Draft Environmental Assessment

Sand Point Wind Installation Project
Sand Point, Alaska
DOE/EA -1584

U.S. Department of Energy Golden Field Office
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ACRONYMS AND ABBREVIATIONS

ACMA	Alaska Coastal Management Act
ACMP	Alaska Coastal Management Program
AEA	Alaska Energy Authority
AEB	Aleutians East Borough
AEBCMP	Aleutians East Borough Coastal Management Plan
agl	above ground level
ANCSA	Alaska Native Claims Settlement Act
APIA	Aleutian Pribilof Islands Association
AWE	Aleutian Wind Energy
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practices
CCDP	Comprehensive Community Development Plan
CEC/CDFG	California Energy Commission and California Department of Fish and Game
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO_2	carbon dioxide
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel scale
DEC	Department of Environmental Conservation
DOD	Department of Defense
DOE	Department of Energy
EA	Environmental Assessment
EERE	Energy Efficiency and Renewable Energy
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
ft	feet
ft^2	square feet
ft/s	feet per second
GEC	Global Energy Concepts
GPS	global positioning system
kW (h)	Kilowatt (hour)
lbs	pounds
LED	light emitting kiode
m	meter
m^2	square meter
MET	meteorologic station
m/s	meters per second
mph	miles per hour

ACRONYMS AND ABBREVIATIONS (Continued)

MW	Megawatt
MWh	Megawatt hour
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
PCE	Power Cost Equalization Program
RFFA	reasonably foreseeable future action
RSA	rotor sweep area
SHPO	State Historic Preservation Officer
SWPPP	Stormwater Pollution Protection Plan
TDX	Tanadgusix Corporation
TSPG	TDX Sand Point Generating
U.S.	United States
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
W/ft^2	watt per square feet

1.0 INTRODUCTION

Based on an action by the U.S Congress, the U.S. Department of Energy (DOE) has funding available to support the Alaska Energy Authority (AEA)'s Alaska Wind Energy Program. AEA is dedicated to support design and construction of wind energy power plants, wind feasibility demonstration, and methods necessary for widespread adoption of alternative energy systems in rural Alaska (AEA, 2009). AEA proposes to provide funding received from DOE to Aleutian Wind Energy, LLC (AWE) to support the installation of a wind power generation system at the existing Tanadgusix Corporation (TDX) Power generation facility in Sand Point, Alaska. The funding of this project constitutes a major federal action, therefore, DOE is required to evaluate the potential environmental impacts in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ), and the DOE NEPA implementing regulations. In compliance with NEPA (42 United States Code [U.S.C.] § 4321 et seq.) and the DOE's NEPA implementing regulations (10 Code of Federal Regulations [CFR] Part 1021) and procedures, this Environmental Assessment (EA) examines the potential environmental impacts of DOE's Proposed Action, No Action Alternative, Applicant Committed Measures, and Residual Impacts.

1.1 NATIONAL ENVIRONMENTAL POLICY ACT AND RELATED PROCEDURES

In accordance with the DOE NEPA implementing regulations, DOE is required to evaluate the potential environmental impacts of DOE facilities, operations, and related funding decisions. In compliance with these implementing regulations and procedures, this EA:

- Examines the potential environmental impacts of the proposed project, as well as a No Action Alternative;
- Identifies unavoidable adverse environmental effects of the Proposed Action;
- Describes the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and
- Characterizes any irreversible and irretrievable commitments of resources that would be involved should the proposed action be implemented.

These requirements must be met before a final decision is made to proceed with any proposed Federal Action that could cause adverse impacts to human health or the environment. This EA is intended to meet DOE's regulatory requirements under NEPA and provide DOE with the information needed to make an informed decision associated with the installation of the proposed wind-diesel hybrid power generation system.

This EA evaluates the potential individual and cumulative effects of the Proposed Action. No other action alternatives are analyzed. For purposes of comparison, this EA also evaluates the impacts that would occur if DOE did not provide funding to support the installation of the wind power generation system (the No Action Alternative).

1.2 BACKGROUND

AEA's Wind Energy Program provides information and technical assistance, wind-monitoring equipment, and educational opportunities for Alaskans interested in wind power. AEA issued a competitive solicitation for wind development projects in Alaska and has selected a proposal from TDX Sand Point Generating (TSPG) as a potential recipient of the DOE funding. TSPG is a wholly owned subsidiary of TDX Power. TDX Power has experience installing and operating a "high penetration" wind power system in rural Alaska (Saint Paul Island, AK). A high penetration wind power system is one that is capable of

generating a large proportion of the electrical demand for the local electrical grid relative to the existing generation capacity. As of the date of this document, TSPG has assigned all of its rights, title and interest, and any amendments and supplements, to AWE. AWE would be responsible for the installation of two wind turbines and the integration of these machines with the balance of the Sand Point power system.

Sand Point currently operates on electricity produced from diesel-powered generators. The cost of electricity is subsidized by the State of Alaska through the Power Cost Equalization Program (PCE). However, despite the subsidy, the rising cost of imported diesel is economically affecting communities throughout Alaska. In an effort to find a cost-effective solution to the unpredictable future price and availability of diesel, AWE and the AEA have collaborated to develop a wind power project in Sand Point. Information such as total power consumption in Sand Point, future changes in Sand Point power requirements, equipment operations and output, and economics were considered in determining the proposed need for the wind system specifications. TDX's proposed high penetration wind turbine project involves the installation of two 500 kilowatt (kW) Vestas V39 wind turbines. Adding the two 500 kW wind turbines to the existing Sand Point diesel plant would significantly reduce the amount of diesel used to produce electricity in the area.

TDX determined the cost effectiveness of this proposed project based on wind speed data supplied by the National Renewable Energy Laboratory (NREL). Wind resources are expressed in wind power classes ranging from Class 1 to Class 7, with each class representing a range of mean wind power density (watt per square foot [W/ft^2]) or equivalent mean speed (feet per second [ft/s]) at 165 feet above the ground. The measured annualized average wind speed (@ 61 feet [ft] [20 meters (m)] above ground level [agl]) is 21 ft (6.8 m)/s. Using a shear of 0.14 this gives a 152 ft (50 m) average wind speed of 23.5 ft (7.7 m)/s. This is between Class 5 and Class 6, which would be a very good wind source (T. Jimenez, NREL, National Wind Technology Center, personal communication with B. Wright, Aleutian Pribilof Islands Association [APIA] 2009) (Appendix A). The DOE Energy Efficiency and Renewable Energy (EERE) Wind Program website states that areas designated Class 4 or greater are suitable for wind power production using currently available wind turbine technology (DOE, 2009).

1.3 PURPOSE AND NEED

The DOE's Wind & Hydropower Technologies Program is managed in accordance with the National Energy Policy. The U.S Congress and DOE's Wind and Hydropower Technologies Program supports wind power in an effort to stimulate rural economic development, displace harmful emissions created by traditional fuels, diversify the Nation's options for low-cost electricity generation, and increase energy and national security. The Proposed Action and the decision to provide federal funding for AWE's wind turbine installation project are intended to support the National Energy Policy and to continue deployment of wind generated power in rural Alaska.

The Proposed Action would provide a cost effective and clean source of electricity, reduce overall diesel fuel consumption, and decrease air emissions associated with the consumption of diesel fuel. TDX projects that the Proposed Action would produce 1 megawatt (MW) of renewable power, which would decrease diesel fuel consumption by an estimated 130,000 gallons/year under normal operating conditions. As recent prices of diesel in Sand Point have fluctuated between $4 and $5 per gallon, such a decrease in consumption would result in reduced fuel costs of $520,000 - $650,000 per year. The Environmental Protection Agency (EPA) estimates that one gallon of diesel can produce 22.2 pounds

(lbs) of carbon dioxide (CO_2); hence about 1,443 tons of CO_2 emissions per year would be avoided if the Proposed Action is implemented.

1.4 PUBLIC SCOPING AND CONSULTATION

Federal, state, municipal, borough, tribal, and regional organizations have been contacted regarding the Proposed Action and DOE's NEPA review process via e-mail, hard copy, telephone, and/or by face-to-face meetings (Appendix B). Individuals and organizations contacted were provided with proposed project information and an opportunity to comment.

The APIA, with funding from the Bureau of Indian Affairs (BIA), has conducted elements of the scoping process on behalf of DOE. Representatives from APIA visited Sand Point between December 4 and 7, 2006, to view the proposed site and meet with community members and leaders. Information regarding the Proposed Action and EA process was presented to the public via door-to-door visits and public information meetings (Appendix C). Prior to visiting Sand Point, notifications with simulated photos of the wind turbine installation and information pertaining to the upcoming visit and community meeting were displayed in various locations. Posters referencing the Proposed Action were first displayed December 1, 2006. These posters were located at the Sand Point City Airport, the Sand Point City Office Building (which also serves as the offices for the Qagan Tayagungin Tribe and the Pauloff Harbor Tribe), the Sand Point Post Office, the health clinic, Sand Point Electric, Shumagin Corporation, Shumagin Pub, Alaska Commercial Store, the Aleutian China Restaurant, Sand Point School, and the Aleutians East Borough Offices. An initial radio announcement concerning the upcoming visit and community meeting was made on the local Sand Point radio station (KSDP) December 1, 2006. Regular KSDP announcements continued.

Representatives of APIA visited offices and places of business in Sand Point, including the Alaska Commercial Store, Aleutians East Borough, the Aleutians East School District Offices, and the Sand Point City Offices between December 5 and 7, 2006. Information about the proposed project and the EA process was presented at public meetings including a Sand Point Community Meeting on December 6, 2006 and an APIA Board of Directors meeting on December 9, 2006. Fifty-three comments were collected during the scoping process (Appendix C). As reflected by the comments collected from residents, businesses, Tribes, and borough and municipal leaders, there is strong public support for the Proposed Action.

In addition, DOE has consulted with federal and state agencies regarding the potential environmental impacts associated with the Proposed Action (Appendix D). Specifically, DOE sent consultation letters to the United States Fish and Wildlife Service (USFWS), the State Historic Preservation Officer (SHPO) of Alaska, and the Department of Defense (DOD), including the Department of the Air Force, the Federal Aviation Administration (FAA), and the Alaska Department of Natural Resources (regarding the Alaska Coastal Management Program [ACMP]). Copies of the correspondence received from these agencies are included in Appendix E.

Issues raised by government organizations and the public that are addressed in this EA include, but are not limited to:

- potential avian impacts (e.g., impacts to bald eagles and threatened Steller's eiders);
- potential hazards to air navigation; and
- potential socioeconomic impacts.

1.5 ENVIRONMENTAL JUSTICE

In 1994, the President issued an Executive Order to focus federal attention on the environmental and human health conditions in minority and low income communities with the goal of achieving environmental justice. The purpose of environmental justice is to ensure that no segment of the population, regardless of race, ethnicity, or income, bears disproportionately high and adverse environmental effects.

The total population of Sand Point in 2000 was 952, with a density per square mile of 122. The estimated population in 2007 was 893, an approximate 6% decrease. The highest percentage of Sand Point residents is Alaskan Natives at 42.3%, followed by white at 27.7%, Asian at 23.2%, and Hispanic or Latino at 3.6%. African American, Pacific Islanders, and other races or mixes of races and ethnicities make up the remaining 3.2% of the population in the community. At the time of the 2000 census, the per capita income in Sand Point was $21,954 as compared with $21,587 nationally.

The proposed project would not have any adverse effects with regard to environmental justice issues. Conversely, the project would lead to a decrease in the consumption of diesel fuel and would ideally keep electricity costs from escalating. The potential benefits from the proposed project would be distributed equally to all Sand Point residents. The proposed project is not expected to result in unfair or unequal treatment of any low income or impoverished communities or populations.

1.6 CONSIDERATIONS NOT CARRIED FORWARD FOR ANALYSIS

The following issues are commonly discussed in EAs for various DOE projects. However, for the reasons discussed below, the proposed project is not expected to have any measurable effects on the given resources and have not been carried forward for analysis of effects in Chapter 3.

- Air quality

  The proposed construction of the wind power system would result in some exhaust emissions from construction equipment and fugitive dust from exposed soils during the short construction phase of the project. This temporary source of air emissions would not require any permits or affect the ability of Sand Point to meet all clean air standards. Sand Point is currently in attainment for all EPA criteria pollutants (Alaska Department of Environmental Conservation [DEC], 2009). Fugitive dust would be minimized by watering the exposed bare solid surface of the construction site during periods of dry weather. The Proposed Action would decrease diesel fuel consumption by an estimated 130,000 gallons/year under normal operating conditions and therefore reduce emissions proportionally. Air quality was not identified as an issue during the scoping process.

- Climate

  The operation of the wind turbines would result in less greenhouse gas emissions due to the displacement of diesel fuel by renewable wind energy. Reduction of greenhouse gas emissions could potentially have a positive residual impact on the regional climate. However, the potential impact of an incremental change in emissions from one point source is likely to be negligible and cannot be estimated at this time.

- Water resources (including wetlands)

  There are no surface water sources such as streams or drainage channels that are located on the proposed project site or that could be affected by the construction and operation of the wind turbines. The proposed project would have no components that could alter or affect groundwater flows or quality.

The USFWS, National Wetlands Inventory (NWI) maps of the area were consulted and no wetlands or surface water bodies were identified on or near the two proposed sites. A subsequent wetlands site visit found no wetland indicators on either of the two proposed sites and classified them as upland sites (B. Wright, APIA, Senior Scientist, personal communication). There would be no placement of fill in jurisdictional wetland on either of the two turbine sites or their access roads.

- Geologic Resources

  Geology of Popof Island is comprised of primarily igneous rock of volcanic origin and the bedrock near Sand Point consists of tertiary extrusions of dacitic or andesitic rock (Richle, 1999). Weathered bedrock underlies much of the area. There is no permafrost in this region. No issues were identified for geology during the scoping process.

- Essential Fish Habitat

  There are no anadromous fish streams near the proposed project site and there are no components of the project that would require alterations to, or crossings of, water bodies that affect anadromous fish streams. There are also no components of the project that would affect intertidal or marine habitats that could be essential fish habitat.

- Mammals

  There are a number of terrestrial mammals that occur on Popof Island, including introduced bison and native populations of smaller species. Domestic dogs and cats may play a potential role in scavenging birds that collide with the wind turbines, thus making it more difficult for an avian monitoring program to evaluate collision mortality (if it occurs). However, habitat loss due to the project would be negligible for all mammal species based on the small area affected and abundance of similar habitat in the vicinity of Sand Point and on Popof Island. No further adverse effects are likely from the construction and operation of the wind turbines. However, there have been documented mortalities of bats from turbine collisions in other parts of the country but there is only one species of bat in Southwestern Alaska, the little brown bat (*Myotis lucifugus*), and it is not known to occur regularly in the Sand Point area, if at all. There are a number of marine mammal species in the waters around Sand Point but there is no marine component of the project and therefore no mechanism for potential effects on marine mammals.

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2.0 ALTERNATIVES

2.1 PROPOSED ACTION

DOE is proposing to provide funding to support the installation of a high penetration wind system at the TSPG power plant in Sand Point, Alaska. Two 500 kW Vestas V39 wind turbines would be installed if the Proposed Action is implemented (Figure 2-1).

The proposed turbine sites are at similar elevation of approximately 164 ft and are approximately 1/3 mile from marine waters. Each wind turbine would be mounted on a 131 ft (40 m), free-standing, monopole unsupported by guy wires (Figure 2-2). The towers would be approximately 335 ft apart. Each turbine has three blades with a rotor diameter of 128 ft (39 m), producing a rotor-swept area of 12,852 square feet (ft^2) (1,194 square meters [m^2]). The wind turbines would be integrated with the existing diesel generator into the power distribution system so no new power transmission lines or other support structures would be needed.

2.1.1 Project Location

Sand Point, Alaska is situated on the northwestern shore of Popof Island, south of the Alaska Peninsula, on a hilly peninsula adjacent to Popof Strait and Humboldt Harbor, approximately 570 air miles southwest of Anchorage. Sand Point lies at approximately 55° 20' N Latitude, 160° 30' W Longitude, within Section 08, Township 56 South, Range 73 West of the Seward Meridian. Sand Point has a maritime climate with cool summers and mild winters. Mean monthly summer temperatures range from 45.5º to 55.7º F. Mean monthly temperatures in winter range from 29.1 to 36.6º F. Mean annual precipitation is 44.7 inches per year.

The existing power plant and proposed wind energy project are located in the Industrial Subdivision No.2, Lots 1, 2A, and 3, Plat No. 85-1, Aleutian Island Recording District (Figure 2-3). The Proposed Project location is adjacent to Sand Point residential and commercial areas, approximately 1/3 mile from coastal waters, and 2.1 miles north of the Sand Point airport. This location is accessible via the Sand Point local service road.

The Proposed Project would have Turbine 1 located in a vacant lot currently owned by Trident Seafoods (Lot 3). TDX Power has negotiated a lease agreement with Trident for use of the vacant lot. Turbine 2 would be located in Lot 1, approximately 335 ft southeast of Turbine 1. The global positioning system (GPS) coordinates for Turbine 1 would be 55° 20’ 42.84” N, 160° 29’ 25.34” W and 55° 20’ 38.00” N, 160° 29’ 21.00” W for Turbine 2.

Figure 2-1. Location of project area and proposed wind turbine sites in Sand Point, Alaska.

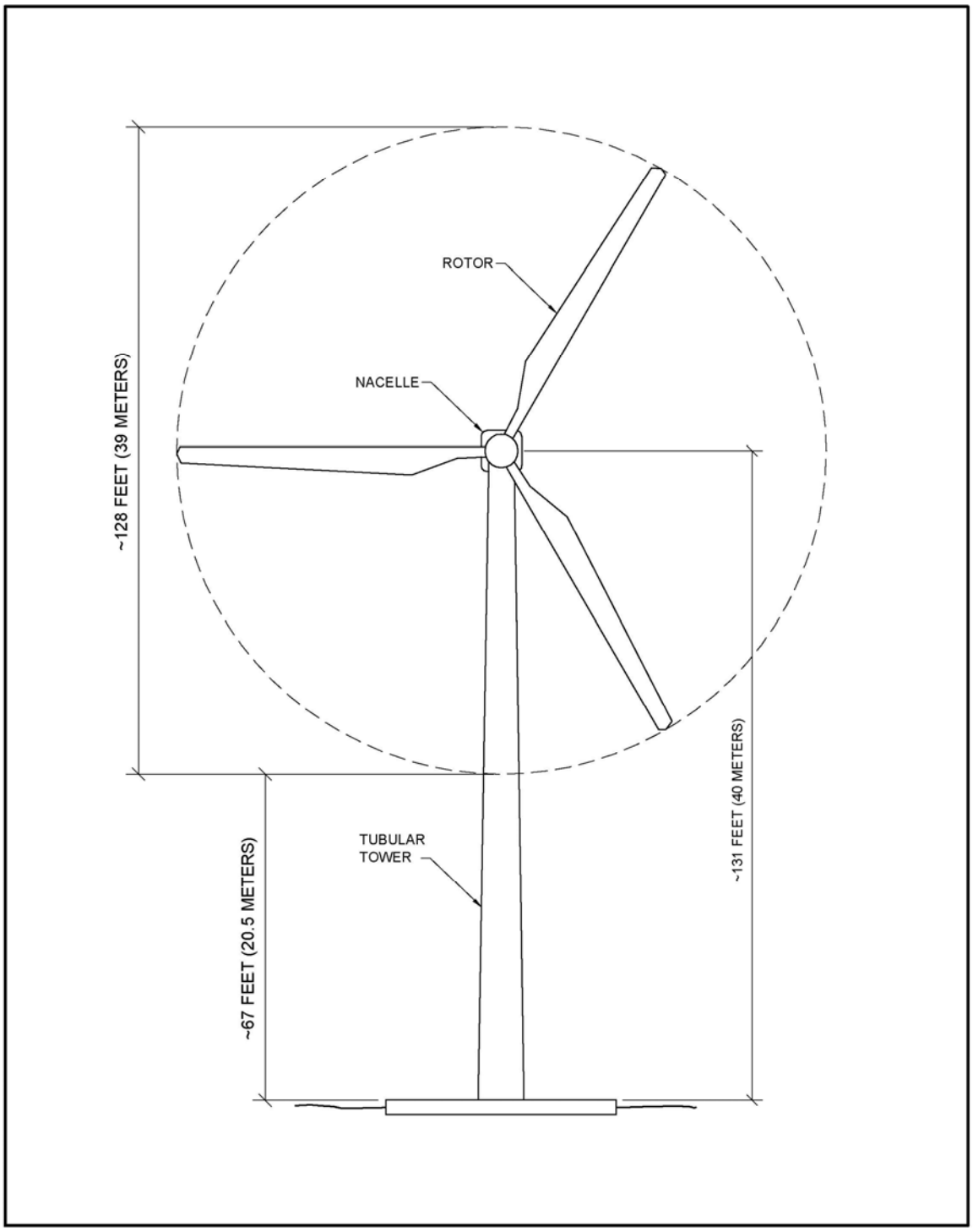

Figure 2-2. Schematic of a wind turbine of similar size to the proposed Vestas 39.

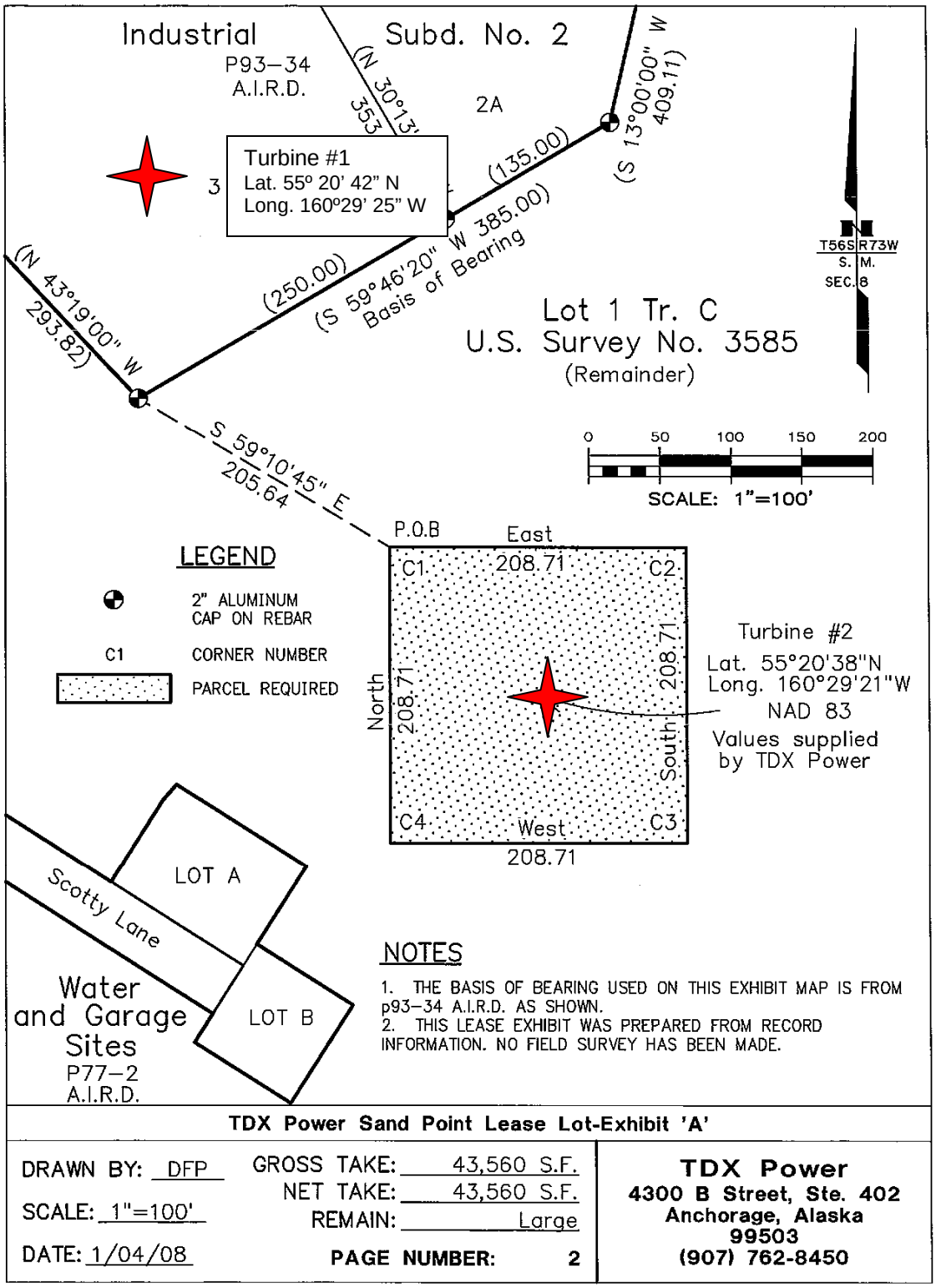

Figure 2-3. Proposed locations for Turbines 1 and 2.

