Categorical Exclusion
Boulder City Bypass

A. Background

NEPA Number: DOI-BLM-NV-S010-2013-0161-CX

NV Energy is a private corporation with a Certificate of Public Convenience and Necessity issued by the Public Utilities Commission of Nevada to provide electric service in the certificated area of Clark County and a portion of Nye County. The company currently occupies and manages 1,100+ BLM rights-of-way in the States of Nevada, Utah, and Arizona.

BLM Office:

Bureau of Land Management
Las Vegas Field Office
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130

LLNVS01000

Lease/Serial/Case File No.:

N–1909/E/ & N-1909-03

Proposed Action Title/Type:

Right-of-way for the installation of underground electrical distribution facilities and above ground related appurtenances, and the removal of existing overhead electrical lines for the NDOT Boulder City Bypass project and a short term ROW (STR) for a temporary construction area for the construction of said electrical facilities.

Location of Proposed Action:

Located in the southeastern portion of the Las Vegas Valley just northwest of Boulder City.

LEGAL DESCRIPTION:

M.D.M., Nevada
T.22 S., R.63 E., sec.35, SW¼SW¼.
T.23 S., R.63 E., sec. 2, lots 7, 23 and 27, E½E½SE¼SE¼; sec. 11, lots 2 and 12.

Description of Proposed Action:

On June 4, 2013 NV Energy submitted an application to amend ROW N-1909. Amendment to N-1909 for the removal of existing overhead distribution line and replace with underground facilities of 1000 MCM TRI (15kV) in 6' plastic conduits, and above ground boxes and related underground appurtenances to be installed within a utility corridor area designed by NDOT for the benefit of the above mentioned project.

Construction will take approximately six months. Work-force will include an estimated 8–10 peoples including inspectors, linemen, laborers, and equipment operators. The construction equipment will include trucks, trailers, and backhoe. This translates into an estimated 4 vehicles.

Sequence of major construction activities is as follows: dig trench, install conduits, install above ground boxes/appurtenances, install new cable in conduits, backfill trench to existing grad, remove overhead lines. The final phase of construction is cleanup and reclamation. Excess soil excavated from the trench will be used to fill the trench with the excess spread around in the vicinity of the trenched area.

The ROW requested is 6,957 feet long and 10 feet wide for 1.60 acres, and the short term ROW requested is 6,957 feet long and 20 feet wide for 3.19 acres. The power line is being relocated to a different location to accommodate NDOT's Boulder City Bypass project. NDOT has completed an EIS for this project including a utility corridor which the new power line will be within.

This is a CX per 516 DM 11.9 E. Realty (12) "Grants of right-of-way wholly within the boundaries of other compatibly developed rights-of-ways."

Other ROW located within the same area are as follows:
N-60832– Southwest Gas- Gas Pipeline
N-3661– Century Link- Telephone Line

B. Land Use Plan Conformance

Land Use Plan Name:

Las Vegas Resource Management Plan and Final Environmental Impact Statement (RMP), and the Record of Decision for the Approved Las Vegas Resource Management Plan and Final Environmental Impact Statement.

Date Approved/Amended:

RMP dated October 5, 1998.

The proposed action is in conformance with the LUP, even though it is not specifically provided for, because it is clearly consistent with the following LUP decision(s) (objectives, terms, and conditions) :

Rights-of-Way Management. Objective: RW-1. "Meet public demand and reduce impacts to sensitive resources by providing and orderly system of development for transportation, including legal access to private inholdings, communications, flood control, major utility transmission lines and related facilities."

Management Direction. Objective: RW-1–h. "All public land within the planning area, excepted as stated in RW1–c through 1–g, are available at the discretion of the agency for rights-of-way under the authority of the Federal Land Policy Management Act."

C. Compliance with NEPA:

The Proposed Action is categorically excluded from further documentation under the National Environmental Policy Act (NEPA) in accordance with 516 DM 2, Appendix 1, or 516 DM 11.9, E. (12) "Grants of right-of-way wholly within the boundaries of other compatibly developed rights-of-ways."

This categorical exclusion is appropriate in this situation because there are no extraordinary circumstances potentially having effects that may significantly affect the environment. The

proposed action has been reviewed, and none of the extraordinary circumstances described in 516 DM 2 apply.

Comments providing substantive new information relevant to the analysis and mitigation measures have been incorporated into the Exhibit A stipulations which are attached to this document.

I have reviewed the plan conformance statement and have determined that the proposed action is in conformance with the approved land use plan and that no further environmental analysis is required.

D. Approval and Contact Information

Vanessa L. Hice
Assistant Field Manager
Division of Lands

7/19/14
Date

Contact Person

Vivian Browning, Realty Specialist
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130
Phone: (702) 515–5000

EXHIBIT A

STIPULATIONS

1.0 Special Stipulations

1.1 The Holder must abide by monitoring, maintenance, and reporting requirements of Programmatic Biological Opinion, File No. 84320-2010-F-0285. Failure to abide by the terms and conditions of the grant and Biological Opinion, could result in temporary suspension of all activities within your right-of-way (ROW) area per 43 CFR 2807.16, CFR 2807.17, 43 CFR 2886.16, and CFR 2886.17. The Biological Opinion is attached as Exhibit B.

1.2 Workers will be provided educational information on the desert tortoise which includes the legal protection and consequences for the violation of the Endangered Species Act.

2.0 General Stipulations

2.1. The ROW is issued subject to all valid existing rights.

2.2. No signs or advertising devices shall be placed on the premises or on adjacent public lands, except those posted by or at the direction of the authorized officer.

2.3. The ROW shall be maintained in a sanitary condition at all times. Waste materials at those sites shall be disposed of promptly at an approved waste disposal site. "Waste", as used in this paragraph, shall mean all discarded matter of any kind.

2.4. Holder shall mark the exterior boundaries of the ROW with stake and/or lath at 100 to 200 foot intervals. The intervals may be varied at the time of staking at the discretion of the Authorized Officer. The tops of the stakes and/or laths will be painted and the laths flagged in a distinctive color as determined by the Holder. Holder shall maintain all boundary stakes and/or laths in place until final cleanup and restoration is completed.

2.5. Holder shall conduct all activities associated with construction, operation, maintenance and termination of this ROW within its authorized limits.

2.6. Holder shall maintain the ROW in a safe, useable condition, as directed by the Authorized Officer. A regular maintenance program shall include, but is not limited to, soil stabilization.

2.7. Holder shall maintain copy of the authorization along with stipulations on construction site at all times. In the event that the public land underlying the ROW encompassed in this grant, or a portion thereof, is conveyed out of Federal ownership and administration of the ROW or the land underlying the ROW is not being reserved to the United States in the patent/deed and/or the ROW is not within a ROW corridor being reserved to the United States in the patent/deed, the United States waives any right it has to administer the ROW, or portion thereof, within the conveyed land under Federal laws, statutes, and regulations, including the regulations at 43 CFR Part [2800][2880], including any rights to have the holder apply to BLM for amendments, modifications, or

assignments and for BLM to approve or recognize such amendments, modifications, or assignments. At the time of conveyance, the patentee/grantee, and their successors and assigns, shall succeed to the interests of the United States in all matters relating to the ROW, or portion thereof, within the conveyed land and shall be subject to applicable State and local government laws, statutes, and ordinances. After conveyance, any disputes concerning compliance with the use and the terms and conditions of the ROW shall be considered a civil matter between the patentee/grantee and the ROW Holder.

2.8. Within 90 days of construction completion, the Holder shall provide the Authorized Officer with data in a format compatible with the Bureau's Arc-Info Geographic Information System to accurately locate and identify the ROW:

Acceptable data formats are:
Corrected Global Positioning System files with sub-meter accuracy or better, in UTM NAD 83; Zone 11;
ARCGIS export files on a CD ROM, shapefile, geodatabase.

Data may be submitted in any of the following formats:
ARCGIS interchange, shapefile or geodatabase format.
CD ROM in compressed or uncompressed format.

All data shall include metadata for each coverage, and conform to the Content Standards for Digital Geospatial Metadata Federal Geographic Data Committee standards. Contact the GIS Department at (702) 515-5000.

3.0 Air Quality

3.1. The Holder shall not violate applicable air standards or related facility siting standards established by or pursuant to applicable federal, state, or local laws or regulations. The Holder shall be responsible for dust abatement within the limits of the ROW and is responsible for obtaining all necessary permits from appropriate authorities for acceptable dust abatement and control methods (e.g., water, chemicals). The Holder shall be solely responsible for all violations of any air quality permit, law or regulation, as a result of its action, inaction, use or occupancy of the ROW.

Notwithstanding whether a violation of any air quality permit, law or regulation results, the Holder will cooperate with the Authorized Officer in implementing and maintaining reasonable and appropriate dust control methods in conformance with law and appropriate to the circumstances at the sole cost of the Holder.

Ensure dust control permit is obtained from DAQ for all soil disturbing activities of .25 acres or greater, in the aggregate and all permit stipulations are in compliance for the duration of the project(s).

Prior to relinquishment, abandonment, or termination of this ROW, the Holder shall apply reasonable and appropriate dust abatement and control measures to all disturbed areas. The abatement and measures shall be designed to be effective over the long-term (e.g., rock mulch or other means) and acceptable to the Authorized Officer.

3.2. During excavation, backfilling, and contouring, the disturbed soil should be wetted sufficiently in order to effectively reduce airborne dust and reduce soil erosion.

4.0 Cultural

4.1. Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the Holder, or any person working on his behalf on public or Federal lands shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The Holder will be responsible for the cost of evaluation. Any decision regarding suitable mitigation measures will be made by the Authorized Officer after consulting with the Holder. Holder shall be responsible for the resultant mitigation costs.

5.0 Hazardous Material/Pesticides/Liability

5.1. No hazardous material, substance, or hazardous waste, (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, *et seq.*, or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*) shall be used, produced, transported, released, disposed of, or stored within the ROW area at any time by the Holder. The Holder shall immediately report any release of hazardous substances (leaks, spills, etc.) caused by the Holder or third parties in excess of the reportable quantity as required by federal, state, or local laws and regulations. A copy of any report required or requested by any federal, state or local government agency as a result of a reportable release or spill of any hazardous substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved federal, state or local government agency.

5.2. The Holder shall immediately notify the Authorized Officer of any release of hazardous substances, toxic substances, or hazardous waste on or near the ROW potentially affecting the ROW of which the Holder is aware.

5.3. As required by law, Holder shall have responsibility for and shall take all action(s) necessary to fully remediate and address the hazardous substance(s) on or emanating from the ROW.

5.4. Use of pesticides shall comply with the applicable Federal and state laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the Holder shall obtain from the Authorized Officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers and any other information deemed necessary by the Authorized Officer.

The plan shall be submitted no later than December 1 of any calendar year that covers the proposed activities for the next fiscal year.

Pesticides shall not be permanently stored on public lands authorized for use under this ROW.

5.5. The Holder shall comply with all applicable local, state, and federal air, water, hazardous substance, solid waste, or other environmental laws and regulations, existing or hereafter enacted or promulgated. To the full extent permissible by law, the Holder agrees to indemnify and hold harmless, within the limits, if any, established by state law (as state law exists on the effective date of the right-of-way), the United States against any liability arising from the Holder's use or occupancy of the ROW, regardless of whether the Holder has actually developed or caused development to occur on the ROW, from the time of the issuance of this ROW to the Holder, and during the term of this ROW. This agreement to indemnify and hold harmless the United States against any liability shall apply without regard to whether the liability is caused by the Holder, its agents, contractors, or third parties. If the liability is caused by third parties, the Holder will pursue legal remedies against such third parties as if the Holder were the fee owner of the ROW.

Notwithstanding any limits to the Holder's ability to indemnify and hold harmless the United States which may exist under state law, the Holder agrees to bear all responsibility (financial or other) for any and all liability or responsibility of any kind or nature assessed against the United States arising from the Holder's use or occupancy of the ROW regardless of whether the Holder has actually developed or caused development to occur on the ROW from the time of the issuance of this ROW to the Holder and during the term of this ROW.

6.0 Mineral Material

6.1. If excavation that produces mineral materials within the ROW is necessary, the mineral materials must be used within the ROW or stockpiled on site for disposal by the BLM. If mineral materials are to be stockpiled on site for a future disposal, specific BLM use authorization in the form of a contract, free use permit or material site right-of-way will be necessary before the stockpiled mineral materials can removed from the ROW.

7.0 Survey Monuments

7.1. Holder shall protect all survey monuments found within the authorization area. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coast and Geodetic Survey benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. If any of the above are to be disturbed during operations, the holder shall secure the services of a Professional Land Surveyor or Bureau cadastral surveyor to perpetuate the disturbed monuments and references using surveying procedures found in the Manual of Instructions for the Survey of the Public Lands of the United States and Nevada Revised Statutes, Chapter 329, Perpetuation of Corners. The holder shall record such survey in the appropriate county and send a copy to the authorized officer. If the Bureau cadastral surveyors or other Federal surveyors are used to restore the disturbed survey monuments, the holder shall be responsible for the survey cost.

8.0 Vegetation/Noxious Weeds/Land surface Treatment/Soil/Water/Riparian

8.1. Vegetation: There is potential for BLM sensitive plant species rosy two toned beardtongue (Penstemon bicolor spp roseus) to be in the project area. Direct impacts to these species may include mortality and loss of habitat.

8.2. The proposed actions must comply with all mitigation measures in FHWA-NV-EIS-00-02-F, N-90786 under Biology/Threatened Species for protected or otherwise sensitive plants which includes salvage of individual plants (or seed collection) and topsoil prior to any site preparation and construction. Coordinate salvage/seed collection efforts with BLM Botanist to ensure they take place during the growing season for rosy two toned beardtongue.

8.3. Land surface treatment for areas previously undisturbed: Strip the top three to six inches of soil material with associated plant material over all surfaces to be disturbed by construction. Stockpile this material along the course of construction will be salvaged and transplanted out of harm's way but still within the right of way. At the conclusion, including trench backfilling and compaction, replace the stockpiled soil with plant debris uniformly back on the surface of the disturbed area.

8.4. Land surface treatment for areas previously undisturbed: Strip the top three to six inches of soil material with associated plant material over all surfaces to be disturbed by construction. Stockpile this material along the course of construction will be salvaged and transplanted out of harm's way but still within the right of way. At the conclusion, including trench backfilling and compaction, replace the stockpiled soil with plant debris uniformly back on the surface of the disturbed area.

8.5. Land surface treatment for areas previously disturbed: Following excavation, trenches will be backfilled with the excavated soil. The soil will be distributed and contoured evenly over the surface of the disturbed area. The soil surface will be left rough to help reduce potential wind erosion.

8.6. Woodland/Forestry: Cactus and yucca may be present within the project impact area. Cactus and yucca are considered government property and are regulated under the Nevada BLM forestry program. All cactus and yucca within permanent and temporary impact areas must be salvaged and replanted in temporary impact areas, undisturbed portions of the project area or used in the landscape design of the school once developed.

8.7. Unless otherwise directed by the BLM botanist, all replanted cactus and yucca must be watered and otherwise maintained for a period of one year. To ensure successful salvage and transplant, all cactus and yucca must be salvaged using a contractor (or other approved by the BLM botanist) with at least three years' experience salvaging and maintaining plant materials in the Mojave or Sonoran Deserts.

8.8. Invasive Species/Noxious Weeds: Invasive species/noxious weeds does not appear to have been analyzed in the EA. Increased disturbance and traffic during construction increases the risk of weed invasion/spread. However, much of the affected area is already disturbed from previous development.

The risk of weed introduction and spread can be minimized by following standard weed stipulations. Please ensure that the following Standard Stipulations for Weed Control are adhered to. At a minimum, these stipulations must be followed as well as any additional stipulations identified in the original authorizations for these ROWs. In addition to the Holder being responsible for weed control within their ROW's they will also be responsible for any weeds that spread to adjacent lands from the ROW, and any access routes and equipment cleaning sites that become infested as a result of project associated activities. Please adhere to the following Standard Stipulations for Weed Control:

STANDARD STIPULATIONS FOR WEED CONTROL

Weed Stipulations for Construction Projects

1. The project proponent will limit the size of any vegetation and/or ground disturbance to the absolute minimum necessary to perform the activity safely and as designed. The project proponent will avoid creating soil conditions that promote weed germination and establishment.

2. At the onset of project planning in the NEPA analysis phase, the project proponent, project lead or the SNDO noxious weed coordinator will complete the Risk Assessment Form for Noxious/Invasive Weeds. This will provide information about the methods of weed treatments and weed prevention schedules for the management of noxious weeds on the project footprint. This will identify the level of noxious weed management necessary for stipulation 3 below.

3. The project proponent will coordinate project activities with the BLM Weed Coordinator (702-515-5295) regarding any proposed herbicide treatment. If herbicide treatment is needed, the project proponent will prepare, submit, obtain and maintain a pesticide use proposal (PUP) for the proposed action. Weed treatments may include the use of herbicides, and only those herbicides approved for use on Public lands by the BLM.

4. Before ground-disturbing activities begin, the project proponent will review the weed risk assessment and prepare a weed management plan that will inventory and prioritize weed infestations for treatment within the project foot print. Should the weeds spread beyond the project foot print as a result of project activity then these weeds will be treated as a part of the project. This will include access routes.

5. The project proponent will begin project operations in weed free areas whenever feasible before operating in weed-infested areas.

6. The project proponent will locate pits and staging areas for the use of equipment storage, machine and vehicle parking or any other area needed for the temporary placement of people, machinery and supplies. These staging areas will be selected from locations that are relatively weed-free. The project proponent will avoid or minimize all types of travel through weed-infested areas or restrict major activities to periods of time when the spread of seed or plant parts are least likely.

7. BLM or the project proponent will determine equipment cleaning sites. These sites will be coordinated with the BLM. Project related equipment and machinery (**this especially includes the nooks and crannies of undercarriages**) will be cleaned of all mud, dirt and plant parts before moving into relatively weed-free areas and when leaving weed infested sites. Seeds and plant parts need to be collected, bagged and deposited in landfills through the waste disposal system when practical. (This is not meant to apply to service vehicles that will stay on roadways avoiding weed infested sites.)

8. Project workers need to inspect, remove, and dispose of weed seed and plant parts found on their clothing and equipment. Disposal methods vary depending on the project.

9. The project proponent will evaluate options, including area closures, to regulate the flow of traffic on sites where native vegetation needs to be established.

10. A Noxious weed inventory will be performed for the project footprint prior to any ground disturbing activities. The results of this initial inventory will be incorporated into the Weed Management Plan. The type of survey needed will depend on the size of the project footprint.

11. The proponent shall be responsible for controlling all undesirable invading plant species (including listed noxious weeds and other invasive plants identified as undesirable by federal, state or local authorities) within the boundaries of their authorization area and Bureau-authorized ancillary facilities (e.g. access and utility corridors), including all operating and reclaimed areas, until revegetation activities have been deemed successful and responsibility released by the authorized officer. Control standards and measures proposed must conform to applicable state and federal regulations.

12. The proponent shall use weed free seed for reclamation and for other organic products for erosion control, stabilization, or revegetation (e.g. straw bales, organic mulch) must be certified weed free.

