

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
NEEDLES FIELD OFFICE**

ENVIRONMENTAL ASSESSMENT

**PROPOSED INSTALLATION, USE AND MAINTENANCE OF THE
SHEEP HOLE MOUNTAINS S.D. BIG GAME ARTIFICIAL WATER SOURCE
SAN BERNARDINO COUNTY, CALIFORNIA**

CA-690-EA05-25

February 14, 2007

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INTRODUCTION

The California Department of Fish and Game (CDFG) proposes to install one big game artificial water source in the Sheephole Valley Wilderness. The S.D. big game artificial water source would be located on the western side of the Sheep Hole Mountains near Sheep Hole Pass. The proposed water development would consist of a small dam, a pipeline, a buried 10,000-gallon fiberglass storage tank, and a wildlife accessible subterranean drinker. An access way, an existing, former mining road, would also be utilized for the construction, use and maintenance of the site.

1. **CONTROL NUMBER:**
CA-690-EA05-25
2. **CASE FILE / SERIAL NUMBER:**
CA42960
3. **PROPONENT:**
California Department of Fish and Game
4. **PROJECT:**
S.D. Big Game Artificial Water Source
5. **LOCATION:**
Sheep Hole Mountains; T. 2 N., R. 12 E., NE1/4 Section 34, SBBM
6. **AFFECTED ACREAGE:**
1.4 acres
7. **7.5' QUADRANGLE:**
Dale Lake
8. **MULTIPLE-USE CLASS:**
Limited and Controlled
9. **LAW ENFORCEMENT SECTOR:**
92
10. **LAND STATUS:**
Public
11. **SPECIAL DESIGNATION AREA(s):**

California Desert Conservation Area; Sheephole Valley Wilderness; Desert Training Center/California - Arizona Desert Maneuver Area

12. AUTHORITY:

BLM has the authority to permit construction of an artificial water source for wildlife under Sections 302(b) and 307(b) of the *Federal Land Policy Management Act of 1976* (43 United States Code [U.S.C.] 1737). Section 302(b) authorizes the Secretary of the Interior to enter into cooperative agreements or other instruments deemed appropriate to manage use, occupancy and development of public lands. It recognizes the authority of the states to regulate hunting, fishing and the management of wildlife. Section 307(b) authorizes the Secretary to enter into contracts and cooperative agreements involving the management of public lands.

BLM will utilize these FLPMA authorities to complete a Memorandum of Understanding with the California Department of Fish and Game which details the responsibilities of each agency for construction and maintenance of the SD big game artificial water source, generally termed a guzzler.

The structure must also be in compliance with provisions of the *Wilderness Act of 1964* (16 U.S.C. 1131) and the *California Desert Protection Act of 1994* (CDPA) (16 U.S.C. 410), which created the Sheephole Valley Wilderness.

The CDPA in section 103 (a) requires BLM to manage the wilderness area in accordance with the provisions of the Wilderness Act, which provides overall management direction. Section 4(c) of the Wilderness Act prohibits specific uses in the wilderness area. These include new commercial uses and permanent roads. Except as "... necessary to meet the minimum requirements for the administration of the area for the purpose of the Act", there shall be no temporary roads, use of motor vehicles, motorized equipment or motorboats, landing of aircraft, mechanical transport and structures or installations.

Two provisions of the CDPA address fish and wildlife management within the wilderness areas designated by the Act. Section 103(e) states: "As provided in section 4(d) of the Wilderness Act, nothing in this title shall be construed as affecting the jurisdiction of the State of California with respect to wildlife and fish on the public lands located in that State." In section 103(f): "Management activities to maintain or restore fish and wildlife populations and the habitats to support such populations may be carried out within wilderness areas designated by this title and shall include the use of motorized vehicles by the appropriate State agencies".

The California Department of Fish and Game proposes the construction and maintenance of an artificial water source in the wilderness portion of the Sheep Hole Mountains, an area managed by BLM to enhance habitat for the maintenance of bighorn sheep populations. This proposed action falls within the parameters of the CDPA and the Wilderness Act, to the extent the State of California has jurisdiction over this species on public lands.

FLPMA specifically provides that in managing the use, occupancy and development of the public lands, the Secretary shall take any action necessary to prevent unnecessary or undue degradation of the lands [43 USC 1732(b)]. Within the context of the 1980 CDCA Plan, as amended over time, and as recently amended by the West Mojave plan amendment, BLM will take action necessary to manage the public lands in order to prevent unnecessary or undue degradation. For example, BLM may impose reasonable mitigation measures or may use its enforcement authorities to ensure that unnecessary or undue degradation of the public lands does not result from public use, occupation or development. The Memorandum of Understanding utilized to permit the construction and maintenance of the SD guzzler will include federal actions necessary to achieve this result.

13. LAND USE PLAN, STATUTE AND GUIDELINE CONFORMANCE:

LAND USE PLAN CONFORMANCE

The proposed action is subject to and in conformance with the *California Desert Conservation Area Plan of 1980* (CDCA Plan), as amended. Two major bioregional CDCA Plan amendments affect the determination of BLM land use plan conformance in this region: the West Mojave Plan amendment (2006) and the Northern and Eastern Colorado Desert (NECO) amendment (2002).