2.1.2 Existing TDX Sand Point Generating Operations

TSPG and Sand Point electrical systems are isolated grid power systems. Fiscal year generation requirements in Sand Point amounted to 4,136 megawatt hours (MWh) in 2005 and 4,059 MWh in 2007. With additional load from the recently completed health clinic and the potential addition of Trident Seafoods to the grid, annual generation requirements are projected to increase to 4,779 MWh. Spread over 8,760 operational hours in a year, average projected generation requirements would be 546 kW per hour. The peak hourly demand in 2005 was 776.9 kW.

The existing power plant is a pre-designed insulated building made of structural steel. The power plant has a 480-volt switchgear that includes a breaker for each diesel-powered generator unit and a breaker for each of the outgoing feeder lines to the distribution system. The power plant also includes five generator sets that are mechanically installed and connected to a common bus. The generator set control system consists of seven cubicles of automated control assemblies. The diesel tank farm is situated 35 ft from the southwest corner of the structure and consists of two above-ground, double-wall steel tanks with under-ground feed and overflow return lines. The fuel transfer system consists of a 500-gallon steel day tank situated inside the power plant. The main fuel header feeds the day tank from an automatic float control. The secondary fuel header branches off to feed the engine/generator set. Diesel fuel for the power generating system is trucked 1.5 miles to the facility from a nearby seafood processing plant.

A plate and frame heat exchanger/heat recovery circuit is incorporated into the existing power generation system to provide space heat and domestic hot water for the adjacent office/apartment building. A conventional oil-fired boiler is located in the office/apartment building to act as a standby to the heat recovery system. Piping from the power generation system to the office building is underground.

2.1.4 Integration of Wind Power with Existing Diesel Power

AWE proposes to integrate a high penetration wind power production system with the existing Sand Point diesel-generator power plant. Since wind velocities are variable over time, power produced by wind turbines may fluctuate substantially over short periods. Wind-diesel hybrid systems therefore require active system controls to increase or reduce diesel-generated power quickly to accommodate the changes in wind power and keep power levels consistent. Without such active controls, wind-generated power could potentially exceed the load demand at high wind speeds, causing the engines to be back-driven and the power distribution system to become unstable.

The proposed power system would operate in diesel mode during periods of no wind, in wind-diesel parallel mode during moderate wind speed periods, and in full diesel-off, wind-only mode during high wind periods. When the diesel generator is shut off, a synchronous condenser provides reactive power to the grid to maintain voltage stability. Because the diesel generators cannot absorb significant excess wind turbine power, power control requires the addition of an active load element, herein defined as a secondary load tank (a hot water storage system). During wind-only operating mode, the secondary load tank acts as a load-shedding sink for all excess-to-load wind energy as it occurs during high wind conditions. Typically heated to 170-190°F, the fluid mixture of water and additives can then be pumped from the power house through a radiator network, reducing or in some cases eliminating the need for furnace fuel.

To apply this design in Sand Point, AWE would use two fully reconditioned 500 kW Vestas V39 wind turbines, the existing Caterpillar 3512 diesel generator currently in service, and a new Caterpillar 3456

diesel generator. The power plant switchgear was upgraded in 2004, so only minor modifications to the control system would be required. The addition of two V39 wind turbines into the existing facility would require the integration of several hardware components and control cabinets inside the power plant. Space would be required for the synchronous condenser and controller, a wind system controller, and the secondary load tank. One Caterpillar 379 standby diesel generator from the power plant would be removed to make room for this equipment. The control cabinets would be located in an enclosed area in close proximity to the wire trough, engines, and synchronous condenser. In addition, the secondary load tank would be located close to the power plant to ensure a quick response between the tank and the secondary load controller.

The proposed power system would consist of the following components (Figure 2-4):

- two 500 kW Vestas V39 wind turbines;
- one low load, high efficiency Caterpillar D-3456 diesel generator;
- one synchronous compensator to provide reactive power support;
- one demand device and automated load control;
- one thermal tank secondary load control and binary load control for the power plant; and
- one supervisory management control.

2.1.5 Construction and Installation

The construction and installation phase of the Proposed Action would begin after all required authorizations are obtained from DOE and any other federal, state, or local regulatory agencies. The turbines have been purchased by AWE and are waiting for a retrofit prior to final installation. The wind turbine installation, including site preparation, erection, and final commissioning, power plant systems upgrades, new generator installation, and overall systems tie-in and start-up is planned to be completed within four months of project start. Final project close out and operator training would be expected to be completed within one month of the wind turbine installation.

Each proposed turbine site would require 64 ft^2 for the turbine foundations and would require some clearing of vegetation prior to installation. A single access road less than 1/4 mile long would cross the lot owned by TSPG and lead to both turbines. Turbine 1 would be constructed on Lot 3, which is currently vacant and leased by TDX. This location is approximately 335 ft away from the Turbine 2 site, which has previously been partially cleared for the installation of an anemometer tower. Turbine 2 would be placed on the existing anemometer location. The total site area that would be affected by the construction and installation phase is approximately two acres.

TDX would use a construction crane to remove two old, non-functioning wind turbines and their support towers (known as the Harry Foster towers) on adjacent property. As these towers are often used by perching birds, including bald eagles, their removal would help mitigate potential bird collisions and improve safety considerations at the site (see Section 3.5).

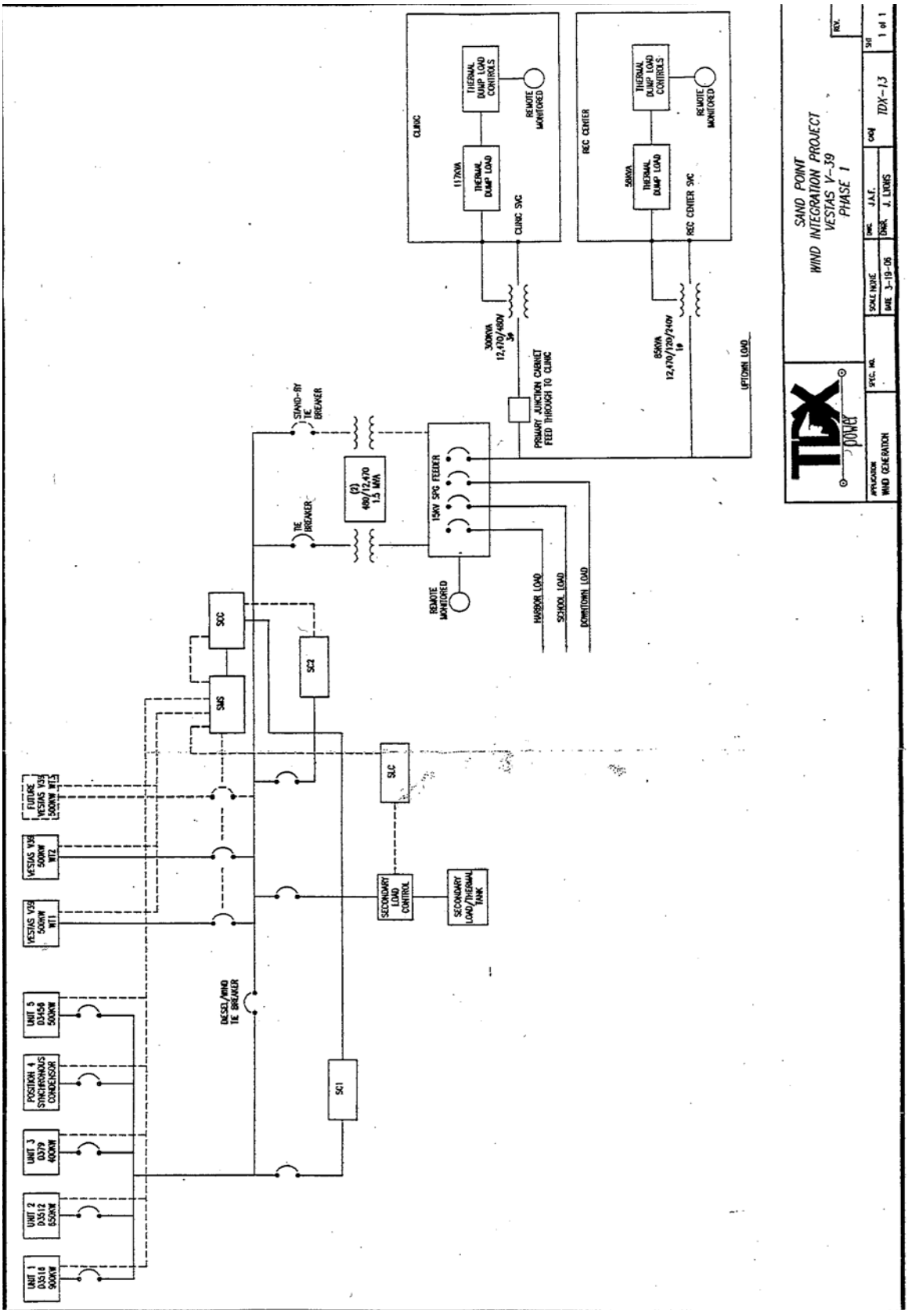

Figure 2-4. TDX electrical integration schematic

2.1.6 Wind Turbine Operation

As verified by TDX Power's Saint Paul Island project, the high penetration design has been demonstrated to function with utility grade reliability and efficiency. Experience shows equipment failure is most likely to occur during initial start-up through to the end of the first year of operation. Operations through the second and third years typically involve scheduled component changes, which would follow the recommended protocol specified by the manufacturer. Often for new generation facilities, the most critical period for equipment maintenance occurs in the fourth and fifth year of operation. During this period, the AWE would adjust parts inventory to address local experience and historical failure trends. The long-term operation and maintenance required for the wind component addition in Sand Point would create a critical new consideration for the utility. Without a systematic maintenance regime performed by knowledgeable technicians, total system performance would rapidly degrade. In addition to ongoing training and support programs, AWE would maintain a full inventory of spare parts.

AWE signed a turbine purchase contract that includes:

- installation according to manufacturer guidelines;
- on-site start-up performed by turbine vendor, which includes testing and configuration of all turbine sensors, motors, generators, and controllers; and
- regularly-scheduled maintenance.

2.2 PERMITS AND AUTHORIZATIONS

Prior to construction, the AWE/TXD would ensure compliance with all required federal and state permits and approvals (Table 1-1).

Table 1-1. Required agency permits and approval types

Agency	***Permit/Approval Type***
Federal	
U.S. Fish and Wildlife Service (USFWS)	Endangered Species Act (ESA), Section 7 Consultation
Federal Aviation Administration (FAA)	FAA Aeronautical Determination
Environmental Protection Agency (EPA)	National Pollutant Discharge Elimination System (NPDES) Construction General Permit
State	
ADNR, State Historical Preservation Office (SHPO)	National Historic Preservation Act (NHPA), Section 106 Review
Department of Environmental Conservation (DEC)	Stormwater Pollution Protection Plan (SWPPP)

2.2.1 Air Safety Determination

Due to the proximity of the local airport, the FAA and the DOD were contacted for comments and approvals (Appendix D).

The FAA made a "Determination of No Hazard to Air Navigation" for the installation of Turbine 1. The aeronautical study revealed, "*The structure would have no substantial effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities.*" This determination was made provisional based on the conditions that the turbine be painted white and equipped with synchronized red lights in accordance with FAA Advisory circular 70/7460-1K, Obstruction Marking and Lighting (Chapters 4, 12, and 13), which specifies that each tower would have two bright red lights located at the top of the tower that flash 40-60 times per minute at night and during low light conditions. After subsequent review and consultation, it was determined that the additional

proposed Turbine 2 would not interfere with air traffic as long as the same paint and lighting conditions specified for Turbine 1 are implemented. Both of these determinations are according to an Obstruction Evaluation/Airport Airspace Analysis, located on the Internet at https://oeaaa.faa.gov/oeaaa/external/portal.jsp. The determinations for Turbine 1 and Turbine 2 were completed on April 12, 2007 and May 17, 2007, respectively. Extensions for these determinations were granted on October 21, 2008.

The U.S. Air Force has coordinated a review of the proposed installation of one 500 kW wind turbine in the community of Sand Point. As a part of this review, the DOD consulted the Air Force's Headquarters Range and Air Space Division, which concluded that the proposed installation would have no impact on military training conducted by DOD components. Because the DOD reviewed only Turbine 2 during the initial consultations, a review of Turbine 1's potential impacts on military training would be completed within the 30-day review period for this EA.

2.3 No Action Alternative

Under the No Action Alternative, AWE/TDX would continue to produce electricity from the existing diesel generators and therefore the potential fuel and economic savings associated with the wind-diesel hybrid system would not be realized. AWE/TDX would explore alternative energy technologies when funds become available.

2.4 Applicant Committed Measures

The applicant has made commitments to avoid or minimize impacts to the environment in constructing and operating the proposed project including:

- Areas of bare soil would be revegetated with native plant materials after construction to minimize soil erosion. Silt fences would be used as necessary to prevent runoff from disturbed areas from affecting adjacent areas.
- TDX will conduct post-construction surveys to assess the potential for bird collisions with the wind turbines and notify the USFWS immediately if any Endangered Species Act (ESA)-listed species are found during the post-construction mortality surveys and will consult with them regarding the need for any additional applicant committed measures.
- Anti-perching devices will be placed on each turbine nacelle (if necessary) to discourage perching or nesting on the turbines, which would greatly increase the potential for bird collisions.
- Anti-perching devices will be installed on electric poles in adjacent areas to discourage perching and reduce the potential for electrocution, especially for bald eagles.
- The turbine towers will not have external ladders or other structures that would allow birds to perch anywhere near the turbine blades.
- TDX would remove the old Harry Foster towers at the time of construction, thus removing one of the most well-used perches for bald eagles and other resident birds in the area.
- Structures with guy wires will be avoided. The turbine towers will be self-supporting monopoles.
- Electric transmission lines from the wind turbines to the TDX power plant will be buried below ground.
- Lighting on the turbine towers will be limited to what is necessary for aviation safety, as determined by the FAA.
- A post-construction monitoring plan will be implemented for one year, starting immediately after construction, to determine if birds are killed by collisions with the turbines.

- If any historical or cultural resources are identified which have potential conflicts with the project, applicant committed measures will be developed to minimizing the potential impacts.
- All construction operations would occur during normal working hours.
- The construction and operation of the Proposed Action will comply with all required regulatory statutes set forth by federal, state, and local regulatory agencies, including FAA Advisory circular 70/7460-1K.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 LAND USE

3.1.1 Affected Environment

The Aleutians East Borough (AEB), of which Sand Point is the Borough Seat, includes approximately 15,000 square miles of the lower Alaska Peninsula and islands, and six communities within the Aleutian Islands chain. The year-round population of the AEB is approximately 2,500 with a seasonal influx for seafood processing. Commercial fishing provides the backbone of the AEB economy.

Land ownership on Popof Island is a mix of City, Alaska Native Corporation, and private. The Shumagin Corporation (the village Alaska Native Claims Settlement Act [ANCSA] Corporation) is the primary landowner in Sand Point. Sand Point's overall land use pattern has been shaped by its origins as a fishing community.

The existing power plant and proposed wind energy project sites are located in the Industrial Subdivision No.2, Lots 1, 2A, and 3, Plat No. 85-1, Aleutian Island Recording District. This location is accessible via the Sand Point local service road. The proposed wind turbines are located approximately two miles north of the Sand Point airport.

3.1.2 Environmental Consequences

3.1.2.1 No Action Alternative

Under the No Action Alternative, DOE would not provide the funding to AWE/TDX for the Sand Point Wind Project and it would not be built as a part of a Federal Action. There would be no additional impacts to existing land uses as a result of the No Action Alternative.

3.1.2.2 Proposed Action

In assessing land use impact, the Proposed Action was evaluated for consistency with land use plans and guidance, and compatibility with current and future land uses. The goal of this project was deemed consistent with the "City of Sand Point Comprehensive Community Development Plan (CCDP)" of September 2004, where Goal C is to, "Develop efficient and alternative energy supply and distribution systems" (URS Corp., 2004: 12).

Applicant Committed Measures

The Proposed Action would begin after all required authorizations are obtained from DOE and other federal, state, and local regulatory agencies. Each agency may require land use applicant committed measures as conditions of their authorizations or permits. No additional applicant committed measures or monitoring is recommended.

Residual Impacts

A total of two acres would be disturbed during the construction phase of the Proposed Action. Because the installation of the Proposed Action corresponds with the goals set forth by the CCDP there would be no residual impacts to land use and community development planning for the City of Sand Point.

3.2 COASTAL ZONE RESOURCES

3.2.1 Affected Environment

In 1972, the United States Congress passed the Coastal Zone Management Act (CZMA) to promote the orderly development and protection of the country's coastal resources. The CZMA established a voluntary partnership among the federal government, coastal states, and local governments to develop individual state programs for managing coastal resources. In 1977, the State of Alaska passed the Alaska Coastal Management Act (ACMA) and joined the partnership envisioned by the CZMA.

Sand Point is within the Port Moller district in the Southwest Region of the Alaska Coastal Zone. The coastal resources of Sand Point have been identified and analyzed in the Aleutians East Borough Coastal Management Plan (AEBCMP). The AEBCMP was developed in 1985 and was most recently updated in 2005 (AEB, 2005).

The AEBCMP includes a resource inventory and a resource analysis encompassing Sand Point's coastal resources. The resource inventory describes major land and water uses, natural resources, cultural resources, and land ownership. The resource analysis also includes a discussion of demands on coastal resources and habitats, conflicting uses, and sensitivity of uses and resources to development impacts. The AEBCMP resource inventory addresses energy resources that exist in the coastal zone and specifically addresses wind power generation. It further identifies potential barriers to the development of wind energy in the coastal district that include anticipated conflicts with migratory birds and endangered species and their designated Critical Habitat (see Sections 3.4 and 3.5). The Proposed Action site is not designated in the AEBCMP as important habitat, critical habitat, refuge, or sanctuary.

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

Under the No Action Alternative, DOE would not provide the funding to AWE/TDX for the Sand Point Wind Project and it would not be built as a part of a Federal Action. There would be no additional impacts to coastal zone resources as a result of the No Action Alternative.

3.2.2.2 Proposed Action

An ACMP Coastal Project Questionnaire and a Certification Statement were submitted to the State of Alaska Department of Natural Resources April 4, 2007. A reply letter dated April 20, 2007, states that, "Based upon the information you have supplied, your proposed project does not require a State review for consistency with the Alaska Coastal Management Program (ACMP)."

Applicant Committed Measures

The construction and operation of the proposed wind system will be consistent with the AEBCMP. No additional applicant committed measures or monitoring is recommended at this time.

Residual Impacts

The construction and operation of the Proposed Action would not result in residual impacts to coastal resources.

3.3 VEGETATION AND SOILS

3.3.1 Affected Environment

The majority of the vegetation found on Popof Island in the Sand Point area is heath or dry shrub tundra. This is mainly composed of low and dwarf shrubs such as crowberry (*Empetrum nigrum.*), Labrador tea (*Ledum palustre*), and kinnikinnick berry (*Arctostaphylos uvi-ursa*). Taller shrubs include Sitka alder (*Alnus sinuate*), and several species of willows (*Salix spp*.). Sedges (Family *Cyperaceae),* mosses, lichens, and a variety of native and non-native grasses grow throughout the area and provide ground cover. Except for a few Sitka spruce trees (*Picea sitchensis*), Popof Island is essentially treeless. Areas along the shoreline contain beach rye grass (*Loliumn arenaria*), beach arnica shrubs (*Arnica unalaschcensis*), alders (*Alnus spp.*), and low/prostrate willows (*Salix polaris*) (URS Corp., 2004).

The proposed site is located in a coastal tundra upland area. It consists mainly of low-growing alder thickets and a variety of grasses and forbs. These may include tufted hair grass (*Deschampsia caespitosa),* Wainwright slender wheatgrass (*Agropyron pauciflorum),* and alpine bluegrass (*Poa alpina)* with an additional mix of non-native plant species. Alder thickets are prevalent within the project site location and are typically found in the Alaska Peninsula coastal upland areas. Alders are sturdy and fast growing, even in acidic and disturbed sites.

Surficial soils are classified as dystric cryandepts and are typically located on hilly to steep terrain (Reiger et al., 1979). These are well-drained, thixotrophic (becoming fluid when disturbed) ashy soils consisting of deep to moderately-deep volcanic ash over glacial till or cinders. A thin layer of organic material of decomposed alder leaves and grass typically covers the surface.

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Under the No Action Alternative, DOE would not provide funding for the Sand Point Wind Project and the project would not be built as a Federal Action. There would be no additional impacts to vegetation or soils at the proposed turbine sites as a result of the No Action Alternative.

3.3.2.2 Proposed Action

Under the Proposed Action, approximately two acres would be cleared of vegetation or disturbed by the construction and installation of the two wind turbines. The shrub-tundra habitat that would be affected by this action is neither rare nor unique to the area and does not contain any critical habitat for any federally-listed threatened or endangered species. The area affected by the turbine foundations would be 64 ft^2 for each turbine. Access roads to the turbines would result in a permanent loss of approximately 0.2 acres of native vegetation, a portion of which has been previously disturbed.

Potential effects on the soil would include the increased erosion from loss of vegetation from clearing the site for the construction of the foundations and access road. However, the relatively low gradient of the sites would preclude soil erosion as a major issue and the potential for adverse effect on the soils is low.

Applicant Committed Measures

The operation and construction of the Proposed Action will comply with all required regulatory statutes set forth by DOE and other federal, state, and local regulatory agencies. Best Management Practices (BMPs) would be used as appropriate. Areas of bare soil will be revegetated with native plant materials

after construction to minimize soil erosion. Silt fences would be used as necessary to prevent runoff from disturbed areas from affecting adjacent areas. No additional applicant committed measures or monitoring is recommended at this time.

Residual Impacts

Although portions of the sites would likely revegetate, the area affected by the turbine foundations and the access road would result in a permanent loss of approximately 0.2 acres. The remainder of the affected area would be maintained by mechanical cutting of brush to keep vegetation in a relatively low stature to facilitate documentation of bird collision mortality.

With the use of BMPs during construction and revegetation of the exposed soil following construction, impacts to the native soils in the area would be minor.

3.4 THREATENED AND ENDANGERED SPECIES

3.4.1 Affected Environment

The ESA protects federally-listed threatened and endangered plant and animal species and their critical habitats. Endangered species are those that are in danger of extinction throughout all or a significant portion of their range. Threatened species are those that are likely to become endangered in the near future throughout all or a significant portion of their range. There are several marine bird and mammal species that are protected under the ESA that occur in the Sand Point area.

Steller's eider (*Polysticta stelleri*) (Alaska breeding population) is currently listed as threatened. They are highly dependant on the health of lagoons and bays that promote the growth of eelgrass beds. Eelgrass communities are among the most diverse and productive in the world, providing food and nursery areas for fish, crabs, and many other invertebrates. The invertebrates, in turn, provide an essential food base for Steller's eider and other species (USFWS, 2009). The Consultation Guide for Alaska's Threatened and Endangered Species (USFWS, 2004) states that Sand Point is located in a molting and wintering range for Steller's eider and that more than 1,000 eiders may winter in the marine waters surrounding Popof Island in any given year. Sand Point is not in designated critical habitat for Steller's eider, although the Nelson Lagoon critical habitat area is located approximately 50 miles from Sand Point on the north side of the Alaska Peninsula (USFWS, 2004).

The short-tailed albatross (*Phoebastria albatrus),* is listed as endangered under the ESA. Although the short-tailed albatross has been seen along the Gulf of Alaska shelf south of Popof Island, it is a highly pelagic species that occurs almost exclusively in open waters well away from the coast (USFWS, 2004).

Several species of ESA-listed marine mammals occur in the waters surrounding Sand Point. The waters around Sand Point are designated critical habitat for the western stock of Steller sea lions (*Eumetopias jubatus*), which is listed as endangered (NMFS, 1993). Several species of endangered whales could also occur, although there are no designated critical habitats for these species near Sand Point. The southwest stock of northern sea otter (*Enhydra lutris kenyoni),* is listed as threatened. The USFWS has proposed critical habitat for this population in nearshore waters, including Humboldt Harbor adjacent to Sand Point (USFWS, 2008). The USFWS would review public and other agency comments on the proposal before finalizing the critical habitat designation.

The USFWS has oversight responsibility for ESA-listed birds and sea otters. The National Marine Fisheries Service (NMFS) has oversight responsibility for ESA-listed Steller sea lions and whales.

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

Under the No Action Alternative, DOE would not provide funding for the Sand Point Wind Project and the project would not be built as a Federal Action; therefore, there would be no impacts to ESA-listed species or their critical habitat as a result of the No Action Alternative.

3.4.2.2 Proposed Action

The proposed wind turbine installation site is at an elevation of 164 ft and approximately 1/4 mile from the closest marine waters; there is no marine component to the project. The project would therefore be unlikely to have any effects on any ESA-listed marine mammals or their critical habitats.

The two listed bird species are also marine species and rarely, if ever, fly over land except during the nesting season. Short-tailed albatross nest in Japan, while Steller's eiders nest in tundra on Alaska's northern coast and Yukon-Kuskokwim Delta as well as northern Russia (USFWS, 2004). It is therefore unlikely that either species would collide with inland/upland structures in Sand Point, including the proposed wind turbines.

In fulfillment of their obligations under Section 7 of the ESA, DOE initiated informal consultation with the USFWS regarding the potential impacts of the proposed project on listed species. In a letter dated March 10, 2009, DOE described the proposed project and assessed the potential effects on listed species. In their reply, dated March 11, 2009, USFWS concurred that the proposed project was "not likely to adversely affect" Steller's eiders or their critical habitat and "would have no adverse affect" on any other listed species (Appendix D).

