AM Radio Analysis

The Project will not impact existing AM radio transmissions. No mitigation measures will be necessary.

NTIA Notification

Should the NTIA identify Project-related concerns related to signal blockage following their 30-day review of the Project, SLW would relocate the appropriate project facilities.

3.13 Safety and Security

3.13.1 Affected Environment

3.13.1.1 Microwave Analysis

Safety concerns associated with the construction of wind energy projects mirror the concerns of most large-scale construction projects. These concerns include, but are not be limited to (1) transportation of equipment and materials using heavy construction equipment, (2) overhead hazards, (3) open excavations, and (4) electrocution. These "typical" hazards are well understood, and would be mitigated through the use of common construction safety measures.

During the operation of wind energy facilities, other, more unique, safety concerns sometimes arise and need to be addressed to mitigate their potential effect. Examples of such safety concerns include possible ice shedding, tower collapse, blade throw, stray voltage, fire and lightning strikes.

3.13.1.2 Ice Shed

Ice shed may occur when ice builds up on the blade of a turbine and then breaks off and falls to the ground. While this is a potential safety concern, it should be noted that there has never been a reported injury from ice shed by wind turbines, despite the installation of more than 6,000 MW of wind energy worldwide (Morgan, Bossanyi, and Siefert, 1998).

The ice that forms on a wind turbine's blades is relatively thin. Ice buildup on a turbine's blade changes its shape, reducing the lift-drag ratio and increasing surface friction and resulting in the blade losing its ability to develop speed (AWEA, 2006). Ice would be shed from blades as the temperature rises, and then the blades would begin to rotate at higher speeds.

3.13.1.3 Tower Collapse/Blade Failure

While there is the potential for a tower collapse or blade failure during the operation of wind energy projects, these events are extremely rare. Such collapses are potentially dangerous for both project personnel and the general public. Past incidents have generally been the result of

manufacturing defects, poor maintenance, wind gusts that exceeded the maximum design load of the turbine structure, or lightning strikes (AWEA, 2006). Technological improvements and safety standards have made such occurrences rare in the industry.

3.13.1.4 Stray Voltage

The term stray voltage generally refers to low levels of neutral-to-earth electrical currents that occur between two points on a grounded electrical system (Wisconsin Legislative Council, 2000). Stray voltage usually is the result of poorly connected or damaged wiring systems, corrosion, or damaged insulation materials. Wind power facilities have the potential to create stray voltage if the electrical system is both poorly grounded and located near underground or poorly grounded metal objects.

3.13.1.5 Fire

Due to their height, physical dimensions, and complexity, wind turbines may present response difficulties to local emergency responders should a fire occur within or near the structures. Storage and use of diesel fuels, lubricating oils, and hydraulic fluids within the Project creates the potential for fire or medical emergencies.

3.13.1.6 Lightning Strikes

Wind turbines are susceptible to lightning strikes due to their height and construction materials. Modern wind turbines include lightning protections systems, which generally prevent catastrophic blade failure.

3.13.1.7 Homeland Security

The United States Department of Homeland Security (DHS) has developed a series of regulations that apply to the design and operation of Critical Energy Infrastructure.

3.13.2 Potential Impact

3.13.2.1 Ice Shed

Ice build-up on turbine blades would cause an imbalance, which would alert turbine sensors resulting in a complete shut down of the effected turbine. As previously noted, as the ice thaws it would typically fall straight to the ground, as the turbine would not be rotating. While a very remote potential exists for ice shed to cause personal or property injury, the sensors within the towers themselves greatly reduce these risks by shutting down the affected turbines as soon as they detect an imbalance.

3.13.2.2 Tower Collapse/Blade Failure

International engineering standards are used to certify modern wind turbines from manufacture, through construction. The ratings include withstanding different levels of hurricane force winds and other criteria (AWEA, 2006, a, b, c, d). Modern wind turbines also include state-of-the-art braking systems, pitch controls, sensors, and speed controls which greatly reduce the risk of tower collapse and blade failure. The safety features installed on modern wind turbines greatly lower the chance of a catastrophic failure.

3.13.2.3 Stray Voltage

Stray voltage is preventable through the use of proper electrical installation and grounding practices. Certified electrical engineers would ensure that all electrical facilities are properly grounded and insulated to reduce the risk of stray voltage. Proper maintenance of all facilities would ensure that the wind energy project does not contribute to stray voltage within the Project area.

3.13.2.4 Fire

Fire at operating wind turbines has been extremely rare over the several decades that turbines have been employed worldwide. However, as there are flammable materials such as lubricants in the turbine nacelle, there is a remote possibility that a turbine fire could occur.

3.13.2.5 Lightning Strikes

Lightning protection systems were first added to rotors in the mid-1990s. These protection systems are now a standard component of modern turbines. The protection systems can detect all lightning events. Should the system detect a problem, the turbine would be shut down automatically.

3.13.2.6 Homeland Security

It is not anticipated that the proposed Project would be a target for any homeland security concerns. However, as the Project contains Critical Energy Infrastructure, SLW would design all facilities in accordance with guidance and regulations of the DHS.

3.13.3 Mitigation Measures

3.13.3.1 Ice Shed

The use of buffers from roads and property lines and public control measures would minimize the already low public safety risk of ice shed. Ice detectors would be installed at previously determined locations to notify maintenance personnel of icing conditions, which would allow the operator to take the appropriate actions.

3.13.3.2 Tower Collapse/Blade Failure

The use of buffers from roads and property lines and public control measures would minimize the already low public safety risk associated with tower collapse or blade failure. The standard engineering design and protection systems incorporated into modern wind turbines would prevent and minimize problems that could lead to tower collapse or blade failure.

3.13.3.3 Stray Voltage

Stray voltage concerns would be addressed through proper electrical engineering design and grounding of Project electrical components.

3.13.3.4 Fire

A Fire Prevention and Control Plan would be developed for the Project to ensure the safety of company employees and local residents, visitors, and their property. Prior to the commencement of construction SLW would present, review and finalize the Fire Prevention and Control Plan in cooperation with local fire departments.

3.13.3.5 Lightning Strikes

The standard lightning protection system installed within the rotor blades would be used to prevent and minimize problems associated with lightning strikes.

3.13.3.6 Homeland Security

SLW would design all facilities in accordance with guidance and regulations of the DHS.