CDCA Plan

A proposed action is in conformance with the CDCA Plan if it is consistent with the applicable CDCA Multiple-Use Class designation and the applicable Plan Element provisions. In this case, the proposed action is consistent with the applicable multiple-use classes for the Sheep Hole Mountains, Class C (Controlled) and Class L (Limited). Class C areas are managed to protect wilderness and areas recommended for wilderness designation. Class L areas are managed to “provide for generally lower-intensity, carefully controlled multiple use of resources while ensuring that sensitive values are not significantly diminished” (CDCA, p.13). Both Classes C and L provide that, “projects to improve wildlife habitat may be allowed subject to environmental assessment” (CDCA Plan, Table 1, Multiple-Use Class Guidelines).

The stated objectives of the CDCA Plan relevant to this project are:

Objective #1 - “Avoid, mitigate, or compensate for impacts of conflicting uses on wildlife populations and habitats. Promote wildlife populations through habitat enhancement projects so that balanced ecosystems are maintained and wildlife abundance provides for human enjoyment” (CDCA Plan, p. 28).

Objective #4 - “Manage those wildlife species officially designated as sensitive by the BLM for California and their habitats so that the potential for Federal or State listing is minimized” (CDCA Plan, p. 29).

In accordance with Objective #1, the proposed project would mitigate the historical effects of habitat fragmentation on bighorn sheep. It is a habitat enhancement project that will promote wildlife (bighorn sheep) populations through increased foraging range, numbers and dispersal.

In accordance with Objective #4, the desert bighorn sheep is a BLM California "sensitive species" and is cited on Table 3 in the Wildlife Element of the CDCA Plan. By increasing range utilization, numbers and dispersal of bighorn sheep, the potential for Federal or State listing is minimized.

West Mojave Plan (WEMO) Amendment

The CDCA Plan was amended in 2006 to incorporate landscape level or bioregional management of the public lands to better protect the desert tortoise and other wide-ranging species, including desert bighorn sheep and mule deer. The proposed action is in conformance with the West Mojave Plan amendment conservation strategy for desert bighorn sheep (WEMO, p. 2-81) which states:

"Few direct threats now exist to western Mojave Desert bighorn. The primary conservation needs are maintenance of water sources, maintenance of open space linkages between mountain ranges, and prevention of barriers to movement."

Two of the seven implementing measures of the West Mojave Plan address bighorn water sources:

"(Mam-1) Natural water sources in permanent habitat would be protected and diversions at bighorn springs would be prohibited."

"(Mam-5) Mitigation measures for mining proposals within occupied bighorn habitat in the San Bernardino Mountains and the San Gabriel Mountains would include funds to monitor potentially impacted sheep herds or to provide additional water sources."

Neither of these measures is relevant to the proposed project, although the need for permanent and additional water sources is recognized. The lack of water in the Sheep Hole Mountains is believed to act as a barrier to bighorn sheep movement because it limits the dispersal of bighorn sheep within the Sheep Hole Mountains and among nearby mountain ranges.

CONFORMANCE WITH OTHER STATUTES AND GUIDING DOCUMENTS

BLM-Federal

The proposed action is in conformance with the following federal statutes and guidance:

Section 404 of the Clean Water Act:

According to a letter received on May 5, 2006 by CDFG from the U.S. Army Corps of Engineers, "The project is not subject to our jurisdiction under Section 404 of the Clean Water Act and a Section 404 permit is not required from our office."

"Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands." BLM, 1988:

This document prescribed habitat enhancement in mountain ranges supporting remnant herds, which included the Sheep Hole Mountains. It stated: "State wildlife agency priorities for habitat enhancement should receive a high priority."

"Mountain Sheep Ecosystem Management Strategy in the 11 Western States and Alaska." Fish and Wildlife 2000 series. BLM, 1995:

The national mountain sheep management document identified water as a limiting factor for bighorn distribution and stressed partnerships with state wildlife agencies and non-governmental organizations to implement habitat enhancement projects.

CDFG-State

The proposed action is in conformance with the following statutes and guidance:

Section 401 of the Clean Water Act:

A letter received on July 19, 2006 by CDFG from the California Regional Water Quality Control Board stated: "In a letter dated May 5, 2006, the U.S. Army Corps of Engineers (ACOE), Los Angeles District, provided notification to the CDFG that the proposed project does not discharge dredge or fill material into water of the United States or an adjacent wetland. Therefore the project is not subject to jurisdiction under Section 404 of the Clean Water Act and a Section 404 permit is not required."

"Pursuant to the ACOEs determination that the proposed project is non-jurisdictional, the Regional Water Board has determined that a Clean Water Act Section 401 Water quality certification is not required for the proposed project."

Fish and Game Code Section 1602 (Streambed Alteration Program):

The CDFG has issued a permit allowing the minor alteration of this streambed.

California Environmental Quality Act:

The CDFG project was determined to be exempt pursuant to the CEQA Guidelines Sections 15303, 15304, and 15333.

14. PURPOSE AND NEED FOR PROPOSED ACTION:

Purpose

This Environmental Assessment has been prepared to document federal authorization of a CDFG proposal to construct and maintain the SD artificial water source to enhance habitat for bighorn sheep in the Sheephole Valley Wilderness.

This proposed action will assist in the stabilization, maintenance and recovery of bighorn in the southern Mojave Desert.

