Appendix F: Biological Opinion

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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September 26, 2012
File No. 84320-2012-F-0211

Memorandum

To: Assistant Field Manager, Division of Renewable Resources, Bureau of Land Management, Las Vegas Field Office, Las Vegas, Nevada

From: State Supervisor, Nevada Fish and Wildlife Office, Reno, Nevada

Subject: Biological Opinion for the Searchlight Wind Energy Project, Clark County, Nevada

As requested in your April 12, 2012, memorandum, attached is the Fish and Wildlife Service's (Service) biological opinion for the Searchlight Wind Energy Project. The Bureau of Land Management (BLM) determined that the proposed approval of issuance of a right-of-way grant for the subject project may adversely affect the Mojave desert tortoise (*Gopherus agassizii*), a species listed as threatened under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). In addition, BLM determined that the project may adversely affect designated Mojave desert tortoise critical habitat.

The attached biological opinion is based on information provided in your memoranda dated April 12, 2012; the March 2012, biological assessment for the project; discussions and electronic transmissions among the Service and BLM, the project consultant (Tetra Tech); and our files. A complete project file of this consultation is available in the Service's Nevada Fish and Wildlife Office in Las Vegas.

If you require additional assistance concerning the biological opinion, please contact Susan Cooper in the Nevada Fish and Wildlife Office in Las Vegas at (702) 515-5230. Please reference File No. 84320-2012-F-0211 in future correspondence concerning this consultation.

In addition, the Service has a legal mandate and trust responsibility to maintain healthy, migratory bird populations for the benefit of the American public pursuant to the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 *et seq.*), and the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d). The Eagle Act prohibits a variety of actions with respect to eagles, including their "take." "Take" under the Eagle Act is defined as "pursue, shoot, shoot at,

poison, wound, kill, capture, trap, collect, or molest or disturb." Anyone who takes an eagle is in violation of the Eagle Act unless the take has been authorized by the Secretary of the Interior (see 50 C.F.R 22.26, 22.27). No one is required to seek a permit for any activity; however, where an activity results in take, it is a violation of the Eagle Act unless a permit authorizing that take has been obtained prior to the action.

The construction and operation of the Searchlight Wind Project has the potential to result in the "take" of golden eagles. We appreciate the efforts by the BLM and Duke Energy to develop a Bird and Bat Conservation Strategy (BBCS) for the project. Under the Service's current direction we recommend energy proponents develop an Eagle Conservation Plan to address potential project impacts to eagles and develop a BBCS to identify minimization and avoidance measures to address impacts to other migratory bird species. We encourage Duke Energy to continue to coordinate with the Service to develop an Eagle Conservation Plan in a manner that would be consistent with the Service's goal of maintaining a stable or increasing breeding population for golden eagles, and then to apply for a golden eagle programmatic take permit. We encourage the BLM and Duke Energy to continue your coordination with Dr. Chris Nicolai [chris_nicolai@fws.gov, (775-861-6333)] and Ms. Heather Beeler [heather_ beeler@fws.gov, (916- 414-6651)] with our Migratory Bird Program with respect to compliance with the Eagle Act for the Searchlight Wind Project.

Edward D. Koch
State Supervisor

cc:
Supervisory Biologist – Habitat, Nevada Department of Wildlife, Las Vegas, Nevada

ATTACHMENT

BIOLOGICAL OPINION
FILE NO. 84320-2012-F-0211

CONSULTATION HISTORY

On April 30, 2009, Tetra Tech, a consultant to Duke Energy (Duke), contacted the Fish and Wildlife Service (Service) on behalf of the Bureau of Land Management (BLM) requesting information regarding sensitive species potentially occurring near the proposed Searchlight Wind Energy Facility (SWEF). On June 10, 2009, the Service responded to this request (84320-2009-SL-0343), identifying the occurrence of the Mojave desert tortoise (*Gopherus agassizii*) (hereafter, desert tortoise or tortoise) in the project area.

On February 28, 2012, Tetra Tech, BLM, and Service personnel conducted a visit to the project site to review the occupied desert tortoise habitat where project features would occur. Discussion topics included minimization measures, post-construction monitoring, project access, and project features.

On April 12, 2012, the Service received BLM's request for consultation and biological assessment (Tetra Tech 2012) for the subject project and determined the submitted materials were sufficient to initiate consultation.

On August 16, 2012, the Service sent BLM a notification of a 60-day extension for the consultation to allow the Service additional time for review of the draft biological opinion.

DESCRIPTION OF THE PROPOSED ACTION

Searchlight Wind Energy, LLC (Searchlight Wind; Applicant) a wholly-owned subsidiary of Duke has applied to BLM for a right-of-way (ROW) grant on public land to develop a wind energy project (NVN-084626). Searchlight Wind is proposing to develop a 200-megawatt (MW) wind energy facility on a site located in southern Clark County, Nevada (Figure 1). Western Area Power Administration (WAPA) proposes to construct, operate, and maintain a new switching station to interconnect the SWEF project and has submitted a ROW application (NVN-086777) to BLM for construction and operation of the switching station. The interconnection switching station is analyzed as part of the proposed action.

The project area for the proposed action lies to the north of the Newberry and south of the Eldorado Mountain ranges in southern Clark County, Nevada. It is situated approximately 1.5 miles west of Lake Mead National Recreation Area, 60 miles southeast of Las Vegas and 40 miles north of Laughlin, Nevada. Specifically, the project area for the proposed action

encompasses lands approximately 0.5 mile northeast to 3 miles southeast of the town of Searchlight (Figure 1).

The footprint of the proposed action occurs within a project area that is approximately 8,400 acres of land, of which approximately 388.5 acres of habitat would be disturbed. Included in the 388.5 acres is the 7 acres of disturbance needed for the WAPA interconnection switching station, which would occur in Mojave desert tortoise critical habitat (CH) (Service 2011). Although the location of the proposed interconnection switching station falls within CH, it would be located within 0.5 mile of State Route 164 (SR-164), a Federal aid designated highway traversing the Area of Critical Environmental Concern (ACEC). Development within BLM ACECs (and thus CH in the case of the project) is allowable under BLM's Resource Management Plan when development is within 0.5 mile of Federal aid highways.

Facilities and Structures

Wind Turbines

The proposed action would involve the construction of 87 2.3-MW wind turbine generators (WTG) that would provide up to 200 MW of electricity. Wind turbines consist of three principal components that would be assembled and erected during construction: the tower, the nacelle, and the rotor assembly. The Applicant proposes to use the Siemens Model 2.3-101 MW WTG with a 331-foot rotor diameter on a 262-foot tower (turbine hub height). These modern wind turbines would have maximum height of up to 427.5 feet with three mounted rotor blades, each 165 feet in length.

Access Roads

All roads would be constructed for the specific purpose of the proposed action and be used as primary access routes for all larger turbine components delivered to the project area, as well as for construction, operation and maintenance crews, and smaller materials delivery. They would be located to minimize ground disturbance, avoid sensitive resources (e.g., biological habitat) and maximize transportation efficiency.

Regional and local access to the area would be via U.S. Highway (US-95) and SR-164. Access to the proposed project facilities would be provided by newly constructed extensions of existing north and south access roads, and upgraded or partially realigned (to reduce maximum grade to 10 percent or less, or to increase the inside radius of turns on the road) existing access roads that begin from US-95 and SR-164. New roads would link the individual turbines, substations, and other project facilities.

From the north end of Fourth of July Mountain, the existing road from SR-164 would be upgraded to a gravel road and would be the primary access route for all larger turbine components. New gravel turbine string roads would be constructed to link the turbines. The turbine string roads would be designed to enable the transport of large cranes between each

individual turbine site. New short spur roads would be constructed along the turbine strings to access each individual turbine.
Each turbine manufacturer has slightly different equipment transport and crane requirements. These requirements dictate road width and road turn radius. Although the Applicant has proposed using the Siemens 2.3 MW WTG, the type and brand of turbines installed would be determined by commercial factors within the timeframe of the proposed action schedule. To allow safe passage of the large transport equipment used in construction, gravel roads would be built which consist of an aggregate road base over compacted native material per geotechnical recommendations, and with adequate drainage and compaction to handle 15-ton-per-axle leads. Road widths would range between 16 and 36 feet. BLM would require that all roads be designed, built, surfaced, and maintained to minimize ground disturbance, and to provide safe operating conditions at all times.

Electrical System

Each wind turbine would generate electricity at approximately 690 volts. The low voltage from each turbine generator would be increased via a pad-mounted transformer located at each turbine to the 34.5-kV level required for the medium-voltage collector system. The power collection system would consist of medium-voltage, high-density, insulated underground cables that connect each turbine transformer to one of two on-site substations. These underground cables would be buried in trenches located adjacent to the roadbed of the turbine connector roads, wherever technically feasible. At the substations, voltage would be further increased to 230 kV. The two on-site substations would be connected with a 6.1-mile, 230-kV overhead transmission line. The stepped-up power would then be delivered from the northern substation through the 2.6-mile transmission interconnect line to the proposed WAPA switching station, which would provide an interconnection with WAPA's Davis-Mead transmission line.

Underground Communications System

The wind turbine generators would be operated via a Supervisory Control and Data Acquisition (SCADA) system mounted on the control panel inside the tower of each WTG. Each turbine would be connected via fiber optic cable to a central computer in an operation and maintenance (O&M) building. Data could be accessed, and the WTGs could be controlled, either on site or remotely. The fiber optic communications cable would be co-located with the electrical collection system to reduce environmental impacts. Where feasible, collection cabling and communication lines would be co-located with roads to minimize environmental impacts.

Substations

Two project substations are proposed: one in the northeastern portion of the project area (adjacent to SR-164) and one in the southern portion of the project site (south of Tip Top Well Road). The proposed substations' main functions would be to step-up the voltage from the collection lines (34.5 kV) to the transmission line level (230 kV) and to provide electrical fault protection. Based on the transmission system studies conducted by WAPA, the Applicant would install capacitor banks at each of the two project 230-kV substations. The basic elements of the step-up substation facilities would be a control house, one or two main transformers, outdoor

breakers, capacitor banks, relaying equipment, high-voltage bus work, steel support structures, an underground grounding grid, and overhead lightning suppression conductors. All of the main outdoor electrical equipment and control house would be installed on a concrete foundation. Each substation site would consist of a graveled footprint area of approximately 1.5 acres, a 12-foot chain link perimeter fence, and an outdoor lighting system.

Transmission Lines

Overhead 230-kV transmission lines are proposed for the 6.1-mile transmission line. This proposed line would connect the two project substations and the 2.6-mile transmission line to a proposed interconnection switching station (WAPA) to connect with the 230-kV Davis-Mead transmission line. The Applicant proposes to support the transmission line conductors from steel monopole structures. Each monopole structure would be approximately 80 to 100 feet tall and be spaced at approximately 500-foot intervals. The 230-kV transmission line conductors would maintain the required National Electrical Safety Code (NESC) clearances of 22.5 feet for 230 kV over terrain subject to vehicular traffic plus an additional safety buffer (typically 5 feet). The conductor would be attached to the structures at varying heights to maintain the required NESC wire-to-ground clearances between structures.

The design for the 2.6-mile transmission line to WAPA's proposed switching station would be subject to WAPA's review and may be modified to meet WAPA's requirements during the design phase for the proposed project. In addition, WAPA would require the installation of an overhead optical ground wire containing fiber optics to provide communication between WAPA's proposed switching station and the Applicant's system.

The Collection System would be a buried conductor tying several of the WTGs together in a circuit to collect the power generated at the WTGs and routing that power to the project substation where it would be stepped up to the 230-kV transmission voltage. At several locations along the transmission lines, it may be advantageous to install the Collection System Conductor aboveground due to elevation changes, limited easement, cost of installation, minimization of environmental impact, and geotechnical conditions which would not allow it to be buried. An underbuilt circuit on the 2.6-mile transmission line to WAPA's proposed switching station would be subject to WAPA's review.

Meteorological Towers

Four permanent anemometer (wind measurement) towers have been installed at strategic locations along the turbine strings. These meteorological towers are approximately 180 to 200 feet (55 to 60 meters) in height and have anemometers mounted at varying distances above the ground. Information collected from the anemometers would be relayed to the O&M building via the proposed project's communication system. The meteorological towers have been constructed of tubular steel structures and are perch-discouraging for raptors and other large birds.

O&M Facility

The O&M facility would be located east of the town of Searchlight and along the south side of SR-164. The O&M facility would include a main building with offices, spare parts storage, restrooms, a septic system, a shop area, outdoor parking facilities, a turnaround area for larger vehicles, outdoor lighting, and a gated access with partial or full-perimeter fencing. Power for the O&M facility would come from the local electric grid. The O&M building would have a foundation footprint of approximately 60 by 140 feet. The projected permanent footprint of the O&M facility (including parking area) would be approximately 5 acres. The building would be of composite materials constructed or painted to match the surrounding landscape color. Portable water supplies would be used in the building, and sewage disposal would be by means of an onsite septic tank. Telecommunication lines and SCADA system would be installed.

Construction

The proposed action would use standard construction procedures used for other wind power projects in the western United States. These procedures, with minor modification to allow for site-specific circumstances and differences among turbine manufacturers, are summarized below. Additionally, project construction and operations would follow BLM's best management practices (BMPs) as described in the Appendix B of BLM's biological assessment. Construction is anticipated to continue for approximately 8 months.

Traffic

Construction of the proposed project roads, facilities, transmission lines, and electrical/communication lines would occur at approximately the same time, using individual vehicles for multiple tasks. During the construction period, there would be approximately 60 round trips per day to the site on existing roads by vehicles transporting construction personnel and small equipment. Over the entire construction period, there would be a maximum of 625 trips of large trucks delivering the turbine components and related equipment to the site. In addition, there would be more than 9,025 truck trips by dump trucks, concrete trucks, water trucks, cranes, and other construction and trade vehicles.

A traffic management plan would be prepared for project construction to minimize hazards from the increased truck traffic and to minimize impacts on traffic flow on local roads and highways. This plan would incorporate measures, such as informational signs, traffic flaggers when equipment may result in blocked throughways, traffic cones, and flashing lights, to identify any necessary changes in temporary road configuration. During construction, refueling and maintaining vehicles that are authorized for highway travel would be performed off site at an appropriate facility. Construction vehicles that are not highway-authorized would be serviced on the project site by a maintenance crew using a specially designed vehicle maintenance truck.

Road Construction

The minimum full-surfaced width for project access roads would be 16 feet. The roadways connecting turbine sites would be 16 feet wide with 10 foot shoulders needed for movement of

the turbine erection crane. Cut-and-fill slopes would be at a ratio of two horizontal to one vertical making actual cleared area for construction (inclusive of grade, shoulder and road) between 36 and 48 feet depending on topography. Equipment clearance would require a minimum inside radius of 148 feet at all turns, and would be graded to within no more than 6 inches of rise or drop in any 50-foot length. Turnouts may be needed to allow for safe passing of construction vehicles and would be 16 feet wide and 210 feet long. Road shoulders would be removed and restored post construction.

No material quarries would be located on BLM or other Federal lands. Any needed fill or road base material in excess of that generated from road cut activities would be obtained from a licensed, certified weed free off-site private source. Weed free topsoil removed during road construction would be stockpiled at project laydown areas. The stockpiled topsoil would be spread on cut-and-fill slopes, and then re-vegetated following guidelines in the SWEF Reclamation, Restoration, and Revegetation Plan upon completion of road construction.

Construction traffic would be restricted to the roads developed for the project. Use of existing, unimproved roads would be for emergency situations only. Along all roads, flaggers with two-way radios would be used to control construction traffic and reduce the potential for accidents. To avoid unnecessary impacts on vegetation, construction equipment would be limited to construction corridors and to designated staging/equipment laydown area footprints. Additional information on vehicle speeds is described in the *Conservation Measures* section below (Conservation Measure 10).

To help limit the spread and establishment of an invasive plant species community within disturbed areas, prompt establishment of the desired vegetation would be required. Seeding and transplanting would occur as soon as possible during the optimal period after construction using certified "weed-free" seed and native species to the extent possible, in a mix prescribed by BLM and methods described in the Weed Management Plan.

<u>Laydown Areas</u>
Two temporary laydown areas would be required near the proposed electrical substation locations. Access to the laydown areas would be via existing but upgraded roads leading from US-95 north of Searchlight and SR-164 east of Searchlight. The laydown areas would be temporary and used during construction only. Each laydown area would be approximately 10 acres and may be fenced for security for the duration of its use. Areas of identified sensitive habitat near laydown areas would be fenced off with caution tape to prevent damage. During construction, equipment, cable, foundation parts, components, towers, blades, nacelles, etc., may be temporarily stored either at one of the two laydown areas, or in temporary laydown areas at the base of each WTG location. All equipment and components would be supported on wooden frames, pallets, or straw bales, which would be placed on the ground while turbine components are loaded, pre-assembled, or awaiting installation. A mobile concrete batch plant and rock crusher would be located within one laydown area and relocated to the other as necessary during construction.