13. The proponent is responsible for ensuring that all project related vehicles and equipment arriving at the site (including, but not limited to, drill rigs, dozers, support vehicles, pickups and passenger vehicles, including those of the operator, any contractor or subcontractor and invited visitors) do not transport noxious weeds onto the project site. The proponent shall ensure that all such vehicles and equipment that will be traveling off constructed and maintained roads or parking areas within the project area have been power washed, including the undercarriage, since their last off road use and prior to off road use on the project. When beginning off road use on the project, such vehicles and equipment shall not harbor soil, mud or plant parts from another locale. Depending on the site setting such as remoteness, or other site condition, the operator may be required to have an on-site wash area identified and readily available. If a noxious weed infestation is known or later discovered on the project site, project related vehicles or equipment that have traveled through such an infestation shall be power washed including the undercarriage prior to leaving the site, at an established, identified wash area. Wash water and sediment shall be contained in an adjacent settling basin. Should any vegetation emerge in the wash area or settling basin, it will be promptly identified and appropriately controlled if found to be an undesirable invasive plant.

14. Should undesirable invasive plants become established on developed areas prior to reclamation reshaping; appropriate measures will be taken to ensure that the invasive plants are eradicated prior to reclamation earthwork. Should undesirable invasive plants become established on reshaped areas prior to reclamation seeding; appropriate measures will be taken to ensure that invasive plants are eradicated prior to seeding the site.

9.0 Visual

9.1. The proposed action is located within and meets the objectives for VRM Class III and IV. The level of change within Class III should be moderate and not dominate the view of the casual observer. Changes should repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

10.0 **Fish and Wildlife**

10.1. Wildlife species in the general area include small mammals, rodents, birds and reptiles. Additionally, the BLM sensitive species western burrowing owl, Mojave shovel-nosed snake, desert glossy snake, Mojave Desert sidewinder may be present in the general area. As proposed, utility relocations will result in an additional 4.79 acres of surface disturbance that was previously analyzed in the Boulder City Bypass FEIS (FHWA-NV-EIS-00-02-F). Impacts to common and BLM sensitive wildlife species analyzed in the EIS are the same as those anticipated for proposed relocations. All measures in the previous analysis are to be carried forward and complied with when carrying out the proposed utility relocations.

11.0 **Fire Management**

11.1. Fire restrictions are generally enacted May through October. Compliance with fire restrictions is mandatory while fire restrictions are in effect. Specific activities may be waived on a case by case basis by a line officer after review and approval by the Fire Management Officer. Conditions that support wildland fire spread can occur any time of the year in Southern Nevada. In general and when fire restrictions are not in effect, utilize standard fire prevention measures and best management practices to prevent fires.

Migratory Birds

11.1. Migratory birds, including the BLM sensitive species western burrowing owl (Athene cunicularia), may be present on the project site. As proposed, utility relocations will result in an additional 4.79 acres of surface disturbance that was previously analyzed in the Boulder City Bypass FEIS (FHWA-NV-EIS-00-02-F). Impacts to migratory bird species analyzed in the EIS are the same as those anticipated for proposed relocations. All measures in the previous analysis are to be carried forward and complied with when carrying out the proposed utility relocations. The applicants must also comply with the following stipulations:

1) To prevent undue harm, habitat-altering projects or portions of projects should be scheduled outside bird breeding season. In upland desert habitats and ephemeral washes containing upland species, the season generally occurs from March 1st through August 31st.

2) If a project that may alter any breeding habitat has to occur during the breeding season, then a qualified biologist must survey the area for nests prior to commencement of construction or maintenance activities. This shall include burrowing and ground nesting species in addition to those nesting in vegetation. If any active nests (containing eggs or young) are found, an appropriately-sized buffer area must be avoided until the young birds fledge.

12.0 Threatened and Endangered Wildlife and Plant Species Stipulations

12.1. The utility relocations are a connected action to the Boulder City Bypass. The Federal Highway Administration (FHWA) and Nevada Department of Transportation (NDOT) are the lead federal agencies for Section 7 Consultation with the US Fish and Wildlife Service (USFWS) for this project. The proposed relocations will result in an additional 4.79 acres of new surface disturbance, which is covered under the Federal Highway Administration's appended Programmatic Biological Opinion (PBO) 84320-2010-F-0285. This PBO states that it covers utility relocations. Tortoise fees have already been paid under casefile N-90786. Impacts to desert tortoise analyzed in the EIS are the same as those anticipated for proposed utility relocations. All measures in the previous analysis are to be carried forward and complied with when carrying out the proposed relocations.

The Holder must abide by the monitoring, maintenance, and reporting requirements of the Programmatic Biological Opinion, File No. 84320-2010-F-0285, which is attached to this document as Exhibit B.

EXHIBIT B

Programmatic Biological Opinion

File No. 84320-2010-F-0285

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
4701 North Torrey Pines Drive
Las Vegas, Nevada 89130
Ph: (702) 515-5230 ~ Fax: (702) 515-5231

September 27, 2010
File No. 84320-2010-F-0285

Dr. Abdelmoez Abdalla, PhD
Federal Highway Administration
705 North Plaza Street, Suite 220
Carson City, Nevada 89701-0602

Dear Dr. Abdalla:

Subject: Formal Consultation under Section 7 of the Endangered Species Act for Effects to the Desert Tortoise and its Critical Habitat that may Occur as a Result of Programmatic Activities Conducted by the Nevada Department of Transportation in Southern Nevada

This transmits the Fish and Wildlife Service's (Service) programmatic biological opinion (PBO) based on our review of programmatic activities proposed for implementation by the Nevada Department of Transportation (NDOT) with funding from the Federal Highway Administration (FHWA). These programs are described in your March 2010 programmatic biological assessment (FHWA and NDOT 2010). This consultation evaluates potential effects on the threatened Mojave desert tortoise (*Gopherus agassizii*) and its designated critical habitat in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*).

The enclosed PBO is based on information provided by FHWA and NDOT including the programmatic biological assessment; letter from FHWA to the Service requesting formal consultation dated April 22, 2010; references cited; draft Service guidance for PBOs (Service 2003); discussions and email communication between NDOT and the Service; comments on, and responses to draft programmatic biological assessments; interagency section 7 consultation regulations in 50 CFR Part 402; and our files. A complete record of this consultation is on file in the Nevada Fish and Wildlife Office in Las Vegas.

Please contact Michael Burroughs in the Nevada Fish and Wildlife Office in Las Vegas at (702) 515-5230 if you have any questions.

Robert D. Williams

Enclosure

cc:
Supervisory Biologist - Habitat, Nevada Department of Wildlife, Las Vegas, Nevada
Chief, Environmental Services, Nevada Department of Transportation, Carson City, Nevada

ENCLOSURE

BIOLOGICAL OPINION

A. CONSULTATION HISTORY

In January 2009, Nevada Department of Transportation (NDOT), Federal Highway Administration (FHWA), and Fish and Wildlife Service (Service) personnel met to discuss the strategy for developing a programmatic biological assessment for transportation-related actions in southern Nevada which may affect listed species. The agencies agreed to limit the scope of the programmatic consultation to the desert tortoise considering the vast majority of consultations for NDOT projects with a Federal nexus over the past 10 years involved only the desert tortoise.

In November 2009 and March 2010, the NDOT provided draft programmatic biological assessments to the Service. The Service reviewed the drafts and provided comments which were addressed in the final programmatic biological assessment.

On April 22, 2010, FHWA submitted a final programmatic biological assessment to the Service with their request for formal consultation. The Service received FHWA's request and programmatic biological assessment on April 26, 2010, and determined that FHWA provided information sufficient to initiate formal consultation, at which time consultation was initiated.

B. PROGRAMMATIC CONSULTATIONS

This biological opinion was prepared in accordance with the July 16, 2003, draft guidance for programmatic-level consultations (Service 2003). The term "programmatic consultation" has become a generic term encompassing a broad category of section 7 consultations that evaluate the potential for Federal agency programs to affect listed and proposed species, and designated and proposed critical habitat. Such programs typically guide implementation of future agency actions by establishing standards, guidelines, or governing criteria to which future actions must adhere. At times the term *programmatic consultation* has been used to refer to consultations on a large group of similar actions (*e.g.*, a National Forest's timber harvest program for a particular year) as well as to refer to consultations covering different types of actions proposed within a large geographic area, such as a watershed. Such consultations can provide the benefit of streamlining the consultation process while leading to a more landscape-based approach to consultations that can minimize the potential "piecemeal" effects that can occur when evaluating individual projects out of the context of the complete agency program.

This programmatic biological opinion (PBO) analyzes the potential effects of implementing NDOT projects with FHWA funding and potentially additional Federal actions, followed by the appropriate project-specific documentation addressing the effects of individual projects. This PBO contains all of the elements found in a standard biological opinion. The format of this PBO

conforms to the *appended programmatic consultation approach*, which will require that FHWA and the Service produce project-specific documentation that is physically appended to this PBO before the action occurs.

Project-Level Consultation under the Appended Programmatic Consultation Approach

The Service reviews the information and effects analysis provided for each proposed project and this project-specific review is documented in accordance with the guidance provided below. To initiate the project-specific review, the project information and effects analysis should be accompanied by a cover letter that specifies that FHWA has determined the proposed project is consistent with the PBO, and requests that the proposed project be appended to the PBO to fulfill FHWA's consultation requirements. In this PBO, the Service determined the overall anticipated incidental take for all proposed FHWA activities in the action area over a 10-year period at the programmatic level. As each action is submitted by FHWA to the Service to be appended to this PBO, the Service will determine the anticipated incidental take for each action, at the project level, as a subset of the incidental take anticipated in the PBO.

Individual actions that are *likely to adversely affect* listed species shall require a letter from FHWA to the Service (or attached form, Appendix A) that contains:

(1) a summary of any information not identified in the PBO used to evaluate the effects of the proposed action;
(2) a short project summary describing the Federal action and indentifying which program the proposed action falls under;
(3) a detailed discussion of the effects of the proposed action on listed species and critical habitat;
(4) a statement regarding the specific project's effects to the environmental baseline, including a restatement of the estimated acres of disturbance and possible forms of take that are anticipated and a tallying of the overall effects to the environmental baseline from projects implemented under the PBO to date; and
(5) a detailed description of proposed minimization measures.

On a limited, project-by-project basis, additional effects may occur in action areas that extend beyond the project footprint, but are subject to Federal nexus as defined in 50 CFR 402.02 (activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States).

Although there is no standard for the required project-specific documentation, the Service generally should complete its response in approximately two pages and within 30-45 days. This documentation is then physically attached (appended) to the PBO in an appendix. Therefore, the PBO, together with the appended documentation, fulfills the consultation requirements for implementation of both program-level and project-level actions.

Annual reports are prepared by FHWA and submitted to the Service for review to assure that the effects analysis in the PBO is accurate including a comprehensive review of how the PBO is working, and whether its implementing procedures are in compliance. During this review, the environmental baseline should be reviewed and updated as needed to account for unanticipated effects or the lack of anticipated effects. The FHWA shall be responsible for accurately reporting any incidental take of listed species to the Service that occurs in association with actions covered under this PBO. During this process it may be determined that the program-level biological opinion is functioning as anticipated and, therefore, activities should continue, or that adjustments should be made.

C. DESCRIPTION OF THE PROPOSED ACTION

The FHWA proposes to provide funding to NDOT for the construction and maintenance of projects on Federal-aid highways and associated activities including use of material sites. Additional Federal actions associated with FHWA-funded projects such as rights-of-way (ROW) grants issued by Bureau of Land Management (BLM) and permits issued by the U.S. Army Corps of Engineers may also be required for some projects; if FHWA is the lead agency for these projects, FHWA may choose to include those additional Federal actions under this PBO. The scope of the proposed action is limited to future projects with a Federal nexus. NDOT would receive FHWA funding to administer and implement programs for the planning, development, construction, and operation of the State's transportation system. FHWA and NDOT identified four programs of activities for this consultation which are described below.

Over the past approximately 20 years, FHWA has consulted with the Service for NDOT projects they proposed to fund that may adversely affect the desert tortoise. Information on these projects including the effects on the desert tortoise that occurred during this 20-year period was used to develop the proposed action for this PBO. The Service determined that information on these previous projects resulted in predictable effects on the desert tortoise, thus facilitating the program-level analysis in this consultation.

Table 1 represents the upper limits of disturbance based on the current knowledge of anticipated future projects for the next 10 years (2010-2020). NDOT and FHWA identified projects likely to be implemented under this PBO. Future highway projects are in Table 2 and anticipated use of material sites can be found in Table 3. A total of 5,638 (4,468 + 1,170) acres of disturbance is anticipated based on 5,288 acres disturbed as a result of known projects to occur (1,600 + 2,768 + 920), plus 200 acres estimated for improvement and maintenance, plus 150 for a potential, unplanned expanded capacity project.

Table 1. Anticipated acres of desert tortoise habitat disturbed by program (2010-2020).

Program	Non-Critical Habitat	Critical Habitat	CHU Affected
New Construction	830	0	None
Expanded Capacity	770	150[1]	Mormon Mesa
Improvement & Maintenance[2]	100	50	Mormon Mesa
		50	Piute-Eldorado
Material Sites	2,768	920	Mormon Mesa
Totals	**4,468 acres**	**1,170 acres**	

[1] Estimate based on the possibility of a highway expansion to accommodate traffic near the Coyote Springs urban development and is not included in Table 2 or 3.
[2] These are estimates since improvement and maintenance projects are determined yearly based on need and generally disturb a small amount of habitat

Table 2. Potential highway projects and acreage of desert tortoise habitat to be disturbed (2010-2020). No critical habitat is anticipated to be affected.

Location	Program	Total Acres
Northwest of Las Vegas		
US 95 & SR-157 construct 4-lane interchange	Expansion	40
SR-156, SR-157, & SR-158 resurfacing	Maintenance	0
Las Vegas to Pahrump		
SR-160 widen to 4 lanes - Red Rock Canyon Rd. to Mountain Springs - CL 11.1-20.8	Expansion	30
SR-160 widen to 5 lines - NY 0.0-8.5	Expansion	50
Northeast of Las Vegas		
Apex to Mesquite		
I-15 widen to 6 lines from Craig to Speedway	Expansion	20
I-15 new interchange at Speedway	Expansion	40
I-15 & Speedway Park & Ride	Expansion	40
I-15 widen to 6 lanes from Speedway to Apex	Expansion	135
I-15 & CC-215 NE - widen interchange to 6 lanes	Expansion	40
I-15 & US-93 new interchange	Expansion	40
I-15 in Mesquite - new interchange CL 118	Expansion	40
I-15 in Mesquite - new interchange Airport CL 108	Expansion	40
North of I-15 to Alamo		
US-93 flush seal repaving LN 0.0-24.7	Maintenance	0
South of I-15		
Lake Mead NRA - roadway rehabilitation	Maintenance	0
Valley of Fire – roadway paving	Maintenance	0
Southwest of Las Vegas		
Primm to Sloan		
I-15 widen to 8 lanes – CL 0.0-25.5	Expansion	75*
I-15 at Sloan – construct interchange	Expansion	40*
I-15 widen to 10 lanes – CL 25.5-35.5	Expansion	120*
Sloan to Las Vegas		
I-15 widen to 10 lanes St. Rose to Tropicana – CL27-37.4	Expansion	20
I-15 at Bermuda Rd – construct interchange – CL 27.5	Expansion	40
I-15 at Star Ave – construct interchange – CL 27.69	Expansion	40
I-15 at Pebble Rd – construct interchange & widen to 6 lanes from LV Blvd to SR160	Expansion	40

I-15 at Cactus Ave. – construct interchange – CL 30.5	Expansion	40
SR-604 widen to 6 lanes – St. Rose to Serene – CL 16-20	Expansion	24
I-15 South - Super Speed Train Project – LA to LV Proposed within I-15 ROW – 40 miles in NV	New	250*
Southeast of Las Vegas		
US-93 & US 95 Jct to Hoover Dam - Boulder City Bypass new freeway & interchange CL 0.0-10.9	New	800
US 95 & US-93 Jct to Railroad Pass – truck climbing lane	Expansion	5
US 95 – widen to 4 lane divided – CL 0-1	Expansion	5
SR-564 – widen to 6 lanes & intersection – CL 12-19	Expansion	41
SR-163 – New Bridge Laughlin to Bullhead City	New	30
Total acres		**2,085**

* within fenced ROW

The programmatic biological assessment for this consultation identified the potential effects of transportation-related programs on the desert tortoise and its critical habitat based on proposed projects listed in the 2009 State Transportation Improvement Plan. Subsequent NDOT projects with a Federal nexus would follow a project-level consultation under the appended programmatic consultation approach. FHWA would consult with the Service for each individual project proposed, and develop a project-specific document which would be appended to the PBO prior to project implementation.

The action area for this consultation encompasses Federal-aid highways and associated material sites in Clark County, Nye County north to the Nye/Esmeralda county line, and southern Lincoln County north to Caliente (FHWA and NDOT 2010, pp. A-1 - A-4). In the programmatic biological assessment, the action area is divided into four quadrants around Las Vegas: northwest, northeast, southwest, and southeast (Figure 1).

1. New Construction

This program involves future construction of new travel routes or facilities with FHWA funding. Project may include new roadways, bridges, interchanges, rail lines, bicycle paths, staging areas, rest stops, welcome centers, maintenance stations, communication sites, and other transportation-related structures, infrastructures, and facilities. FHWA and NDOT anticipate no more than 830 acres of disturbance of desert tortoise habitat as a result of new construction projects during the 10-year term of this consultation; no critical habitat will be disturbed.

2. Expanded Capacity

Projects under this program would increase the capacity of existing transportation routes, structures, and facilities structures. Future projects may include construction of additional travel lanes, widening of roadways, and expansion of structures and facilities including rest stops,

Figure 1

welcome centers, maintenance stations, pull-out areas, communication sites, etc. FHWA and NDOT anticipate no more than 920 acres of disturbance of desert tortoise habitat as a result of the expanded capacity program during the 10-year term of this consultation including up to 150 acres of non-critical habitat disturbance.

3. Improvements and Maintenance

NDOT is responsible for maintaining highways that traverse the Mormon Mesa and the Nevada portion of the Piute-Eldorado designated critical habitat units (CHU). Highways northeast of Las Vegas that traverse the Mormon Mesa CHU include U.S. Highway 93 (US 93), State Route (SR) 168, and Interstate 15 (I-15). Southeast of Las Vegas, U.S. Highway 95 (US 95), SR 163, SR 164, and SR 165 traverse the Piute-Eldorado CHU. Only those NDOT improvement and maintenance projects with FHWA funding fall under purview of this consultation and biological opinion; other projects should be planned and implemented in accordance with an incidental take permit under section 10 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*)

Specific actions under this program may include preserving, repairing, and/or enhancing existing transportation-related routes, structures or facilities; resurfacing roadways; widening, flattening, and grading shoulders; installing drainage and erosion-control structures including culvert and pipe replacement, expansion, and lengthening; installing drainage channels, detention basins, and ditches; installing and repairing fencing, lighting, utility, signs, railing, cattle guards, landscaping, etc; vegetation management; erosion control; and drainage and structure repair.