Bighorn sheep are wilderness animals and represent an important wilderness value to the public. The majority of permanent bighorn habitat in the California desert is within the isolated mountain ranges and is designated as wilderness. BLM manages this habitat for its wilderness values, and recovery and maintenance of the bighorn populations is a goal of BLM management.

Bighorn sheep have suffered declines throughout the California desert as a result of unregulated hunting early in the twentieth century, spread of disease from livestock, and habitat fragmentation by highways, railroads and canals. Drought has played a role in local extirpations of bighorn in southeastern California. The South Mojave metapopulation is defined by interstate highways which act as barriers that the bighorn do not cross. These barriers prevent access by bighorn in the South Mojave Desert region to traditional water sources on the other side of the highways. In the pre-settlement past, bighorn could access water at permanent springs throughout the South Mojave area, and they could utilize temporary water sources in several other ranges when it was available in wet years or wet seasons or specific locales.

There are now few natural water sources for bighorn within the South Mojave region, and some ranges have none. Bighorn now have to travel great distances to reach reliable water sources, which has limited the population size in some ranges, and has confined other bighorn demes to ranges that have sufficient water.

As a general rule, bighorn sheep do not travel farther than three miles from water. The CDFG used this as a basis for locating artificial water sources in the Sonoran Desert metapopulation and the Northern and Eastern Colorado Desert Coordinated Management Plan. The existing and proposed future locations of artificial water sources for bighorn in wilderness are determined using this spacing, the suitability of surrounding habitat, the potential for encouraging dispersal, ease of access, and practicality of construction.

The Sheep Hole Mountains are in a central location within the South Mojave metapopulation region. This makes for a logical source population for restoration of bighorn populations in all of the desert ranges, particularly the Pinto Mountains, Bullion Mountains, Coxcomb Mountains and Iron Mountains. The Department of Fish and Game has described a logical method for bighorn restoration in the South Mojave metapopulation area by providing water sources to the central ranges, then gradually adding water sources to outlying ranges where they may aid in recovery.

BLM is obligated under the Wilderness Act and The California Desert Protection Act to utilize the minimum means necessary for management of the wilderness. Provision of artificial water sources is the minimum tool for managing the South Mojave wilderness areas for healthy populations of bighorn sheep, and it has proven effective in past restoration efforts. After the initial construction, the water sources are nearly invisible and they require little maintenance because they have

no moving parts. Many can be accessed for monitoring by foot. For those sites that are more difficult, the CDPA specifically allows for vehicle access to maintain or restore fish and wildlife populations and the habitats to support such populations. The land ownership pattern in the South Mojave is primarily BLM-managed public lands, facilitating the state and federal cooperative effort and limiting other opportunities to achieve the goal of landscape-scale bighorn restoration.

The purpose and need of this Environmental Assessment has been developed given these parameters, opportunities and constraints on bighorn and wilderness management. Additional purposes to construct, use and maintain an artificial water source in the Sheep Hole Mountains are:

- a. To expand useable habitat for bighorn sheep. The proposed S.D. water source would expand useable habitat because water is a limiting factor for sheep in this range. Without dependable water sources, the sheep remain confined to the eastern portion of the Sheep Hole Mountains.
- b. To satisfy CDFG's objectives identified in the South Mojave Metapopulation Management Objectives (Appendix B).
- c. To enhance the stability of this desert bighorn sheep deme and the South Mojave metapopulation in the California Mojave Desert, where feasible and appropriate, through increased dispersion and interaction of the herds throughout their ranges. The proposed action will encourage the Sheep Hole deme to increase its range which could result in increased utilization of available forage. The development of permanent water sources in appropriate sheep habitat (as determined by CDFG) where there is no water is a means of encouraging population dispersal. One result of increased dispersal between isolated demes is greater genetic exchange.
- d. To achieve the minimum viable population demographic parameters identified below (the minimum number of adult ewes and the ram to ewe ratios) for individual demes (sub populations) within the South Mojave Metapopulation Plan area. These are the same parameters applied to adjacent desert sheep metapopulation areas.

An important purpose of the proposed project is to implement portions of the CDCA Plan Wildlife Element. The CDCA Plan Wildlife Element includes mitigating for impacts on wildlife populations and managing sensitive wildlife species and their habitats to preclude the need for Federal or State listing. The S.D. artificial water source would mitigate the effects of historical habitat fragmentation on a bighorn sheep population. Construction of the S.D. water source would constitute a wildlife habitat enhancement project for the desert bighorn sheep, a BLM-designated sensitive species in California.

The 2006 West Mojave amendment to the CDCA Plan prescribes maintenance of existing water sources and management of the public lands to prevent barriers to movement. CDFG sited the S.D. artificial water source in a location where lack of

water was acting as a barrier to sheep movement.

