Department of Energy
Argonne Site Office
9800 South Cass Avenue
Argonne, Illinois 60439

MAY 24 2012

Dr. Eric Isaacs
Director, Argonne National Laboratory
President, UChicago Argonne, LLC
9700 South Cass Avenue
Argonne, IL 60439

Dear Dr. Isaacs:

SUBJECT: NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) DETERMINATION FOR ARGONNE NATIONAL LABORATORY (ANL)

The Argonne Site Office (ASO) has approved the following as a categorical exclusion (CX) under the category of "B 5.18 Conservation, Fossil, and Renewable Energy Activities-Wind turbines".

- Wind Energy Installations-Wind Turbine project (ASO-CX-293)

Therefore, no further NEPA review is required. However, if any modification or an expansion of the scope is made to the above project, additional NEPA review will be necessary.

Enclosed please find a copy of the approved Environmental Review Form (ERF) for the project. If you have any questions please contact Kaushik Joshi of my staff at (630) 252-4226.

Sincerely,

Joanna M. Livengood

Dr. Joanna M. Livengood
Manager

Enclosure:
As Stated

cc: J. Stauber, ANL/FMS, w/encl.
D. Hodge, ANL/FMS, w/encl.
P. Rash, ANL/FMS, w/encl.
M. Finder, ANL/FMS, w/encl.
K. Joshi, DOE-ASO, w/o encl.
S. Heston, DOE- ASO, w/o encl.
P. Siebach, DOE-CH, w/encl.
J. Blackistone, SC-31.1, w/encl.

Forest Preserve District of DuPage County

3 S. 580 Naperville Road • Wheaton, IL 60189-8761 • 630.933-7200 • Fax 630.933-7204 • TTY 800.526.0857

December 7, 2011

Mr. Devin Hodge
Sustainability Program Manager
Argonne National Laboratory
9700 S. Cass Ave., Bldg. 200
Argonne, IL 60439-4836

Re: Argonne Wind Turbine Installation Project

Dear Mr. Hodge,

Thank you for taking the opportunity to meet with Forest Preserve staff to share Argonne National Laboratory's plan for constructing a 120' tall wind turbine on ANL property. As you know, extensive research conducted nationally has indicated that large wind turbines can pose a hazard to natural resources, especially bird and bats. Given the proximity of Waterfall Glen Forest Preserve to ANL, concerns regarding impacts to natural resources and recreational activities were raised.

District staff has reviewed the information you provided along with information available in professional literature and have concluded that turbine impacts to natural resources and to recreational activities do not appear imminent from your proposal. The District was pleased to learn that the planned turbine would incorporate a tubular frame in lieu of a lattice frame and is less than 164'; both of these design elements reduce impacts to birds and bats. The lack of research on turbines of the proposed size precludes the assessment that adverse impacts to natural resources will occur. The consensus among many ecologists and wind turbine professionals is that home- or farm-sized turbines, like the one proposed, are too small and too widely distributed to cause serious concern. However, since very few studies have been conducted at turbines of this scale, we encourage ANL to seek research or monitoring opportunities that attempt to quantify any post-construction impact to birds and bats at this location.

From a recreational standpoint, we were pleased to learn that placement of the wind turbine—1,000' from Cass Ave.—would preclude any visitor to Waterfall Glen from hearing any noise that may be generated by the turbine. Furthermore, the turbine will be far enough away that if trail users at Waterfall Glen can see the turbine, it would only be for a very short length of trail.

2. Air Pollutant Emissions Yes ____ No X

Standard construction equipment will be used such as back hoes and trucks. No exhaust streams will exist after construction is complete.

3. Noise Yes X No ____

Sound Power Levels for Bergey XL-S at 120 feet

Wind Speed (mph)	Sound Pressure Level (dBA)
2.2	37.08
10.1	41.06
20.1	51.04
30.2	65.44
40.3	71.53
44.7	62

The tower/turbine blades closest to the Building 46 parking lot will be over 135 feet away. As such, noise levels at the parking lot edge should be below 70 dB.

4. Chemical/Oil Storage/Use Yes ____ No X

No oil containing equipment will be installed. Minor construction related oils and chemicals may be used. They will be stored per MSDS requirements.

5. Pesticide Use Yes ____ No X

6. Polychlorinated Biphenyls (PCBs) Yes ____ No X

7. Biohazards Yes ____ No X

8. Effluent/Wastewater (If yes, see question #12 and contact Gregg Kulma (FMS-SEP) at 2-9147 or gkulma@anl.gov Yes X No ____

No ground water is expected at this location. However, if rain events require storm water pumping, the project's Erosion control plan will address the management and filtering of the discharge. Concrete truck washout will be collected and disposed of unless room is available within the foundation's excavations area.

9. Waste Management

a) Construction or Demolition Waste — Yes X No ____

During the construction of the wind turbine foundation, there will be some general construction material wastes generated but will be minimized to the extent practical. All waste is expected to be recycled. Excess excavated soil may be generated. Any unused excavated soil will be recycled at the job site by spreading the soil and covering with topsoil. If approved by the Laboratory, excess soil can be placed in the 800 Area soil stockpile. Concrete washout from the trucks will be controlled and disposed of properly either in recycling dumpsters or in the tower excavation.

b) Hazardous Waste — Yes ____ No X

c) Radioactive Mixed Waste — Yes ____ No X

d) Radioactive Waste — Yes ____ No X

e) PCB or Asbestos Waste — Yes ____ No X

f) Biological Waste — Yes ____ No X

g) No Path to Disposal Waste — Yes ____ No X

h) Nano-material Waste — Yes ____ No X

10. Radiation — Yes ____ No X

11. Threatened Violation of ES&H Regulations or Permit Requirements — Yes ____ No X

See Item #12

12. New or Modified Federal or State Permits — Yes ____ No X

Since the power service will not be connected to the grid, the local utility will not need to be notified. The power service will be connected directly to Builidng46. They only review connections if power will be sent to public grid. The DuPage Forest Preserve and local land owners were consulted with.