For highway safety purposes, the first 9 feet of shoulder from the edge of roadway pavement is maintained as bare ground by blading or scraping off the vegetation or the application of a localized pre-emergent herbicide. Vegetation management up to 12 feet from the edge of pavement may include mowing to limit the height of vegetation. Noxious and invasive weeds may be sprayed with a post-emergent herbicide within the ROW, generally with a boom spray from a truck, within the first 12 feet from edge of pavement. Selective areas of known noxious weed infestations may be targeted and hand sprayed within the ROW but beyond the12-foot-wide area. Only herbicides approved by BLM are used within NDOT rights-of-way. Only certified pesticide applicators are used for weed control services and a no drift policy is strictly enforced.

4. Material Sites

Activities that may occur under the Material Sites Program include excavation, extraction, processing, and transport of materials; staging and storage areas; access roads; and fencing installation and maintenance. FHWA and NDOT anticipate up to 6,838 acres of disturbance of desert tortoise habitat which includes 920 acres of critical habitat, within the 10-year period of this biological opinion (Table 3). Material sites not identified in the programmatic biological assessment will be evaluated for relinquishment, particularly sites in critical habitat.

Table 3. Material sites by location and anticipated maximum potential acreage of disturbed desert tortoise habitat.

Location	Total Acres	Non-habitat	Non-Critical	Critical
Northwest of Las Vegas				
US 95 NLV to Cactus Springs – 5 sites	680	240	440	
US 95 Mercury to Beatty – 8 sites	900	270	630	
US 95 Beatty to SR 266 Jct – 8 sites	550	210	340	
SR-373 Amargosa Valley – 1 site	40	10	30	
SR-267 Scotty's Castle Road – 2 sites	80	0	80	
SR-160 Pahrump – 3 sites	328	100	228	
SR-159 Blue Diamond – 1 site	80	80	0	
Northeast of Las Vegas				
I-15 Apex to Mesquite – 6 sites 1 site in Mormon Mesa CHU	840	540	80	220
SR 168 Warm Springs – 1 site	40	40		
US-93 to Alamo – 5 sites 4 sites in Mormon Mesa CHU	860	0	160	700
Southwest of Las Vegas				
I-15 Primm to Henderson – 4 sites	1,620	840	780	
Southeast of Las Vegas				
US 95 Stateline to Boulder City – 3 sites 1 site in Piute-Eldorado – 40 acres	180	180		*
SR-164 Searchlight – 1 site in Piute-Eldorado	640	640		*
Totals	6,838	3,150	2,768	920

* Material sites in the Piute-Eldorado CHU are fenced and/or cleared of vegetation. Fees have been paid in full to the Clark County Multiple Species Conservation Plan for 680 acres of disturbances at these sites.

PROPOSED PROGRAMMATIC-LEVEL MEASURES TO MINIMIZE POTENTIAL EFFECTS

The FHWA and NDOT propose to minimize the effects of proposed projects and activities on the desert tortoise and its critical habitat by implementing the measures below (FHWA and NDOT 2010). Specific projects may include additional site-specific measures to be proposed during the project-level consultation at which time, the action would be appended to the PBO.

1. New highway construction and highway widening projects in desert tortoise habitat will be evaluated for the installation of permanent tortoise-proof fencing, particularly projects in or near critical habitat. The Boulder City Bypass project will include permanent fencing.

2. When new permanent tortoise-proof fencing is installed, fencing will tie in to culverts which can be utilized by tortoises to move under the roadway where appropriate. NDOT biologists will coordinate culvert passageway locations with Service and BLM biologists.

3. Tortoise-friendly barriers will be placed at gates to material sites and access road locations where requested by BLM and the Service.

4. Material sites not included in this document will be evaluated for relinquishment, particularly sites in critical habitat.

5. NDOT includes the following requirements in the contract documents for all projects within desert tortoise habitat. The contractor is responsible for adhering to these requirements throughout the life of the project (i.e., pre-construction, construction, and post-construction activities). The NDOT Resident Engineer assigned to the project is responsible for assuring the contractor is adhering to the requirements.

   a. *Speed-limit.* A 25 mile per hour speed limit is posted within the project area, including material sites and on unpaved access roads.

   b. *Education.* A desert tortoise education program which includes the identification, habits, and protected status information for the desert tortoise is provided to all workers.

   c. *Litter control.* A litter control program, including use of covered, raven-proof trash receptacles and daily trash removal is implemented.

   d. *Fencing.* The installation and maintenance of tortoise-proof fencing to exclude tortoises from entering the project area is required as part of the pre-construction activities. The fence must meet Service and NDOT standards, with zero clearance between the ground and the bottom of the fence. The exposed fence line must be kept clear of weeds and debris. The contractor reports their fence installation and maintenance schedule and plan to the NDOT Environmental Services Division for approval.

   e. *Staging and storage areas.* Vehicles and equipment must be parked inside of the fenced project area. Materials and equipment must be stored inside of the fenced project or material site area. No land disturbance can take place outside of the fenced area.

   f. *Tortoise clearance.* An authorized desert tortoise biologist (Service approved) will conduct a tortoise clearance survey prior to land disturbance and material site use. The biologist will remove tortoises from the site following Service protocol, and excavate and collapse all burrows found. The biologist will forward all tortoise encounter and movement documentation to the NDOT Environmental Services Division, who will include this information in the post-project report to the Service. Tortoises will be cleared from fenced areas prior to the project beginning.

   g. *Land disturbance.* An authorized desert tortoise biologist will be present and check for tortoises during all new land disturbance activities, including new fence installation.

   h. *Tortoise encounters.* If a tortoise is found:

      - All activity in the vicinity of the tortoise will stop.

- A person trained in tortoise handling (i.e. authorized desert tortoise biologist) will move the tortoise according to Service protocol.
- The NDOT Environmental Services Division will be contacted within 24 hours.
- An NDOT Tortoise Take Form will be completed and sent to NDOT Environmental Services Division who will ensure that this information is included in the post-project report to the Service.

i. *Reporting.* NDOT Environmental Services Division will report tortoise encounters to the Service every six months and complete a post-project report within one month of project completion.

j. *Fees.* NDOT Environmental Services Division pays fees per acre of disturbance based on Service recommended rates.

D. ANALYTICAL FRAMEWORK FOR JEOPARDY/ADVERSE MODIFICATION DETERMINATION

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

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

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

E. STATUS OF THE SPECIES/CRITICAL HABITAT - RANGEWIDE

The following summarizes the rangewide status of the desert tortoise and its designated critical habitat, which includes information on its listing history, recovery plan, recovery and CHUs, species account, reproduction, population distribution and monitoring, and threats.

1. Listing History

On August 20, 1980, the Service published a final rule listing the Beaver Dam Slope population of the desert tortoise in Utah as threatened (45 FR 55654). In the 1980 listing of the Beaver Dam Slope population, the Service concurrently designated 26 square miles of BLM-administered land in Utah as critical habitat. The reason for listing was population declines because of habitat deterioration and past over-collection. Major threats to the desert tortoise identified in the rule included habitat destruction through development, overgrazing, and geothermal development, collection for pets, malicious killing, road kills, and competition with grazing or feral animals.

On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered (54 FR 42270). On April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened (55 FR 12178). Reasons for the determination included significant population declines, loss of habitat from construction projects such as roads, housing and energy developments, and conversion of native habitat to agriculture. Livestock grazing and off-highway vehicle (OHV) activity have degraded additional habitat. Also cited as threatening the desert tortoise's continuing existence were: illegal collection by humans for pets or consumption; upper respiratory tract disease (URTD); predation on juvenile desert tortoises by common ravens, coyotes, and kit foxes; fire; and collisions with vehicles on paved and unpaved roads.

On February 8, 1994, the Service designated approximately 6.45 million acres of critical habitat for the Mojave population of the desert tortoise in portions of California (4,750,000 acres), Nevada (1,220,000 acres), Arizona (339,000 acres), and Utah (129,000 acres) (59 FR 5820-5846, also see corrections in 59 FR 9032-9036), which became effective on March 10, 1994.

2. Recovery Plan

On June 28, 1994, the Service approved the final Desert Tortoise (Mojave Population) Recovery Plan (1994 Recovery Plan) (Service 1994). The 1994 Recovery Plan divided the range of the desert tortoise into 6 recovery units and recommended establishment of 14 desert wildlife management areas (DWMAs) throughout the recovery units. Within each DWMA, the 1994 Recovery Plan recommended implementation of reserve-level protection of desert tortoise populations and habitat, while maintaining and protecting other sensitive species and ecosystem functions. The design of DWMAs should follow accepted concepts of reserve design. As part of the actions needed to accomplish recovery, the 1994 Recovery Plan recommended that land management within all DWMAs should restrict human activities that negatively impact desert

tortoises (Service 1994). The DWMAs/Area of Critical Environmental Concern (ACECs) have been designated by BLM through development or modification of their land-use plans in Arizona, Nevada, Utah, and parts of California.

The U.S. General Accounting Office (GAO) Report, *Endangered Species: Research Strategy and Long-Term Monitoring Needed for the Mojave Desert Tortoise Recovery Program* (GAO 2002), directed the Service to periodically reassess the 1994 Recovery Plan to determine whether scientific information developed since its publication could alter implementation actions or allay some of the uncertainties about its recommendations. In response to the GAO report, the Service initiated a review of the 1994 Recovery Plan in 2003. In March 2003, the Service impaneled the Desert Tortoise Recovery Plan Assessment Committee (Committee) to assess the 1994 Recovery Plan. The charge to the Committee was to review the entire 1994 Recovery Plan in relation to contemporary knowledge to determine which parts of the 1994 Recovery Plan needed updating. The recommendations of the Committee were presented to the Service and Desert Tortoise Management Oversight Group on March 24, 2004 (Tracy *et al.* 2004). The recommendations were used as a guide by a recovery team of scientists and stakeholders to modify the 1994 Recovery Plan.

On November 3, 2004, the Service announced the formation of the Desert Tortoise Recovery Office. This office is revising the 1994 Recovery Plan and coordinating with regional recovery implementation work groups to develop five-year recovery action plans under the umbrella plan. A draft revision of the recovery plan was released to the public on August 4, 2008 (Service 2008). The Service anticipates a final recovery plan in 2010.

3. Recovery Units

a. Northeastern Mojave Recovery Unit

The 1994 Recovery Plan delineates the Northeastern Mojave Recovery Unit to occur primarily in Nevada, but it also extends into California along the Ivanpah Valley and into extreme southwestern Utah and northwestern Arizona. Vegetation within this unit is characterized by creosote bush scrub, big galleta-scrub steppe, desert needlegrass scrub-steppe, and blackbrush scrub (in higher elevations). Topography is varied, with flats, valleys, alluvial fans, washes, and rocky slopes. Much of the northern portion of the Northeastern Mojave Recovery Unit is characterized as basin and range, with elevations from 2,500 to 12,000 feet. Desert tortoises typically eat summer and winter annuals, cacti, and perennial grasses. Since the northern portion of this recovery unit represents the northernmost distribution of the species, desert tortoises are typically found in low densities (about 10 to 20 adults per square mile).

The Northeastern Mojave Recovery Unit includes the Mormon Mesa, Coyote Spring, Beaver Dam Slope and Gold Butte-Pakoon DWMAs; and a portion of the Piute-Eldorado DWMAs. These areas generally overlap the Mormon Mesa, Piute-Eldorado, Beaver Dam Slope, and Gold Butte-Pakoon CHUs.

Using the U.S. Geological Survey (USGS) habitat model (Nussear *et al.* 2009) and a 0.5 probability threshold based on the prevalence approach (Liu *et al.* 2005), the Service estimates that about one half of the Northeastern Mojave Recovery Unit contains potential desert tortoise habitat (approximately 4,853,368 acres). Although this analysis likely omits some marginal desert tortoise habitat, it explains the occurrence of 95 percent of the 938 test points used in the model. This analysis does not consider habitat loss, fragmentation, or degradation associated with human-caused impacts.

b. Eastern Mojave Recovery Unit

The 1994 Recovery Plan delineates the Eastern Mojave Recovery Unit to occur primarily in California, but also extends into Nevada in the Amargosa, Pahrump, and Piute valleys. The Ivanpah, Piute-Eldorado, and Fenner DWMAs are included in the Eastern Mojave Recovery Unit which generally overlaps the Ivanpah and Piute-Eldorado CHUs in California. In the Eastern Mojave Recovery Unit, desert tortoises are often active in late summer and early autumn in addition to spring because this region receives both winter and summer rains and supports two distinct annual floras on which they can feed. Desert tortoises in the Eastern Mojave Recovery Unit occupy a variety of vegetation types and feed on summer and winter annuals, cacti, perennial grasses, and herbaceous perennials. They den singly in caliche caves, bajadas, and washes. This recovery unit is isolated from the Western Mojave Recovery Unit by the Baker Sink, a low-elevation, extremely hot and arid strip that extends from Death Valley to Bristol Dry Lake. The Baker Sink area is generally not considered suitable for desert tortoises. Desert tortoise densities in the Eastern Mojave Recovery Unit can vary dramatically, ranging from 5 to as much as 350 adults per square mile (Service 1994).

c. Northern Colorado Recovery Unit

The 1994 Recovery Plan delineates the Northern Colorado Recovery Unit completely in California. The 874,843-acre Chemehuevi DWMA is the sole conservation area for the desert tortoise in this recovery unit. Desert tortoises in this recovery unit are found in the valleys, on bajadas and desert pavements, and to a lesser extent in the broad, well-developed washes. They feed on both summer and winter annuals and den singly in burrows under shrubs, in intershrub spaces, and rarely in washes. The climate is somewhat warmer than in other recovery units, with only 2 to 12 freezing days per year.

d. Eastern Colorado Recovery Unit

The 1994 Recovery Plan delineates the Eastern Colorado Recovery Unit completely in California. The Chuckwalla DWMA and CHU, and a portion of the Joshua Tree DWMA and Pinto Basin CHU, occur in this recovery unit. This recovery unit occupies well-developed washes, desert pavements, piedmonts, and rocky slopes characterized by relatively species-rich succulent scrub, creosote bush scrub, and Blue Palo Verde-Ironwood-Smoke Tree communities. Winter burrows are generally shorter in length, and activity periods are longer than elsewhere due

to mild winters and substantial summer precipitation. The desert tortoises feed on summer and winter annuals and some cacti; they den singly.

e. Western Mojave Recovery Unit

The 1994 Recovery Plan delineates the Western Mojave Recovery Unit completely in California. It is composed of the Western Mojave, Southern Mojave, and Central Mojave regions which are exceptionally heterogeneous and have broad, indistinct boundaries due to gradational transitions among sub-regions and with surrounding areas (Webb *et al.* 2009). The central Mojave is topographically and climatically transitional between the southwestern and eastern Mojave Desert. The south-central Mojave is a transitional region to the Colorado/Sonoran Desert, and the southern half of this region is similar climatically and floristically to the eastern Mojave. Many of the differences in vegetation among these regions can be explained by differences in climate (Rowlands 1995), which varies linearly across the range of the desert tortoise. The most pronounced difference between the Western Mojave and other recovery units is in timing of rainfall and the resulting vegetation. Most rainfall occurs in fall and winter and produces winter annuals, which are the primary food source of desert tortoises. Aboveground activity occurs primarily in spring, associated with winter annual production. Thus, desert tortoises are adapted to a regime of winter rains and rare summer storms. Here, desert tortoises occur primarily in valleys, on alluvial fans, bajadas, and rolling hills in saltbrush, creosote bush, and scrub steppe communities. Desert tortoises dig deep burrows (usually located under shrubs on bajadas) for winter hibernation and summer aestivation. These desert tortoises generally den singly.

Four DWMAs occur wholly or partially within the Western Mojave Recovery Unit: Fremont-Kramer, Ord-Rodman, Superior-Cronese, and Joshua Tree. These areas approximate the Fremont-Kramer, Ord-Rodman, Superior-Cronese, and Pinto Basin CHUs.

f. Upper Virgin River Recovery Unit

The 1994 Recovery Plan delineates the Upper Virgin River Recovery Unit to encompass all desert tortoise habitat in Washington County, Utah, except the Beaver Dam Slope, Utah population. Only the Upper Virgin River DWMA and CHU occur in this recovery unit. The desert tortoise population in the area of St. George, Utah is at the extreme northeastern edge of the species' range and experiences long, cold winters (about 100 freezing days) and mild summers, during which the desert tortoises are continually active. Here the desert tortoises live in a complex topography consisting of canyons, mesas, sand dunes, and sandstone outcrops where the vegetation is a transitional mixture of sagebrush scrub, creosote bush scrub, blackbush scrub, and a psammophytic community. Desert tortoises use sandstone and lava caves instead of burrows, travel to sand dunes for egg-laying, and use still other habitats for foraging. Two or more desert tortoises often use the same burrow.

4. Species Account

The desert tortoise is a large, herbivorous reptile that occurs in portions of California, Arizona, Nevada, and Utah. It also occurs in Sonora and Sinaloa, Mexico. The Mojave population of the desert tortoise includes those desert tortoises living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Sonoran Desert in California.

Desert tortoises reach 8 to 15 inches in carapace length and 4 to 6 inches in shell height. Hatchlings emerge from the eggs at about 2 inches in length. Adults have a domed carapace and relatively flat, unhinged plastron. Their shells are high-domed, and greenish-tan to dark brown in color with tan scute centers. Desert tortoises weigh 8 to 15 pounds when fully grown. The forelimbs have heavy, claw-like scales and are flattened for digging, while hind limbs are more stumpy and elephantine.

Optimal habitat for the desert tortoise has been characterized as creosote bush scrub in which precipitation ranges from 2 to 8 inches, where a diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982; Turner and Brown 1982). Soils must be friable enough for digging burrows, but firm enough so that burrows do not collapse. Desert tortoises occur from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 feet (Luckenbach 1982). Neonate desert tortoises use abandoned rodent burrows for daily and winter shelter; these burrows are often shallowly excavated and run parallel to the surface of the ground.

Desert tortoises are most commonly found within the desert scrub vegetation type, primarily in creosote bush scrub. In addition, they occur in succulent scrub, cheesebush scrub, blackbrush scrub, hopsage scrub, shadscale scrub, microphyll woodland, Mojave saltbush-allscale scrub and scrub-steppe vegetation types of the desert and semidesert grassland complex (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 Desert region, desert tortoises occur most commonly on gently sloping terrain with soils ranging from sandy-gravel and with scattered shrubs, and where there is abundant inter-shrub space for growth of herbaceous plants. Throughout their range, however, desert tortoises can be found in steeper, rockier areas (Gardner and Brodie 2000).

The size of desert tortoise home ranges varies with respect to location and year. Desert tortoise activities are concentrated in overlapping core areas, known as home ranges. In the western Mojave Desert, Harless *et al.* (2007) estimated mean home ranges for desert tortoises to be 111 acres for males and 40 acres for females. 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, the ability of desert tortoises to drink while surface water is available

following rains may be crucial for desert tortoise survival. During droughts, desert tortoises forage over larger areas, increasing the likelihood of encounters with sources of injury or mortality including humans and other predators.