Applicant Committed Measures

The USFWS has recommended that TDX conduct post-construction surveys to assess the potential for bird collisions with the wind turbines (see Section 3.5). These surveys would help reduce uncertainty regarding potential adverse effects to listed species. TDX would notify the USFWS immediately if any ESA-listed species are found during the post-construction mortality surveys and would consult with them regarding the need for any additional applicant committed measures.

Residual Impacts

The proposed project is not expected to have any residual impacts on any ESA-listed species.

3.5 BIRDS

3.5.1 Affected Environment

In response to public scoping, including recommendations of the USFWS (E. Lance, personal communication, April 14, 2007), and in compliance with DOE procedures, an avian monitoring program was implemented during the pre-construction phase of the Proposed Action. The program includes observations of all bird species near the proposed turbine sites, with particular concern regarding the vulnerability of bald eagles to potential turbine strikes, and a search for bird carcasses near the existing meteorological station (MET) tower. The pre-construction surveys are designed to determine the prevalence and behavior of birds, including bald eagles, in the immediate vicinity of the proposed turbine locations. This program is intended to help the project avoid violating the provisions prohibits bird

mortality ("take") in the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712) and the Bald and Golden Eagle Protection Act of 1972 (16 U.S.C. 668-668c).

Trained avian monitoring technicians have been responsible for making avian and carcass/scavenger observations as established in the avian monitoring program protocol (Appendix E). Table 3-1 summarizes the results of observations made from December 6, 2006 through August 17, 2007 and from October 20, 2008 through March 25, 2009.

Table 3-1. Summary of bird observations[1] from the proposed wind turbine site by season[2].

Species	Winter (n=23)	Spring (n=9)	Summer (n=8)	Fall (n=10)
Bald eagle	1.48	0.89	0.75	0.50
Black-billed magpie	0.70	0.44	0.38	0.60
Common raven	0.26	0.22	0	0.10
Northwest crow	1.17	0	0	0
Passerine spp.	0.09	0	1.00	0.60
Gull spp.	0	0.22	0.13	0

Note: Data are mean numbers of birds seen per observation period during each season
[1] This table includes all observations up to March 25, 2009
[2] Winter = November through March, Spring = April through May, Summer = June and July, Fall = August through October
n = number of observation periods

The marine waters off Popof Island support a variety of marine birds such as loons, grebes, alcids, gulls, and sea ducks. With the exception of gulls, these species rarely, if ever, fly over land except at their nesting grounds.

Bald eagles are common residents of the Sand Point area and are protected under the Bald and Golden Eagle Protection Act. This act prohibits anyone, except under permit from the Secretary of the Interior, from "taking" bald eagles, their eggs, nests, or any other parts of the birds. The Act defines "take" as "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb." Because of the absence of trees in this region, bald eagles are ground-nesters and nest along the coast using rock pinnacles (sea stacks) and other area inaccessible to land predators. Because the project site is inland from the coast and within a developed area, nesting bald eagles are not a concern for this project.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

Under the No Action Alternative, DOE would not provide funding for the Sand Point Wind Project and the project would not be built as a Federal Action. There would be no additional impacts to birds as a result of the No Action Alternative.

3.5.2.2 Proposed Action

The avian monitoring program results indicate that very few species of birds appear to use the proposed installation site on a regular basis. Bald eagles have been seen in small numbers in the area, usually perched on the old, dysfunctional, wind turbines across the road from the proposed installation site (known as the Harry Foster towers or Foster windmills). Black-billed magpies, northwestern crows, and common ravens were often observed landing on the ground at the proposed installation site or on the anemometer tower guy wires. No bird or bat mortalities were documented near the MET from the carcass searches during the pre-construction avian monitoring program. The avian monitoring program did not produce sufficient data to characterize flight patterns (elevations and directions) for any species in the

project area. However, all of the observed species are common residents in populated areas throughout Alaska and antidotal observations suggest they generally habituate to and avoid collisions with various human structures, such as communication towers and electric power lines.

Bureau of Land Management (BLM) recently completed a Programmatic Environmental Impact Statement on wind power development in the western states, excluding Alaska (BLM, 2005). No similar document has been prepared for Alaska. The BLM document compared bird abundance and post-construction mortality studies at numerous existing wind farms across the country and found that there was little correlation between species that are present in an area and those that are killed in collisions with wind turbines. The document concluded that not all species are prone to collisions at wind farms, probably through a combination of their typical flight patterns, their abilities to perceive the turbines, and their abilities to avoid the turbines. The BLM document notes that no bald eagles have been reported to be killed at any wind power farm in the western states. Corvids (ravens, crows, and magpies) are also apparently able to avoid collisions judging by their common frequency of occurrence versus their rare frequency of mortality. Erickson et al. (2001) also compared bird mortality rates at various wind developments and found a similar pattern: no bald eagles killed and relatively few ravens killed.

The proposed turbine site is approximately 1/3 mile from coastal waters and sits at an elevation of 164 ft, making it unlikely for any marine species to use the area near the turbine sites. No waterfowl or seabird species were observed at the proposed project site during the avian monitoring program. The proposed turbine sites are not within a major migration corridor and there are no major waterfowl staging areas nearby.

Wind turbines are known to cause some degree of mortality to individual birds. The national average collision-related mortality for birds at wind farms is low (<3 birds/turbine/yr; Erickson et al., 2001). Collision mortality rate for birds based on rotor sweep area (RSA) for western and Midwestern wind farms is 1.1 to 5.6 birds/3,000 m^2 and as measured by MW of the turbines, the collision mortality rate ranges from 0.9 to 4.7 birds/MW (Erickson, 2003). The two Vestas 39 wind turbines are rated at 500 kW and have a RSA of 12,863 ft^2 (1,195 m^2), therefore the mortality rate would be expected to be between 0.5 and 2 birds /turbine/year base on the RSA and between 0.5 and 2.4 birds/turbine/year based on MW.

Based on the location of these two turbines inland from the coast and at a higher elevation, the low occurrence of birds in the general area from the avian monitoring program, and the low susceptibility to collision-related morality for the common birds that use the area (i.e. bald eagles and corvids), avian collision mortality as a result of the Proposed Action is expected to be low and not adversely affect any local bird populations.

Applicant Committed Measures

The USFWS has published interim guidelines for wind power projects to minimize the potential risks of bird fatalities due to collisions (USFWS, 2003). Many of these guidelines pertain to siting considerations and are more pertinent to much larger projects. However, the following recommendations would be implemented:

- Anti-perching devices would be placed on each turbine nacelle (if necessary) to discourage perching or nesting on the turbines, which would greatly increase the potential for bird collisions.
- Anti-perching devices would be installed on electric poles in adjacent areas to discourage perching and reduce the potential for electrocution, especially for bald eagles.

- The turbine towers would not have external ladders or other structures that would allow birds to perch anywhere near the turbine blades.
- TDX would remove the old Harry Foster towers at the time of construction, thus removing one of the most well-used perches for bald eagles and other resident birds in the area.
- Structures with guy wires would be avoided. The turbine towers would be self-supporting monopoles.
- Electric transmission lines from the wind turbines to the TDX power plant would be buried below ground.
- Lighting on the turbine towers would be limited to what is necessary for aviation safety, as determined by the FAA.
- A post-construction monitoring plan would be implemented for one year, starting immediately after construction, to determine if birds are killed by collisions with the turbines.

The post-construction monitoring plan would sample for potential seasonal variations in bird collisions, with an emphasis on the fall and spring migration seasons when bird activity is expected to be highest. Searches would be conducted at a frequency that minimizes the potential for bias from scavengers. The following elements would be incorporated into the post-construction monitoring plan:

- Surveys would be conducted two times per week in three consecutive weeks during spring and fall sampling periods and one time per week in four consecutive weeks during winter and summer sampling periods.
- The spring sampling period would consist of six surveys during the main migration season (~April 15 to ~May 31).
- The summer sampling period would consist of four surveys during the main breeding season (~June 1 to ~August 10).
- The fall sampling period would consist of six surveys during the main migration season (~August 11 to ~October 10).
- The winter sampling period would consist of four surveys during the non-breeding season (~October 11 to ~April 14).
- Surveys would be conducted by trained observers who would record their name, date, time, and standard weather variables.
- Each survey would include a search for dead or injured birds beneath each turbine tower, conducted on foot by slowly walking transect lines approximately 25-30 ft apart, looking about 12-15 ft on both sides of the transect line. Each set of transects would cover a search area defined as one-half of the maximal height of the rotor-swept area (California Energy Commission and California Department of Fish and Game [CEC/CDFG], 2007), which is about a 100 ft radius around each tower (tower height is about 130 ft agl and the turbine blades are about 130 ft in diameter, thus putting the upper reach of the turbine blades at 195 ft agl). This search pattern is estimated to require about 40 minutes for each tower.
- If any bird is found, data would be collected on its position relative to the tower, species (if possible), condition of the carcass, and evidence of scavenging. AWE/TDX would establish a file for all search results, including records for searches when no birds were found.

Residual Impacts

The USFWS recognizes that there may be some bird collisions with wind turbines even if all of their recommended applicant committed measures are followed (USFWS, 2003). Given the relatively low numbers of species and birds that have been observed to use the project area, the potential for future bird fatalities as a result of the Proposed action is considered to be very low. The actual level of collision-related mortalities would be monitored by conducting a post-construction monitoring study at the wind

turbines to determine the numbers and species of birds killed by collisions with the wind turbines or towers. If post-construction monitoring indicates that bird collision rates are higher than expected or occur under particular conditions or seasons, additional applicant committed measures would be taken to reduce residual effects.

3.6 CULTURAL RESOURCES

3.6.1 Affected Environment

Cultural resources are the nonrenewable physical remains of past human activity and are protected under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, the Archaeological Resources Protection Act of 1978, as amended, and other laws and regulations. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on "historic properties", which include those cultural resources (prehistoric, historic, and ethno-historic) that are listed in or eligible for listing in the National Register of Historic Places (NRHP).

The majority of the known archaeological resources of the Alaska Region date between roughly 11,500 years before present and the arrival of the Russians and Europeans (circa AD 1750). Prehistoric interactions during this period are characterized by sites reflecting the movement of people, ideas, and goods back and forth across the Bering Strait. The area that is now Sand Point was influenced by this cultural exchange.

The Aleuts subsisted by open-water hunting and fishing and occupied a large area ranging from the tip of the Alaska Peninsula westward throughout the Aleutian Islands. The Aleut Tradition of maritime hunters developed over time and remained strong until the invading Russians disrupted many Native communities in the late 18th century. Historic and ethno-historic settlements of the Native peoples of Alaska are part of a remembered past and often have traditional cultural value to Native Alaskans. Many traditional lifestyles, with various modifications, continue today.

For this proposed project, tribes and/or individuals were contacted and their comments were solicited regarding any potential conflicts with historical and cultural resources. Connie Fredenberg and Bruce Wright, both of APIA, visited all three tribal offices in this region and spoke with Council Presidents, Tribal Administrators, and Environmental Coordinators on December 5, 2006. The proposed project has been discussed at APIA board meetings for over two years. All of the Tribes that may have concerns are represented on the APIA board. One response has been received as a result of these contacts.

The President of the local Qagan Tayagungin Tribe commented that the area is not considered to possess any unique ethnic cultural value and is not used for subsistence or religious purposes. This is the only Tribe in the area that is originally from Sand Point. The Pauloff Harbor Tribe is originally from Sanak Island and the Unga Tribe is from the Shumagin Islands.

A Class I records search was conducted by APIA at the Alaska Office of History and Archaeology to determine the nature and extent of prior archaeological investigations in the Sand Point area. An area within two miles of three different potential turbine sites (all within the community of Sand Point) was examined. Extensive land surveys have been undertaken near the project area for road and housing construction and one historic property, outside the project area by nearly 1/2 mile, was noted. The property is a Russian Orthodox Church, which was listed in the National Register as part of a Thematic Nomination for the Russian Orthodox Church on June 6, 1980. There is also a dilapidated modern cabin on the north side of Mud Bay, more than one mile away from the chosen site, which was recorded in

1989. There are other reported archaeological sites on Popof Island, but they are located a minimum of four miles from the proposed project area.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Under the No Action Alternative, DOE would not provide funding for the Sand Point Wind Project and the project would not be built as a Federal Action. There would be no ground disturbance at the site and, therefore, no impacts to any cultural resources as a result of the No Action Alternative.

3.6.2.2 Proposed Action

Cultural resource concerns specific to the proposed project area were discussed in a meeting between APIA and Ms. Joan Dale, staff archaeologist with the Alaska Office of History and Archaeology, in September 2006. Ms. Dale stated that the proposed project area is likely devoid of any unrecorded historic properties and is considered low in cultural resource sensitivity. This opinion is based upon the disturbed nature of the area and the lack of findings from previous cultural resource studies in the project vicinity.

On February 1, 2007, DOE sent a letter to Ms. Judith E. Bittner, Alaska SHPO requesting concurrence with a Finding of No Historic Properties Affected for the proposed project site. This request was based on the findings of the Class I records search and the other consultations described above. A response from the SHPO was received on March 9, 2007, stating concurrence with DOE's recommendation (File 3130-1R Dept. Energy).

Applicant Committed Measures

With respect to resources of Native Alaskan traditional cultural significance, the Native Alaskan community has been informed of the project during the scoping process and their input has been solicited, as described above. DOE is making this EA available to the individual Tribes on the APIA board that may have concerns, along with a request for formal consultation regarding this project. DOE expects a response within the 30-day review period for this EA. If any historical or cultural resources are identified which have potential conflicts with the project, applicant committed measures will be developed to minimizing the potential impacts.

The operation and construction of the Proposed Action would comply with the regulatory statutes set forth under NHPA to protect cultural resources; no additional applicant committed measures or monitoring is recommended at this time.

Residual Impacts

At this time, the Proposed Action is not anticipated to result in any unavoidable adverse residual impacts to identified cultural resources.

3.7 NOISE

3.7.1 Affected Environment

The most common unit of measure used to describe the magnitude of sound levels is the decibel (dB). Sound levels are often stated in terms of decibels on the A-weighted scale (dBA), which is weighted to reflect the sound frequency range of human hearing.

The dBA scale is used extensively in the United States (U.S.) to measure community and transportation sound levels, which decrease with distance from the source. Typical sound levels include about 110 dBA for construction noise, 90 dBA for a heavy truck accelerating, 60 dBA for a conversation, and 50 dBA for a quiet office.

Global Energy Concepts (GEC) was contracted to perform a visual and sound impact analysis report for the proposed project (GEC, 2006, Appendix F). Since background noise measurements had not been taken at the turbine site, GEC modeled three background levels: 40 dBA, 50 dBA, and 60 dBA. Both low wind speed and high wind speed impacts were modeled using wind speeds of 4.0 meters per second (m/s) (9 miles per hour [mph]) and 8.0 m/s (18 mph), respectively, at a height of 10 m (33 ft) agl.

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Under the No Action Alternative, DOE would not provide funding for the Sand Point Wind Project and the project would not be built as a Federal Action. There would be no additional noise impacts at the project site as a result of the No Action Alternative.

3.7.2.2 Proposed Action

During construction of the turbine towers, sound frequencies and levels would depend on the specific construction equipment used, the amount of equipment operating simultaneously, and hours of operation. It is anticipated that typical construction equipment would be used and that the hours of operation would occur only during normal working hours. In addition, it is anticipated that the construction activities would occur over a relatively short period.

The GEC report states that when operating, wind turbines produce a “swishing” or “whooshing” sound as their rotating blades encounter turbulence in the passing air, as well as some sounds from the mechanical parts such as the gearbox, generator, and cooling fans. At a distance of approximately 600 to 900 feet, the sounds generated by a wind turbine are frequently masked by the “background noise” of winds blowing through alders and brush or moving around obstacles. Wind turbines are typically quiet enough for people to hold a normal conversation while standing at the base of the tower (GEC, 2006).

The GEC report identified three representative receptor sites (structures or areas where people are often or consistently gathered and that may be affected by chronic sound levels) that would have potential impacts from the Proposed Action. One site is the local schoolhouse (H1) and the other two (H2 and H3) are private residential properties (Figure 3-1). The closest receptor site location is identified as H2 and is approximately 1/4 mile from the project location.

The findings of the sound impact analysis indicate that the wind turbines would produce sound levels of no more than 60 dBA at the project boundaries. The study also evaluated expected changes in sound level at the three receptor sites and concluded that the change to the background sound levels at these locations would be minimal. However, due to its close proximity to the wind turbines, the H2 receptor has the potential to be impacted by sounds from the wind turbines, depending on existing background noise conditions. If background sound power levels are 40 dBA, the H2 receptor would experience a 6 dBA increase in sound pressure level due to the wind turbines, which could represent a “noticeable difference” to the homeowner. Whether or not this difference is considered an annoyance is subjective. However, if

the background sound of the wind, diesel power plant, or other community activities is 50 dBA, the additional sound from the wind turbines would not be perceptible.

Community sentiment (Appendix C) was gauged regarding the expected noise level of wind turbines at the Sand Point Electric Utility site. Opinion was unanimously in favor of installing the turbines.

Applicant Committed Measures

Manufactures of construction equipment are required to adhere to noise standards. These standards make it unlikely that excessive noise would be generated from the construction operations. All construction operations would occur during normal working hours. No other applicant committed measures are recommended at this time.

Residual Impacts

Daily turbine operation is expected to generate residual noise impacts. However, based on the GEC sound analysis report, the noise levels would be low to potential receptor sites (GEC, 2006) and would be considered to have minor impact.

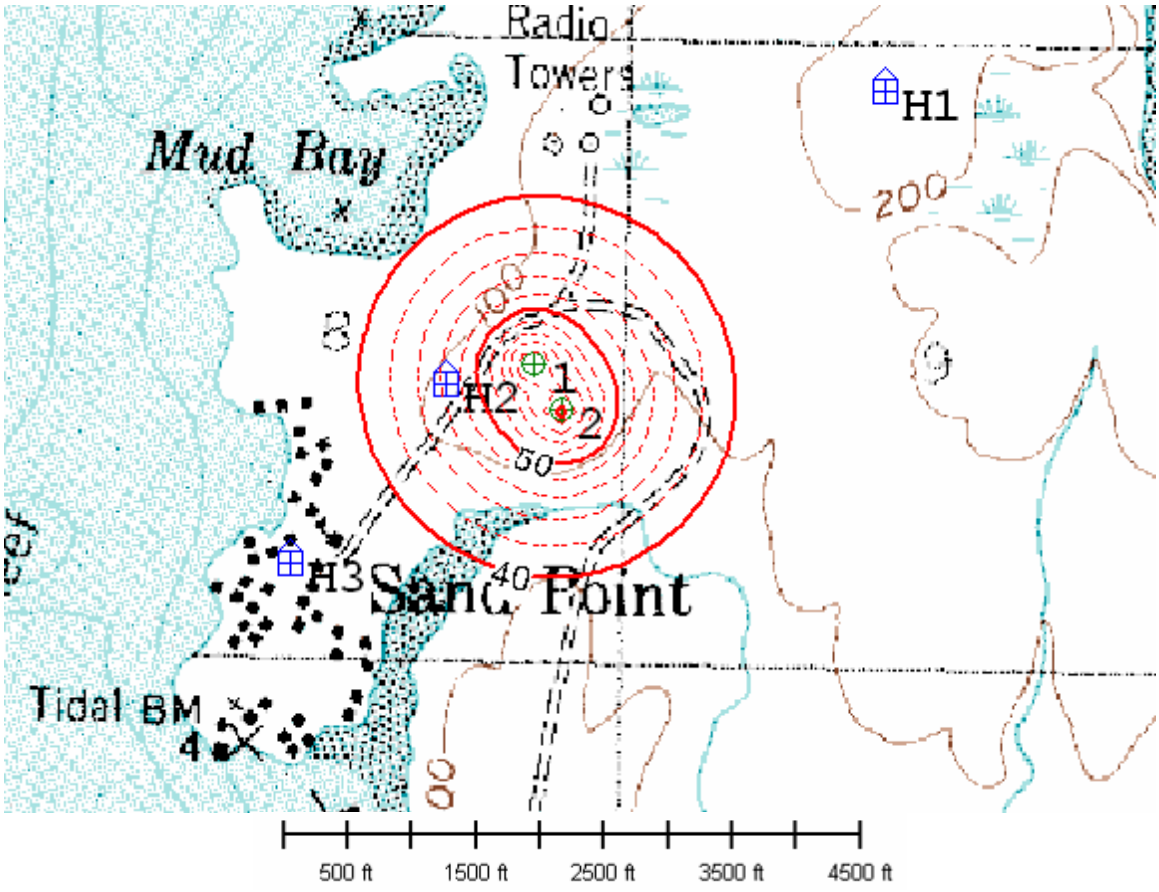

Figure 3-1. Locations of the proposed turbines (1 and 2), the representative receptor sites (H1 – H3), and projected sound levels under typical operating conditions. At the base of each turbine, sound levels are projected to reach approximately 58 dBA. The solid red circles indicate the distances from the turbines where the sound levels would attenuate to 50 dBA and 40 dBA.

3.8 VISUAL ENVIRONMENT

3.8.1 Affected Environment

The proposed wind turbines would be located on a relatively high point (164 ft elevation) and the view from the site generally provides a 360-degree perspective of portions of the City of Sand Point, Humboldt Harbor, and the nearby mountains. This tower would have a hub height of 131 ft and the rotors would be 128 ft in diameter, therefore, the height at the top of the blade (top of the sweep area) would be approximately 195 ft agl. Both turbines would be visible from most of the area surrounding Sand Point and add a strong vertical element to the landscape. There are no existing functioning wind turbines in Sand Point but an anemometer is present on the TDX property nearby. In addition, there are two old wind generator towers on the property of Harry Foster near the proposed site locations.

GEC was contracted to perform a visual impact analysis report for the proposed project (GEC, 2006). Photographs taken from various reference points throughout Sand Point (Figure 3-2) were used to create photo simulations of the proposed turbine installation from various viewpoints and oriented toward the proposed turbine site (Figures 3-3 to 3-7).

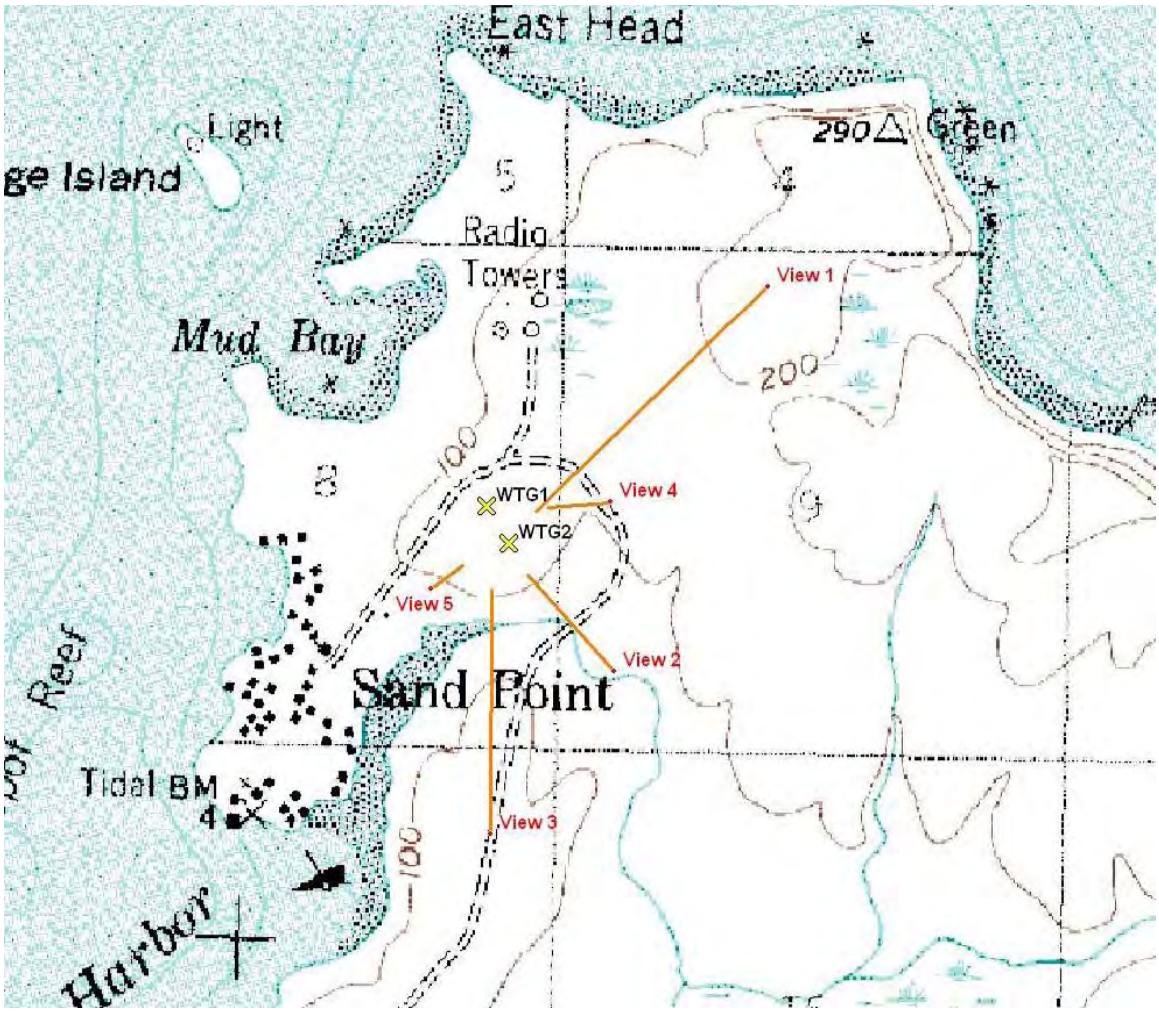

Figure 3-2. Locations of the proposed wind turbines and the viewpoints used in the visual impacts study (GEC, 2006).