Need

The need for the proposed action, as described by CDFG, is based on the following biological, physical, and other factors:

- a. A minimum of 50 adult females is needed within individual demes for a stable sustainable population based on recommendations by Franklin (1980). Fifty females help guarantee a minimum effective population size of > 50, assuming that all adult females breed each year. Since systematic population monitoring began in 1997, this deme's adult female population has not reached this threshold.
- b. A 40:100 ram:ewe ratio ensures that there are enough mature rams in the population to breed with the females. These numbers also help to ensure adequate numbers of mature males in the population from a genetics and behavioral perspective (Geist 1975).
- c. There is a need to minimize the limiting habitat factors, including available water, that repress the resident sheep population numbers in the Sheep Hole Mountains, and to allow the numbers to increase to levels which meet the CDFG's minimum population criteria.
- d. To fulfill the statutory requirement of Fish and Game Code Sections 1800 - 1801 which describe maintaining, in perpetuity, "... species of wildlife and their habitat..." and Sections 4900 - 4901 which specifically address bighorn sheep by stating: "...it is the policy of the State to encourage the preservation, restoration, utilization, and management of California's bighorn sheep population."
- e. To mitigate the historical effects of habitat fragmentation by highways, mining on Bristol, Dale and Cadiz Dry Lakes, past and present military use, and residential use and development in Wonder Valley (Epps *et al.* 2005).
- f. To encourage both the seasonal and year-round use of additional habitat within these mountains currently limited by lack of available water. Through increased distribution of sheep and anticipated population growth, the likelihood of intermountain movement of sheep between the mountain ranges composing the South Mojave Sheep Metapopulation Area would be increased. Intermountain movement would increase the probability of sheep persistence in this desert region.
- g. To ensure that the Sheep Hole Mountains deme remains viable in both the short- and long-term. This is the largest deme within this metapopulation and is essential for its persistence. This deme would most likely be the source population for any future translocation. The probability of any sheep emigrating to other demes is directly linked to size and distribution of this

deme. Because of its size and central location relative to the other demes, the Sheep Hole deme is critical to the health of the metapopulation.

h. To increase the distribution of sheep within the range and produce population growth that would help ensure the protection of this component of the California desert wilderness. Available habitat outside of designated wilderness is extremely limited.

i. To maintain viable deme numbers across the South Mojave Metapopulation area, thus creating the greatest probability for its long-term persistence.