Desert tortoises spend most of the year in subterranean burrows or caliche caves (Nagy and Medica 1986). Desert tortoises in the west Mojave are primarily active in May and June, with a secondary activity period from September through October. In Nevada and Arizona, desert tortoises are considered to be most active from approximately March 1 through October 31. Their activity patterns are primarily controlled by ambient temperature and precipitation (Nagy and Medica 1986; Zimmerman *et al.* 1994). In the east Mojave and Colorado deserts, annual precipitation occurs in both summer and winter, providing food and water to desert tortoises throughout much of the summer and fall. Most precipitation occurs in winter in the west Mojave Desert, resulting in an abundance of annual spring vegetation, which dries up by late May or June. Neonate desert tortoises emerge from their winter burrows as early as late January to take advantage of freshly germinating annual plants through the spring. Under certain conditions desert tortoises may be aboveground any month of the year, particularly during periods of mild or rainy weather in summer and winter.

During active periods, they usually spend nights and the hotter part of the day in their burrow; they may also rest under shrubs or in shallow burrows (pallets). Desert tortoises may use an average of 7 to 12 burrows at any given time (Bulova 1994; TRW Environmental Safety Systems Inc. 1997). Walde *et al.* (2003) observed that desert tortoises retreated into burrows when air temperature reached 91.0° Fahrenheit (F) ± 3.55° F and ground temperatures reached 94.6° F ± 6.05° F; 95 percent of observations of desert tortoises aboveground occurred at air temperatures less than 91° F. The body temperature at which desert tortoises become incapacitated ranges from 101.5° F to 113.2° F (Naegle 1976; Zimmerman *et al.* 1994).

Although desert tortoises eat nonnative plants, they generally prefer native forbs when available (Jennings 1993; Avery 1998). Consumption of nonnative plants may cause desert tortoises to have a nitrogen and water deficit (Henen 1997). Droughts frequently occur in the desert, resulting in extended periods of low water availability. Periods of extended drought place desert tortoises at even greater water and nitrogen deficit than during moderate or high rainfall years (Peterson 1996; Henen 1997). During a drought, more nitrogen than normal is required to excrete nitrogenous wastes, thus more rapidly depleting nitrogen stored in body tissues. Plants also play important roles in stabilizing soil and providing cover for protection of desert tortoises from predators and heat.

The USGS modeled desert tortoise habitat across the range of the desert tortoise (Nussear *et al.* 2009). This model, which is based on 3,753 desert tortoise locations, uses 16 environmental variables, such as precipitation, geology, vegetation, and slope. In addition, Nussear *et al.* used 938 additional occurrence locations to test the model's accuracy. Using this model and a 0.5 probability threshold based on the prevalence approach (Liu *et al.* 2005), the Service estimates that there are approximately 20,542,646 acres of potential desert tortoise habitat rangewide. This analysis likely omits some marginal desert tortoise habitat, and it does not

consider habitat loss, fragmentation, or degradation associated with human-caused impacts; however, it provides a reference point relative to the amount of desert tortoise habitat.

Further information on the range, biology, habitat, and ecology of the desert tortoise is available in: Bury (1982); Bury and Germano (1994); Ernst *et al.* (1994); Jennings (1997); Service (2008); Tracy *et al.* 2004; Van Devender (2002); and collected papers in Chelonian Conservation and Biology (2002, Vol. 4, No. 2), Herpetological Monographs (1994, No. 8), and the Desert Tortoise Council Proceedings.

5. Reproduction

Desert tortoises possess a combination of life history and reproductive characteristics that affect the ability of populations to survive external threats. Desert tortoises grow slowly, require 15 to 20 years to reach sexual maturity, and have low reproductive rates during a long period of reproductive potential (Turner *et al.* 1984; Bury 1987; Tracy *et al.* 2004).

Choice of mate is mediated by aggressive male-male interactions and possibly by female choice (Niblick *et al.* 1994). Desert tortoises in the west Mojave Desert may exhibit pre-breeding dispersal movements, typical of other vertebrates, ranging from 1 to 10 miles in a single season (Sazaki *et al.* 1995). The advantage of pre-breeding dispersal may be to find a more favorable environment in which to reproduce. However, risks include increased mortality from predation, exposure, starvation, or anthropogenic factors (e.g., motor vehicle mortality).

The average clutch size is 4.5 eggs (range 1 to 8; on rare occasions, clutches can contain up to 15 eggs), with 0-3 clutches deposited per year (Turner *et al.* 1986). Clutch size and number probably depend on female size, water, and annual productivity of forage plants in the current and previous year (Turner *et al.* 1984, 1986; Henen 1997). The eggs typically hatch from late August through early October. The ability to alter reproductive output in response to resource availability may allow individuals more options to ensure higher lifetime reproductive success. The interaction of longevity, late maturation, and relatively low annual reproductive output causes desert tortoise populations to recover slowly from natural or anthropogenic decreases in density. To ensure stability or increased populations, these factors also require relatively high juvenile survivorship (75 to 98 percent per year), particularly when adult mortality is elevated (Congdon *et al.* 1993). Bjurlin and Bissonette (2004) determined that 74 percent of desert tortoise nests survived and, over 2 years, 84 and 91 percent of the neonates survived the initial period of post-hatching dispersal. They predicted that 40 percent of eggs produce hatchlings that survive to hibernation at their study site. Desert tortoises generally lay eggs from mid-May to early July, but occasionally as late as October (Ernst *et al.* 1994). Eggs are laid in sandy or friable soil, often at the entrance to burrows. Hatching occurs 90 to 120 days later, mostly in late summer and fall (mid-August to October). Eggs and young are untended by the parents. Desert tortoise sex determination is environmentally controlled during incubation (Spotila *et al.* 1994). Hatchlings develop into females when the incubation (*i.e.*, soil) temperature is greater than 88.7° F and males when the temperature is below that (Spotila *et al.* 1994). Mortality is higher when incubation temperatures are greater than 95.5° F or less than 78.8° F. The

sensitivity of embryonic desert tortoises to incubation temperature may make populations vulnerable to unusual changes in soil temperature (e.g., from changes in vegetation cover).

At Yucca Mountain in Nye County, Nevada (Northeastern Mojave Recovery Unit), Mueller *et al.* (1998) estimated that the mean age of first reproduction was 19 to 20 years; clutch size (1 to 10 eggs) and annual fecundity (0 to 16 eggs) were related to female size but annual clutch frequency (0 to 2) was not. Further, Mueller suggested that body condition during July to October may determine the number of eggs a desert tortoise can produce the following spring. McLuckie and Fridell (2002) determined that the Beaver Dam Slope desert tortoise population, within the Northeastern Mojave Recovery Unit, had a lower clutch frequency (1.33 ± 0.14) per reproductive female and fewer reproductive females (14 out of 21) when compared with other Mojave desert tortoise populations. In the 1990s, Beaver Dam Slope experienced dramatic population declines due primarily to disease, and habitat degradation and alteration (Service 1994). The number of eggs that a female desert tortoise can produce in a season is dependent on a variety of factors including environment, habitat, availability of forage and drinking water, and physiological condition (Henen 1997; McLuckie and Fridell 2002).

6. Population Distribution and Monitoring

Patterns of desert tortoise distribution are available from preliminary spatial analyses in Tracy *et al.* (2004). Their analyses revealed areas with higher probabilities of encountering both live and dead desert tortoises. In the western Mojave Desert, areas with concentrations of dead desert tortoises without corresponding concentrations of live desert tortoises were generally the same areas where declines have been observed in the past, namely the northern portion of the Fremont-Kramer CHU and the northwestern part of the Superior-Cronese CHU. Limited data revealed large areas where dead desert tortoises, but no live desert tortoises, were observed in the Piute-Eldorado Valley and northern Coyote Spring Valley, Nevada, and the western and southern portions of the Ivanpah Valley CHU in California. Most other recently sampled areas (mostly within critical habitat) reveal continued desert tortoise presence, although local population declines are known within some of these areas, such as the Beaver Dam Slope, Arizona.

Rangewide desert tortoise population monitoring began in 2001 and is conducted annually. The status and trends of desert tortoise populations are difficult to determine based only upon assessment of desert tortoise density due largely to their overall low abundance, subterranean sheltering behavior, and cryptic nature of the species. Thus, monitoring and recovery should include a comprehensive assessment of the status and trends of threats and habitats as well as population distribution and abundance. Studies during early research on desert tortoises focused on basic biology and demography and were largely centered in areas with high densities of desert tortoises. These high-density areas were used to establish permanent (long-term) study plots that have been studied at various intervals from 1979 through the present, while some low-density plots were discontinued (Berry and Burge 1984; K. Berry, USGS, pers. comm. 2003, as reported in Tracy *et al.* 2004). However, historic estimates of desert tortoise density or abundance do not exist at the range-wide or regional level for use as a baseline. While a substantial body of data has been collected from long-term study plots and other survey efforts over the years, plot

placement is generally regarded as a factor limiting demographic and trend conclusions only to those specific areas. Tracy *et al.* (2004) concluded that estimating accurate long-term trends of desert tortoise populations, habitat, and/or threats across the range was not feasible based on the combined suite of existing data and analyses. Instead, these data provide general insight into the rangewide status of the species and show appreciable declines at the local level in many areas (Berry 2003; Tracy *et al.* 2004).

In an attempt to refine the long-term monitoring program for the desert tortoise, annual rangewide population monitoring using line distance transects began in 2001 (1999 in the Upper Virgin River Recovery Unit; McLuckie *et al.* 2006) and is the first comprehensive effort undertaken to date to estimate densities across the range of the species (Service 2006). Rangewide sampling was initiated during a severe drought that intensified in 2002 and 2003, particularly in the western Mojave Desert in California. At the time the 1994 Recovery Plan was written, there was less consideration of the potentially important role of drought in the desert ecosystem, particularly regarding desert tortoises. In the meantime, studies have documented vulnerability of juvenile (Wilson *et al.* 2001) and adult desert tortoises (Peterson 1994, Peterson 1996, Henen 1997, Longshore *et al.* 2003) to drought.

The monitoring program is designed to detect long-term population trends, so density estimates from any brief time period (e.g., 2001 to 2005) would be expected to detect only catastrophic declines or remarkable population increases. Therefore, following the first five years of the long-term monitoring project, the goal was not to document trends within this time period, but to gather information on baseline densities and annual and regional (between recovery unit) variability (Service 2006). Density estimates of adult desert tortoises varied among recovery units and years. Only if this variability is associated with consistent changes between years will monitoring less than 25 years describe important trends. For instance, considerable decreases in density were reported in 2003 in the Eastern Colorado and Western Mojave recovery units, with no correspondingly large rebound in subsequent estimates (Service 2006). Until the underlying variability that may affect our interpretation of these first years of data can be identified, inferences as to the meaning of these data should not be made. Over the first five years of monitoring, desert tortoises were least abundant in the Northeast Mojave Recovery Unit (0.68 to 8.30 desert tortoises per kilometer^2 [0.26 to 3.20 desert tortoises per mile^2] (Service 2009a).

There are many natural causes of mortality, but their extents are difficult to evaluate and vary from location to location. Native predators known to prey on desert tortoise eggs, hatchlings, juveniles, and adults include: coyote, kit fox, badger (*Taxidea taxus*), skunks (*Spilogale putorius*), common ravens, golden eagles (*Aquila chrysaetos*), and Gila monsters (*Heloderma suspectum*). Additional natural sources of mortality to eggs, juvenile, and adults may include desiccation, starvation, being crushed (including in burrows), internal parasites, disease, and being turned over onto their backs during fights or courtship (Luckenbach 1982, Turner *et al.* 1987). Free-roaming dogs cause mortality, injury, and harassment of desert tortoises (Evans 2001). Population models indicate that for a stable population to maintain its stability, on average, no more than 25 percent of the juveniles and 2 percent of the adults can die each year

(Congdon *et al.* 1993, Service 1994). However, adult mortality at one site in the western Mojave Desert was 90 percent over a 13-year period (Berry 1997). Morafka *et al.* (1997) reported 32 percent mortality over five years among free-ranging and semi-captive hatchling and juvenile desert tortoises (up to five years old) in the western Mojave Desert. When the 26 that were known to have been preyed on by ravens were removed from the analysis, mortality dropped to 24 percent. Turner *et al.* (1987) reported an average annual mortality rate of 19 to 22 percent among juveniles over a nine-year period in the eastern Mojave Desert.

Declines in desert tortoise abundance appear to correspond with increased incidence of disease in some desert tortoise populations. The Goffs permanent study plot in Ivanpah Valley, California, suffered 92 to 96 percent decreases in desert tortoise density between 1994 and 2000 (Berry 2003). The high prevalence of disease in Goffs desert tortoises likely contributed to this decline (Christopher *et al.* 2003). URTD has not yet been detected at permanent study plots in the Colorado Desert of California, but is prevalent at study plots across the rest of the species' range (Berry 2003) and has been shown to be a contributing factor in population declines in the western Mojave Desert (Brown *et al.* 2002; Christopher *et al.* 2003). High mortality rates at permanent study plots in the northeastern and eastern Mojave Desert appear to be associated with incidence of shell diseases in desert tortoises (Jacobson *et al.* 1994). Low levels of shell diseases were detected in many populations when the plots were first established, but were found to increase during the 1980s and 1990s (Jacobson *et al.* 1994; Christopher *et al.* 2003). A herpesvirus has recently been discovered in desert tortoises, but little is known about its effects on desert tortoise populations at this time (Berry *et al.* 2002; Origgi *et al.* 2002).

The general trend for desert tortoises within the California Desert is one of decline. Tracy *et al.* (2004) concluded that the apparent downward trend in desert tortoise populations in the western portion of the range that was identified at the time of listing is valid and ongoing. Results from other portions of the range were inconclusive, but recent surveys of some populations found too few desert tortoises to produce population estimates (*e.g.*, 2000 survey of the Beaver Dam Slope, Arizona), suggesting that declines may have occurred more broadly. Transects in the Western Mojave Recovery Unit that did not detect any sign over large areas of previously-occupied habitat, and the numerous carcasses found on permanent study plots provided evidence of a decline. During line distance sampling conducted in 8 DWMAs in California in 2003, 930 carcasses and 438 live desert tortoises were detected; more carcasses than live desert tortoises were detected in every study area (Woodman 2004). In 2004, workers conducting line distance sampling in California detected 1,796 carcasses and 534 live desert tortoises; more carcasses were detected than live desert tortoises in every study area (Woodman 2005). Below, we elaborate on patterns within each recovery unit.

a. Northeastern Mojave Recovery Unit

A kernel analysis was conducted in 2003-2004 for the desert tortoise (Tracy *et al.* 2004) as part of the reassessment of the 1994 Recovery Plan. The kernel analyses revealed several areas in which the kernel estimations for live desert tortoises and carcasses did not overlap. The pattern of non-overlapping kernels that is of greatest concern is those in which there were large areas

where the kernels encompassed carcasses but not live animals. These regions represent areas within DWMAs where there were likely recent die-offs or declines in desert tortoise populations. The kernel analysis indicated large areas in the Piute-Eldorado Valley where there were carcasses but no live desert tortoises. For this entire area in 2001, there were 103 miles of transects walked, and a total of 6 live and 15 dead desert tortoises found, resulting in a live encounter rate of 0.06 desert tortoises per mile of transect for this area. This encounter rate was among the lowest that year for any of the areas sampled in the range of the Mojave desert tortoise (Tracy *et al.* 2004).

Results of desert tortoise surveys at three survey plots in Arizona indicate that all three sites have experienced significant die-offs. Six live desert tortoises were located in a 2001 survey of the Beaver Dam Slope Exclosure Plot (Walker and Woodman 2002). Three had definitive signs of URTD, and two of those also had lesions indicative of cutaneous dyskeratosis. Previous surveys of this plot detected 31 live desert tortoises in 1996, 20 live desert tortoises in 1989, and 19 live desert tortoises in 1980. The 2001 survey report indicated that it is likely that there is no longer a reproductively viable population of desert tortoises on this study plot. Thirty-seven live desert tortoises were located in a 2002 survey of the Littlefield Plot (Young *et al.* 2002). None had definitive signs of URTD. Twenty-three desert tortoises had lesions indicative of cutaneous dyskeratosis. Previous surveys of this plot detected 80 live desert tortoises in 1998 and 46 live desert tortoises in 1993. The survey report indicated that the site might be in the middle of a die-off due to the high number of carcasses found since the site was last surveyed in 1998. Nine live desert tortoises were located during the mark phase of a 2003 survey of the Virgin Slope Plot (Goodlett and Woodman 2003). The surveyors determined that the confidence intervals of the population estimate would be excessively wide and not lead to an accurate population estimate, so the recapture phase was not conducted. One desert tortoise had definitive signs of URTD. Seven desert tortoises had lesions indicative of cutaneous dyskeratosis. Previous surveys of this plot detected 41 live desert tortoises in 1997 and 15 live desert tortoises in 1992. The survey report indicated that the site may be at the end of a die-off that began around 1996-1997.

b. Eastern Mojave Recovery Unit

The permanent study plot in the Ivanpah Valley is the only such plot in this DWMA; consequently, we cite information from that plot herein, although it is located within the Mojave National Preserve. Data on desert tortoises on a permanent study plot in this area were collected in 1980, 1986, 1990, and 1994; the densities of desert tortoises of all sizes per square mile were 386, 393, 249, and 164, respectively (Berry 1996).

The Shadow Valley DWMA lies north of the Mojave National Preserve and west of the Clark Mountains. It occupies approximately 101,355 acres. Data on desert tortoises on a permanent study plot in this area were collected in 1988 and 1992; the densities of desert tortoises of all sizes per square mile were 50 and 58, respectively (Berry 1996).

The Piute-Fenner DWMA lies to the east of the southeast portion of the Mojave National Preserve. It occupies approximately 173,850 acres. The permanent study plot at Goffs is the

only such plot in this DWMA; consequently, we cite information from that plot herein, although it is located within the Mojave National Preserve. Data on desert tortoises on the permanent study plot were collected in 1980, 1990, and 1994; Berry (1996) estimated the densities of desert tortoises of all sizes at approximately 440, 362, and 447 individuals per square mile, respectively. As Berry (1996) noted, these data seem to indicate that this area supported "one of the more stable, high density populations" of desert tortoises within the United States. Berry (1996) also noted that "a high proportion of the desert tortoises (had) shell lesions." In 2000, only 30 live desert tortoises were found; Berry (2003) estimated the density of desert tortoises at approximately 88 desert tortoises per square mile. The shell and skeletal remains of approximately 393 desert tortoises were collected; most of these desert tortoises died between 1994 and 2000. Most of the desert tortoises exhibited signs of shell lesions; three salvaged desert tortoises showed abnormalities in the liver and other organs and signs of shell lesions. None of the three salvaged desert tortoises tested positive for URTD.

Ivanpah and Piute-Eldorado valleys contained study plots that were analyzed in the Eastern Mojave Recovery Unit analysis. While there was no overall statistical trend in adult density over time, the 2000 survey at Goffs and the 2002 survey at Shadow Valley indicate low densities of adult desert tortoises relative to earlier years. Unfortunately, there are no data in the latter years for all five study plots within this recovery unit, and therefore, while there is no statistical trend in adult densities, we cannot conclude that desert tortoises have not experienced recent declines in this area. The probability of finding a carcass on a distance sampling transect was considerably higher for Ivanpah, Chemehuevi, Fenner, and Piute-Eldorado, which make up the Eastern Mojave Recovery Unit.

c. Northern Colorado Recovery Unit

Two permanent study plots are located within the Chemehuevi DWMA. At the Chemehuevi Valley and Wash plot, 257 and 235 desert tortoises were registered in 1988 and 1992, respectively (Berry 1999). During the 1999 spring survey, only 38 live desert tortoises were found. The shell and skeletal remains of at least 327 desert tortoises were collected; most, if not all, of these desert tortoises died between 1992 and 1999. The frequency of shell lesions and nutritional deficiencies appeared to be increasing and may be related to the mortalities.

