. Employees, contractors, and site visitors will be instructed to avoid harassing and disturbing wildlife. This is already federal policy and policy of the ANG base.
21. Vehicles and human activities on site now are guided by federal and military fire safety standards. Thus, fire is not a significant issue.
22. All federal and state measures for handling toxic substances will be followed, primarily because the project site is a military base and those measures are part of standard operating procedure on the base.
23. All recommended measures will be taken to prevent invasive species from being introduced. However, the grassy lawns and weedy areas where turbine construction will be built are likely already dominated by invasive species as are most industrial-type areas.
24. Regarding invasive species prevention and control measures, all activities on the Camp Perry ANG base adhere to federal policies.
25. Waste and garbage on site will be managed per the current federal standards for an ANG base, thereby reducing or eliminating the potential for creating attractive nuisances for wildlife.

26. Although it is highly unlikely that large animal carcasses will be present on the base, this recommendation will be followed should such a carcass appear close to the turbine on the ANG base.

Recommendations and Guidance for Retrofitting, Repowering, and Decommissioning from the U.S. Fish and Wildlife Service Land-Based Guidance are not applicable at this time. If such retrofitting, repowering, or decommissioning is needed, the Service guidance and recommendations will be followed.

**Post-construction Monitoring for the Camp Perry ANG Wind Turbine and Adaptive Management**

Post-construction monitoring for the turbine at Camp Perry ANG will include a fatality study in which the number and species of birds and bats killed by the turbine will be determined via on the ground studies. For the fatality monitoring protocol, we relied on the Ohio DNR protocol (Exhibit A from the "On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio. An Addendum to the Ohio Department of Natural Resource's Voluntary Cooperative Agreement" May 4, 2009). Because the document is nearly four years old, the protocol to be used would be a slight modification of the ODNR protocol, as outlined below. This protocol is very similar to that recommended by the U.S. Fish and Wildlife Service and the methods used by many consultants, university faculty (i.e., University of Wisconsin), and non-profit environmental organizations (i.e., Bat Conservation International) that have done this type of work.

The fatality study will be conducted by an independent, third party (consultant or university), although the actual searches will be conducted by one or two ANG staffers. This approach insures that the design, training of searchers, analysis and other methodologies are controlled by a scientist with experience in this type of research. In addition, access to the base and the wind turbine area for searching will be accomplished by someone who has a security clearance for the base. That person will be supervised by the independent, third party who is chosen to conduct the study.

Fatality searches will be conducted between dawn and 9 a.m. year-round during the first year after construction and the turbine is operating without maintenance issues. In other words, searches will commence after all major maintenance activities have been completed. Major maintenance sometimes continues for up to a month after turbines are installed. Searches will not be conducted until such major maintenance is completed because turbines are often not running during the initial operational period and need adjustment and fine tuning.

Searches will be conducted along transects separated by five meters within a square that extends outward to 50 m from the turbine base. The ODNR protocol stipulates the area to be search should be two times the turbine blade length, which is about 22 m at the Camp Perry ANG turbine. Thus, the search area would be larger than suggested by the ODNR. This additional search area will provide a conservative estimate of fatalities. In addition, because the area is mowed lawn, searching will not be hampered by tall vegetation. It will require roughly one hour to search the lawns beneath the turbine during on each day the turbine is searched. This time will include entering data on data sheets. A greater amount of time, perhaps 1.5 hours per search, if one or two birds or bats are found dead, which is very rare at individual turbines.

Vegetation mapping will be done at the beginning of the project to determine whether the entire search area can be searched with relative ease. Because the area beneath the turbine is a grass lawn that is mowed regularly, mapping should only be needed once. However, if there is a change in mowing schedule that makes any of the search area difficult to search (grass taller than 20 cm [ 8"]), vegetation mapping will be done per the ODNR fatality monitoring protocol.

Searches will be conducted every three days during the period April 1 through November 15 and weekly during the remainder of the first year of operation. Three day search intervals are greater than has been used at a majority of wind power sites studied, which sample at 7-day/weekly intervals. The winter surveys at weekly intervals will be done mostly to search for large birds, including eagles. The ODNR fatality monitoring protocol did not include a recommended search interval. Most sites are now studied at 7-day intervals, which is statistically adequate when sampling a much larger number of turbines. For searching one turbine, 3-day intervals represent an effort that is more than twice the effort normally used for similar studies. Also, because the U.S. Fish and Wildlife Service and ODNR have expressed concern about bird and bat risk at the Camp Perry ANG site, a greater number of searches will provide a more conservative data base.

In the event of heavy rain, lightning, or snow/ice, a turbine search may be delayed for one or two days after which searches will proceed at 3 day intervals. Missed days that result in longer search intervals will be dealt with statistically. Winter surveys will not be done when there is evidence of ice or snow on the blades. Such accumulations are dangerous to searchers, precluding searching at those times. In the case of ice and snow on turbine blades during winter, a survey for larger birds can be accomplished by scanning the area with binoculars from a safe distance. Because large birds like raptors and eagles may be easily seen on grass or snow, this winter sampling protocol balances the need for searcher safety and conducting a survey.

Because not all bird and bat carcasses are found by searchers, both searcher efficiency and carcass removal studies will be conducted per the ODNR protocol. These studies will determine the efficiency of searchers for small and medium birds and for bats. Because the search area is grass, large carcasses, like ducks, raptors, etc., will all be found with relative ease. Searcher efficiency for those large birds has been found to be virtually 100% in open habitats like mowed fields, making use of large carcasses unnecessary. Scavenging test will use a similar number of carcasses for birds and bats. Calculation of efficiency and scavenging rates will be done via standard methods (see Huso 2011, Arnett et al. 2009, etc.), which have been used for studies at dozens of wind energy facilities and communication towers (Gehring et al. 2009).

Although the ODNR recommends conducting 200 random searcher efficiency trials per year (200 carcasses or a smaller number planted multiple times), planting this number of carcasses at the one Camp Perry ANG turbine would attract scavengers. These might include crows, raptors, vultures, and possibly eagles, not to mention rats, raccoons, and other mammals. Attracting

avian scavengers to the turbine area, an area that is devoid of good wildlife habitat, would potentially result in higher scavenging rates than would be the case and perhaps fatalities of these avian species as they are attracted to food. For example, eagles and hawks are regularly killed by trains and automobiles as they are attracted to carcasses along tracks and highways. Thus, the numbers of carcasses we propose herein for determining efficiency and scavenging rates are more appropriate and will result in a robust estimate of these parameters.

Reporting for each turbine search, including carcasses found will be done via the data sheets provided on the last four pages of the ODNR fatality monitoring guidance document (2009). Data sheets will be available to both the U.S. Fish and Wildlife Service and the ODNR at the end of the first year of study. When a carcass is found, all data recommended by the ODNR will be recorded.

Safety precautions should be taken by searchers to avoid contracting diseases that are vectored by birds (and bird parasites) and bats. Use of rubber gloves to handle carcasses, along with sterile procedures will be routine for handling and salvaging specimens found. In addition, all searchers will be required to be vaccinated for rabies. Carcasses will be stored in a freezer at Camp Perry ANG. Prior to salvaging any carcasses or bird/bat parts, permits to salvage carcasses will be acquired through the U.S. Fish and Wildlife Service and the ODNR.

At the end of the first year of fatality searching, the fatality rate for bats and birds (small and medium, and large if any are found) will be determined using the calculations of Huso (2011), which includes the determined scavenging and searcher efficiency rates. This calculation method is now accepted by the agencies, as well as non-profit environmental organizations such as Bat Conservation International. In addition to the mean fatality rate per turbine and per megawatt per study period, 95% confidence intervals will be calculated so that the fatality rate from the Camp Perry ANG turbine may be compared with the rate from other turbines in the eastern and Midwestern U.S. To determine if the fatality rate at the Camp Perry ANG turbine is above or below the regional average, we will compare the rate with the mean and 95% fatality rates from other turbine sites in the eastern and Midwestern United States. Thus, it will be determined if the rate found at Camp Perry ANG is statistically different from rates reported elsewhere and if significant, whether it is above or below those rates. In addition, the magnitude of difference will be determined as a percentage above or below the mean of other sites, only if the difference exceeds the 95% confidence interval.

In the event that a rare threatened or endangered species or a Bald Eagle is found dead, the U.S. Fish and Wildlife Service and the ODNR will be contacted within 24 hours. These carcasses will be left in place, although they will be covered with a tarp so that they cannot be scavenged or taken away, and so they may be found again. In the case of Myotis species, the specimens will be collected and provided to an expert bat biologist for identification. This process will

insure that Indiana bats are not overlooked or misidentified among Myotis species as can easily be done by non-experts.
A report will be provided to the U.S. Fish and Wildlife Service and the ODNR within two months of the completion of one year of searches. The report will provide summaries of all searches conducted, the effort involved (time in the field, etc.), searcher efficiency and scavenging studies, vegetation surveys, species list for carcasses found, fatality rates for small and medium, as well as large birds, if needed. Species not protected by the Migratory Bird Treaty Act (European Starling, House Sparrow, and Rock Pigeon [Rock Dove]) will not be included in the calculation of fatality rates per turbine or per megawatt.

