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AUG 22 1996

File No. 1-5-96-F-33

Dr. Donald R. Elle, Director
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Dear Dr. Elle:

Subject: Final Programmatic Biological Opinion for Nevada Test Site Activities

The Fish and Wildlife Service (Service) has reviewed your biological assessment (BA) for programs at the Nevada Test Site (NTS) and Alternative 3 of the Draft Environmental Impact Statement (DEIS) for programmatic activities proposed to occur within the range of the desert tortoise (*Gopherus agassizii*) on the NTS within the next 10 years. Your November 8, 1995, request for formal consultation and a draft biological opinion was received on November 13, 1995. This document represents the Service's final biological opinion on the effects of implementation of proposed actions on the threatened desert tortoise.

On May 20, 1992, the Service issued a biological opinion (File No. 1-5-91-F-225) to the Department of Energy, Nevada Operations (DOE/NV) for activities planned on the NTS for fiscal years 1992 through 1995. The biological opinion concluded that the proposed activities were not likely to jeopardize the continued existence of the Mojave population of the desert tortoise; no critical habitat would be destroyed or adversely modified. Terms and conditions of the biological opinion were amended on September 8, 1993; April 13, 1994; and October 28, 1994.

On January 9, 1995, DOE/NV requested formal consultation on activities associated with programs on the NTS as identified in a December 20, 1994, BA. The Service issued a draft biological opinion to DOE/NV for those activities on June 12, 1995. On July 5, 1995, the Service received your letter dated July 3, 1995, requesting termination of consultation because the BA should be revised to include proposed activities described in the DEIS for the NTS. Consequently, consultation was terminated per your request on July 5, 1995.

The Service received additional information and documents from your office between November 13, and December 14, 1995, and determined that the information was sufficient to initiate consultation on December 14, 1995. On April 22, 1996, the Service requested a 30-day extension of the consultation period. The Service issued a draft biological opinion to the DOE/NV on May 20, 1996. DOE/NV provided comments on the draft during a meeting with Service staff in Las Vegas, Nevada on June 5, 1996. During the consultation process, it was mutually agreed that the draft biological opinion would be finalized upon release of the final EIS. On July 29, 1996, DOE/NV provided a revised Appendix A to the BA as requested by the Service. Subsequently, based on assurances from DOE/NV staff that the draft EIS will not be substantially different from the final EIS, the Service determined it appropriate to finalize this biological opinion prior to release of the final EIS.

The peregrine falcon (*Falco peregrinus*) and bald eagle (*Haliaeetus leucocephalus*) are rare, wide-ranging species on the NTS. The peregrine falcon is federally listed as endangered and the bald eagle, as threatened. No nest sites or wintering areas are known to occur on the NTS. Therefore, the DOE/NV has determined that the programs it will conduct on the NTS will not affect the bald eagle or peregrine falcon. The Service concurs with this determination.

This biological opinion contains information from DOE/NV correspondence dated January 9, March 15, July 3, July 13, November 8, 1995, and February 28, 1996; facsimiles dated December 5, 1995, and August 12, 1996; Reader's Guide to the DOE's NTS DEIS dated December 1995; NTS DEIS dated January 1996; BA dated October 31, 1995, and the revised Appendix A to the BA received on July 29, 1996; Implementation Plan for the Nevada Test Site EIS dated June 1995; Draft Revegetation and Monitoring Plan for the Double Tracks Clean-up Site dated August 1995; NTS Tortoise Population Monitoring Study, Final Report prepared for DOE/NV by EG&G Energy Measurements (EG&G/EM) dated December 1994; conversations with DOE/NV staff; and in our files.

Description of the Proposed Action

The NTS was established in December 1950, and has served as DOE's Nevada field laboratory for the nation's nuclear weapons research, development, and testing program. Following the end of the Cold War, the DOE/NV mission is changing in response to a comprehensive ban on future nuclear weapons testing. The last underground nuclear test was performed at the NTS in September 1992. In November 1993, Congress, through the National Defense Authorization Act (P.L. 103-160), instructed the Secretary of Energy to establish a stewardship program to ensure the preservation of the core intellectual and technical competencies of the United States in nuclear weapons. DOE/NV needs to maintain the basic capability to conduct underground nuclear testing

activities should a situation arise from unanticipated problems in the nuclear weapons stockpile. DOE/NV also needs to enhance its capability to perform tests and experiments to assess the condition and behavior of aging stockpiled weapons.

The NTS occupies 1,350 square miles in Nye County, approximately 65 miles northwest of Las Vegas (Figure 1) and is divided into 30 areas for administrative and management purposes (Figure 2). All land on the NTS is managed by DOE/NV, and access is strictly controlled. Between 3,000 and 4,000 people work at the NTS, with the majority residing in Mercury, Nevada.

Areas and Projects Excluded from this Biological Opinion

Three 22-acre, circular enclosures were constructed in Rock Valley during 1962-1963 in the southwestern portion of the NTS. The enclosures were used to study the effects of chronic, low-level ionizing radiation on the desert flora and fauna. At least 24 tortoises have been found in the enclosures, individually marked, and periodically measured and weighed over the decades. There are approximately 18 adult desert tortoises remaining in the enclosures, and DOE/NV intends to continue to monitor their growth and survival. Take of these tortoises will not be included in this biological opinion because: (1) The tortoises were removed from the wild by means of a long-term enclosure prior to listing of the species as threatened under the Endangered Species Act of 1973, as amended (Act), and (2) the tortoises are physically restricted to conditions which have the characteristics of captivity (i.e., no longer capable of interacting with members of their species outside the enclosure or dispersing into adjacent areas, etc.). Therefore, the Service considers these pre-Act tortoises. Progeny of these tortoises, however, are considered protected tortoises under the Act which restricts any activities involving the progeny outside normal captive husbandry practices without authorization under section 10(a)(1)(A) of the Act. Normal husbandry practices include such actions as feeding, weighing, measuring, assessing health status, and movement to provide suitable captive conditions. If the boundaries of the enclosures are removed, the desert tortoises may leave the enclosure and will be considered wild tortoises protected under the Act.

Areas 1 through 4, 7 through 10, 12, 13, 15 through 20, and 30 and portions of Areas 6, 11, 14, 25, and 29 occur outside the range of the desert tortoise, and activities proposed by DOE/NV within these areas will not be addressed in this consultation; Areas 21, 24, and 28 do not occur on NTS and likewise will not be included in this consultation. Projects proposed in the DEIS by DOE which occur on the NTS but outside the range of the desert tortoise as defined by Rautenstrauch et al. (1994) and shown in Figure 2 are not addressed in this biological opinion. Similarly, proposed programs at the Tonapah Test Range, Central Nevada Test Area, and

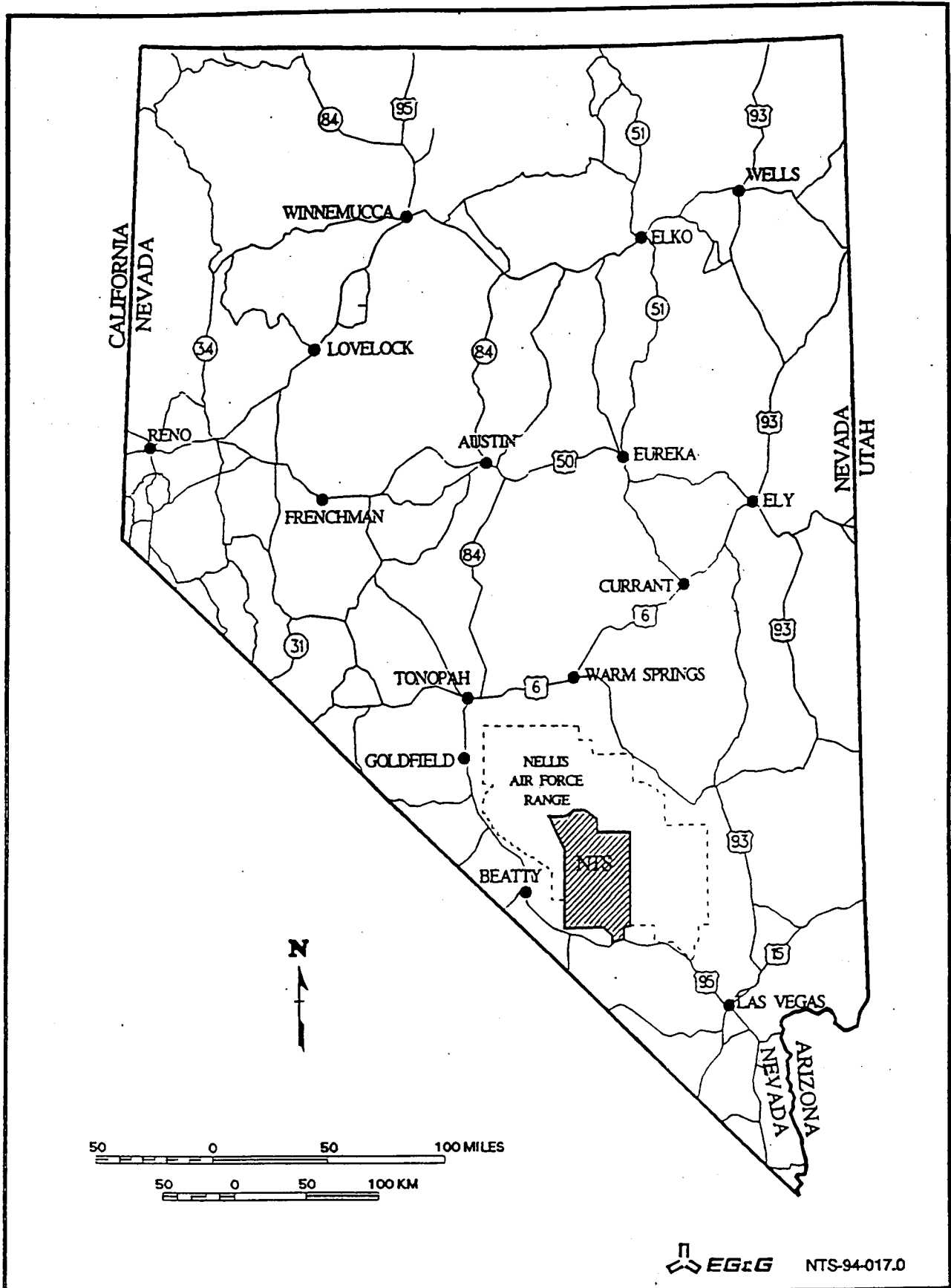


Figure 1. Location of the Nevada Test Site.

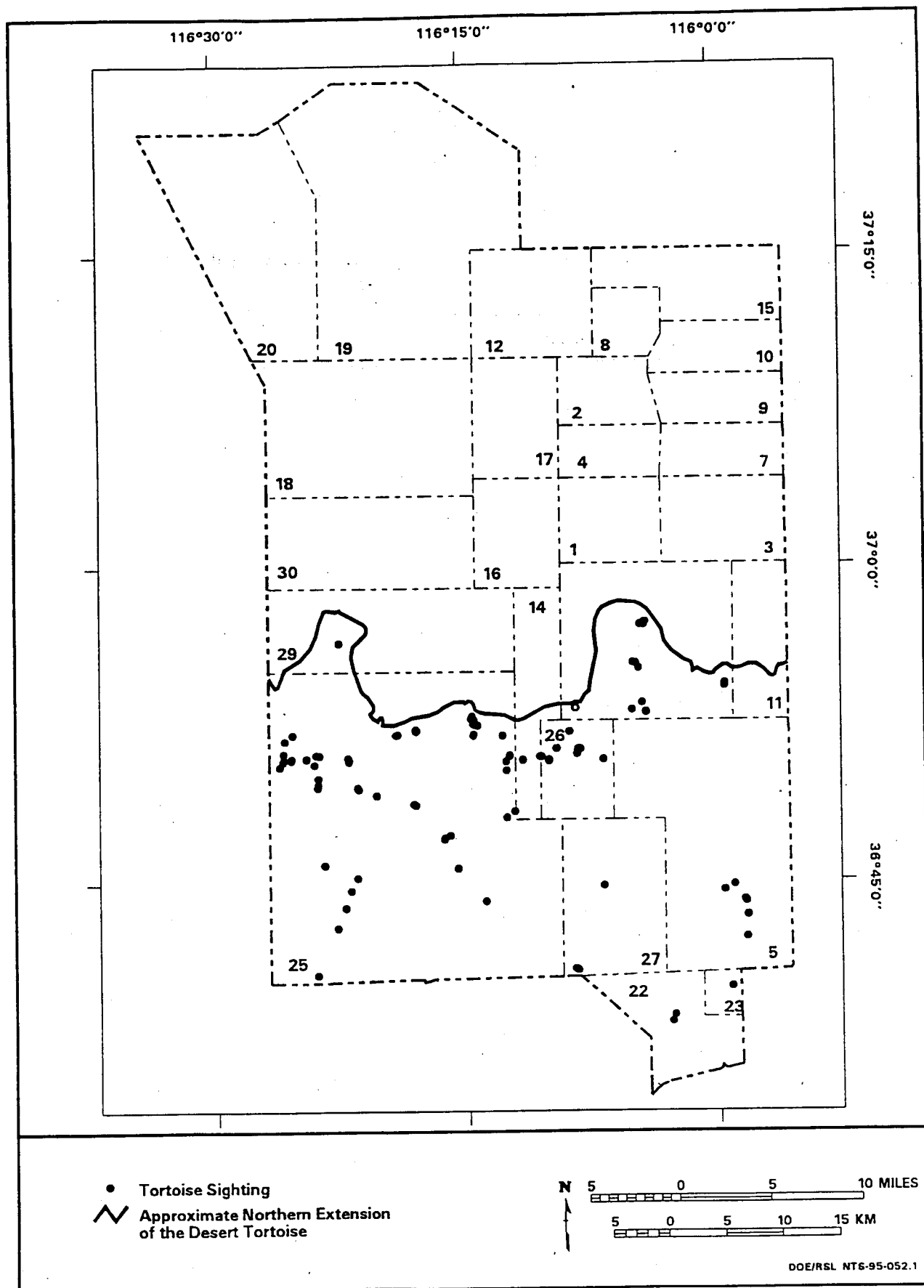


Figure 2. Administrative areas and range of the desert tortoise on the Nevada Test Site.