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Under the No Action Alternative, DOE would not provide funding for the Sand Point Wind Project and the project would not be built as a Federal Action. There would be no additional visual impacts to the project site as a result of the No Action Alternative.

3.8.2.2 Proposed Action

The wind turbines would be visible from much of the area surrounding the Sand Point community. Visual simulations from five viewpoints around the community are presented in Figures 3-2 though Figure 3-7. The wind turbine's visibility could be influenced by the color choice, which at this point would be the commercial standard off-white. However, only one turbine of the two turbines is visible from a residential area, located less than 1/4 mile southwest of the proposed turbine sites because this area is slightly below the hill on which the turbines would be located. The furthest viewpoint, (view 3) a little over 1/2 mile to the northeast at the school, shows both turbines would be clearly visible from this distance. No photo simulations were created from viewpoints west, northwest, and north of the proposed turbine locations because these areas are uninhabited.

Figure 3-3. Photo simulation from the southwest corner of the school looking southwest (View 1)

Figure 3-4. Photo simulation from the south side of the pump house pond looking northwest (View 2)

Figure 3-5. Photo simulation from power pole #43 looking north (View 3)

Figure 3-6. Photo simulation from the SDP Fisheries building looking west (View 4)

Figure 3-7. Photo simulation from residential area southwest of the turbine site looking northeast (View 5)

Both towers would also comply with FAA Advisory circular 70/7460-1K, Obstruction Marking and Lighting, which recommends air-safety markings and lighting schemes for structures such as wind turbines. The FAA has determined that both towers should be white and have synchronous flashing red

lights to make them easily visible to local aircraft. This would also increase visibility of the turbines from all viewpoints, especially at night and during inclement weather.

Applicant Committed Measures

The construction and operation of the Proposed Action would comply with all required regulatory statutes set forth by federal, state, and local regulatory agencies, including FAA Advisory circular 70/7460-1K. No additional applicant committed measures or monitoring is recommended at this time.

Residual Impacts

The wind turbines would create residual visible impacts from numerous points in the community. Community sentiment was gauged regarding the visual impacts of wind turbines at the Sand Point electric utility site and no issues were raised (see Appendix C). Public opinion was unanimously in favor of installing the turbines. The residual visual impacts are therefore considered minimal.

3.9 THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term use of the environment, as used here, is that used during the life of the project, whereas long-term productivity refers to the period of time after the project as been decommissioned, the equipment removed, and the land reclaimed and stabilized. The short-term use of the project area for the Proposed Action would not affect the long-term productivity of the area. If it is decided at some time in the future that the project has reached its useful life, the turbines, towers, and foundations could be decommissioned and removed, and the sites reclaimed and revegetated to resemble a similar habitat to the pre-disturbance conditions. The installation of wind turbines at these two sites would not preclude using the land for purposes that were suitable prior to this project.

3.10 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

An irreversible and irretrievable commitment of resources is defined as a permanent reduction or loss of a resource that, once lost, cannot be regained. The primary irretrievable and irreversible commitment of resources for the Proposed Action would be the labor, materials, and energy expended in clearing the site and constructing the two wind turbines. Other commitments include the loss of productivity of the sites (primary production and wildlife habitat) and the loss of an unknown number of birds due to collision with the turbines. These commitments of resources would extend for the duration of the project.

3.11 UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts associated with the Proposed Action include:

- Long-term loss of approximately 0.2 acres of vegetation resulting from the construction of two tower foundations and the access road to the sites.
- Increase in noise levels during construction of the foundations and erecting of the wind towers.
- Increase in noise levels to residents living close to the turbine sites.
- Addition of two dominant vertical elements into the existing Sand Point viewshed.
- Potential direct impact to birds from collision with the wind turbine.

These impacts are both temporary, in the case of the construction noise, and long-term in regards to the visual impacts and the impact to birds from collisions. Overall, impacts of the Proposed Action on the environment are considered negligible.

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4.0 CUMULATIVE EFFECTS

Cumulative impacts result from the incremental impacts of an action that is added to other past, present, and reasonably foreseeable future actions (RFFAs), regardless of who is responsible for such actions. Cumulative impacts may result from individually minor, but collectively significant, actions occurring over a period of time (40 CFR 1508.7). The process of assessing cumulative effects therefore requires the agency to put the potential impacts of the proposed project into the context of the existing baseline conditions and projected impacts from other RFFAs. The baseline conditions in Sand Point and the potential impacts of the project are described in Chapters 1, 2, and 3 of this document. Past and present actions that have contributed to effects on birds have included the 200-ft tall former U.S. Navy communication towers north of town, and the local KSDP Radio Station tower (K. Ketherington, KDSP Radio, personal communication, 2009). The KSDP tower is a 200-ft guyed lattice AM transmitter tower and is illuminated in the evenings and during foul weather conditions with a newly installed light emitting diode (LED) beacon at the top of the tower and three mid-level LED sidelights. Two relatively small, single wind generators, referred to as "Harry Foster's Windmills" are the only previously installed wind generators in the area. These towers are not currently functioning and would be taken down as applicant committed measure for the Proposed Action.

RFFAs are defined as those projects or actions that have progressed beyond the speculative stage, generally including only those projects that are listed in official planning documents, have funding secured, initiated permitting processes, or begun implementation. According to the AEB website (AEB, 2009), there are several major construction projects that have recently been completed in Sand Point, including a new medical/dental clinic, a runway extension at the airport, a harbor expansion and new wharf, and a new water treatment plant. According to Paul Day, City Administrator for Sand Point (P. Day, City of Sand Point, personal communication, 2009) RFFAs in Sand Point include a new proposed seafood processing plant and planned installation of cell towers for wireless service for the area. The website for the Shumagin Corporation (Shumagin Corporation, 2009), the local Alaska Native Corporation that is the primary landowner on the island, describes ongoing shareholder activities and commercial use of their stone quarries but does not list any future projects that are proceeding toward development. The Local Radio station, KSDP, is proposing to install a small 10 kW wind turbine, mounted on a 78 ft guyed pole tower, to generate capacity sufficient to sustain the radio station requirements. This would be located near the radio tower (http://apradio.org/combination-power-generation-and-back-up-system/). DOE is unaware of any other RFFAs within the general project area that could contribute to any cumulative impacts.

The analysis of environmental consequences in Chapter 3 indicates that, relative to the existing baseline conditions, the proposed project would have minimal impacts on land use, coastal zone resources, vegetation and soils, threatened and endangered species, noise, and the visual landscape. The Proposed Action would have negligible contribution to the overall cumulative effect.

Past and present actions that have contributed to collision hazards for bird include the old communication towers and the KSDP towers, and Foster's wind generators. The only RFFA that would contribute to the some risk of collision mortality is a proposed 10 kW wind generator project for the local radio station. The Proposed Action would contribute to the cumulative effect on bird collision mortality; however, the overall cumulative effect would be nominal.

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APPENDIX A

SAND POINT WIND DATA

Appendix A. Sand Point Wind Data

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Project:
Sand Point - TDX

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+1 303-384-7027

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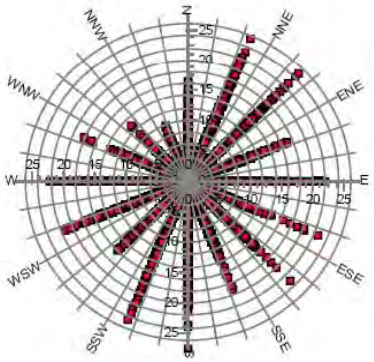
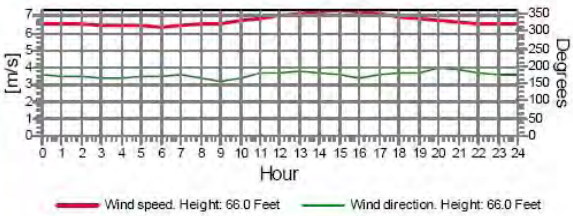
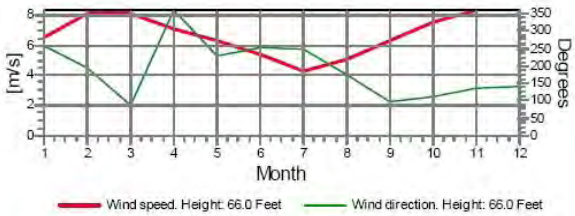


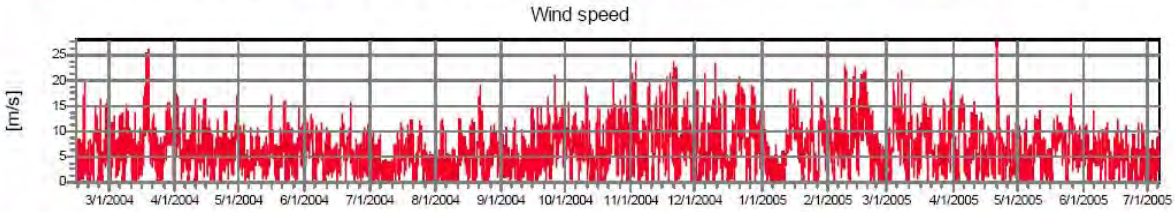
Wind speed [m/s]

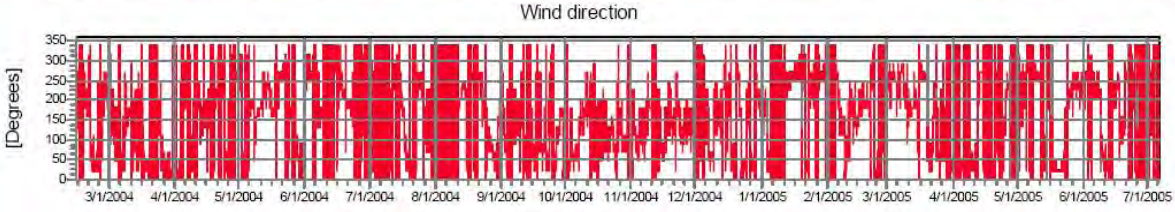
Monthly mean values of wind speed in m/s

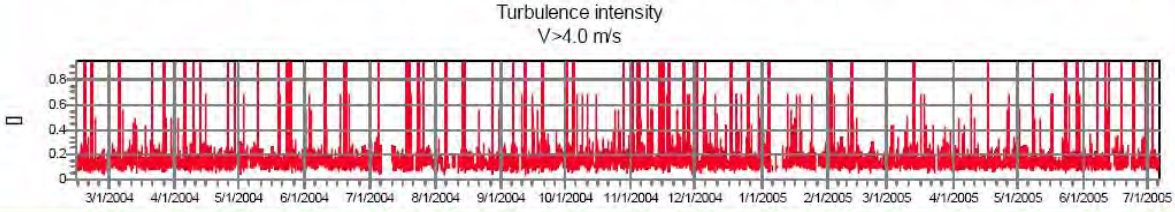
Month	2004	2005	mean	mean of months
Jan		6.5	6.5	6.5
Feb	6.5	8.9	8.0	7.7
Mar	7.8	8.5	8.1	8.1
Apr	7.2	7.0	7.1	7.1
May	5.8	6.7	6.3	6.3
Jun	5.7	5.1	5.4	5.4
Jul	4.3	4.2	4.3	4.2
Aug	5.0		5.0	5.0
Sep	6.3		6.3	6.3
Oct	7.5		7.5	7.5
Nov	8.3		8.3	8.3
Dec	8.3		8.3	8.3
mean, all data	6.6	7.0	6.8	
mean of months	6.6	6.7		6.7











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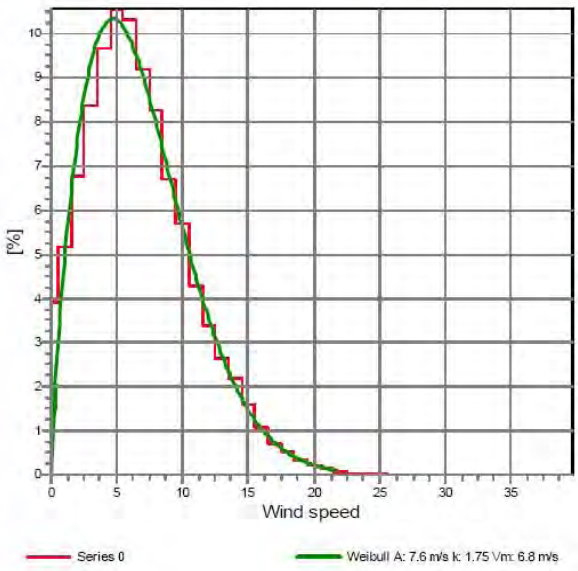

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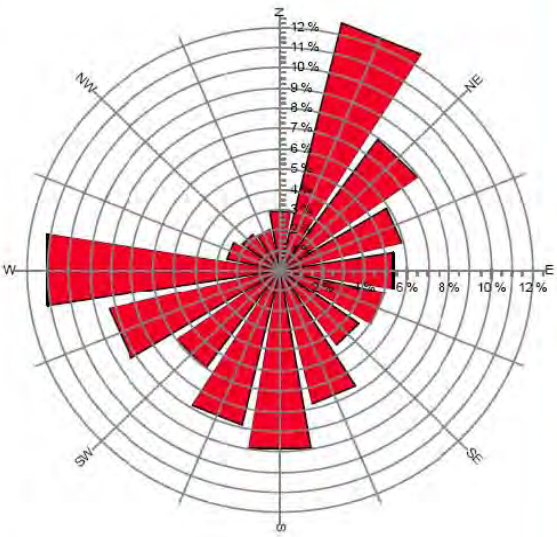

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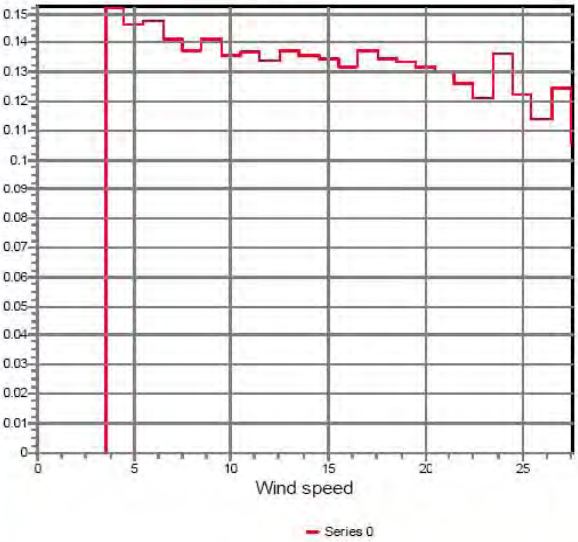

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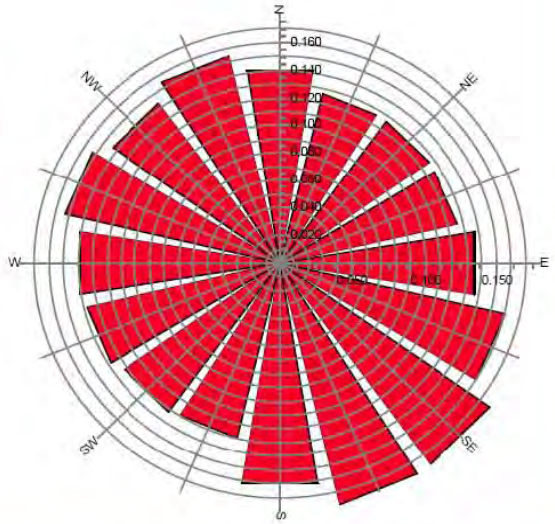

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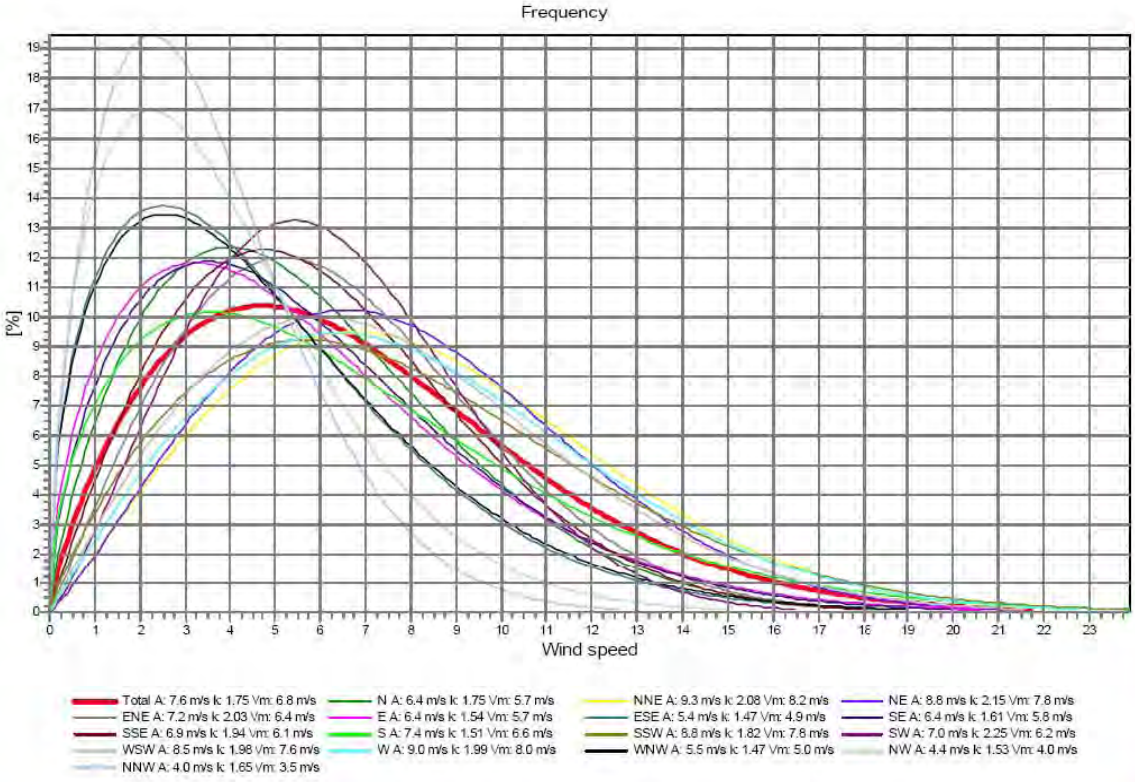
Weibull Data

k-parameter correction: 0.0080/m

Sector	A- parameter [m/s]	Mean wind speed [m/s]	k- parameter	Frequency	Frequency [%]	Wind shear
0-N	6.44	5.73	1.754	2.94	2.9	0.00
1-NNE	9.29	8.23	2.082	12.53	12.5	0.00
2-NE	8.82	7.81	2.154	7.92	7.9	0.00
3-ENE	7.23	6.41	2.033	5.89	5.9	0.00
4-E	6.36	5.72	1.542	5.37	5.4	0.00
5-ESE	5.40	4.89	1.474	5.05	5.0	0.00
6-SE	6.43	5.76	1.607	4.59	4.6	0.00
7-SSE	6.88	6.10	1.944	6.77	6.8	0.00
8-S	7.36	6.64	1.510	8.89	8.9	0.00
9-SSW	8.79	7.81	1.823	7.87	7.9	0.00
10-SW	7.04	6.23	2.250	5.98	6.0	0.00
11-WSW	8.52	7.55	1.982	8.30	8.3	0.00
12-W	9.05	8.02	1.988	11.10	11.1	0.00
13-WNW	5.51	4.99	1.469	2.55	2.5	0.00
14-NW	4.42	3.98	1.531	2.20	2.2	0.00
15-NNW	3.96	3.54	1.649	2.03	2.0	0.00
mean	7.65	6.81	1.747	100.00	100.0	0.00



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APPENDIX B

AGENCY CONTACT

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Sand Point Wind Installation Project Contact List

Sand Point Community

City - City of Sand Point, Mayor Glen Gardner
P.O. Box 249 Sand Point, AK 99661 Phone 907-383-2696 Fax 907-383-2698 E-mail sptcity@arctic.net

Electric Utility - TDX Power, CEO Nick Goodman 4300 B Street, Suite 402 Anchorage, AK 99503-5946 Phone 907-278-2312 Fax 907-278-2316 E-mail ngoodman@tdxpower.com

Village Corporation -Shumagin Corporation
P.O. Box 189 Sand Point, AK 99661 Phone 907-383-3525 Fax 907-383-5356 E-mail rweller@arctic.net

Village Council - Qagan Tayagungin Tribe of Sand Point, President Dorothy McCallum
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Pauloff Harbor Tribe, President William Dushkin PO Box 97 Sand Point, AK 99661 Phone 907-383-6075 Fax 907-383-6094 E-mail pauloff@arctic.net

Unga Tribe, President Bruce Foster PO Box 508 Sand Point, AK 99661 Phone 907-383-2415 Fax 907-383-5553 E-mail ungatribe@arctic.net

Regional Organizations

Borough - Aleutians East Borough, Mayor Stanley Mack 3380 C Street, Suite 205 Anchorage, AK 99503 Phone 907-274-7555 Fax 907-276-7569 E-mail developmentdirector@aleutianseast.org, admin@aleutianseast.org Web http://www.aleutianseast.org

Regional Native Corporation - Aleut Corporation 4000 Old Seward Hwy., Suite 300 Anchorage, AK 99503 Phone 907-561-4300 Fax 907-563-4328 E-mail info@aleutcorp.com Web http://www.aleutcorp.com

Regional Native Health Corporation - Eastern Aleutian Tribe 3380 C Street, Suite 100 Anchorage, AK 99503-3949 Phone 907-277-1440 Fax 907-277-1446 E-mail lcdevlin@gci.net Web http://easternaleutiantribes.org

Native Housing Authority - Aleutian Housing Authority 4000 Old Seward Hwy. #202 Anchorage, AK 99503 Phone 907-563-2146 Fax 907-563-3105 E-mail jacques@aleutian-housing.com

Regional Development - Southwest Alaska Muni. Conf. 3300 Arctic Blvd. #203 Anchorage, AK 99503 Phone 907-562-7380 Fax 907-562-0438 E-mail wayers@swamc.org Web http://www.southwestalaska.com

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William Marritt
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APPENDIX C

PUBLIC COMMENTS

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Sand Point, Alaska
Public Comments Regarding Proposed Wind Turbine Installation
December 5 - 9, 2006

Summary of Methods

Bruce Wright, Senior Scientist with Aleutians Pribilof Island Association, Inc. conducted a series of meetings in Sand Point, Alaska, to solicit comments on the proposed between December 5 through 9, 2006.

Informational bulletins were posted by a local representative with simulated photos of the installation and information regarding the visit and community meeting. Posters were places December 1, 2006 at The Airport, City Office Building (which also is the offices for Qagan Tayagungin Tribe and Pauloff Harbor Tribe), Post Office, Clinic, Sand Point Electric, Shumagin Corporation, the Shumagin Pub, Alaska Commercial Store, Chinese Restaurant, Sand Point School and Aleutians East Borough Offices.

Regular announcements regarding the upcoming visit and community meeting were made on KSDP radio in Sand Point beginning December 1, 2006. Over the course of the next 3 days, the following information was presented to community members on behalf of the USDOE:

> *TDX Power intends to install two 500kW Vestas Wind Turbines near the existing diesel generating plant in Sand Point. The Alaska Energy Authority/ AEA awarded TDX a grant towards the installation. The funding to AEA would be provided by USDOE, a federal agency. Federal funding triggers the National Environmental Policy Act/ NEPA. One requirement of NEPA is for the public to be informed of the plan and given the opportunity to comment on the plan.*
>
> *The Aleutian Pribilof Islands Association/ APIA, with funding from the Bureau of Indian Affairs, would assist USDOE with the NEPA process. Because these wind turbines are the largest to be installed in Alaska to date, APIA has contracted with Global Energy Concepts/ GEC for a "Sight and Sound Analysis" of the proposed installation to allow residents to "see" exactly how these turbines would look in the community. The sound analysis describes the level of noise to be expected from the installation.*

Comments on the proposed wind generation project were solicited on several occasions:

- December 5 - Alaska Commercial Store and various offices and places of business in Sand Point.

- December 6 - Community Meeting on the project was held at the Sand Point City Chambers,
- December 7 - Aleutians East Borough, Aleutians East School District Offices and Sand Point City Office
- December 9 - APIA Board of Directors Meeting

On these occasions, a total of 53 residents of Sand Point were presented with the five simulated photos, animations of the five photos, and a description of the sound analysis. Included in

these residents are: Glen Gardner, Mayor of the City of Sand Point; Stanley Mack, Mayor of Aleutians East Borough; David Osterback, President of the Qagan Tayagungin Tribe; Bruce Foster, President of the Unga Tribe; Arlene Gundersen, Administrator of the Pauloff Harbor Tribe.