The report will also compare the fatality rate and species composition found at Camp Perry ANG with results from other fatality studies conducted at wind turbines. In addition, comparisons will be made to fatality rates and species composition found at communication towers. The rationale for the latter comparison is to provide a quantitative perspective regarding the number and type of birds killed by the Camp Perry ANG turbine. Once the report is finalized, a copy will be provided to the American Wind and Wildlife Institute for entry into their database. To insure complete transparency, unlike some of the study "results" provided by the recent FWS comment letter, the results from the Camp Perry ANG fatality study will be made entirely public record.

Radar and Behavioral Studies, and Mitigation

With respect to radar and behavioral (direct visual) monitoring post-construction, as well as the need for mitigation, the plan for Camp Perry ANG is to consider these studies, as well as mitigation after the first year of fatality monitoring. For several reasons radar and behavioral monitoring, along with mitigation may not be needed. Those reasons include the fact that there will be only one turbine, that turbine will be roughly one-half the height of most modern utility scale wind turbines, and the turbine is not located in significant wildlife habitat. In fact, the turbine would be on a lawn, between buildings and Route 2, a four-lane, state highway. Thus, fatality rates are unlikely to be significant, from a NEPA standpoint, because birds will not be attracted to the immediate turbine area.

To determine whether an additional year of fatality study is needed, the results of the fatality study, as reported in the year-end report, will be compared to predictions provided by the wildlife agencies in their letters and to fatality rates from the dozens of other post-construction fatality studies conducted at wind turbines in the eastern and Midwestern United States. Both agencies that commented have assumed that the site would be a "high risk" site for a single development, but neither provided any quantitative information as to what constitutes a high risk site. In other words, they never stipulated how many bird or bat fatalities make a site "high risk."

The methodology for comparing fatality rates among sites was described above. In short, if the fatality rate per turbine or per megawatt exceeds the upper 95% confidence interval (the standard statistical difference test) from other studies, a second year of fatality study will be conducted. Also, if this is the case, marine radar and behavioral studies will be considered. Prior to consideration, the efficacy of using radar or behavioral studies for evaluating risk or developing mitigation will be determined. To date, radar has never been demonstrated as a robust or reliable tool for predicting risk at wind energy facilities.

The ODNR protocol does not explain how radar can be used to predict risk or how it would be useful with respect to reducing or eliminating risk to birds or bats. Even the FWS land-based guidance document suggests that radar is an unreliable tool for predicting how many birds or bats will be killed at a wind energy facility (page 30. "While an active area of research, the use of radar for determining passage rates, flight heights and flight directions of nocturnal migrating animals has yet to be shown as a good indicator of collision risk."). So prior to using radar, NEPA would require a better understanding and demonstration of the efficacy of using radar for wind energy risk assessment and mitigation.

With respect to behavioral studies, fatalities of daytime flying birds would have to exceed the trigger number for mitigation. Most importantly, night migrating birds and bats cannot be studied with direct visual observations, so behavioral studies using direct visual observations are not applicable to those species, which account for a majority of fatalities at wind plants.
A similar process will be used to determine if mitigation is needed. If the fatality rate per turbine or per megawatt exceeds the 95% confidence limit for other fatality studies, mitigation will be considered. Prior to determining the type of mitigation, the species involved will be examined. Most importantly, the numbers of individuals killed of a given species and whether it is rare or very common should be the metric that determines mitigation. Mitigation may be needed if a species is rare or very uncommon, whereas such mitigation is not likely to be needed if a species is common. In other words, mitigation should be used primarily for rarer or uncommon species that are impacted at wind plants.

[Note. The ODNR protocol states that mitigation is necessary if the facility fatality rates exceed one standard deviation above the mean of regional fatality rates. We do not understand how a non-significant difference from regional average would require mitigation when such a difference is not necessarily statistically significant. Note that the 95% confidence interval is the accepted level of discerning random from statistically significant differences. Thus, the ODNR is not relying on statistically correct or accepted practices, which is why we have chosen to rely on the 95% confidence interval. Why the ODNR used one standard deviation as their metric for mitigation actions is unknown and was not explained in their guidelines.]

The type of mitigation that is to be used, if mitigation is determined to be necessary should be an adaptive management process. In other words, the mitigation should focus on reducing mortality of species that have been demonstrated to be killed. If bat fatalities are high enough or if species are involved that warrants mitigation, mitigation might include curtailment of the turbine during the late summer-early fall period when bats swarm and migrate. In addition, the mitigation should focus on the time of night and weather conditions that are conducive to bat mortality. This has been outlined by Arnett and Huso (2009) and is now being used at several wind energy facilities. Details of the mitigation can be discussed with the wildlife agencies in an effort to be transparent and open.

**Merlin Radar Study Results for Camp Perry ANG ANG – 2012**

Fall and spring 2012 radar studies for the Camp Perry ANG wind turbine project have been completed and a report is now available (Detect 2013a, 2013b). As with other radar studies, it is difficult to determine what the data collected means for interpretation, with respect to risk to birds. Data were collected almost daily from January 25-May 31, 2012 and from August 15-December 15, 2012, covering virtually all of the migratory period for birds and most bats in the western coastal area of Ohio. Radar data were not collected at times when precipitation precluded observations. In the sections that follow, data pertinent to determining potential risk to night migrants at the Camp Perry ANG project are presented. Most importantly, we compared the Merlin data to data taken at other prospective wind energy facilities. We also compared the Merlin to non-Merlin radar as a means of determining whether there were biases in the Merlin data. Bias would mean that data from different radars would not be comparable. Readers interested in the complete reports and data, should request those reports from the ANG through the Freedom of Information Act process.

There are several types of marine radars that have been used for detecting and measuring aerial biological activity (birds, bats, and insects) at prospective and existing wind energy sites. Differences in radars used at wind energy projects arise from a continuing evolution of technology since 1982, when radar was first used at a prospective wind energy project in the San Gorgonio Pass of southern California. During the 30 years since, changes in radar use have included more powerful radar, different methods of screening insects from bird and bat data, different configuration of vertical and horizontal components, as well as different software used for interpreting and analyzing raw radar data (NRC 2007, http://www.detect-inc.com/avian.html). Some recent software developed for use at wind energy sites is also proprietary, making it virtually impossible to calibrate or compare the results from different radars.

There has also been a variation in the training and experience of individuals who use radar to monitor biological targets at wind energy sites. In the mid-1980s, only one company and one university professor were conducting radar studies for the wind power industry. As of 2012, there were at least ten consulting firms, federal agencies, non-profit environmental organizations, and academics using radar for the wind power projects. Thus, as wildlife agencies, including the U.S. Fish and Wildlife Service and various state governments (New York State, Maine, Vermont, Montana, Massachusetts, Ohio, etc.) required or recommended radar studies at prospective wind energy projects, more companies and other groups purchased radars and commenced using them. As this occurred, there was little effort to standardize radar technologies, field methods used, training of technicians, metrics used for reporting, or software used to analyze the data collected with radar. Furthermore, no one made side-by-side radar comparisons to see if the units and methods used were comparable. For example, in the 1990s,

radars were usually 10 kW units, whereas today, some are 30 kW. With the greater power, target detection and sensitivity to various types of biological targets has likely changed. Again, no one has examined such changes over the past two decades.

Because there are differences in various technologies and methodologies among radars used at wind energy sites, this report compares the results of studies conducted with Merlin and non-Merlin systems as a means of determining the magnitude and variability of the differences, if any. The radar report for Camp Perry ANG relied on a 30 kW Merlin system and the present report compares the results of the radar study done for fall and spring migration at Camp Perry ANG, Ohio, with other non-Merlin radar results from the eastern United States.

Although both Merlin and non-Merlin systems are based on the same underlying microwave technology, the Merlin system differs somewhat from other technologies. Differences in the setup and processing of radar data can affect reported results and data, both quantitatively and qualitatively. Merlin type radars count target heights and numbers in real time, using the vertical beam (VSR) to count both target flight heights and numbers. While the Merlin used VSR in real time, some other radar systems use one radar beam for both the HSR and VSR and alternate between them when sampling the airspace over the radar unit. The samples are then analyzed in various ways, depending on the operator, and analyzed to estimate target flight heights, targets per km/h, and flight direction. Different software is also used to analyze the raw data, as well as to estimate the number of targets observed passing a given location. The Merlin system for the Camp Perry ANG project did not measure flight direction.