Project Shoal Area are not included in this biological opinion. The Next Generation Radiographic Facility and Next Generation Magnetic Flux Compression Facility are not included in this consultation. These facilities are conceptual at this time and may not be located within desert tortoise habitat. Furthermore, effects on desert tortoise as a result of DOE's Yucca Mountain Site Characterization Project and development of Solar Enterprise Projects proposed for Eldorado Valley, Dry Lake Valley, and Coyote Springs shall be covered under separate consultations and likewise will not be included in this biological opinion.

On March 1, 1996, the Service received DOE's request to exclude specified areas in Frenchman Flat (Area 5 of the NTS) from this programmatic consultation (Figure 3). DOE/NV determined that activities within this area is not likely to adversely affect the desert tortoise. This area occurs around the Spill Test Facility and Area 5 Radioactive Waste Management Site. Survey data for this area indicate: (1) Tortoises are absent and not expected to occur, and (2) the substrate is poor for plant growth with vegetation very sparse which is not likely capable of supporting tortoises. The Service concurs with DOE/NV's determination that this specified area is not suitable habitat for desert tortoise and excludes DOE/NV activities proposed for this area from this programmatic consultation.

Informal consultation under section 7 of the Act has been completed for the following projects on the NTS and are excluded from this consultation because they were found not to have adverse impacts on desert tortoise:

- Construction of Area 23 Fire Training Facility (File No. 1-5-93-I-360).
- Routine Maintenance Operations at the Radioactive Waste Management Site in Area 5 (File No. 1-5-94-F-230).
- Closure and Removal of Underground Storage Tanks at Various Locations on the NTS (File No. 1-5-94-I-248).
- Implementation of Phases I, II, and III of Project CALIOPE (File Nos. 1-5-94-I-255, 1-5-95-I-174, and 1-5-96-I-006).
- Closure of the Area 27 Explosive Ordnance Facility (File No. 1-5-94-I-259).
- Construction of the Nevada Support Facility in North Las Vegas (File No. 1-5-94-I-264).

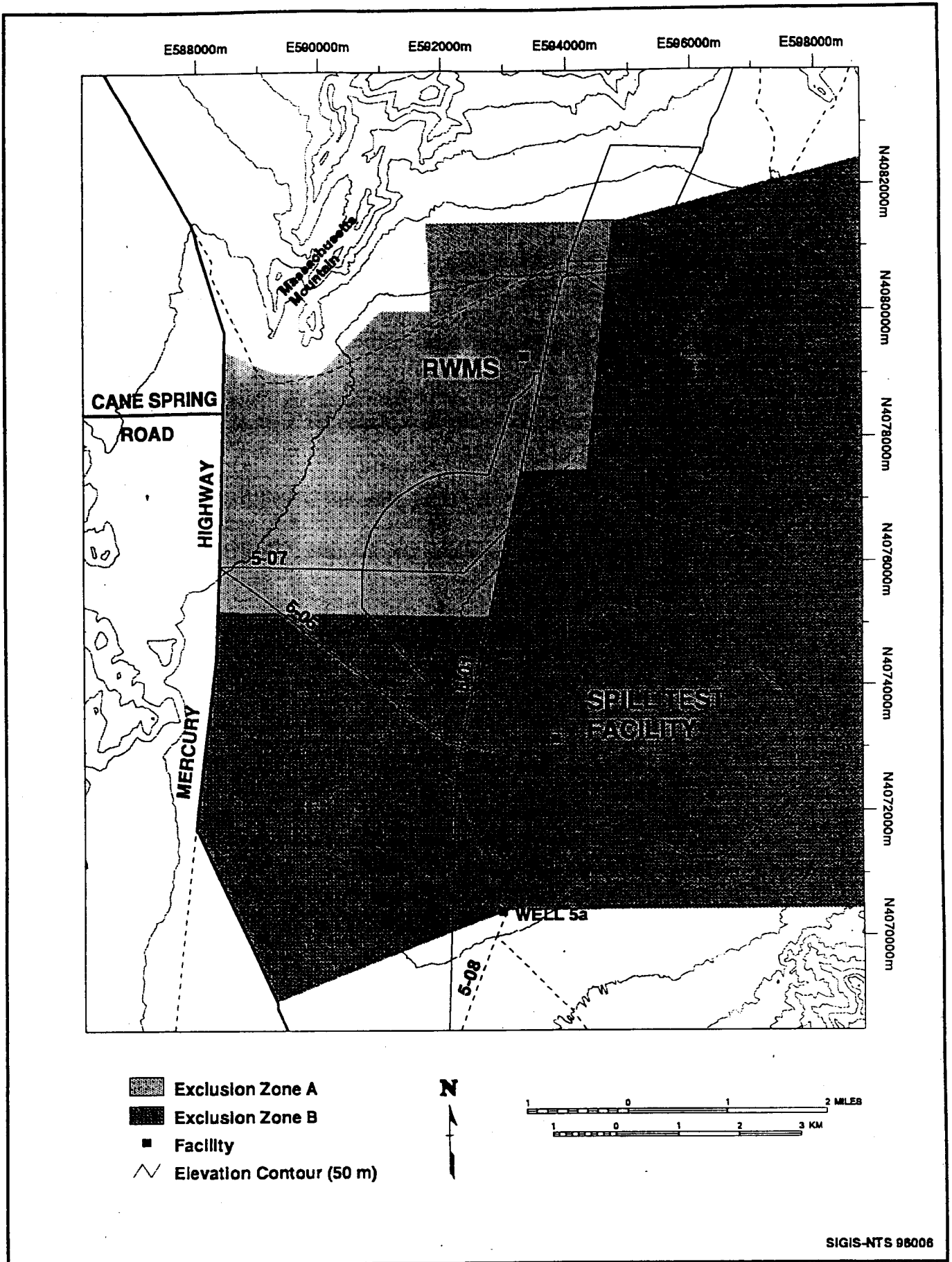


Figure 3. Location of habitat exclusion zones in Frenchman Flat, Nevada Test Site.

- Operation of the Area 5 Gravel Pit (File No. 1-5-94-I-278) Clean-up Operations at the Building 650 Leachfield in Area 23 (File No. 1-5-94-I-279).
- Construction of Four Sewage Lagoons and Associated Pipelines in Area 5 (File No. 1-5-94-I-325).
- Installation of a Waterline to the Radioactive Waste Management Site (RWMS) in Area 5 (File No. 1-5-95-I-41).
- Repair and Upgrade of Road 5-07 in Area 5 (File No. 1-5-95-I-100).
- Western Area Power Substation Easement and Upgrade (File Nos. 1-5-94-I-318 and 1-5-95-I-209).
- Extension of Cane Springs Road (File No. 1-5-96-I-034).

NTS Programs

This biological opinion will focus on DOE/NV programs and their potential effect on the desert tortoise. DOE/NV conducts activities at the NTS that are organized into five major programs: Defense; Waste Management; Environmental Restoration; Nondefense Research and Development; and Work for Others. Infrastructure and support facilities at the NTS are also described. Activities within these programs are proposed to occur at the NTS over the term of this biological opinion (10 years) as described below and in greater detail in the DEIS for the NTS (DOE 1996a), BA (DOE 1995a), and implementation plan (DOE 1995b).

Defense Program

The primary mission of the Defense Program is stockpile stewardship, which includes maintenance of readiness to conduct underground nuclear tests, if directed. Defense experiments provide information to support a variety of national security programs. On August 11, 1995, President Clinton announced his decision to seek a zero-yield Comprehensive Test Ban Treaty which would ban any nuclear test explosion or any other nuclear explosion. The current primary mission of the Defense Program at the NTS is to help ensure the safety and reliability of the nation's nuclear weapons stockpile.

The stockpile stewardship program includes maintaining the readiness and capability to conduct underground nuclear weapons tests and conducting such tests if directed by the President or Congress. The President, through an end of the moratorium or through a specific clause of a test ban treaty, may direct DOE to conduct one or more nuclear-yield tests. Other aspects of stockpile stewardship include conventional high-explosive tests, dynamic experiments, destruction of damaged nuclear weapons, and hydrodynamic testing. High-explosive nuclear experiments are key activities associated with hydrodynamic and dynamic testing which investigate the early phase of nuclear weapons performance within test facilities and in underground situations. Advanced nuclear weapons simulators consist of technology used within the proposed Advanced Hydrodynamic Test Facility and High-Explosive Pulsed-Powered Facility. These simulators are used to acquire data critical to evaluating the safety and reliability of the stockpiled nuclear weapons in the absence of underground testing.

Since 1963, the United States has conducted all of its nuclear weapons tests underground in accordance with the terms of the Limited Test Ban Treaty. As part of DOE/NV's nuclear test readiness, one or more underground nuclear tests may be conducted if directed by the President. In order to ensure that complete containment of all nuclear weapons tests is achieved, nuclear test devices are emplaced at the bottom of a vertically drilled hole or horizontally mined tunnel. Emplacement of a test device is not accomplished until approved by the Containment Evaluation Panel.

The National Ignition Facility (NIF) is proposed for construction on a 45-acre undisturbed site in Area 22, southwest of Mercury. Experiments at the NIF would duplicate conditions in the center of the sun, which would promote and expedite advancements in astrophysics, plasma physics, and other basic sciences. Other activities at the facility may include large-scale precision optics, rapid crystal growth technology, advanced X-ray lithography for integrated circuit manufacturing, advanced health care technologies, new material development, and various scientific and analytical instrumentation. Five new buildings would be constructed and an underground water pipeline would likely be built to supply the facility. Design and construction of a storm drain system would depend on the specific layout of the facility and its proximity to existing roads and structures. Sanitary wastewater would be treated using a sewage lagoon system dedicated to the facility.

Stockpile management includes the hands-on, day-to-day functions and operations involved in maintaining the enduring nuclear weapons stockpile. Stockpile management is currently being conducted at the Pantex Plant in Amarillo, Texas. Because of the limited space available at the Pantex Plant for the staging of retired weapons as they await disassembly, the DOE could potentially store nuclear weapons in six earth-covered storage magazines in Area 27 of

the NTS. Pantex stockpile management operations could be transferred to the NTS. Relocation of Pantex operations to the NTS would require the construction of approximately 327,000 square feet (7.5 acres) of new facilities centered around the Device Assembly Facility in Area 6.

A Device Assembly Facility (DAF) is a multi-structure facility where numerous activities are performed. These activities include: Assembly, disassembly or modification, staging, and component testing, maintenance, repair, retrofit, and surveillance of nuclear devices. This facility is covered with a minimum of 5 feet of compacted earth with one exterior wall and occupies approximately 100,000 square feet on 29 acres. Bunkers, mechanical and electrical support areas, and administrative offices are located at the DAF. The Area 27 complex has been the primary facility for assembly of nuclear devices and an alternate assembly facility for the DAF.

Nuclear Emergency Response comprises a number of separate, but related, emergency response operations located mostly offsite. These operations are directed at providing support services for various accidents, emergencies, and radiological incidents. Key elements of the Nuclear Emergency Response component include:

- *A Nuclear Emergency Search Team* is prepared to provide technical assistance upon request.
- *The Federal Radiological Monitoring and Assessment Center* is responsible for acquiring, processing, and providing assessment of radiological data in the field.
- *The Aerial Measuring System* conducts aerial surveys, provides remote sensing, and provides emergency response capabilities involving radiation, radioactive materials, or other hazardous materials.
- *An Accident Response Group* focuses on accidents involving nuclear weapons of the United States.
- *The Radiological Assistance Program* provides assistance and cleanup for accidents involving radioactive material that may pose a threat to public health and safety.
- *The Internal Emergency Management Program* provides response to onsite emergencies such as fire, bombs or bomb threats, earthquakes, aircraft accidents, and power outages.

The tritium supply and recycling component maintains stockpiled nuclear weapons by providing a supply of tritium. DOE currently recycles tritium at the Savannah River Plant in South Carolina and will likely continue to do so. However, the NTS may be considered as a candidate for similar types of facilities in the future. An Accelerator Tritium Production Facility may be included in this component which may consist of a linear accelerator, beam transport and switchyard, target chamber facility, secondary cooling system, electric substation, auxiliary power system, operations facility, maintenance facility, waste treatment facility, and administration facility. A Tritium Recovery and Recycling Facility may be housed in two major process buildings and several support facilities for processing and recycling tritium.

Waste Management Program

Radioactive waste disposal operations began at the NTS in 1961 with the establishment of the Area 5 RWMS for disposal of radioactive waste from NTS and offsite DOE generators. Radioactive wastes were deposited in selected pits, trenches, landfills, and disposal boreholes on the NTS. Near-surface burial (10 to 60 feet deep) of radioactive waste in subsidence craters, pits, and trenches has been the historical practice on the NTS. In 1981, the DOE adopted the concept of greater confinement burial (70 to 120 feet deep) for waste with radioactive exposure levels that are inappropriate for near-surface burial (e.g., fuel rod claddings and sealed sources).