The Upper Ward Valley permanent study plot was surveyed in 1980, 1987, 1991, and 1995; Berry (1996) estimated the densities of desert tortoises of all sizes at approximately 437, 199, 273, and 447 individuals per square mile, respectively.

d. Eastern Colorado Recovery Unit

Two permanent study plots are located within this DWMA. At the Chuckwalla Bench plot, Berry (1996) calculated approximate densities of 578, 396, 167, 160, and 182 desert tortoises per square mile in 1979, 1982, 1988, 1990, and 1992, respectively. At the Chuckwalla Valley plot, Berry (1996) calculated approximate densities of 163, 181, and 73 desert tortoises per square mile in 1980, 1987, and 1991, respectively. Tracy *et al.* (2004) concluded that these data show a

statistically significant decline in the number of adult desert tortoises over time; they further postulate that the decline on the Chuckwalla Bench plot seemed to be responsible for the overall significant decline within the recovery unit.

The kernel analysis of the Eastern Colorado Recovery Unit shows that the distributions of the living desert tortoises and carcasses overlap for most of the region. The Chuckwalla Bench study plot occurs outside the study area, which creates a problem in evaluating what may be occurring in that area of the recovery unit. However, the few transects walked in that portion of the DWMA yielded no observations of live or dead desert tortoises. This illustrates our concern for drawing conclusions from areas represented by too few study plots and leaves us with guarded concern for this region. The percentage of transects with live desert tortoises was relatively high for most DWMAs within the Eastern Colorado Recovery Unit. In addition, the ratio of carcasses to live desert tortoises was low within this recovery unit relative to others.

e. Western Mojave Recovery Unit

This recovery unit includes the Pinto Mountains, Ord-Rodman, Superior-Cronese, and Fremont-Kramer DWMAs. Based on areas sampled within the Western Mojave Recovery Unit (Service 2009a), we estimate 43,701 desert tortoises (with a 95 percent confident interval of 24,361 to 79,126 tortoises) occur in this recovery unit.

The 117,016-acre Pinto Mountains DWMA is located in the southeastern portion of the Western Mojave Recovery Unit. No permanent study plots are located in this proposed DWMA. Little information exists on the densities of desert tortoises in this area. Tracy *et al.* (2004) noted that the distribution of carcasses and live desert tortoises appeared to be what one would expect in a "normal" population of desert tortoises; that is, carcasses occurred in the same areas as live desert tortoises and were not found in extensive areas in the absence of live desert tortoises.

The Ord-Rodman DWMA is located to the southeast of the city of Barstow, California, and covers approximately 247,080 acres. The 1994 Recovery Plan notes that the estimated density of desert tortoises in this area is 5 to 150 desert tortoises per square mile (Service 1994). Three permanent study plots are located within and near this proposed DWMA.

The Superior-Cronese DWMA is located north of the Ord-Rodman DWMA; two interstate freeways and rural, urban, and agricultural development separate them. This DWMA covers 629,389 acres. No permanent study plots have been established in this area; the density of desert tortoises has been estimated through numerous triangular transects and line distance sampling efforts. This DWMA supports densities of approximately 20 to 250 desert tortoises per square mile (Service 1994).

The Fremont-Kramer DWMA is located west of the Superior-Cronese DWMA; the two DWMAs are contiguous and cover approximately 511,901 acres. The 1994 Recovery Plan notes that the estimated density of desert tortoises in this area was 5 to 100 desert tortoises per square mile (Service 1994). Berry (1996) notes that the overall trend in this proposed DWMA is "a steep,

downward decline," and identifies predation by common ravens and domestic dogs, off-road vehicle activity, illegal collecting, URTD, and environmental contaminants as contributing factors.

During the summers of 1998 and 1999, BLM funded surveys of over 1,200 transects over a large area of the western Mojave Desert. These transects failed to detect sign of desert tortoises in areas where they were previously considered to be common. Although these data have not been fully analyzed and compared with previously-existing information, they strongly suggest that the number of desert tortoises has declined substantially over large areas of the western Mojave Desert. The Desert Tortoise Recovery Plan Assessment Committee also noted that the Western Mojave Recovery Unit has experienced declines in the number of desert tortoises (Tracy *et al.* 2004).

The Western Mojave Recovery Unit has experienced marked population declines as indicated in the 1994 Recovery Plan and continues today. Spatial analyses of this Recovery Unit show areas with increased probabilities of encountering dead rather than live animals, areas where kernel estimates for carcasses exist in the absence of live animals, and extensive regions where there are clusters of carcasses where there are no clusters of live animals. Collectively, these analyses point generally toward the same areas within the Western Mojave Recovery Unit, namely the northern portion of the Fremont-Kramer DWMA and the northwestern part of the Superior-Cronese DWMA. Together, these independent analyses, based on different combinations of data, all suggest the same conclusion for the Western Mojave. Data are not currently available with sufficient detail for most of the range of the desert tortoise with the exception of the Western Mojave Recovery Unit (Tracy *et al.* 2004).

f. Upper Virgin River Recovery Unit

The 1994 Recovery Plan states that desert tortoises occur in densities of up to 250 adult desert tortoises per square mile within small areas of this recovery unit; overall, the area supports a mosaic of areas supporting high and low densities of desert tortoises (Service 1994). The Utah Division of Wildlife Resources (UDWR) has intensively monitored desert tortoises using a distance sampling technique since 1998. Monitoring in 2003 indicated that the density of desert tortoises was approximately 44 per square mile throughout the reserve. This density represents a 41 percent decline since monitoring began in 1998 (McLuckie *et al.* 2006). The report notes that the majority of desert tortoises that died within one year (n=64) were found in areas with relatively high densities; the remains showed no evidence of predation.

In the summer of 2005, approximately 10,446 acres of desert tortoise habitat burned in the Red Cliffs Desert Reserve. The UDWR estimated that as many as 37.5 percent of adult desert tortoises may have died as a direct result of the fires (McLuckie *et al.* 2006).

7. Threats

The Service identified key threats when the Mojave population of the desert tortoise was emergency listed as endangered, and subsequently listed as a threatened species, which remains valid today. The 1994 Recovery Plan discusses threats and developed recovery objectives to minimize their effects on the desert tortoise and allow the desert tortoise to recover. Since becoming listed under the Act, more information is available on threats to the desert tortoise with some threats such as wildfires and nonnative plants affecting large areas occupied by desert tortoises.

Nonnative plants continue to contribute towards overall degradation or habitat quality for the desert tortoise. Land managers and field scientists identified 116 species of nonnative plants in the Mojave and Colorado deserts (Brooks and Esque 2002). The proliferation of nonnative plant species has also contributed to an increase in fire frequency in desert tortoise habitat by providing sufficient fuel to carry fires, especially in the intershrub spaces that are mostly devoid of native vegetation (Service 1994; Brooks 1998; Brown and Minnich 1986). Changes in plant communities caused by nonnative plants and recurrent fire may negatively affect the desert tortoise by altering habitat structure and species composition of their food plants (Brooks and Esque 2002).

Changing ecological conditions as a result of natural events or human-caused activities may stress individual desert tortoises and result in a more severe clinical expression of URTD (Brown *et al.* 2002). For example, the proliferation of non-native plants within the range of the desert tortoise has had far-reaching impacts on desert tortoise populations. Desert tortoises have been documented to prefer native vegetation over non-natives (Tracy *et al.* 2004). Nonnative, annual plants in desert tortoise critical habitat in the western Mojave Desert were identified to compose over 60 percent of the annual biomass (Brooks 1998). The reduction in quantity and quality of forage may stress desert tortoises and make them more susceptible to drought- and disease-related mortality (Brown *et al.* 1994). Malnutrition has been associated with several disease outbreaks in other chelonians (Borysenko and Lewis 1979).

Numerous wildfires occurred in desert tortoise habitat across the range of the desert tortoise in 2005 due to abundant fuel from the proliferation of nonnative plant species after a very wet winter. These wildfires heavily impacted two of the six desert tortoise recovery units, burning almost 19 percent of desert tortoise habitat in the Upper Virgin River and 10 percent in the Northeastern Mojave (Table 4). There were no significant fires from 2007 to 2009 in this area. In the Upper Virgin River Recovery Unit, 19 percent of the Upper Virgin River CHU burned. In the Northeastern Mojave Recovery Unit, three CHUs were impacted: approximately 23 percent of the Beaver Dam Slope CHU burned, 13 percent of the Gold Butte-Pakoon CHU, and 4 percent of the Mormon Mesa CHU. Although it is known that desert tortoises were burned and killed by the wildfires, desert tortoise mortality estimates are not available. Recovery of these burned areas is likely to require decades.

Table 4. Area (acres) of desert tortoise critical habitat burned in the Northeastern Mojave and Upper Virgin River recovery units unit during 2005*.

Recovery Unit	Critical Habitat Unit	Total Area Burned	Percent Burned
Northeastern Mojave			
	Beaver Dam Slope	53,528	26
	Gold-Butte Pakoon	65,339	13
	Mormon Mesa	12,952	3
	non-Critical Habitat	404,685	-
Upper Virgin River			
	Upper Virgin River	10,557	19

*Complete data sources. NV fire data from BLM as a single 2005 file: *http://www.blm.gov/nv/st/en/prog/more_programs/geographic_sciences/gis/geospatial_data.html*. AZ fire data from Forest Service, part of historic files (cross referenced against BLM ADSO fire data): *http://www.fs.fed.us/r3/gis/datasets.shtml*; UT fire data from BLM, as part of historic fires file: *http://www.blm.gov/ut/st/en/prog/more/geographic_information/gis_data_and_maps.print.html*.

Disease and raven predation have been considered important threats to the desert tortoise since its emergency listing in 1989. What is currently known with certainty about disease in the desert tortoise relates entirely to individual desert tortoises and not populations; virtually nothing is known about the demographic consequences of disease (Tracy *et al.* 2004). Disease was identified in the 1994 Recovery Plan as an important threat to the desert tortoise. Disease is a natural phenomenon in wild populations of desert tortoises and can contribute to population declines by increasing mortality and reducing reproduction. However, URTD appears to be a complex, multi-factorial disease interacting with other stressors to affect desert tortoises (Brown *et al.* 2002; Tracy *et al.* 2004). The disease probably occurs mostly in relatively dense desert tortoise populations, as mycoplasmal infections are dependent upon higher densities of the host (Tracy *et al.* 2004).

From 1969 to 2004 the numbers of common ravens in the West Mojave Desert increased approximately 700 percent (Boarman and Kristan 2006). Population increases have also been noted at other locations particularly in the California Desert. This many-fold increase above historic levels and a shift from a migratory species to a resident species is due in large part to recent human subsidies of food, water, and nest sites (Knight *et al.* 1993, Boarman 1993, Boarman and Berry 1995). While not all ravens may include desert tortoises as significant components of their diets, these birds are highly opportunistic in their feeding patterns and concentrate on easily available seasonal food sources, such as juvenile desert tortoises.

Boarman (2002) identified the following major categories of threats: Agriculture, collection by humans, construction activities, disease, drought, energy and mineral development, fire, garbage and litter, handling and deliberate manipulation of desert tortoises, invasive or nonnative plants, landfills, livestock grazing, military operations, noise and vibration, OHV activities, predation, non-off-road vehicle recreation, roads, highways and railroads, utility corridors, vandalism, and wild horses and burros. For additional information on threats to the desert tortoise refer to Boarman (2002), Tracy *et al.* (2004), and Service (2008).

8. Desert Tortoise Critical Habitat – Rangewide Status

Desert tortoise critical habitat was designated by the Service to identify the key biological and physical needs of the desert tortoise and key areas for recovery, and focuses conservation actions on those areas. Desert tortoise critical habitat is composed of specific geographic areas that contain the primary constituent elements of critical habitat, consisting of the biological and physical attributes essential to the species' conservation within those areas, such as space, food, water, nutrition, cover, shelter, reproductive sites, and special habitats. The specific primary constituent elements of desert tortoise critical habitat are:

a. sufficient space to support viable populations within each of the six recovery units, and to provide for movement, dispersal, and gene flow;

b. sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species;

c. suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites;

d. sufficient vegetation for shelter from temperature extremes and predators; and

e. habitat protected from disturbance and human-caused mortality.

The CHUs were based on recommendations for DWMAs outlined in the *Draft Recovery Plan for the Desert Tortoise (Mojave Population)* (Service 1993). These DWMAs are also identified as desert tortoise ACECs by BLM. Because the critical habitat boundaries were drawn to optimize reserve design, the CHU may contain both "suitable" and "unsuitable" habitat. Suitable habitat can be generally defined as areas that provide the primary constituent elements.

Although recovery of the desert tortoise will focus on DWMAs/ACECs, section II.A.6. of the 1994 Recovery Plan and section 2(b) of the Act provide for protection and conservation of ecosystems on which federally-listed threatened and endangered species depend, which includes both recovery and non-recovery areas. The Mojave Desert ecosystem, of which the desert tortoise and its habitat are an integral part, consists of a dynamic complex of plant, animal, fungal, and microorganism communities and their associated nonliving environment interacting as an ecological unit (Noss and Cooperrider 1994). Actions that adversely affect components of the Mojave Desert ecosystem may directly or indirectly affect the desert tortoise. The 1994 Recovery Plan further states that desert tortoises and habitat outside recovery areas may be important in recovery of the tortoise. Healthy, isolated desert tortoise populations outside recovery areas may have a better chance of surviving catastrophic effects such as disease, than large, contiguous populations (Service 1994).

The 1994 Recovery Plan recommended DWMAs and subsequently the Service designated CHUs based on these proposed DWMAs (Service 1993). When designated, desert tortoise critical habitat contained all the primary constituent elements of desert tortoise critical habitat. While

stochastic events or temporary disturbances may occur in critical habitat resulting in localized removal of one or more primary constituent element, the Service anticipates that these areas will receive a higher level of protection to ensure their timely recovery. The following seven principles of conservation biology serve as the standards by which the Service determines whether or not the CHUs are functioning properly:

a. *Reserves should be well-distributed across the species' range.* The entire range of the Mojave desert tortoise occurs within one of the six recovery units identified in the 1994 Recovery Plan and at least one DWMA and CHU occurs within each recovery unit. The reserves remain well-distributed across the range of the desert tortoise.

b. *Reserves should contain large blocks of habitat with large populations of target species.* The desert tortoise requires large, contiguous areas of habitat to meet its life requisites. Each DWMA and its associated CHUs that were designated to conserve contiguous blocks of habitat that exceed 500,000 acres, with the exception of the Upper Virgin River Recovery Unit (Table 5). The Upper Virgin River Recovery Unit does not meet the minimum size requirement identified in the 1994 Recovery Plan; however, the Service anticipates that reserve-level management will adequately conserve the desert tortoise within this recovery unit. Designation of CHUs were based largely on transect data and included areas with the largest populations of desert tortoises.

c. *Blocks of habitat should be close together.* This principle was met when CHUs were designated and remains valid.

d. *Reserves should contain contiguous rather than fragmented habitat.* This principle was met when CHUs were designated and generally continue to be met. Desert tortoise-proof fencing has been constructed along major roads and highways that traverse critical habitat including I-15 in Nevada and California (Ivanpah Valley DWMA/CHU), US 95 in Nevada (Piute-Eldorado DWMA/CHU), and Highway 58 in California (Fremont-Kramer DWMA/CHU). Major roads and highways alone constitute a barrier to desert tortoise movements without fencing; however, the fencing minimized take of desert tortoises and culverts or underpasses allow for limited desert tortoise movement across the road or highway.

e. *Habitat patches should contain minimal edge-to-area ratios.* This principle was met when CHUs were designated and generally continue to be valid. Notable exceptions include the northern Gold Butte-Pakoon CHU, and the southern termini of the Mormon Mesa, Ivanpah Valley, and Chuckwalla CHUs which have large edge-to-area ratios and further compromised by highways that traverse these relatively narrow areas within the CHUs.

f. *Blocks should be interconnected by corridors or linkages connecting protected, preferred habitat for the target species.* Most CHUs are contiguous with another CHU with the exception of Ord-Rodman, Ivanpah Valley, Gold Butte Pakoon, and Upper Virgin River CHUs. I-15 and the Virgin River separate the Gold Butte-Pakoon CHU from other CHUs in the Northeastern Mojave Recovery Unit. Similarly, Interstate 40 separates the Piute-Eldorado and Chemehuevi CHUs, and Ord Rodman and Superior-Cronese CHUs.

g. *Blocks of habitat should be roadless or otherwise inaccessible to humans.* Achieving this principle is the most problematic. A 2001 inventory of roads in the western Mojave Desert suggests that road density increased from the mid-1980s. Further evaluation should be conducted as some of the recently mapped roads were actually historical roads especially with the advent of effective mapping capabilities (Tracy *et al* 2004). Roads proliferate desert tortoise habitat rangewide and may be increasing in density (Tracy *et al.* 2004).

The 1994 Recovery Plan contains conservation recommendations for desert tortoise critical habitat. The recommendations include the elimination of grazing by livestock, feral burros and horses on desert tortoise critical habitat. Since approval of the 1994 Recovery Plan, livestock grazing in desert tortoise critical habitat has been substantially reduced. BLM and the National Park Service (NPS) manage for zero burros in Nevada in critical habitat. In 2004, the California Desert Managers Group developed a burro management plan.

The status of the desert tortoise and its critical habitat has been impacted by decades of human activities. In their 1991 report, the GAO found that livestock grazing practices of the late 1880s and early 1990s badly damaged desert lands in the southwest. Domestic livestock grazing on BLM's hot desert allotments continue to pose the greatest risk of long-term environmental damage to a highly fragile resource. The GAO offered several options for consideration by Congress including the discontinuation of livestock grazing in hot desert areas. They concluded that BLM did not have the resources to properly manage the intensity of livestock grazing in hot deserts. Without sufficient monitoring data, BLM will not have the necessary data to change active preference levels and overgrazing may occur (GAO 1991).