For the purpose of comparing the Merlin radar with non-Merlin type radars, three independent measures were extracted from the studies and used for the analyses: 1) mean targets per kilometer per hour; 2) percentage of targets observed within or below the rotor swept zone; and, 3) mean altitude of targets observed. A peer-reviewed or proven analytical tool for using radar data to predict or assess risk is not available. However, these three variables were chosen because they are the three metrics that may be the most useful for assessing or predicting risk to birds or other biota at a given site, and these are sometimes cited by agency biologists as metrics that may provide insight into the number of fatalities that will likely occur at a prospective wind plant. Again, it is important to note there has been little to no use of these data for predicting actual risk to birds or bats.

The literature was examined to assemble a list of spring and fall radar studies (Table 1) from which the summary data were extracted for subsequent statistical analyses. A total of roughly 90 studies, conducted in seven states in the eastern United States were used for the analyses that follow. Eight studies were done with the Merlin system at seven different sites, including the Camp Perry ANG project site. For non-Merlin radar systems, there were about 82 studies done at 71 sites (Table 1). Some of those sites were studied more than once and those studies listed

more than once in Table 1 were either done in different years or at slightly different geographic or topographic locations.

Table 1 provides the spring and fall data for three variables, permitting six statistical tests between data collected by Merlin vs. non-Merlin systems. The variables included mean rate of target passage per kilometer per hour for both spring and fall, the percentage of targets observed flying at altitudes less than 62 m - the height of the rotor when blades are in the 12 o'clock position, and mean altitude of flight. Not all studies included spring and fall observations, so sample sizes are unequal between these groups and different sample sizes were used for the statistical analyses. In addition, not all studies reported mean altitude of migration. Studies that are listed more than once in Table 1 represent studies in different years or sites that were separated by relatively short distances, sometimes at nearby sites with different topography. For some studies, the results are for pre- and post-construction.

Several radar studies conducted at prospective and operating wind energy facilities in the eastern United States could not be included in the analyses that follow. For example, studies conducted by New Jersey Audubon Society at the Maple Ridge facility in upstate New York and the Atlantic County Utilities Authority in New Jersey were not included because results were reported using different metrics for target passage rate which were not statistically comparable. Those studies reported densities of targets in a volume of the airspace over the radar site, rather than linear measurements of passage rate. Such use of different metrics has made it impossible to make comprehensive comparisons of all studies done. The analysis presented here includes as many sites as could be found that used the same metrics as were used in the eight Merlin studies listed in Table 1.

## Analysis of Merlin vs. non-Merlin radar data

For the comparison of results from Merlin and non-Merlin radar studies, a review of the literature revealed a total of 90 studies from 78 different wind energy sites in the eastern United States. Eight Merlin-type radar studies were available from seven different sites and 82 radar studies were available at 71 sites for non-Merlin radar (Table 1). Mean values for each of the six variables were provided in Table 1 (see also Table 2), along with standard error, and sample sizes. Numerical and statistical comparisons of the Merlin vs. non-Merlin data from in Table 1 are provided in Table 2. A randomized t-test was used to determine whether the mean values provided at the bottom of Table 1 for Merlin-type radar and non-Merlin-type radar studies differed statistically. Also presented in Table 2 are measures of absolute and relative (in percentages) differences between the means from Merlin and non-Merlin study results.

On average, the Merlin-type radar consistently detected a greater number of targets in both spring and fall. In fact, the passage rate for spring Merlin studies averaged almost twice that of spring non-Merlin studies (671 vs. 337 targets per kilometer per hour, Table 2), and was 87% greater than for non-Merlin studies. For fall studies, there was also a much greater traffic rate for the Merlin studies (607 vs., 349 targets per kilometer per hour) and averaged nearly 70% greater passage rate. Thus, sites where Merlin was used had a much greater average target passage rate than did the 70+ studies where non-Merlin-type radar was used. In other words, use of Merlin-type radar resulted in higher target counts, on average, than non-Merlin-type radar, which site differences alone cannot explain. The t-test statistic revealed a significant difference for spring and fall (Table 2). The fact that there was nearly a 50+% difference in average target passage rate between Merlin and non-Merlin for spring and fall, strongly also suggests that the differences are real, even with the small sample sizes.

With respect to the mean altitude of flight, Merlin-type radar studies reported lower flight for both spring and fall studies (Table 2). For spring studies, there was an 112 m difference (291 m vs. 381 m) and for fall studies there was a 80 m difference (277 m vs. 415 m), both of which reflect lower flight as measured by the Merlin radar (Table 2). The mean altitude of targets was 24% lower for the Merlin measurements for spring and 34% lower in fall (Table 2). Both the fall and spring data showed a highly significant difference via t-test, with both having P values $<0.05$. These data indicate that there is a real and statistical difference between Merlin and non-Merlin data with respect to altitude even with the small sample size for Merlin data. This appears to indicate that Merlin radar can see more targets close to the ground than non-Merlin radars.

The Merlin radar, detected greater percentages of targets flying at altitudes below the rotor swept height (the tip of the turbine rotors in the 12 o'clock position - 61 m) than did non-Merlin radars. There was a significant differences between the average percentages observed flying below the rotor swept height zone in fall ($P<0.05$, Table 2), but not in spring ($P < 0.15$). Overall, the Merlin studies (Table 1) averaged a greater percentage of targets within and below the rotor swept height than did non-Merlin radars. For spring, the percentage for Merlin was 4.8% greater in the rotor swept height zone than for non-Merlin radar and for fall the difference was 175% different (Table 2). However, for the Camp Perry Merlin radar study, the percentage of targets within and below the rotor swept height was lower than was the case for the average for non-Merlin radars. These results are unlike results from the other sites where Merlin radars have been used.

Although only one of the six statistical tests did not demonstrate differences between Merlin and non-Merlin radar data at better than the $P<0.05$ level, it is important to note that the other statistical tests showed levels of $P<0.15$. In other words, the difference was better than the 85% level. In other words, there is concordance among the statistical tests, especially for mean

passage rate and mean altitude of targets. What was bizarre is the fact that the percentage of targets reported by Merlin in the turbine height zone was statistically lower for one of two tests.

These results strongly suggest that there is a bias among radar types with some systematically detecting more targets and targets flying at lower altitudes. There are plausible and testable reasons for the differences found between Merlin and non-Merlin types of radar. The data seem to indicate that the Merlin radar is simply more sensitive at detecting targets, especially low targets, than other radars. The fact that more targets were observed by Merlin radar, combined with the fact that more were observed at lower altitude make a case for greater sensitivity by that type of radar or by the software used for analyzing the Merlin data.

There are three potential explanations for the pattern of differences between Merlin and non-Merlin radars. First, the Merlin software may be confusing ground clutter with vertebrate targets, which would inflate the number of targets counted at lower altitudes. Second, the Merlin radar algorithm may not screen for insect targets as well as other radars. The fact that entomologists use X-band radar, the same wavelength as the Merlin radar, for studying insect makes a plausible case for the confusion of insect, bat, and bird targets. Finally, it is possible that the Merlin radar simply "sees" more birds and bats because of greater power and, or sensitivity. One or a combination of these explanations would make it virtually impossible to compare directly Merlin and non-Merlin derived radar data.

It is important to remember that the mean statistics for target passage rate, altitude of targets, and percentage of targets detected within and below the rotor swept zone were not entirely for migration seasons. Because the data used for both spring and fall included non-migration season data, it is likely that the number of targets during the migration seasons would have been much greater if data from the migration seasons had been used alone. Mean target passage rate for spring included the period January 25 through May 30. If the data included in the Appendices are examined and the figures in the report for Camp Perry ANG, it is obvious that the rate of passage was several times greater for the period April 1-May 30 than for earlier in the "spring" and winter. The mean for the April-May period would have been well over 1,000 targets per kilometer per hour, which would have increased the differences between Merlin and non-Merlin radars in the statistical analyses. Similarly, the late fall season (November and December) were much lower and when included make the fall migration target passage rate much lower than if only the migration season were included. Again, inclusion of only the migration season would have increased the mean passage rate to more than 1,000 targets per kilometer per hour, thereby increasing the difference between Merlin and non-Merlin radar results. If corrections were made to include only migration season, as is done with non-Merlin radar studies, it would have been more evident that Merlin radar is biased and comparisons between these types of radars cannot be done.

The difference between Merlin and non-Merlin radars may also be a result of several other factors including differences in hardware or software used, or of some other difference between the study methods. The latter include operator experience, radar settings [attenuation, orientation in relation to the axis of migration, etc.] weather, numbers of insect targets, wave clutter, etc. These differences also suggest that the Merlin radar may be more sensitive or more adept at identifying small targets than other radars. The fact that more targets are seen and more are detected at lower altitudes by Merlin radars than are seen by other radars is what would be expected from a more sensitive radar system. The fact that Merlin radars consistently report significantly different passage rates and altitudes, not to mention vastly greater variation than other radars, strongly suggests that the higher number of targets recorded at Camp Perry ANG by the Merlin, is related more to the radar than to differences in migration behavior among project sites. This is reinforced by the possibility that ground clutter and insect contamination may also affect the radar data. These factors increase the uncertainty of the database, thereby making predictions regarding fatality rates based on radar data alone tenuous.