The NTS waste management activities are conducted at five sites on the NTS. Only the Area 5 site and portions of the Area 6 site occur within the range of the tortoise. The Waste Management Program provides for the safe and permanent disposal of waste through either disposal on the NTS or offsite commercial waste treatment or disposal facilities. The Area 5 RWMS encompasses 732 acres of allocated land, of which 92 acres are currently used for storage and disposal. There are a total of 13 personnel-support buildings for the existing site. Low-level and mixed wastes are disposed via shallow land burial in pits and trenches. Some of these disposal units will be filled within the next 10 years. As previously described, the Area 5 RWMS occurs within a zone of unsuitable desert tortoise habitat and is excluded from this biological opinion (DOE 1996b).

Area 6 includes a waste accumulation building for polychlorinated biphenyl (PCB) wastes, a landfill, and is identified as a site for the Liquid Waste Treatment System facility. Initially, there will be two 500,000-gallon double-walled steel evaporation tanks for low-level or low-level mixed wastes. In addition to the tanks, the facility will include a leak detection system, yard lights, a

mobile-home-type trailer for offices and monitoring equipment, control features, access, fencing, and storm water protection. The facility may be expanded to handle up to 4 million gallons of waste per year. A hydrocarbon landfill is located near the southern edge of Area 6. The landfill is used for the sole purpose of discarding hydrocarbon-burdened soil, septic sludge, and debris. The minimum remaining capacity of the disposal site is approximately 1,483,216 million cubic feet. Approximately 540,000 cubic feet of soil, sludge, and debris have been disposed of in the landfill.

A sanitary landfill will be constructed in Area 5 to serve the needs of the expanded Defense and Environmental Restoration Program activities. This landfill will receive construction and sanitary waste, and will have an approximate capacity of 15 million cubic feet. The landfill is proposed to be located within an existing borrow pit and occupy approximately 15 acres of previously disturbed habitat.

Environmental Restoration Program

All industrial waste to be remediated occurs within disturbed areas and no desert tortoise habitat will be disturbed. Examples include, but are not limited to, above-ground and underground storage tanks, sewage lagoons, leachfields, and sanitary landfills. All remediation activities will be restricted to disturbed areas that have been denuded of vegetation, graded, compacted, or paved. Non-eroding surfaces in developed industrial settings will be accomplished by grading, gravel armoring, or paving. Industrial sites may be remediated by conducting a clean closure or by being closed in place. The types of wastes that may be present at industrial sites are low-level radioactive wastes, transuranic wastes, hazardous wastes, and mixed wastes.

At clean closure sites, contaminants will be collected and shipped to permitted treatment, storage, or disposal facilities. Digging, ground planing, drilling, and other similar activities will be used to recover most of the contaminants and leave residuals at acceptable, pre-determined levels. Removal of underground tanks and contaminated soils may create open excavations for a period of time until all wastes are covered. Mixed and transuranic wastes will be removed to the RWMS in Area 5. Bulk low-level radioactive waste will be disposed of at the RWMS in Area 3. Neither RWMS involves desert tortoise habitat. Hazardous wastes, batteries, and lead items will be shipped to approved disposal and recycling facilities off the NTS.

In some cases, it is not feasible or safe to remove contaminants from a site. In other cases, it is more efficient to immobilize the contaminants in place (closure-in-place). Drilling, excavating, grading, and other similar activities may occur during a closure-in-place. All waste landfills will probably utilize closures-in-place. Contaminants will be contained or immobilized at the site, and monitoring equipment may be installed to monitor the containment. Slurry wells, which are

constructed wells drilled near the site for injecting materials that inhibit the movement of contaminants, and/or impermeable liners may be used to restrict the movement of wastes. Sites may be capped or plugged in place, with materials such as gravel or concrete. Soil-moisture monitoring tubes may be inserted around the area to detect the potential movement of waterborne contaminants over time. Sites may also be vitrified (made "glass-like," especially through heat fusion) to immobilize contaminants.

The goal of the Environmental Restoration Program is to identify contaminated areas and clean up those areas, as appropriate to ensure that risks to the environment and human health and safety are either eliminated or reduced to protective levels. Protective levels are determined through site conditions, risk assessments, and consultation with State and Federal agencies. Habitat restoration activities include chemical, fabric, or rock armoring; seeding; transplanting native vegetation; contouring; uncompacting soils; treating or spreading topsoil; and planting. Prior to the early 1980s, the major focus of environmental restoration was the decontamination of testing areas for future use and the identification of contaminated areas that required restricted access. Beginning in the 1980s, environmental restoration at NTS increased substantially to comply with national environmental statutes. Activities include: Characterization, remediation, removal of underground storage tanks and PCBs, and closure of hazardous waste disposal trenches.

Specific environmental restoration projects proposed by the DOE to occur within the range of the desert tortoise on the NTS under the Environmental Restoration Program are:

(1) Underground Test Area Corrective Action Unit; (2) Soils Media Corrective Action Unit; (3) Industrial Sites Corrective Action Unit; and (4) Decontaminating and Decommissioning. Defense Nuclear Agency sites, a fifth project, was identified in the DEIS. However, Defense Nuclear Agency sites are all located north of the range of the desert tortoise, with most of the approximately 100 sites included in this project occurring within Area 12.

1. Underground Test Area Corrective Action Unit (UTACAU)

DOE established the UTACAU in July 1991 to investigate and possibly remediate ground water impacted by underground nuclear test events conducted at the NTS between 1952 and 1992. The GMX event is the only site proposed for cleanup within the range of the desert tortoise. Primary activities involved in this project include the siting of monitoring wells; construction of the wells and selection and placement of monitoring devices; well development, which represents pumping water and any excess materials to clean out the well; sampling, which involves taking samples from the well to identify the baseline data; and monitoring, in which scheduled monitoring results are gathered and analyzed.

The UTACAU project is anticipated to continue on a long-term basis and generate approximately 48,000 cubic feet of low-level waste. This waste would be disposed of on the NTS at one of the RWMSs.

2. Soils Media Corrective Action Unit (SMCAU)

The SMCAU project provides for cleanup of approximately 3,257 acres of plutonium-contaminated soils on the NTS and offsite locations. These contaminated areas occur in the northern half of the NTS with the exception of two sites in northeastern Area 5. These sites in Area 5 are contaminated as a result of the GMX and Smallboy events which occurred within the portion of Frenchman Flat which was excluded from consultation (DOE 1996b). The SMCAU is not expected to result in disturbance of desert tortoise habitat or impact tortoises on the NTS.

3. Industrial Sites Corrective Action Unit

In October of 1992, DOE/NV implemented a project to inventory existing and potential environmental restoration sites on the NTS. Environmental restoration sites include such waste types as inactive and abandoned drums, batteries, lead materials, tanks, sumps, sewage lagoons, leachfields, muck piles, waste dumps, spills, mud pits, landfills, injection wells, disposal trenches, hazardous waste accumulation sites, and ponds. In conjunction with environmental restoration sites inventory field efforts, the DOE/NV also conducts debris removal activities at selected sites. Debris materials include sanitary, construction, and recyclable waste, such as cabling, lumber, and steel pipes.

Restoration of contaminated waste sites includes: Characterization, remediation, and closure of radiation-contaminated sites, landfills, sewage lagoons decontamination pads and areas, waste dumps and trenches, spill sites, chemical storage areas, disposal craters, burn pits, explosion pits, wastewater pits and ponds, conditional release storage yards, material dumps, and unknown materials. Steam cleaning effluent ponds and the Decontamination Pond Facility were used for disposal of untreated liquid effluent. These ponds are scheduled for closure which will involve removal of waste-impacted soil.

4. Decontamination and Decommissioning

This component provides surveillance, maintenance, assessment and characterization, environmental review, engineering design, decontamination and decommissioning operations, waste disposal, and closure of retired DOE-owned or DOE-sponsored nuclear facilities that were used to support the development of nuclear power and nuclear weapons. DOE/NV proposes

eight facilities for demolition to ground level after verification that radioactivity levels are below the action level. Contaminated soils will be remediated under Environmental Restoration Program activities.

Nondefense Research and Development Program

The Nondefense Research and Development Program includes original research efforts by the DOE, universities, industry and other Federal agencies. Research on the safety aspects of handling, shipping, and storing hazardous fluids and liquefied gaseous fuels are conducted at the Spill Test Facility. The Solar Enterprise Zone concept was established to determine methods to create a sustaining solar manufacturing infrastructure through construction of utility-scale solar generating facilities. The Spill Test Facility and Solar Enterprise Zone projects are included in this program but were excluded from this consultation for reasons described previously.

The Alternate Fuels Demonstration Projects currently focus on alternative fuels used (e.g., natural gas) for vehicles. The intent is to build the infrastructure, convert the original vehicle fleet to operate on alternative fuel, and further develop partnerships geared to study other alternative fuel and energy sources. Such sources may include fuel cell research and development, exotic fuels development, additive research, and electric automobile development and use.

The Environmental Management and Technology Development component focuses on overcoming major obstacles to progress in cleaning up DOE sites. Five major remediation and waste management areas are included in this component:

- Containment Plume Control and Remediation
- Mixed Waste Characterization, Treatment, and Disposal
- High-Level Remediation
- Landfill Stabilization
- Facility Transitioning, Decommissioning, and Final Disposition

Varieties of other projects have been proposed for the NTS, including refinement of landfill monitoring technologies, demonstration of waste management techniques, application of remote sensing technologies, and soil sorting and washing techniques.

The National Environmental Research Park Program supports environmental research activities at the NTS. The Environmental Management and Technology Development programs continue to conduct research and development focused on overcoming major obstacles to progress in cleaning

up DOE sites. Research includes habitat reclamation, hydrogeologic systems, radionuclide transport, ecological change, waste management, monitoring processes, remediation, and characterization.

Work for Others Program

The Work for Others Program provides for the use of NTS areas and facilities by other groups and agencies for activities such as military training exercises. The NTS provides large, remote, and secured areas for host projects such as co-use of NTS airspace, training exercises, and research and development projects. Implementation of international arms control treaties have and will continue to impact NTS activities and facilities. This program is expected to expand, but currently includes five components:

1. Treaty Verification

The implementation of international arms control treaties allows for various types of monitoring associated with nuclear and chemical weapons testing. Activities may include various types of inspections, and construction and operation of monitoring equipment.

2. Nonproliferation Projects

Nonproliferation is defined as the use of the full range of political, economic, and military tools to prevent proliferation of nuclear weapons, impose diplomatic actions, or protect the United States' interests against an opponent armed with weapons of mass destruction or missiles, if necessary. Nonproliferation tools include intelligence, global nonproliferation norms and agreements, diplomacy, export control, security assurances, defenses, and the application of military force.

3. Counter Proliferation Research and Development

Counter proliferation refers to U.S. Department of Defense efforts to combat the international proliferation of weapons of mass destruction. Since facilities for developing, producing, and storing these weapons are likely located below ground, a considerable amount of counter proliferation research and development involves the detection, monitoring, and neutralization of buried targets. The Big Explosives Experimental Facility in Area 6, which is located outside the range of the tortoise, was specifically designed for research, development, and testing of counter proliferation technologies. Other areas on the NTS may be considered for these purposes.

4. Conventional Weapons Demilitarizing

This component involves disposal of millions of pounds of obsolete conventional munitions in NTS tunnels under static-burning methods that scrub gaseous combustion products prior to atmospheric release. Residues would be disposed of or recycled. Existing tunnels (X or Y in Area 25) and facilities at the NTS would be used and modified to meet the objectives of this component.

5. Defense-Related Research and Development

Activities in the past have included tests and training exercises employing weaponry and a variety of electronic, imagery, and sensory technologies including infrared, lasers, and radar. It is expected that additional experiments and tests similar to those just mentioned will occur at the NTS in the future.

Infrastructure and Support Facilities at the NTS

Existing infrastructure and support facilities present at the NTS include utilities and communications, transportation, and construction, operation, and maintenance of support facilities.

Utilities and Communication

Electrical power at the NTS is transmitted through a 100-mile-long 138-kV transmission loop that supplies eight major substations and one 138-kV radial transmission line. Basic load centers for the NTS are at Mercury, Areas 2, 3, 6, 12, and 25. Six existing water wells occur within the range of the desert tortoise on the NTS and two occur just outside the northern limit of the tortoise in Area 11. Water is delivered to a large storage reservoir near Mercury by an 8-inch-diameter waterline. Water is hauled into Areas 26 and 27 by truck. Four reservoirs in Area 26 store construction water and potable water. One reservoir in Area 27 stores fire protection and potable water.

Construction of buried or overhead power lines, water lines, telephone lines, sewer lines, fiber-optic cables, and other utilities may be required. Utility installation will require travel on existing roads or construction of new roads, digging trenches, and digging holes for poles. Maintenance is conducted as needed and will be restricted to existing roads or previously disturbed areas.

Transportation

New paved and unpaved roads will be constructed as needed by grading, hauling in fill material and gravel, construction of shoulders, application of asphalt, and installation of culverts. The source of fill material is the existing Area 5 gravel pit. Shoulders of paved roads are maintained or repaired by grading and reshaping. Ditches are maintained when required due to storm damage. On occasion, old deteriorated asphalt is ripped up and replaced with new asphalt. Unpaved roads are repaired by grading and watering. Primary paved roads in the southern part of the NTS include Mercury Highway, Jackass Flats Road, Cane Spring Road, and Lathrop Wells Road.

Construction, Operation, and Maintenance of Support Facilities

Construction of new support facilities and expansion of existing ones are proposed at Mercury, Nevada, in Area 23, the Control Point in Area 6, Device Assembly Facility in Area 6, Area 5 RWMS, and /or other areas on the NTS. These projects will occur mostly in previously disturbed areas.