Turbine Pads and Foundations

At the location of each turbine pad, an assembly area would be required for off-loading, storage, and assembly of up to three tower sections, nacelle, rotor hub, and blades, called a lay down area. In level or near-level terrain, this laydown area would not need to be graded or cleared of vegetation. If the terrain is not level, the laydown area would be cleared and graded to create a level surface. Construction access to this area would be limited to wheeled vehicles and due to activity, some crushing of vegetation and soil compaction would be expected. Within this laydown area, a smaller section of approximately 60-foot by 60-foot area would be cleared of vegetation and graded. The cleared and graded area would facilitate construction of the turbine foundation.

To allow a large, track-mounted crane to access the turbine foundations, a crane pad would be constructed adjacent to the turbine access road. It would be constructed using standard cut-and-fill compacted road construction procedures. To allow the crane to safely lift the large and extremely heavy turbine components, the crane pad must be nearly flat. Wind turbine foundation designs would be based on the load requirements of the selected WTG and the load-bearing characteristics of the soil. Prior to construction, geotechnical investigations would be conducted to determine the soil characteristics at each WTG location. These geotechnical data would assist the project proponent in the selection of the appropriate WTG foundation type.

A typical foundation for a 2.3-MW WTG would be a reinforced concrete spread foundation resting directly on soil approximately 10 feet belowground. The foundation generally would be an octagon shape from 40 to 60 feet wide with a concrete pier on the top of the mat extending to ground level. Each foundation would require approximately 300 cubic yards of concrete. In the north portion of the project area, bedrock may be present within a few inches to 2 feet of the ground surface at some WTG locations. In these instances, a "Rock Anchor" type foundation could be required. In the Rock Anchor design, the rock would be removed to a depth of approximately 5 feet and a diameter of approximately 24 feet by mechanical removal methods and possibly engineered blasting.

In the southern portion of the project area, the tensionless tube foundation design may be utilized. With this foundation design, either by mechanical or explosive means, a 20-foot diameter by 30-foot-deep excavation is made, then two concentric corrugated metal pipes,
12 feet and 16 feet in diameter, are installed in the excavation. The inside of the smaller pipe and the outside of the larger pipe are then backfilled with the excavation materials. If the soils of the south area are not conducive to a tensionless tube foundation, the spread foundation design would be utilized in this area.

Grounding

To adequately ground the turbines to prevent damage from electrical storms, 3-inch-diameter, 30-foot-deep holes may be required for placement of turbine grounding rods as needed. These holes would be located adjacent to the turbine foundations within the 90-foot-diameter area to be

cleared for foundation construction. Following placement of the grounding rods, the holes would be backfilled and capped with concrete.

Tower Erection

Tower erection would require the use of one large track-mounted crane and two small-wheeled cranes. Two smaller wheeled cranes would be used to off-load turbine components from trucks, and to assist in the precise alignment of tower sections. The smaller crane would be used first to raise and install the two bottom tower sections, and then used to lower it over the threaded foundation bolts. The large crane would then raise the upper mid- and upper-tower section to be bolted through the attached flanges to the lower tower section, and to raise the nacelle, rotor hub, and blades to be installed atop the towers.

Underground Communication and Electrical Cables

Trenching equipment would be used to excavate trenches within or near the access road bed to bury the insulated underground cables that would connect each turbine transformer to one of the two project substations. Trenches for the large conductor cable would be approximately 42 inches deep, and backfilled with engineered trench material to protect the cables from damage or possible contact. Optical fiber communication links would be placed in the same trenches as the conductor cables. The depth, number of trenches, and backfill requirements would be determined by the size of the cable required and the thermal conductivity of the soil or rock surrounding the trench.

Transmission Line Construction

Overhead 230-kV transmission lines construction would use standard industry procedures including surveying, ROW preparation, materials hauling, structure assembly and erection, ground wire, conductor stringing, cleanup, and restoration. All transmission lines and structures would be designed to prevent the perching of birds. Construction procedures described below would be the same for the proposed 6.1-mile transmission line between the on-site substations and the 2.6-mile transmission line connecting to the WAPA proposed switching station.

Overhead 230-kV transmission interconnect lines would be constructed on monopole structures. The monopole structures typically would be set in auger holes approximately 3.6 feet in diameter and about 10 feet deep; if consolidated rock is encountered structure, holes would be advanced using mechanical removal methods and possibly engineered blasting. All blasting would be conducted by a permitted contractor, and would be in compliance with State and Federal regulations. Structures would be assembled on site. Structure erection and conductor stringing would occur sequentially along the ROW.

Existing public and private roads would be used to transport materials and equipment from laydown areas to ingress points along the proposed transmission line ROW using the shortest distance possible. The ROW would be used to access transmission line construction sites. The transmission lines would require the installation of temporary access routes. The access routes would be 12 feet wide, and cleared of large boulders to allow high-clearance, four-wheel-drive

vehicles to pass. The routes would be installed to allow access to support the construction of the transmission lines. Clearing of vegetation and minor grading may be necessary at some of the transmission line structures to facilitate their construction. Once construction is complete, some access routes would be used approximately twice a year for inspection and maintenance. Native vegetation would be allowed to re-establish over the routes to the extent that four-wheel-drive vehicle travel remains practical.

Temporary Concrete Batch Plant

The proposed project would require more than 40,000 cubic yards of concrete for construction of the wind tower foundations, substations, and O&M facility. Depending upon weather conditions, concrete typically needs to be poured within 90 minutes of its mixing with water. Delivery time to pour locations would likely exceed 90 minutes from existing concrete suppliers in the vicinity of the proposed project area. Therefore, a temporary, mobile concrete batch plant would be located within the laydown areas to facilitate the sub-90 minute delivery time needed. If concrete is mixed at the mobile batch plant, as opposed to existing concrete suppliers, cement, water, and aggregate would be staged in the laydown areas.

The batch plant would operate during project construction hours for approximately 4 to 5 months of the anticipated 8-month construction period. To construct the mobile batch plant, vegetation would be cleared and the ground leveled. For the containment of process water, a 1-foot-high earth berm or other appropriate erosion control device, such as silt fences and straw bales, would be installed around the area. Diversion ditches would be installed as necessary to prevent storm-water from surrounding areas running onto the site.

The batch plant would require a stand-alone, diesel-powered 250-kW generator. The generator would draw diesel fuel from an approximately 500-gallon aboveground storage tank with secondary storage for spill prevention. It is estimated that the batch plant would consume 2,000 to 4,000 gallons of water per day. An onsite 4,000-gallon water tank would be replenished as needed. The batch plant operation would be permitted by the Nevada Division of Environmental Protection.

Stockpiles of sand and aggregate would be located at the batch plant in a manner that would minimize exposure to wind. Cement would be discharged via screw conveyor directly from an elevated storage silo without outdoor storage. Cement trucks would be cleaned and washed at the batch plant. Cement residue would be washed from the cement delivery trucks into an aboveground lined and bermed settling pond. Cement residue would be collected from the settling pond and trucked off site for disposal, as needed.

Following completion of construction activities requiring cement, the batch plant would be demobilized, and the batch plant area would be restored. The area would be recontoured, stockpiled topsoil would be replaced, and the area would be restored according to the Reclamation, Restoration, and Revegetation Plan.

Portable Rock Crusher

To construct the proposed project's roads, a rock crusher would be required to provide appropriately-sized aggregate for fill and road base. The rock crusher would have an average capacity that could be more than 30,000 tons per day. The crusher would be located within the laydown areas and operated during project construction hours for approximately 4 to 5 months of the anticipated 8-month construction period. In accordance with BMPs, the rock crushing area would be sprayed by a water truck to suppress dust. The crusher contains several dust-suppression features including: built-in dust control measures on the crusher, including screens and water sprayers that would be operated at all emission points during crusher operation, including startup and shut down periods, as required by the Clark County Department of Air Quality and Environmental Management.

Water Use

During construction, water would be needed for dust control, making concrete, and equipment washing. All needed water would be transported from an off-site municipal or private source. No wells would be drilled or springs developed for the proposed project.

Post-Construction Clean Up

Final clean up and restoration of the proposed project area would occur immediately following construction. Waste materials would be removed from the area and recycled or disposed of at appropriate facilities. All construction-related waste would be properly handled in accordance with county, State, and Federal regulations and permit requirements. This waste may include vegetation, trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials. Excess material, such as soil and rocks excavated during the construction of the project, would be stockpiled at a location on site and made available as a saleable material.

Construction Work Force

A peak of approximately 250 to 300 workers per day would be required for construction of the proposed project. The beginning and end of the construction period would involve a slightly lower number of workers than required during the middle months. Construction of the proposed project would be completed over an approximate 8-month period.

Operation and Maintenance

Following installation and startup, routine maintenance of the turbines would be necessary to maximize performance and detect potential difficulties. Routine activities primarily would consist of daily visits by maintenance workers that would test and maintain the wind facilities. A standard planned maintenance schedule on each turbine is twice a year; once at the 6-month point and once at the 12-month point. The 6-month maintenance takes about 8 hours (1 day) and the 12-month maintenance takes about 16 hours (2 days). Based on this schedule, technicians work on only one turbine a day. If multiple turbines require simultaneous maintenance, an effort would be made to select neighboring turbines. The only other visits to a turbine would be in the event of an unplanned fault. Staff would travel in pick-ups or other light-duty trucks. Most

servicing and repair would be performed within the nacelle, without using a crane to remove the turbine from the tower. Rarely, the use of a crane or equipment transport vehicles may be necessary for cleaning, repairing, adjusting, or replacing the rotors or other components of the turbine.

Monitoring the operations of the SWEF would be conducted from computers located in the base of each turbine tower and from the O&M building using telecommunication links and computer-based monitoring.

Over time it would be necessary to clean or repaint the blades and towers, and periodically exchange lubricants and hydraulic fluids in the mechanisms of the turbines. All lubricants and hydraulic fluids would be stored, used, and disposed of in accordance with applicable laws and regulations. Any necessary repainting would be performed by licensed contractors in compliance with applicable laws and regulations.

The turbine gearboxes would be sealed to prevent lubricant leakage. The gearbox lubricant would be sampled periodically and tested to confirm that it retains adequate lubricating properties. When the lubricants have degraded to the point where they no longer contain the needed lubricating properties, the gearbox would be drained and new lubricant would be added. Transformers contain oil for heat dissipation, and are sealed and contain no moving parts. The transformer oil would be subject to periodic inspection but should not need replacement. Construction equipment and O&M vehicles would be properly maintained at all times to prevent leaks of motor oils, hydraulic fluids, and fuels. During operations, O&M vehicles would be serviced and fueled at the O&M building or at an off-site location. A Spill Prevention, Containment, and Countermeasures Plan would be prepared and include information regarding training, equipment inspection and maintenance, and refueling for construction vehicles, with an emphasis on preventing spills.

The proposed action would produce nonhazardous waste during O&M activities, which may include rags, broken or used metal machine and/or electrical parts, empty containers, typical refuse generated by employees in the field and office, and miscellaneous solid wastes. This waste would be properly disposed of at an approved landfill accepting Class I Municipal Solid Waste and/or Class III Industrial Waste within Clark County, Nevada.

Reclamation

Reclamation refers to the restoration of lands used temporarily during a construction activity (such as laydown areas) to their approximate condition prior to construction. After construction is complete, temporary work areas, trenches, and tower pads would be graded to the approximate original topographic contours, and the areas would be re-vegetated with a BLM-approved mixture of native grass, forbs, and shrub species. Reclamation would include implementation of all applicable BLM BMPs (Appendix B of Tetra Tech 2012).

WAPA's Interconnection Switching Station

WAPA proposes to construct, own, and operate a new switching station to interconnect the proposed project with WAPA's transmission system. It is anticipated that the switching station would become a permanent part of the WAPA transmission system. The proposed switching station would be located just west of WAPA's existing Davis-Mead 230-kV transmission line, approximately 7.5 miles east of the town of Searchlight, north of Cottonwood Cove Road (Figure 1). Access to the proposed switching station would be along the existing Davis-Mead transmission line road, entering from Cottonwood Cove Road. The switching station is located in the Paiute-Eldorado Critical Habitat Unit (PECHU) for Mojave desert tortoise. The transmission line road would require improvement for approximately 0.5 mile to be suitable for traffic to the site by construction vehicles, equipment delivery, and WAPA construction and maintenance personnel.

Facilities would include a control building, microwave tower, take-off structures and other steel support structures, buswork, and electrical and control equipment for switching, protection, metering, safety, and O&M purposes. The switching station would occupy approximately 3.5 acres, with an additional 2.5 acres outside the security fence required for site preparation, drainage, and road access. An 8-foot-tall chain-link fence topped with razor wire would provide security for the switching station. Adequate space would be provided inside the fence to maneuver construction and maintenance vehicles. Additionally, the facility would be sized to accommodate additional bays for future interconnections.

The terrain at the proposed location of the switching station features rolling hills and dry washes. Substantial civil design and earth moving would be required to level the station yard and provide for site drainage and roads, including excavation, grading, and other site improvements to accommodate the required electrical equipment. Construction would be performed by a WAPA-managed contractor in accordance with WAPA's standard environmental protection provisions (Appendix C of Tetra Tech 2012) and safety standards. A representative from WAPA would be present at all times while a contractor was working on site.

Three power circuit breakers would be installed at the switching station to facilitate two interconnections for the existing transmission line and one for the proposed wind energy facility line. These breakers would be used to automatically interrupt power flow in the event of an electrical fault. Gas breakers planned for the proposed switching station would be insulated by special non-conducting gas (sulfur hexafluoride [SF_6]). During normal operation of the new switching station, authorized WAPA personnel would conduct periodic inspections and service equipment as needed. WAPA would monitor and manage the use, storage, and replacement of SF_6 to minimize any releases to the environment. Gas used in switching station circuit breakers is contained in sealed units that are factory-certified to not leak; equipment would be monitored nonetheless. Seven disconnect switches used to mechanically disconnect or isolate equipment would be installed. A 3-inch deep layer of gravel surfacing selected for its insulating properties

would be placed on the ground within the substation to protect O&M personnel from electrical danger in the event of electrical faults.

Power would move within the substation and between breakers and other equipment on bus tubing (smooth aluminum pipe less than 6 inches in diameter). Bus tubing would be elevated by supports called bus supports. Buswork within the proposed switching station would route the wind energy facility's output to the Davis-Mead transmission line. The buswork would be approximately 30 feet high.

Electric/electronic controls and monitoring equipment for the power system would be housed in a building approximately 30 feet by 60 feet within the switching station. The control building would be environmentally controlled to provide a suitable environment for the equipment housed there. Station service power would be supplied by a tap on an adjacent local utility distribution line and/or from a 230-kV power voltage transformer within the switching station. A new distribution line on single wood-pole (monopoles) structures about 1,000 feet long would be constructed between the switching station to the existing distribution line. The primary station service source would be determined during the design phase for the switching station.

WAPA's Transmission Interconnection

WAPA proposes to install two new transmission line structures to tie in the new switching station with the Davis-Mead 230-kV transmission line. Each turning structure would be a steel monopole structure, self-supporting with no down-guys. These structures would provide for turning the line into the station at angles of 90 degrees Fahrenheit (°F) or more to line up and connect with the take-off structures within the proposed switching station. It is envisioned that the new structures would be located within the existing Davis-Mead transmission line ROW in the span between the two existing structures east of the proposed switching station.

A temporary line might be built in order to keep the Davis-Mead transmission line operational while the bulk of the switching station construction is being completed. When the new switching station is complete and ready for energization, the existing Davis-Mead transmission line conductors in the span east of the station would be cut and attached to the new turning structures. New conductors would be installed from the new turning structures to the steel take-off structures within the switching station.

Conservation Measures

BLM and the Applicant have proposed the following measures to minimize negative project impacts to desert tortoises. The project is designed to minimize ground disturbance wherever practicable.

1. *Waste Management Plan.* The Applicant will prepare a Waste Management Plan, in accordance with applicable laws and regulations, which will describe the storage,

transportation, and handling of hazardous materials and wastes; will emphasize the recycling of wastes, where possible; and will identify the specific landfills that will receive wastes that cannot be recycled.

2. *Weed Management Plan.* An Invasive Plant Management Plan will be developed for construction and O&M activities and include results of noxious weed inventories, identification of problem areas, preventative measures, treatment methods, agency-specific requirements, monitoring requirements, and herbicide treatment protocol.

3. *Site Rehabilitation and Facility Decommissioning Plan.* The applicant will develop a Reclamation, Restoration, and Revegetation Plan in consultation with appropriate agencies prior to adoption of the Final Environmental Impact Statement that will guide restoration and revegetation activities for all disturbed lands associated with construction of the project and the eventual termination and decommissioning of the project.

4. *Water Usage.* If water is used for fugitive dust control, it will not be allowed to pool on access roads or other project areas, as this can attract desert tortoises. Similarly, leaks on water trucks and water tanks will be repaired to prevent pooling water.

5. *Minimize Overhead Collection Line.* Collection lines will be buried to the greatest extent feasible to reduce the opportunity for perches for raptors and ravens.