13. Siting, Construction, or Major Modification of Facility to Recover, Treat, Store, or Dispose of Waste — Yes ____ No X

14. Public Controversy — Yes X No ____

The public might view the wind turbines as being harmful to birds and bats because of the chance of either flying into the turbines rotating blades. The relatively small 23 ft diameter

rotor of the selected turbine model should not pose a significant risk to any flying species at Argonne. The DuPage Forest Preserve and local land owners were consulted with. See the attached letter.

15. Historic Structures and Objects — Yes ____ No X

16. Disturbance of Pre-existing Contamination — Yes ____ No X

Near the proposed site of the proposed turbine base and utility service, there is a closed SWMU and some abandoned sanitary sewer lines. The SWMU #150 has been cleaned up and deemed clean. The IEPA issued determinations of No Further Action in 2000 concerning the laboratory and sanitary sewer systems following investigations in the mid-1990's. Nonetheless, the tower will not be built close to any known sanitary sewer lines or the SWMU #150.

17. Energy Efficiency, Resource Conserving, and Sustainable Design Features — Yes X No ____

As renewable energy installations, the project encompasses efficiency, resource conservation, and sustainable design features. Wind power produces clean, renewable energy to offset a small portion of Argonne's conventional electricity. The excavated materials are will be recycled.

B. For projects that will occur outdoors, complete Section B as well as Section A.

18. Threatened or Endangered Species, Critical Habitats, and/or other Protected Species — Yes ____ No X

19. Wetlands — Yes ____ No X

20. Floodplain — Yes ____ No X

21. Landscaping — Yes X No ____

There are several trees in the area. A few of these trees which are greater than 6 inches in diameter will impact the operation of the turbine. These trees are isolated and not in a grove. One of these trees is a non-native buck thorn. The other two are maples. The project will cut down these trees and several small saplings. The project will plant several new native trees at the Laboratory where directed by the Land Management group.

Disturbed soil areas will be planted with native grasses.

22. Navigable Air Space — Yes ____ No X

23. Clearing or Excavation — Yes X No ____

The installation will displace about 70 CY of soil. Soil will be reused to fill in around poured concrete and the excess will be spread around the work area and re-vegetated and/or removed and placed in the 800 Area soil stockpile for future re-use. In addition, standard trenching may be done to bury transmission lines. Vegetation degradation and soil erosion will be negligible. All impacted areas will be returned to existing conditions. The project will have an erosion control plan.

24. Archaeological Resources — Yes ____ No X

25. Underground Injection — Yes ____ No X

26. Underground Storage Tanks — Yes ____ No X

27. Public Utilities or Services — Yes ____ No X

The wind turbine installation will transmit power to Argonne's Building 46. The service will not be connected to the Argonne Grid System.

28. Depletion of a Non-Renewable Resource — Yes ____ No X

C. For projects occurring outside of ANL complete Section C as well as Sections A and B.

29. Prime, Unique, or Locally Important Farmland — Yes ____ No ____

30. Special Sources of Groundwater (such as sole source aquifer) — Yes ____ No ____

31. Coastal Zones — Yes ____ No ____

32. Areas with Special National Designations (such as National Forests, Parks, or Trails) — Yes ____ No ____

33. Action of a State Agency in a State with NEPA-type Law — Yes ____ No ____

34. Class I Air Quality Control Region — Yes ____ No ____

IV. Subpart D Determination: (to be completed by DOE/ASO)

Are there any extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal? — Yes ____ No X

Is the project connected to other actions with potentially significant impacts or related to other proposed action with cumulatively significant impacts? — Yes ____ No X

If yes, is a categorical exclusion determination precluded by 40 CFR 1506.1 or 10 CFR 1021.211? Yes ____ No ____

Can the project or activity be categorically excluded from preparation of an Environment Assessment or Environmental Impact Statement under Subpart D of the DOE NEPA Regulations? Yes X No ____

If yes, indicate the class or classes of action from Appendix A or B of Subpart D under which the project may be excluded. Appendix B B5.18 Wind turbines

If no, indicate the NEPA recommendation and class(es) of action from Appendix C or D to Subpart D to Part 1021 of 10 CFR.

ASO NEPA Coordinator Review: Kaushik Joshi

Signature: [signature] Date: 5-22-2012

ASO NCO Approval of CX Determination:

The preceding pages are a record of documentation that an action may be categorically excluded from further NEPA review under DOE NEPA Regulation 10 CFR Part 1021.400. I have determined that the proposed action meets the requirements for the Categorical Exclusion identified above.

Signature: [signature] Date: 5-22-2012

Peter R. Siebach
Acting Argonne Site Office NCO

ASO NCO EA or EIS Recommendation:

Class of Action: _____

Signature: _____ Date: _____

Peter R. Siebach
Acting Argonne Site Office NCO

Concurrence with EA or EIS Recommendation:

CH GLD: _____

Signature: _____ Date: _____

ASO Manager Approval of EA or EIS Recommendation:

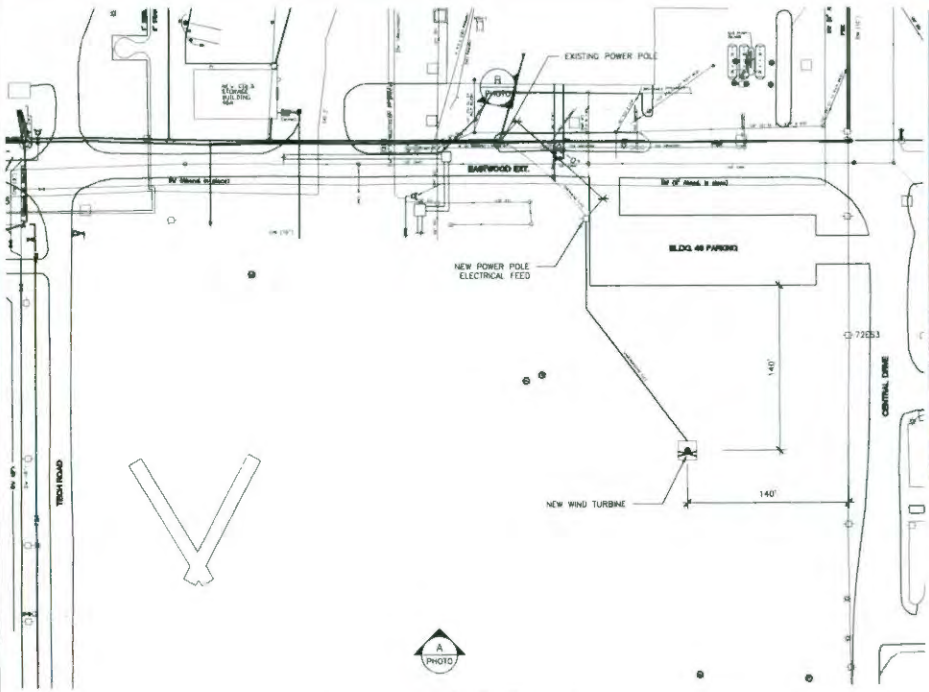
An ____ EA ____ EIS shall be prepared for the proposed _____ and

_____ shall serve as the document manager.

Signature: _____ Date: _____

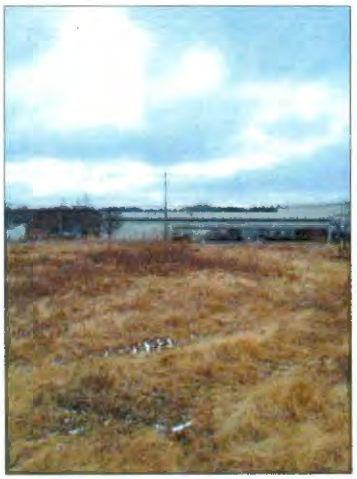
Dr. Joanna M. Livengood
Manager

October 2011



SITE PLAN
SCALE: 1"=50'

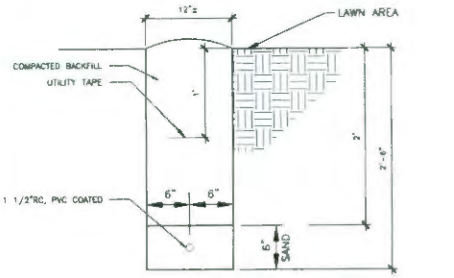
0 25' 50' 100'
SCALE: 1" = 50'-0"



GENERAL NOTES

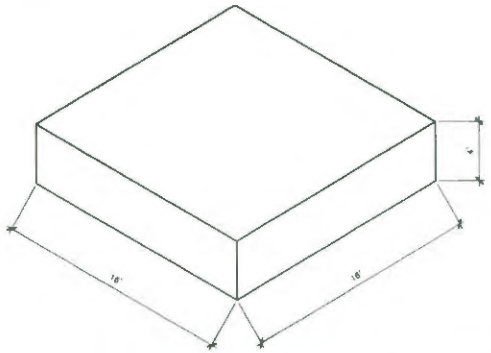
1. COORDINATE THIS DRAWING WITH CONSTRUCTION SPECIFICATIONS DOCUMENT No. J586-101-W-T001.
2. STRUCTURAL DRAWINGS ARE FOR REFERENCE ONLY.
3. STRUCTURAL DESIGN AND INSTALLATION IS TO BE COMPLETED ACCORDING TO SPECIFICATIONS BY PROFESSIONAL STRUCTURAL ENGINEER.
4. CONTRACTOR MUST FIELD VERIFY ALL FIELD CONDITIONS PRIOR TO WORK. MEASUREMENTS ARE APPROXIMATE DISTANCES AND DUE TO FIELD CONDITIONS PLACEMENT OF TURBINE STRUCTURE MAY CHANGE. CONTRACTOR SHALL ACQUIRE THE SERVICES OF A THIRD PARTY TO CONDUCT SOIL TESTING OF WHERE THE TURBINE STRUCTURE IS TO BE INSTALLED.
5. SLAB DETAIL IS JUST A PLACE HOLDER FOR A SLAB AND DOES NOT DESIGNATE THE TRUE DIMENSIONS. CONTRACTOR SHALL ACQUIRE THE SERVICES OF A QUALIFIED LICENSED STRUCTURAL ENGINEER TO DESIGN THE CONCRETE SLAB WHICH SHALL SUPPORT THE 120FT POLE, TURBINE, AND ALL ASSOCIATED EQUIPMENT IN CONNECTION WITH THE WIND TURBINE IN THE FIELD. THE STRUCTURE SHALL BE DESIGNED TO HANDLE ALL OUTDOOR CONDITIONS THAT ARE COMMON TO THE SURROUNDINGS. THE DRAWING SHALL BE STAMPED BY THE PE AND THE DRAWING SHALL INCLUDE PAD SIZE, CONCRETE MATERIAL MIX, REINFORCEMENT MATERIAL, ANCHOR BOLT SIZES AND MATERIAL FOR POLE BASE, AGGREGATE MATERIAL, SOIL COMPACTION, AND OTHER REQUIRED MATERIAL. ARGONNE RESERVES THE RIGHT OF THE APPROVAL OF THE DRAWING. THE DRAWING GENERATED OF THE SUPPORT STRUCTURE MUST MATCH ARGONNE'S DRAWING FORMAT.
6. CONTRACTOR'S SHALL INSTALL POWER POLE IN APPROXIMATE AREA AS SHOWN. THE LOWEST POINT OF THE AERIAL CABLE SHALL BE NO LESS THAN 20FT IN REFERENCE TO GROUND LEVEL. POLE SHALL BE INSTALLED IN ACCORDANCE WITH NESC AND ALL APPLICABLE CODES.
7. CONTRACTOR SHALL USE ARGONNE SUPPLIED TOPSOIL MATERIAL FROM BDG AREA STOCK PILE WITH MINIMUM OF 1" PULVERIZED.