There are other explanations for differences among the various types of radars used for studying birds and bats at prospective wind energy project sites. A study by Schmaljohann et al. (2008) demonstrated that density estimations using radar can be as much as 400% different among different radar systems or operators. The reason is because the radars were not calibrated, so it is impossible to determine if one radar type consistently detects more targets than another type of radar. Schmaljohann et al. empirical results suggested that the large differences were due to different detection probabilities related to calibration of the radars' density setting. Schmaljohann et al. conclude, "We fear that quantification of bird migration and predicted bird numbers affected by collisions with artificial structures are in many cases based on unreliable estimates." In addition, it is known that the magnetrons of marine radars degrade over time and become less sensitive, so a new system will likely be more sensitive and pick up more targets than an older one. Radar operators in the U.S. who study prospective wind energy sites simply have never compared their data or tested whether their radars are seeing the same targets. The statistical tests reported above are the first to compare radar results, although the Merlin and non-Merlin radar data are from different sites, so they do not conclusively answer the key question.

The insect issue, raised by the higher passage rate and lower altitude of targets "seen" by Merlin radars, has been suggested previously for this type of radar. Kerlinger (Paul Kerlinger rebuttal testimony for the East Haven Wind project, Vermont – Vermont Public Service Board, February 11, 2005) believed that insect contamination was an issue with the Merlin radar that was used. He contended that the reason the Merlin radar system detected 1,700+ targets per kilometer per hour for fall migration at a site in northeastern Vermont was related to migrating insect contamination of the radar data. The reported 1,700+ targets per kilometer per hour was roughly four to five times the average rate per kilometer per hour reported by most radar studies in eastern North America at that time (and since – see Table 1). Support for Kerlinger's contention

comes from some of the most respected radar ornithologists in the world. Schmaljohann et al. (a team of veteran radar ornithologists from Europe) demonstrated how difficult it is to discriminate between insects and birds when using marine radars like the Merlin or non-Merlin systems. What is interesting about this insect issue is the fact that different radar operators screen or filter out insects using different methods and there is no general consensus as to how insects should be screened out. The Merlin system uses apparent size of echoes to separate insects from birds and bats, whereas others often use the speed of targets. Because insects move at slower airspeeds, they can be screened by speed. However, there is overlap among both size and airspeed, so neither method is exact and how each method is implemented may also account for some of the differences between these two radar systems. It is interesting also that some non-Merlin radar operators who use the same basic hardware report so many insects that they must shut down their radar on some nights (S.A. Gauthreaux personal communication and presentation to New Jersey Department of Environmental Protection) because they are not confident about the data they are recording.

**Risk to Night Migrants at the Camp Perry ANG Wind Power Project.**

There is no universally accepted method for predicting how many birds will be killed or at what rate they will be killed at wind energy projects. There are two "camps" regarding how to predict fatalities. Some consultants, environmentalists, and wildlife agency biologists have suggested that data from radar can be useful for predicting risk, although at this time it is untested and will not be used to make predictions regarding numbers of night migrants likely to be killed annually at the Camp Perry ANG turbine. The other camp believes that the best means of determining relative risk is to examine collision rates from empirical data from wind plants in the same geographic region. That is, real data from post-construction fatality studies. Using historical data, risk for proposed sites can be determined. This method has been used by some consultants for more than a decade with success.

The empirical data approach for estimating fatality rates of night migrants is based on a very large body of peer reviewed science gathered from 27 empirical studies (Table 3) of fatalities at wind plants in the eastern North America. This approach relies strictly on the weight of evidence from previous empirical studies rather than on untested predictions based on radar or other speculation. At those sites, about one to five night migrants per turbine per year were killed (Table 3). These studies required many years to conduct and during that time 47,000+ individual turbines searches were conducted. No other industry has assembled a similar empirical body of data that demonstrates actual impacts to birds.

Using this approach, the maximum for the single Camp Perry ANG turbine may be as high as about 10 night migrants per year. However, it is more likely that fatalities would be lower, perhaps in the range of 5-6 night migrants per year, as has been found at other sites in the eastern U.S. and Ontario. Even if the Camp Perry ANG turbine, which is much smaller than all the

utility scale turbines in the studies in Table 3, kills twice the average, the fatalities would still be roughly 10 per year. This number is not significant from a population perspective.

For comparison, it is of heuristic value to compare the probable rate of fatalities likely for Camp Perry ANG with other tall structures, including those owned and operated by state governments and used by the U.S. Fish and Wildlife Service. Just across the border in Michigan, Kerlinger et al. and Gehring et al. (2009, 2011) conducted a study of communication towers that are roughly twice the height of the Camp Perry ANG turbine and are equipped with guy wires and steady burning FAA lighting. The rate of fatalities at those towers was found to be about 100 night migrants per year, which is between 10 and 25 times the number we are predicting for the Camp Perry ANG turbine. Thus, the fatality rate at the Camp Perry ANG turbine would be far fewer per than can be found at hundreds of individual public safety communication towers in the United States (Gehring et al. 2009, 2011, Kerlinger, P., J. et al. 2012, Longcore et al. 2012), including Ohio. These towers are owned and used by state and federal agencies and were subject to review under the NEPA process prior to construction. Thus, if fatalities at communication towers that have been licensed via NEPA and are being used by federal and state agencies it is obvious that these levels of fatalities are not biologically significant. Therefore, it is highly improbable that fatalities caused by wind turbines are biologically significant.

## Discussion of Radar Efficacy and Data Issues

Although radar has been used for more than 20 years for evaluating the potential for risk to birds and bats at wind energy facilities, there has been only one true test of whether the data collected with radar is correlated with fatality rates of night migrating birds. During spring and fall migration in 2007 and 2008, marine radar and fatality studies were conducted simultaneously. Radar was used by the New Jersey Audubon Society to measure the density of migration, along with Curry & Kerlinger, LLC conducted fatality studies of night migrating birds and bats. The project was contracted and funded by the New York State Energy Research Development Authority (NYSERDA) to determine whether radar data were correlated with fatality data. The results showed no significant relationship with fatalities, even when passage rates at different altitudes were analyzed separately. After peer review, the report will be made public by NYSERDA.

Based on previous assessments of radar by the U.S. Fish and Wildlife (2012) and the National Academy of Science (National Research Council 2007), the results of the NYSERDA study do not appear to be surprising. In their most recent guidance document for wind energy development, the U.S. Fish and Wildlife Service stated the following (page 30):

“In contrast to the diurnal avian survey techniques previously described, considerable variation and uncertainty exist on the optimal protocols for using acoustic monitoring devices, radar, and other techniques to evaluate species composition, relative abundance, flight height, and trajectory

of nocturnal migrating birds. While an active area of research, the use of radar for determining passage rates, flight heights and flight directions of nocturnal migrating animals has yet to be shown as a good indicator of collision risk."

Thus, even the agency that has recommended radar as a preconstruction tool for evaluating potential risk to birds and bats understands that there are issues with radar. That they recognize that there is considerable variation and uncertainty in radar data is important for understanding that the Camp Perry ANG site radar results cannot be used with certainty to predict risk to birds and bats.

A National Academy of Science (National Research Council 2007) volume on the environmental impacts of wind energy development also made it clear that radar used for assessing projects and predicting risk had issues. For example, they stated that "it is essential that calibration of the unit be performed before studies are begun, and the calibrations be conducted periodically during the study" (page 316). Schmaljohann et al. (2008) also made it clear that without proper calibration, radar errors, with respect to numbers of targets, may be as much as 400% off. The report from Camp Perry ANG site provides no indication of calibration of the Merlin radar, so it is not known how accurate their estimates of target rate may be. This lack of calibration should also be done for altitude measurements because without calibration, higher or lower targets may be detected differentially.

In addition, the National Academy (page 318) panel made it clear that "the identification of birds, bats, and insects and determination of the number of targets per echo on marine radars can be problematic." They further made it clear that "not all marine radars detect biological targets equally" (page 316). This statement is borne out in the analyses above that show Merlin radars produce different results as compared to non-Merlin radars. Other analyses may show that there are other systematic differences between the various types of radars and radar operators that have or are now working at wind energy facilities.