6. *Reduce Night Lighting.* Night lighting will be reduced in all natural areas to avoid unnecessary visual disturbance to wildlife using directed lighting, shielding methods, and/or reduced lumen intensity except as required by regulatory agencies such as the Federal Aviation Administration.

7. *Clean up.* SWEF will ensure that all unused material and equipment will be removed upon completion of construction activities or maintenance activities conducted. Upon completion, all construction equipment and refuse, including, but not limited to wrapping material, cables, cords, wire, boxes, rope, broken equipment parts, twine, strapping, buckets, metal or plastic containers will be removed from the site and disposed of properly. Any unused or leftover hazardous products will be properly disposed of offsite.

8. *Desert Tortoise Fencing.* Desert tortoise fencing will be installed around permanent facility structures including the O&M building and WAPA's proposed switching station.

9. *Desert Tortoise Measures.* The applicant or a qualified consultant will provide for the following to reduce impacts to desert tortoise:

a. A compliance manager will be designated and will oversee compliance monitoring activities and coordination with authorizing agency(s). Compliance activities will at a minimum include conducting preconstruction surveys, assuring proper handling of desert tortoise, adequate staffing of biological monitors during construction, and upholding all authorized conditions. The compliance manager will oversee all compliance documentation including daily observation reports, non-compliance and corrective action reports, and final reporting to any authorized agency upon project completion.

b. Construction monitoring will employ a designated compliance inspection contractor and authorized desert tortoise biologist(s) during the construction phase. A qualified biologist is defined as a person with appropriate education, training, and experience to conduct tortoise surveys, monitor project activities, provide worker education programs, and supervise or perform other implementing actions. An authorized desert tortoise biologist is defined as a wildlife biologist who has been approved to handle desert tortoises by the Service. A minimum of one monitor per crew is needed for construction crews using heavy equipment (e.g., backhoes, large trucks). One roving monitor will monitor multiple times per day in other active construction zones where heavy equipment is not in use.

c. All work area boundaries associated with temporary and permanent disturbances will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers will strictly limit activities and vehicles to the designated work areas.

d. Crushing or removal of perennial vegetation in work areas will be avoided to the maximum extent practicable.

e. Trash and food items will be contained in closed lid (raven- and coyote-proof) containers. Trash will be removed regularly (at least once a week) to reduce the attractiveness to the site to opportunistic tortoise predators such as common ravens and coyotes and to reduce the possibility of animals ingesting or becoming entangled in foreign matter.

f. Pets will not be allowed in working areas unless restrained in a kennel.

g. Where possible, motor vehicles will be limited to maintained roads and designated routes.

h. Desert tortoise caution signs will be installed on turbine access roads.

i. Desert tortoise clearance surveys at the project site must consist of at least two consecutive surveys of the site. Surveys shall involve walking transects less than

or equal to 15-feet (5-meter) wide under typical conditions. In areas of dense vegetation or when conditions limit the ability of the surveyors to locate desert tortoises, transects should be reduced in width accordingly. Clearance surveys should be conducted when desert tortoises are most active (April through May or September through October). If desert tortoises are observed during the second pass, the Service and the appropriate State wildlife agency may require a third survey.

j. All methods used for handling desert tortoises during the clearance surveys must be in accordance with the Desert Tortoise Field Manual (Service 2009). Anyone that handles desert tortoises during clearance activities must have the appropriate authorizations from the Service and the State.

k. During the clearance surveys, desert tortoises in burrows may be removed through tapping or careful excavation. Multiple visits may be necessary if desert tortoises are inaccessible in deep caves or burrows. During all handling procedures, desert tortoises shall be treated in a manner to ensure that they do not overheat or exhibit signs of overheating (e.g., gaping, foaming at the mouth, etc.), or are placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being. Desert tortoises shall be kept shaded at all times until it is safe to release them. Ambient air temperature shall be measured in the shade, protected from wind, at a height of 2 inches (5 centimeters) above the ground surface. All clearance activities (capture, transport, release, etc.) shall occur when ambient temperatures are below 95°F (35°C) and not anticipated to rise above 95°F (35°C) before handling and processing desert tortoises are completed.

l. For desert tortoises that need to be relocated out of harm's way, the tortoise should be placed out of the path of project activity as per the instructions and guidance from the authorized desert tortoise biologist.

m. The area cleared and number of desert tortoises located within that area must be reported to the local Service and the appropriate State wildlife agency. The report should be made in writing, either by mail or email. Notification should be received within one week.

n. For activities conducted between March 15 and November 1 in desert tortoise habitat, all activities in which encounters with tortoises might occur will be monitored by an authorized desert tortoise biologist. The biologist will be informed of tortoises relocated during preconstruction surveys so that he or she could watch for the relocated tortoises in case they attempted to return to the construction site. The authorized desert tortoise biologist will watch for tortoises wandering into the construction areas, check under vehicles, examine excavations and other potential pitfalls for entrapped animals, examine exclusion fencing, and

conduct other activities to ensure that death or injuries of tortoises were minimized.

o. For open trenches, earthen escape ramps will be maintained at intervals of no greater than 0.25 mile. A biological monitor will inspect all trenches, auger holes, or other excavations a minimum of twice per day, and also immediately prior to back-filling. Any wildlife species located will be safely removed and relocated out of harm's way, using a suitable tool such as a pool net when applicable. For safety reasons, biological monitors will under no circumstance enter open excavations.

p. No overnight hazards to desert tortoises (e.g., auger holes, pits, or other steep-sided depressions) will be left unfenced or uncovered; such hazards will be eliminated each day prior to the work crew and biologist leaving the site. Plywood board will be used to cover open hazards. All excavations will be inspected for trapped desert tortoises at the beginning, middle, and end of the work day. Should a tortoise become entrapped, the authorized desert tortoise biologist will remove it immediately.

q. If blasting is required in desert tortoise habitat, a biological monitor will be assigned to each blasting crew or area in which blasting will occur. Prior to any blast, a 200-foot area around the blast site will be surveyed for desert tortoises. Aboveground tortoises will be relocated at least 500 feet from the blast site. Tortoises in burrows within 50 feet of the blast site will be relocated at least 75 feet away from the blast site to an unoccupied existing or artificial burrow. Burrows located between 50 and 150 feet away from the blast site will be flagged and stuffed with newspaper prior to the blast. The newspaper will be removed immediately after the blast and burrows assessed for damage.

r. Routine inspection and maintenance of transmission lines will be limited to the desert tortoise inactive periods of November through February and June through August. All access roads with re-established native vegetation that are used for scheduled, routine maintenance activities will be cleared by a tortoise monitor ahead of any vehicular movement. Should unscheduled, emergency maintenance become necessary, a tortoise monitor will clear the route ahead of vehicular movement.

s. Any incident occurring during project activities that was considered by the biological monitor to be in non-compliance with the mitigation plan will be documented immediately by the biological monitor. The compliance manager will ensure that appropriate corrective action was taken. Corrective actions will be documented by the monitor. The following incidents will require immediate cessation of the construction activities causing the incident, including 1) imminent

threat of injury or death to a desert tortoise; 2) unauthorized handling of a desert tortoise, regardless of intent; 3) operation of construction equipment or vehicles outside a project area cleared of desert tortoise, except on designated roads; and 4) conducting any construction activity without a biological monitor where one is required. If the monitor and compliance inspection manager do not agree, the BLM's compliance officer will be contacted for resolution. All parties would refer the resolution to the BLM's authorized officer.

t. *Worker Environmental Awareness Program.* A Worker Environmental Awareness Program (WEAP) will be prepared. Construction crews and contractors associated with the SWEF or the WAPA switching yard or power line will be required to participate in WEAP training prior to starting work on the project. This instruction will include specific desert tortoise training on distribution, general behavior and ecology, identification, protection measures, reporting requirements, and protections afforded by State and Federal endangered species acts.

u. Parked vehicles will be inspected prior to being moved. If a tortoise is observed beneath a vehicle, the authorized desert tortoise biologist will be contacted to move the animal from harm's way, or the vehicle will not be moved until the desert tortoise left of its own accord. The authorized desert tortoise biologist will be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner is not exposed to temperature extremes that could be harmful to the animal.

v. Should any desert tortoise be injured or killed, all activities will be halted, and the compliance inspection manager and/or authorized desert tortoise biologist immediately contacted. The compliance inspection manager and/or authorized desert tortoise biologist will be responsible for reporting the incident to the authorizing agencies.

w. A report to the Service will be produced reporting all tortoises seen, injured, killed, excavated, or handled. GPS locations of live tortoises will be reported.

x. The applicant will implement a Raven Management Program that will consist of: 1) an annual survey to identify raven nests on towers and any tortoise remains at tower locations; this information will be relayed to BLM so that the ravens and/or their nests in these towers would be targeted for removal, 2) SWEF making an annual or one time contribution to an overall raven reduction program in the Nevada desert, with an emphasis on raven removal in the vicinity of this project.

y. BLM will hold a preconstruction meeting with Duke Energy and the compliance inspection contractor (CIC) to discuss implementation of the terms and conditions of the biological opinion.

In addition, BLM proposes the additional measures described in detail below that include 1) a transportation plan to reduce potential mortality from vehicles during construction, restoration, and O&M and 2) the payment of remuneration fees to compensate for the loss of desert tortoise habitat from the SWEF (Appendix A).

10. *Transportation Plan.* The transportation plan will be implemented during construction, O&M, and reclamation. The year will be divided into three periods based on Mojave desert tortoise activity levels as follows:

    - High activity period – April 1 to May 31 and September 1 to October 31
    - Moderate activity period – March 1 to March 31 and June 1 to August 31
    - Low activity period – November 1 to February 28 or 29

    During the high activity periods, a speed limit of 15 miles per hour will be maintained on all roads related to access for construction, post-construction (i.e., operation), and restoration. One biological monitor will travel in front of each piece of construction, post-construction, and restoration equipment and other construction-related vehicles entering and exiting the construction areas. If possible, construction, post-construction, and restoration equipment will be grouped while being escorted by a biological monitor entering and exiting the construction areas. Vans, busses, or carpooling will be employed to reduce the number of worker-related vehicles within the construction, post-construction, and restoration areas. These vehicles will be grouped and escorted by a biological monitor entering and exiting the construction, post-construction, and restoration area.

    During the moderate activity period of March 1 to March 31, low activity measures (see below) will be in effect until the temperature exceeds 68°F for three consecutive days or a tortoise is observed. If a tortoise is observed or the temperature exceeds 68°F for three consecutive days, minimization measures for the high activity period will take effect unless the weather forecast for the next day is for the temperature to drop below 68°F.

    During the moderate activity period of June 1 to August 31, high activity measures will be in effect until the temperature exceeds 95°F. After the temperature exceeds 95°F, minimization measures for the low activity period will take effect.

    During the low activity periods, a speed limit of 20 miles per hour will be maintained on all roads related to access for construction, post-construction, and restoration. Construction, post-construction, and restoration equipment entering and exiting a construction site will not need to be escorted by a biological monitor. Vans, busses, or carpooling will be optional to reduce the number of worker-related vehicles within the construction, post-construction, and restoration areas. Vans, busses, or carpooling will

still be recommended to reduce the number of worker-related vehicles in construction areas.

11. *Remuneration Fees.* BLM will ensure payment by the project proponent of remuneration fees (see Tetra Tech 2012 for more details).

Remuneration fees would be used for management actions expected to promote recovery of the desert tortoise over time. Actions may involve habitat acquisition, population or habitat enhancement, increasing knowledge of the species' biological requirements, reducing loss of individual animals, documenting the species status and trend, and preserving distinct population attributes (Hastey et al. 1991, BLM 2010).

DESCRIPTION OF THE ACTION AREA

The action area is defined as all areas to be affected directly or indirectly by the Federal action, including interrelated and interdependent actions, and not merely the immediate area involved in the action (50 CFR § 402.02). Subsequent analyses of the environmental baseline, effects of the action, cumulative effects, and levels of incidental take are based upon the action area as determined by the Service. Regulations implementing the Act define the environmental baseline as the past and present effects of all Federal, State, or private actions and other human activities in the action area (50 CFR § 402.02). Also included in the environmental baseline are the anticipated effects of all proposed Federal projects in the action area that have undergone section 7 consultation, and the effects of State and private actions that are contemporaneous with the consultation in progress.

The action area for the SWEF project includes the turbine pads, new and upgraded roads and crane pads, O&M facility, the equipment storage and construction laydown areas, the overhead transmission line ROW, substations, batch plant, meteorological towers, and WAPA's switching station, which combined account for approximately 388.5 acres of surface disturbance (Figure 2). To address adverse effects to desert tortoises whose home ranges overlap all project features, the action area also includes a 0.5-mile buffer surrounding all project features and isolated islands of habitat surrounded by features that may not otherwise be within the 0.5-mile buffer, which accounts for approximately 21,750 acres (Figure 2).

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATION

Jeopardy Determination

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and

recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion considers the effects of the proposed Federal action, and any cumulative effects, on the rangewide survival and recovery of the desert tortoise. It relies on four components: 1) the Status of the Species, which describes the rangewide condition of the desert tortoise, the factors responsible for that condition, and its survival and recovery needs; 2) the Environmental Baseline, which analyzes the condition of the desert tortoise in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the desert tortoise; 3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the desert tortoise; and 4) the Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the desert tortoise.

Adverse Modification Determination

Section 7(a)(2) of the Act also requires that Federal agencies ensure that any action they authorize, fund, or carry out does not result in the destruction or adverse modification of designated critical habitat. Our analysis of effects to desert tortoise designated critical habitat follows Service-issued guidance: *Application of the "Destruction or Adverse Modification" Standard under section 7(a)(2) of the Endangered Species Act* issued on December 9 2004. The guidance addresses the 9th Circuit Court of Appeals ruling in *Gifford Pinchot Task Force v U.S. Fish and Wildlife Service*, No. 03-35279 (August 6, 2004) and states that an evaluation of effects to designated critical habitat should consider the concepts embodied in the sections 3 (definitions of "critical habitat" and "conservation"), 4 (the procedures for delineating and adjusting areas included in a designation) and 7 (the substantive standard in paragraph (a)(2) and the procedures in paragraph (b)) and focus on the function and conservation role of both the affected critical habitat unit (CHU) as well as the entire designation.

The critical habitat within the action area includes undisturbed desert tortoise habitat, as well as degraded areas as a result of previous projects and activities. When critical habitat was designated in 1994, disturbances to desert tortoises and their habitat in the action area included off-road vehicle (ORV) activity, mining, transmission lines, and roads (Service 1994). Desert tortoise habitat conditions and disturbances in the action area are similar to those identified in 1994 and also include drought and fire (Service 2011). Desert tortoise critical habitat is composed of specific geographic areas that contain the primary constituent elements (PCEs) of critical habitat, consisting of the biological and physical attributes essential to the species' conservation within those areas. Undisturbed designated critical habitat in the action area retains the PCEs of critical habitat as discussed below.

PCE 1: Sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow. Urban and agricultural development, concentrated use by ORVs, and other activities of this nature completely remove habitat. Although we are aware of local areas within the boundaries of critical habitat that have been heavily disturbed by the unauthorized use of such activities, we do not know of any areas that have been disturbed to the intensity and extent that this PCE has been compromised. To date, the largest losses of critical habitat are likely the result of the widening of existing freeways. Despite these losses of critical habitat, which occur in a linear manner, the CHUs continue to support sufficient space to support viable populations within each of the five recovery units.

In some cases, major roads likely disrupt the movement, dispersal, and gene flow of desert tortoises. Highways 58 and 395 in the Fremont-Kramer CHU; U.S Highway 95 in the PECHU; and Fort Irwin Road in the Superior-Cronese CHU are examples of large and heavily traveled roads that likely disrupt movement, dispersal, and gene flow. Roads that have been fenced and provided with underpasses may alleviate this fragmentation to some degree; however, such facilities have not been in place for sufficient time to determine whether they would eliminate this effect.

The threats of invasive plant species described in the revised recovery plan generally do not result in the removal of this PCE because they do not convert habitat into impervious surfaces, such as urban development would.

PCE 2: Sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species. This PCE addresses the ability of critical habitat to provide adequate nutrition to desert tortoises. As described in the revised recovery plan and 5-year review, grazing, historical fire, invasive plants, altered hydrology, drought, wildfire potential, fugitive dust, and climate change/temperature extremes contribute to the stress of "nutritional compromise." Paved and unpaved roads through critical habitat of the desert tortoise provide avenues by which invasive native species disperse; these legal routes also provide the means by which unauthorized use occurs over large areas of critical habitat. Nitrogen deposition from atmospheric pollution likely occurs throughout the entire CHUs and exacerbates the effects of the disturbance of substrates. Because paved and unpaved roads are so widespread through critical habitat, we expect that this threat has, to some degree, compromised the conservation value and function of critical habitat throughout the range of the desert tortoise.