Copies of the GEC report "Photo Simulations and Sound Impact Analysis for Sand Point Wind Power Project" were made available to any residents who requested a copy and copies were left with The City of Sand Point, Qagan Tayagungin Tribal Office, Pauloff Harbor Tribal Office, Unga Tribal Office, Aleutians East Borough Office, Aleutians East Borough School District Office, and the Sand Point Medical Clinic.

A summary of comments received on the Sand Point Wind Installation Project from Sand Point Residents are provided below:

Opinions Collected from Visiting Offices and Places of Business
12/5/06

1. Put 'em up!
Wayne Hodges, Hodges B&B PO Box 247 Sand Point, AK 99661

2. I agree. Put 'em up. It sounds like money in my pocket.
Edie Hodges, Hodges B&B PO Box 247 Sand Point, AK 99661

3. I'm all for wind energy.
Kathleen Harper, High School Teacher PO Box 192 Sand Point, AK 99661

4. I'm all for them.
Nellie Roehl, Secretary for Pauloff Harbor Tribe PO Box 424 Sand Point, AK 99661

5. I wouldn't mind looking at them.
Ilene Dushkin, Environmental Assistant for Pauloff Harbor Tribe PO Box 382 Sand Point, AK 99661
6. I don't mind at all!
Michael Kochuten, Air Quality Technician for Pauloff Harbor Tribe PO Box 13 Sand Point, AK 99661

7. I'm all for it, but hope that the savings get passed on to the customer and not just make TDX richer.
Anne Morris, Environmental Coordinator for the Pauloff Harbor Tribe PO Box 382 Sand Point, AK 99661

8. I think they would be a small inconvenience for the benefit they would provide to the community.
Arlene Gundersen, Administrator for the Pauloff Harbor Tribe PO Box 51 Sand Point, AK 99661

9. I'm all for it.
Jay Moon, Fisherman PO Box 263 Sand Point, AK 99661

10. They should've been here yesterday.
Charles Jackson, Fisherman PO Box 54 Sand Point, AK 99661

11. Order 10 more of them.
Representative Carl Moses PO Box 389 Sand Point, AK 99661

12. I'd like to see them.
Laresa Moses, Business Owner PO Box 389 Sand Point, AK 99661

13. They should look at putting some up by the school, too. It's a good wind spot. Insulate the wires so they (eagles) don't get electrocuted. If they could make the dump so the eagles couldn't eat from it, there would be less eagles. During the peak fishing time in June and July, there's a lot of birds down by the fish plant.
Andrew Gilbert, Janitor PO Box 395 Sand Point, AK 99661
14. I think it's a great idea. Energy costs are outrageous – it's a great thing to do.
Lucinda McGlashan, Administrator Qagan Tayagungin Tribe PO Box 394 Sand Point, AK 99661

15. I think it's a great idea, especially if they can reduce the price of our electricity.
Dana Osterback, Environmental Coordinator for Qagan Tayagungin Tribe PO Box 144 Sand Point, AK 99661

16. I'm for anything that lowers the price of energy.
Michael Gundersen PO Box 115 Sand Point, AK 99661

1 *I've always wondered why they didn't have them here in the first place. Great idea.* Jim Newman, Clinic Director PO Box 107 Sand Point, AK 99661
2 *Finally, somebody using their brains and making a future my children and grandchildren. I thank you and my son thanks you.*

Angel Bravo, self-employed welder PO Box 228 Sand Point, AK 99661

19. Good idea. They look good, definitely not an eyesore.
Dustin Stroud, Bartender PO Box 37 Sand Point, AK 99661

20. Thumbs up. Good idea.
David Cabot PO Box 361 Sand Point, AK 99661

21. I have no problem with them. I'm all for them. I've seen wind farms in England and they look fine and aren't too noisy.
Jenny Wood PO Box 212 Sand Point, AK 99661
22. I'm all for them. I think it's a good thing.
Nick Skyles PO Box 212 Sand Point, AK 99661

Opinions Collected from the Alaska Commercial Store, 4pm – 5:30 pm 12/6/06

In Favor:

1 Fritz Bjornstad

Gloria Gronholdt
Robert Dushkin
Bruce Lee
Taylor Lundgren
Jessica Nunez
Joanna Ludvick
Edee Jacobsen
Diana Holmberg
Leonard Holmberg
Paula Cabot
Andrew Gundersen
Joe Ludvick
Rayette McGlashan
Dennis McGlashan, Jr.
Carmen Holmberg
Lou Kuchenoff
I can't wait. They should've done this back in the 1980's!

Jason Bjornstad PO Box 58 Sand Point, AK 99661

41. I'm surprised there aren't more of these in rural Alaska.
Robbie Gilmour PO Box 296 Sand Point, AK 99661

Opinions Collected from Community Meeting Sand Point City Chambers December 6, 2006
The meeting was attended by 7 residents, 5 of whom had already commented.

42. I want to see the savings passed on to the consumer. Commercial users should be included in the tariff. Or credit the profit from the commercial users to the residential consumers. The local people don't benefit from the commercial users.
Dick Jacobsen, Aleut Corporation Board Member Sand Point, AK 99661

43. It's a good thing – good for the community. The cost of energy needs to go down. The money is well spent.
Kells Hetherington, General Manager KSDP Radio Sand Point, AK 99661

Opinions Collected Aleutians East Borough, Aleutians East School District Offices and Sand Point City Office December 7, 2006

44. Anything that uses less diesel is a good thing out there. I like the benefit to the Clinic and the Rec Center with heat.
Tina Anderson, Aleutians East Borough Clerk Sand Point, AK 99661

45. I am all in favor of developing our wind resource. We certainly have an abundant supply.
Stanley Mack, Mayor of Aleutians East Borough Sand Point, AK 99661

46. I am for it and don't see a huge problem with noise. As for an eyesore, if it reduces the price of electricity – no problem.
Cherilyn Lundgren, AEB School District PO Box 216 Sand Point, AK 99661

47. I think they look good and that the community is looking ahead. We have all kinds of towers, these aren't going to be a problem. And if we can save money, everyone would see money when they see them.
Bill Burr, AEB School District PO Box 63 Sand Point, AK 99661

1 *It's a good idea. Let's bring the cost of electricity down*. Glen Gardner, Mayor City of Sand Point PO Box 444 Sand Point, AK 99661
2 *They look fine.*

Krista Galvin, Administrative Assistant City of Sand Point PO Box 171 Sand Point, AK 99661
50. I think it's a great idea. I help my grandma pay her electric bill.
John Gardner IV Sand Point, AK 99661

51. I think it's a great idea.
Patricia Curtis PO Box 464 Sand Point, AK 99661

Opinions Collected at APIA Board of Directors Meeting December 9, 2006

52. It's a good idea. We've got to do something about the price of electricity.
David Osterback, President Qagan Tayagungin Tribe Sand Point,
AK 99661

53. I'm all for it. We've had them in Sand Point before, I just hope these ones work.
Bruce Foster, President Unga Tribe Sand Point,
AK 99661

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APPENDIX D

AGENCY SCOPOING COMMENTS AND CONSULTATION

U.S. Fish and Wildlife Service
Endangered Species Act

Section 7 Consultation

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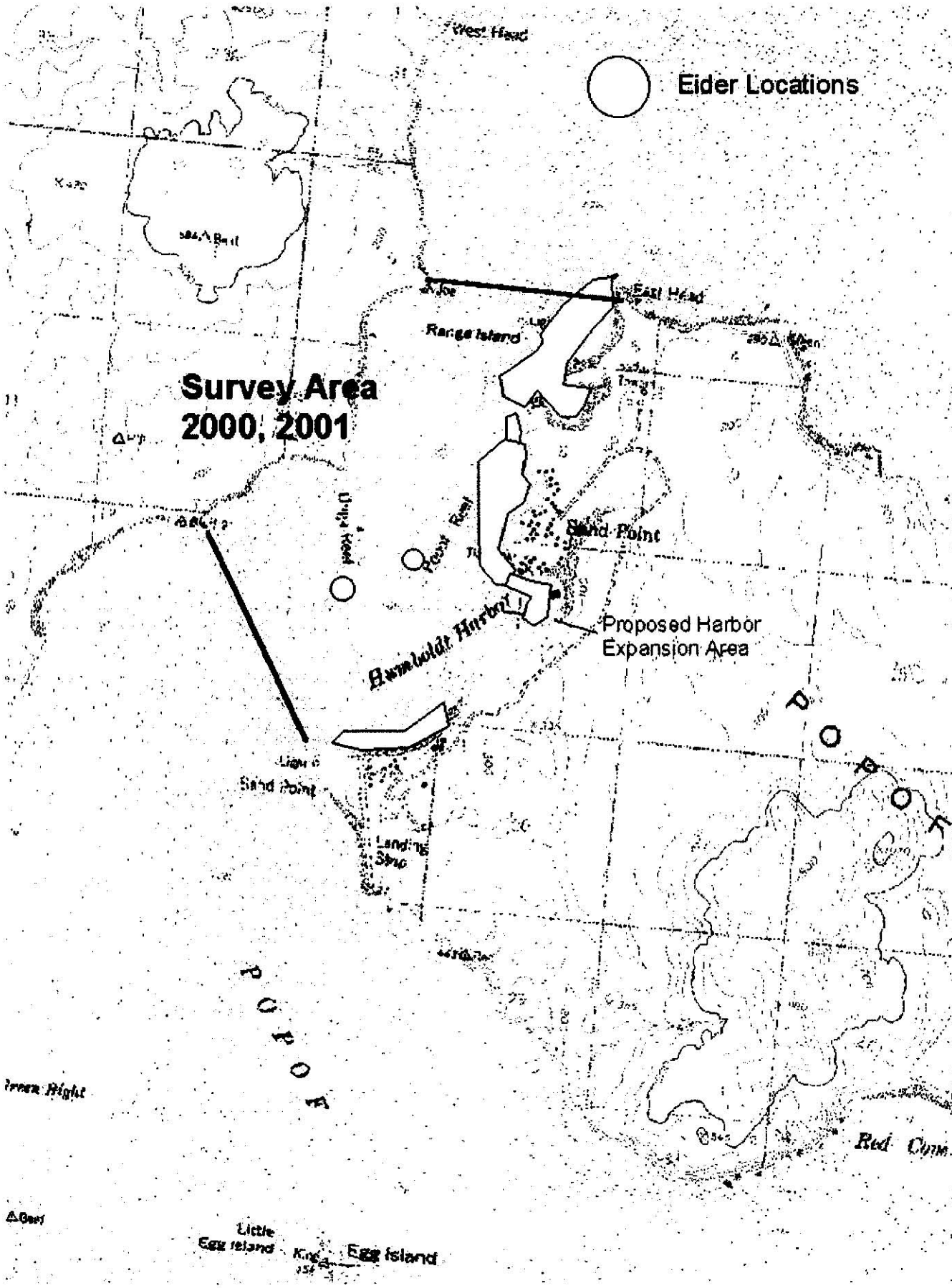
From: Ellen_Lance@fws.gov [mailto:Ellen_Lance@fws.gov]
Sent: Monday, May 22, 2006 2:35 PM
To: Constance Fredenberg
Subject: Sand Point

Connie,
I'm emailing with information regarding the TDX proposal to install 2-600kW Vestas turbines in Sand Point, presumably at the same location that the MET tower was installed in 2004,

Steller's eiders winter all around Sand Point in abundances nearly reaching 1000 individuals. We don't know anything about thei nocturnal movements through the area, but flights over Lot 3, where the MET tower was installed are unlikely.

We recommend that you and the folks from TDX review the Service's guidelines for siting wind turbines at http://www.fws.gov/habitatconservation/wind.pdf. Further, the FWS, Alaska Region has modified this guidance for Alaska . We suggest you strongly consider preconstruction surveys to determine the prevalence and behavior of bald eagles in the immediate vicinity of the proposed turbine location.



If you need further assistance, don't hesitate to contact me.

Best,
Ellen

Ellen W. Lance
Endangered Species Program
USFWS/AFWFO
605 W. 4th Ave. Rm G-61
Anchorage, AK 99501
(907) 271-1467

Aleutian/Pribilof Islands Association, Inc.

1131 E. International Airport Rd.
Anchorage, Alaska 99518-1408
Phone (907) 276-2700
Fax (907) 279-4351

February 27, 2009

Ms. Ellen Lance
U.S. Fish and Wildlife Service
Endangered and Threatened Species Division
605 West 4th Avenue, Suite 60
Anchorage, Alaska 99501

Re: Request for informal ESA Section 7 consultation on the proposed Sand Point Wind Energy Project

Dear Ms. Lance,

Aleutian Pribilof Island Association, on behalf of the U.S Department of Energy (DOE), is submitting this letter to initiate informal ESA Section 7 consultation on the proposed Sand Point Wind Energy Project in Sand Point, Alaska. The DOE has provided funding to the Alaska Energy Authority (AEA) Alaska Wind Energy Project. AEA proposes to provide funding received from DOE to Aleutian Wind Energy, LLC (AWE) to support the installation of a wind power generation system at the existing TDX Power generation facility in Sand Point, Alaska. Because of this federal funding, DOE is required to evaluate the potential environmental impacts of its facilities, operations, and related funding decisions in accordance with the National Environmental Policy Act (NEPA) and DOE NEPA implementing regulations. DOE has initiated the NEPA process and will soon complete an Environmental Assessment (EA) to document the potential environmental impacts of the proposed project, including potential effects on threatened and endangered species. In fulfillment of our obligations under Section 7 of the Endangered Species Act (ESA), we are supplying the following information about the project and our analysis of potential effects to ESA-listed species under the regulatory authority of the USFWS. We request that you review this information and provide us with a determination of whether the proposed project is or is not likely to have adverse effects on listed species under your authority.

Project Description

DOE is proposing to provide funding to support the installation of two 500 kW Vestas V39 wind turbines at the existing electrical power plant in Sand Point, AK. The proposed turbine site is at an elevation of 164 ft and is approximately 1/3 mile from marine waters (Figure 1). The wind turbines would be mounted on towers that are 131 feet (40 meter) tall and are free-standing,

monopoles with no guy wires (Figure 2). The towers would be approximately 400 feet apart. Each turbine has three blades with a rotor diameter of 128 ft (39 m), producing a rotor-swept area that is 12,852 ft^2 (1,194 m^2). The wind turbines would be integrated with the existing diesel generator and power distribution system so no new power transmission lines or other support structures would be needed.

The FAA made a "Determination of No Hazard to Air Navigation" for the installation of the turbines provided that the turbines are painted white and equipped with synchronized red lights in accordance with FAA Advisory circular 70/7460-1K, Obstruction Marking and Lighting. These safety systems are intended to make the towers easily visible to local aircraft and would thus increase visibility from all approaches, especially at night and inclement weather.

The proposed project would reduce overall diesel fuel consumption and decrease air emissions associated with the consumption of diesel fuel. The two wind turbines could produce 1 megawatt (MW) of power under favorable winds, which would decrease diesel fuel consumption by an estimated 130,000 gallons/year under normal operating conditions. The EPA estimates that one gallon of diesel can produce 22.2 lbs of CO_2; hence about 1,443 tons of greenhouse gas emissions per year will be avoided if the proposed project is implemented.

ESA-listed Species

According to the Consultation Guide for Alaska's Threatened and Endangered Species (USFWS 2004), there are currently three listed species under the jurisdiction of the USFWS that occur in the Sand Point area.

Steller's eider (*Polysticta stelleri*) (Alaska breeding population) is currently listed as threatened under the ESA. They are highly dependant on nearshore marine waters, especially those with eelgrass beds that provide an essential food base for Steller's eider and other species (USFWS 2009). The Consultation Guide for Alaska's Threatened and Endangered Species (USFWS 2004) states that Sand Point is located in a molting and wintering range for Steller's eider and that more than 1,000 eiders may winter in the marine waters surrounding Popof Island in any given year. Sand Point is not in designated critical habitat for Steller's eider, although the Nelson Lagoon critical habitat area is located approximately 50 miles from Sand Point on the north side of the Alaska Peninsula (USFWS 2004).

The short-tailed albatross (*Phoebastria albatrus*), is listed as endangered under the ESA. Although they have been seen along the Gulf of Alaska shelf south of Popof Island, this is a highly pelagic species that occurs almost exclusively in open waters well away from the coast (USFWS 2004).

The southwest stock of northern sea otter (*Enhydra lutris kenyoni*), is listed as threatened under the ESA. The USFWS has proposed critical habitat for this population in nearshore waters, including Humboldt Harbor adjacent to Sand Point (USFWS 2008). The USFWS will review public and other agency comments on the proposal before finalizing the critical habitat designation.

Potential Impacts and Proposed Mitigation Measures

The USFWS has issued interim guidelines to minimize wildlife impacts from wind turbines (USFWS 2003). These guidelines discuss several measures that should be taken during the planning stages of a project, including careful consideration of where wind towers would be sited and pre-construction surveys to assess avian use of the proposed development. Both of these recommendations have been implemented for the proposed Sand Point project.

The proposed wind turbine installation site is at an elevation of 164 ft and approximately 1/3 mile from the closest marine waters. There are no bluffs or other nearby land features that would create consistent updrafts that attract soaring species. The setback away from the coast is very important with regard to the two listed bird species in the area, both of which are closely tied to marine habitats and rarely, if ever, fly over land except during the nesting season. Short-tailed albatross nest in Japan. Steller's eider nest in tundra on Alaska's northern coast and the Yukon-Kuskokwim Delta as well as northern Russia (USFWS 2004). It is therefore unlikely that either species would collide with inland/upland structures in Sand Point, including the proposed wind turbines.

In response to public scoping, including recommendations of the USFWS, an avian monitoring program for the proposed site was implemented from 6 December 2006 through 17 August 2007 and from 20 October 2008 to the present. No waterfowl or any other marine bird species have been recorded at the proposed installation site during these observation periods.

The USFWS guidelines also recommend post-construction monitoring to assess actual collision rates. The project proponents in Sand Point, TDX Sand Point Generating (TSPG), have committed to developing and implementing a post-construction monitoring program to determine if there are any inadvertent avian mortalities due to collisions with the wind turbines and, if so, whether there are any discernable patterns to those mortalities (i.e. if they occur at consistent times or weather conditions). The post-construction monitoring program will include regular walking surveys around the towers and surrounding areas to look for carcasses/feathers and signs of scavenging that may mask collision mortalities. Because bird collisions are more likely during periods of limited visibility (e.g. foggy weather or at night), the surveys will be conducted in the morning and/or after periods of inclement weather. Although the frequency of the surveys is still to be determined, they will include a substantial effort during seasonal migration periods and during the fall and winter months when Steller's eiders are in the Sand Point area. If any potential eider collisions are detected during the surveys, TSPG will notify the USFWS immediately and consult on the appropriate level of response.

In regard to the endangered sea otter population, there is no marine component to the project and no mechanism for potential effects on marine habitats. The project would therefore be unlikely to have any effects on any listed marine mammals or their critical habitats.

Conclusions

The proposed project would take place in an area where three ESA-listed species could occur that are under the care of the USFWS. Short-tailed albatross and the southwest stock of northern sea otter are unlikely to be adversely affected by the proposed project. Steller's eiders occur in nearshore waters around Sand Point, especially in fall and winter months, but rarely fly over land except to nest, which they do not do around Sand Point. It is therefore extremely unlikely that Steller's eiders would be adversely affected by the proposed wind turbines at the proposed

inland/upland site. Post-construction monitoring will help determine actual collision rates and the USFWS will be notified if any Steller's eiders are found. The proposed project has no marine components and therefore no mechanism for potential effects on marine habitats of any of these species.

We request your review of the proposed action with respect to ESA compliance and concur with our finding of no adverse affect to listed species. Should you require additional information, please contact me at 907 222-4260 or via email at brucew@apiai.org. I would like to thank you for your time and assistance, and I look forward to return reply and working with you on this project.

Sincerely,

Bruce Wright
Aleutian Pribilof Island Association, Inc

cc: James Jensen, Alaska Energy Authority
Steve Blazek, U.S.Department of Energy
Jennifer Zabel, U.S. Department of Energy

Attachments – Figure 1. Location of Proposed Wind Turbines in Sand Point, Alaska.
Figure 2. Visual Simulation of Vestas 39 Wind Turbines, Sand Point, Alaska.

References Cited

United States Fish and Wildlife Service (USFWS), 2004. Alaska's Threatened and Endangered Species. Anchorage Fish and Wildlife Field Office, Anchorage, Alaska. 63 pp. Available online: http://alaska.fws.gov/fisheries/endangered/consultation_guide.htm

USFWS, 2003. Interim guidelines to avoid and minimize wildlife impacts from wind turbines. Memorandum to the USFWS regional directors from the Deputy Director, 13 May 2003. Available online at: http://www.fws.gov/habitatconservation/Service%20Interim%20Guidelines.pdf

USFWS, 2008. Federal Register, Dec. 16, 2008. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Southwest Alaska Distinct Population Segment of the Northern Sea Otter (Enhydra lutris kenyoni); Proposed Rule. 73 FR 76453-76469.

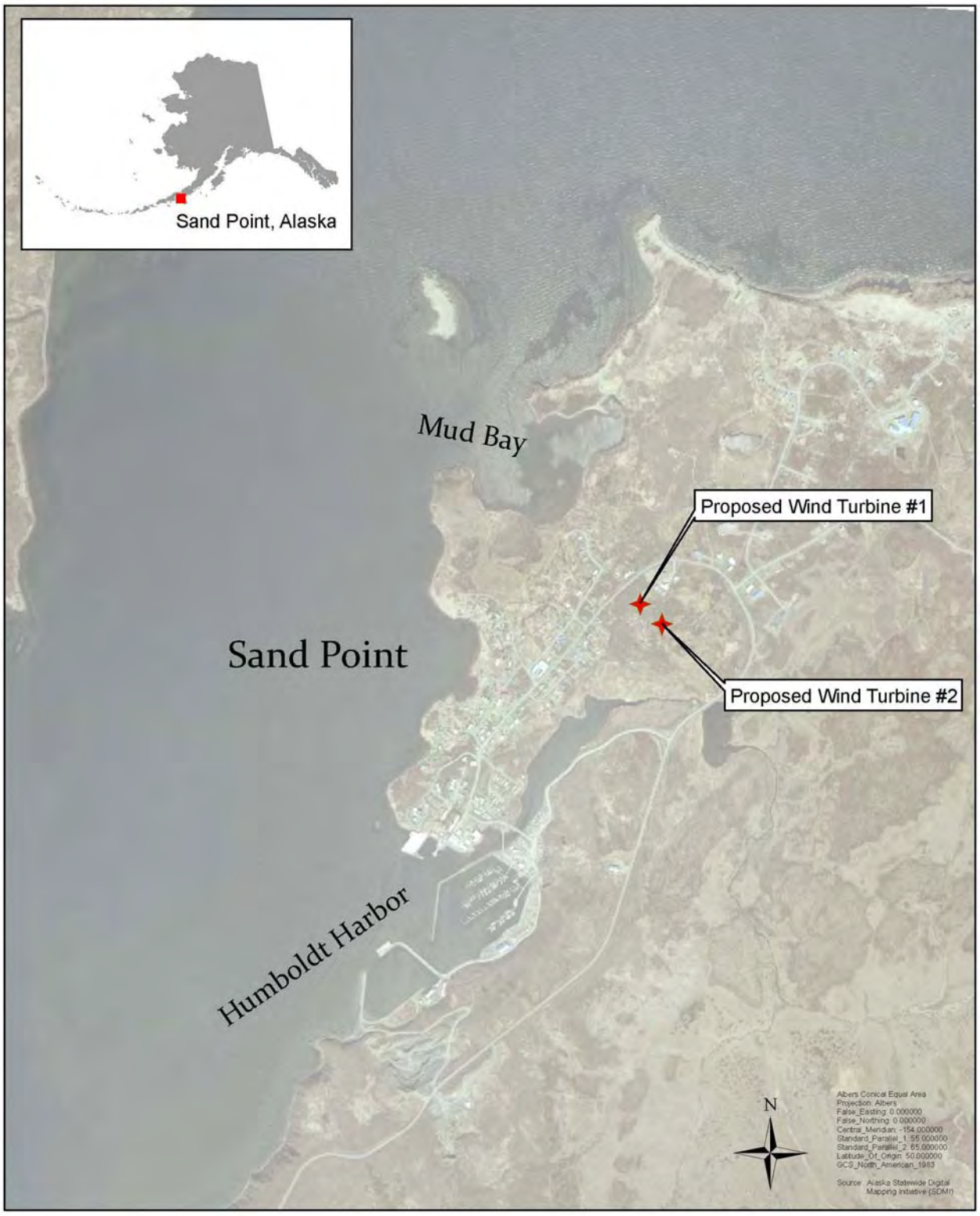
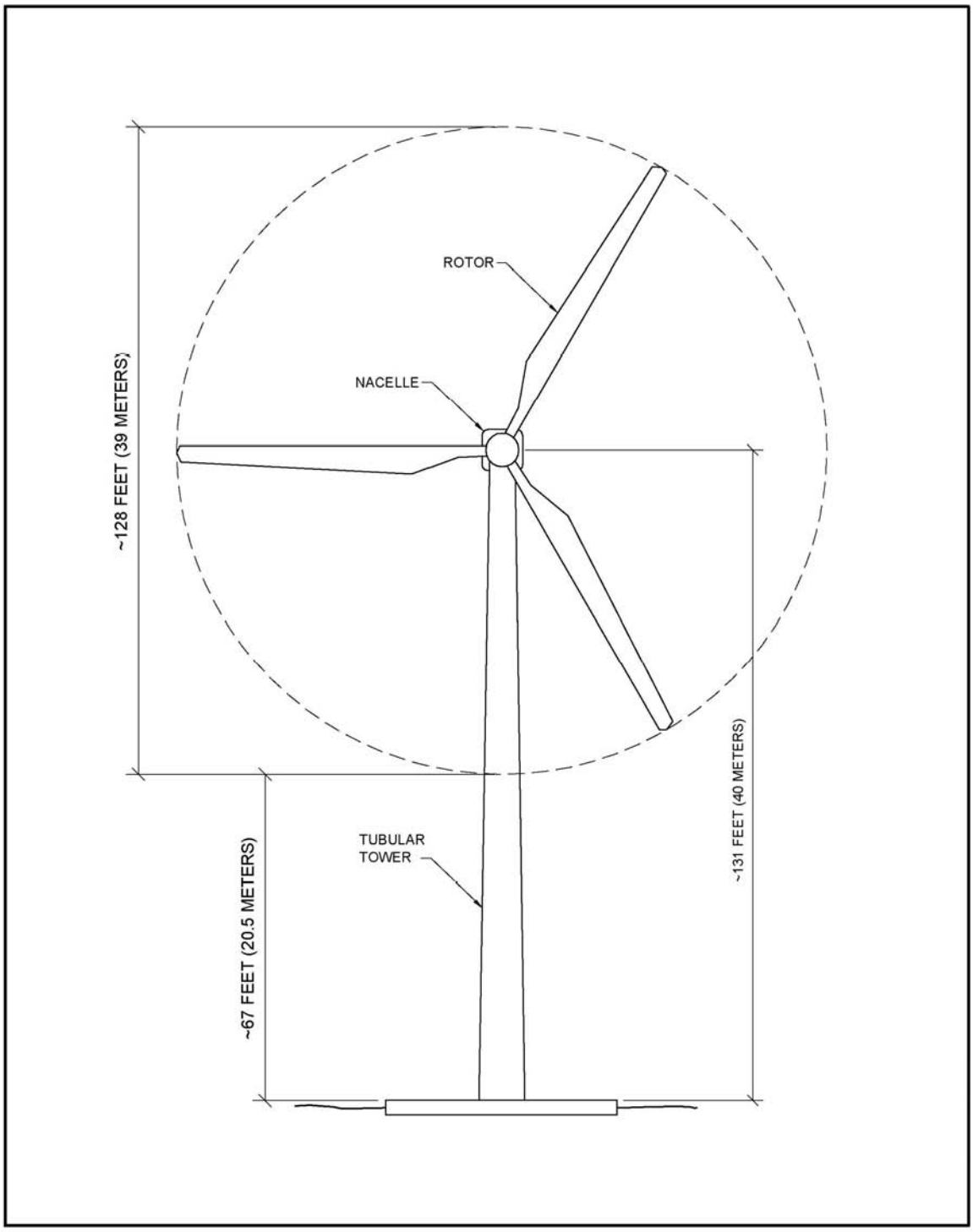


Figure 1. Location of project area and proposed wind turbine sites in Sand Point, Alaska. Figure 2. Schematic of a wind turbine of similar size to the proposed Vestas 39.