Table 5. Desert Tortoise CHUs, DWMAs, and Recovery Units—Size and Location

CHU	SIZE (ac.)	STATE	DWMA	RECOVERY UNIT
Chemehuevi	937,400	CA	Chemehuevi	Northern Colorado
Chuckwalla	1,020,600	CA	Chuckwalla	Eastern Colorado
Fremont-Kramer	518,000	CA	Fremont-Kramer	Western Mojave
Ivanpah Valley	632,400	CA	Ivanpah Valley	Eastern Mojave
Pinto Mtns.	171,700	CA	Joshua Tree	Western Mojave/ Eastern Colorado
Ord-Rodman	253,200	CA	Ord-Rodman	Western Mojave

Piute-Eldorado- CA Piute-Eldorado- NV	453.800 516.800	CA NV	Fenner Piute-Eldorado	Eastern Mojave Northeastern & Eastern Mojave
Superior-Cronese	766.900	CA	Superior-Cronese Lakes	Western Mojave
Beaver Dam:	87.400 74,500 42,700	NV UT AZ	Beaver Dam Beaver Dam Beaver Dam	Northeastern Mojave (all)
Gold Butte-Pakoon	192.300 296.000	NV AZ	Gold Butte-Pakoon Gold Butte-Pakoon	Northeastern Mojave (all)
Mormon Mesa	427.900	NV	Mormon Mesa Coyote Spring	Northeastern Mojave
Upper Virgin River	54,600	UT	Upper Virgin River	Upper Virgin River

Further information on desert tortoise critical habitat can be found in the following documents:

- Desert Tortoise Recovery Plan Assessment Report (Tracy *et al.* 2004)—all CHUs
- Final Environmental Impact Report and Statement for the West Mojave Plan (BLM 2005)— Fremont-Kramer CHU, Superior-Cronese CHU, Ord-Rodman CHU, and Pinto Mountains CHU
- Mojave National Preserve General Management Plan (NPS 2002)—Ivanpah Valley CHU and Piute-Eldorado CHU
- Northern and Eastern Colorado Coordinated Management Plan (BLM 2002a)—Chemehuevi CHU, Pinto Mountains CHU, and Chuckwalla CHU
- Northern and Eastern Mojave Desert Management Plan (BLM 2002b)—Ivanpah Valley CHU, Piute-Eldorado CHU, and Chemehuevi CHU
- Clark County Multiple Species Habitat Conservation Plan (MSHCP) (RECON 2000)—Beaver Dam Slope CHU, Mormon Mesa CHU, Gold Butte-Pakoon CHU, and Piute-Eldorado CHU
- Washington County Habitat Conservation Plan (Washington County Commission 1995)—Upper Virgin River CHU
- Biological Assessment for the Proposed Addition of Maneuver Training Land at Fort Irwin, CA (U.S. Army National Training Center 2003)—Superior-Cronese CHU

- Desert Tortoise (Mojave Population) Recovery Plan and Proposed Desert Wildlife Management Areas for Recovery of the Mojave Population of the Desert Tortoise (companion document to the Desert Tortoise Recovery Plan) (Service 1994)—all CHUs

E. ENVIRONMENTAL BASELINE

1. Status of the Desert Tortoise and its Critical Habitat in the Action Area

Table 6 summarizes reported desert tortoise encounters on NDOT highway construction projects from 2002 through 2009. In those eight years, only one tortoise was killed during a highway construction project. The other tortoise found dead near a project was killed by a coyote. A total of 49 desert tortoises have been moved, 46 of those were in areas south of Las Vegas.

Table 6. Incidental take of desert tortoises on previous FHWA-funded projects (2002-2009).

Location	Tortoises Moved	Tortoises Killed	Biological Opinion	Comments
US 95 North of Las Vegas – Horse Interchange	1	0	84320-2008-F-0428	Same tortoise moved twice in 2 days
US 95 near Kyle Canyon Road (SR-157)	1	1	BLM Programmatic 1-5-97-F-251	A coyote-killed tortoise was found near the project
SR-160 east of Pahrump	1	0	1-5-06-F-498	1 in ROW
I-15 widening Primm to Sloan	12	1	1-5-94-F-82	3 in ROW 9 in CL 81-01 material site
US 95 widening Railroad Pass to Stateline	14	0	1-5-02-F-447	2 in ROW 4 in CL 09-01 material site
Searchlight Material site on SR-163	20	0	1-5-02-F-447	CL 32-02 material site
Total	**49**	**2**		

Table 7 summarizes tortoise sign detected during desert tortoise presence/absence surveys from 2002 to 2009. Based on tortoise sign detected, the southeast quadrant along US 95 from the Nevada-California state line to Railroad Pass has the highest number of tortoises affected by highway projects to date. The US 95 widening project is now completed and the highway is fenced on both sides, which substantially reduces the likelihood of future impacts to tortoise from transportation-related programs in this area.

Two material sites totaling 680 acres occur within the Piute-Eldorado CHU. These sites are fenced and fees have been paid into the Clark County MSHCP Section 7 fund for full disturbance

of both sites. The 640 acre site east of Searchlight (CL 32-02) has approximately 200 acres cleared, with the rest of the site undisturbed. Consequently, each project which uses this material site requires a tortoise clearance and temporary tortoise fencing of the project area (within the existing permanently fenced site). Several material sites occur along US 95 within the CHU. These sites either have not been used in the past 10 years or have never been used. They will not be developed and will be relinquished back to BLM.

In the southwest quadrant, I-15 from Primm to Sloan is fenced on both sides. During the I-15 widening project in 2006, three tortoises were moved out of the ROW and nine were moved out of the CL 81-01 material site. The western side of I-15 contains a tortoise translocation site, so tortoise densities are high in this area. Consequently, tortoises will continue to be encountered along the fence line, particularly after a tortoise release. Fence monitoring and repairs are conducted regularly to keep tortoises out of the ROW.

In 2005, a tortoise survey along SR-160 from Mountain Springs to Pahrump detected a high number of tortoise sign within the zone of influence, but only one tortoise was found and moved out of the ROW. As part of the SR-160 widening project in 2006, a total of 37 miles of tortoise fencing was installed along 18.5 miles of roadway from Lovell Wash to the Trout Canyon Road. Several fence-to-culvert structures allow tortoise passage under the roadway.

Based on the small number of surveys conducted in the northwest quadrant, tortoise densities along US 95 north of Las Vegas appear to be low. The most recent survey located five tortoise burrows and one carcass within the 200-300 ft. ROW of US 95 between Kyle Canyon Road and Indian Springs (40 miles). Three carcasses were found within a 400 ft. ROW along 13 miles of roadway beginning at the junction of US 95 and SR-160 and heading north.

The highest tortoise density estimates for the Northeast Mojave Recovery Unit are three tortoises per km^2, roughly three tortoises per 247 acres or one tortoise per 82 acres.

Fifty-one miles of US 93 and 11.5 miles of SR-168 traverse the Mormon Mesa CHU. Construction of tortoise exclusionary fencing along 19 miles of US 93 in Coyote Spring Valley and the Mormon Mesa CHU is underway and will be completed by early 2011. I-15 borders the southern boundary for 18 miles. The 18 miles along I-15 bordering the Mormon Mesa CHU has tortoise fencing along both sides of the highway. NDOT does not anticipate any resurfacing projects will occur within the next 10 years; however, since this type of project does not create additional disturbance and occurs within the fenced ROW, no tortoise habitat is affected. Use of materials for resurfacing projects will be considered as part of the project and evaluated to determine if their use will result in adverse effects to listed species. No tortoises or tortoise sign has been observed in the Toquop material site (I-15 west of Mesquite) or the Warm Springs material site on SR-168.

Table 7. Desert tortoise sign observed during surveys for highway projects (2002-2009)

Location (mileposts)	Tortoise Observed	Type: No. of tortoise sign	Survey Date	Survey Area: ROW Width and Length
Northwest				
US 95 Washington to Kyle Canyon (CL 81.6 to 94.6)		B: 3	07/2008	200 ft. ROW only 13 miles
US 95 at Kyle Canyon to Indian Springs (CL 92.5 to 120.0)		B:2 C:1	07/2008	292 ft. ROW only 27.5 miles
US 95 at SR-160 going north (NY 13.0 to 26.0)		C:3	12/2008	400 ft. ROW only 13 miles
SR-160 at I-15 to Rainbow Blvd. (CL 0.0 to 4.0)		B:1	09/2002	600 ft. ROW plus 1500 ft. ZOI 4 miles
SR-160 Mountain Springs to Pahrump (CL 43.0 to 23.0)		CBS:131	10/2005	400 ft. ROW plus 900 ft. ZOI 20 miles
Northeast				
US-93 near Coyote Springs (CL 56.5 to 75.5)		B:8	04/2009	200 ft. ROW only 19 miles
Southwest				
I-15 Primm to Sloan (CL 0.0 to 25.0)	1	B:1	10/2005	400 ft. ROW only 25 miles
Southeast				
Boulder City Bypass Phase I Railroad Pass to US 95	3	C:1 B:70	06/2006	200 ft ROW plus 1200 ft. ZOI 7 miles
US 95 Railroad Pass to Stateline (CL 0.0 to 57.0)		CBS: 122	01/2002	400 ft. ROW plus 2400 ft. ZOI 57 miles
SR-564 Lake Mead Parkway (CL 2.0 to 6.0)	2	B:2	01/2008	400 ft. ROW only 4 miles
US 95 & SR-163 Welcome Center (CL 3.25)		CBS:13	06/2009	1000 ft. ROW plus 900 ft. ZOI 1000 ft.

Abbreviations: C=Carcass; B=Burrow S=Scat ROW=ROW ZOI= zone-of-influence

The Service has determined that the physical and biological habitat features (referred to as the primary constituent elements or PCEs) that support nesting, foraging, sheltering, dispersal, and gene flow are essential to the conservation of the desert tortoise. These PCEs were identified in studies on desert tortoise habitat preferences (*e.g.*, habitat structure and use, forage requirements) throughout the range of the species and used to designate critical habitat for the tortoise (59 FR 5820). Recognizing the action area is NDOT ROW and material sites, changes to the status of the five PCE of desert tortoise critical habitat in the action area have changed since critical habitat was designated in 1994 mostly as a result of previous actions identified in Appendix B.

2. Factors affecting the desert tortoise and its critical habitat in the action area.

Appendix B contains a list of biological opinions and fee payments associated with previous FHWA-funded NDOT projects from 1990 to 2010. During this time, the Service issued 23 biological opinions for FHWA for highway projects and 24 biological opinions for material sites. The biological opinions for highway projects involved disturbance of 3,681 acres non-critical habitat and 1,514 acres of critical habitat; and harassment of up to 446 tortoises and incidental mortality or injury of no more than 64 tortoises. The 24 material site consultations

involved disturbance of 2,739 acres non-critical habitat and no critical habitat; and harassment of up to 292 tortoises and incidental mortality or injury of no more than 27 tortoises.

Table 8 identifies NDOT-maintained highways and miles of tortoise exclusionary fencing installed by location within desert tortoise habitat which may involve a Federal nexus subject to section 7 consultation. Of the four designated CHUs in Nevada, only the Mormon Mesa and Piute-Eldorado contain NDOT-maintained highways. The miles fenced column is the distance along the roadway that has been fenced on both sides. As of February 2010, 189.5 miles of roadway have been or will soon be fenced. All highways traversing and adjoining critical habitat are fenced except for portions of US 93 and SR 168 north of I-15 within the Mormon Mesa CHU. Fence is being installed along US 93 and is anticipated to be completed by early 2011. Twelve active material sites in desert tortoise habitat are fenced with tortoise guards at the entrance.

Table 8. NDOT-maintained highways in desert tortoise habitat and miles fenced to exclude tortoises

Highways within Tortoise Habitat	Critical Habitat Unit (CHU)	Road Miles in CHU	Location in CHU	Road Miles not in CHU	Road Miles Fenced*	Fence Location (mileposts)
Northwest of LV						
US 95 (NLV to 20 miles S. of Goldfield)				148.0		
SR-159 (Red Rock)				18.0		
SR-157 (Kyle Canyon)				12.0		
SR-156 (Lee Canyon)				10.0		
SR-160 (Pahrump)				50.0	18.5	NY 24.5-43
SR-372 (W. Pahrump)				7.0		
SR-373 (Amargosa)				16.0		
SR-374 (Beatty to DV)				12.0		
SR-267 (to Scotty's Castle)				20.0		
Northeast of LV						
I-15 (Apex to Mesquite)	Mormon Mesa	18.0	CL 96-114	54.0	47.0	CL 64-111
US-93 (to Caliente)	Mormon Mesa	67.5	CL 57-86.5 LN 0-38	94.0	19.0	CL 56.5-75.5 by early 2011
SR-168 (Warm Springs)	Mormon Mesa	11.5	CL 12.5-24	12.5		
SR-169 (Logandale)				24.0		
SR-170 (Mesquite)				21.0		
Valley of Fire State Park				11.0		
SR-318 (Hiko)				6.0		
Southwest of LV						
I-15 (Primm to Sloan)				26.0	24.5	CL 1.5-26
SR-161 (W of Jean)				7.0	3.5	CL 3.5-7

Southeast of LV						
US 95 (Stateline to Railroad Pass)	Piute-Eldorado	38.0		18.0	56.0	CL 0-56
SR-163 (Laughlin)	Piute-Eldorado	17.0		2.0	8.0	CL 0-8
SR-164 (Searchlight W)	Piute-Eldorado	6.5		12.0	5.0	CL 1-6
SR-165 (Nipton)	Piute-Eldorado	10.5		.5	8.0	CL 0-8
US-93 (Boulder City)				5.0		
Totals		**169.0**		**586.0**	**189.5**	

* Note: Actual miles of fencing is twice the 'miles fenced' number, since both sides of the highway are fenced.

F. EFFECTS OF THE ACTION

Direct effects are the immediate effects of the action and are not dependent on the occurrence of any additional intervening actions for the impacts to species or critical habitat to occur. *Indirect effects* are those for which the proposed action is an essential cause, and that are later in time, but still are reasonably certain to occur. If an effect will occur whether or not the action takes place, the action is not an *essential cause* of the indirect effect. In contrast to direct effects, indirect effects are more subtle, and may affect tortoise populations and habitat quality over an extended period of time, long after surface-disturbing activities have been completed. Indirect effects are of particular concern for long-lived species such as the desert tortoise because project-related effects may not become evident in individuals or populations until years later.

The amount of desert tortoise habitat disturbance over the next 10 years (2010-2020) due to transportation-related programs is estimated to be up to 5,638 acres which includes 1,170 acres of critical habitat (1,120 in the Mormon Mesa CHU and 50 in the Piute-Eldorado CHU). New highway construction and material site development would result in most of the anticipated habitat disturbance and have the greatest potential to adversely affect tortoises.

1. Effects of handling and moving desert tortoises

Desert tortoises found in areas to be disturbed or other situations where they are in harm's way would be captured and relocated to nearby habitat. Capture and handling of desert tortoises, particularly if performed improperly, may result in adverse effects to tortoises. Moving tortoises exposes them to an increased risk of predation, illness, and other stressors associated with trying to find forage and cover in unfamiliar territory. Blythe *et al.* (2003) found that Sonoran desert tortoises moved out of harm's way a distance less than 0.5 mile, returned to their home ranges within a few days. Unless movement barriers are in place, tortoises moved a distance of less than 0.5 mile out of harm's way are likely to return to potentially harmful conditions. Tortoises may die or become injured by capture and relocation if performed improperly, particularly during extreme temperatures, or if they void their bladders. Averill-Murray (2001) determined that tortoises that voided their bladders during handling had significantly lower, overall survival rates (0.81-0.88) than those that did not void (0.96). If multiple desert tortoises are handled by biologists/monitors without protective measures including unused latex gloves, pathogens may

be spread among the tortoises. Disease may be transmitted to healthy tortoises in adjacent habitat if ill displaced tortoises are moved into home ranges of other tortoises. The risk of disease transmission would be minimized by limiting the distance displaced tortoises are moved. The potential effects of handling and moving tortoises may result from all programs of proposed activities described below.

2. Effects of new construction on the desert tortoise

New highway construction, such as the proposed Boulder City Bypass Project, may create isolated islands of tortoise habitat between roadways. The proposed Boulder City Bypass Project from Railroad Pass to Hoover Dam in the southeast quadrant would disturb 800 acres of desert tortoise habitat, of the total 820 acres anticipated for new construction, which occurs north of the Piute-Eldorado CHU. Other habitat-based effects are similar to those described below for material site projects.

Mortality could occur during pre-construction activities, vegetation removal, and fence construction. Given the size of the disturbance, it is likely some tortoises, particularly hatchlings and juveniles, will not be located and moved during the tortoise clearance activities. Tortoises in harm's way and not relocated before project activities commence, or avoided by vehicles, could also be killed or injured.

If no barrier such as exclusionary fencing exists along roads and highways, tortoises may enter such roads and highways and be inadvertently run over or collected for pets. Barriers along highways would reduce tortoise mortality but may result in habitat fragmentation and restrict tortoise movements unless underpasses accessible by tortoises are in place. If breaches in the fence occur, tortoise may enter the ROW and be killed, injured, or collected as pets; tortoises may also become trapped within the ROW if they cannot locate the breach. Roads that intersect project highways are weak points in tortoise exclusion fencing, particularly when crossing two-track dirt roads with OHV use. If the fencing gets damaged or gates are left open, tortoises may access the roadway. Areas with high tortoise density which are typically critical habitat are of the greatest concern. Tortoise guards installed at openings in tortoise fencing for access have reduced fence damage and kept tortoises from entering the road. Project vehicles or equipment that stray from designated areas may crush desert tortoises aboveground or in their burrows or damage habitat outside the project area. Tortoises could wander into the construction work area or take refuge underneath project vehicles and equipment, and be killed or injured when the vehicle/equipment is moved.

The presence of a road poses potential harm to tortoises and their habitat and the more roads there are the greater is the proportion of the tortoise population that is under the threat of unauthorized off-road activity (Boarman 2002). Moderate to high volume traffic flow on roads may result in habitat fragmentation; increased opportunities for collection or vandalism; introduction of alien plants and exotic animals; injury or mortality as a result of encounters with humans; and illegal release of pet tortoises including exotic species.

Areas within and along project roads will continue to provide food in the form of trash, litter, and road-killed animals which attracts important tortoise predators such as the common raven, kit fox, and coyote (Boarman and Berry 1995; Knight and Kawashima 1993, Boarman 1993). Ravens, being partly scavengers, are known for cruising road edges in search of road kills (Kristan *et al.* 2004). Some forms of trash may be ingested by tortoises or they may become entangled resulting in their injury or death. New construction would create a new source of food currently not present in the areas.

Census data indicate that desert tortoise numbers decline as vehicle use increases (Bury *et al.* 1977) and that tortoise sign increases with increased distance from roads (Nicholson 1978). Other potential effects of these activities include mortality, injury or harassment of individuals including disruption of behavior as a result of noise and general disturbance of nearby tortoises during road construction, grading/paving/graveling, and maintenance, activities.

A zone of depression (*i.e.*, area where tortoise numbers have been reduced as a result of road mortality) may exist along roads that extend one-quarter mile on each side (Nicholson 1978, Berry and Turner 1987, Berry *et al.* 1990, Boarman and Sazaki 1996, von Seckendorff Hoff and Marlow 1997). If a new road is constructed a zone of depression may result that did not occur prior to the construction. Generally, the impact of a road on desert tortoise populations depends upon traffic speed and volume, density and demography of surrounding tortoise population, and perhaps width and age of road (Boarman 2002). The major cause of this depression is likely road kills, but illegal collections, noise, and other factors may also contribute.

3. Effects of expanded capacity, and improvements and maintenance of existing transportation routes, structures, and facilities on the desert tortoise

Desert tortoise mortality is less likely for expanded capacity projects that new construction, particularly for the highways which are already wider than two lanes and have been in place for decades. These highways would continue to act as barriers to tortoise movement and provide resources to subsidized desert tortoise predators. In unfenced areas, roadside vegetation management reduces cover making tortoise more visible and deters tortoises from using the roadside for forage or cover. If tortoises are more visible from the roadway, they are at greater risk for collection for pets or other human uses. Previous NDOT surveys conducted within ROW for previous projects support the finding that tortoise occurrence decreases as distance to a roadway decreases.