PCE 3: Suitable substrates for burrowing, nesting, and overwintering. Surface disturbance, motor vehicles traveling off route, use of off-highway vehicle management areas, off-highway vehicle events, unpaved roads, grazing, historical fire, wildfire potential, altered hydrology, and climate change leading to shifts in habitat composition and location, storms, and flooding can alter substrates to the extent that they are no longer suitable for burrowing, nesting, and overwintering; erosion caused by these activities can alter washes to the extent that desert tortoise burrows placed along the edge of a wash, which is a preferred location for burrows, could be destroyed. We expect that the area within critical habitat that is affected by ORV use to

the extent that substrates are no longer suitable is relatively small in relation to the area that desert tortoises have available for burrowing, nesting, and overwintering; consequently, we expect that ORV use does not have a substantial effect on this PCE.

Most livestock allotments have been eliminated from within the boundaries of critical habitat. Additionally, we expect that livestock would compact substrates to the extent that they would become unsuitable for burrowing, nesting, and overwintering only in areas of concentrated use, such as around watering areas and corrals. Because livestock grazing occurs over a relatively small portion of critical habitat and the substrates in most areas within livestock allotments would not be substantially affected, we expect that suitable substrates for burrowing, nesting, and overwintering remain throughout most of the CHUs.

PCE 4: Burrows, caliche caves, and other shelter sites. We expect that human-caused effects to burrows, caliche caves, and other shelter sites likely occur at a similar rate as effects to substrates for burrowing, nesting, and overwintering for the same general reasons. Consequently, we expect that sufficient burrows, caliche caves, and other shelter sites remain throughout most of the CHUs.

PCE 5: Sufficient vegetation for shelter from temperature extremes and predators. In general, sufficient vegetation for shelter from temperature extremes and predators remains throughout critical habitat. In areas where large fires have occurred in critical habitat, many of the shrubs that provide shelter from temperature extremes and predators have been destroyed; in such areas, cover sites may be a limiting factor. The proliferation of invasive plants poses a threat to shrub cover throughout critical habitat as the potential for larger wildfires increases.

In 2005, wildfires in Nevada, Utah, and Arizona burned extensive areas of critical habitat. The revised recovery plan notes that the fires caused statistically significant losses of perennial plant cover, although patches of unburned shrubs remained. Given the patchiness with which the PCEs of critical habitat are distributed across the CHUs and the varying intensity of the wildfires, we cannot quantify precisely the extent to which these fires disrupted the function and value of the critical habitat.

PCE 6: Habitat protected from disturbance and human-caused mortality. In general, the Federal agencies that manage lands within the boundaries of critical habitat have adopted land management plans that include implementation of some or all of the recommendations contained in the original recovery plan for the desert tortoise. To at least some degree, the adoption of these plans has resulted in the implementation of management actions that are likely to reduce the disturbance and human-caused mortality of desert tortoises. For example, these plans resulted in the designation of open routes of travel and the legal closure (and, in some cases, physical closure) of unauthorized routes. Numerous livestock allotments have been relinquished by the permittees and retired by BLM and the National Park Service. As a result of planning efforts, BLM's record of decision included direction to withdraw areas of critical habitat from mineral entry. As a result of actions on the part of various agencies, many miles of highways and

other paved roads have been fenced to prevent desert tortoises from wandering into traffic and being killed. The Service and other agencies of the Desert Managers Group in California are implementing a plan to remove common ravens that prey on desert tortoises and to undertake other actions that would reduce subsidies (i.e., food, water, sites for nesting, roosting, and perching, etc.) that facilitate their abundance in the California desert.

Despite the implementation of these actions, disturbance and human-caused mortality continue to occur in many areas of critical habitat (which overlap the desert wildlife management areas to a large degree and are the management units for which most data are collected) to the extent that the conservation value and function of critical habitat is, to some degree, compromised. For example, many highways and other paved roads in California remain unfenced. Twelve desert tortoises were reported to be killed on paved roads from within Mojave National Preserve in 2011; we fully expect that desert tortoises are being killed at similar rates on many other roads, although these occurrences are not discovered and reported as diligently as by the National Park Service.

Unauthorized ORV use continues to disturb habitat and result in cleared areas within the boundaries of critical habitat in California (e.g., Coolgardie Mesa in the Western Mojave Recovery Unit); although we have not documented the death of desert tortoises as a result of this activity, it likely occurs. Additionally, the habitat disturbance caused by this illegal activity exacerbates the spread of invasive plants, which displace native plants that are important forage for the desert tortoise, thereby increasing the physiological stress faced by desert tortoises.

STATUS OF THE SPECIES AND CRITICAL HABITAT RANGEWIDE

The rangewide status of the desert tortoise and its critical habitat consists of information on its listing history, species account, recovery plan, recovery and CHUs, distribution, reproduction, and numbers. This information is dated February 9, 2012, and provided on the Service's website at: http://www.fws.gov/nevada/desert_tortoise/dt_life.html. If unavailable on this website, contact the Nevada Fish and Wildlife Office in Las Vegas at (702) 515-5230, and provide File No. 84320-2012-F-0211 along with the date of February 9, 2012. Additional information is provided in our 5-year review (Service 2010a) and revised recovery plan for the Mojave desert tortoise (Service 2011).

ENVIRONMENTAL BASELINE

Status of the Desert Tortoise in the Action Area

The project is located on the boundary between the Eastern Mojave and Colorado Desert Recovery Units for desert tortoise. The vegetation present in the action area is characteristic of the Mojave Desert Scrub biome and is comprised of creosote bush (*Larrea tridentata)*, Joshua tree (*Yucca brevifolia*), Mojave yucca (*Yucca schidigera*), white bursage (*Ambrosia dumosa*), and several species of cholla cactus (*Opuntia* spp.). A number of other shrub and annual plant

species are generally also present. The elevation ranges from 2,240 to 4,327 feet above mean sea level. The northern portion of the project area is characterized by a higher variation in both topography and vegetation including Joshua tree woodlands when compared to the WAPA portion, which is flat, primarily in the valley floor and contains a more uniform, creosote bush-dominated habitat. The action area is situated along a bajada (alluvial fan) which extends north, south, and east from the town of Searchlight. According to GAP analysis, six GAP vegetative communities exist within the project area: Sonoran-Mojave Creosote bush-White Bursage Desert Scrub, Mojave Mid-Elevation Mixed Desert Scrub, North American Warm Desert Wash, North American Warm Desert Bedrock Cliff and Outcrop, Sonora-Mojave Mixed Salt Desert Scrub, and Intermountain Basins Semi-Desert Shrub Steppe (see Figure 2 in Tetra Tech 2012). Soil largely consists of sandy, stony loam with abundant rock/boulder deposition and dry washes exist throughout the project area. The weather at the project area is characterized by extreme temperatures and dry conditions; the area receives approximately 7 inches of precipitation annually.

Desert tortoise surveys were conducted in accordance with Service protocol (Service 2010) by qualified field biologists from April 4 to May 16, 2011. This survey time encompassed the desert tortoise active season of April to May; a timeframe selected to minimize the probability of the temperature rising above 40 °C which serves as a temperature threshold for desert tortoise activity (Zimmerman et al. 1994; Freilich et al. 2000; Nussear et al. 2007). All survey methods were reviewed and agreed to by BLM and the Service prior to conducting surveys.

A 200-foot buffer was placed around all approximately mapped final locations of project features (survey boundary in Figure 3), and desert tortoise surveys were conducted within this buffer. This survey area is a smaller part of the Action Area (Figures 2 and 3). In some areas, intersecting facilities created isolated islands of habitat that were not included in a survey corridor. Per discussions with BLM, these islands were included in the survey area in order to best assess desert tortoise density and assess project impacts. Therefore, the survey area totaled 3,612 acres (600-foot exterior belt transect in Figure 3). The survey area is within the known range of the desert tortoise (Service 2010b). Although the 3,612 acre (14.6 km^2) survey area is above the 4.5 km^2 threshold needed for probabilistic sampling (Table 2 of Service 2010b), the linear features of the project required 100 percent coverage methods for the pre-construction survey. Therefore, 100 percent coverage surveys were completed throughout the entirety of the described survey area.

A total of 122 live desert tortoises were located within the survey area. Ninety-five occurred within the main survey boundary, 19 occurred along the exterior belt transects, and 8 occurred incidentally outside of the survey area (Figure 3). However, the Service takes into account only adult tortoises above 160 millimeters midline carapace length for abundance estimates (Service 2010b). Of the 122 live tortoise detected, 60 met this requirement. Using the "number of tortoises observed within the action area equation" (Table 3 of Service 2010b) and average monthly precipitation from the winter (October through March) preceding the surveys averaged

37 millimeters (1.463 inches) per month, 150 tortoises are estimated to occur within the 3,612 acre survey area.

Other observed and documented desert tortoise sign included 240 pieces of scat, 95 carcasses, 750 tortoise burrows, and 22 pieces of miscellaneous sign (1 courtship ring, 2 egg shell fragments, 19 bone/scute fragments; Table 1).

Table 1. Summary of Live Desert Tortoise and Desert Tortoise Sign Detected within the Action Area

Area Surveyed		
Detection Type	Action Area	Exterior Belt Transect
Live Desert Tortoise	95	19
Burrows	650	100
Carcasses	74	21
Scat	220	20

Based on the 150 tortoises estimated from the 2011 surveys, an approximate desert tortoise density for the proposed action was calculated using the tortoise density calculator (Service 2010b). As the survey methods covered 100 percent of the survey area, the total area used for density calculations was 3,612 acres (14.6 km^2). The tortoise density, then, was calculated to be approximately 0.04 tortoises per acre or 10.2 tortoises per km^2. Because similar quality habitat occurs in the area surrounding the survey area, we assume a similar density of tortoises is present throughout the Action Area.

The majority of tortoises and sign were observed in the lower elevation, creosote scrub flats of the northern and southern survey area (Figure 3 and 4). These sections consist of substrate suitable for burrow construction and numerous washes, as well as abundant preferred food sources of the desert tortoise (e.g., globe mallow and desert marigold). Such characteristics of suitable substrate and quality food source provide higher quality habitat thus increasing the potential for encountering tortoise in the lower elevation flats represented in the northern and southern sections.

The higher elevation areas within the action area are much rockier, with steeper slopes and less abundant food sources. Although still considered suitable desert tortoise habitat, these characteristics are less favorable to desert tortoise thus reducing the potential for desert tortoise encounters in those portions of the project containing this type of habitat. Although survey results demonstrate desert tortoise are more widely distributed in the lower elevation flats of the project area, a large amount of sign was observed and documented in these higher elevation areas (Figure 4).

We recognize that the survey data used for these estimates represents a single point in time and the number of individuals in these areas can change in response to environmental conditions. Efforts to accurately estimate the number of desert tortoises that may be encountered on linear projects such as the SWEF are difficult. Variables that affect the number of tortoises occurring

or entering the action area include habitat quality, season, temperature, and precipitation. All desert tortoises may not have been detected during the survey; some desert tortoises may die or may leave the project area before construction commences; other unaccounted desert tortoises may move onto the site before construction begins; and undetected hatchling desert tortoises may emerge from rodent burrows or nests on, or adjacent to the ROW. However, the information above provides the best available data to establish a baseline for analysis.

Status of the Critical Habitat in the Action Area

The vegetation present in critical habitat within the undisturbed action area is characteristic of the Mojave Desert Scrub biome and is comprised of creosote bush (*Larrea tridentata)*, Joshua tree (*Yucca brevifolia*), Mojave yucca (*Yucca schidigera*), white bursage (*Ambrosia dumosa*), and several species of cholla cactus (*Opuntia* spp.). A number of other shrub and annual plant species are generally also present. The elevation ranges from 2,240 to 4,327 feet above mean sea level. A small amount of the proposed project occurs in the PECHU (Figure 5), which totals 516,655 acres. As a result of the proposed project, 7 acres of critical habitat, where the WAPA transmission line would be constructed, would be disturbed. This accounts for a statistically insignificant amount of habitat disturbance in the PECHU.

Factors Affecting the Species and its Critical Habitat in the Action Area

Currently, there are three sites in the testing phase for wind energy development on BLM-managed lands within a 20 mile radius of the SWEF. One other site on BLM-managed lands approximately 35 miles northwest of the project is pending authorization for development of a wind energy facility. Two solar energy facilities on privately-owned lands occur approximately 20 miles north of the SWEF. Additionally, several competitive ORV races occur in the Laughlin and Searchlight areas. The Hare Scrambles Championship Team Race is a 37-mile course with a start and finish point located approximately 10 miles west of Laughlin off of SR 163. DNF Racing's SNORE-Laughlin Rage at the River is another competitive ORV race held in the Laughlin area over an 11.8-mile race course. SCORE's Laughlin desert challenge truck and buggy race is a 3-day event held every January on an approximately 6.5-mile designated loop course near Laughlin. The Searchlight Grand Prix is a motorized event held every year during a weekend in November on an approximately 10-mile designated loop that includes both private streets in Searchlight as well as BLM-designated routes through desert tortoise habitat.

Section 7 Consultations Affecting the Proposed Project Area

The following consultations address areas that overlap the action area addressed in this biological opinion.

On November 25, 1997, the Service issued a Programmatic Biological Opinion (PBO) (File No. 1-5-97-F-251) to BLM for implementation of various land management programs within the Las Vegas District planning area excluding desert tortoise critical habitat and ACECs, and outside the

Las Vegas Valley. Activities proposed that may affect the desert tortoise in the action area include issuance of ROW, Recreation and Public Purposes leases, mineral material sales and leases, and mining plans of operation. The PBO is limited to activities which may affect up to 240 acres per project, and a cumulative total of 10,000 acres excluding land exchanges and sales. Only land disposals by sale or exchange in Clark County (but outside the Las Vegas Valley) are covered under the consultation up to a cumulative total of 14,637 acres. Thus, a maximum total of 24,637 acres of desert tortoise habitat may be affected by the proposed programmatic activities.

On June 18, 1998, the Service issued a PBO (File No. 1-5-98-F-053) to BLM for implementation of various land management programs within desert tortoise habitat and the Las Vegas planning area, including desert tortoise critical habitat and ACECs. Activities that were proposed that may affect the desert tortoise in the action area include recreation; designation of utility corridors and mineral material extraction areas and designation of the Piute-Eldorado ACEC.

Habitat Conservation Plans

Since the Mojave population of the desert tortoise was first listed under the Act in 1989, three regional-level habitat conservation plans (HCPs) have been implemented for development of desert tortoise habitat in Clark County, Nevada. Approximately 89 percent of Clark County consisted of public lands administered by the Federal government, thereby providing little opportunity for mitigation for the loss of desert tortoise habitat under an HCP on non-Federal lands. Alternatively, funds are collected under HCPs and spent to implement conservation and recovery actions on Federal lands as mitigation for impacts that occur on non-Federal lands. Lands managed by BLM are included in these areas where mitigation funds are used to promote recovery of the desert tortoise. Actions taken in relation to the HCPs mentioned here are/were taken in areas that overlap the action area addressed in this biological opinion.

On November 22, 2000, the Service issued an incidental take permit (TE-034927) to Clark County, Nevada, including cities within the County and Nevada Department of Transportation (NDOT). This HCP is the only regional HCP in place that overlaps the action area. The incidental take permit allows incidental take of desert tortoises for a period of 30 years on 145,000 acres of non-Federal land in Clark County, and within NDOT ROWs, south of the 38th parallel in Nevada. The multiple species habitat conservation plan (MSHCP) and Environmental Impact Statement (RECON 2000), serves as the permittees' HCP and details their proposed measures to minimize, mitigate, and monitor the effects of covered activities.

EFFECTS OF THE PROPOSED ACTION ON THE DESERT TORTOISE AND ITS DESIGNATED CRITICAL HABITAT

Project Effects on Desert Tortoise

Direct effects are the immediate, often obvious effect of the proposed action on the desert tortoise or its designated critical habitat. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur (50 CFR § 402.02). In contrast to direct effects, indirect effects can be more subtle, and may affect desert tortoise populations and habitat quality over an extended period of time, long after project activities have been completed. Indirect effects are of particular concern for long-lived species such as the desert tortoise, because project-related effects may not become evident in individuals or populations until years later.

Effects from Construction and O&M

Death and injury of desert tortoises could result from excavation activities such as clearing and grubbing of vegetation; trenching activities and entrapment in open trenches and pipes; and collisions with or crushing by vehicles or heavy equipment, including individuals that take shelter under parked vehicles and are killed or injured when vehicles are moved. Desert tortoises that enter or attempt to cross project access roads may be struck resulting in death or injury. Mortality mechanisms also include individual desert tortoises or their eggs being crushed or buried in burrows during construction and O&M-related activities. Because of increased human presence in the area, desert tortoises may be killed or injured due to collection or vandalism associated with increased encounters with workers, visitors, and unauthorized pets. Desert tortoises may ingest or be entangled in trash or debris left on work sites, which may lead to death or injury (Walde et al. 2007). Desert tortoises may be attracted to the construction area by application of water to control dust, placing them at higher risk of death or injury. Desert tortoises may be adversely affected by construction noise, ground vibrations, and artificial lighting (Ruby et al. 1994). Culverts used in constructed roads may be used as burrows and shelter by desert tortoises, and tortoises could be trapped or entombed by debris or mud if culverts are not properly designed (Lovich et al. 2011). Long-term effects from wind energy facilities to desert tortoise populations are not well understood as only one facility currently exists; monitoring results from this facility have indicated that over time, desert tortoises appear to avoid areas of high turbine density and activity (Dr. Jeff Lovich, 2012, personal communication).