United States Department of the Interior

FISH AND WILDLIFE SERVICE Anchorage Fish and Wildlife
Field Office 605 West 4th Avenue, Room G-61 Anchorage, Alaska
99501-2249

in reply refer to AFWFO

March 11,

2009 Bruce Wright Aleutian Pribilof Island Association, Inc. 1131 E. International Airport Road Anchorage, Alaska 99518-1408

Re: Sand Point Wind Energy Project (*Consultation number 2009-0057*)

Dear Mr. Wright,

On March 2, 2009, we received your letter requesting informal Section 7 consultation on the proposed Sand Point Wind Energy Project in Sand Point, Alaska. The US Department of Energy (DOE) has provided funding to the Alaska Energy Authority (AEA) Alaska Wind Energy Project. AEA proposes to provide funding received from DOE to Aleutian Wind Energy, LLC (AWE) to support the installation of a wind power generation system. The proposed system is two 500 kW Vestas V39 wind turbines located at the existing TDX Power generation facility in Sand Point, 164 feet above sea level and approximately 1/3 mile from marine waters.

As stated in your biological evaluation, North American breeding Steller's eiders (*Polysticta stelleri*), listed as threatened in 1997, are found in the action area. Sand Point is located in a molting and wintering range for Steller's eiders and more than 1,000 may winter in the marine waters surrounding Popof Island in any given year. Sand Point is not in designated critical habitat, but critical habitat at Nelson Lagoon is located 50 miles from Sand Point on the north side of the Alaska Peninsula. In response to public scoping, including recommendations of the Service, an avian monitoring program for the proposed site was implemented from 12/6/06 to 8/17/07 and 10/20/08 to present. No waterfowl or any other marine bird species have been recorded at the proposed installation site during these observations periods.

Your letter also mentioned northern sea otters (*Enhydra lutris kenyoni*) and short-tailed albatross (*Phoebastria albatrus*). Because proposed critical habitat for sea otters is nearshore maritime waters up to 20 meters deep (11 fathoms, 66 feet), and short-tailed albatross is a highly pelagic species that occurs almost exclusively in open U.S. waters well away from the coast, we expect no adverse effects as a result of this proposed project for either species.

On March 5, 2009, we discussed the project during a conference call with Ellen Lance (USFWS) and David Erikson (URS Corporation). We discussed the post-monitoring program, which will include regular walking surveys around the towers and surrounding areas to look for carcasses/feathers and signs of scavenging that may mask collision mortalities. Also, because

bird collisions are more likely during periods of limited visibility (e.g., foggy weather or at night), the surveys will be conducted in the morning and/or after periods of inclement weather. We understand that the proposed monitoring period is once per week for 3 weeks. We recommended that a scavenging trial is done with specific pathogen free quail and that the survey intervals are appropriate given the removal rates observed during this study. Once the survey interval is determined, you offered that surveys should be done in consecutive days at the beginning to verify trial results.
Mr. Bruce Wright

We also discussed the old decommissioned turbines in the action area that may be used as perch sites. You replied in an email later that day that the old wind towers near the site would likely be dismantled while the large crane is in town for the erection of the new wind towers. Furthermore, you indicated that local residents have expressed a desire to have the old towers removed. We discussed what would happen to the two new turbines that are proposed to be constructed. You also responded later that day via email that the turbines would be used for their operational life and at that time would be reconditioned or repaired to continue operating. When new technology comes along, the older model turbines would be replaced with the new ones.

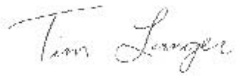
As stated in your letter, if any potential eider collisions are detected during the surveys, TDX Sand Point Generating (TSPG) will notify my office immediately (907-271-2778) and consult on the appropriate level of response. Since you have built measures into your proposed work to avoid the risk of Steller's eiders colliding with turbines, and because of your post-construction monitoring and reporting program, we believe the probability that this action will result in the taking of listed species is discountable. As a result, the Service concurs with your determination that the proposed action is not likely to adversely affect listed species or adversely modify critical habitat. Preparation of a biological assessment or further consultation under section 7 of the ESA is not necessary at this time. In view of this, requirements of section 7 have been satisfied. However, obligations under the ESA must be reconsidered if new information reveals project impacts that may affect listed species or critical habitat in a manner not previously considered, if this action is subsequently modified in a manner which was not considered in this assessment, or if a new species is listed or critical habitat is determined that may be affected by the identified action.

This letter relates only to federally listed or proposed species, and/or designated or proposed critical habitat, under our jurisdiction; namely, the Aleutian shield fern (*Polystichum aleuticum*, listed as endangered in 1988), spectacled eider (*Somateria fischeri,* listed as threatened in 1993), North American breeding Steller's eider (*Polysticta stelleri*, listed as threatened in 1997), the southwest distinct population segment of northern sea otter (*Enhydra lutris kenyoni*, listed as threatened in 2005), short-tailed albatross (*Phoebastria albatrus*, listed as endangered in 2000), polar bear (*Ursus maritimus*, listed as threatened in 2008), and Kittlitz's murrelet (*Brachyramphus brevirostris*, listed as a candidate species in 2005). This letter does not address species under the jurisdiction of the National Marine Fisheries Service, or other legislation or responsibilities under the Fish and Wildlife Coordination Act, Clean Water Act, National Environmental Policy Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, or Bald and Golden Eagle Protection Act.

Thank you for your cooperation in meeting our joint responsibilities under section 7 of the ESA. If you have any questions, please contact me at (907) 271-3063 and refer to consultation

number 2009-0057.

Sincerely,



Tim Langer, Ph.D.
Endangered Species Biologist

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Federal Aviation Administration Correspondence

Federal Aviation Administration
Air Traffic Airspace Branch, ASW-520
2601 Meacham Blvd.
Fort Worth, TX 76137-0520

Aeronautical Study N
2006-AAL-563-OE

Issued Date: 01/25/2007

send to Keith & Laura ✓

Nicholas Goodman
Aleutian Wind Energy, LLC
4300 B Street, #402
Anchorage, AK 99503

**** NOTICE OF PRESUMED HAZARD ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine AWE #1
Location:	Sand Point, AK
Latitude:	55-20-42.84 N NAD 83
Longitude:	160-29-25.34 W
Heights:	120 feet above ground level (AGL)
	280 feet above mean sea level (AMSL)

Initial findings of this study indicated that the structure as described exceeds obstruction standards and/or would have an adverse physical or electromagnetic interference effect upon navigable airspace or air navigation facilities. Pending resolution of the issues described below, the structure is presumed to be a hazard to air navigation.

If the structure were reduced in height so as not to exceed 109 feet above ground level (269 feet above mean sea level), it would not exceed obstruction standards and a favorable determination could subsequently be issued.

To receive a favorable determination at the originally submitted height, further study would be necessary.
Further study entails distribution to the public for comment, and may extend the study period up to 120 days.
The outcome cannot be predicted prior to public circularization.

If you would like the FAA to conduct further study, you must make the request within 60 days from the date of issuance of this letter.

NOTE: PENDING RESOLUTION OF THE ISSUE(S) DESCRIBED ABOVE, THE STRUCTURE IS PRESUMED TO BE A HAZARD TO AIR NAVIGATION. THIS LETTER DOES NOT AUTHORIZE CONSTRUCTION OF THE STRUCTURE EVEN AT A REDUCED HEIGHT. ANY RESOLUTION OF THE ISSUE(S) DESCRIBED ABOVE MUST BE COMMUNICATED TO THE FAA SO THAT A FAVORABLE DETERMINATION CAN SUBSEQUENTLY BE ISSUED.

IF MORE THAN 60 DAYS FROM THE DATE OF THIS LETTER HAS ELAPSED WITHOUT ATTEMPTED RESOLUTION, IT WILL BE NECESSARY FOR YOU TO REACTIVATE THE STUDY BY FILING A NEW FAA FORM 7460-1, NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION.

383-6000

Rob Van-Hastaart
271-5863

If we can be of further assistance, please contact our office at (718)553-2560. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2006-AAL-563-OE.

Signature Control No: 492326-522506 (NP

William Merritt
Specialist

Federal Aviation Administration
Air Traffic Airspace Branch, ASW-520
2601 Meacham Blvd.
Fort Worth, TX 76137-0520

Aeronautical Study No.
2006-AAL-563-OE

Issued Date: 04/12/2007

Nicholas Goodman Aleutian Wind Energy, LLC 4300 B Street, #402 Anchorage, AK 99503

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine AWE #1
Location:	Sand Point, AK
Latitude:	55-20-42.84 N NAD 83
Longitude:	160-29-25.34 W
Heights:	120 feet above ground level (AGL) 280 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe
and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities.
Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a
hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked and/or lighted in accordance with FAA Advisory
circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights
Chapters 4,12&13(Turbines).

It is required that the enclosed FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed
and returned to this office any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part I)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part II)

See attachment for additional condition(s) or information.
This determination expires on 10/12/2008 unless:

(a) extended, revised or terminated by the issuing office.
(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE POSTMARKED OR DELIVERED TO THIS OFFICE AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before May 12, 2007. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted in triplicate to the Manager, Airspace and Rules Division - Room 423, Federal Aviation Administration, 800 Independence Ave., Washington, D.C. 20591.

This determination becomes final on May 22, 2007 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Office of Airspace and Rules via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance

responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

A copy of this determination will be forwarded to the Federal Communications Commission if the structure is subject to their licensing authority.

If we can be of further assistance, please contact William Merritt, at (718)553-2560. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2006-AAL-563-OE.

Signature Control No: 492326-100014847 (DNH) Kevin P. Haggerty Manager, Obstruction Evaluation Service

Attachment(s)
Additional Information Map(s)

7460-2 Attached

Aditional information for ASN 2006-AAL-563-OE

Aeronautical study number 2006-AAL-563-OE

Proposal: To construct a wind turbine to a height of 120 feet above ground level (AGL), 280 feet above mean sea level (AMSL).

Location: The proposed structure would be located 2.14 nautical miles (NM), north of Sand Point Airport (SDP), Sand Point, Alaska.

Federal Aviation Regulation (FAR) Part 77 Obstruction Standards Exceeded:

Section 77.23(a)(5) airport surfaces, by penetrating...

Section 77.25(b) SDP conical surface by 11 feet, a height that exceeds the takeoff or landing area of an airport, as applied to SDP.

Negotiation: Negotiation was attempted with the proponent, but site availability and wind patterns dictated this specific location and height.

Circularized: This aeronautical study was given public notice on February 25, 2007.

Aeronautical Objections Received: None were received.

Aeronautical Study Results:

Sand Point Airport is a publicly owned, public use airport, located 2 miles southwest of Sand Point, Alaska, on the Alaska Peninsula. The airport has a single hard-surfaced runway. Runway 13/31 is 5,213 feet in length and lighted with medium intensity runway lights and Visual Approach Slope Indicator (VASI) lights.

An NDB/DME non precision instrument approach is available to Runway 31. Runway 13 has an NDB, NDB/DME and RNAV(GPS) non precision instrument approach procedure. Special IFR alternate minimums apply on all procedures. Special takeoff minimums are applicable to each runway with a departure procedure for each runway. The six single engine aircraft based at the airport account for 40 percent of the airport's 39 average weekly operations. Air taxi and commuter operations account for slightly for than 40 percent of this total, while transient general aviation account for the remainder.

The wind turbine would not adversely impact any plan on file for Sand Point Airport.

The proposed structure would adversely impact the Sand Point Airport traffic pattern airspace. FAA Handbook 7400.2E, Procedure for Handling Airspace Matters, Chapter 6, paragraph 6-3-8d, state that any structure that would exceed a Part 77 obstruction standard is considered to have an adverse effect on the airport traffic pattern airspace. There would be substantial adverse effect if a significant volume of VFR aeronautical operations were affected. A standard left-hand traffic pattern is flown to Runway 31. A nonstandard right-hand traffic pattern is flown to Runway 13, thus keeping aircraft over water and away from the higher terrain inland and east of

the airport. This proposed structure nearly two nautical miles east of the Runway 13 final approach course is well beyond the dimensions of any Category A, B, C and D type aircraft traffic pattern airspace. When properly obstruction marked and lighted this wind turbine will be able to be seen and avoided. There would not be a substantial adverse effect to VFR operations at Sand Point Airport.

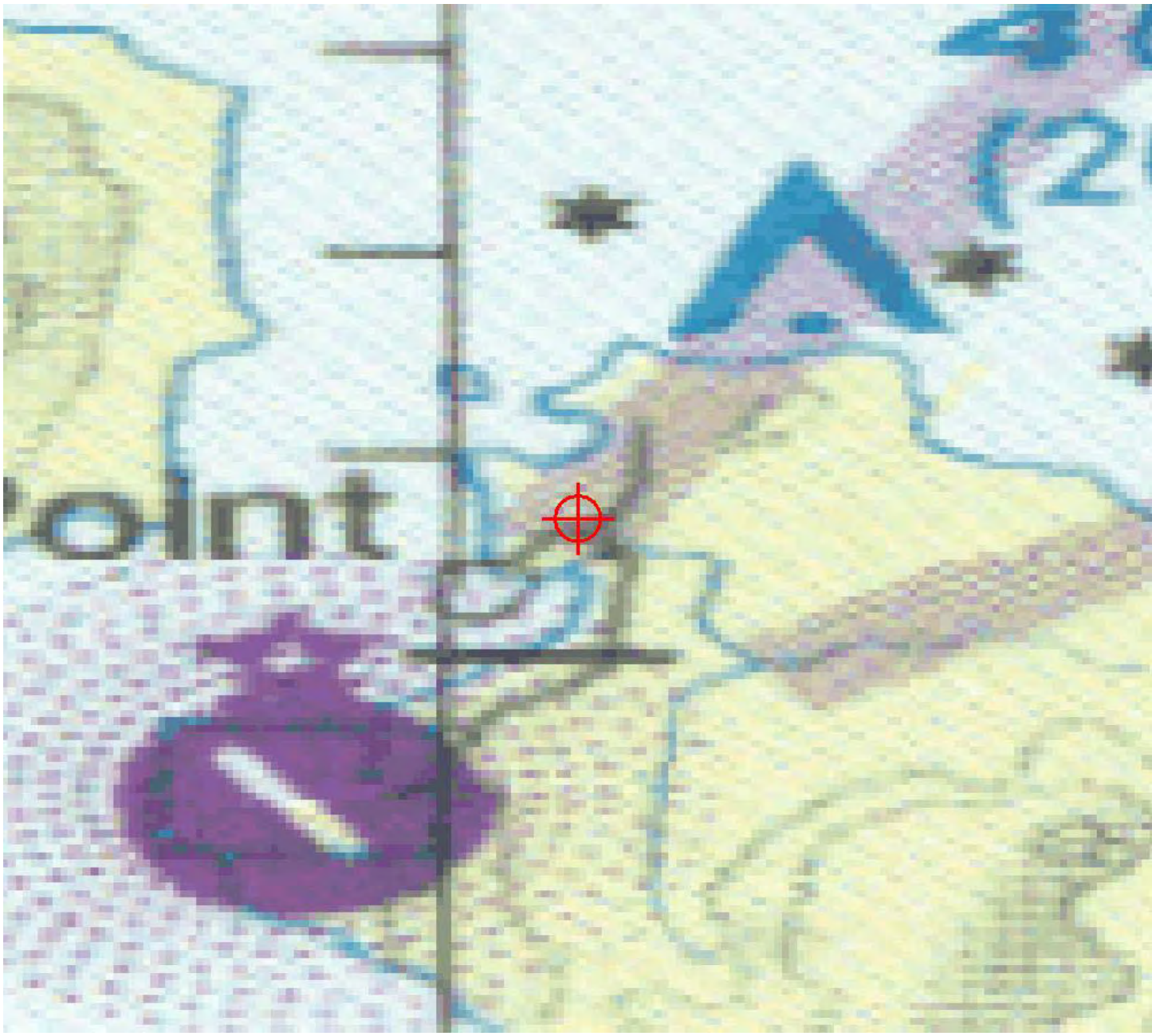
The structure would not adversely impact any present or future VFR or IFR terminal procedure. Runway 31 departures climb via 314 bearing from the Borland (HBT) NDB/DME to 1,800 feet before then making a climbing right turn - well above this proposed wind turbine.

The proposed structure would not impact any VFR or IFR en route procedure.

The structure would not have a cumulative impact on any existing or planned airport.

The structure would exceed obstruction standards and should be obstruction lighted in accordance with FAA AC 70/7460-1K, Change 2, Chapters 4, 12 and 13, white paint/red obstruction light system.

Sectional Map for ASN 2006-AAL-563-OE



Federal Aviation Administration
Air Traffic Airspace Branch, ASW-520
2601 Meacham Blvd.
Fort Worth, TX 76137-0520

Aeronautical Study No.
2006-AAL-563-OE

Issued Date: 10/21/2008

Nicholas Goodman Aleutian Wind Energy, LLC 4300 B Street, #402 Anchorage, AK 99503

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine AWE #1
Location:	Sand Point, AK
Latitude:	55-20-42.84N NAD 83
Longitude:	160-29-25.34W
Heights:	120 feet above ground level (AGL) 280 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition on or before November 20, 2008. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and should be submitted in triplicate to the Manager, Airspace Branch, Federal Aviation Administration, 800 Independence Ave SW, Washington, D.C. 20591.

This extension becomes final on November 30, 2008 unless a petition is timely filed. If so, this extension will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 04/21/2010 unless otherwise extended, revised, or terminated by this office.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this extension will be forwarded to the Federal Communications Commission if the structure is subject to their licensing authority.

Page 1 of 2 If we can be of further assistance, please contact our office at (770) 909-4401. On any future correspondence
concerning this matter, please refer to Aeronautical Study Number 2006-AAL-563-OE.

Signature Control No: 492326-103458448 (EXT) Earl Newalu Specialist

Federal Aviation Administration
Air Traffic Airspace Branch, ASW-520
2601 Meacham Blvd.
Fort Worth, TX 76137-0520

Aeronautical Study No.
2007-AAL-66-OE
Prior Study No.
2006-AAL-564-OE

Issued Date: 05/17/2007

Nicholas Goodman Aleutian Wind Energy, LLC 4300 B Street, #402 Anchorage, AK 99503

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine AWE #2 REVISED
Location:	Sand Point, AK
Latitude:	55-20-38.00 N NAD 83
Longitude:	160-29-21.00 W
Heights:	120 feet above ground level (AGL)
	284 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe
and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities.
Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a
hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked and/or lighted in accordance with FAA Advisory
circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights
Chapters 4,12&13(Turbines).

It is required that the enclosed FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed

and returned to this office any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part I)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part II)

See attachment for additional condition(s) or information.
This determination expires on 11/17/2008 unless:

(a) extended, revised or terminated by the issuing office.
(b) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE POSTMARKED OR DELIVERED TO THIS OFFICE AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before June 16, 2007. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted in triplicate to the Manager, Airspace and Rules Division - Room 423, Federal Aviation Administration, 800 Independence Ave., Washington, D.C. 20591.

This determination becomes final on June 26, 2007 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Office of Airspace and Rules via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use

of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

A copy of this determination will be forwarded to the Federal Communications Commission if the structure is subject to their licensing authority.

If we can be of further assistance, please contact William Merritt, at (718)553-2560. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2007-AAL-66-OE.

Signature Control No: 505775-100527735 (DNH) Kevin P. Haggerty Manager, Obstruction Evaluation Service

Attachment(s)
Additional Information Map(s)

7460-2 Attached

Aditional information for ASN 2007-AAL-66-OE

Aeronautical study number 2007-AAL-66-OE

Proposal: To construct a wind turbine to a height of 120 feet above ground level (AGL), 284 feet above mean sea level (AMSL).

Location: The proposed structure would be located 2.1 nautical miles (NM), north of Sand Point Airport (SDP), Sand Point, Alaska.

Federal Aviation Regulation (FAR) Part 77 Obstruction Standards Exceeded:

Section 77.23(a)(5) airport surfaces, by penetrating...

Section 77.25(b) SDP conical surface by 28 feet, a height that exceeds the takeoff or landing area of an airport, as applied to SDP.

Negotiation: Negotiation was attempted with the proponent, but site availability and wind patterns dictated this specific location and height.

Circularized: This aeronautical study was given public notice on April 5, 2007.

Aeronautical Objections Received: None were received.

Aeronautical Study Results:

Sand Point Airport is a publicly owned, public use airport, located 2 miles southwest of Sand Point, Alaska, on the Alaska Peninsula. The airport has a single hard-surfaced runway. Runway 13/31 is 5,213 feet in length and lighted with medium intensity runway lights and Visual Approach Slope Indicator (VASI) lights.

An NDB/DME non precision instrument approach is available to Runway 31. Runway 13 has an NDB, NDB/DME and RNAV(GPS) non precision instrument approach procedure. Special IFR alternate minimums apply on all procedures. Special takeoff minimums are applicable to each runway with a departure procedure for each runway. The six single engine aircraft based at the airport account for 40 percent of the airport's 39 average weekly operations. Air taxi and commuter operations account for slightly for than 40 percent of this total, while transient general aviation account for the remainder.

The wind turbine would not adversely impact any plan on file for Sand Point Airport.