Thus, ample doubt has been expressed by various experts regarding the use of radar for assessing risk to birds and bats at wind energy facilities. These doubts focus on calibration of radar, differences in power of radar, the varying detectability of biological targets in the atmosphere, target passage rate, altitude of targets, identification of targets (birds vs. bats vs. insects vs. non-biological phenomena) and, perhaps other issues. These issues should be resolved before radar continues to be recommended for predicting risk at prospective wind energy sites, as well as radar used post-construction for potentially reducing risk via curtailment of turbine activity.

Despite the doubts, the ANG at Camp Perry ANG has used radar, as stipulated in letters from both the FWS and ODNR. The radar data are available for scrutiny by agencies and their experts. At this time the radar cannot be used for predicting risk or fatality rates at wind plants because there has been no validation of the technique and there are no standard ways for estimating fatalities based on radar results. Instead, empirical data from 27 studies conducted at

wind plants in eastern North America were used and the results of those studies demonstrate that a single small turbine, like the Camp Perry ANG turbine, is not likely to kill more than about 5 birds per year, although it is remotely possible that the rate could be as high as 10 birds per year.

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**Table 1.** Summary of results of Merlin and non-Merlin type radars from available studies in the eastern United States. References available upon request.

| | **Targets Per Km Per Hour** | | **Percentage of Targets Below RSZ** | | **Mean Altitude of Targets (m)** | |
|---|---|---|---|---|---|---|
| **Merlin Radar** | Spring | Fall | Spring | Fall | Spring | Fall |
| Canton1, ME - original | 628 | 292 | 28 | 49 | 217 | 158 |
| Canton2, ME | 304 | 181 | 35.3 | 40.7 | 197 | 178 |
| East Haven, VT | | 1732 | | 49 | | |
| Saddleback, ME | 708 | 624 | 16 | 24 | 354 | 290 |
| Spruce Mtn, ME | 409 | 480 | 25 | 21 | 367 | 316 |
| Ripley-Westfield, NY | 1062 | 774 | 12 | 13 | 340 | 332 |
| Colonel Holman, ME | | 162 | | 19.2 | | 249 |
| Moscow, ME | | 678 | | 29.8 | | 355 |
| Camp Perry ANG | 671 | 539 | 5.7 | 6.3 | 269 | 338 |
| | | | | | | |
| ***Sample Size - N*** | 6 | 9 | 6 | 9 | 6 | 8 |
| ***Mean*** | 630 | 607 | 20.3 | 28 | 291 | 277 |
| ***Standard Error*** | 108 | 179 | 4 | 9 | 30 | 28 |
| | | | | | | |
| **Non-Merlin Radar** | | | | | | |
| Mars Hill, ME | 342 | 512 | 14 | 8 | 332 | 424 |
| Kibby, ME | 443 | 201 | | 12 | 334 | 352 |
| Kibby, ME | 456 | 585 | 14 | 16 | 368 | 370 |
| Kibby, ME | 197 | 452 | 22 | 16 | 412 | 391 |
| Kibby, ME | 512 | 201 | 25 | 12 | 378 | 352 |
| Sisk, Kibby, ME | 207 | 458 | 18 | 23 | 293 | 287 |

| | Targets Per Km Per Hour | | Percentage of Targets Below RSZ | | Mean Altitude of Targets (m) | |
|---|---|---|---|---|---|---|
| Stetson Mt, ME | 147 | 476 | 22 | 13 | 210 | 378 |
| Stetson Mt, ME - Post | | 457 | | 2 | | 420 |
| Oakfield/PenobscotCity, ME | 498 | 501 | 21 | 18 | 276 | 309 |
| Bowers, ME | 289 | 344 | 26 | 14 | 315 | 315 |
| Roxbury, ME | 539 | 420 | 18 | 14 | 312 | 365 |
| Highland, Somerset2, ME | 511 | | 23 | | 314 | |
| Highland, Somerset C, ME | 496 | 549 | 26 | 17 | 287 | 348 |
| Rollins Lincoln, ME | 247 | 368 | 13 | 13 | 316 | 343 |
| Bull Hill, ME | 387 | 431 | 38 | 26 | 217 | 279 |
| Bull Hill, Me | 519 | 614 | 21 | 20 | 371 | 357 |
| Bingham, ME | | 803 | | 20 | | 377 |
| Lempster, NH | 542 | 620 | 18 | 8 | 358 | 387 |
| Tenney, NH | 234 | 470 | 12 | 13 | 321 | 342 |
| Granite, NH | 342 | 469 | 14 | 1 | 332 | 310 |
| Errol, NY | | 366 | | 15 | | 343 |
| Deerfield, VT | 404 | 178 | 6 | 4 | 523 | 556 |
| Deerfield, VT - YR 2 | 263 | 559 | 11 | 17 | 435 | 395 |
| Sheffield, VT | 199 | 109 | 6 | 1 | 552 | 566 |
| Milton, VT (Georgia Mtn) | | 326 | | 7 | | 371 |
| Vermont Comm Wind, VT | 435 | 443 | 22 | 15 | 320 | 330 |
| Kingdom Comm, VT | 223 | 356 | 22 | 15 | 298 | 350 |
| Clinton Co, NY | 110 | 197 | 20 | 12 | 338 | 333 |

| | Targets Per Km Per Hour | | Percentage of Targets Below RSZ | | Mean Altitude of Targets (m) | |
|---|---|---|---|---|---|---|
| Marble River, NY | 254 | 152 | 11 | 5 | 422 | 438 |
| Howard, NY | 440 | 481 | 13 | 5 | 426 | 491 |
| Ball Hill, NY | 419 | 189 | 3 | 9 | 493 | 353 |
| Dutch Hill, NY | 535 | 535 | 11 | 11 | 358 | 358 |
| Dairy Hills, NY | 117 | 94 | 15 | 10 | 397 | 466 |
| Prattsburgh1, NY | 170 | 200 | 18 | 9 | 319 | 365 |
| Prattsburgh2, NY | 277 | 193 | 16 | 3 | 370 | 516 |
| Chautauqua, NY | 395 | 238 | 4 | 5 | 528 | 532 |
| Arkwright, NY | 175 | 112 | 13 | 10 | 450 | 458 |
| Allegheny, NY | 268 | 451 | 19 | 14 | 316 | 382 |
| New Grange | | 112 | | 10 | | 458 |
| Jordanville, NY | 409 | 380 | 21 | 6 | 371 | 440 |
| Munnsville, NY | 160 | 732 | 25 | 2 | 291 | 644 |
| Bliss, NY | | 440 | | 13 | | 411 |
| Clayton, NY | 460 | 418 | 14 | 10 | 443 | 475 |
| West Hill, NY** | 160 | 732 | 25 | 3 | 291 | 664 |
| Horse Creek, NY | 450 | 418 | 14 | 10 | 443 | 475 |
| High Sheldon, NY | 112 | 197 | 6 | 3 | 418 | 422 |
| Top Notch, NY | 509 | 691 | 20 | 4 | 419 | 516 |
| Flat Rock, NY (Maple Ridge) | | 158 | | 8 | | 415 |
| Chrubusco, Clinton, NY | 254 | 152 | 11 | 5 | 422 | 438 |
| Blenberg, Clinton, NY | | 197 | | 12 | | 333 |
| Chateaugay, NY | 360 | 843 | 18 | 8 | 409 | 431 |

| | Targets Per Km Per Hour | | Percentage of Targets Below RSZ | | Mean Altitude of Targets (m) | |
|---|---|---|---|---|---|---|
| Wethersfield, NY | 324 | 256 | 19 | 11 | 355 | 344 |
| Perry, NY | | 64 | | 10 | | 466 |
| Stamford, NY | | 315 | | 3 | | 494 |
| Alabama, NY | 112 | 67 | 6 | 14 | 413 | 489 |
| Centerville, NY | 290 | 259 | 16 | 12 | 351 | 350 |
| Wethersfield, NY | 324 | 256 | 19 | 11 | 355 | 344 |
| Copenhagen, NY | 192 | 225 | | | | |
| Cape Vincent, NY | 166 | 346 | 14 | 8 | 441 | 490 |
| Hounsville, NY | 624 | 281 | 19 | 17 | 319 | 298 |
| Villenova, Chautauqua, NY | 419 | 189 | 3 | 9 | 493 | 353 |
| Moresville, Del Co, NY | 210 | 315 | 8 | 3 | 431 | 494 |
| Moresville, Del Co, NY | 230 | | 12 | | 314 | |
| Martinsburg, NY | | 230 | | | | |
| New Grange, Chatauqua,NY | 175 | | 13 | | 450 | |
| Martindale, PA | 271 | 187 | 12 | 8 | 416 | 436 |
| Fayette City, PA | | 297 | | 5 | | 426 |
| Swallow Farm, PA | 146 | 166 | 12 | | 401 | 402 |
| Somerset, PA | | 316 | | 8 | | 374 |
| Casselman, PA | | 174 | | 7 | | 448 |
| South Chestnut, PA | | | 9 | 5 | 382 | 426 |
| Bedford City, PA | | 438 | | 10 | | 379 |
| Dans Mtn, MD | 493 | 188 | 15 | 7 | 541 | 542 |