We estimate that all life stages of desert tortoise that occur on the SWEF and in harm's way on other project activity areas described above may be adversely affected by the proposed action. Our estimate of the numbers of desert tortoises and eggs that are likely to occur within the action area is mostly from pre-project survey data. We acknowledge, however, that not all individuals killed or injured during construction, operations, and maintenance activities will be detected by biological monitors or project staff and subsequently reported to us. The inability to detect all tortoises is largely due to the cryptic nature of desert tortoises, fossorial habits, and limited

abundance; and in the case of juveniles and eggs, their small size and location underground reduce detection probabilities of these life stages. Another confounding factor is that scavengers may locate, consume, or remove tortoise carcasses before monitors can locate them.

Overall, we expect death and injury of most subadult and adult tortoises to be avoided during construction and O&M activities through implementation of and compliance with proposed Conservation Measures. A waste management plan (Conservation Measure 1) and proper clean up after construction and maintenance activities (Conservation Measure 7) will reduce the likelihood of a desert tortoise ingesting or being entangled in trash or debris. Implementation of Conservation Measure 4 will minimize pooled water and leaks from water trucks and tanks and thus reduce this potential attractant that could draw desert tortoises to roads. Fencing of project features (Conservation Measure 8) where more human activity is likely to occur during O&M activities will reduce human-tortoise encounters. Employment of a WEAP, FCRs, authorized desert tortoise niologists, and biological monitors (Conservation Measure 9) will reduce tortoise occurrence in areas of surface-disturbing activities.

Project Access Effects

Primary access to the SWEF site would be via US-95 and SR-164. Access to project features would require construction of approximately 27.5 miles of access roads and the upgrading of approximately 9.4 miles of existing roads. Effects from the construction of access roads and upgrading of existing roads are described above (see *Construction and O&M*).

The primary effect of project access on desert tortoises is the risk of vehicle strikes due to the potential increase use of roads. Project access roads also may increase public use in the action area, which could result in additional morality or injury to desert tortoises. If designated project roads are not used, vehicles use could lead to soil compaction and vegetation changes, including decreased native plant cover and diversity, and increased erosion and non-native, invasive plant cover within the action area.

Implementation of Conservation Measures 2, 8, 9, and 10 are expected to minimize impacts to desert tortoises from increased vehicular use within the action area. Because 1) all workers will participate in the WEAP (Conservation Measure 9.s.), 2) desert tortoise caution signs will be installed on turbine access roads (Conservation Measure 9.h.), and 3) a transportation plan will be enforced to reduce speed limits from 20 miles per hour during desert tortoise low activity periods to under 15 miles per hour during desert tortoise high activity periods (Conservation 10), workers may be less likely to strike desert tortoises than a casual user. In addition, clearance surveys (Conservation Measures 9.q. and 10) and the use of authorized desert tortoise biologists and monitors during construction of the access roads (Conservation Measures 9.a. and 9.b.).

We cannot predict how many individuals will be killed or injured due to project-related access because of variables such as weather conditions, the nature and condition of roads, public use which may be confused with project use, and activity patterns of desert tortoises at the time the roads are in use; however, we expect this number to be small.

Effects of Habitat Loss and Fragmentation

Approximately 388.5 acres of occupied desert tortoise habitat would be disturbed as a result of the proposed project (Table 2). This disturbance would occur within a larger project boundary (Figure 2). Although the majority of the project would not occur in designated CH, habitat throughout the project area has similar characteristics to that in the PECHU which surrounds it. Habitat in this area has been modeled as highly suitable for desert tortoises (Nussear et al. 2009), and tortoise surveys conducted for the SWEF project indicate a moderate to high density of tortoises in the area. The removal of food and shelter resources used by desert tortoises could cause tortoises to alter their use of the area or leave it completely. Surface-disturbing activities resulting from the construction of project features could increase erosion, leading to degraded habitat (Belnap et al. 2008), which may have a negative impact on desert tortoises.

Table 2. Anticipated disturbance of desert tortoise habitat that would result from the SWEF project.

Project Feature	Total Acres of New Habitat Disturbance (acres)	Approximate Temporary Construction Disturbance (acres)[1/]	Approximate Permanent Construction Disturbance (acres)
Turbine pads	69.2	66	3.2
New and upgraded project roads and crane pads[2/]	253.0	111.4	141.6
Operations and maintenance facility	6.5	1.5	5.0
Equipment storage and construction laydown areas[3/]	28.3	28.3	0
Overhead transmission line right-of-way	16.5	16.5	0
Substations	7.0	5.0	2.0
Batch plant	1.0	1.0	0
Meteorological towers	0.01	0	0.01
WAPA's switching station	6	2.5	3.5
Total Estimated Impacts	**388.5**	**232.2**	**155.3**

1/ Temporary construction impacts are in addition to permanent impacts.
2/ Restoration of roadsides.
3/ Includes temporary office trailers and crane assembly areas.

Because recovery of vegetation in the desert can take decades or longer, we consider all ground-disturbing impacts associated with the proposed project to be long-term. Vasek et al. (1975) determined that in the Mojave Desert transmission line construction and O&M activities resulted in an unvegetated maintenance road, enhanced vegetation along the road edge and between tower sites (often dominated by nonnative species), and reduced vegetation cover under the towers, which recovered significantly but not completely in about 33 years. Webb (2002) determined that extensive disturbance and compaction in the Mojave Desert with no active restoration, soils in this environment could take between 92 and 124 years to recover. Other studies have shown that recovery of plant cover and biomass in the Mojave Desert could require 50 to 300 years in the absence of restoration efforts (Lovich and Bainbridge 1999). Based on a quantitative review of studies evaluating post-disturbance plant recovery and success in the Mojave and Sonoran

deserts, Abella (2010) determined that reestablishment of perennial shrub cover (to amounts equivalent to undisturbed areas) generally occurs within 100 years but no fewer than 40 years in some situations. He also determined that a number of variables likely affect vegetation recovery times, including but not limited to climate (e.g., precipitation and temperatures), invasion by nonnative plant species, and the magnitude and extent of ongoing disturbance.

Habitat fragmentation by roads and other project features are likely to alter desert tortoise distribution and use of the project area. Desert tortoise use of the project area may decrease or discontinue due to the increased density and use of roads, especially during construction when traffic volume will be highest (Hoff and Marlow 2002, Boarman and Sazaki 2006). Latch et al. (2011) demonstrated that roads, regardless of traffic volume and construction material, can significantly influence desert tortoise movements and therefore, gene flow at the local population level with almost immediately detectable effects. We expect these effects to be subtle and not immediately obvious but detectable over the duration of the project.

We anticipate some tortoises using the Action Area may shift or reduce their home ranges due to habitat fragmentation and degradation, but much of the habitat will remain intact and suitable and continue to be used by tortoises. Additionally, by implementing a weed management plan (Conservation Measure 2) and site rehabilitation and facility decommissioning plan (Conservation Measures 3) and restricting vehicles from inadvertent habitat disturbance, the extent of habitat fragmentation and degradation will be minimized.

Effects from Desert Tortoise Handling

Capturing and handling of tortoises for the purpose of moving them out of harm's way may result in accidental death or injury if these methods are performed improperly, such as during extreme temperatures, or if individuals void their bladders and are not rehydrated. Averill-Murray (2002) determined desert tortoises that voided their bladders during handling had lower overall survival rates (0.81 to 0.88) than those that did not void (0.96). If multiple desert tortoises are handled by biologists without the use of appropriate protective measures and procedures, such as reused latex gloves, pathogens may be spread among individuals. Because the Applicant would employ desert tortoise biologists approved by the Service and adhere to the most recent handling guidelines, we anticipate any mortality or injury to desert tortoises from activities associated with removing individuals from the proposed project site is unlikely.

Effects from Relocating Desert Tortoises

The Applicant provided measures include protocols to minimize effects to desert tortoises from moving them. Desert tortoises located in harm's way would be moved a safe distance from the location they were detected to an area of undisturbed desert habitat (e.g., more than 200 feet but less than 1,000 feet, at the discretion of the qualified desert tortoise biologist but would not be translocated as a result of the project. Because relocated tortoises would be moved a short distance and within their home ranges, we do not anticipate density-dependent effects to the population within the Action Area. Because the Applicant would employ desert tortoise

biologists approved by the Service and adhere to the most recent Service guidance in addition to implementing the conservation measures (Conservation Measure 9) outlined in the proposed action, we anticipate any mortality or injury to desert tortoises from activities associated with relocating individuals into nearby areas within the Action Area is unlikely.

Effects from Predator Subsidies

Common ravens and coyotes are attracted to human activities in the desert because of food and water subsidies, and roosting and nesting substrates that would otherwise be unavailable. Human activities also facilitate expansion of raven and coyote populations into areas where they were previously absent or in low abundance. Ravens likely will frequent the project areas because of the potential availability of such subsidies. Road-kill of wildlife along US-95 and SR-164 provides additional attractants and subsidies for opportunistic predators and scavengers; road-kill is not likely to increase appreciably as a result of the project as US-95 and SR-164 are heavily traveled highways.

Facility infrastructure, such as power poles, fences, buildings, and other structures on the project site, may provide perching, roosting, and nesting opportunities for ravens and other avian predators. Natural predation rates may be altered or increased when natural habitats are disturbed or modified. As stated above, common raven populations in some areas of the Mojave Desert have increased 1,500 percent from 1968 to 1988 in response to expanding human use of the desert (Boarman 2002). Since ravens were scarce in the Mojave Desert prior to 1940, the existing level of raven predation on juvenile desert tortoises is considered an unnatural occurrence (BLM 1990). In addition to ravens, feral dogs have emerged as significant predators of desert tortoises adjacent to residential areas. Though feral dogs may range several miles into the desert and have been found digging up and killing tortoises (Evans 2001), we are not aware of any reports of feral dogs in the project area.

To avoid and minimize the availability of project sources for predator, subsidies will be minimized by Conservation Measure 9.w., which proposes monitoring for the presence of ravens and other predators. Conservation Measures 1, 5, and 9.e. will minimize terrestrial predators and raptors and ravens in the project area by reducing attractants and perching opportunities. Specific minimization actions to be implemented include onsite trash management, elimination of available water sources, designing structures to discourage potential nest sites, use of hazing to discourage raven presence, and active monitoring of the site for presence of ravens.

Effects from Nonnative Plant Species

Another indirect effect from the development of the proposed project is the potential introduction and spread of nonnative, potentially invasive plant species into habitats adjacent to the project sites. Construction and O&M activities of the proposed project components may increase distribution and abundance of nonnative species within the action area due to ground-disturbing activities that favor these species. Project equipment may transport nonnative propagules into the project area where they may become established and proliferate. In addition, the introduction

of nonnative plant species may lead to increased wildfire risk, which ultimately may result in future habitat losses (Brooks et al. 2003) and changes in forage opportunities for desert tortoises.

The Applicant proposed conservation measures as part of the proposed action to address the potential effects from nonnative plant species. Conservation Measure 2 describes a Weed Management Plan, which will be approved by BLM prior to the initiation of ground-disturbing activities. Measures in the Weed Management Plan include: noxious weed inventory, identification of problem areas, preventative measures, herbicide treatment methods and protocol, monitoring requirements. Conservation Measure 3 describes a Site Rehabilitation and Facility Decommissioning Plan, which will include restoration and revegetation activities that should address nonnative plant infestations.

While we cannot reasonably predict the increase in nonnative species abundance that this project may cause within the action area, the degradation of habitat due to spread of nonnative plants would be minimized through the measures outlined above and in the Weed Management Plan.

Edge Effects

Increased noise levels and the presence of full-time facility lighting may affect desert tortoise behavior during construction and operations of the facility over a 30-year period. While limited data exist on the effect of noise on desert tortoises, Bowles et al. (1999) demonstrated that the species has relatively sensitive hearing (i.e., mean = 34 dB SPL), but few physiological effects were observed with short-term exposures to jet aircraft noise and sonic booms. These results cannot be extrapolated to chronic exposures over the lifetime of an individual or a population. Additionally, we do not have sufficient data documenting the effects of seismic vibrations or artificial lighting on desert tortoise behavior and therefore, cannot reasonably predict the magnitude of effect noise, seismic vibrations, or light will have on adjacent desert tortoise populations. Based on the ability of other species to adapt to noise disturbance, noise attenuation as distance from the project increases, and the fact that desert tortoises do not rely on auditory cues for their survival, we do not expect any desert tortoises to be injured or killed as a result of project-related noise impacts. In addition, the Applicant has included measures as part of the proposed action to minimize noise and light-related impacts to the species (Conservation Measure 6).

Because few data exist relative to edge effects from noise, light, vibration, and increased dust from construction and O&M activities, we cannot determine how these potential impacts may affect desert tortoise populations adjacent to the development sites. The lack of information is especially relevant when evaluating effects to individuals within the habitat linkage that would be impacted by the proposed project. Thus, the magnitude and extent of these edge effects cannot be articulated at this time, but conceivably could disturb individual desert tortoises to the extent that they abandon all or a portion of their established home ranges and move elsewhere.

Effects on Population Connectivity

Landscape genetic analysis performed by Latch et al. (2011) identified both natural (slope) and anthropogenic (roads) landscape variables that significantly influenced desert tortoise gene flow of a local population. Although they found a higher correlation of genetic distance with slope compared to roads, desert tortoise pairs from the same side of a road exhibited significantly less genetic differentiation than tortoise pairs from opposite sides of a road. Latch et al. (2011) demonstrated that roads, regardless of traffic volume and construction material, can significantly influence desert tortoise movements and therefore, gene flow at the local population level with almost immediately detectable effects.

As discussed in the revised recovery plan (Service 2011) and elsewhere, habitat linkages are essential to maintaining rangewide genetic variation (Edwards et al. 2004, Segelbacher et al. 2010) and the ability to shift distribution in response to environmental stochasticity, such as climate change (Ricketts 2000, Fischer and Lindenmayer 2007, EPA 2009). Natural and anthropomorphic constrictions (e.g., US-95) can limit gene flow and the ability of desert tortoises to move between larger blocks of suitable habitat and populations. In the action area, existing anthropomorphic constrictions compound effects of natural barriers on desert tortoise population connectivity.

Based on research from other projects, roads and other features of the Searchlight Wind Energy Facility may affect movement of tortoises. We anticipate desert tortoises will shift away from project features, which could alter gene flow patterns and affect local genetic structure without completely disconnecting populations. However, because no major anthropomorphic constrictions (e.g., major roads, fences) would be constructed for this project, we, therefore, do not anticipate the proposed action would impede population connectivity.

Critical Habitat

Project equipment may compact soils and transport weeds into the project area where they may become established, thus reducing the capability of critical habitat to serve its role for recovery of the tortoise. Additionally, the introduction of noxious weeds may lead to increased wildfire risk (Brooks et al. 2003). Measures proposed by BLM to restore disturbances, implement a fire protection plan, and implement a weed monitoring and management plan should minimize or eliminate these potential effects.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Increased development would cause continued habitat loss, degradation, and fragmentation for the local desert tortoise population; as well as increased harm and harassment of individual desert tortoises, contributing to the cumulative degradation of the area. Planned future actions such as future industrial solar power plants and wind energy facilities would likely continue this trend. However, we know of no specific proposal by any non-Federal entity in the action area. The Service determined that most other future actions in the action area would likely require section 7 consultation since the action area is managed by BLM.

CONCLUSION

After reviewing the current status of the Mojave desert tortoise, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the species, and is not likely to adversely modify designated critical habitat. We have reached this conclusion based on the following factors:

- BLM, the applicant, and their contractors will implement numerous measures outlined above to ensure that most tortoises are located and moved out of harm's way and potential desert tortoise injury and mortality is minimized on project work sites (e.g., clearance surveys, authorized desert tortoise biologists, desert tortoise monitors). Since these measures will be implemented, we anticipate that the level of take will be low.

- BLM, the applicant, and their contractors will implement measures that are outlined above to ensure that impacts to desert tortoise critical and non-critical habitat are minimized.

- The project would not significantly affect the rangewide number, distribution, or reproduction of the species; desert tortoises that are moved out of harm's way and placed within their home range will remain in the wild with no long-term adverse effects to survival and reproduction;

- PCEs of critical habitat would be adversely affected but not to the extent they would no longer function within the PECHU or reduce the capability of the PECHU to support the current number of tortoises in the PECHU; amount to be disturbed is small (7 acres).

- This project would not result in a substantial increase in fragmentation of desert tortoise habitat because BLM would implement measures to minimize fragmentation within the Action Area and much of the area would remain intact and suitable for tortoises. ;

- The potential spread of non-native plant species would be minimized through implementation of an invasive weed management plan.