The proposed structure would adversely impact the Sand Point Airport traffic pattern airspace. FAA Handbook 7400.2E, Procedure for Handling Airspace Matters, Chapter 6, paragraph 6-3-8d, state that any structure that would exceed a Part 77 obstruction standard is considered to have an adverse effect on the airport traffic pattern airspace. There would be substantial adverse effect if a significant volume of VFR aeronautical operations were affected. A standard left-hand traffic pattern is flown to Runway 31. A nonstandard right-hand traffic pattern is flown to Runway 13, thus keeping aircraft over water and away from the higher terrain inland and east of

the airport. This proposed structure nearly two nautical miles east of the Runway 13 final approach course is well beyond the dimensions of any Category A, B, C and D type aircraft traffic pattern airspace. When properly obstruction marked and lighted this wind turbine will be able to be seen and avoided. There would not be a substantial adverse effect to VFR operations at Sand Point Airport.

The structure would not adversely impact any present or future VFR or IFR terminal procedure. Runway 31 departures climb via 314 bearing from the Borland (HBT) NDB/DME to 1,800 feet before then making a climbing right turn -well above this proposed wind turbine.

The proposed structure would not impact any VFR or IFR en route procedure.

The structure would not have a cumulative impact on any existing or planned airport.

The structure would exceed obstruction standards and should be obstruction lighted in accordance with FAA AC 70/7460-1K, Change 2, Chapters 4, 12 and 13, white paint/red obstruction light system.

Sectional Map for ASN 2007-AAL-66-OE

Federal Aviation Administration
Air Traffic Airspace Branch, ASW-520
2601 Meacham Blvd.
Fort Worth, TX 76137-0520

Aeronautical Study No.
2007-AAL-66-OE
Prior Study No.
2006-AAL-564-OE

Issued Date: 10/21/2008

Nicholas Goodman Aleutian Wind Energy, LLC 4300 B Street, #402 Anchorage, AK 99503

**** Extension ****

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Wind Turbine AWE #2 REVISED
Location:	Sand Point, AK
Latitude:	55-20-38.00N NAD 83
Longitude:	160-29-21.00W
Heights:	120 feet above ground level (AGL)
	284 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

This extension is subject to review if an interested party files a petition on or before November 20, 2008. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and should be submitted in triplicate to the Manager, Airspace Branch, Federal Aviation Administration, 800 Independence Ave SW, Washington, D.C. 20591.

This extension becomes final on November 30, 2008 unless a petition is timely filed. If so, this extension will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 04/21/2010 unless otherwise extended, revised, or terminated by this office.

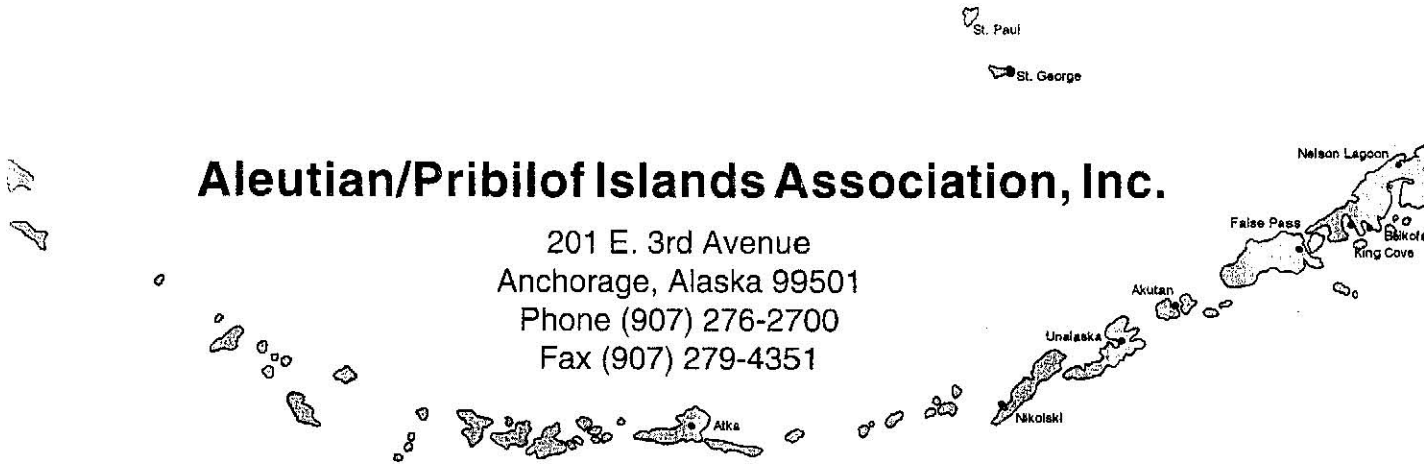
This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this extension will be forwarded to the Federal Communications Commission if the structure is subject to their licensing authority.

Page 1 of 2 If we can be of further assistance, please contact our office at (770) 909-4401. On any future correspondence
concerning this matter, please refer to Aeronautical Study Number 2007-AAL-66-OE.

Signature Control No: 505775-103458386 (EXT) Earl Newalu Specialist

State Historic Preservation Office (SHPO) Correspondence



Aleutian/Pribilof Islands Association, Inc.

201 E. 3rd Avenue
Anchorage, Alaska 99501
Phone (907) 276-2700
Fax (907) 279-4351

Ms. Judith E. Bittner
State Historical Preservation Office
Alaska Division of Parks and Outdoor Recreation
550 W. 7th Avenue, Suite 1310
Anchorage, AK 99501-3565

September 14, 2006

Dear Ms. Bittner:

The Aleutian Pribilof Islands Association (APIA), the non-profit organization serving the thirteen tribes of the Aleutian a Pribilof Islands region. We are presently assisting the electric utilities in four (4) communities with projects to integrate wi energy with diesel power plants, significantly reducing the need for diesel fuel. One of our duties is to obtain t environmental assessment documentation required prior to developing the projects.

Sand Point's Electric Utility has been partially funded by the Alaska Energy Authority through a grant from the USDOE install (2) 500 kW wind turbines in the summer of 2007. USDOE requires proof of SHPO approval before the funds can released. This is our most pressing concern.

St. George has completed the study phase and is searching for funds to install (2) 225 kW wind turbines and a new die power plant at the same location.

False Pass and King Cove are nearly complete with the feasibility studies and will soon decide on whether to pursue wi energy based on the results of these studies.

I visited the State Historical Preservation Office in Anchorage on September 12th to confer with Joan Dale, who was or again very helpful. After going over many maps Ms. Dale determined that there are no areas of potential effect on histori sites at any of the proposed locations in the four communities.

In optimistic anticipation that we will obtain funding to move forward with all of these projects, may we get a letter from yo office stating your approval for all of these sites?

Enclosed is a copy of the AHRS User Agreement signed by Ms. Dale on March 9 of this year when we looked at t community of Nikolski. Also enclosed are maps of the proposed locations in Sand Point, St. George, False Pass and Ki Cove.

Thank you,

Connie Fredenberg

Connie Fredenberg

AHRS USER AGREEMENT

Office of History and Archaeology
Division of Parks and Outdoor Recreation
Department of Natural Resources
State of Alaska

Statement of Policy: Access to historic, prehistoric, and paleontological site location information contained in the Alaska Heritage Resources Survey is closed to the general public AS 40.25.120(a)(4) (Alaska State Parks Policy and Procedure 50200). Authorized users are representatives of federal, state, or local governments on official business; researchers engaged in legitimate scientific research; individuals or representatives of organizations conducting cultural resource surveys aimed at protection of such information or sites; or such individuals determined by the Chief of the office maintaining the Alaska Heritage Resources Survey as having a legitimate need for access. Users requiring use of large blocks of data will be asked to obtain permission of large area land owners or managers for to receive data from their land.

The undersigned agrees to abide by the following conditions in order to obtain all or a portion of the site listings of the Alaska Heritage Resources Survey. Access to and distribution of site locational information will be limited to the applicant's use in legitimate scientific research or governmental planning, will be held in a secure place, and will not be redistributed to others.

User Name: Connie Fredenberg

Affiliation: APIA / Nikolski Project - Wind Turbine

Address: 201 E 3rd Ave.
Anchorage, AK 99501

Signature: Connie Fredenberg Date: 3-9-06

OFFICE OF HISTORY AND ARCHAEOLOGY

[X] Approved [ ] Disapproved Date: 3/9/2006

Signature: Rachel Dan Dale

Ø - APE

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- (•) Large

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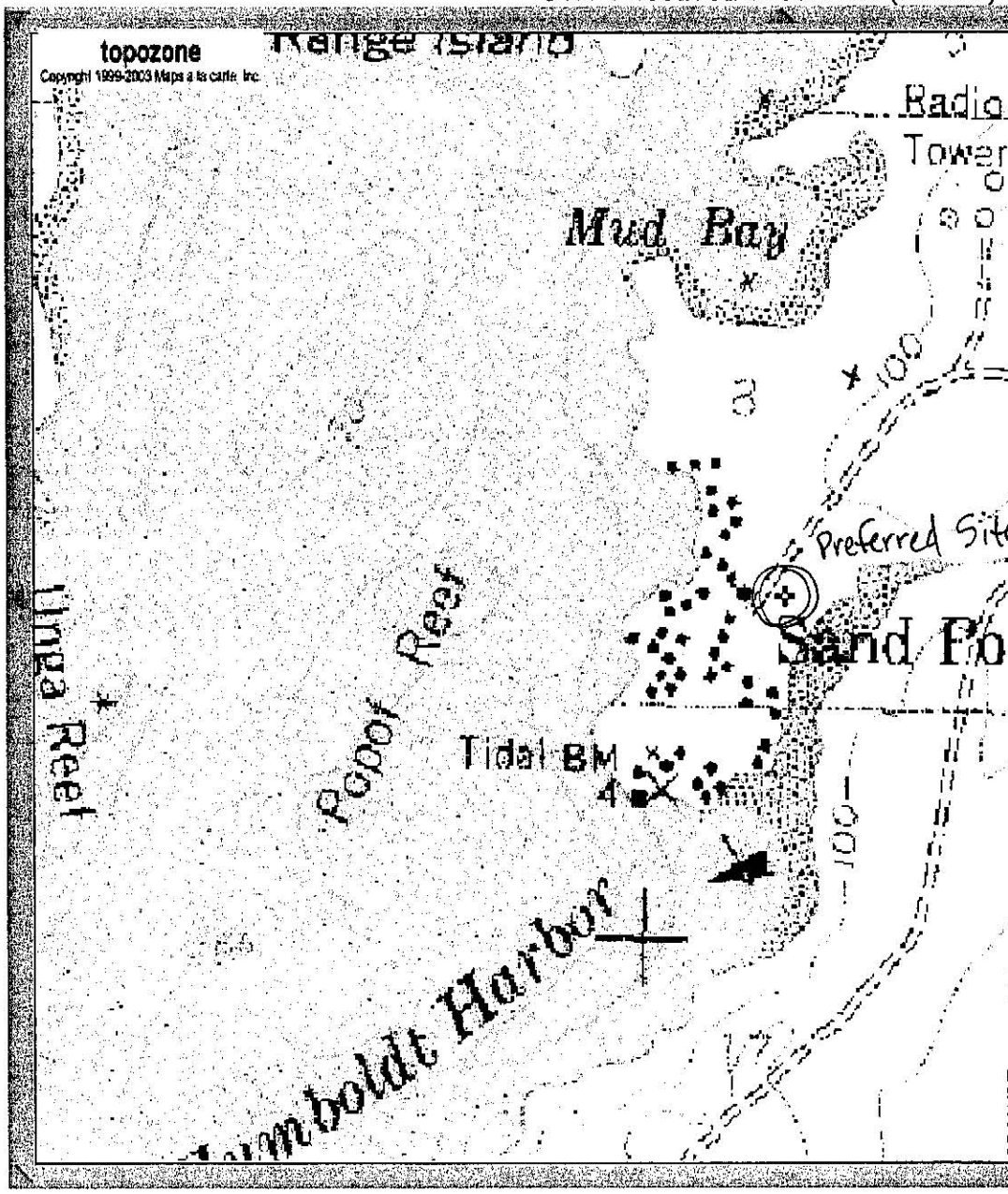

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FALSE PASS

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- 1:63K (AK) Topo Maps
- 1:250K Topo Maps
- (•) Automatic selection

Map Size

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- Medium
- (•) Large

View Scale

1 : 50,000

Coordinate Format

UTM

Map Datum

NAD27

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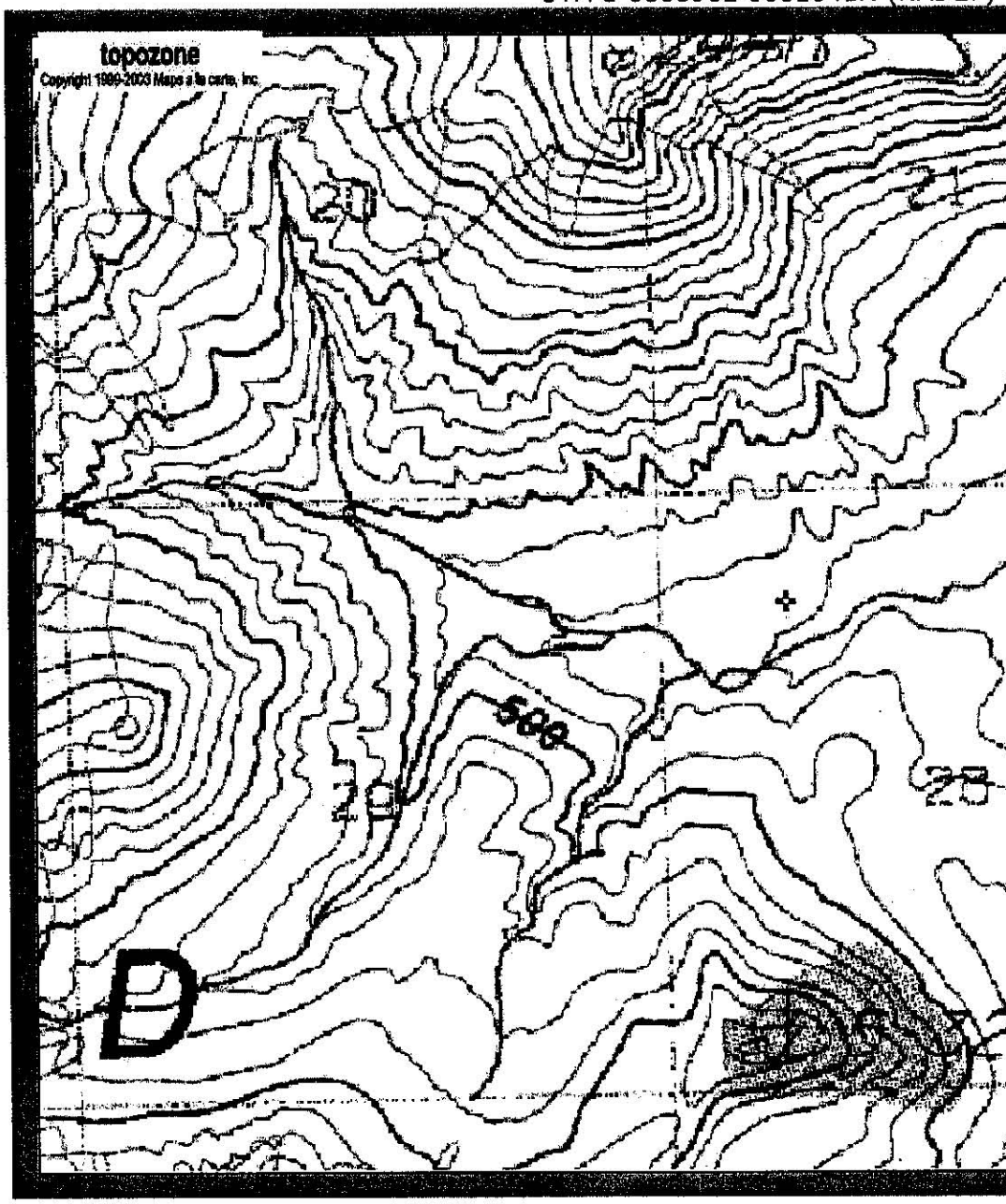

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FRANK H. MURKOWSKI, GO

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF PARKS AND OUTDOOR RECREATION
OFFICE OF HISTORY AND ARCHAEOLOGY

550 W 7th Ave, SUITE 1310
ANCHORAGE, ALASKA 99501-35
PHONE: (907) 269-8721
FAX: (907) 269-8908

September 27, 2006

File No. 3130-1R Dept. of Energy
3130-2R AEA

SUBJECT: Installation of Wind Turbines, Sand Point
St. George, False Pass and King Cove Wind Turbines, Scoping

Connie Fredenberg
Alternative Energy Coordinator
Aleutian/Pribilof Islands Association, Inc.
201 E. 3rd Ave.
Anchorage, AK 99501

Dear Ms. Fredenberg,

We have reviewed the proposed installation of two wind turbines in Sand Point, Alaska for potential impacts to historic and archaeological resources under Section 106 of the National Historic Preservation Act. According to the Alaska Historic Resources Survey database, there are no reported archaeological sites within the "preferred site" project area that was defined in your letter of 9/27/06. Therefore, the State Historic Preservation Office concurs with your finding of no historic properties affected for the Sand Point project.

The above referenced letter also contains scoping information for installation of wind turbines in St. George, False Pass and King Cove. Once a definite scope-of-work, location, and funding source has been determined, each project should then be resubmitted to our office. For future Section 106 submittals, please include the federal agency contact information.

Please contact Margie Goatley at 269-8722 if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner
State Historic Preservation Officer

JEB:mmg

Department of the Air Force
Correspondence

DEPARTMENT OF THE AIR FORCE
AIR FORCE CENTER FOR ENVIRONMENTAL EXCELLENCE
REGIONAL ENVIRONMENTAL OFFICE, WESTERN REGION
50 FREEMONT, SUITE 2450
SAN FRANCISCO, CALIFORNIA 94105-2196

9 February 2007

Martina Dabo
Alaska Energy Authority
813 West Northern Lights Blvd.
Anchorage, AK 99503

Dear Ms Dabo;

The Department of the Air Force has coordinated a review of the proposed installation of a 500 kW wind turbine in the community of Sand Point, Alaska (55-20-42.84N, 160-29-25.34W, 160ASL). As a part of the review we have consulted with the Department of Defense Long Range Radar Program Office, Air Space Managers stationed at Elmendorf Air Force Base who conducted a review in association with the Pacific Air Force Major Command, and the Department of the Navy.

Based upon the received replies, the Western Regional Environmental Office in consultation with the Air Force's Headquarters Range and Air Space Division concludes that the proposed installation will have no impact on military training conducted by the Department of Defense components. We have received early indications of negligible impacts to long range radar, however in the absence of receipt of a final response we suggest you contact Mr. Kenneth Kingsmore at the DoD/DHS Joint Program Office at kingsmkh@langley.af.mil or 757-764-4392 to confirm.

This determination is limited to an assessment of the project for possible impacts on military training. Your agency may have other obligations for compliance with other local, state, or federal agency requirements, including but not limited to the Federal Aviation Administration.

Thank you for the opportunity to review and comment on this project proposal. If you have any questions concerning these comments, please contact Mr. Gary Munsterman, Planning Coordinator, at 415-977-8884 or gary.munsterman@brooks.af.mil.

Sincerely

CLARE R. MENDELSOHN
DoD Regional Environmental Coordinator,
Region 10

APPENDIX E

BIRD AND BAT MONITORING STUDIES

Appendix E

Avian and Bat Monitoring Studies and Proposed Mitigation Sand Point Wind Installation Project

Pre-Construction Monitoring

Survey Protocols

A pre-construction avian monitoring program was conducted from December 6, 2006 through August 17, 2007 and again from October 20, 2008 through March 25, 2009. The purpose of this study was to collect baseline data on the level of bird use in the area and to determine if the site was an appropriate area for siting wind turbines. The avian monitoring program employed several residents familiar with local bird species to make observations at or near the proposed wind turbine sites using the following general protocol. Emphasis was placed on observations of bald eagles since they have special status under the Bald and Golden Eagle Protection Act (16 U.S.C 668, as amended).

(1) Observations were made weekly if possible throughout the year; include spring and fall migration periods, and at different times of day. The observer recorded the date, time of observations, observer's name, weather conditions, and visibility.

(2) The site was approached in a vehicle and stopped about 100 meters (m) from the guyed meteorological (met) tower; the observer spent 30 minutes in vehicle and record any birds, predators, or scavengers seen. Data on animals was collected to determine the scavenging of carcasses of birds killed by the tower.

(3) All birds sighting were recorded during the observation period(s), including numbers, approximate flight altitudes, and flight behaviors in relation to the met tower and proposed wind turbine site.

(4) After the ½-hour observation period was finished, and the observer exited the auto and walked the area under the MET tower (proposed location of Turbine 1) up to 50 m (150 feet) from MET tower or as permitted by thick vegetation to search for dead birds and evidence of scavenging; noting any tracks in the snow or dirt, including snowshoe hare, dog tracks, and any other signs of predators (e.g., scat). Bird observations were also recorded as outlined above.

(5) All observations of dead or downed birds would have been recorded and their location recorded on an area map. Photographs of the dead bird(s) would have been taken to help determine the cause of death, and the location would have been revisited daily to determine when/if it was scavenged.

Results

Pre-construction monitoring will continue until the wind turbines are erected. Results will be regularly sent to the U.S. Fish and Wildlife Service (USFWS). Table 1 tabulates the numbers of different species recorded for all observation periods. A summary of results by season is presented in Table 2.

Table 1. Observation data from the pre-construction avian monitoring program.

Date	Bald eagle	Black-billed magpie	Common raven	Northwestern crow	Gull spp.	Passerine spp.
12/6/2006	3		6			
2/26/2007		2				
3/28/2007	1	1				
3/28/2007	1					
5/15/2007	2					
5/15/2007	2	1	2			
5/16/2007						
5/17/2007	1					
5/24/2007						
5/24/2007		3			2	
5/29/2007						
5/29/2007	1					
5/29/2007	2					
7/17/2007						2
7/18/2007	1					
7/18/2007	2					
7/18/2007	1	1			1	2
7/20/2007						
7/23/2007						1
7/24/2007	2					
7/30/2007		2				3
8/2/2007	1					
8/3/2007						
8/6/2007						
8/8/2007						
8/10/2007	3					
8/14/2007	1					
8/15/2007		2				
8/17/2007						

Date	Bald eagle	Black-billed magpie	Common raven	Northwestern crow	Gull spp.	Passerine spp.
Break in observations						
10/20/2008						
10/27/2008		4	1			6
11/4/2008		1		1		
11/12/2008		2		1		
11/18/2008	1			7		
11/26/2008	1					
12/5/2008						
12/12/2008	1	2				
12/16/2008						
12/24/2008	1					
12/31/2008		1		8		
1/9/2009				3		
1/16/2009				1		
1/22/2009						
2/6/2009		1				
2/13/2009		1		1		
2/19/2009	3	1				
2/27/2009	7	1		2		
3/6/2009	1					
3/20/2009	1			1		
3/25/2009	2	1		2		2

Note: Multiple records for the same day indicate observations were made at different times of day. Cells with no numbers are 0 by default.

Table 2. Summary of pre-construction bird observations[1] from the proposed wind turbine sites by season.[2]

Species	Winter (n=23)	Spring (n=9)	Summer (n=8)	Fall (n=10)

Bald eagle	1.48	0.89	0.75	0.50
Black-billed magpie	0.70	0.44	0.38	0.60
Common raven	0.26	0.22	0	0.10
Northwest crow	1.17	0	0	0
Passerine spp.	0.09	0	1.00	0.60
Gull spp.	0	0.22	0.13	0

Note: Data are mean numbers of birds seen per observation period during each season

[1] This table includes all observations up to March 25, 2009 [2] Winter = November through March, Spring = April through May, Summer = June and July, Fall = August through October n = number of observation periods

Proposed Mitigation

The USFWS has published interim guidelines for wind power projects to minimize the potential risks of bird fatalities due to collisions (USFWS 2003). Many of these guidelines pertain to siting considerations and are more pertinent to much larger projects. However, the following recommendations will be implemented:

Anti-perching devices will be placed on each turbine nacelle (if necessary) to discourage perching or nesting on the turbines, which would greatly increase the potential for bird collisions.

Anti-perching devices will be installed on electric poles in adjacent areas to discourage perching and reduce the potential for electrocution, especially for bald eagles.

The turbine towers will not have external ladders or other structures that would allow birds to perch anywhere near the turbine blades.

AWE/TDX will remove the old Harry Foster towers at the time of construction, thus removing one of the most well-used perches for bald eagles and other resident birds in the area.

The turbine towers will be self-supporting monopoles.

Electric transmission lines from the wind turbines to the TDX power plant will be buried below ground.

Lighting on the turbine towers will be limited to what is necessary for aviation safety, as determined by the FAA.

A post-construction monitoring plan will be implemented for one year to determine if any birds are killed by collisions with the turbines.

Post-Construction Monitoring

The post-construction monitoring plan was developed to document avian and bat mortality related to the operation of the two wind turbines. Because birds are protected under the Migratory Bird Treaty Act (16 U.S.C 703-712) post-construction studies will be conducted to quantify the number and types of birds (or bats) killed by the two wind turbines. If fatality rates from the wind turbines are greater than anticipated, or if high number of fatalities occur under conditions such as fog, heavy rain, high winds, or during specific season, these data can be used to modify operation of the wind turbines to reduce incidence of collisions. This information will capture an example of collision-mortality rates of wind turbines in a northern coastal environment, such as Sand Point.