| | **Targets Per Km Per Hour** | | **Percentage of Targets Below RSZ** | | **Mean Altitude of Targets (m)** | |
|---|---|---|---|---|---|---|
| Mount Storm/Ned2,WV | | 241 | | 13 | | 410 |
| Mount Storm/Ned, WV | | 199 | | 16 | | 410 |
| Liberty Gap, WV | 457 | 229 | 11 | 8 | 492 | 583 |
| North Briery, WV | | | | 10 | | 420 |
| Franklin, WV | | 229 | | 8 | | 583 |
| Laurel Mtn, WV | 277 | 321 | 3 | 6 | 533 | 533 |
| New Creek, WV | 1031 | 811 | 13 | 17 | 354 | 360 |
| Preston, WV | | 379 | | 10 | | 420 |
| Highland Co, VA | | 385 | | 12 | | 492 |
| | | | | | | |
| ***Sample Size - N*** | 60 | 77 | 59 | 77 | 60 | 77 |
| ***Mean*** | 337 | 349 | 15.5 | 10.2 | 381 | 418 |
| ***Standard Error*** | 21 | 21 | 1 | 1 | 10 | 9 |

**Table 2**. Summary of mean values and *P* values (t-test) from data in Table 1 for Merlin and non-Merlin type radars. Sample sizes are provided in Table 1.

| | **Merlin** | **Non-Merlin** | **Difference (Merlin – non-Merlin) - Δ** | **Percentage Difference (Merlin – non-Merlin)** | ***P* value** |
|---|---|---|---|---|---|
| | | | | | |
| **Targets/Km/Hour** | | | | | |
| Spring | 630 | 337 | + 294 | +87.1% | <0.05 |
| Fall | 607 | 349 | + 258 | +68.1% | <0.05 |
| | | | | | |
| **Percent Below Top of Rotor Swept Zone** | | | | | |
| Spring | 20.3% | 15.5% | +4.8% | +31.0% | <0.15 |
| Fall | 28.0% | 10.2% | +17.9% | +175.5% | <0.05 |
| | | | | | |
| **Mean Altitude** | | | | | |
| Spring | 291 m | 381 m | -90 m | -23.6% | <0.05 |
| Fall | 277 m | 418 m | -141 m | -33.7% | <0.05 |

**Table 3**. Summary of fatality studies conducted in eastern North America at wind turbine facilities. **Asterisk indicates non-standard lighting on two (perhaps more) turbines** at Criterion caused higher than average fatality rates, confounding study results – the number provided for fatalities per turbine and per megawatt do not include fatalities logged at two turbines with non-standard lighting. **Asterisk indicates that a radar study was done for this site**. References available upon request.

| Location | Turbine height | Months sampled | Number searches | Number carcasses in searches (incidental) | Searches to find one carcass | Adjusted mortality per turbine/yr | Adjusted mortality per MW/yr |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| ***Eastern U.S.*** | | | | | | | |
| Mars Hill, ME* | 119 m | 13 | 1169 | 20 (23) | 58.5 | 0.44 - 2.04 | 0.29 - 1.36 |
| Stetson Mountain, ME* | 119 m | 7 | 506 | 30 (8) | 16.9 | 4.03 | 2.68 |
| Atlantic County, NJ | 116 m | 24 | 1500 | 31 (0) | 48.4 | Not reported | Not reported |
| Altona, NY | 119 m | 7 | 966 | 14 (5) | 69.0 | 0.54 - 1.01 | 0.36 - 0.67 |
| Bliss, NY | 119 m | 16 | 3703 | 45 (14) | 82.3 | 0 - 4.45 | 0 - 2.97 |
| Chateaugay, NY* | 119 m | 7 | 607 | 19 (9) | 32.0 | 2.48 | 1.65 |
| Clinton, NY* | 119 m | 15 | 2944 | 30 (17) | 98.1 | 1.43 - 3.26 | 0.96 - 2.17 |
| Cohocton, NY | 119 m | 8 | 1087 | 15 (3) | 72.5 | 2.90 - 4.70 | 1.16 - 1.88 |
| Ellenburg, NY* | 119 m | 15 | 2412 | 31 (12) | 77.8 | 1.18 - 5.69 | 0.79 - 3.79 |
| Madison, NY | 100 m | 7 | 98 | 4 (2) | 24.2 | Not reported | Not reported |
| Maple Ridge, NY* | 122 m | 22 | 5671 | 256 (48) | 22.2 | 3.13 - 9.59 | 1.90 - 5.81 |
| Munnsville, NY* | 119 m | 8 | 320 | 5 (5) | 64.0 | 2.22 | 1.48 |
| Wethersfield, NY | 119 m | 7 | 691 | 11 (7) | 62.8 | 2.55 | 1.70 |
| Allegheny Ridge, PA | 124 m | 10 | 2395 | 10 (0) | 239.5 | 2.71 - 8.57 | 1.36 - 4.29 |
| Bear Creek, PA | 124 m | 8 | 2190 | 6 (3) | 365.0 | 1.03 - 2.00 | 0.52 - 1.00 |
| Casselman, PA* | 119 m | 8 | 2040 | 16 (5) | 127.5 | 0.37 - 4.69 | 0.25 - 3.13 |
| Garrett, PA | 90 m | 12 | 136 | 0 (0) | 0 | Not reported | Not reported |

| Location | Turbine height | Months sampled | Number searches | Number carcasses in searches (incidental) | Searches to find one carcass | Adjusted mortality per turbine/yr | Adjusted mortality per MW/yr |
|---|---|---|---|---|---|---|---|
| Meyersdale, PA | 115 m | 3 | 480 | 9 (4) | 53.3 | Not reported | Not reported |
| Buffalo Mountain, TN | 88-120 m | 37 | 1329 | 55 (14) | 24.2 | 1.80 - 7.27 | 1.00 - 11.02 |
| Searsburg, VT | 59 m | 5 | 84 | 0 (0) | 0 | Not reported | Not reported |
| Mountaineer, WV | 105 m | 10 | 2002 | 48 (36) | 41.7 | 4.04 | 2.69 |
| Mount Storm, WV* | 118 m | 4 | 978 | 26 (11) | 37.6 | 2.41 - 3.81 | 1.21 - 1.91 |
| Criterion, MD** | 127 m | 8 | 5,316 | 241 (20) | 22.1 | 11* | 4.4 |
| Criterion, MD-Yr 2 | 127 | 8 | 417 | 18 (14) | 23.2 | 5.5 | 2.2 |
| | | | | | | | |
| ***Canada*** | | | | | | | |
| Erie Shores, ON | 119 m | 12 | 2391 | 59 (0) | 40.5 | 2.00 - 2.50 | 1.33 - 1.67 |
| Exhibition Place, ON | 94 m | 4 | 34 | 2 (0) | 17.0 | 3.00 - 4.00 | 4.00 - 5.33 |
| Pickering, ON | 117 m | 12 | 59 | 3 (0) | 19.7 | 4.00 | 2.22 |
| Wolfe Island, ON | 117 m | 12 | 6192 | 165 (0) | 37.5 | 13.40 | 5.83 |
| | | | | | | | |
| **Totals** | | | **47,717** | **1,169** (280) | **41.1** | | |

** Project objectors will not make the results of the radar study available to wildlife agencies, wind energy companies, or others.

# EXHIBIT 10

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 200TH RED HORSE SQUADRON
CAMP PERRY ANG STATION PORT CLINTON, OHIO

22 August 2013

AGENCY: 200th RED HORSE Squadron (OHANG), Camp Perry, OH

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: Congress appropriated $3.2 million for a wind turbine technologies project at the Camp Perry Air National Guard Station. The 200th Red Horse Squadron proposed a Research, Development, Test, and Evaluation (RDTE) renewable energy, wind power project for the Camp Perry ANGS. The original design for the project involved the erection of three wind turbines. As originally designed, the turbines would have been closer to Lake Erie and to flyways for wildfowl than the current design, a steel tubular tower on a concrete pad and interconnecting electrical components. The selected system is a 600-kilowatt wind tower that stands 131-feet tall with a three-blade rotor with an overall diameter of 135-feet. The height of the rotor tip at the 12 o'clock position will be 198-feet above ground and at the 6 o'clock position will be 85-feet above ground. The Turbine's monopole tower would be sited at the southern portion of the base in a five acres grassy landscaped area between buildings and Route 2, where there is no significant or desirable wildlife habitat. This parcel of land also has an outdoor training area with existing electrical utility distribution making underground electrical transmission lines relatively short with minimal ground disturbance required to connect into the existing electrical systems on base.