- Compensation requirements through BLM would result in implementing recovery actions for the desert tortoise, as identified by BLM and the Service.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act, and Federal regulation pursuant to section 4(d) of the Act, prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below for desert tortoises are non-discretionary and must be undertaken by BLM so that they become binding conditions of any grant or permit issued to the applicants/permittees, as appropriate, for the exemption in section 7(o)(2) to apply. BLM has a continuing duty to regulate the activity covered by this incidental take statement. If BLM: 1) fails to assume and implement the terms and conditions; or 2) fails to require the Applicant to adhere to the terms and conditions of the incidental take statement through enforceable stipulations that are incorporated into the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, BLM must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

AMOUNT AND EXTENT OF TAKE

The proposed action will result in take of all desert tortoises that occur on project work sites and roads; and areas where tortoise exclusion fencing would be installed. Additional desert tortoises in the action area, including buffer areas, may be affected by the project to the extent that incidental take may occur; however, such effects are anticipated to be minor and involve mostly alteration in feeding, sheltering, and reproductive behavior due to project disturbances and the reduction or fragmentation of habitat in their home ranges.

We acknowledge that we cannot precisely quantify the amount of take that will occur during all project activities. Some of the constraints that make it difficult to determine desert tortoise densities and abundance include the cryptic nature of the species (i.e., individuals spend much of

their lives underground or concealed under shrubs), inactivity in years of low rainfall, and low abundance across a broad distribution within several different habitat types. In addition, population numbers and distribution of individuals fluctuate in response to weather patterns and other biotic and abiotic factors over time. The number of juvenile desert tortoises and eggs is even more difficult to quantify because of their small size, their location underground, and low detection probabilities during surveys. The following paragraphs define the form of take and the number of individuals we anticipate will taken by project activities.

TAKE FROM CONSTRUCTION AND O&M ACTIVITIES

Table 3 identifies the incidental take threshold for all age classes of desert tortoises during construction and O&M activities and the estimated loss of critical and non-critical habitat. The actual number of individuals missed during clearance surveys and killed during construction is unknown. We expect most tortoises missed would be hatchlings and juveniles. Locating the carcasses of small tortoises or egg fragments is unlikely. To address this issue, we have used the threshold for capture of subadult and adult individuals on the proposed project site as a surrogate measure of mortality of the smaller size classes and eggs. Using this threshold as a surrogate assumes that our method of calculating the number of reproductive females, which is based on the estimated abundance of subadult and adult desert tortoises on the proposed project sites, allows us to also calculate the number of juveniles and eggs that may be affected. Consequently, finding more than 51 subadult and adult desert tortoises on the SWEF would indicate that a larger number of juveniles and eggs may be killed or destroyed during construction.

Although we do not know how many desert tortoises will be encountered in harm's way, based on the proposed action and tortoise survey, we estimate that 50 desert tortoises may be located in harm's way and captured and moved out of harm's way during construction activities. We estimate 3 desert tortoises per year may be located in harm's way and captured and moved out of harm's way during O&M activities. No more than one subadult or adult desert tortoise and two hatchling or juvenile tortoise would be killed or injured during construction activities. No more than one subadult or adult desert tortoise and two hatchling or juvenile tortoise not to exceed one per calendar year would be killed or injured during O&M activities.
O&M activities may result in incidental take, in the form of mortality or injury, of no more than two subadult or adult desert tortoise and two hatchling or juvenile desert tortoises but not to exceed more than one per calendar year for each of the two size groups (Table 3).

The disturbance of up to 388.5 acres of habitat from construction or upgrading activities for the SWEF, including access roads, turbine pads, project facilities, and transmission lines, may result in harm to desert tortoises that use this area as part of their home range. If the proposed project-related activities result in impacts to desert tortoise habitat beyond this acreage, the amount or extent of take will be exceeded.

Table 3. Desert Tortoise Incidental Take Thresholds for the Searchlight Wind Energy Project, Clark County, Nevada.

Activity	Exempted Mortality, Injury, and Destruction		Exempted Capture and Handling		Anticipated Habitat Loss (acres)	
	Adults / Subadults	Juveniles / Hatchlings	Adults / Subadults	Juveniles / Hatchlings	Critical	Non-critical
Construction	1	2	All in harm's way; estimate = 50	All in harm's way; Unknown	7	382
Operation and Maintenance	1	2[1]	All in harm's way; estimate = 3/year	All in harm's way; Unknown	0	0

[1]Not to exceed one per calendar year.

After facility closure, decommissioning activities and restoration of long-term disturbances from the SWEF would be conducted. Because we do not have sufficient information regarding the method or extent of these activities, we cannot determine the level of take that would be associated. Consequently, we are not granting an exemption from the prohibitions against take for these activities. These actions would require reinitiating consultation.

EFFECT OF TAKE

In the accompanying biological opinion, the Service determined that the levels of anticipated take associated with this project alone are not likely to jeopardize the continued existence or adversely affect the recovery of the Mojave desert tortoise, and the action is not likely to result in the destruction or adverse modification of its critical habitat.

REASONABLE AND PRUDENT MEASURES (RPMS) WITH TERMS AND CONDITIONS

BLM and the Applicant will implement numerous conservation measures as part of the proposed action to minimize the incidental take of desert tortoises. Our evaluation of the proposed action is based on the assumption that the actions as set forth in the *Description of the Proposed Action – Conservation Measures* section of this biological opinion will be implemented. Any proposed changes to the conservation measures or in the conditions under which project activities were evaluated may constitute a modification of the proposed action. If this modification causes an effect to desert tortoises that was not considered in the biological opinion, reinitiation of formal

consultation pursuant to the implementing regulations of section 7(a)(2) of the Act (50 CFR § 402.16) may be warranted. The following RPMs supplement and clarify conservation measures included as part of the proposed action. The RPMs are necessary and appropriate to minimize the impact of take on desert tortoises.

To be exempt from the prohibitions of section 9 of the Act, BLM and the Applicant, including all agents and contractors, must comply with the following terms and conditions, which implement the RPMs described below, and are intended to minimize the impact of incidental take on the Mojave desert tortoise. These terms and conditions are non-discretionary.

RPM 1: *BLM shall ensure the level of incidental take anticipated in this biological opinion is commensurate with the analysis contained herein.*

Terms and Conditions:

The following terms and conditions implement RPM 1:

1.a. To ensure that the conservation measures are effective and properly implemented, the Service shall be informed immediately upon discovery of a desert tortoise that has been killed or injured as a result of project activities. At that time, and in coordination with the Service, BLM must review the circumstances surrounding the incident to determine whether additional protective measures are required. Project activities may continue pending outcome of the review, provided the conservation measures included as part of the proposed action (see *Conservation Measures* section) and the terms and conditions in this biological opinion have been and continue to be fully implemented.

1.b. We do not expect that take, in the form of capture and handling, required to move desert tortoises out of harm's way during construction and O&M activities will result in mortality or injury of any individuals. If desert tortoise mortalities and injuries exceed thresholds identified in Table 3, BLM must reinitiate consultation on the proposed action. This term and condition only applies to clearance of the project sites for construction and does not apply to the relocation of desert tortoises out of harm's way.

1.c. BLM shall coordinate with the Service to develop a monitoring program to determine long-term project impacts on desert tortoise occurrence and distribution in the Action Area.

RPM 2: *BLM shall ensure that desert tortoises and their eggs in harm's way are located, properly handled, and moved to safety.*

Terms and Conditions:

2.a. A desert tortoise education program shall be presented by an authorized desert tortoise biologist to all personnel onsite during construction activities. This program will contain information concerning the biology and distribution of the desert tortoise, its legal status and occurrence in the project area, the definition of take and associated penalties, measures designed to minimize the effects of construction activities, the means by which employees can facilitate this process, and reporting requirements to be implemented when desert tortoises are encountered.

2.b. A designated field contact representative (FCR) will be assigned to the construction phase of the SWEF; additional FCRs will be assigned for the linear project components including the transmission line on the BLM ROW. Authorized desert tortoise biologists and the FCRs shall be onsite during all construction activities to ensure compliance with this biological opinion, including avoidance of inadvertently harming any desert tortoises that may wander onto the construction site. The authorized desert tortoise biologist and FCRs shall be responsible for: 1) enforcing the litter-control program; 2) ensuring that desert tortoise habitat disturbance is restricted to authorized areas; 3) ensuring that all equipment and materials are stored within the boundaries of the construction zone or within the boundaries of previously-disturbed areas or designated areas; 4) ensuring that all vehicles associated with construction activities remain within the proposed construction zones; and 5) ensuring compliance with the conservation measures of this biological opinion.

Potential authorized desert tortoise biologists must submit their statement of qualifications to the Service's Nevada Fish and Wildlife Office for approval, allowing a minimum of 30 days for Service response. The statement form is available on the internet at:
http://www.fws.gov/nevada/desert_tortoise/auth_dt_form.htm.
Within 3 days of employment or assignment, the Applicant or BLM, shall provide the Service with the names of FCRs and biological monitors who assisted the authorized desert tortoise biologist.

2.c. Prior to surface-disturbing activities, authorized desert tortoise biologists potentially assisted by project monitors, shall conduct a clearance survey to locate and remove all desert tortoises from areas to be disturbed or harm's way using techniques providing full coverage of all areas. Two passes of complete coverage will be accomplished. The authorized desert tortoise biologists shall also capture, handle, and relocate desert tortoises from harm's way in accordance with the Desert Tortoise Field Manual (Service 2009), as appropriate. Any desert tortoise eggs found in harm's way will be relocated from harm's way, up to 1,000 feet

from the point of capture, by an authorized desert tortoise biologist in accordance with approved protocol (Service 2009). Desert tortoise burrows that occur immediately outside work areas that can be avoided by project activities shall be clearly marked or flagged to prevent crushing. Burrows occupied by adult females will be examined thoroughly for nests and eggs during the months of May through October.

2.d. All burrows found within areas proposed for disturbance, whether occupied or vacant, shall be excavated by an authorized desert tortoise biologist and collapsed or blocked to prevent desert tortoise re-entry. All burrows will be excavated with hand tools to allow removal of desert tortoises or desert tortoise eggs. All desert tortoise handling and excavations, including nests, will be conducted by an authorized desert tortoise biologist in accordance with Service-approved protocol (Service 2009).

2.e. For desert tortoises that need to be relocated out of harm's way, the tortoise should be placed out of the path of project activity as per the instructions and guidance from the authorized desert tortoise biologist.

2.f. If a tortoise is found and relocated to a safe area, an authorized desert tortoise biologist, biological monitor, or FCR shall inform workers in the area to be particularly watchful for the tortoise as it may return to the work area.

2.g. Areas underneath parked project vehicles and equipment will be inspected for desert tortoises before moving them.

2.h. Vehicle speeds within the project area will not exceed those identified in the Conservation Measure 10 proposed under the *Description of the Proposed Action*. Speed limits will be clearly marked and all workers will be made aware of these limits.

2.i. Water used for fugitive dust control will not be allowed to pool on access roads or other project areas outside the fenced area, as this can attract desert tortoises. Similarly, leaks on water trucks and water tanks will be repaired to prevent pooling water.

2.j. Should any desert tortoise be injured or killed, all activities that have the potential for take will be halted, features that present a danger to desert tortoises (e.g., open trenches) will be secured, and the FCR and/or authorized desert tortoise biologist immediately contacted, who will notify the appropriate office of the Service.

2.k. BLM and the Applicant shall implement appropriate measures, which may include measures not specified in this biological opinion, to ensure that desert tortoises

captured and moved, or occurring in harm's way do not die or become injured as a direct or indirect (e.g., predation, maladjustment to release areas) result of the project. Measures in this biological opinion may require modification, and additional measures may be necessary in response to conditions and situations that pose a threat to the well-being of desert tortoises, in consultation with the Service.

RMP 3: *BLM shall ensure implementation of measures to minimize predation on desert tortoises by ravens or other desert tortoise predators attracted to the action area.*

Terms and Conditions:

3.a. A litter control program shall be implemented to reduce the attractiveness of the area to opportunistic predators such as desert kit fox, coyotes, and common ravens. Trash and food items will be disposed properly in predator-proof containers with re-sealing lids. Trash containers will be emptied and construction waste will be removed daily from the project area and disposed of in an approved landfill.

3.b. The Applicant will monitor for the presence of ravens and other potential human-subsidized predators will be conducted and a control plan will be implemented if predator densities substantially increase in the vicinity of the facility, in coordination with the Service. In addition to trash management, the Applicant will implement BMPs to discourage the presence of ravens onsite including elimination of available water sources, designing structures to discourage potential nest sites, use of hazing to discourage raven presence, and active monitoring of the site for presence of ravens.

3.c. Dogs will be prohibited in all project work areas.

RMP 4: *BLM shall ensure implementation of measures to minimize loss and long-term degradation of desert tortoise habitat, such as soil compaction, erosion, crushed vegetation, or introduction of non-native invasive plants or weeds as a result of project activities.*

Terms and Conditions:

4.a. Perennial native vegetation will be flagged and avoided to the maximum extent practicable.

4.b. Cross-country travel and travel outside designated areas shall be prohibited.

4.c. The Applicant and BLM will coordinate to salvage and relocate cacti, yuccas, and shrubs on linear ROWs and plant them back on temporarily disturbed portions of the ROWs.

4.d. All work area boundaries will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers, equipment, vehicles, and construction materials shall remain within the ROW, existing roads, and designated areas. Staging areas will be located in previously-disturbed areas whenever possible.

4.e. The Applicant will develop a habitat restoration plan to be implemented for all temporary disturbances associated with construction of the project to be approved by BLM and the Service.

4.f. The proposed Weed Management Plan will be developed and implemented (Conservation Measure 2) and will be approved by BLM and the Service.

4.g. Final power transmission tower and associated spur road locations will be adjusted to avoid potentially active tortoise burrows.

4.h. Prior to surface-disturbing activities associated with the SWEF, BLM shall collect remuneration fees for compensation of desert tortoise habitat loss (Appendix A). Remuneration fees shall be used for management actions, as identified by the BLM and Service, expected to promote recovery of the desert tortoise over time. Actions may involve habitat acquisition, population or habitat enhancement, increasing knowledge of the species' biological requirements, reducing loss of individual animals, documenting the species status and trend, and preserving distinct population attributes.

BLM estimates that 382 acres of non-critical habitat and 7 acres of critical habitat will be disturbed. The current rate is $810 per acre of disturbance outside desert tortoise critical habitat. The fees will be indexed for inflation based on the Bureau of Labor Statistics Consumer Price Index for All Urban Consumers (CPI-U) and becomes effective March 1 of each year. The next adjustment will occur March 1, 2013. Information on the CPI-U can be found on the internet at: http://www.bls.gov/news.release/cpi.toc.htm. Total fees for project disturbance of desert tortoise non-critical habitat will be (382 acres x $810) $309,420.

For disturbance of critical habitat on BLM lands, the fee would be assessed at the rate of (4 x $810) $3,240 per acre of disturbance (Hastey et al. 1991). Total fees for project disturbance of desert tortoise critical habitat will be (7 acres x $3,240) $22,680.

This fee will be paid directly to BLM. The payment shall be accompanied by the Section 7 Fee Payment Form and completed by the payee. Payment shall be certified check or money order payable to BLM, and delivered to:

DOI/BLM
ATTN: Information Access Center
The Bureau of Land Management
1340 Financial Boulevard
Reno, Nevada 89502
Contact: (775) 861-6400

RPM 5: *BLM shall ensure implementation of measures to ensure compliance with the RPMs, Terms and Conditions, reporting requirements, and reinitiation requirements contained in this biological opinion.*

Terms and Conditions:

5.a. BLM will hold a preconstruction meeting with Duke Energy and the compliance inspection contractor (CIC) to discuss implementation of the terms and conditions of the biological opinion.

5.b. Construction and O&M reporting requirements: BLM will be responsible for providing immediate notification to the Service of any desert tortoise mortality or injury that occurs during construction or O&M activities.

The authorized desert tortoise biologist shall record each observation of desert tortoise handled in the tortoise monitoring reports. Information will include the following: location (GPS), date and time of observation, whether desert tortoise was handled, general health and whether it voided its bladder, location desert tortoise was moved from and location moved to, unique physical characteristics of each tortoise, and effectiveness and compliance with the desert tortoise protection measures.

BLM will be responsible for providing a final report within 90 days of completion of the construction activities of the SWEF to the Service reports shall be provided to the Service during O&M activities for the life of the facility. Specifically, these reports must include Table 4 (see below), the information described above, and information on any instances when desert tortoises were killed, injured, or captured and handled; the circumstances of such incidents; and any actions undertaken to prevent similar incidents from reoccurring. Additional information regarding the effectiveness of minimization measures and RPMs of this biological opinion should be included in the annual report.

Table 4. Desert Tortoise Actual Incidental Take for the Searchlight Wind Energy Project, Clark County, Nevada.