Schedule

Post-construction monitoring will be initiated following installation and testing of the wind turbines when they are under normal operation. Aleutian Wind Energy, LLC (AWE) and TDX Power (TDX), the proponents of the Sand Point Wind project, will retain a professional Avian Contractor to oversee the implementation of the Post-Construction Monitoring Plan (Plan) and will hire and train local observers to conduct the field work. This Plan will sample for potential seasonal variations in bird collisions, with an emphasis on the fall and spring migration seasons when bird activity is expected to be highest. Surveys will be conducted two times per week for three consecutive weeks during the spring and fall sampling periods, and one time per week for four consecutive weeks during winter and summer sampling periods. Post-construction monitoring will be conducted for one calendar year.

Observation and Survey Protocols

Observation will be conducted by trained observers and the observer name, date, time, and standard weather variables will be recorded. Observations will be a minimum of one hour duration from a blind. An automobile may be used. Following the observation period, a bird strike and predator/scavenger survey will be conducted. Each survey will include a search for dead or injured birds (or bats) beneath each turbine tower. The surveys will be conducted on foot by slowly walking transect lines approximately 25 to 30 feet apart, and looking about 12 to 15 feet on both sides of the transect line. Each set of transects will cover a search area defined as one-half of the maximal height of the rotor-swept area (California Energy Commission and California Department of Fish and Game [CEC/CDFG] 2007) or a radius of about 100 feet around each tower. The tower height is about 130 feet above ground level (agl) and the turbine blades are about 130 feet in diameter, thus putting the upper reach of the turbine blades at 195 feet agl. This search pattern is estimated to take about 40 minutes to complete for each tower. Searches will be conducted at a frequency that minimizes the potential for bias from carcasses lost to scavengers.

Standard data collected during each survey will include:

Survey date
Weather during observation and the previous 24 hours
Observer name
Start and stop times
Turbine number and activity (turbine speed, direction of hub)
Search area conditions (i.e. ice, snow, bare ground, green vegetation)

If any bird or bat carcass is found, the following data will be collected.

Position relative to the wind tower, including distance, and location on the sample grid
Species (if identifiable), condition of the carcass, injury type, and evidence of scavenging
Cause of death (i.e. killed by the turbine) and evidence of cause of death
Approximate length of time the carcass has been there (i.e. days, weeks, months)

Carcasses will be collected, labeled, bagged, and placed in a freezer for later analysis. Some of the carcasses each season will be left in place to determine how long the carcass remains and to ascertain the scavenging rate, which would then be applied to the overall mortality rate. No carcasses will be brought in (i.e frozen feeder quail) to conduct the scavenging study as this may promote scavenger habituation and potential for additional bird strikes.

If a carcass of protected species, such as a bald eagle or Steller's eider is found, a call will be made to the USFWS in Anchorage within one business day to report the incident.

AWE/TDX will establish a file on site for all of the raw data sheets from searches and scavenging studies. Data sheets will be sent monthly to the Avian Contractor.

Spring

Spring migration sampling is an important time period for collision studies because birds are migrating from wintering areas to nesting grounds and bird numbers are more concentrated than at other times of the year. The spring sampling period will consist of six surveys during the main migration season (approximately April 15 to May 31).

Summer

During the breeding season, birds are generally oriented to the specific breeding areas. Local breeders move between feeding areas and nest sites. Young inexperienced birds are leaving the nest and are thought to be more susceptible to collisions than adults. The summer sampling period will consist of four surveys during the main breeding season (approximately June 1 to August 10).

Fall

Fall migration is generally more protracted in time than spring migrations because of the migration timing of the different species in this region of Alaska. Shorebirds and songbirds tend to migrate earlier than waterfowl and seabirds. Fall migration typically has higher numbers of migrants due to the addition of young-of-the-year to the population. The fall sampling period will consist of six surveys during the main migration season (approximately August 11 to October 10).

Winter

The winter season represent the period of lowest bird activity for species and numbers. The winter sampling period will consist of four surveys during the non-breeding season (approximately October 11 to April 14).

Reporting

The Avian Contractor will submit a letter report at the end of each seasonal sampling effort. This report will present the survey data and the sample effort for that period including the species and number of carcasses found and disposition of the samples.

At the end of the last seasonal survey event, a summary report will be developed reporting on all survey effort. This report will be submitted to AWE/TDX for review and comment. The final report will be sent to the Department of Energy (DOE) and USFWS for review and comment on the draft report. Comments responses will be formulated, and a final report submitted to DOE and USFWS.

Mitigation

If bird mortality from collisions with the wind turbines is greater than the highest recorded mortality rate for wind farms, 4.45 birds per turbine per year (BLM 2005). Mitigation measures would be implemented to try and reduce the mortality rate. Some possible mitigation measure would include:

Clearing brush or planting additional vegetation (such as grasses) around the towers, which every is appropriate to discourage bird use of the immediate area

Changing the turbine lighting with FAA approval to make them less of an attractant

Adding white strobe light to make the towers more visible under low light conditions and during adverse weather.

Feathering the rotors to slow the turbine speed during critical periods

Idling the turbines during certain specific critical time periods demonstrated to have high collision rate

Idling the turbines during seasonal periods such as spring migrations if major mortality events are documented

Mitigation measures will depends on the results of the mortality study, the species most affected, the season, and the site specific weather conditions contributing to mortality. Coordination with the USFWS and DOE will be initiated prior to implementing any mitigation measure.

Mitigation measures will be sequential with the most severe (feathering and idling) being used as a last resort. If migration measures are implemented, additional mortality monitoring will need to be conducted to determine if the measures are effective in lowering the mortality rate.

References

Bureau of Land Management. 2005. Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States. Prepared by Argonne National Laboratory for BLM, Washington, D.C..

CEC/CDFG (California Energy Commission and California Department of Fish and Game). 2007. California guidelines for reducing impacts to birds and bats from wind energy development. California Energy Commission and California Department of Fish and Game, Report No. CEC-700-2007-08-CTF. 125 pp.

USFWS, 2003. Interim guidelines to avoid and minimize wildlife impacts from wind turbines. Memorandum to the USFWS regional directors from the Deputy Director, 13 May 2003. Available online at: http://www.fws.gov/habitatconservation/Service%20Interim%20Guidelines.pdf

APPENDIX F

VISUAL AND SOUND REPORT

Photo Simulations and Sound Impact Analysis for Sand Point Wind Power Project

APIA1-001

CONFIDENTIAL

November 30, 2006

Prepared for:

Aleutian/Pribilof Islands Association
201 East 3rd Avenue
Anchorage, AK 99501

Approvals

Mia Devine November 30, 2006 Prepared by Mia Devine Date

Kevin J. Smith November 30, 2006 Reviewed by Kevin J. Smith Date

Revision Block

Revision	Release Date	Summary of Changes
Original	November 30, 2006	

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Introduction

The Aleutian/Pribilof Islands Association (APIA) contracted with Global Energy Concepts, LLC (GEC) to create photo simulations and perform a sound impact analysis for the proposed Sand Point wind power project located in the East Aleutian Borough of Alaska. The proposed wind power project consists of two Vestas V39 500 kW wind turbines that will be installed on 40-m tubular towers. This report presents five photo simulations and findings from the sound impact analysis.

The findings of the sound impact analysis indicate that the wind turbines will produce sound levels of no more than 60 decibels on the A-weighed scale (dBA) at the project boundaries. The study also evaluated expected changes in sound level at nearby locations, and concluded that at these locations the change to the background sound levels would be minimal.

Photo Simulations

The proposed wind turbine coordinates, photographs, and GPS coordinates of various reference points throughout Sand Point were provided by TDX Power and were used to create photo simulations of the proposed wind farm from various vantage points throughout the community. GEC has not visited the site.

WindFarm Version 4.0.2.3 software by ReSoft Ltd. was used to create all photo simulations. The following information was taken into account when creating the photo simulations:

Wind direction data from the meteorological tower in Sand Point indicate two primary wind directions: north-northwest and south-southwest. Therefore, the wind turbines in each photo are oriented to the north-northwest.

The angle of rotation of the blades for each turbine is random (i.e., the tips of the blades of all turbines are not pointed straight up at the same time). This more closely matches reality as there is a low probability that the rotation of the blades would be synchronized.

The angle of the sun, light intensity level, and shadows on the turbines were adjusted to most closely match the local conditions at the time the photo was taken.

Coordinates of the proposed wind turbines are listed in Table 1. If the final turbine locations are modified from these original coordinates, the photo simulations may no longer be valid.

Table 1. Coordinates of Proposed Wind Turbines in Sand Point, Alaska

Description	UTM Zone 4, NAD83		Elevation (m)	
	Easting			Northing
Turbine #1	405490	6134190	56	
Turbine #2	405560	6134074	59	

Visual and Sound Impact Analysis for Sand Point Wind Power Project APIA1-001

Figure 1 illustrates where each photo was taken with respect to the proposed wind project location. The five photo simulations are provided in Figure 2 through Figure 7. The JPEG images as well as animations of each image will be provided to APIA electronically.

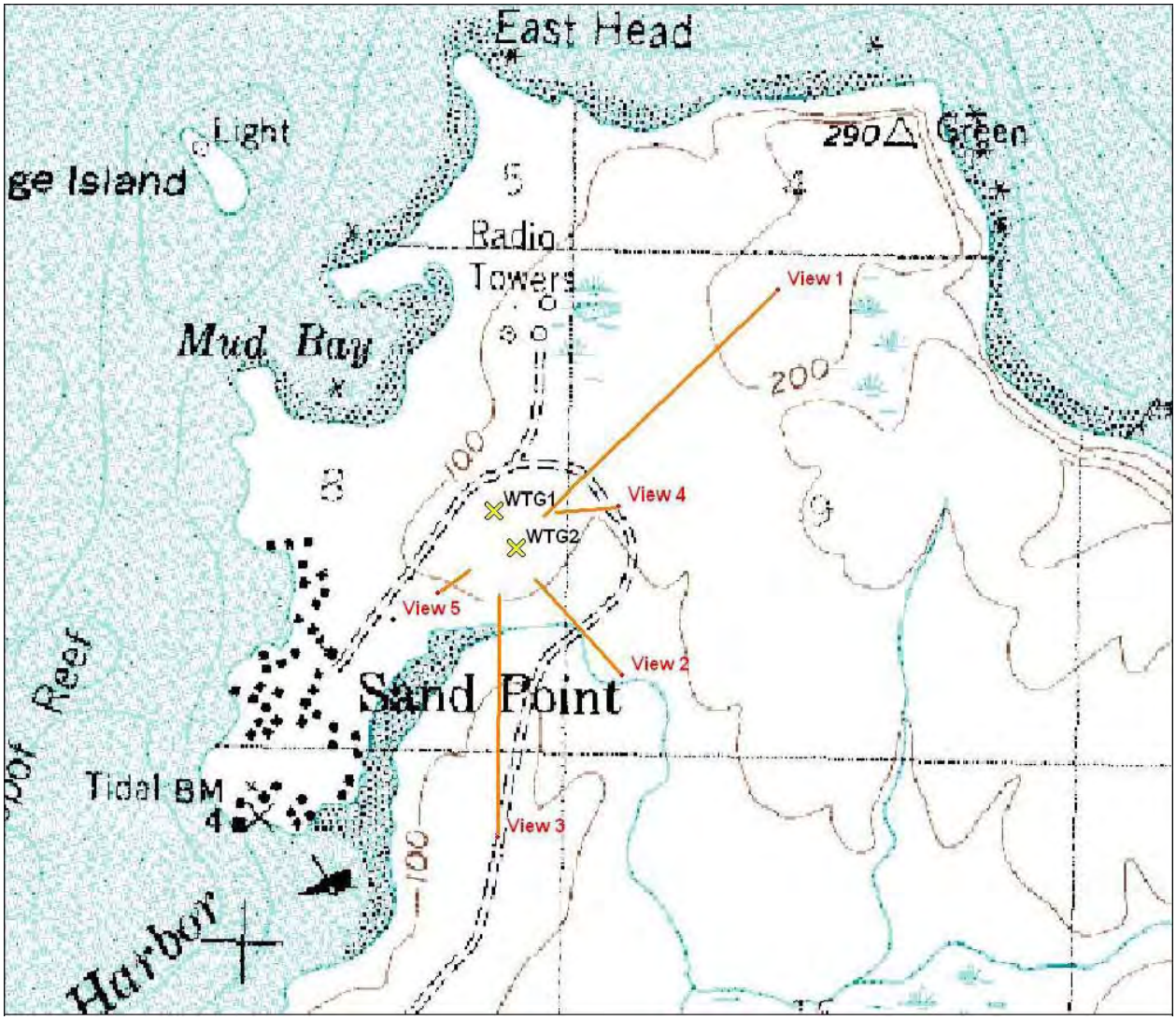

Figure 1. Map of Wind Farm Site and Viewpoints from Which the Photos Were Taken

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Figure 2. Photo Simulation from the Southwest Corner of the School (View 1)

Figure 3. Photo Simulation from the South Side of the Pump House Pond (View 2)

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Figure 4. Photo Simulation from Power Pole #43 (View 3)

Figure 5. Photo Simulation from the SDP Fisheries Building (View 4)
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Figure 6. Photo Simulation from the SDP Fisheries Building (View 4)

Figure 7. Photo Simulation from Housing to the Southwest of the Wind Farm Site (View 5)

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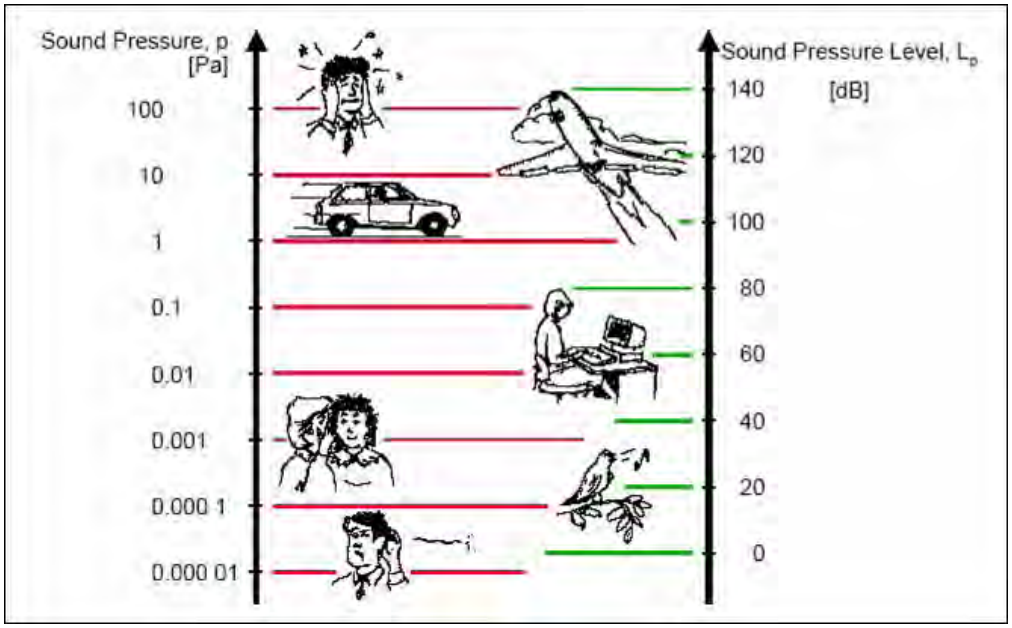
Sound Impact Analysis

Sound moves through air as waves of pressure fluctuations caused by vibrations. As sounds move away from their source, the sound pressures decrease because the sound is spread over an increasing area and attenuated (dissipated) by obstructions, obstacles, and the atmosphere. The most common unit of measure used to describe the magnitude of sound levels is the decibel (dB). Sound levels are often stated in terms of decibels on the A-weighted decibel scale (dBA), which is weighted to reflect the response of the human ear by attenuating, or discounting, some of the noise in the low- and high-frequency ranges to which the human ear is less responsive.

Sound pressure levels differ from sound power levels. Sound power levels are characteristic of a sound source. This sound power rating is a property of the equipment and is not dependent on distance from the source or environmental factors.

Sound pressure levels are what is perceived by the human ear and vary with distance from the source. Typical sound pressure levels include about 110 dBA for construction noise, 90 dBA for a heavy truck accelerating, 60 dBA for a conversation, and 50 dBA for a quiet office. Figure 8 illustrates sound pressure levels of common noise sources.



(Source: Bruel & Kjaer Instruments)

Figure 8. Range of Sound Pressure Levels from Common Sources

The dBA scale is logarithmic, so individual dBA ratings for different sources cannot be added directly to calculate the sound level for combined sources. For example, two sources, each producing 50 dBA will, when added together logarithmically, produce a combined sound level of 53 dBA. In typical situations, a 3 dBA change in sound level is considered a just-perceivable difference, while a 10 dBA change is considered an approximate doubling of perceived loudness.

Visual and Sound Impact Analysis for Sand Point Wind Power Project APIA1-001

Table 2. Perception of Changes in Sound Pressure Level

Change in Sound Level (dB)	Change in Perceived Loudness
1	Cannot be perceived
3	Just perceptible
5	Noticeable difference
10	Twice (or ½) as loud
15	Large change
20	Four times (or ¼) as loud

(Source: Bruel & Kjaer Instruments)

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

Acoustic Modeling

Wind turbines are often rated at a particular sound power level which is calculated from measurements performed according to a standard (such as International Electrotechnical Commission Standard IEC 61400-11). The acoustic reference conditions for the IEC 61400-11 standard are when the wind speed is 8.0 m/s (18 mph) measured at a height of 10 m (33 ft) above ground level. Assuming a site average vertical wind shear coefficient of 0.14, the reference condition is equivalent to a wind speed of 9.7 m/s (22 mph) at a 40-m turbine hub height. At higher wind speeds, sounds from the wind turbine become less noticeable because background noise associated with the wind itself increases and tends to cover or mask that being generated by the turbine.

The WindFarm software was used for the sound impact analysis. This software contains a database of various wind turbine models and technical specifications for each. It also allows the user to modify any default specifications. According to the WindFarm database, the Vestas V39 wind turbine produces a sound power level of 101 dBA during the acoustic reference conditions defined by the IEC 61400-11 standards. It should be noted, however, that the wind turbines to be installed in Sand Point have already been in operation at another location for a number of years. It is unknown how the aging of the turbine or the remanufacturing process might affect the sound rating of these turbines. Results from field measurements performed in 1995 were provided by the turbine supplier and indicate a sound power level of 97.8 dBA at the IEC 61400-11 reference conditions. The sound power level of a turbine is usually warranted by the manufacturer not to exceed a maximum level of 104 dBA at the reference conditions. Therefore, for this analysis, GEC assumes that 101 dBA is a reasonable estimate of the sound power level of these turbines.

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

Impact on the Community

As described above, GEC performed sound impact modeling based on the rated turbine sound power level of 101 dBA at the acoustic reference conditions. Figure 9 represents the resulting sound contour map of the project area.

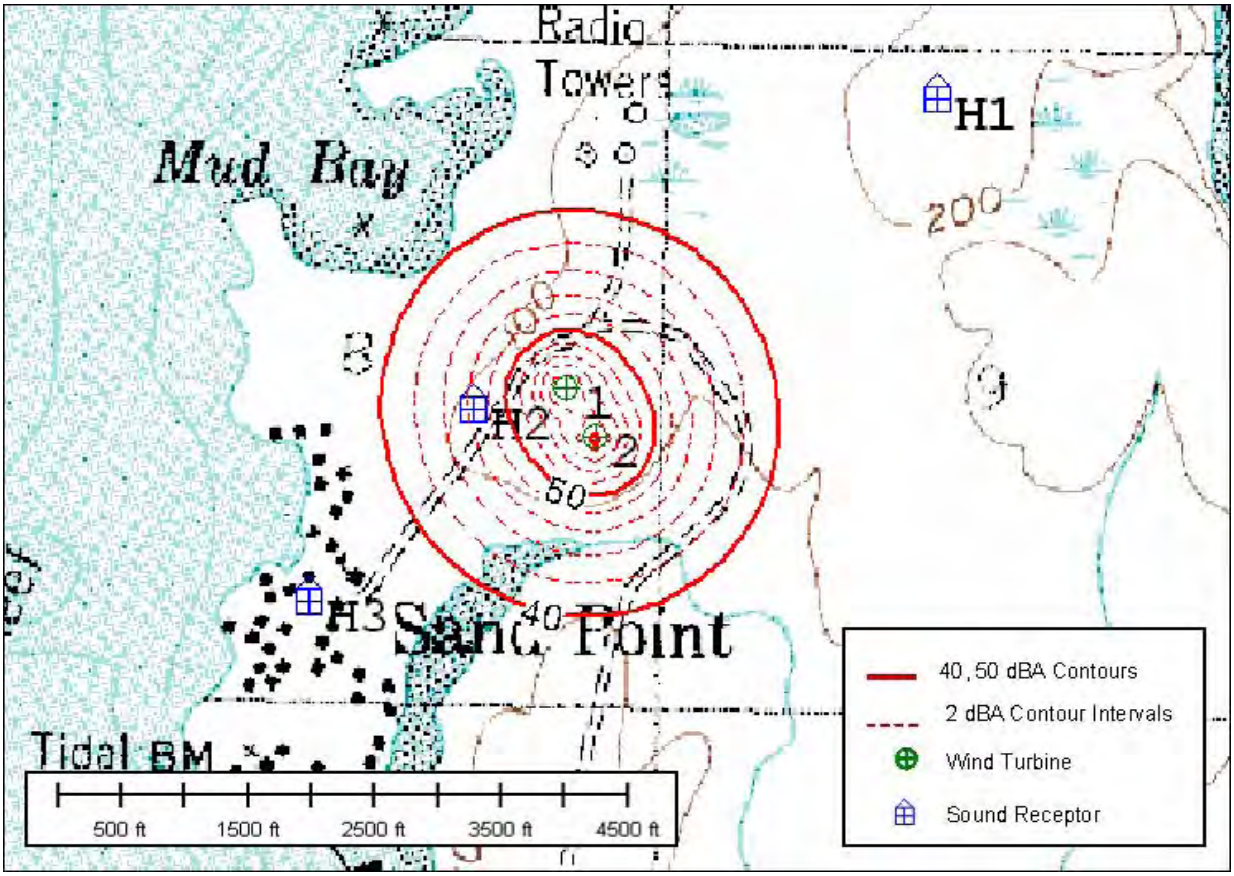


Figure 9. Sound Contour Map for Sand Point Project Area at Reference Conditions: 8 m/s Wind Speed at 10-m Height

As shown, when standing 400 to 500 ft away from either turbine, the calculated sound pressure level is 50 dBA, equivalent to a quiet office setting. When standing immediately beneath the turbines, the maximum sound pressure level is 58 dBA.

Visual and Sound Impact Analysis for Sand Point Wind Power Project APIA1-001

Impacts on Identified Receptors

In addition to modeling the expected sound levels from the turbines, GEC analyzed the incremental change in sound levels that is expected to be perceived by observers at nearby locations around Sand Point. Three sound receptors are shown on the map in Figure 9. H1 represents the location of the school while H2 and H3 represent different housing areas.

Both background noise and turbine noise will vary with wind speed. Noise from a wind turbine will likely be most noticeable at low wind speeds (8-10 mph) during which the wind turbines are just beginning to operate and the background noise is at the lowest levels. At higher wind speeds, turbine noise tends to be masked by the sound generated by the wind. Both low wind speed and high wind speed impacts were modeled using wind speeds of 4.0 m/s (9 mph) and 8.0 m/s (18 mph), respectively, at a height of 10 m (33 ft) above ground level.

Since background noise measurements have not been taken at the site, GEC modeled three different background levels: 40 dBA, 50 dBA, and 60 dBA. The sound impact due to the wind turbines on each receptor was combined with the background noise levels to provide an estimate of the total sound level at each receptor for both the 4 m/s and 8 m/s wind speed conditions. The results are shown in Table 3.

Table 3. Sound Impacts for Varying Background Noise Levels and Wind Speeds

Receptor ID	4 m/s Wind Speed (10-m height)			8 m/s Wind Speed (10-m height)		
	Background Sound Levels (dBA)	Turbine Sound Impact (dBA)	Turbines and Background Combined (dBA)	Background Sound Levels (dBA)	Turbine Sound Impact (dBA)	Turbines and Background Combined (dBA)
H1	40	27	40	40	29	40
	50	27	50	50	29	50
	60	27	60	60	29	60
H2	40	44	46	40	46	47
	50	44	51	50	46	52
	60	44	60	60	46	60
H3	40	32	41	40	34	41
	50	32	50	50	34	50
	60	32	60	60	34	60

These results show that the change to the background noise levels at the H1 and H3 receptors would not be significant across the range of operating wind speeds. However, due to its close proximity to the wind turbines, the H2 receptor has the potential to be impacted by sounds from the wind turbines, depending on existing background noise conditions. If background sound power levels are 40 dBA, the H2 receptor would experience a 6 dBA increase in sound pressure level due to the wind turbines, which could be a “noticeable difference” to the homeowner. Whether or not this difference is considered an annoyance is subjective. However, if the background sound of the wind, diesel power plant, or other community activities is 50 dBA, the additional sound from the wind turbines would not be perceptible.