Before construction, the Ohio ANG examined the potential environmental impacts of the proposed action in compliance with the National Environmental Policy Act (42 U.S.C. 4321 et seq; NEPA). The funding for the project included preparation of the Environmental Assessment (EA), consultation with wildlife professionals, conducting analyses, and consultation with regulatory agencies. During the initial stages of the project, several environmental studies were conducted to determine what impact the installation of wind energy technology would have on the wildlife in the area. The initial draft EA was completed by Hull and Associates (2008). Based on these findings a Merlin Avian Radar System, the same as used by U.S. Fish and Wildlife Service, was installed (2011) to collect migratory bird and bat data for the site. The radar study was completed in late 2012 and the report is available to the public. The Radar will be able to provide valuable pre and post-construction data regarding impacts to birds and bats with the Turbine. The Final EA was completed by the Environmental Design Group in 2012 with an Addendum to the former EA added in 2013. The EA now includes an Avian Risk Assessment by Curry & Kerlinger, LLC which provides design modifications to reduce impacts to wildlife.

All discussion, analysis, and findings related to the potential impacts of the construction and operation of the wind-power project are contained in the *Final Environmental Assessment Design/Build Renewable Energy Demonstrations Phase IV Proposed Wind Turbine* and the addendum to that EA. The latter was added after letters from the U.S. Fish and Wildlife Service and Ohio Department of Natural Resources provided comment letters on 25 September 2012.

The Ohio ANG prepared this FONSI in accordance with NEPA, the Council of Environmental Quality regulations for implementing NEPA, as amended (40 CFR Parts 1500 to 1508).

**ENVIRONMENTAL IMPACTS:** The Final EA with Addendum examined the potential environmental impacts of the Proposed Action and a NO-Action Alternative. Under the No-Action Alternative, the Ohio ANG would not meet the purpose and need, including the appropriation, The Department of Defense (DoD) directive implementing Executive Orders 13123, 13423 and 13514; and the Energy Policy Act of 2005 (EPAct 2005). Together, these mandate reductions in energy consumption, emissions, and greenhouse gases at federal sites. The Ohio ANG as a result of the process moved the project and reduced its scope. The Ohio ANG now proposes to construct a single turbine on previously disturbed land located adjacent to the south retention pond at the Camp Perry ANGS, further from the lake and flyway than the original site. The turbine would be situated between buildings and Route 2 in habitat that is poor quality for wildlife.

The Wind Energy Project is anticipated to generate 1,4 3,864 kilowatt-hours per year, offsetting approximately 12 percent of electricity used by the base. Based on the information presented within the EA, the Ohio ANG concludes that the Wind Energy Project would not impact or will have minimal impact upon the following resources: safety, air quality, and noise, land use, geological, water, transportation, visual, cultural, socioeconomics, hazardous material and waste. Therefore, these resource areas were addressed but did not require a detailed analysis in the EA. Camp Perry ANGS discusses all resource areas in the EA, but only focuses detailed discussion of impacts on biological resources. The discussion below summarizes impacts for the biological resource that is of particular concern for wind turbine projects.

The implementation of the Wind Energy Project is expected to have limited and minor effects to biological resources.

Mowed vegetation and landscaped areas would be disturbed around the area of construction. Such habitats do not support endangered or threatened species (no critical habitat for any species), so loss of such habitat would not impact listed species and would have minimal impact on more common species. The size of roads, turbine pad, and ancillary structures will be reduced to the most practical dimensions to minimize the disturbance to vegetation and soil.

Wetlands surveys conducted at Camp Perry have determined that no wetlands are present in the proposed location; therefore, the Proposed Action is not expected to impact any wetlands.

Wildlife impacts to any terrestrial, amphibian, or aquatic federal or state listed species are not anticipated from the Proposed Action due to the lack of habitat in the area of construction.

A low diversity and small numbers of avian and bat species occur where the turbine will be located and in adjoining areas of Camp Perry. Camp Perry ANGS is within a designated Important Bird Area (IBA) and within an Ohio DNR designated Avian Concern Zone. Such zones are intended to raise awareness of the presence of wildfowl. These zones do not impart specific legal protections and do not impose regulatory restrictions regarding development and use of land. The Ohio ANG was not consulted in the process of creation of the IBA, nor by those

who designated Camp Perry or private properties nearby as part of these avian protection areas. The Ottawa National Wildlife Refuge - Darby Unit is located approximately 0.8 miles northwest of the Proposed Action area. The predominant types of birds expected in the Proposed Action area are songbirds, with lesser number of raptors, and water birds flying over or near the site. Bald eagle nests were identified within a three-mile radius of Camp Perry. No nests were located within about 1/2-mile of the turbines proposed location, although the birds do fly over Camp Perry at times.

Wind turbines present two types of potential impact to birds and bats including: 1) disturbance/displacement and 2) collision resulting in injury and fatality. Displacement impacts are not expected, because there is little suitable habitat close to the turbine; nor will many birds be on site regularly. It is possible, but not likely, that a small number of songbirds and a smaller number of raptors may collide with the turbine during the life of the project, but those potential fatalities are not likely to result in significant impacts as discussed in the EA because the populations of species likely to be impacted are relatively large and robust. Studies have shown that night migrating songbirds, water-fowl and shore birds typically fly at altitudes well above the proposed turbine height. The single turbine proposed for Camp Perry ANGS is only one-half the height of standard utility scale turbines. Therefore, collision impacts are not likely to be of great concern for these species.

Eagles occur in the area year round and nest in nearby woodlands. They are observed flying over Camp Perry ANGS, but are unlikely to fly at the location where turbine is located because the habitat there is not very suitable for foraging by these birds, nor is it suitable for nesting or resting. The turbine would be between some buildings, a solar array, and Route 2, a four-lane roadway. Therefore, collision impacts to these species are not expected.

Regarding Kirtland's Warblers and Piping Plovers, both federally endangered species, impacts are highly implausible. The species do not nest at the site, nor do they nest within 50 miles of the turbine site. It is unknown but possible that small numbers of these birds fly over the turbine site each spring and, or fall, but such flights over the turbine will likely involve very, very small numbers and analytical tools developed by the U.S. Fish and Wildlife Service for predicting impacts to these species in their Biological Opinions were used determine how many of each of these species would collide with the wind turbines. The analysis discussed in the EA revealed that during the 25 year life of the single turbine at Camp Perry, fewer than 0.1 Kirtland's Warbler and 0.02 Piping Plovers would be killed. This represents no significant impact to these species.

As with birds, some minor effects to bat species may result from the Proposed Action. No Indiana Bat (federally endangered species) habitat or Indiana Bats were observed during mist netting surveys at the proposed turbine location. An analysis was conducted to determine the probability of an Indiana bat colliding with the single Camp Perry turbine. Using empirical data on collision fatalities of Indiana bats at existing wind plants, it was determined that the turbines would have to operate for 100-300 years before one Indiana Bat would be killed. Therefore, no significant effects to the Indiana Bat are anticipated as part of this Proposed Action.

The placement of a single, small wind turbine on the Camp Perry ANGS will not likely result in significant adverse impacts to local or regional avian and bat populations. The collision impacts to birds and bats will likely be localized, most resulting from the birds and bats that hunt, rest, or

creek in proximity to Camp Perry. Some night migrating birds may also be affected. Thus, the impact to any particular species is likely to be nil; but at the most, biologically insignificant. The turbines' proposed location is absent of natural vegetation and wildlife habitat. It is positioned near State Route 2 and State Route 358, as well as several buildings and other industrial activity.

Camp Perry ANGS will authorize a qualified third party to conduct one year of post-construction fatality monitoring using methods stipulated by the Ohio DNR and consistent with practices recommended by the U.S. Fish and Wildlife Service. The methods are outlined in the Addendum to the EA. This study will be prepared and submitted to various governmental agencies for review. Following the one year monitoring period and based on the results of the study, an evaluation will be made to determine the effect that the wind turbine has on avian and bat species.

Contingent upon the results of the 1 year post-construction data collection for this Research and Development project, Camp Perry ANGS will evaluate the need to implement Adaptive Management techniques to reduce the impact to associated receptors. The primary criterion for this evaluation will be whether impacts to birds and bats are proving to be biologically significant and impacting populations of any species. The Adaptive Management could include such things as continued monitoring, mitigation steps, and alternate operational procedures such as curtailment during defined hours and, or seasons, specific to the species impacted. The Camp Perry ANGS will consult with other government agencies, peer reviewed literature and industry experts to determine the best adaptive management approach for further Research and Development of wind technologies in accordance with the appropriation.

Federal or State Listed Species - No significant impacts to any terrestrial, amphibian, or aquatic federal or state listed species are anticipated as a result of this Proposed Action. Due to the expected flight attitudes of most migrating avian species and the conditions observed within the area of the Proposed Action, no avian species are anticipated to be significantly affected by the Proposed Action. No impacts to endangered and threatened species are anticipated by the Proposed Action.