Activity	Actual Mortality, Injury, and Destruction		Actual Harassment: Capture and Removal		Actual Habitat Loss (ac)	
	Adults / Subadults	Juveniles / Hatchlings	Adults / Subadults	Juveniles / Hatchlings	Critical	Non-critical
Construction						
Operation and Maintenance						
Predation					None	
Minimization Measure Implemented		**Effectiveness and Recommendations**				

5.b. Any incident occurring during project activities that was considered by the FCR, authorized desert tortoise biologist, or biological monitor to be in non-compliance with this biological opinion will be documented immediately by the authorized desert tortoise biologist.

REPORTING REQUIREMENTS

BLM will be responsible for providing monthly reports during construction and annual reports during O&M activities. BLM may delegate this responsibility to the Applicant. In addition, a final construction report will be submitted to the Service within 60 days of completion of construction of the project. All monthly reports are due within 10 days following the end of the month and annual reports are due February 1 of each year. The Service anticipates the first annual report by February 1, 2014, if construction or project activities are initiated in 2013. Annual reports shall be provided to the Service during O&M activities for the life of the facility. Specifically, these reports must include Table 4 (see above) and information on any instances when desert tortoises were killed, injured, or handled; the circumstances of such incidents; and any actions undertaken to prevent similar incidents from reoccurring.

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Activity	Actual Mortality, Injury, and Destruction		Actual Harassment: Capture and Removal		Actual Habitat Loss (ac)	
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Construction						
Operation and Maintenance						
Predation					None	
Minimization Measure Implemented		**Effectiveness and Recommendations**				

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Any incident occurring during project activities that was considered by the FCR, authorized desert tortoise biologist or biological monitor to be in non-compliance with this biological opinion will be documented immediately by the authorized desert tortoise biologist to be included in reporting.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

> *We recommend BLM develop a monitoring program to determine long-term project effects to desert tortoise abundance, distribution, and use of the project area in coordination with a university or government entity that will be able to disseminate information that is collected through peer-reviewed publications.*

REINITIATION NOTICE

This concludes formal consultation on the BLM's proposal to issue ROW grants to Searchlight Wind and WAPA for construction of the SWEF and its associated structures and components on BLM-administered lands. Consistent with 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of take specified in the incidental take statement is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this biological opinion; and 4) a new species is listed or critical habitat designated that may be affected by the action. In addition, if any of the stated assumptions used in our analysis are invalidated, BLM must reinitiate consultation.

LITERATURE CITED

Abella, S.R. 2010. Disturbance and plant succession in the Mojave and Sonoran deserts of the American Southwest. International Journal of Environmental Research and Public Health 7:1248-1284.

Averill-Murray, R.C. 2002. Effects on survival of desert tortoises (*Gopherus agassizii*) urinating during handling. Chelonian Conservation and Biology 4:430-435.

Belnap, J., R. H. Webb, M. E. Miller, D. M. Miller, L. A. DeFalco, P. A. Medica, M. L. Brooks, T. C. Esque, and D. Bedford. 2008. Monitoring ecosystem quality and function in arid settings of the Mojave Desert. U.S. Geological Survey Scientific Investigations Report 2008-5064, 199 pp.

Boarman, W.I. 2002. Threats to desert tortoise populations: A critical review of the literature. U.S. Geological Survey, Western Ecological Research Center, Sacramento, California.

Boarman, W.I., and M. Sazaki. 2006. A highway's road-effect zone for desert tortoises (*Gopherus agassizii*). Journal of Arid Environments 65:94-101.

Bowles, A.E., E. Eckert, L. Starke, E. Berg, L. Wolski, and J. Matesic, Jr. 1999. Effects of flight noise from jet aircraft and sonic booms on hearing, behavior, heart rate, and oxygen consumption of desert tortoise (*Gopherus agassizii*). AFRL-HE-WP-TR-1999-0170. Sea World Research Institute, Hubbs Marine Research Center, San Diego, California.

Brooks, M.L. 2003. Effects of increased soil nitrogen on the dominance of alien annual plants in the Mojave Desert. Journal of Applied Ecology 40:344-353.

Bureau of Land Management (BLM). 1990. Draft raven management plan for the California Desert Conservation Area. Prepared by Bureau of Land Management, California Desert District, Riverside, California.

BLM (Bureau of Land Management). 2010. Memorandum of Understanding Between the Bureau of Land Management in Nevada and the United States Fish and Wildlife Service in Nevada to Coordinate the Management of Compensation Fees to Benefit the Mojave Population of the Desert Tortoise (*Gopherus Agassizii*) in Nevada. May 2010. 6 pp.

Edwards, T., E.W. Stitt, C.R. Schwalbe, and D.E. Swann. 2004. *Gopherus agassizii* (desert tortoise). movement. Herpetological Review 35:381-382.

Evans, R. 2001. Free-roaming dog issues at the United States Marine Corps Air Ground Combat Center, Twentynine Palms, California. Proceedings of the 2001 Desert Tortoise Council Symposium.

Fischer, J. and D. B. Lindenmayer. 2007. Landscape modification and habitat fragmentation: a synthesis. Global Ecology and Biogeography 16:265-280.

Freilich, J. E., K. P. Burnham, C. M. Collins, C. A. Garry. 2000. Factors affecting population assessments of desert tortoises. Conservation Biology 14:1479-1489.

Hastey, E., L. K. Rosenkrance, B. R. Templeton, J. M. Parker, W. H. Radtkey, D. L. Harlow, B. D. Taubert, F. Worthley, W. A. Molini, and R. D. Radantris. 1991. Compensation for the desert tortoise. A report prepared for the Desert Tortoise Management Oversight Group. November 1991. 16 pp.

Hoff, K. V. S., and R. W. Marlow. 2002. Impacts of vehicle road traffic on desert tortoise populations with consideration of conservation of tortoise habitat in southern Nevada.

Boarman, W.I. 2002. Threats to desert tortoise populations: A critical review of the literature. U.S. Geological Survey, Western Ecological Research Center, Sacramento, California.

Boarman, W.I., and M. Sazaki. 2006. A highway's road-effect zone for desert tortoises (*Gopherus agassizii*). Journal of Arid Environments 65:94-101.

Bowles, A.E., E. Eckert, L. Starke, E. Berg, L. Wolski, and J. Matesic, Jr. 1999. Effects of flight noise from jet aircraft and sonic booms on hearing, behavior, heart rate, and oxygen consumption of desert tortoise (*Gopherus agassizii*). AFRL-HE-WP-TR-1999-0170. Sea World Research Institute, Hubbs Marine Research Center, San Diego, California.

Brooks, M.L. 2003. Effects of increased soil nitrogen on the dominance of alien annual plants in the Mojave Desert. Journal of Applied Ecology 40:344-353.

Bureau of Land Management (BLM). 1990. Draft raven management plan for the California Desert Conservation Area. Prepared by Bureau of Land Management, California Desert District, Riverside, California.

BLM (Bureau of Land Management). 2010. Memorandum of Understanding Between the Bureau of Land Management in Nevada and the United States Fish and Wildlife Service in Nevada to Coordinate the Management of Compensation Fees to Benefit the Mojave Population of the Desert Tortoise (*Gopherus Agassizii*) in Nevada. May 2010. 6 pp.

Edwards, T., E.W. Stitt, C.R. Schwalbe, and D.E. Swann. 2004. *Gopherus agassizii* (desert tortoise). movement. Herpetological Review 35:381-382.

Evans, R. 2001. Free-roaming dog issues at the United States Marine Corps Air Ground Combat Center, Twentynine Palms, California. Proceedings of the 2001 Desert Tortoise Council Symposium.

Fischer, J. and D. B. Lindenmayer. 2007. Landscape modification and habitat fragmentation: a synthesis. Global Ecology and Biogeography 16:265-280.

Freilich, J. E., K. P. Burnham, C. M. Collins, C. A. Garry. 2000. Factors affecting population assessments of desert tortoises. Conservation Biology 14:1479-1489.

Hastey, E., L. K. Rosenkrance, B. R. Templeton, J. M. Parker, W. H. Radtkey, D. L. Harlow, B. D. Taubert, F. Worthley, W. A. Molini, and R. D. Radantris. 1991. Compensation for the desert tortoise. A report prepared for the Desert Tortoise Management Oversight Group. November 1991. 16 pp.

Hoff, K. V. S., and R. W. Marlow. 2002. Impacts of vehicle road traffic on desert tortoise populations with consideration of conservation of tortoise habitat in southern Nevada. Chelonian Conservation and Biology 4:449-456.

Latch, E.K., W.I. Boarman, A. Walde, and R.C. Fleischer. 2011. Fine-scale analysis reveals cryptic landscape genetic structure in desert tortoises. PLoS ONE 6(11):e27794. doi:10.1371/journal.pone.0027794.

Lovich, J.E., and D. Bainbridge. 1999. Anthropogenic degradation of the southern California desert ecosystem and prospects for natural recovery and restoration. Environmental Management 249:309-326.

Lovich, J. E., J. R. Ennen, S. Madrak, and B. Grover. 2011. Turtles, culverts, and alternative energy development: an unreported but potentially significant mortality threat to the desert tortoise (*Gopherus agassizii*). Chelonian Conservation and Biology 10:124-129.

Nussear, K. E., T. C.Esque, D. F. Haines, and C. R. Tracy. 2007. Desert tortoise hibernation: temperatures, timing, and environment. Copeia 2007:378-386.

Nussear, K. E., T. C. Esque, R. D. Inman, L. Gass, K. A. Thomas, C. S. A. Wallace, J. B. Blainey, D. M. Miller, and R. H. Webb. 2009 Modeling habitat of the desert tortoise (Gopherus agassizii) in the Mojave and parts of the Sonoran Deserts of California, Nevada, Utah, and Arizona. U.S. Geological Survey Open-File Report 2009-1102, 18 pp.

RECON (Regional Environmental Consultants). 2000. Clark County MSHCP. Prepared for Clark County, 500 Grand Central Parkway, Las Vegas, Nevada 89155.

Tetra Tech. 2012. Biological assessment for Searchlight Wind Energy Project Clark County, Nevada. Prepared for Bureau of Land Management, Las Vegas Field Office, March 2012.

Ricketts, T.H. 2000. The matrix matters. The American Naturalist 158(1):87-99.

Ruby, D. E., J. R. Spotila, S. K. Martin, and S. J. Kemp. 1994. Behavioral responses to barriers by desert tortoises: implications for wildlife management. Herpetological Monographs 8:144-160.

Segelbacher, G., S.A. Cushman, B.K. Epperson, M. Fortin, O. Francois, O.J. Hardy, R. Holderegger, P. Taberlet, L.P. Waits, and S. Manel. 2010. Applications of landscape.

Service (Fish and Wildlife Service). 1994. Desert tortoise (Mojave population) recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon.

Service (Fish and Wildlife Service). 2009. Desert tortoise (Mojave population) field manual (*Gopherus agassizii*). Region 8, Sacramento, California. Available on the internet at: http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/index.html

Service (Fish and Wildlife Service). 2010a. Mojave population of the desert tortoise *(Gopherus agassizii),* 5-year review: summary and evaluation. Desert Tortoise Recovery Office, Reno, Nevada. September 30, 2010. Available on the internet at: www.fws.gov/.../five_year_review/doc3572.DT%205Year%20Review_FINAL.pdf

Service (Fish and Wildlife Service). 2010b. Preparing for any action that may occur within the range of the Mojave Desert Tortoise. Region 8, Sacramento, California. Available on the internet at: http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/index.html

Service (Fish and Wildlife Service). 2011. Revised recovery plan for the Mojave population of the desert tortoise (*Gopherus agassizii*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 222 pp.

U.S. Environmental Protection Agency (EPA). 2009. A framework for categorizing the relative vulnerability of Threatened and Endangered species to climate change. EPA/600/R-09/011. National Center for Environmental Assessment, Washington, D.C.

Vasek, F. C., H. B. Johnson, and D. H. Eslinger. 1975. Effects of pipeline construction on creosote bush scrub vegetation of the Mojave Desert. Madroño 23:1-13.

Walde, A. D., M. L. Harless, D. K. Delaney, and L. L. Pater. 2007. Anthropogenic threat to the desert tortoise (*Gopherus agassizii*): litter in the Mojave Desert. Western North American Naturalist 67:147-149.

Webb, R.H. 2002. Recovery of severely compacted soils in the Mojave Desert, California, USA. Arid Land Research and Management 16: 291-305.

Zimmerman, L.C., M.P. O'Connor, S.J. Kemp, and J.R. Spotila. 1994. Thermal ecology of desert tortoises in the Eastern Mojave Desert: seasonal patterns of operative and body temperatures and microhabitat utilization. Herpetological Monographs 8:45-59.

Personal Communications

Lovich, Jeffrey E. 2012. Deputy Director of the Southwest Biological Science Center, U.S. Geological Survey, Flagstaff, Arizona.

Appendix A

Appendix A. NEVADA BLM SECTION 7 LAND DISTURBANCE FEE PAYMENT FORM

Biological Opinion File Number: 84320-2012-F-0211

Biological Opinion Issued By: Nevada Fish and Wildlife Office, Las Vegas, Nevada

Species: Desert Tortoise (*Gopherus agassizii*) (Mojave population)

Project Name: Searchlight Wind Energy Project

Project Applicant: Searchlight Wind Energy, LLC

Phone Number: _____

Payment Calculations:	Clark County		_____ County		_____ County	
	Critical habitat	Non-critical habitat	Critical habitat	Non-critical habitat	Critical habitat	Non-critical habitat
# acres anticipated to be disturbed on federal land	7	382				
Fee rate (per acre)	$3,240	$810				
Subtotals	$22,680	$309,420				
Total cost per county	$ 332,100		$ -		$ -	

Amount paid: _____ **Date:** _____ **Check/Money Order #:** _____

Authorizing agencies: Bureau of Land Management, Las Vegas Nevada

Make check payable to: Bureau of Land Management

Deliver check to:

Physical Address
Bureau of Land Management
Attn: Information Access Ctr
1340 Financial Blvd.
Reno, NV 89502

PO Box
Bureau of Land Management
Attn: Information Access Ctr
PO Box 12000
Reno, NV 89520-0006

For BLM Public Room

Process check to:
Contributed Funds-All Other
WBS: LVTFF1000800
7122 FLPMA

Please provide a copy of this completed payment form and the payment receipt to NV-930, Attn: T&E Program Lead
***T&E Program Lead will provide a copy to the appropriate District Office(s)*

All other Res. Dev. Project and Management
Remarks: LLNV9300000 L71220000.JP0000 LVTFF1000800 Desert Tortoise Conservation Program

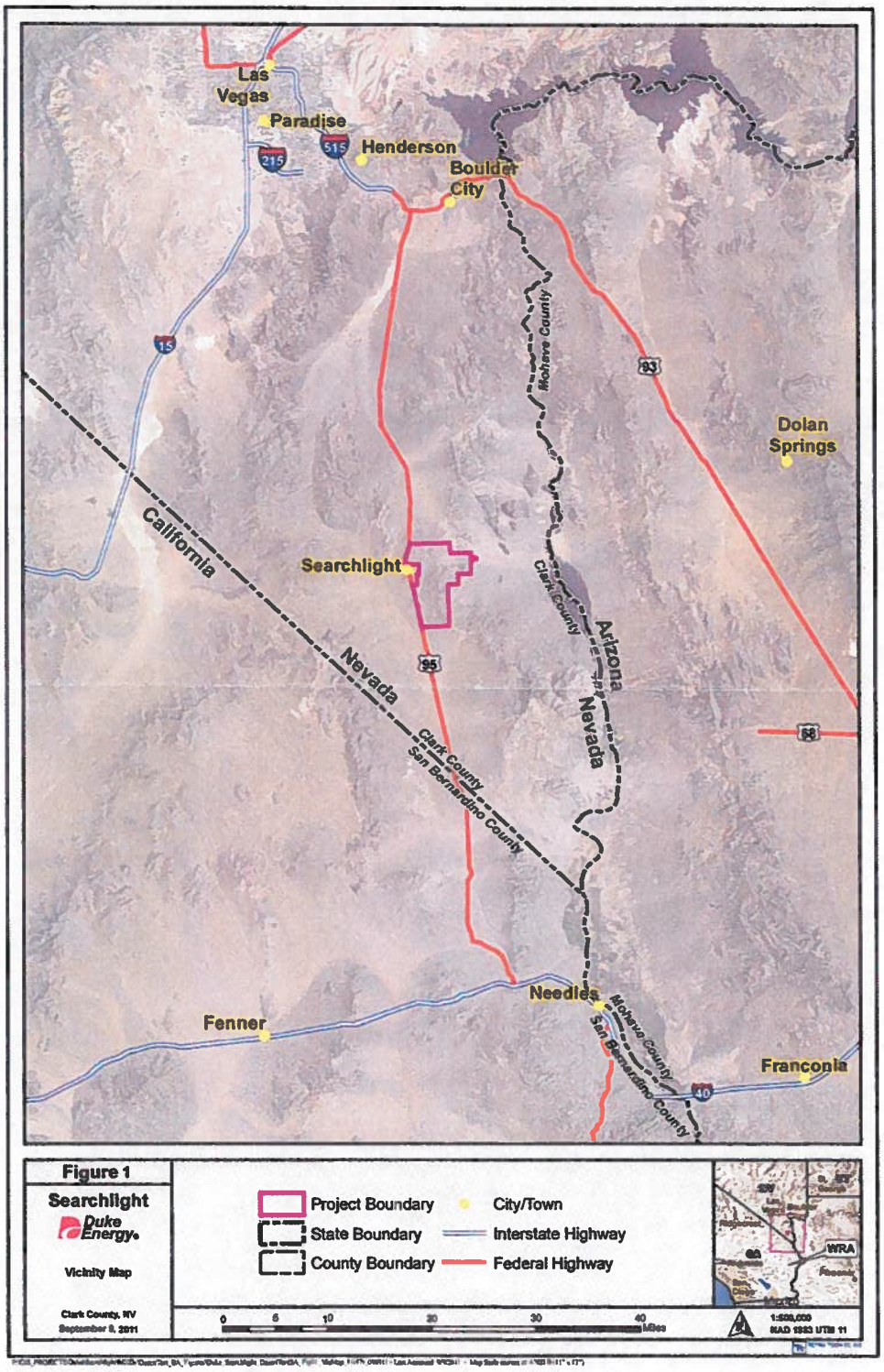

Figure 1. General location of the Searchlight Wind Energy Project, Clark County, Nevada.