15. PROPOSED ACTION AND ALTERNATIVES:

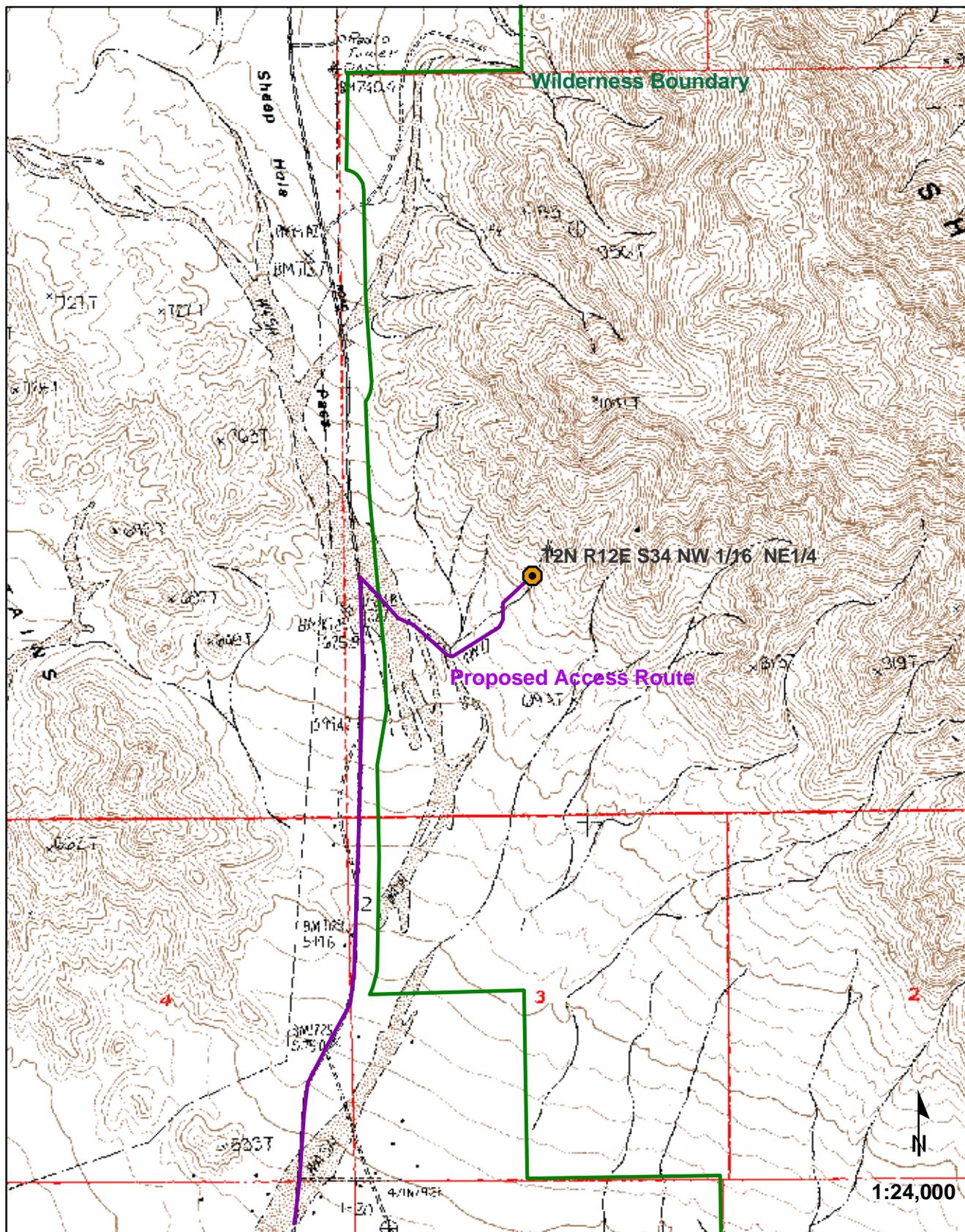
15.1 Proposed Action

The CDFG proposes to construct, use, and maintain one Desert Wildlife Unlimited (DWU) type artificial water source (Lesicka and Hervert 1995), to be named S.D., in the western portion of the Sheephole Valley Wilderness (Map 1). See Figure 1 for a schematic and photo of a DWU type water source and a schematic of the proposed facility. The proposed water development would consist of a small concrete dam, a metal pipeline, a buried 10,000 gallon storage tank, and a 2,500 gallon wildlife accessible subterranean drinker. The total area of surface disturbance for the construction site would include a 100 x 140 feet area around the installation (dam, tank and drinker) site, as well as an existing 50 X 50 feet vehicle turnaround area currently adjacent to the work site. A total of 0.6 acres (0.5 mile) along a pre-existing dirt vehicle way to a former mine site would be utilized for vehicle access. Sand outside the wilderness would be borrowed to protect the walls of the drinker and tank from punctures.

MAP 1

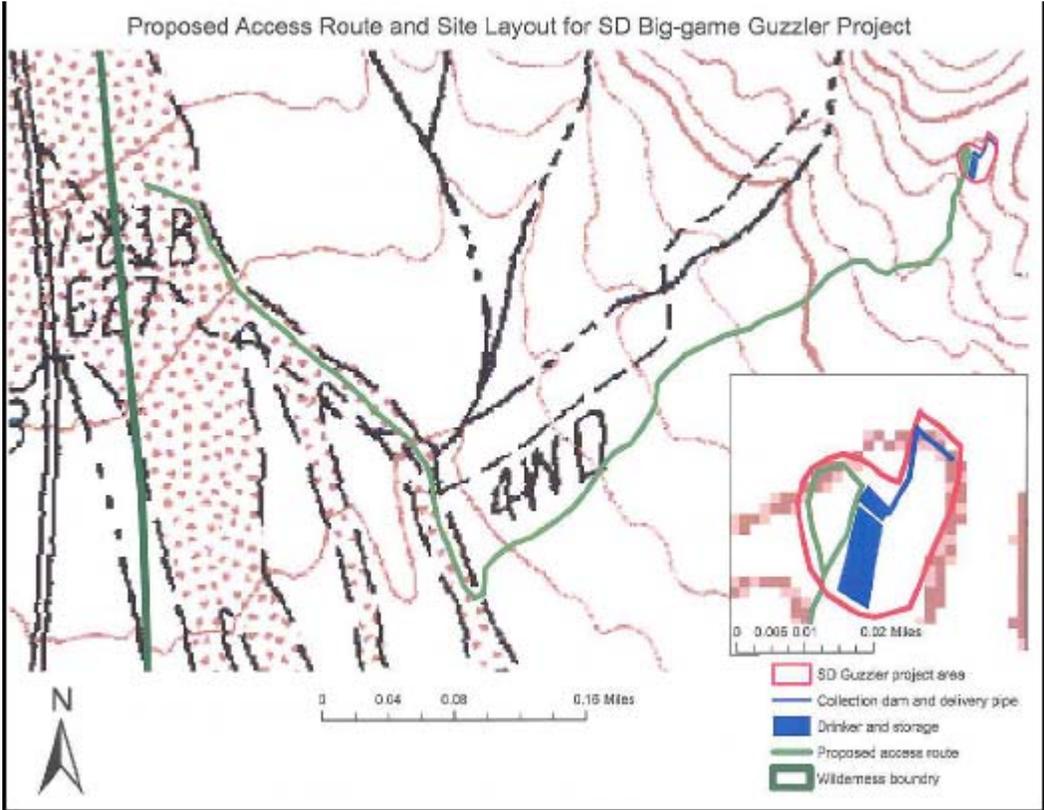
Proposed S.D. Big Game Guzzler

Location of Site and Roads



29 Palms - 22 miles

Figure 1. Photo and diagram of Lesicka style big game guzzler.



Unique to the DWU system are a number of factors that contribute to the efficiency and reduction of required maintenance. The design simplicity, lack of mechanical parts, and the ability to collect and store large amounts of water from small rain events has reduced costly repairs and or replacements experienced by different water source designs. The number of inspections, monitoring visits and water hauling would also be minimized. Additional attributes include low visual impact as the system is completely buried except for the drinker and small dam (and occasionally short sections of pipe which are exposed at ground level), increased availability of water for multiple species use, and desert tortoise compatibility.

1. Excavation of Site

A trench would be excavated and backfill materials would be placed to the side of the trench adjacent to the wash. The tank and drinker would be placed in the trench below the dam area and the excavated rock and soil would be replaced and smoothed back to the surrounding gradient, with the installation buried as described below.