LEGEND
WIND TURBINE



CONDUIT TRENCH DETAIL
SCALE: 1 1/2"=1'-0"

0 6" 1' 2'
SCALE: 1 1/2"=1'-0"



CONCRETE TURBINE BASE DETAIL
SCALE: 1/4"=1'-0"
SEE NOTE #5

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

WARNING
IF PLAN IS ENLARGED OR REDUCED, GRAPHIC SCALE SHALL BE USED.

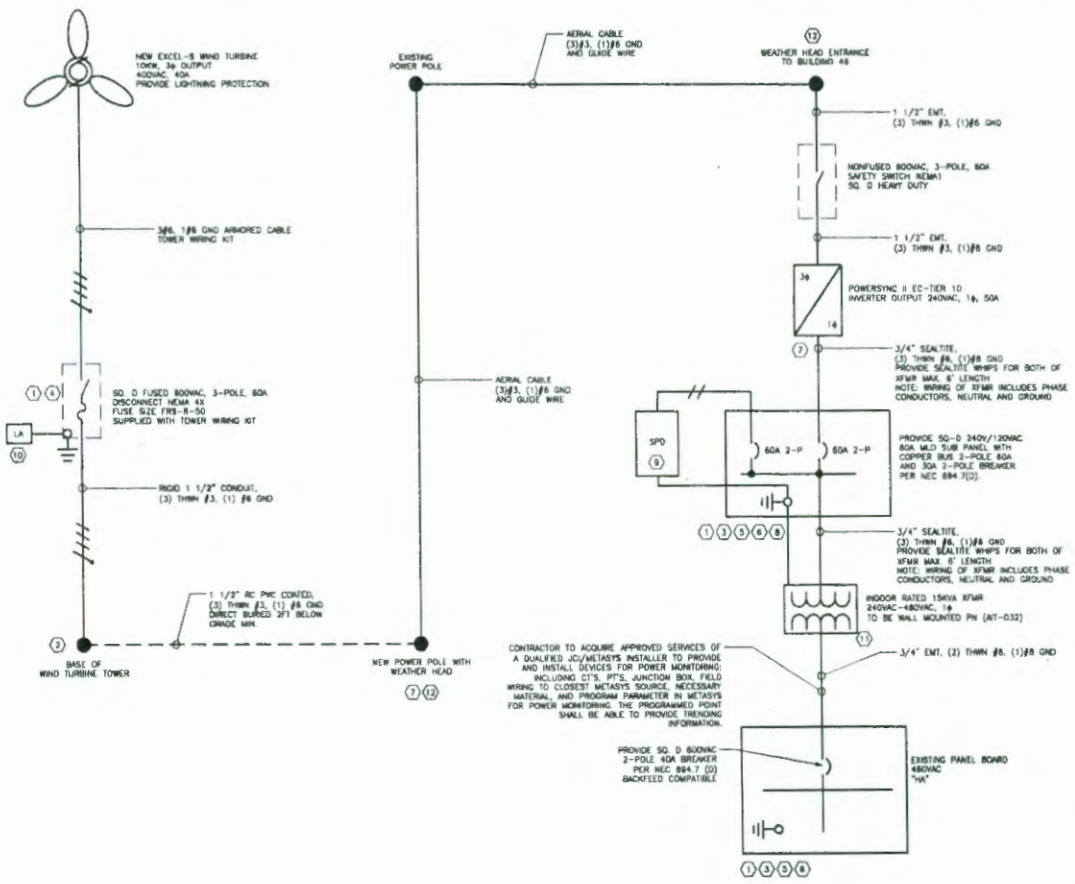
REV. NO.	DESCRIPTION	BY	APVD	DATE
0	ISSUED FOR BIDS			

Argonne NATIONAL LABORATORY

FMS
Facilities Management & Services

PROJECT TITLE
WIND TURBINE INSTALLATION
AT EAST AREA
PROJECT NO. 03584-WE-506
DOCUMENT TITLE
TURBINE INSTALLATION

DESIGNED: F. PERROTTA	A/E CADD FILE:	FACILITY NO(S): 556
DRAWN: D. BRINK	A/E DWG. NO.	
CHECKED: G. JONAS	CADD NO.: 55600001	
PROJECT MANAGER: ANL- P. LYNCH	DWG STATE: C	
DATE:	BID ORDER	
FACILITY DOCUMENT NUMBER: J556-101-W- C001		REV. NO: 0



SINGLE LINE DIAGRAM
NTS

GENERAL NOTES

1. COORDINATE THIS DRAWING WITH CONSTRUCTION SPECIFICATIONS DOCUMENT No. J556-101-W-T001
2. STRUCTURAL DRAWINGS ARE FOR REFERENCE ONLY.