There are 5 sewage treatment facilities, consisting of 17 effluent ponds within the range of the desert tortoise on the NTS. All effluent ponds are fenced with tortoise-proof fencing except four located in Mercury and two inactive ponds in Area 25. Additional sewage facilities may be required in the future.

There are two sanitary landfills which occur within the range of the desert tortoise on the NTS; one is located in Area 23 near Mercury, and the other in Area 6 near the Control Point. The Area 23 landfill is surrounded by a temporary polyethylene fence. The fence is maintained at zero ground clearance, inspected on a quarterly basis, and repaired as needed. The Area 6 landfill is unfenced. New sanitary landfills may be required in the future.

Proposed Mitigation Measures.

DOE/NV (1995a, 1996c) proposes the following mitigation measures to minimize effects to desert tortoises from the proposed actions:

1. All proposed land-disturbing activities on NTS will be reviewed to ensure compliance with the Act and DOE environmental policies. As part of this review, preactivity surveys will be conducted at proposed project sites to determine the presence of threatened,

endangered, or candidate species. Whenever possible, DOE/NV will modify the design or location of a project when it will impact the survival of a listed, proposed or candidate species or may result in the incidental take of desert tortoises.

2. DOE/NV may voluntarily choose to search for and relocate tortoises from lands to be disturbed within very low-density desert tortoise habitat (10 per square mile or less) as identified in Figure 1 of Appendix A of the BA. However, if search and removal activities are chosen by DOE/NV, only individuals trained to handle desert tortoises in accordance with Service-approved guidelines shall be authorized to handle desert tortoises. Currently, the Service-approved handling guidelines are described in *Guidelines for Handling Desert Tortoises during Construction Projects* (Desert Tortoise Council 1994, revised 1996). In areas where desert tortoise densities are unknown or 10 per square mile or greater, surveys will be conducted in accordance with Measures 3 and 4 below. Future surveys may identify other areas on the NTS as very low-density tortoise habitat. DOE/NV may submit these survey results and maps to the Service and request that survey and relocation actions be voluntary for these additional areas as well.
3. Tortoise surveys will be conducted only at sites that have not been cleared of vegetation. The surveys will be conducted not more than one working day prior to any surface-disturbing activities. Qualified biologists shall thoroughly search the project area for tortoises using techniques providing 100-percent coverage of all areas. Project areas will be surveyed once, or twice if a tortoise is found during the first survey. All tortoise burrows, and other animal burrows that may be used by tortoises, that are found during clearance surveys will be conspicuously flagged. During surface-disturbing activities, all burrows will be avoided by at least 30 feet. If a burrow cannot be avoided, it will be inspected to determine the presence of tortoise or tortoise nests, using a fiber-optic scope if necessary. Burrows containing animals will be excavated by hand and tortoises or eggs removed. Tortoises found above ground or in burrows in harm's way will be removed by qualified biologists according to desert tortoise handling procedures approved by the Service (Desert Tortoise Council 1994, revised 1996). All unavoidable burrows that are unoccupied will be crushed.
4. If no tortoise sign is observed during the 100-percent coverage surveys, zone-of-influence surveys will be conducted for projects within the geographic range of the desert tortoise in areas except where tortoises are absent or occur in very low densities as described in Measure 2 above and Appendix A of the BA. If evidence of tortoises is not found within the project boundary and along the zone-of-influence transects, then it will be determined that the project will not negatively influence the species and is exempt from this

consultation and the terms and conditions of this biological opinion. DOE/NV may submit the survey data forms to the Service for their concurrence that the activity will not affect tortoises. If, however, tortoise sign is found within the project area, or along the zone-of-influence transects, the mitigation actions described below will be implemented.

5. Project activities that may endanger a tortoise will cease if a tortoise is found on a project site. An on-call biologist will be contacted by radio or telephone and will respond to the sighting within 1 hour of notification. Project activities will resume after the on-call biologist removes the tortoise from danger or after the tortoise has moved to a safe area.
6. Vehicles will not be driven off existing roads in non-emergency situations unless authorized by DOE/NV. Off-road travel on the Desert National Wildlife Range (DNWR) is prohibited unless approved by the Refuge Manager. In the event non-emergency off-road travel is required, the planned route will be surveyed by qualified biologists immediately prior to its use. All burrows will be conspicuously flagged and avoided by a minimum of 30 feet.
7. All vehicles will be driven at speeds within the posted speed limits on existing roads, and will not exceed 15 miles per hour within project boundaries. Any tortoise observed in harm's way on a paved road may be moved off the road in the direction it was going in accordance with tortoise handling procedures approved by the Service (Desert Tortoise Council 1994, revised 1996) by any worker who has completed DOE/NV's desert tortoise education program.
8. DOE/NV will implement a litter-control program during outdoor program activities that will include the use of covered, raven-proof trash receptacles; disposal of edible trash in trash receptacles following the end of each workday, and disposal of trash in a designated sanitary landfill at the end of each week. Material placed in a sanitary landfill will be covered daily when the landfill is open, as per DOE/NV standard operating procedures.
9. All DOE/NV and contractor personnel working on the NTS in tortoise habitat will complete the DOE/NV Desert Tortoise Conservation Education Program which provides information relative to the occurrence of the desert tortoise on the NTS, the threatened status of the species, the definition of "take," the potential for impacts to the tortoise, the potential penalties for "taking" a threatened species, procedures for protecting tortoises, and when it is appropriate to move tortoises off roads and the proper technique in doing so.

10. The Environmental Restoration Division of DOE/NV has prepared a standard operating procedure for site reclamation which describes the methods of stabilizing and revegetating sites. The goal is to establish stable non-eroding surfaces. In developed industrial settings, this may be accomplished by grading, gravel armoring, or paving. Where decontamination and decommissioning actions result in clean buildings available for new uses, no additional site stabilization will be required. Closed waste sites where the wastes have not been removed will not be revegetated if that will interfere with containment or monitoring of the contaminants. Those sites which are surrounded largely by undisturbed land will be reclaimed to some degree based on the site's future uses and site characteristics. Reclamation may range from chemical, fabric, or rock armoring to seeding and/or transplanting native vegetation. Where revegetation potential is high, that will be the preferred option.
11. Prior to revegetation, a field survey will be conducted at each site and site-specific reclamation plans will be developed. These plans may include specifications for contouring, relieving soil compaction, treating and/or spreading topsoil, and planting. The type of actions recommended will depend on the severity of land disturbance and the site's size, location, and proposed future use. When possible, native perennial vegetation and annual plants, including forage species of desert tortoises on the NTS will be used.
12. As an alternative to rehabilitation and revegetation of disturbed desert tortoise habitat, DOE/NV will pay a mitigation fee to compensate for the loss of tortoise habitat on the NTS (R. Furlow, DOE/NV, pers. comm., December 7, 1995).
13. The installation of tortoise-proof fencing around new impoundments will be considered if tortoise drownings occur.

Status of the Species

The desert tortoise, a large, herbivorous reptile, is generally active when annual plants are most common (spring, early summer, autumn). Desert tortoises usually spend the remainder of the year in sheltered sites, escaping the extreme weather conditions of the desert. Sheltering habits of desert tortoises vary greatly in different geographic locations. Shelter sites may be located under bushes, in the banks or beds of washes, in rock outcrops, or in caliche caves. The size of desert tortoise home ranges vary with respect to location and year. Females have long-term home ranges that are approximately half that of the average male, which range from 25 to 200 acres (Berry 1986). Over its lifetime, each desert tortoise may require more than 1.5 square miles of habitat and make forays of more than 7 miles at a time (Berry 1986). In drought years, tortoises

forage over larger areas, increasing the likelihood of encounters with sources of injury or mortality including humans and other predators. Desert tortoises possess a combination of life history and reproductive characteristics which affect the ability of populations to survive external threats. Tortoises may require 20 years to reach sexual maturity (Turner, Medica, and Bury 1987). Further information on the range, biology, and ecology of desert tortoise can be found in Berry and Burge (1984); Burge (1978); Burge and Bradley (1976); Bury, Esque, DeFalco, and Medica (1994); Hovik and Hardenbrook (1989); Karl (1981, 1983a, 1983b); and Weinstein et al. (1987).

The range of the Mojave population of the desert tortoise includes a portion of the Mojave Desert and the Colorado Desert subdivision of the Sonoran Desert and spans portions of four States. The Mojave Desert is located in southern California, southern Nevada, northwestern Arizona, and southwestern Utah. It is bordered on the north by the Great Basin Desert, on the west by the Sierra Nevada and Tehachapi Ranges, on the south by the San Gabriel and San Bernardino Mountains and the Colorado Desert, and on the east by the Grand Wash Cliffs and Hualapai Mountains of Arizona. In Nevada, the native range of this species is generally restricted to Clark County and those portions of Nye and Lincoln Counties south of 37 degrees North latitude and below approximately 1,330 meters elevation (4,000 feet). The range of the desert tortoise on the NTS is delineated in Figure 2.

The desert tortoise is most commonly found within the desert scrub vegetation type, primarily in creosote bush scrub vegetation, but also in succulent scrub, cheesebush scrub, blackbush scrub, hopsage scrub, shadscale scrub, microphyll woodland, and Mojave saltbush-allscale scrub (Service 1994). Within these vegetation types, desert tortoises potentially can survive and reproduce where their basic habitat requirements are met. These requirements include a sufficient amount and quality of forage species; shelter sites for protection from predators and environmental extremes; suitable substrates for burrowing, nesting, and overwintering; various plants for shelter; and adequate area for movement, dispersal, and gene flow. Throughout most of the Mojave Region, tortoises occur most commonly on gently sloping terrain with soils ranging from sand to sandy-gravel and with scattered shrubs, and where there is abundant inter-shrub space for growth of herbaceous plants. Throughout their range, however, tortoises can be found in steeper, rockier areas. Soil type appears to be a major factor related to desert tortoise density with optimal soils consisting of sandy loams to light gravel-clays to heavy gravels (Clement Associates 1990). In Nevada, tortoises are considered to be active from March 1 through October 31.

Critical Habitat and Recovery Areas

On April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened (55 FR 12178). The Mojave population includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Colorado Desert in California (a division of the Sonoran Desert). Reasons for the determination included loss of habitat from construction projects such as roads, housing and energy developments, and conversion of native habitat to agriculture. Grazing and off-road vehicles (OHV) have degraded additional habitat. Also cited as threatening the desert tortoise's continuing existence were illegal collection, upper respiratory tract disease (URTD), and predation on juvenile desert tortoises by common ravens (*Corvus corax*).

On February 8, 1994, the Service designated approximately 6.4 million acres of critical habitat for the Mojave population of the desert tortoise (59 FR 45748), which became effective on March 10, 1994. Critical habitat units (CHU) are based on recommendations for Desert Wildlife Management Areas (DWMA) outlined in the *Desert Tortoise (Mojave Population) Recovery Plan* (Service 1994). Because the CHU boundaries were drawn to optimize reserve design, the CHUs may contain both "suitable" and "unsuitable" habitat. Suitable habitat can be generally defined as areas that provide the constituent elements of nesting, sheltering, foraging, dispersal, and/or gene flow. The regulation of activities within critical habitat through section 7 (of the Act) consultation will be based on recommendations in the recovery plan. The proposed programmatic area does not occur within designated critical habitat.

The recovery plan divides the range of the desert tortoise into six distinct population segments or recovery units (RU) and recommends establishment of 14 DWMA throughout the RUs. Within each DWMA, the recovery plan recommends implementation of reserve-level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. The design of DWMA should follow accepted concepts of reserve design. As part of the actions needed to accomplish recovery, land management within all DWMA should restrict human activities that negatively impact desert tortoises (Service 1994). DWMA will be designated by the Bureau of Land Management (Bureau) through the Resource Management Plan. Although the proposed programmatic area occurs within the Northeastern Mojave RU and populations on the NTS may be important in recovery of the desert tortoise, it does not occur within a proposed or designated DWMA or any area recommended for recovery of the desert tortoise.

Environmental Baseline

Although large parts of the NTS have been affected by human activities, the majority of the site remains relatively undisturbed. Most disturbances are concentrated in the bottom of Yucca, Frenchman, and Jackass Flats and on parts of the Pahute and Rainer Mesas. Surface disturbance on the NTS is shown in Figure 4. Since the 1980s, hazardous waste generated on the NTS has been shipped offsite to commercial facilities. Receipt of transuranic waste for disposal at the NTS ceased in 1988; receipt of waste for disposal from offsite generators ceased in 1990. Transuranic waste is radioactive waste containing alpha-emitting radionuclides having an atomic number greater than 92, and half-lives greater than 20 years, in concentrations greater than 100 nanocuries per gram.

In October 1992, DOE/NV implemented the Nevada Environmental Restoration Project to conduct an inventory of the existing and potential environmental restoration sites on the NTS. Over 3,300 environmental restoration sites have been identified which will require some level of remediation. As of May 1994, 21.2 tons of debris have been removed from 43 environmental restoration sites.

Historic and Current Land Uses on the NTS

Prior to 1951, the NTS was used primarily for grazing, hunting, and mining. Lands which comprise the NTS have been withdrawn from all forms of appropriation under public land laws, including mining and mineral-leasing laws through the public land orders and Memorandum of Understanding between the Air Force and DOE dated November 1, 1963.

Underground nuclear testing occurred on the NTS from June 1957 through 1992. Of the approximately 800 underground tests, no more than 10 occurred within the range of the tortoise.

Underground nuclear testing has resulted in formation of craters, surface subsidence, and the release of radioactivity into the environment. Additionally, 31 safety tests were conducted at ground level from 1954 to 1963 which resulted in radioactive contamination of the soil. These safety tests were conducted to evaluate the safety of nuclear weapons. The GMX event located in the northwestern portion of Area 5 is the only event which occurred within the range of the tortoise on the NTS. In addition, approximately 100 atmospheric weapons tests have occurred prior to August 1963 on the NTS which include any tests conducted at ground level, from towers or balloons, or by airdrops, some of which occurred in tortoise habitat.