The installation site would be excavated for the burial of a 10,000 gallon fiberglass tank and a 2,500 gallon drinker. Both would be completely buried, except for a 1.5 inch diameter screened U-vent pipe on the storage tank, as well as the drinker lip, opening and concrete overflow apron which would be exposed at ground level. The tank would be covered to a depth of two feet while the drinker top would be buried to ground level. In the event that the underlying geology is rock material that cannot be fractured and removed to the required depth, the tank and drinker would be placed at the greatest obtainable depth. Thus, the excavated material would then be mounded to cover the tank and or built up to support the drinker. All excavated materials from the cavity formed for the installation of the tank and drinker would be stored on the turnaround. The tank would be placed at the rear of the cavity, which would be excavated to a depth lower than the slope wall (if obtainable) adjacent to the wash. The drinker would be set 10 feet away at or just slightly below the level of the tank. Excavated rock and soil would be replaced, smoothed and contoured to best reflect the surrounding surface contours so that the buried tank and drinker would become part of the slope. If additional fill material (maximum of 25 cubic yards) is needed to either line the bed of the drinker and tank or to cover the tank, then fill material would be removed from the wash west of the project site, outside the wilderness from the designated location. Any additional fill would be trucked in by dump-truck over the existing access route. This borrow site would then be reclaimed and raked.

Forty feet of the 80-foot wide wash would be partially dammed. Construction of this dam would require mixing of 25 bags of Portland cement. The construction material storage site would be located approximately 25 feet away from the wash, on flat ground located adjacent to and west of the wash area. Approximately 10 feet of buried perforated ABS pipe would run to the dam base, be connected to a "Y" connector and second screened intake in the dam face and then piped to both

storage tank and drinker. Approximately 150 feet of pipe between the dam and tank would consist of both ABS and corrugated galvanized steel pipe at a 6" diameter and anchored with rebar. Any exposed pipe surface would be painted to match the existing soil color.

2. Storage Tank and Drinker

The 10,000 gallon storage tank would be a 30 foot long x 8 foot diameter fiberglass cylinder. The drinker would be comprised of a 2,500-gallon, 16 foot long by 4 foot wide by 8 foot deep fiberglass tank with a ramp. The drinker would be buried underground, up to 10 feet from the tank, and the two would be connected by a 2 inch flexible schedule 40 PVC pipe to allow for naturally occurring soil movement such as settling or earthquakes. Only the walk-in drinker opening would be exposed. The concrete overflow apron is at the entrance of the drinker opening and would be the width of the drinker, fanning from 4 feet to 8 feet in width. The entrance to the drinker would be a ramp with steps so that animals having access to the water can escape easily. Steps would descend into the drinker at 1 foot intervals and be 2.5 feet wide. The remaining 0.75 foot on each side of the steps would be roughed, and allow for small animal ingress and egress. The concrete steps would be constructed on-site, utilizing approximately eight bags of Portland cement for the ramp.

3. Dam

Runoff from seasonal rainfall would be detained behind the short dam and capture water flow through a buried 6-inch ABS and exposed corrugated galvanized steel pipe into the tank. Ten feet of ABS perforated pipe would be buried upstream at the base of the dam catchment to collect subterranean flows. This pipe would connect at the dam via a "Y" connector to the corrugated pipe in the dam face to collect surface flows. The exposed intake at the dam would be covered with wire mesh to prevent entry of debris or animals. Water would be gravity fed through the corrugated pipe to the tank and drinker. The corrugated pipe would be anchored with rebar to prevent shifting. After the tank and the drinker are filled, excess runoff would flow out of the drinker or over the dam and return to the wash.

The dam would be constructed of reinforced concrete and faced with native stone collected at the site to blend into the surrounding landscape. The dam would partially block water flow in the wash and be no more than 2.5 feet at the highest point. Approximately 20 five-gallon buckets of sand from this site would be used in the dam's construction. A mobile water tank would be utilized to haul all water for construction purposes and would be towed to the site by vehicle. Concrete would be mixed using a gasoline engine cement mixer and conveyed to the dam and drinker site by wheelbarrow. Approximately 20 gallons of concrete rinse water would be generated and disposed of onsite. Natural forces are expected to fill in the upstream side of the dam with wash materials and replace those removed for construction and for mixing concrete.

4. Construction Equipment, Vehicles, Access

Excavation equipment would consist of a Case 680 rubber-tired backhoe and a model 270 John Deere flat-tracked excavator (or equivalents). Attachments for the excavator would include a 36" wide bucket and hydraulic chisel hammer. A trailer-mounted 1,000 gallon water tank (gravity-fed or with a gasoline-powered motorized pump if necessary) would be used for the initial charging of the 2,500 gallon drinker. An additional 300 gallons would be used for mixing concrete. A 3 to 5 cubic yard 4-wheel drive dump truck would be used to haul additional fill from outside the wilderness, if needed.

Passenger vehicles would be utilized to carry work tools (shovels, picks, rakes) as well as materials, tow one 1,000 gallon water tank, one 10,000 gallon fiberglass tank and one 2,500 gallon drinker (both on trailers), one portable gas-powered cement mixer, and one chemical toilet, as well as to transport staff to the site. All but one of the vehicles would then be parked outside of wilderness adjacent to Amboy Road and the project access route, returning only when the project is finished to transport out trailers and equipment. One passenger vehicle would be on site available for emergencies and utilized to transport workers in and out each day. Access to the site by all vehicles and equipment would be via an existing mining road and by desert wash (a total of approximately 0.5 miles). A maximum of 40 round trips of motorized vehicles to the project site would be associated with the construction activity. Motorized equipment would be shut down when not in use to minimize noise disturbance.