Over the 10-year period of this PBO, FHWA and NDOT anticipate that up to 920 acres of desert tortoise habitat would be disturbed as a result of expanded capacity, and improvements and maintenance of existing roads which includes 150 acres of critical habitat disturbance in the Mormon Mesa CHU.

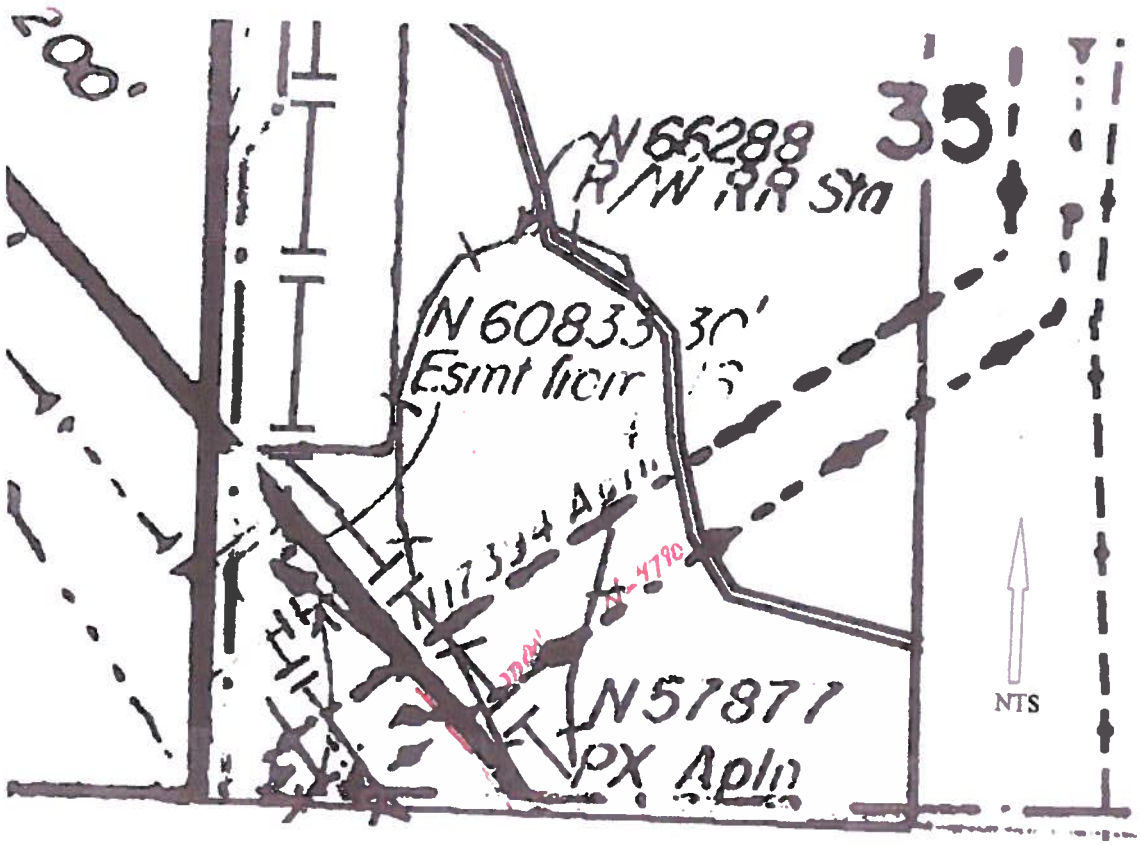
EXHIBIT C & D

MAPS

NV Energy has existing rights of way from BLM N-1909 for an overhead transmission line located within BLM and BOR lands which will be relocated due to the NDOT Boulder City Bypass Project. A new BLM, 10' of underground right of way is needed for said relocation within T. 22 S., R. 63 E., Sec 35, SW¼ SW¼; T. 23 S., R. 63 E., Sec 2, Lots 23 and 27, and within E½ E½ SE¼ SW¼; T. 23 S., R. 63 E., Sec 11, Lots 2 and 12.

T. 22 S., R. 63 E., Sec 35, SW¼ SW¼

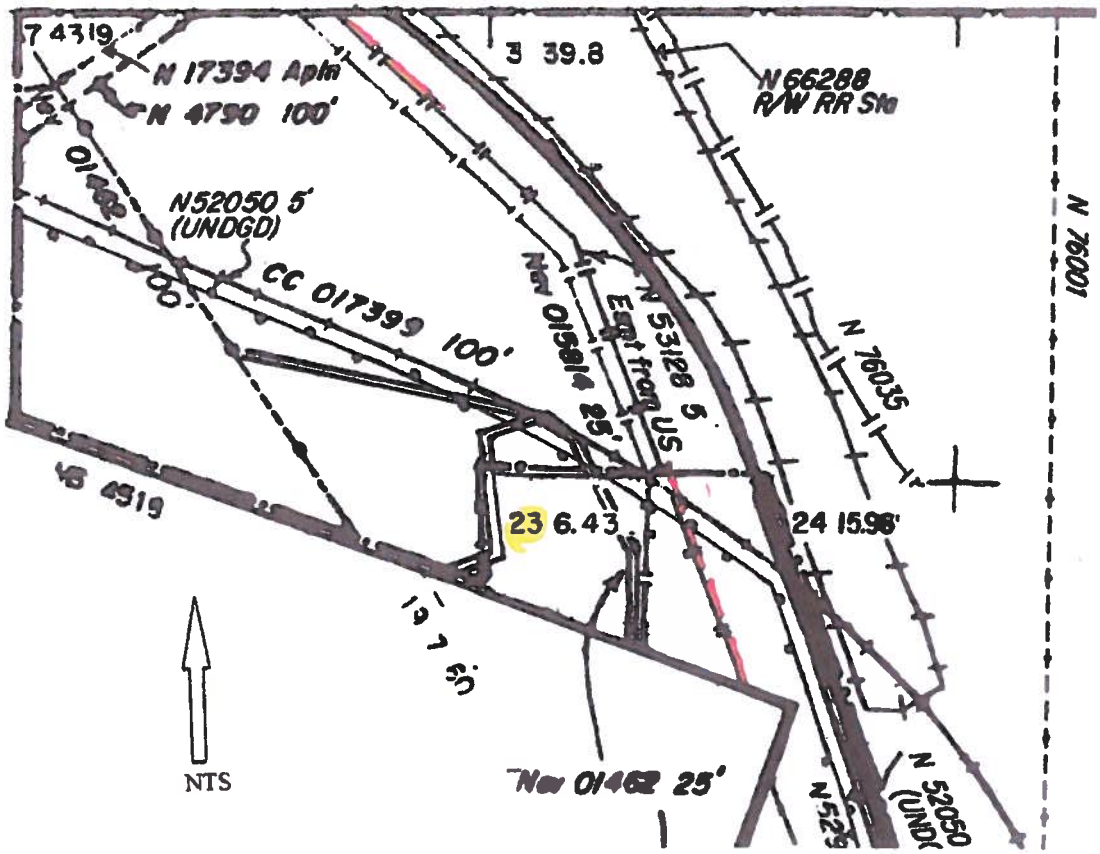
PERMANENT R/W = 400' x 10' = 4,000sf = 0.092ac



TOTAL LENGTH BLM PERMANENT = 6,957'; TOTAL = 69,570sf; = TOTAL = 1.60ac;

T. 23 S., R. 63 E., Sec 2, Lots 7 and 23

PERMANENT R/W = 2,291' x 10' = 22,910sf = .053ac



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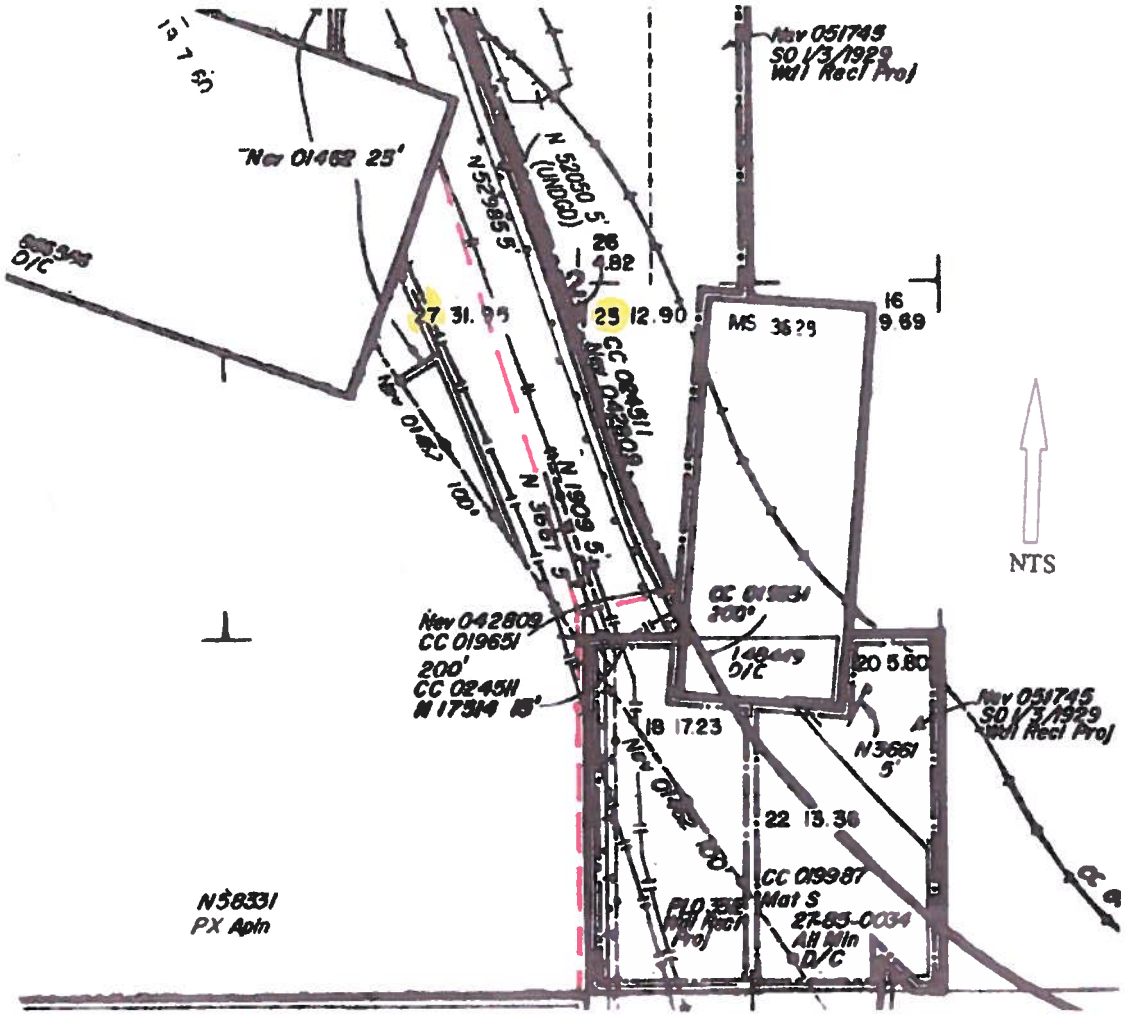
T. 23 S., R. 63 E., Sec 2, Lot 27
And E½ E½ SE¼ SW¼

PERMANENT R/W = 3,041' x 10' = 30,410sf = 0.70ac



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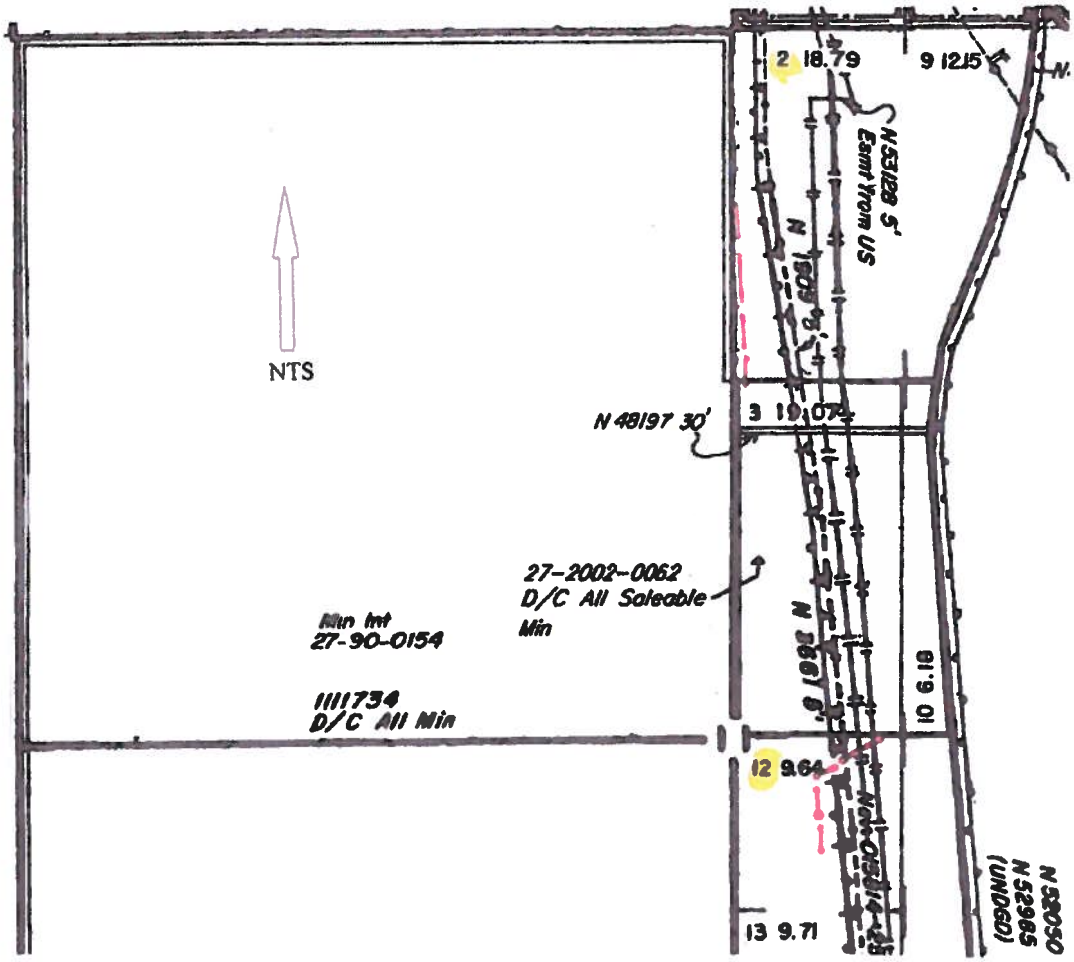
T. 23 S., R. 63 E., Sec 11, Lots 2 and 12

PERMANENT R/W = 1,225' x 10' = 12,250sf = 0.28ac



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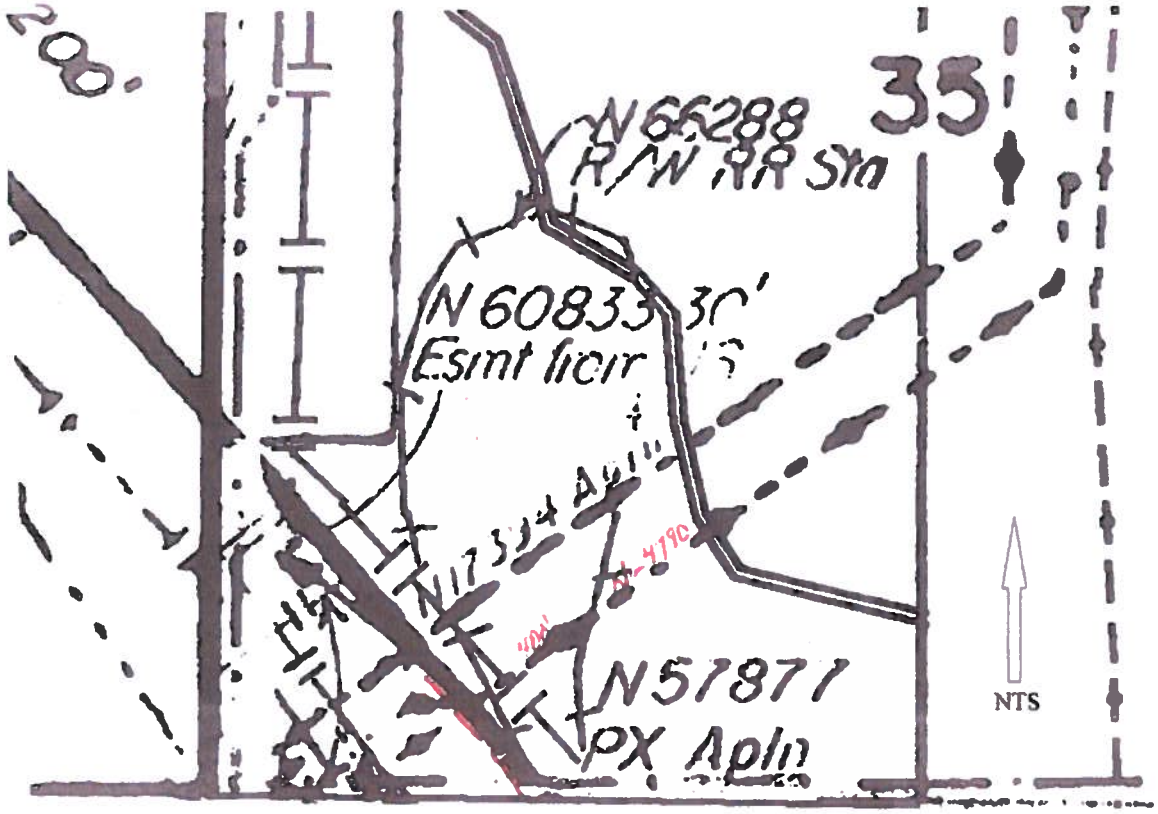
NV Energy has existing rights of way from BLM N-1909 for an overhead transmission line located within BLM and BOR lands which will be relocated due to the NDOT Boulder City Bypass Project. A new BLM, 20' STROW for the installation of underground facilities is needed for said relocation within T. 22 S., R. 63 E., Sec 35, SW¼ SW¼; T. 23 S., R. 63 E., Sec 2, Lots 23, 27, and within E½ E½ SE¼ SW¼; T. 23 S., R. 63 E., Sec 11, Lots 2 and 12.