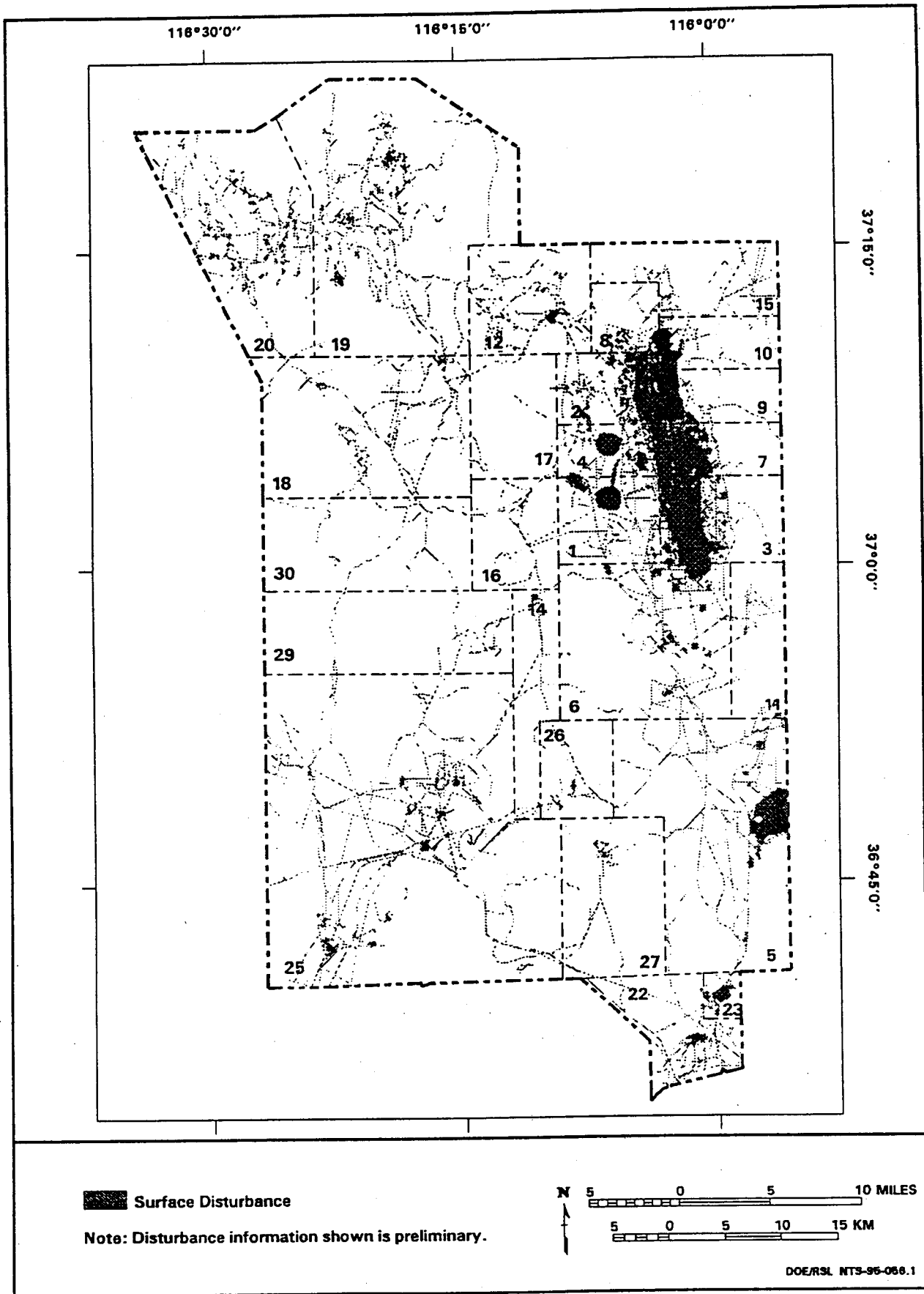


Figure 4. Surface disturbance on the Nevada Test Site.

Twenty-six experimental tests of reactors, nuclear engines, ramjets, and nuclear furnaces were conducted on the NTS between 1959 and 1973. Shallow burial of nuclear and non-nuclear wastes in cells, pits, and trenches continues to be an important waste disposal activity. Contaminated soils and equipment collected during the decontamination of atmospheric testing areas and consolidation of radioactivity contaminated structures, and other bulk wastes, were disposed in subsidence craters in Yucca Flat. In 1981, greater confinement disposal of waste was initiated at Area 5 for certain radioactive low-level wastes not suitable for shallow land disposal.

The NTS has a large infrastructure that provides site support services, which include food and housing, paint shops, vehicle maintenance facilities, machine shops, and road maintenance. There are approximately 400 miles of paved roads and 190 miles of unpaved roads on the NTS. Within the range of the desert tortoise, there are approximately 135 miles of paved roads, 100 miles of maintained unpaved roads, and 145 miles of unpaved roads used for utility maintenance. Non-emergency OHV travel is prohibited without written approval of DOE/NV. There are two sanitary landfills which occur within the range of the desert tortoise on the NTS; one is located in Area 23 near Mercury, and the other in Area 6 near the Control Point. The Area 23 landfill is surrounded by a temporary polyethylene fence. The fence is maintained at zero ground clearance, inspected on a quarterly basis, and repaired as needed. The Area 6 landfill is unfenced. Debris in these landfills is covered every 24 hours, Monday through Thursday; operations cease Friday through Sunday. New sanitary landfills may be required in the future.

In addition to activities described in the *Description of the Proposed Action*, additional existing disturbance from previous activities in the project area includes wild horse use, livestock grazing, fire and fire suppression activities, mining, dumping and waste disposal, OHV use, transportation corridors, residential and commercial development, and utility transmission line and buried pipeline rights-of-way. Ongoing disturbance includes fire and fire suppression activities, residential development, and transportation and utility corridors.

Desert Tortoise Population and Habitat Characteristics on the NTS

The southern two-thirds of the NTS is dominated by three large valleys or basins: Yucca, Frenchman, and Jackass Flats. The northern and northwestern sections of the NTS are dominated by Pahute Mesa and Timber and Shoshone Mountains. The boundary between the northern limit of the Mojave desert and southern limit of the Great Basin desert occurs on the NTS within a broad east-west corridor of transition (Beatley 1976). Typical Mojave Desert plant communities are best developed below 3,900 feet elevation, but are found as high as 4,600 feet elevation in favorable conditions. Grasses and herbaceous perennials are common, and annual herbs are abundant after periods of high rainfall. Little sign of tortoises have been found on transects where

Coleogyne ramosissima is the dominant shrub. Exotic plants have encroached onto the NTS which may have been accelerated by DOE/NV's land disturbing activities (DOE 1996a). Vegetation associations for the NTS are identified in Figure 5.

Soils on the NTS may be characterized by coarse texture, low organic matter content, a low carbon/nitrogen ratio, and little leaching or formation of horizons. Alluvial soils on bajadas are a combination of unconsolidated volcanic and sedimentary parent material. Wind-blown sand deposits cover some areas. A caliche layer is found near the surface of most alluvial soils. Desert pavement is present where smaller particles on the soil surface have been removed by wind and rain. Residual soils on gentle slopes are shallow (EG&G/EM 1991).

Transect surveys were conducted throughout the southern one-third of the NTS to determine the range and distribution of the desert tortoise. From 1981 to 1986, biologists with EG&G/Energy Measurements (1991) conducted 759 transects covering 740 miles in 9 of the 27 areas within the NTS, with 45 percent of these transects at Yucca Mountain in the northwestern quarter of Area 25. Most transects were 0.6-mile (1 kilometer) to 1.9 miles (3 kilometers) long and spaced 656 feet (200 meters) apart. Approximately 90 percent of the transects were straight. Similar methods were used for all transect surveys conducted on the NTS from 1981 to 1986. During the surveys, 17 live tortoises and 363 other tortoise signs were observed.

Additional transects were conducted between 1987 and 1990 during tortoise population and impact monitoring studies. During these surveys, 105 tortoises were found, 54 of which were found at Yucca Mountain during 1989-1990. A relatively large number of tortoises were found on the southeastern bajadas of CP Hills, the southwestern portion of Frenchman Flat, along the Saddle Mountain Road in northeastern Jackass Flats, in the northern portion of Midway Valley, and in the foothills surrounding Midway Valley near Yucca Mountain. Tortoise sign has been found on the NTS up to 5,250 feet in elevation, which is one of the highest elevations reported in the literature on desert tortoise. Only a small portion of the NTS has been searched intensely for tortoises. Areas of tortoise abundance may exist which are greater than those currently known.

Based on the results of these studies, DOE/NV estimates that the southern one-third of the NTS, approximately 450 square miles (288,000 acres), is desert tortoise habitat and contains low to very low densities of desert tortoises. Tortoises on the NTS appear to be more abundant on the bajadas and foothills of the predominantly limestone, dolomite, and shale mountains near mountains of volcanic origin. Since May 1992, over 50 construction projects have occurred on the NTS which were monitored by onsite biologists (2,500 man-hours total) with no desert tortoises observed (DOE 1996b).

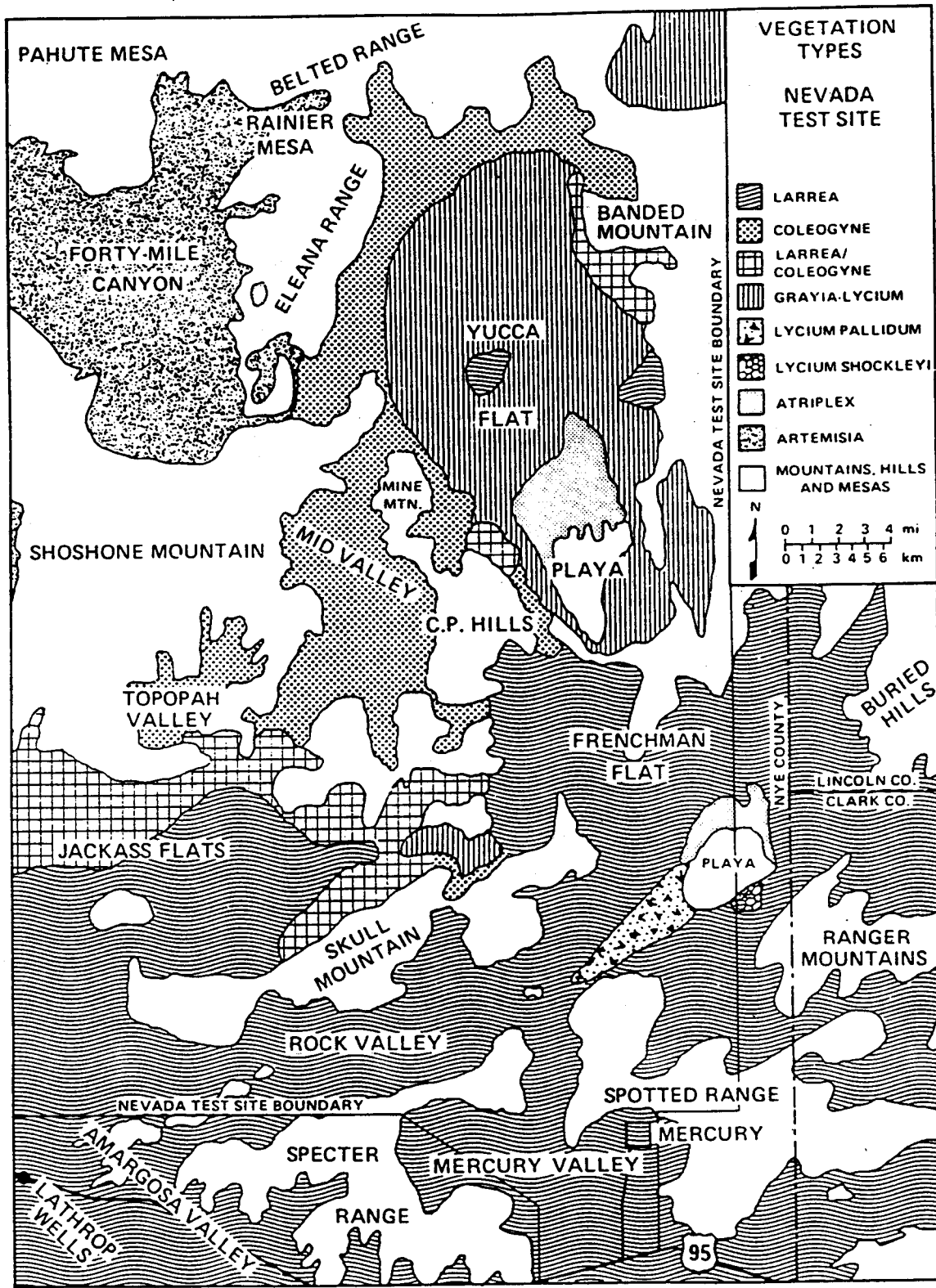


Figure 5. Vegetation types on the Nevada Test Site (O'Farrell and Emery 1976).