ELECTRICAL NOTES

1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH CURRENT NFPA 70, ESPECIALLY NEC ARTICLE 694.
2. SYSTEM SHALL ONLY BE INSTALLED BY QUALIFIED PERSONS
3. PROVIDE WARNING SIGNAGE FOR BOTH LINE SIDE AND LOAD SIDE PER NEC 694-23(A)(4) READING "WARNING ELECTRIC SHOCK HAZARD DO NOT TOUCH TERMINALS". THE SIGNAGE MUST BE OUTDOOR AND UV RATED. THE LETTER HEIGHT SIZE MINIMUM 1"
4. LABEL DISCONNECT "WIND ELECTRIC SYSTEM DISCONNECT" PER NEC 694(32)(C)(2).
5. THE BREAKER FOR PANEL BOARD SHALL BE SUITABLE FOR BACKFEED PER NEC 705-12(D)(5) AND MATCH EXISTING MANUFACTURE.
6. POSITION INVERTER CONNECTION IN PANEL BOARD AT OPPOSITE (LOAD) END FROM THE INPUT FEEDER LOCATION OR MAIN CIRCUIT LOCATION.
7. CONTRACTOR SHALL PROVIDE AND INSTALL POWER SYNC II PART NUMBER EC-TIER 10 INVERTER. POWERSYNC II IS A UL LISTED (UL1741) INVERTER WITH OVER VOLTAGE, UNDER-VOLTAGE, OVER-FREQUENCY, UNDER-FREQUENCY PROTECTION AND TRIP. CONTRACTOR SHALL INSTALL PER MANUFACTURE AND CODE REQUIREMENTS.
8. CONTRACTOR SHALL PROVIDE 240V/120VAC 1-PHASE 60A SQ-D SUB PANEL MLO WITH 60A 2-POLE BREAKER AND 30A-POLE BREAKER FOR SPD.
9. CONTRACTOR TO PROVIDE SURGE PROTECTION DEVICE TO BE INSTALLED AT SERVICE ENTRANCE PER NEC 694.7(D).
10. PROVIDE AND INSTALL LIGHTNING ARRESTOR AT TOWER BASE DISCONNECT SWITCH
11. CONTRACTOR SHALL PROVIDE 15KVA 240-480VAC SINGLE PHASE TRANSFORMER PART NUMBER (AIT-032) FROM BERGEY.
12. ALL SUPPORTS AND HARDWARE FOR OUTDOORS TO BE STAINLESS STEEL MATERIAL.

WARNING
IF PLAN IS ENLARGED OR REDUCED, GRAPHIC SCALE SHALL BE USED.

REV. NO	DESCRIPTION	BY	APVD	DATE
0	ISSUED FOR BIDS			

Argonne NATIONAL LABORATORY

FMS
Facilities Management & Services

PROJECT TITLE
WIND TURBINE INSTALLATION AT EAST AREA

PROJECT NO. 11-055968
DOCUMENT TITLE

ELECTRICAL DIAGRAM

DESIGNED F. PERROTTA	A/E CADD FILE	FACILITY NO(S) 556
DRAWN D. BRINK	A/E DWG. NO.	
CHECKED	CADD NO. 55600002	
PROJECT MANAGER	DWG STATE C	
ANL-DATE-	BIND ORDER	

FACILITY DOCUMENT NUMBER: J556-101-W- E001 | REV. NO: 0

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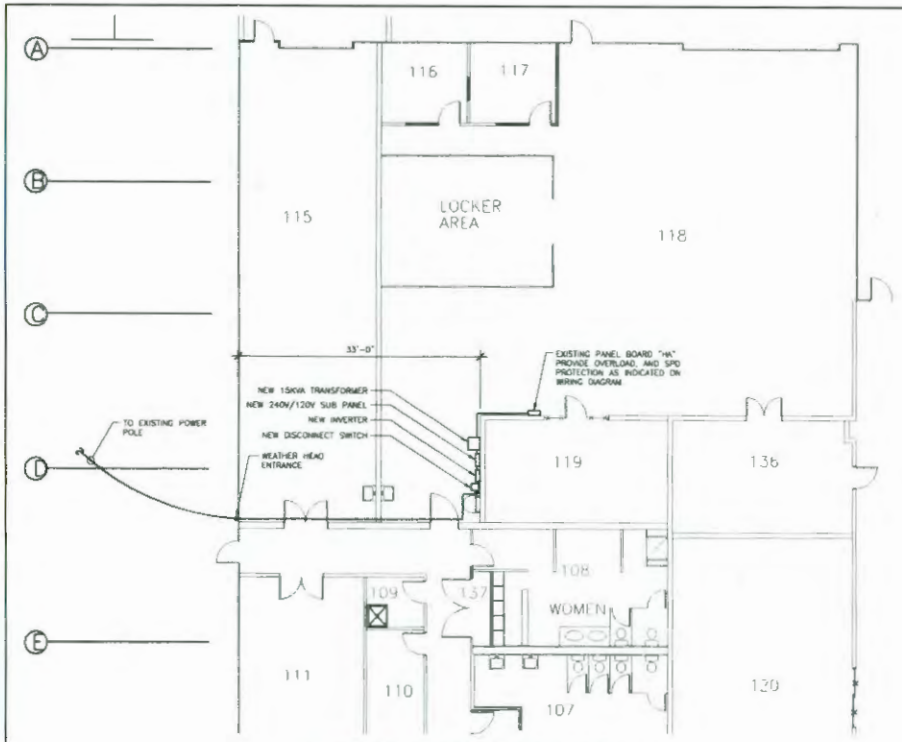


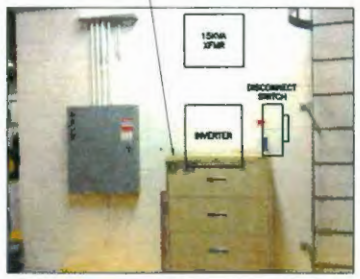
PARTIAL POWER FLOOR PLAN BUILDING 46
SCALE: 1/8"=1'-0"