**PUBLIC PARTICIPATION IN THE EA PROCESS:** In accordance with applicable regulations and policies, Camp Perry ANGS sent an Information for an Environmental Assessment Notice on June 10, 2010, to be posted in the local newspapers notifying the public that the Draft EA was available for viewing and comment at the Ida Rupp Public Library in Port Clinton, OH. Camp Perry ANGS received no comments from the public. Notices were sent to tribal governments with three responses only asking that we contact them in case of inadvertent discovery of human or cultural remains. Hard copies of the Draft EA were sent to the following organizations for review, Ottawa County Soil and Water Conservation District, U.S. EPA Region 5, Northwest District Office Ohio EPA, Office of Federal Facilities Oversight Ohio EPA, Ohio Historical Preservation Office, U.S. Fish and Wildlife Service (USFWS), Ohio Department of Natural Resources (ODNR), Wildlife District Two, Ohio Department of Transportation, Office of Coastal Management, providing 30 days to comment on the scope of the EA. Two responses to the Draft EA were received, one from the USFWS and the other from ODNR. The main concerns from these organizations involved the Indiana bat, piping plover, Kirtland's warbler, and Bald eagle. These topics are discussed in detail in the Final EA.

The Camp Perry ANGS will consult with the USFWS, ODNR, academia, and other agency's to determine the best adaptive management approach and to minimize possible threats to wildlife. Since this is a Research, Development, Test, and Evaluation wind project and not a commercial operation, the turbine can be shut down at any time for any concern biological or other.

DETERMINATION: Based on the information presented in the Final EA, Camp Perry ANGS determined that the Proposed Action would not constitute a major Federal action, significantly affecting the quality of the human environment within the context of NEPA. Therefore, preparation of an environmental impact statement is not required, and Camp Perry ANGS is issuing this FONSI.

TODD M. AUDET, Col, OHo ANG
Commander

cc:
USFWS
ODNR
NGB A7
HQANGIAG

# EXHIBIT 11

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

September 10, 2013

Capt. Roger Nienberg
Ohio Air National Guard
200 RHS/EM
1200 JN. Camp Perry E. Rd.
Port Clinton, OH 43452-9577

Dear Capt. Nienberg:

This letter is in response to your email of August 23, 2013 regarding the proposed wind turbine to be installed at the Camp Perry Air National Guard Base (OHANG). Attached to your email were two documents: August 22, 2013 Finding of No Significant Impact (FONSI); and July 10, 2013 Addendum to the Final Environmental Assessment (EA).

The U.S. Fish and Wildlife Service has reviewed all of these documents. Further, we have provided multiple other letters and attended meetings and calls about this project over the past few years to address potential impacts to migratory birds, bald eagles, and federally listed endangered and threatened species. These are described in detail in our letter dated September 25, 2012. We would be happy to meet with you in person or over the phone to discuss our prior letters or any of the comments provided below. We provide the following comments for your consideration:

Bald Eagle Comments:
As described in detail in our September 25, 2012 letter, a bald eagle nest exists approximately 0.58 miles from the proposed wind turbine site, there are approximately 60 eagle nests within 10 miles of the project area, and the Camp Perry property is located on the shore of Lake Erie, along which bald eagles are expected to migrate and winter. Though the Service requested site-specific eagle monitoring following a standardized protocol, this was not conducted, therefore we are unable to quantify potential risk to bald eagles. However, based on the presence of important eagle use areas nearby, we believe operation of the turbine could result in take of bald eagles. In situations where eagle take is likely, permits are available to authorize a limited amount of take.

Your Addendum to the Final EA and FONSI conclude that take of bald eagles is unlikely. The Service does not agree with this finding for the reasons described above. However, as the Federal Action Agency, it is the decision of the OHANG whether to pursue an eagle take permit,

or assume the risk of violating the Bald and Golden Eagle Protection Act (BGEPA, 16 U.S.C. 668-668d) if an eagle is taken.

Endangered Species Comments:
We agree with the conclusion in the FONSI that the project is unlikely to result in take of federally endangered Indiana bats *(Myotis sodalis)*, based on mist net survey results and the presence of Lake Erie directly north of the project site, which likely presents an obstacle to Myotid bat migration.

As described in our September 25, 2012 letter, we believe that the proposed wind turbine presents a potential risk of take to the federally endangered Kirtland's warbler (*Setophaga kirtlandii*) and piping plover (*Charadrius melodus*). This potential risk was further substantiated by two new observations of piping plover at Camp Perry this year (April 29 and Aug. 20, 2013). Our September 25, 2012 letter described recommended avoidance and minimization measures that could be implemented to minimize the potential for take of these two species.

Your Addendum to the Final EA and FONSI conclude that the risk of take for both piping plover and Kirtland's warbler is less than one individual for the life of the project, without implementation of any avoidance or minimization measures. The models and methods used to generate these estimates were adapted from methods used at communication tower projects and other wind projects. You further conclude that there is no significant risk to either of these species.

As stated in our September 25, 2012 letter, the Service believes that take of Kirtland's warbler and piping plover is likely due to the location of the project relative to migration paths, suitable habitat, and species occurrence data. However, we further believe that implementation of the avoidance and minimization measures in our September 25, 2012 letter would decrease the risk to these species, such that take would be unlikely to occur. As the Federal Action Agency, it is the role of OHANG to commit to avoidance and minimization measures, and make a determination of effects under the Endangered Species Act of 1973, as amended (ESA, 16 U.S. C 1531 *et seq.*) and to request Service concurrence if effects to endangered or threatened species are likely. In the absence of concurrence, OHANG assumes the risk of violating the ESA if a federally listed endangered or threatened species is taken.

Migratory Bird Comments:
As described in our September 25, 2012 letter, because the project is located within 1 mile of the shore of Lake Erie and within 0.6 miles of the Ottawa National Wildlife Refuge, and is located within an Audubon Ohio designated Important Bird Area, the greater project area is very significant for migratory birds. While installation of a single turbine may not present the same risk to migratory birds as installation of a utility-scale wind farm, it still may set a precedent and imply that siting of wind turbines in this area is not a concern for birds, when the reality is that it is a concern.

The Service developed Land-based Wind Energy Guidelines in 2012 to guide development of utility-scale wind projects in areas that minimize risk to wildlife. The applicability of these guidelines to this project is described in our September 25, 2012 letter. Further, our letter

addressed the avoidance and minimization measures discussed at our September 5, 2012 meeting, and recommended implementation of these measures to reduce potential take of migratory birds.

Your FONSI concludes that "It is possible, but not likely, that a small number of songbirds and a smaller number of raptors may collide with the turbine during the life of the project, but those potential fatalities are not likely to result in significant impacts..." even without implementation of the avoidance and minimization measures discussed during our September 5, 2012 meeting and in our September 25, 2012 letter.

The Migratory Bird Treaty Act (MBTA, 16 U.S.C. 703-712) prohibits taking, killing, possession, transportation, and importation of *individual* migratory birds, their eggs, parts, and nests. While the MBTA does not have a provision for allowing incidental take, the Service recognizes that some birds may be taken during activities such as wind turbine operation even if all reasonable measures to avoid take are implemented. We take into account adherence to the Land-based Wind Energy Guidelines and implementation of measures to protect migratory birds when exercising discretion with respect to referring take of migratory birds at wind projects for prosecution. We continue to recommend implementation of the avoidance and minimization measures as described in our September 25, 2012 letter to minimize the potential effects on migratory birds.

Monitoring Comments:
We appreciate your commitment to implementation of post-construction monitoring and adaptive management at the OHANG wind turbine. The post-construction methodology described on pages 17-19 is acceptable to the Service. In the event that a federally listed endangered or threated species or bald eagle is found during post-construction mortality surveys, the Service should be contacted within 24 hours, or by the next business day, and the turbine should be shut-down immediately until further notice.

Status of other bat species:
The Service is voluntarily undertaking a status review of the little brown bat *(Myotis lucifugus)*, due to significant population declines from white-nose syndrome (WNS), a novel fungal disease that is substantially impacting bat populations in the northeastern U.S. and rapidly spreading across the Midwest. While there is not a firm deadline, the Service may soon reach a conclusion on whether or not listing of this species under the ESA may be warranted.

A non-reproductive female little brown bat was detected within the project area during mist net surveys. This capture indicates that this species may occur in the project area and may be at risk from wind turbine operation. While this species is not currently protected under the ESA, should the Service determine that listing is warranted, consultation under the ESA would be recommended.

Thank you for the opportunity to provide comments on these documents. If you have questions or if we may be of further assistance, please contact biologist Megan Seymour at extension 16 in this office.

Sincerely,

Mary Knapp

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Field Supervisor

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