Major Activities Authorized Under Sections 7 and 10(a) of the Act in Nevada within the Northeastern Mojave RU

On April 27, 1990, the Service issued a 2-year section 10(a)(1)(A) permit (PRT-747182) to The Nature Conservancy, Nevada Division of Wildlife (NDOW), and the Bureau, which authorized collection of 871 desert tortoises for scientific research from 12 specified properties proposed for development. On October 17, 1991, the Service issued an amendment to the permit authorizing collection of an additional 156 tortoises from the original properties in addition to other lands in the Las Vegas Valley; extending the term of the permit to December 31, 1993; and including various additional research activities involving desert tortoise. As of December 31, 1993, a total of 961 desert tortoises had been collected from specified properties within the valley, since issuance of the permit. Of these, 31 were collected and released in association with construction of the Desert Tortoise Conservation Center, and 33 were obtained through incidental take provisions of section 7 of the Act (NDOW 1994). There was an average density of 80 desert tortoises per square mile on 7,075 acres of the specified properties (Hardenbrook and Tomlinson 1991).

On May 23, 1991, the Service issued a biological opinion on the issuance of incidental take permit PRT-756260 (File No. 1-5-91-FW-40). The Service concluded that incidental take of 3,710 desert tortoises on up to 22,352 acres of habitat within the Las Vegas Valley and Boulder City in Clark County, Nevada, was not likely to jeopardize the continued existence of the desert tortoise. The permit application was accompanied by Clark County's *Short-Term Habitat Conservation Plan for the Desert Tortoise in the Las Vegas Valley, Clark County, Nevada* (Regional Environmental Consultants 1991) (short-term HCP) and an implementation agreement that identified specific measures to minimize and mitigate the effects of the action on desert tortoises.

On September 26, 1991, the Service issued a programmatic biological opinion (File No. 1-5-91-F-112) to the Bureau's Las Vegas District for implementation of their Management Framework Plan (MFP) within the boundaries of Clark County's short-term HCP and incidental take permit boundary. Approximately 42,240 acres of Bureau land were authorized for disposal by sale, land exchange, mineral leases, rights-of-way leases, or recreation or public purpose leases. These lands could be developed for residential, industrial, commercial, and public infrastructure projects to accommodate rapid urban development. The biological opinion concluded that the proposed implementation of the Bureau's MFP was not likely to jeopardize the continued existence of the Mojave population of the desert tortoise; no critical habitat would be destroyed or adversely modified. The Bureau has disposed of 5,252 acres out of the 42,240 acres authorized for disposal.

On March 5, 1993, the Service issued a biological opinion to the Bureau for the Apex Project, transferring approximately 21,000 acres of Bureau land to private ownership. Approximately 2,000 acres of the Apex land have been authorized for use by Kerr-McGee for a chemical processing plant; 187 acres for the Georgia Pacific Co-Generation Plant; 2,185 acres for Silver State Disposal's regional landfill (File No. 1-5-93-F-173); of which 1,465 is desert tortoise habitat, and 230 acres for two waste facilities and utility routes.

On July 29, 1994, the Service issued a non-jeopardy intra-Service biological opinion on the issuance of an amendment to incidental take permit PRT-756260 (File No. 1-5-94-FW-237) to extend the expiration date of the existing permit by 1 year (to July 31, 1995) and include an additional disturbance of 8,000 acres of desert tortoise habitat within the existing permit area. The amendment did not authorize an increase in the number of desert tortoises allowed to be taken under the existing permit. Additional measures to minimize and mitigate the effects of the amendment were also identified. Approximately 1,300 desert tortoises were taken under the authority of PRT-756260, as amended. In addition, during the short-term HCP, as amended, approximately 541,000 acres of desert tortoise habitat have been conserved in Piute and Eldorado Valleys within Clark County and lands administered by the Bureau and National Park Service.

On July 11, 1995, the Service issued an incidental take permit (PRT-801045) to Clark County, Nevada, including cities within the county and the Nevada Department of Transportation (NDOT), under the authority of section 10(a)(1)(B) of the Act. The permit area (Clark County) mostly occurs within the Northeastern Mojave RU, but also includes a portion of the Eastern Mojave RU. The permit became effective August 1, 1995, and allows the "incidental take" of desert tortoises for a period of 30 years on 111,000 acres of non-Federal land and approximately 2,900 acres associated with NDOT activities in Clark, Lincoln, Esmeralda, Mineral, and Nye Counties, Nevada. The *Clark County Desert Conservation Plan* (CCDCP) (Regional Environmental Consultants 1995), serves as the permittees' HCP and details their proposed measures to minimize, monitor, and mitigate the effects of the proposed take on the desert tortoise. The permittees will impose, and NDOT will pay, a fee of \$550.00 per acre of habitat disturbance to fund these measures. The permittees will expend \$1.35 million per year, and up to \$1.65 million per year for the first 10 years, to minimize and mitigate the potential loss of desert tortoise habitat. It is anticipated that the majority of these funds will be used to implement mitigation measures, such as increased law enforcement; construction of highway barriers; road designation, signing, closure, and rehabilitation; and tortoise inventory and monitoring. The benefit to the species, as provided by the CCDCP, should substantially minimize and mitigate

those effects which will occur through development within the permit area and aid in meeting recovery goals necessary to delist tortoise populations in recovery areas recommended in Clark County.

On April 11, 1996, the Service issued a programmatic biological opinion (File No. 1-5-96-F-23R) to the Bureau's Las Vegas District for implementation of their MFP and Stateline Resource Management Plan within the Las Vegas Valley. Consultation was reinitiated on the 1991 biological opinion to increase the programmatic area from 42,240 acres to 125,000 acres of Bureau lands to meet the needs of development in the Las Vegas Valley and to implement Bureau land use plans. As a result of urban expansion, most Bureau lands within the Las Vegas Valley are highly fragmented and impacted by human activities, particularly a 4,000-acre "exclusionary" zone. The Bureau delineated an exclusionary zone within the programmatic boundary which does not contain suitable desert tortoise habitat. Except for lands within the exclusionary zone, the Bureau will collect a mitigation fee of \$550.00 per acre to compensate for the loss of tortoise habitat within the programmatic boundary. The fees will be used to fund management actions which are expected to provide direct and indirect benefits to the desert tortoise over time.

Effects of the Proposed Action on the Listed Species

Increased human use and development of the desert often result in more human interactions with the desert tortoise and its habitat. The NTS is a restricted access area which prevents tortoises on the NTS from being collected or harassed by the public. Furthermore, isolation and restricted access minimize the potential introduction of disease to tortoises on the NTS through release of captive desert tortoises by the public. The release of captive animals which are ill may contribute to the spread of URTD in wild populations (Jacobson et al. 1995, Jacobson and Gaskin 1990).

Overall, desert tortoise habitats most susceptible to negative impacts are those at the interfaces between developed lands and open desert. Habitat fragmentation associated with development is a major contributor to population declines throughout the range of the tortoise (Berry and Burge 1984). Even near small settlements (e.g., Mercury) and isolated residences the same factors are present, and the cumulative impacts can spread in a radius of several miles from such areas. For example, domestic dogs can be found digging up and killing desert tortoises miles from home (Service 1994).

A recent survey of approximately 54 miles of electrical transmission lines in southern Nevada produced the remains of 78 juvenile tortoises which were found beneath 23 towers (McCullough Ecological Systems 1995). Ravens use power transmission towers and other man-made structures for perches to locate small, slow-moving hatchling and juvenile tortoises. Natural

predation in undisturbed, healthy ecosystems is generally not an issue of concern. However, predation rates may be altered when natural habitats are disturbed or modified. Construction of artificial raven perch and nest sites (e.g., power transmission lines) may increase raven predation of desert tortoises. Roads may provide linear open areas that make tortoises more visible to avian predators. Common raven populations in the California deserts have increased ten-fold from 1968 to 1992 in response to expanding human use of the desert (Boarman and Berry 1995). Because ravens make frequent use of food, water, and nest site subsidies provided by humans, their population increases can be tied to this increase in food and water sources such as landfills and septic ponds (Boarman 1992; Service 1994). Ravens may be attracted to landfills or project sites within the programmatic area if trash is accessible by scavengers (Berry 1985; Bureau 1990). Considering that ravens were very scarce in this area prior to 1940, it is assumed that the current level of raven predation on juvenile desert tortoises is an unnatural occurrence (Bureau 1990). Implementation of a litter-control program and the practice of staying on established roads as proposed by DOE/NV should minimize these effects.

Desert tortoises will continue to be threatened by roads and vehicles on the NTS. Data from permanent study plots in California show that tortoise densities decreased significantly with increasing mileage of linear disturbances (e.g., roads), increasing numbers of human visitors, and increasing percentages of introduced annual plants (Berry 1992). The density of roads, routes, trails, and ways in desert tortoise habitat has a direct effect on mortality rates and losses of tortoises. Access allows people to penetrate into remote, undisturbed parts of the desert which contributes to tortoise mortality and habitat loss or degradation (Service 1994). Minimization and mitigation measures proposed by the DOE/NV to limit the speed of vehicles and prohibit cross-country vehicle travel should minimize these effects. DOE/NV proposes to instruct NTS personnel to move tortoises off roads if in imminent danger (DOE 1996a). Each year tortoises are killed on NTS roads, which is a potential threat to tortoises on the NTS (DOE 1996a). Movement of tortoises out of imminent danger on roads should minimize injury and mortality of tortoises on the NTS. Therefore, the Service concurs with this activity when conducted in accordance with approved protocol.

As a result of implementation of the proposed action, desert tortoises may be taken by capture and removal from project areas or trapped or injured by falling into open holes or trenches. Vehicles that stray from the project area and roads may crush desert tortoises above ground or in their burrows. Furthermore, tortoises may be buried during soil-disturbing activities. Minimization and mitigation measures proposed by DOE/NV to restrict vehicle travel to existing roads and conduct clearance surveys prior to surface disturbance should minimize these effects.

Additional harassment may occur from increased levels of human activity, noise, and ground vibrations produced by vehicles and heavy equipment (Bondello 1976; Bondello et al. 1979) and capture of tortoises by residents or project proponent workers for use as pets. Ground vibrations can cause desert tortoises to emerge from their burrows; slapping the ground several times within a few feet of a desert tortoise burrow entrance will often cause a desert tortoise to emerge (Phil Medica, National Biological Service, pers. comm.). Tortoises may be incidentally taken during project activities which may, under circumstances described in the *Description of the Proposed Action*, be captured and relocated from project areas. Tortoises may be killed or injured from falling into open trenches or other excavations. Tortoises may drown in unfenced water impoundments or drink contaminated water and become ill or die. Mitigation proposed by DOE/NV to implement a tortoise education program and fence areas that are hazardous to tortoises should minimize these effects.

Mitigation fees proposed by DOE/NV to compensate for permanent disturbance (e.g., construction of a building) as an optional alternative to rehabilitation and revegetation will be used for management and recovery of the desert tortoise. Mitigation fees may be used for: Habitat acquisition; population or habitat enhancement; research; minimization of direct and indirect loss of individual tortoises; public information and education; and other actions as identified in the recovery plan (Service 1994).

Implementation of activities as described in DOE/NV's BA (DOE 1995a) and Alternative 3 of the DEIS for the NTS may result in the long-term disturbance of 3,015 acres of desert tortoise habitat and the incidental take of three (3) desert tortoises per year through injury or mortality and ten (10) desert tortoises per year through capture and displacement.

The Service has determined that the level of effect described herein will not reduce appreciably the likelihood of survival and recovery of the Mojave population of the desert tortoise in the wild or diminish the value of critical habitat both for survival and recovery of the desert tortoise because:

- (1) The proposed programmatic area does not occur within any areas recommended for recovery of the desert tortoise or areas designated as critical habitat;
- (2) Rehabilitation and revegetation of disturbed sites or payment of offsite mitigation fees will benefit conservation and recovery of desert tortoise as directed under section 7(a)(1) of the Act;

- (3) The desert tortoise is a wide-ranging species occurring over a large area. The degree of threats to the species vary in different parts of the Mojave Desert, requiring implementation of management actions tailored to the needs of specific areas (Service 1994). The loss of habitat associated with the proposed action translates to approximately 1 percent of the total habitat on the NTS. With proper management and conservation, important desert tortoise populations both inside and outside designated recovery areas, will remain viable; and
- (4) The NTS occurs within the Northeastern RU in Nye County, Nevada. Activities on the NTS should not result in a substantial loss of the tortoises within this RU. The potential effects on desert tortoises as a result of implementation of the proposed programs by DOE/NV as described in the *Description of the Proposed Action* represent a small impact to the Mojave population of the desert tortoise when total desert tortoise population numbers and geographical extent are considered.

Cumulative Effects

Cumulative effects are those effects of future non-Federal (State, local government, or private) activities that are reasonably certain to occur in the programmatic 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.

The NTS occurs on public land in Nye County. Any actions on these lands will be subject to consultation under section 7 of the Act.

Conclusion

After reviewing the current status of the desert tortoise, the environmental baseline for the NTS (programmatic area), the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that DOE/NV's implementation of programs as described in the BA and Alternative 3 of the DEIS for the NTS is not likely to jeopardize the continued existence of the threatened Mojave population of the desert tortoise. Critical habitat for the desert tortoise has been designated (50 CFR § 17.95). However, this action does not affect that area and no destruction or adverse modification of that critical habitat is anticipated.

Incidental Take

Sections 4(d) and 9 of the Act, as amended, prohibit take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering (50 CFR § 17.3). "Harass" is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3). Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the reasonable and prudent measures, and the terms and conditions that implement them, as set forth below.

The Service hereby incorporates by reference the DOE/NV's 13 mitigation measures from the *Description of the Proposed Action* into this incidental take statement as part of these terms and conditions. The following terms and conditions: (1) Restate measures proposed by the DOE/NV; (2) modify the measures proposed by the DOE/NV; or (3) specify additional measures considered necessary by the Service. Where these terms and conditions vary from or contradict the mitigation measures proposed under the *Description of the Proposed Action*, specifications in these terms and conditions shall apply. The measures described below are nondiscretionary and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply.