ROUTING OF CONDUIT RUN TO BE APPROXIMATELY 1'-0" BELOW CEILING

GENERAL NOTES

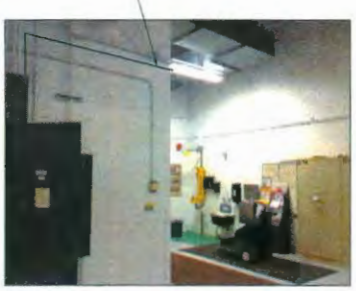
1. COORDINATE THIS DRAWING WITH CONSTRUCTION SPECIFICATIONS DOCUMENT No. J586-101-W-700!
2. CONTRACTOR SHALL PROVIDE SQ. D NEMA 4X DISCONNECT, FUSES, RIGID PVC COATED CONDUIT, THWN MULTI-STRAND COPPER WIRING, 15KVA 208V-480 1Ø TRANSFORMER AND WALL MOUNT, WEATHER HEADS, AERIAL CABLE, SQ. D INDOOR HEAVY DUTY DISCONNECT, INVERTER, EMT CONDUIT FOR INSIDE BUILDING, JUNCTION BOXES, COVER PLATES, CIRCUIT BREAKERS, SURGE PROTECTIVE DEVICE, FITTINGS, SUPPORTS, AND ALL NECESSARY MATERIAL FOR TURN KEY OPERATION OF EQUIPMENT.
3. ALL DESIGN, CONSTRUCTION, INSTALLATION, WORKMANSHIP, EQUIPMENT, AND MATERIALS SHALL CONFORM TO CURRENT EDITIONS OF ALL APPLICABLE CODES AND STANDARDS INCLUDING LATEST NEC, IEEE 1547, NFPA, AND OSHA.
4. PROPER LABELING OF ALL EQUIPMENT SHALL BE IN ACCORDANCE WITH NEC PROVIDING WARNING & ELECTRICAL SHOCK HAZARD USING APPROVED ALL WEATHER TYPE LABELS.
5. RIGID STEEL CONDUIT SHALL BE USED WITHIN THE CONCRETE FOUNDATION AND ALL OTHER SHALL BE RIGID PVC COATED CONDUIT.
6. CONDUIT IS TO BE SUPPORTED BY EXISTING SUPPORTS AND NOT ATTACHED TO LADDER OR SAFETY CAGE.

CABINET SHALL BE REMOVED. LOCATION OF DISCONNECT, INVERTER, AND WALL MOUNTED 15KVA TRANSFORMER



EXISTING PB "HA" PROVIDED OVERLOAD PROTECTION AS INDICATED ON WIRING DIAGRAM

ROUTING OF CONDUIT RUN



ROUTING OF CONDUIT RUN

SCALE: 1/8" = 1'-0"

WARNING
IF PLAN IS ENLARGED OR REDUCED, GRAPHIC SCALE SHALL BE USED.

REV. NO.	DESCRIPTION	BY	APVD	DATE
0				

Argonne NATIONAL LABORATORY

FMS
Facilities Management & Services

PROJECT TITLE
WIND TURBINE INSTALLATION
AT EAST AREA
PROJECT NO. 03584-WE-506
DOCUMENT TITLE
EQUIPMENT LOCATION BUILDING 46

DESIGNED F. PERROTTA	A/E CADD FILE	FACILITY NO(S) 506 46
DRAWN D. BRINK	A/E DWG. NO.	
CHECKED	CADD NO. 55600002	
PROJECT MANAGER	DWG STATE C	
ANL- P. LYNCH	BND ORDER	
DATE-		

FACILITY DOCUMENT NUMBER: J556-101-W- E002 | REV. NO: 0

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Environmental Review Form for Argonne National Laboratory

Click on the question mark for instructions, contacts, and additional information on specific line items (?)

Project/Activity Title: Wind Energy Installations – Wind Turbine

ASO NEPA Tracking No. ASO-CX-293 **Type of Funding**: _____

B&R Code _____

Identifying number: OPS 01136 R2 WFO proposal # _____ CRADA proposal # _____

Work Project # _____ ANL accounting # (item 3a in Field Work Proposal) _____

Other (explain) ANL NEPA Log 1427

Project Manager: Devin Hodge Signature: _____ Date: 5/8/12

NEPA Owner: Phil Rash/M.Finder Signature: _____ Date: 5/8/12 5/8/2012

ANL NEPA Reviewer: Joel Stauber Signature: _____ Date: 5/11/12

I. **Description of Proposed Action:** This action will install one small-scale wind turbine (23 foot diameter blades - 10 Kilowatt on a 120-foot monopole tower) in the East Area south of Building 46. See the attached map. This installation will include clearing the installation area; excavating for and installing a reinforced concrete foundation, installing over head and underground power transmission lines and the associated disconnect switches and meter, and the installation of the mounting pole and wind turbine. Once the concrete base is connected to the tower, the exposed concrete will be backfilled with some of the excavated soil and returned to as-found landscape conditions. After the tower is erected, the power feed will be connected to Building 46. Once connected and tested, the turbine will be operational and self sufficient, with the exception of monitoring and repairs when necessary.

II. **Description of Affected Environment:** The work is proposed for an outdoor site on a previously disturbed area. Once the wind turbine becomes operational, the rotating blades themselves may have minor environmental effects including potential for birds and bats to accidentally fly into the rotating blades. Several trees larger than 6 inches in diameter will be removed. New trees will be planted at the Laboratory.