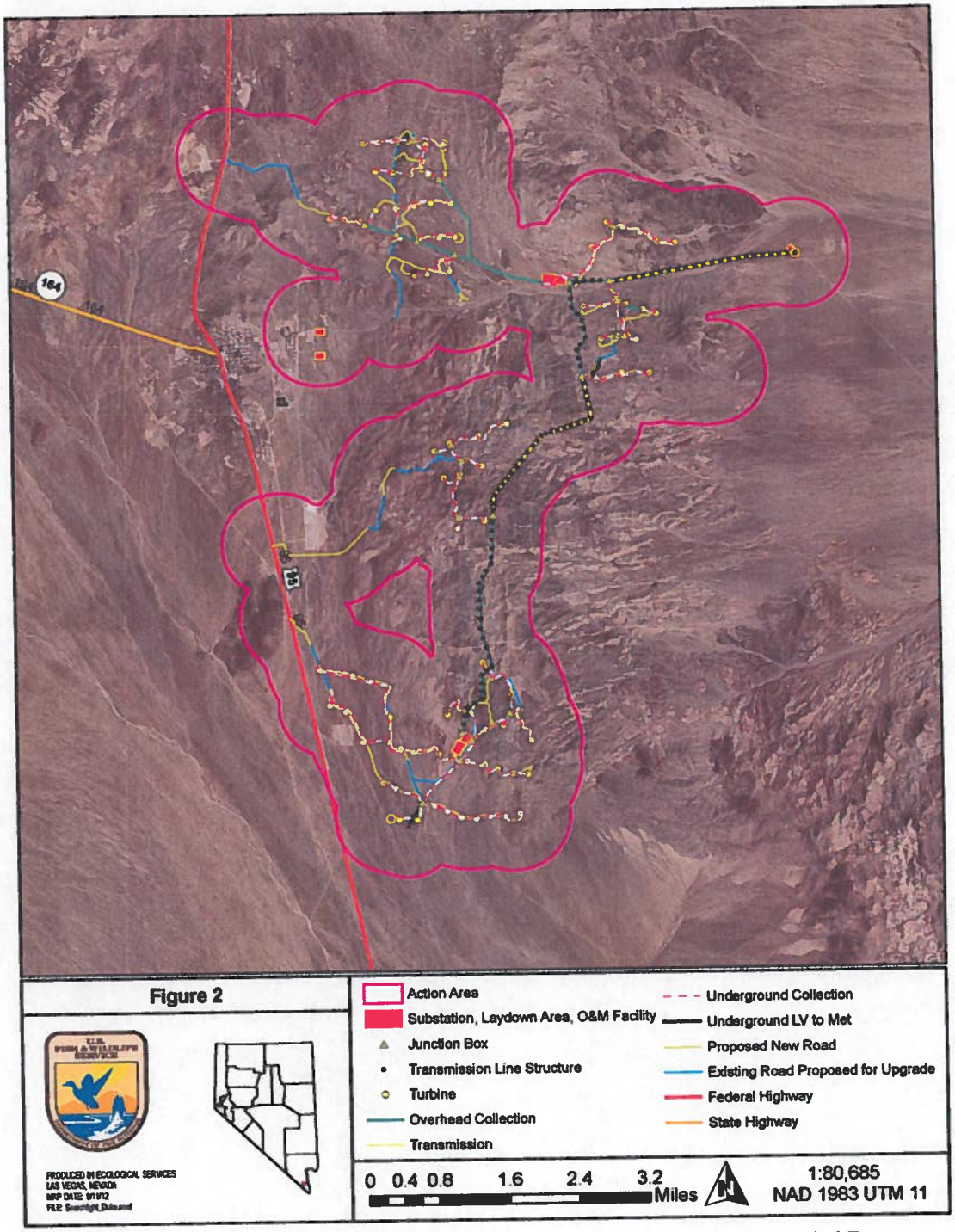

Figure 2. Action Area and approximate location of project features for the Searchlight Wind Energy Project, Clark County, Nevada.

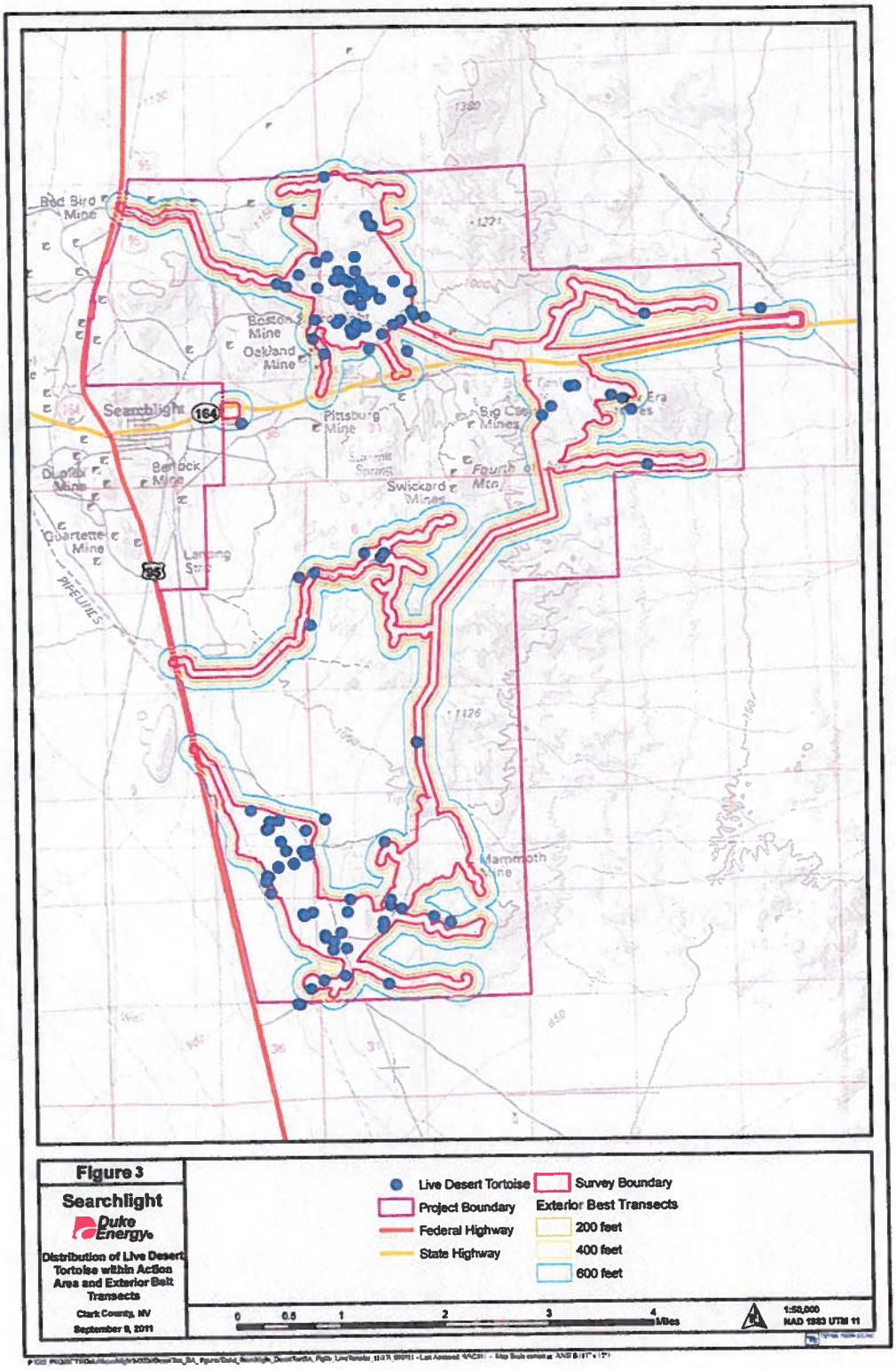

Figure 3. Locations of live Mojave desert tortoise detections on the Searchlight Wind Energy Project, Clark County, Nevada.

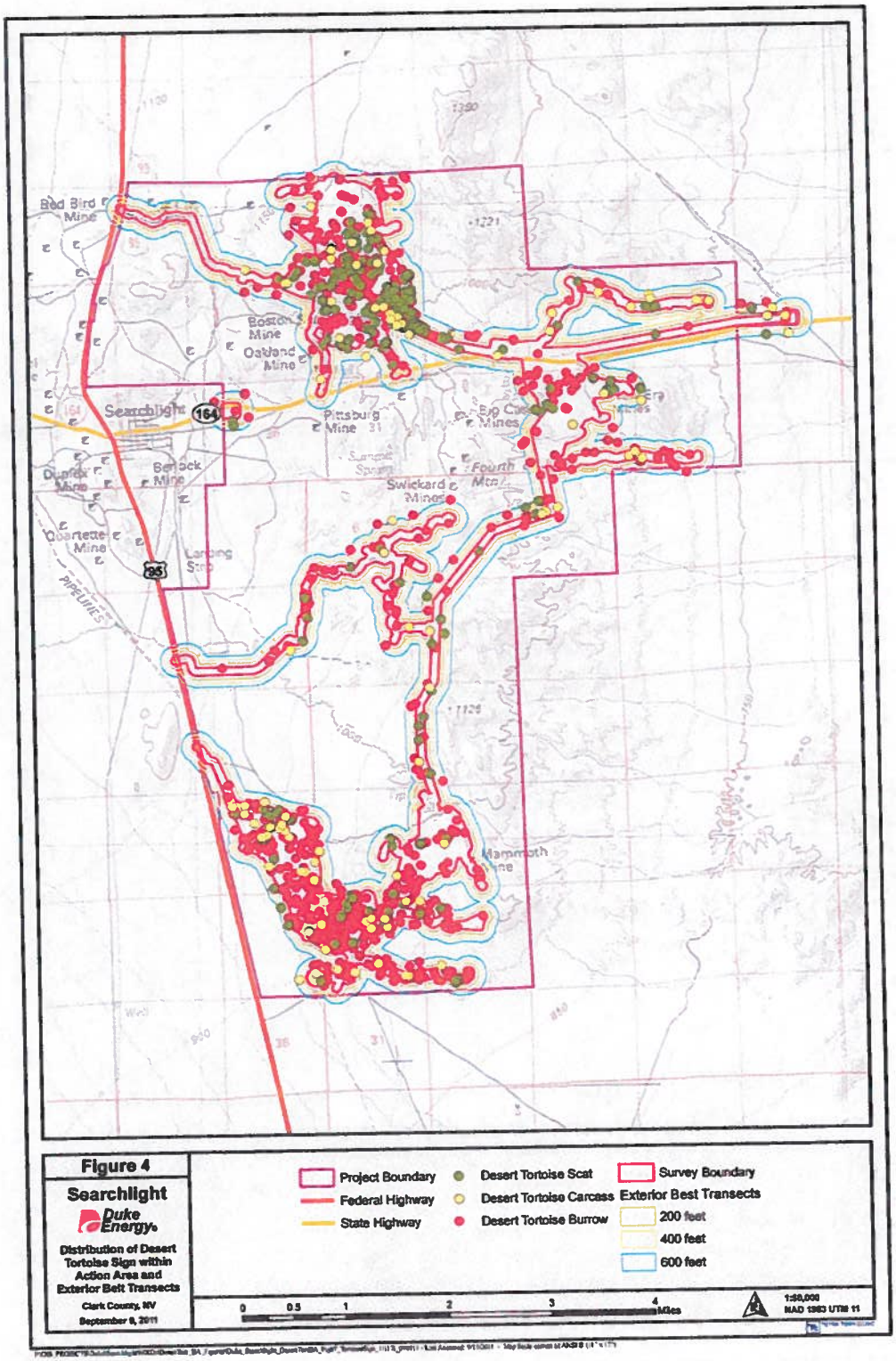

Figure 4. Locations of Mojave desert tortoise sign detected on the Searchlight Wind Energy Project, Clark County, Nevada.

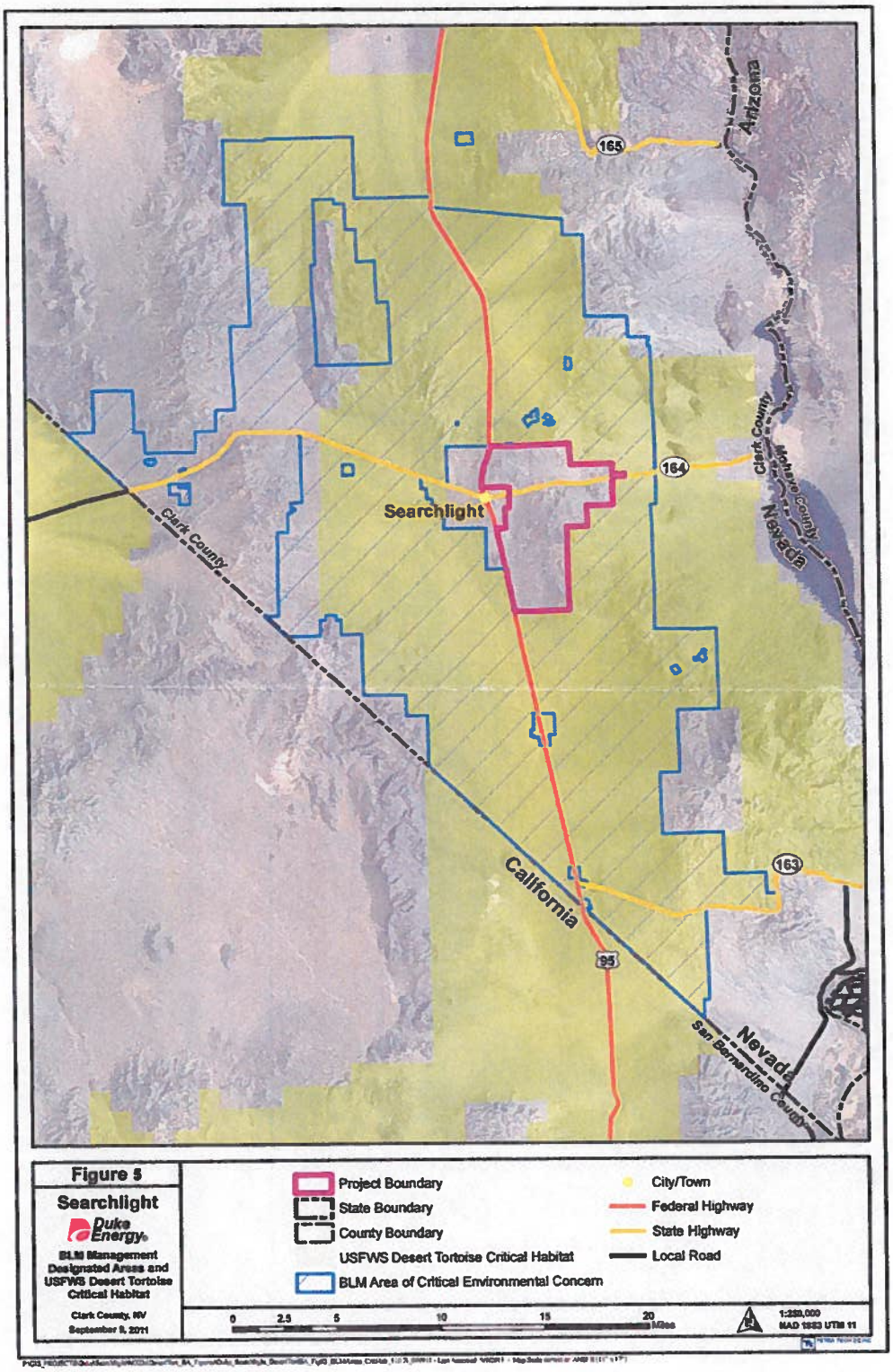

Figure 5. Designated desert tortoise critical habitat occurring near the Searchlight Wind Energy Project, Clark County, Nevada.