The DOE/NV has a continuing duty to regulate the activity that is covered by this incidental take statement. If the DOE/NV fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse.

Extent of Take

Based on the analysis of impacts provided above, mitigation measures proposed by DOE/NV, and anticipated project duration, the Service anticipates that the following take could occur as a result of the proposed action, which is not in addition to, but rather supersedes, that of the previous biological opinion (File No. 1-5-91-F-225, as amended) for NTS activities:

1. Three (3) desert tortoises may be accidentally injured or killed per year as a result of DOE/NV project-related activities on the NTS.
2. Ten (10) desert tortoises may be taken per year through capture and displacement from project sites on the NTS. In addition, all tortoises found in imminent danger on NTS roads may be captured and moved to safety.
3. An unknown number of desert tortoises may be taken in the form of injury or mortality on paved roads on the NTS by vehicles other than those in use during a project.
4. An unknown number of desert tortoises may be taken in the form of indirect mortality or injury through predation by ravens drawn to project sites.
5. An unknown number of desert tortoise eggs may be destroyed during construction activities.
6. An unknown number of desert tortoises may be taken indirectly in the form of harm or harassment through increased noise associated with operation of heavy equipment.
7. A total of 3,015 acres of desert tortoise habitat may be disturbed during project construction.

Effect of Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize take:

1. Measures shall be taken to minimize take of desert tortoises due to project-related activities and operation of heavy equipment.
2. Measures shall be taken to minimize entrapment of desert tortoises in open trenches or water impoundments.

3. Measures shall be taken to minimize predation on tortoises by ravens drawn to project areas.
4. Measures shall be taken to minimize destruction of desert tortoise habitat, such as soil compaction, erosion, or crushed vegetation, due to project-related activities.
5. Measures shall be taken to ensure compliance with the reasonable and prudent measures, terms and conditions, reporting requirements, and reinitiation requirements contained in this biological opinion.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the DOE/NV must comply with the following terms and conditions, which implement the reasonable and prudent measures described above.

1. To implement Reasonable and Prudent Measure Number 1, DOE/NV shall fully implement the following mitigation measures:
 - a. All proposed land-disturbing activities on NTS will be reviewed to ensure compliance with the Act and DOE environmental policies. As part of this review, preactivity surveys will be conducted at proposed project sites to determine the presence of threatened, endangered, or candidate species. Whenever possible, DOE/NV will modify the design or location of a project when it will impact the survival of a listed, proposed or candidate species or may result in the incidental take of desert tortoises.
 - b. DOE/NV may voluntarily choose to search for and relocate tortoises from lands to be disturbed within very low-density desert tortoise habitat (10 per square mile or less) as identified in Figure 1 of Appendix A of this biological opinion. If search and removal activities are chosen by DOE/NV only individuals trained to handle desert tortoises in accordance with Service-approved guidelines shall be authorized to handle desert tortoises. Currently, the Service-approved handling guidelines are described in *Guidelines for Handling Desert Tortoises during Construction Projects* (Desert Tortoise Council 1994, revised 1996).

- c. In areas where desert tortoise densities are unknown or 10 per square mile or greater, surveys will be conducted in accordance with Terms and Conditions 1.d. and 1.f. below. Future surveys may identify other areas on the NTS as very low-density tortoise habitat. DOE/NV may submit these survey results and maps to the Service and request that survey and relocation actions be voluntary for these additional areas as well.
- d. Tortoise surveys will be conducted only at sites that have not been cleared of vegetation. The surveys will be conducted not more than 1 working day prior to any surface-disturbing activities. Qualified biologists shall thoroughly search the project area for tortoises using techniques providing 100-percent coverage of all areas. Based on low-density tortoise habitat and documented tortoise surveys on the NTS with negative results, project areas will be surveyed once, or twice if a tortoise is found during the first survey. All tortoise burrows, and other animal burrows that may be used by tortoises, that are found during clearance surveys will be conspicuously flagged and avoided by construction activities.
- e. During surface-disturbing activities, all burrows will be avoided by at least 30 feet. If a burrow cannot be avoided, it will be inspected to determine the presence of tortoise or tortoise nests using a fiber-optic scope if necessary. If unoccupied, the burrow will be collapsed to prevent tortoise entry. All unavoidable burrows containing tortoise eggs or tortoises will be excavated by hand to remove the tortoise and/or eggs. Tortoise eggs and tortoises in harm's way will be removed and relocated by qualified biologists and handled according to desert tortoise handling procedures approved by the Service (Desert Tortoise Council 1994, revised 1996).
- f. If removed from a burrow, the tortoise will be placed in the shade of a shrub or in an existing, similar, unoccupied tortoise burrow that is approximately the same size, depth, and orientation as the original burrow. Desert tortoises moved in the winter (i.e., November 1 through February 28/ 29), or those in hibernation regardless of date, must be placed into an adequate burrow. In either case, if an adequate burrow is not available, one will be constructed utilizing the protocol for burrow construction in section B.5.f of the Service-approved guidelines (Desert Tortoise Council 1994, revised 1996).

- g. If no desert tortoise sign is observed during the 100-percent coverage surveys, zone-of-influence surveys will be conducted for projects within the geographic range of the desert tortoise except in areas of very low desert tortoise density as described in Term and Condition 1.b. If evidence of tortoises is not found within the project boundary or along the zone-of-influence transects, then DOE/NV may determine that the project will not negatively influence the species. DOE/NV may submit the survey data forms to the Service for their concurrence that the proposed activity is not likely to adversely affect desert tortoise. Therefore, the proposed action will be exempt from the terms and conditions of this biological opinion and no incidental take will be authorized.

If, however, tortoise sign is found within the project area, or along the zone-of-influence transects, DOE/NV shall fully implement the terms and conditions of this biological opinion.

- h. Project activities that may endanger a tortoise will cease if a tortoise is found on a project site. An on-call tortoise biologist will be contacted by radio or telephone and will respond to the sighting within 1 hour of notification. Project activities will resume after the on-call biologist removes the tortoise from danger or after the tortoise has moved to a safe area.
- i. Except in areas of very low desert tortoise density, a tortoise biologist or environmental monitor (in place of a desert tortoise biologist) will be onsite during all phases of project construction to ensure construction activities are in compliance with this biological opinion and that desert tortoises are not inadvertently harmed.

The environmental monitor may be the project foreman or supervisor who will be responsible for: (1) Enforcing the litter-control program; (2) ensuring that tortoise-proof fences are maintained; (3) ensuring that desert tortoise habitat disturbance is restricted to construction zones; (4) ensuring that all equipment and materials are stored within the boundaries of the construction zone or within the boundaries of previously disturbed areas; (5) ensuring that all vehicles associated with construction activities are using existing graded or paved roads or within the proposed construction zones; (6) ensuring open trenches or other excavations are inspected prior to the onset and close of daily construction activities; and

- (7) ensuring that speed limits are observed. An environmental monitor is not authorized to handle tortoises, which is the responsibility of a qualified desert tortoise biologist.
- j. Vehicles will not be driven off existing roads in non-emergency situations unless authorized by DOE/NV. Off-road travel on the DNWR is prohibited unless approved by the Refuge Manager. In the event non-emergency off-road travel is required, the planned route will be surveyed by qualified biologists immediately prior to its use. All burrows will be conspicuously flagged and avoided by a minimum of 30 feet.
- k. All vehicles will be driven at speeds within the posted speed limits on existing roads, and will not exceed 15 miles per hour within project boundaries.
- l. All DOE/NV and contractor personnel working on the NTS in tortoise habitat will complete the DOE/NV Desert Tortoise Conservation Education Program. The program will provide information relative to the occurrence of the desert tortoise on the NTS, the threatened status of the species, the definition of "take," the potential for impacts to the tortoise, the potential penalties for taking a threatened species, and the procedures for protecting tortoises.

The education program shall instruct attendees that the definition of "take" includes capture. Therefore, any unauthorized person who picks up a desert tortoise or restricts the animals ability to move freely, could be found guilty of illegal "take." The same applies for any individual if the authorized level of incidental take has been reached or exceeded.

An exception to illegal take would be moving a tortoise out of the path of an approaching vehicle if the tortoise is observed in the road on the NTS. However, the tortoise may not be moved if it is not in imminent danger and will leave the road of its own accord. If a tortoise must be moved off a road to avoid imminent injury or mortality, the tortoise must be moved in the same direction of travel. The tortoise shall be picked up gently with two hands, kept level, and carried close to the ground. The tortoise shall be placed in the shade of a shrub approximately 25 feet from the road edge. This exception does not apply to project sites and project-related vehicle activity.

- m. In accordance with *Procedures for Endangered Species Act Compliance for the Mojave Desert Tortoise* (Service 1992), a qualified desert tortoise biologist should: (1) Possess a bachelor's or graduate degree in biology, ecology, wildlife biology, herpetology, or related fields; (2) demonstrate a minimum of 60 days prior field experience using accepted resource agency techniques to survey for desert tortoises; and (3) have the ability to recognize and accurately identify all types of desert tortoise sign. The Service does not endorse any individual or company with respect to their abilities to conduct satisfactory surveys.
2. To implement Reasonable and Prudent Measure Number 2, the DOE/NV shall fully implement the following measure:
- a. Within occupied desert tortoise habitat during March 1 and October 31, all trenches and other excavations with side slopes steeper than 1-foot rise to 3-foot length shall be immediately backfilled prior to being left unattended, or:
(1) Fenced with tortoise-proof fencing; (2) covered with tortoise-proof fencing; (3) covered with plywood or similar material; or (4) constructed with escape ramps at each end of the trench and every 1,000 feet, at a minimum. All coverings and fences shall have zero ground clearance. If alternative 4 is selected, the trench or other excavation will be inspected once every 2 weeks during the tortoise active period (March 1 through October 31).
 - b. An open trench or other excavation described in 2.a. shall be inspected for entrapped animals immediately prior to backfilling.
 - c. If at any time a tortoise is discovered within a trench, all activity associated with that trench shall cease until a qualified biologist has removed the tortoise in accordance with Service-approved guidelines (Desert Tortoise Council 1994, revised 1996).
 - d. All new water impoundments constructed within occupied desert tortoise habitat which have steep side slopes or rubber linings, shall be fenced with tortoise-proof fencing. Likewise, if a tortoise drowns in any water impoundment on the NTS, tortoise-proof fencing shall be installed around the impoundment.

3. To implement Reasonable and Prudent Measure Number 3, the DOE/NV shall fully implement the following measure:

DOE/NV will implement a litter-control program during outdoor program activities that will include the use of covered, raven-proof trash receptacles; disposal of edible trash in trash receptacles following the end of each work day, and disposal of trash in a designated sanitary landfill at the end of each week or when nearly full. Material placed in a sanitary landfill will be covered when the landfill is open, as per DOE/NV standard operating procedures.

4. To implement Reasonable and Prudent Measure Number 4, the DOE/NV shall fully implement the following mitigation measures:

DOE/NV shall either rehabilitate and revegetate desert tortoise habitat disturbed as a result of actions included in this biological opinion as follows:

- a. DOE/NV shall conduct a field survey at each site and develop site-specific reclamation plans for surface-disturbing projects within desert tortoise habitat. These plans may include specifications for contouring, relieving soil compaction, treating and/or spreading topsoil, and planting. In addition, these plans will describe in specific detail how disturbed sites will be rehabilitated using reasonable state-of-the-art techniques. The Service shall approve the plans prior to implementation by DOE/NV. As an objective, at least 60-percent recovery towards pre-disturbance conditions should be achieved within 5 years of completion of the rehabilitation project. Only native perennial vegetation and annual plants, including forage species of desert tortoises on the NTS, will be used. Vegetation rehabilitation actions will begin within 1 year of completion of project construction and be completed within 3 years of construction completion. Recovery includes recontouring to natural contours and reestablishing local, native plant species within the disturbed sites. Recovery success will be based upon percent ground cover (both basal and canopy), plant species composition, and plant frequency in relation to those natural conditions occurring within undisturbed habitat adjacent to the site. The rehabilitation plan shall also describe in detail how the evaluation will be made for determining the success of the rehabilitation effort.

-OR-

- b. As an alternative to 4.a. above, DOE/NV shall pay a mitigation fee of \$550.00 for each acre of surface disturbance. This rate will be indexed for inflation based on the Bureau of Labor Statistics Consumer Price Index beginning January 1, 1997. DOE/NV deposited \$81,000.00 into the Desert Tortoise Habitat Conservation Fund 236-8290 administered by Clark County, to mitigate for the loss of desert tortoise habitat under their previous biological opinion (File No. 1-5-91-F-225). Of that, approximately \$16,000.00 has been used for habitat mitigation, leaving a balance of \$65,000.00 to be used for mitigation for the loss of desert tortoise habitat from programs and activities described in this biological opinion. If additional funds are required as a result of surface-disturbance associated with this biological opinion, the mitigation fee shall be paid directly to the Desert Tortoise Habitat Conservation Fund, number 730-9999, administered by Clark County. The administrator (i.e., Clark County) serves as the banker of these funds and receives no benefit from administering these funds.

Payment shall be by certified check or money order payable to Clark County and delivered to:

Clark County
Department of Administrative Services
500 South Grand Central Parkway
Post Office Box 551712
Las Vegas, Nevada 89155-1712

The payment shall be accompanied by a cover letter from the payee that identifies the following information:

- (1) The project name, biological opinion number, DOE/NV case number, and payee's name, address, and phone number.
 - (2) The amount of payment enclosed and the number of the check or money order.
5. To implement Reasonable and Prudent Measure Number 5, the DOE/NV shall fully implement the following measures:
- a. Prior to handling any desert tortoise, carcass, or egg, appropriate State permits will be acquired from the NDOW.