III. **Potential Environmental Effects:** (Attach explanation for each "yes" response. **See Instructions for Completing Environmental Review Form**)

A. Complete Section A for all projects.

1. Project evaluated for Pollution Prevention and Waste Minimization opportunities and details provided under items 2, 4, 6, 7, 8, 16, and 20 below, as applicable Yes X No ____

Thank you again for the open communication with the District on the proposed wind turbine installation. We applaud your efforts to utilize alternative renewable energy as a benefit to the environment and further encourage ANL to utilize this project as an educational tool.

Sincerely,

Brent Manning
Executive Director

cc: Dewey Pierotti, President
Marsha Murphy, District 1 Commissioner
Joe Cantore, District 2 Commissioner
Linda Painter, District 3 Commissioner
Mike Formento, District 4 Commissioner
Carl Schultz, District 5 Commissioner
Roger Kotecki, District 6 Commissioner
Bob Vick, Deputy Director of Natural Resources
Justin Frederick, Director, Office of Land Management
Andrea Hoyt, Director, Office of Planning
John Oldenburg, Director, Office of Natural Resources

Wind Turbines and Potential Bird / Bat Impacts at Argonne

Prepared by: Jared Hayden
Illinois State University – Center for Renewable Energy

Prepared by: Tim Vacura
Illinois State University – Center for Renewable Energy

Reviewed by: Devin S. Hodge
Argonne National Laboratory, FMS Project Manager

Introduction

Although wind turbines have been known to pose a risk to birds, bats, and other avian species, the impact is very small compared to traditional sources of energy production. There is a consensus in the scientific community that wind turbines do not pose a serious threat, in fact, the threat is far less than other structures that we associate with our everyday lives. The purpose of this report is to evaluate, using published information, and document the possible bird /bat impacts at the Argonne site.

Background

The 1,500-acre (608-ha) Argonne site includes approximately 850 acres (344 ha) of developed areas (e.g., facilities, roadways, and parking lots) and 650 acres (264 ha) of relatively undisturbed woodlands, old fields, and wetlands. The site is surrounded by the Waterfall Glen Forest Preserve, which contains habitat types similar to the undeveloped habitats present at Argonne. The 2,240-acre (907-ha) preserve is managed by the Forest Preserve District of DuPage County.

Habitats on the Argonne site include mature and immature deciduous forest, coniferous forest, open woodland, old field, prairie, wetland (marsh and forested wetland), and open water. Large areas of mowed lawn are present in developed areas of the site. Mowed lawn, deciduous forest, and old field are the most common habitat types, each encompassing about 250 acres (100 ha). The dominant species of deciduous forest communities are various species of oak, primarily white oak, bur oak, red oak, and black oak. Coniferous forest totals about 100 acres (40 ha) and consists of planted jack pine, white pine, and red pine stands. Old-field habitats are dominated by non-native grasses, including many invasive species, with infrequent occurrences of native prairie grass species. Mowed lawns are maintained in the facility areas, Argonne Park area, and roadsides. Terrestrial habitats in the East Area consist primarily of mowed lawns and other landscaped areas. These vegetated areas are predominantly composed of non-native grass species. The diverse habitats at Argonne support a high diversity of wildlife species.

Argonne Bird /Bat Populations

The information in this section is derived from the report entitled, Environmental Assessment for Enhanced Operation of the Advanced Photon Source at Argonne National Laboratory-East, Argonne, Illinois, June 2003. As described in the EA, no federally listed threatened or endangered species are known to occur on the Argonne site (Tuggle 1996). The Indiana bat (Myotis sodalis), federally listed as endangered,

may occur in the Argonne region as indicated by an unconfirmed capture in the Waterfall Glen Forest Preserve (DOE 1990). Trees with exfoliating bark may be used by the Indiana bat as summer roosting sites, particularly those in forested areas near open water. Other federally listed species (bald eagle [Haliaeetus leucocephalus], piping plover [Charadrius melodus], and least tern [Sterna antillarum]) could occur in the Argonne area as extremely rare nonbreeders during migration or in winter.

Several species listed as threatened or endangered by the State of Illinois occur in DuPage County. The black-crowned night heron (Nycticorax nycticorax), state-listed as threatened; pied-billed grebe (Podilymbus podiceps); brown creeper (Certhia americana); and red-shouldered hawk (Buteo lineatus), have all been observed on the Argonne site. The black-crowned night heron has been observed at many open water areas at ANL-E, while the pied-billed grebe has been observed at Freund Brook. The redshouldered hawk and brown creeper have been observed in the 600 Area and may utilize most of the wooded areas on-site. Habitats on the site are predominantly disturbed and generally would not provide suitable habitat for listed species.

Common bird species include mallard, Canada goose, mourning dove, blue jay, American crow, American robin, European starling, common grackle, common yellowthroat, song sparrow, and northern cardinal.

Wind Turbine Impacts to Bird / Bat Populations

The amount of fatalities of birds / bats from various tall objects is far greater than wind turbines. Various sources document minimal impacts to bird / bat populations from wind turbines. One source indicated the following:

> "In fall 2010 and spring 2011 the areas around two small wind turbines at Orion Energy Systems were studied. On nearly all mornings during those peak migration periods, Woodland Dunes staff and volunteers searched for bird and bat carcasses beneath the turbines, and also beneath nearby windows on Orion's office building for comparison. Searcher efficiency and rates of carcass removal by scavengers were also measured. Five bird carcasses were found beneath the turbines, and twenty-three carcasses were found under the windows. No bat carcasses were found."

While studies have been conducted to determine bird/bat population impacts from larger, utility-scale wind turbine installations, studies on impacts resulting from residential-scale wind turbines have not been conducted. One source described this:

> "While there have been any number of studies conducted on bird mortality caused by commercial wind installations, none has examined the impact of home-sized wind systems on birds in Wisconsin or elsewhere. Because of the relatively smaller blades and short tower heights, home-sized wind machines are

considered too small and too dispersed to present a threat to birds. Researchers do not consider a study of home-sized wind systems worth funding."