Prior to mobilization on the site, all equipment would be inspected to be sure it is operating correctly and free of leaks. Equipment would be inspected daily to ensure that there are no discharges. Fuels would be contained within the equipment or stored in containers until ready for use. Spill media consistent with specifications in the CDFG Wildlife Operations Plan for California will be carried in vehicles to ensure rapid clean-up response to any spills of oil, chemicals, concrete-residues, or other materials resulting from the project.

5. Post Construction Activities

The project area, including the wash access, would be flagged prior to construction activities and flagging would be removed upon project completion. Upon completion of the project, areas disturbed by the project would be returned to as close to a natural state as possible. All disturbed soil surfaces would be contoured and raked to match the surrounding terrain. Any rocks that would be removed would be scattered over the disturbed area. Upon completion of the project, the route to the site would be blocked with native boulders effectively eliminating vehicular access into the wilderness. The existing abandoned mine access would be left as it was prior to the project. All vehicle tracks from the wash would be raked out, and the access from the wash to the bajada at the wilderness boundary would be obscured. The volunteers would be trained on the importance of non-vehicular access for future routine maintenance and inspection.

6. Personnel

A total of up to 20 people would be at the work area for a maximum of five days for the installation. Site personnel would be briefed daily on the project plan and site safety. Personnel would not camp onsite or on public lands. All trash created on site would be removed daily when leaving. Supplies, tools and materials would be stored, when not in use, at this location and a first-aid/safety area would be established. CDFG law enforcement personnel would provide site security. Personnel sanitation would be provided by means of a portable fiberglass toilet facility and disposal of items would follow standard Leave No Trace/Wilderness Practices. Sufficient potable water to provide for sanitation for cleansing of hands and drinking would be provided and replenished daily.

7. Monitoring

CDFG and/or its agents would walk into the site from the wilderness boundary to monitor the new artificial water source twice each year for water level and quality. Other monitoring would consist of pellet transects, photographic data, and water source operation.

Monitoring reports would be sent to the CDFG Desert Waters Coordinator and to the BLM Needles Field Office and California Desert District Office.

8. Repair and Refill

The anticipated lifespan of the underground tank is greater than 50 years. Other components of the system (i.e. concrete dam, concrete steps, and ABS pipe) may deteriorate or require repair due to infrequent environmental events. Repairs to these components will be made as necessary, with an estimated frequency of once per five years.

Refill activities are anticipated when storm events do not provide sufficient water to the system. When the system is full, the water would be expected to last for approximately two and a half years without needing any natural recharge or refill. The CDFG or its agents may refill this water source using a water pumping truck outside wilderness and hoselay to the drinker. The worst case scenario would require three refills per decade.

9. Health and Safety

The CDFG would comply with California Occupational Safety and Health Administration Title 8 requirements for ensuring employee safety and health. A site-specific health and safety plan for this project has been prepared.

15.2 Alternatives Considered But Eliminated From Detailed Analysis:

Eliminated Alternatives:

1) BLM and CDFG considered installation of the water source as described in the proposed action, but without mechanized equipment or use of motorized vehicles. Installation activity would take longer and more workers would be required than with the proposed action. Workers would walk to the work site and all materials and supplies would be carried or packed in, except for the tank, drinker and water, which would be transported to the site using a helicopter. Monitoring, maintenance, and repair would be the same as in the proposed action; however all access would be by foot or horseback. This alternative was eliminated from detailed analysis due to lack of feasibility because of excessive weight and dimensions of components, increased risk to employees from helicopter use, challenges of working in bedrock and large boulders without mechanized equipment, and longer project duration.

2) The installation of a water source located outside of wilderness was considered but eliminated from detailed analysis. This alternative does not meet the purpose and need of the project because locations outside wilderness would not be associated with steep escape terrain for the sheep, thus potentially increasing levels of predation. Also, the plant community in the flat, open desert outside the wilderness area is less diverse and of lower nutritional value than those found in the washes, bajadas and upland areas within the wilderness area. Human-related disturbances to the sheep are greater outside the wilderness boundary.

3) The installation of a DWU-style water source in other mountain ranges in the metapopulation area (e.g. Bullion and Coxcomb) was considered. However, additional water sources on the military base (Bullion Mountains) or in Joshua Tree National Park (Coxcomb Mountains) would neither directly benefit sheep that currently reside in the Sheep Hole Mountains, nor would they make additional foraging habitat available within this deme's location. These potential water source developments are not within BLM's authority to implement.

4) Directly transplanting sheep into adjacent mountain ranges as a means to augment population and facilitate gene flow was considered as an alternative to water source development. Translocation might encourage movement and increase the amount of habitat available to sheep.

Maintaining extant populations is a far more successful management strategy than trying to replace populations that are lost. Transplanting sheep would benefit gene flow on a one-time, short term basis. Transplanting would not meet the objectives of the Sheep Hole deme, including expansion of available habitat.

Furthermore, transplanting animals requires a source population, construction of artificial water sources prior to transplant, high levels of funding and staff, intensive monitoring for 3 to 5 years, and intrusion into wilderness for capture and release. It can result in increased stress and/or mortality for the sheep. A source population,

additional water, and funding and staff are not currently available.

5) The installation of a different type of water source, such as an above-ground storage tank and drinker, was also considered. This alternative was eliminated from detailed analysis because the system consists of more mechanical parts (i.e. float valve); would require more trips into wilderness for repairs and monitoring; have a shorter functional life span; and have a greater visual impact on wilderness characteristics of the area.