- b. DOE/NV will designate a field contact representative for each project which may also serve as the environmental monitor, if appropriate. The field representative will be responsible for overseeing compliance with protective stipulations for the desert tortoise and for coordinating compliance with the terms and conditions of this biological opinion. The field representative will have the authority to halt activities of construction equipment which may be in violation of the stipulations.

- c. DOE/NV will keep an up-to-date log of all actions taken under this consultation, including acreage affected and which method of mitigation was implemented (revegetation or fee), number of desert tortoises injured, killed, or removed from the project site, and mitigation fees paid for each project. DOE/NV will provide the above information to the Service's Las Vegas SubOffice on January 31 of every year during the time frame of this biological opinion. The first annual report will be due January 31, 1997. Information will be cumulative throughout the life of this consultation.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the anticipated incidental take that may result from the proposed action. With implementation of these measures, the Service believes that no more than 13 desert tortoises may be incidentally taken per year (3 killed or injured and 10 captured and displaced) and 3,015 acres of desert tortoise habitat may be disturbed. If, during the course of the action, the level of incidental take or loss of habitat identified is exceeded, reinitiation of consultation will be required. The DOE/NV must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Reporting Requirements

Upon locating a dead, injured, or sick endangered or threatened species, initial notification must be made to the Service's Division of Law Enforcement in Las Vegas, Nevada, at (702) 388-6380. Care should be taken in handling sick or injured desert tortoises to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured desert tortoises or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by the Service's Division of Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

Sick or injured desert tortoises shall be delivered to any qualified veterinarian for appropriate treatment or disposal. Dead desert tortoises suitable for preparation as museum specimens shall be frozen immediately and provided to an institution holding appropriate Federal and State permits per their instructions. Should no institutions want the desert tortoise specimens, or if it is determined that they are too damaged (crushed, spoiled, etc.) for preparation as a museum specimen, then they may be buried away from the project area or cremated, upon authorization by the Service's Division of Law Enforcement.

The DOE/NV or project proponent shall bear the cost of any required treatment of injured desert tortoises, euthanasia of sick desert tortoises, or cremation of dead desert tortoises. Should sick or injured desert tortoises be treated by a veterinarian and survive, they may be transferred as directed by the Service.

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. Therefore, the Service makes the following conservation recommendations:

1. DOE/NV should compile guidelines for revegetation and rehabilitation of disturbed areas that can be distributed to other agencies and the public. The success of implementation of these guidelines should be monitored and likewise distributed.
2. DOE/NV and its contractors should develop and distribute measures that individuals can take to assist in desert tortoise conservation.

In order for the Service to be kept informed of actions that either minimize or avoid adverse effects or that benefit listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

Reinitiation Requirement

This concludes formal consultation on the actions outlined in the November 8, 1995, request. As required by 50 CFR § 402.16, reinitiation of formal consultation is required if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that

Dr. Donald R. Elle, Director

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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 opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations that are causing such take must be stopped in the interim period between the initiation and completion of the new consultation if any additional taking is likely to occur.

We appreciate the assistance and cooperation of your staff throughout this consultation process. If we can be of any further assistance, please contact Michael Burroughs, in the Las Vegas SubOffice at (702) 646-3499, or me at (702) 784-5227.

Sincerely,



ja Carlos H. Mendoza
State Supervisor

cc:

Director of Public Lands, The Nature Conservancy, Las Vegas, Nevada
Desert Conservation Plan Administrator, Administrative Services, Clark County, Las Vegas,
Nevada
Administrator, Nevada Division of Wildlife, Reno, Nevada
Regional Manager, Nevada Division of Wildlife, Las Vegas, Nevada
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Project Leader, Desert National Wildlife Complex, Fish and Wildlife Service, Las Vegas, Nevada
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Assistant Regional Director, Klamath and California Ecoregions, Fish and Wildlife Service,
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APPENDIX A

VERY LOW AND LOW DESERT TORTOISE ABUNDANCE AREAS AT THE NEVADA TEST SITE (NTS)

Figure 1 shows areas within the geographic range of the desert tortoise at the NTS which support 1) a very low abundance of tortoises (0 to 10 per square mile), 2) a low abundance of tortoises (10 to 45 per square mile), and 3) an unknown abundance of tortoises. Letter codes from A to M on Figure 1 identify the general locations within these areas where field data have been collected. The data from these locations are presented in Table 1. Areas with insufficient tortoise abundance data lack a letter code and are classified as "unknown tortoise abundance" habitat.

Transect studies were conducted at the NTS at locations A through H (Figure 1) during 1981 through 1986 to assess the distribution and abundance of desert tortoises (Rautenstrauch, 1991; Rautenstrauch *et al.*, 1994). Similar transect studies have been conducted elsewhere in Nevada (Karl, 1980, 1981; Garcia, *et al.*, 1982; Schneider *et al.*, 1982). To compare results among different study areas, Karl (1980, 1981) developed five categories of relative abundance of desert tortoises based on sign counted along 1.5 mile long transects. Converted to sign/km, and using the category titles given by Schneider *et al.* (1982), these categories are as follows: none to very low (0-0.4 sign/km), low (0.4-1.5 sign/km), moderate (1.5-3 sign/km), moderately high (3-5 sign/km), and high (>5 sign/km). Table 1 presents the results of the NTS transect surveys conducted in locations A through H that can be related directly to these abundance categories.

In addition to the above mentioned transect studies, areas where tortoises were known to occur were searched in 1987 through 1990 as part of a tortoise population monitoring program for the Yucca Mountain Project (Rautenstrauch, 1991). A relatively large number of tortoises were found in three areas (Locations I, J, and K), which have been categorized for the purpose of this map as low tortoise abundance areas. Seventeen tortoises were found on the north slopes of the Mercury Mountains (Location I), eight tortoises were found in northeastern Jackass Flats (Location J), and 17 tortoises were found in northern Midway Valley (Location K is the portion of this area which falls outside the Yucca Mountain Project Area).

About 190 surveys were conducted at proposed project sites within the range of the desert tortoise at the NTS from 1976 through 1995. These include both preactivity and zone-of-influence surveys. Approximately 80 were conducted in Areas 5, 6, 11, 14, 15, and 26. Only three tortoises were found and tortoise sign was found at only 12 project sites. These survey results support the classification of the very low tortoise abundance areas shown in Figure 1. While conducting a zone-of-influence survey along eight transects totaling 51.2 km around a waterline in southern Mercury Valley, biologists found 11 burrows and 1 tortoise. The computed mean tortoise sign/km per transect was 0.24. It is likely, based on similar vegetation and soils, that all of southern Mercury Valley west of Mercury Highway supports a similar tortoise abundance which is none to very low (Location L).

Eastern Mercury Valley is occupied by the town of Mercury (Location M). Undisturbed land within Mercury is very poor habitat fragmented by paved roads, parking lots, buildings, recreational facilities, and sewage lagoons. This area will not support desert tortoises or tortoise habitat.

Table 1. Results of tortoise transect and other surveys conducted from 1981 through 1995.^a

Map Location	Area	km Walked	# Sign	\bar{x} ^b	Classification
A	Jackass Flats	166.1	29	.19	none to very low
B	Massachusetts Mountains	58.9	7	.14	none to very low
C	Cane Spring Wash	17.0	2	.11	none to very low
D	Mid Valley	22.8	0	0	none to very low
E	Frenchman Flat	113.9	15	.13	none to very low
F	CP Hills	51.2	36	.79	low
G	Rock Valley	136.9	63	.46	low
H	Mercury Valley	103.9	43	.41	none to very low ^c
I	North slopes of Mercury Mountains	N/A ^d	17 tortoises	N/A	low
J	Northeastern Jackass Flats	N/A	8 tortoises	N/A	low
K	Northern Midway Valley	N/A	17 tortoises	N/A	low
L	Southern Mercury Valley	29.0	12	.24	none to very low
M	Mercury	not surveyed	not surveyed	not surveyed	none to very low

^a Transect surveys were conducted at Locations A through H during 1981 through 1986 (Rautenstrauch, 1991),

^b Mean sign counted/km per transect for all regions except Frenchman Flat, which is mean sign for all transects combined.

^c The \bar{x} value of 0.41 was rounded to 0.40 and this area was classified as none to very low tortoise abundance.

^d N/A= not applicable, no transect lengths were recorded during searches conducted in Areas I, J, and K. These areas were designated as "low" tortoise abundant areas based on number of tortoises found (Rautenstrauch, 1991).

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TORTOISE PROTECTION MEASURES

Project Name: _____

NTS Area: _____

General Location: _____

Terms and Conditions of Biological Opinion which must be implemented (see back for further details):

- | | | | |
|--|--------|---------|---------------------------------------|
| 1. All workers received Tortoise Protection Brochure. | Yes | No | If "No" Explain: |
| • Number of workers on project: _____ | — | — | _____ |
| 2. Clearance surveys completed not more than one working day before construction activities. | Yes | No | If "No" Explain: |
| | — | — | _____ |
| 3. Biologist or environmental monitor present during all construction activities. | Yes | No | If "No" Explain: |
| | — | — | _____ |
| 4. Flagged tortoise burrows avoided by at least 30 feet. | Yes | No | If "No" Explain: |
| | — | — | _____ |
| 5. Workers observed 15 mph speed limit within project area. | Yes | No | If "No" Explain: |
| | — | — | _____ |
| 6. Unauthorized off-road driving occurred. | Yes | No | If "Yes" Explain: |
| | — | — | _____ |
| 7. Edible trash was disposed in covered, raven-proof trash receptacles at end of each day. | Yes | No | If "No" Explain: |
| | — | — | _____ |
| 8. Trash disposed in sanitary landfill at end of each week. | Yes | No | If "No" Explain: |
| | — | — | _____ |
| 9. Land disturbance restricted to construction zone. | Yes | No | If "No" Explain: |
| | — | — | _____ |
| 10. All equipment and materials stored within construction zone or previously disturbed area. | Yes | No | If "No" Explain: |
| | — | — | _____ |
| 11. Open trenches or other excavations checked at the beginning of day, at the end of day, and prior to backfilling. | Yes | No | If "No" Explain: |
| | — | — | _____ |
| 12. Unattended trenches with slopes greater than 1-foot rise to 3-foot length were: | Filled | Covered | Fenced Ramp Constructed |
| | — | — | — — |
| 13. Trenches with earthen ramps checked once every two weeks during March 1 through October 31. | Yes | No | If "No" Explain: Not Applicable: |
| | — | — | _____ _____ |

Comments: _____

The above terms and conditions of the Nevada Test Site Biological Opinion were met to the best of my knowledge.

Environmental Monitor (Print Name)

Environmental Monitor (Signature)

Date

**TERMS AND CONDITIONS OF THE NEVADA TEST SITE BIOLOGICAL OPINION
FOR DESERT TORTOISE PROTECTION**

1. All personnel who work at the NTS must receive DOE/NV's Desert Tortoise Worker Education brochure, which provides information about the occurrence of the desert tortoise at the NTS, the threatened status of the species, the definition of "take," the potential for impacts to the tortoise, and the potential penalties (up to \$25,000 in fines and six months in prison) for intentionally taking a desert tortoise.
2. For projects in tortoise habitat where tortoise abundance has been classified as low or unknown, tortoise clearance surveys shall be completed not more than one working day before any surface disturbing activity. Qualified biologists shall thoroughly search the project area for tortoises using techniques providing 100 percent coverage of all areas. Call 295-0845 or 295-0392 for assistance in determining if a survey is needed.
3. A tortoise biologist or environmental monitor (in place of a biologist) will be onsite during all phases of project construction to ensure construction activities are in compliance with the Biological Opinion, and that tortoises are not inadvertently harmed. The environmental monitor may be the project foreman or supervisor. **An environmental monitor is not authorized to handle tortoises.**
4. Desert tortoise burrows in and adjacent to the project site which can be avoided will be avoided by at least 30 feet. If a burrow cannot be avoided, it will be inspected and collapsed by a qualified biologist prior to start of construction.
5. All vehicles shall be driven at speeds within posted speed limits on existing roads and shall not exceed 15 miles per hour within project boundaries.
6. All vehicles shall be restricted to existing paved, graded, or utility access roads. Vehicles shall not be driven off existing roads in nonemergency situations unless authorized by DOE/NV. For non-emergency off-road travel, the planned route will be surveyed by a biologist immediately prior to its use.
7. DOE/NV shall implement a litter control program during construction and maintenance activities that will include the use of covered, raven proof trash receptacles; and removal of edible trash from activity sites to the trash receptacles following the close of each work day.
8. Trash in covered receptacles shall be properly disposed in a designated sanitary landfill at the end of each workweek or when nearly full. Material placed in sanitary landfills shall be covered daily when the landfill is open.
9. The environmental monitor will be responsible for ensuring that desert tortoise habitat disturbance is restricted to project construction zones.
10. The environmental monitor will be responsible for ensuring that all equipment and materials are stored within the boundaries of the construction zone or within the boundaries of previously disturbed areas.
11. An open trench or other excavation shall be inspected for entrapped animals immediately prior to backfilling and at least twice per day, immediately before work in the morning and at the end of the workday.
12. During March 1 through October 31, all trenches and other excavations with side slopes steeper than 1-foot rise to 3-foot length shall be immediately backfilled prior to being left unattended, or (1) fenced with tortoise proof fencing; (2) covered with tortoise proof fencing; (3) covered with plywood or similar material; or (4) constructed with escape ramps at each end of the trench and every 1,000 feet, at a minimum. All coverings and fences shall have zero ground clearance.
13. Trenches or other excavations constructed with earthen ramps will be inspected once every two weeks during March 1 through October 31, to ensure that the ramps are still operational and tortoises are not entrapped.