T. 22 S., R. 63 E., Sec 35, SW¼ SW¼

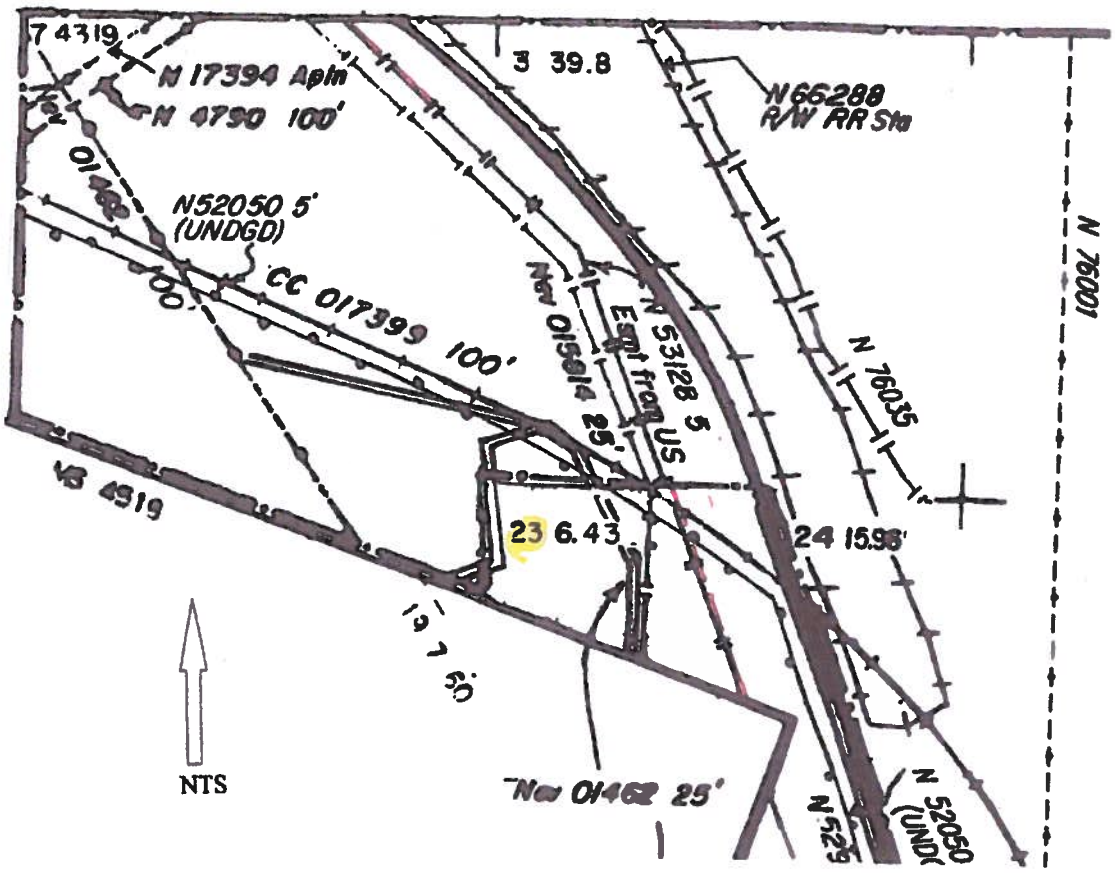
STROW R/W = 400' x 20' = 8,000sf = 0.18ac



TOTAL LENGTH BLM STROW = 6,957'; TOTAL = 139,140sf; = TOTAL = 3.19ac;

T. 23 S., R. 63 E., Sec 2, Lots 7 and 23

STROW R/W =2291' x 20' = 45,820f = 1.052ac



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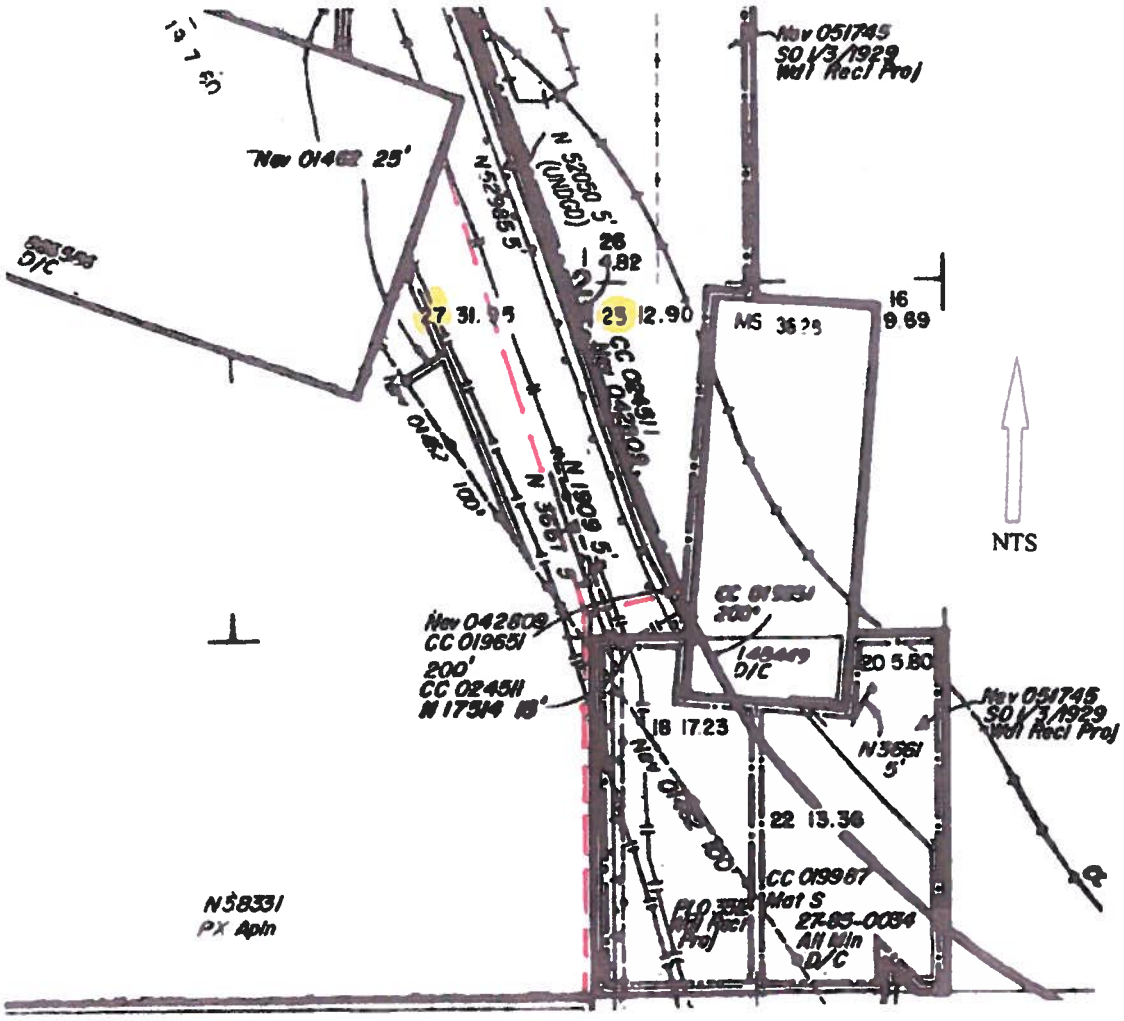
T. 23 S., R. 63 E., Sec 2, Lot 27
And E½ E½ SE¼ SW¼

STROW R/W = 3,041' x 20' = 60,820sf = 1.40ac



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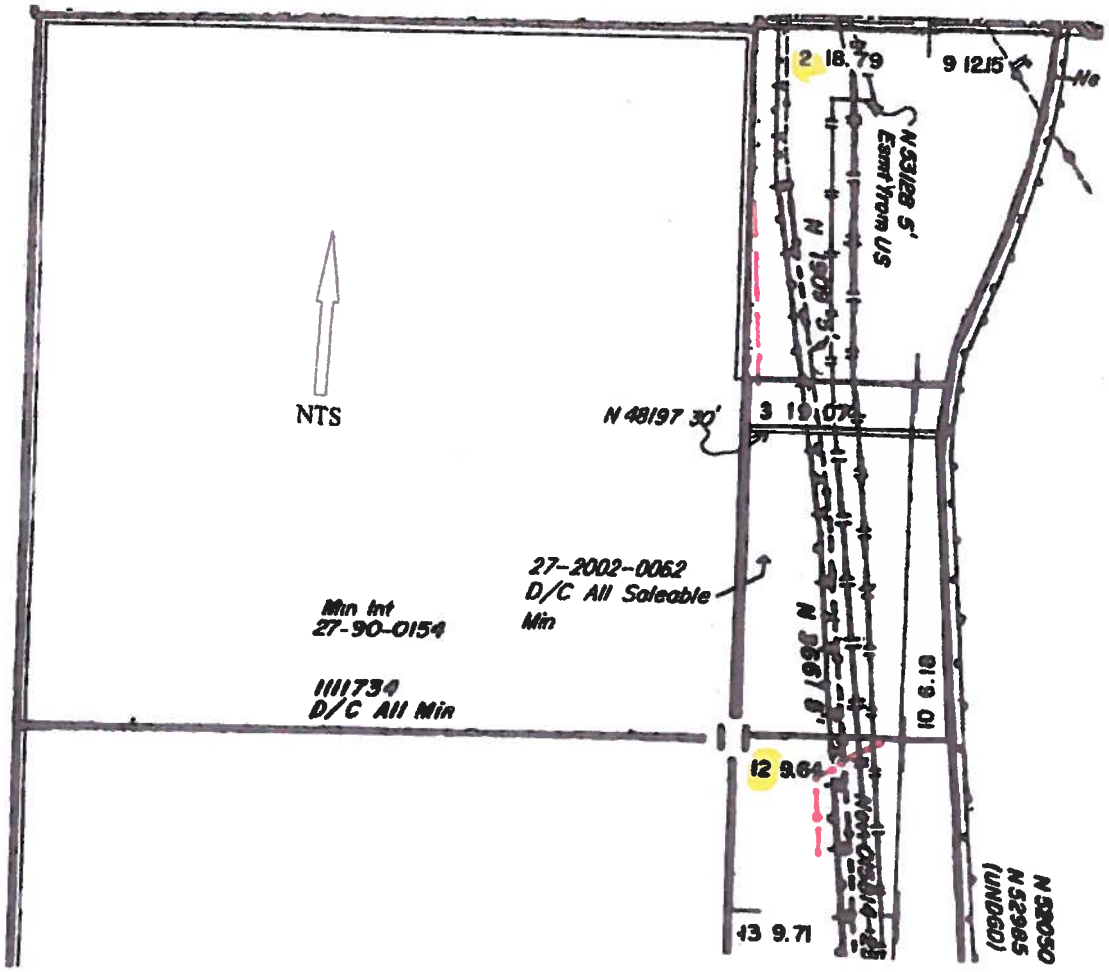
T. 23 S., R. 63 E., Sec 11, Lots 2 and 12

STROW R/W = 1,225' x 20' = 24,500sf = 0.56ac



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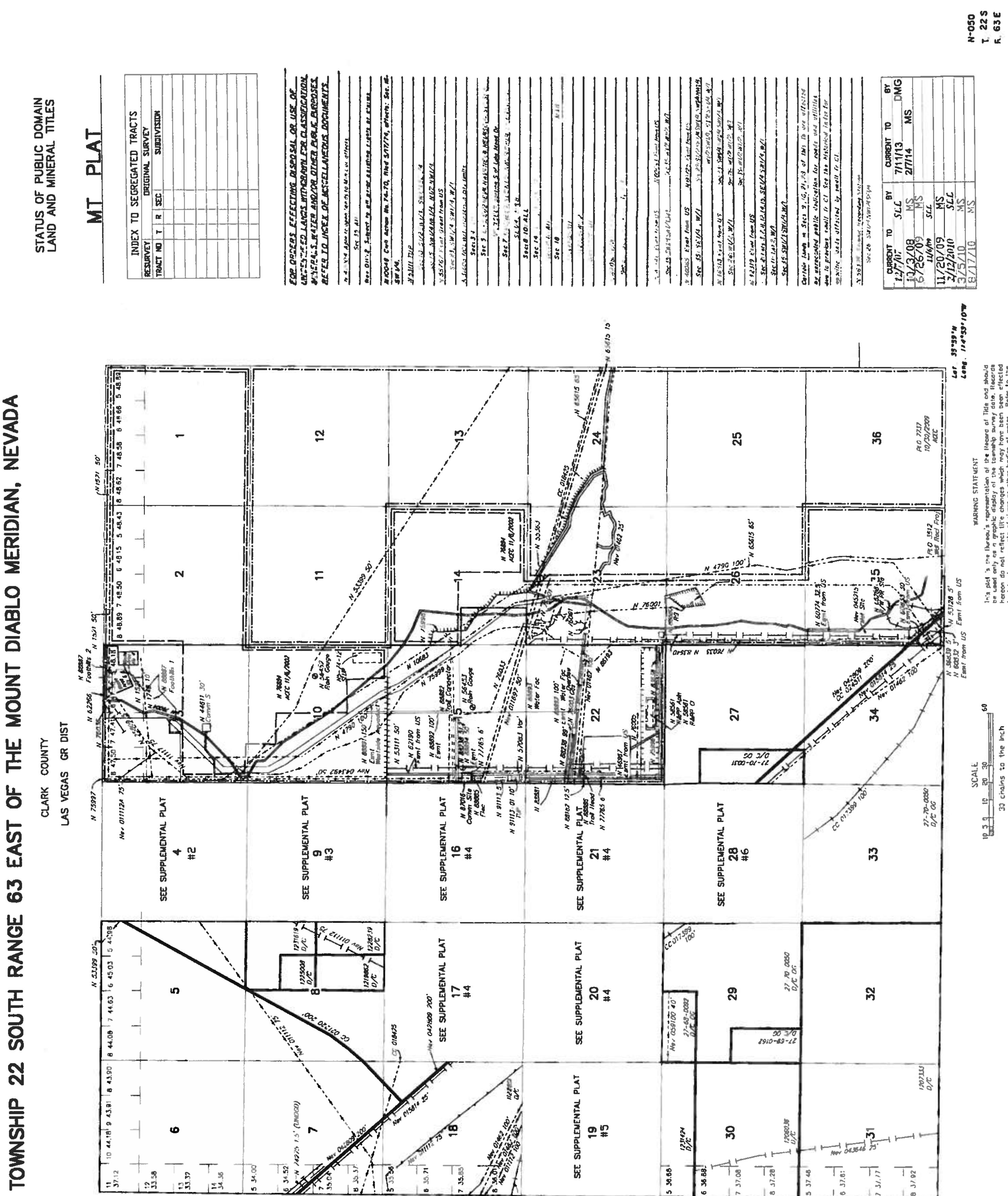

Exhibit D

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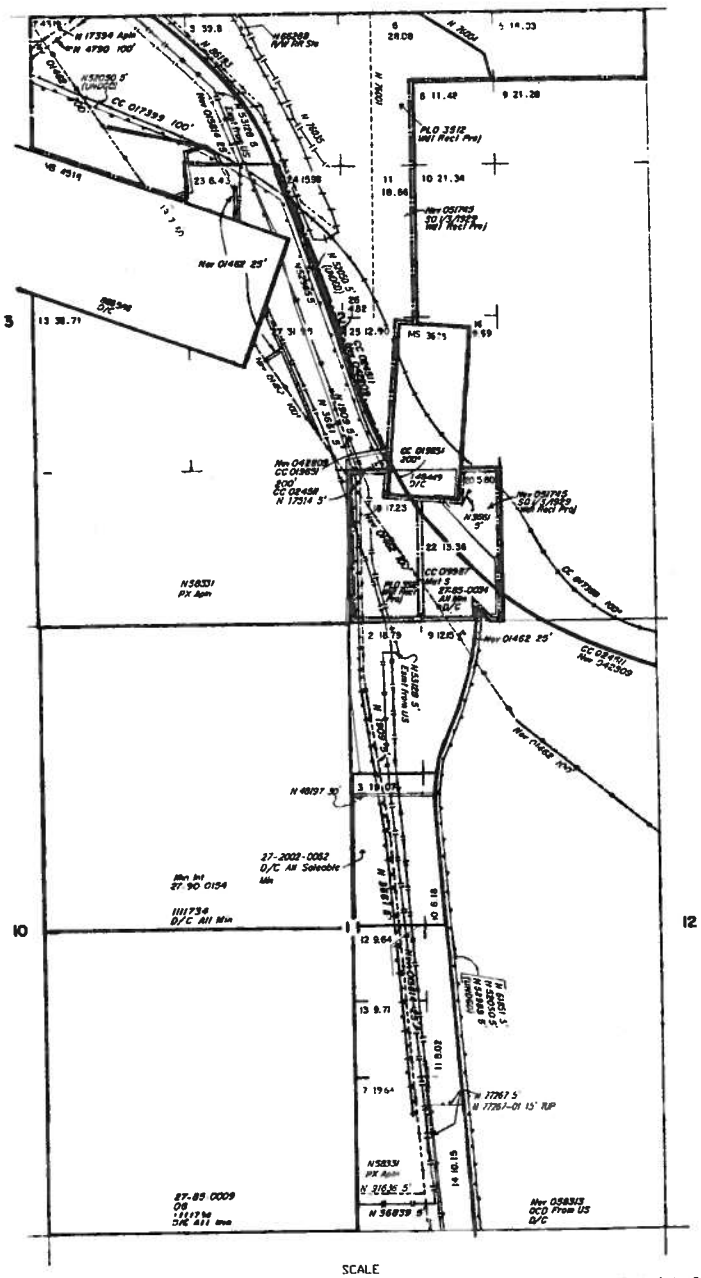
TOWNSHIP 23 SOUTH RANGE 63 EAST OF THE MOUNT DIABLO MERIDIAN, NEVADA

STATUS OF PUBLIC DOMAIN
LAND AND MINERAL TITLES

MTP
SUPPL Sec 2,11



INDEX TO SEGREGATED TRACTS				
RESURVEY		ORIGINAL SURVEY		
TRACT NO	T	R	SEC	SUBDIVISION

FOR ORDERS EFFECTING DISPOSAL OR USE OF UNIDENTIFIED LANDS WITHDRAWN FOR CLASSIFICATION, MINERALS, WATER AND/OR OTHER PUBLIC PURPOSES, REFER TO INDEX OF MISCELLANEOUS DOCUMENTS.

CC 019631, CC 017399, CC 019987 subject to all prior existing rights or claims

N 39949 Access Rd 30' effects Sec 11 (Within)

Suppl Survey Sec 2 Accepted 4/23/1985

N 41946 Event from US Sec 2: Lots 3,7,8,12,14,15, SE¼ SW¼, W/1 Sec 11: Lot 2, W/1

N 46066 Event from US Sec 2: Lots 13,14

N 42318 Event from US Sec 11: Lots 5,6, W/1

N 49621 Event from US Sec 11: Lots 1, 2, W/1

N 58766 R/W Fiber Optic Line (UNDOCD), 5' Sec 2: Lots 3,7,12, 14, 15, W/1 Sec 11: Lots 1, 4, 5, 6, W/1

N 59140 P/W (UNDOCD) Powerline Sec 11 Lots 2 &3, W/1

N 61855, All Public Land in Sect 2 and 11 Segregated from Appropriation Under the General Mining Law.

Suppl Survey Sec 2 Accepted 4/23/1985

CURRENT TO	BY
2/7/14	MS
11/22/02	MS
5/8/03	MS
4/6/04	MS
12/25/04	MS
9/29/05	MS
10/3/08	MS
6/12/09	MS
2/20/13	DMG
3/26/13	DMG

Suppl 2,11
N 050
T. 23S
R. 63E

WARNING STATEMENT
This plat is the Bureau's Record of Title and should be used only as a graphic display of the township survey data. Records hereon do not reflect title changes which may have been effected by lateral movements of rivers or other bodies of water. Refer to the cadastral surveys for official survey information.

Exhibit D
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