Another source documents:

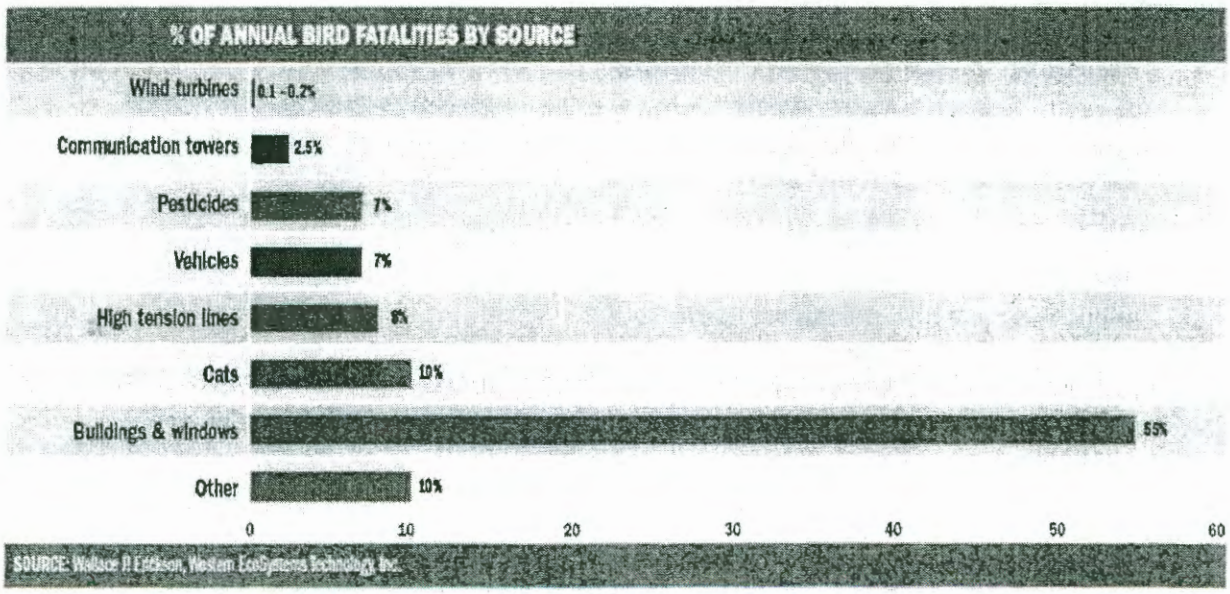
> "While bird collisions do occur (with commercial wind turbines) the impacts on global populations appear to be relatively minor, especially in comparison with other human-related causes of mortality such as communication towers, collisions with buildings, and vehicle collisions. This is especially true for small scale facilities like the Madison Gas & Electric and Wisconsin Public Service Corporation wind farms in Kewaunee County."

A comparison between other sources of energy and their impacts on avian species is indicated in the following:

> "The study estimates that wind farms and nuclear power stations are responsible each for between 0.3 and 0.4 fatalities per gigawatt-hour (GWh) of electricity while fossil-fueled power stations are responsible for about 5.2 fatalities per GWh."

Subsequently, the number of avian fatalities caused by the wind turbine project at Argonne would be relatively insignificant when compared to the onsite coal powered steam plant.

Some collected graphical and tabular data from available sources are as follows:



Collisions with:	Year of estimate	Mortality estimate low	Mortality estimate high
Wind turbines	2009/10	100,000 (2010)	440,000 (2009)
Towers	2008	4,000,000	50,000,000
Power lines	2001	10,000,000	154,000,000
Roads/vehicles	2005	10,700,000	380,000,000
Urban light	2009	31,158,000	
Glass	2006	100,000,000	1,000,000,000

Summary

The majority of the quoted studies are based on data from large scale turbines. The installation of three Skystream turbines at Argonne will have less of an impact due to their smaller blades and shorter towers. A small number of bird collisions with the turbines are inevitable, but the avian impact is negligible when compared to the collisions caused by the numerous other tall structures, electrical lines, and vehicles onsite. In addition, an environmental assessment of the APS documented that no threatened or endangered species are present at Argonne.

Sources

http://smallwindconference.com/wp-content/uploads/2011/07/35-Knickelbine-Woodland-Dunes-Bird-Study.pdf
http://www.focusonenergy.com/files/document_management_system/renewables/windturbinesandbirds_factsheet.pdf
http://www.abcbirds.org/abcprograms/policy/collisions/index.html
http://www.anl.gov/EQO/epc/nepa_adobe_files/aps_final_ea.pdf
http://www.sciencedirect.com/science/article/pii/S0301421509001074

Date	Event	Outcome
6/1/11	Published Solar Power Boosts Argonne's Wind Farm Efforts" blog	Employee and public interest expressed
9/27/2011	Community Leaders Roundtable Meeting - Presented Wind Turbine Project	Concerns raised by CLRT member
10/12/2011	Met with COO to Discuss CLRT Concerns	Developed plan to address concerns
11/7/2011	DuPage County Forest Preserve District	Received letter dated 12/7/11 indicating no concerns over proposed project
11/17/2011	Concerned CLRT member (Timber Lake HOA Rep.) site visit	CLRT member Indicated that meeting with the local community group would be valuable - began planning to host public meeting
12/1/2011	Met with COO to discuss public meeting data	Worked with Argonne and DOE public affairs personnel
12/6/2011	Held meeting with Timberlake HOA at Argonne TCS	Interest expressed by public, all questions answered satisfactorily