6) The modification of existing mine shafts, adits or natural tinajas to provide permanent water for sheep was also considered but eliminated from detailed analysis. One or all of these geologic features have the potential to collect and hold rain water within the Sheep Hole Mountains and in vicinity of this proposed project. However, these features do not fulfill the purpose and need of this project because they do not provide a dependable source of water throughout the year, nor could they be readily modified to become dependable. Water sources of these types have excessive evaporative losses. These features do not have sufficient storage capacities, nor are they capable of capturing sufficient quantities of water from the infrequent rains. In addition, these features could require substantial modifications resulting in the movement of much greater amounts of material as compared to the proposed action. Other issues associated with one or all of these geological features include instability of overlying roof slabs, proximity to potentially contaminated historic mine waste runoff, the need for extensive construction efforts, the high level of maintenance required for a system using these features, the necessity to re-build historic roads to allow access for construction equipment, increased safety risk, and susceptibility to seismic damage rendering these features unusable.

15.3 No Action Alternative:

The proposed new water source would not be constructed. The two existing artificial water sources in the Sheep Hole Mountains would continue to be maintained. Existing management and use of the sites would continue, subject to applicable statutes, policy, and land use plans.

16. AFFECTED ENVIRONMENT

The following elements of the human environment, subject to review specified in statute, regulation or executive order, are not located within the project area and are not addressed further in this document: Ecologically Critical Area, Floodplains, Prime or Unique Farm Lands, Wetlands and Riparian Zones, and Wild and Scenic Rivers.

16.1 Air Quality

The Mojave Desert Air Quality Management District has state air quality jurisdiction over the project area, rules that apply to this project, and permitting requirements.

Air quality throughout the project area is generally good. At times, the area does not meet air quality standards due to locally-generated and/or wind transported pollutants. The project vicinity is currently classified as a federal non-attainment area for ozone and PM-10 under national standards.

16.2 Biological Resources

Threatened and Endangered Species

The Mojave population of the desert tortoise (*Gopherus agassizii*) was listed as threatened on April 2, 1990, and the U. S. Fish and Wildlife Service (USFWS) designated critical habitat for the species on February 8, 1994. The proposed project is not located within designated critical habitat (USFWS 1994), or a BLM designated desert wildlife management area (DWMA). A survey of the proposed access route and project site was conducted according to the USFWS *Field Survey Protocol for any Federal Action that May Occur within the Range of the Desert Tortoise* (1992). No desert tortoise individuals or sign were observed during the survey. However, the remains of a desert tortoise shell were seen in the wash north of the proposed access route. Given this tortoise sign and the presence of desert tortoise habitat primary constituent elements, (i.e. cover shrubs, forage, and adequate burrowing substrate), the site is classified as Category 3, meaning low density desert tortoise habitat. See Table 1 for acres of desert tortoise habitat potentially impacted by the proposed action.

Results of density transects completed by Berry and Nicholson (1984) in the Amboy region north of the proposed project site indicate “the presence of no or few tortoises” in the area. The Amboy study plot was removed from future studies due to the fact that few or no tortoises were present.

Table 1: Acres of Desert Tortoise Habitat Potentially Affected by the Action

Area	Acres of Habitat Potentially Affected
Project Access Way	1.12
Proposed Project	0.28
Total Habitat	1.40

BLM Sensitive Wildlife and California Species of Special Concern (SSC)

1. Prairie Falcon (*Falco mexicanus*) - SSC, Le Conte’s thrasher (*Toxostoma leconteii*) – SSC.

The proposed project is within the range of these species. There is suitable nesting and foraging habitat present for prairie falcon but not for Le Conte’s thrasher. Neither bird was observed on any of the site visits.

2. Chuckwalla (*Sauromalus obesus*) – SSC, Rosy Boa (*Lichanura trivirgata*) – SSC, Mojave fringe-toed lizard (*Uma scoparia*) – SSC and BLM Sensitive.

The proposed project is within the range of these species, and there is habitat for the chuckwalla and rosy boa in broken rock areas at and adjacent to the site. Habitat is not optimum for these species, and none were seen on or within broken rock or rock face areas during examinations of the site. There is limited habitat available for Mojave fringe-toed lizard in the wash along the portion of the access route closest to the highway. However, no fringe-toed lizards were seen during surveys in the area and the habitat is not optimum for this species.

3. Pallid bat (*Antrozous pallidus*) – SSC and BLM Sensitive, Townsend's western big-eared bat (*Plecotus townsendii*) – SSC and BLM Sensitive, Pocketed free-tailed bat (*Tadarida femorosaccus*) – SSC, California leaf-nosed bat (*Macrotus californicus*) – SSC and BLM Sensitive, and Fringed myotis (*Myotis thysanodes*) – BLM Sensitive.

The proposed project is within the range of these species. Suitable seasonal foraging and roosting habitat are present near the project area. No known hibernacula or maternity roosts are present in the area.

4. Desert Bighorn Sheep (*Ovis canadensis*) – BLM Sensitive.

The following life history description is adapted from several sources including The Desert Bighorn Sheep: Its Life History, Ecology and Management (Monson and Sumner, 1990) and Mountain Sheep: A Study in Behavior and Evolution (Geist 1971).

The best estimate of the number of sheep that persisted in California during the early 1900's was 10,000, and now about 3,500 bighorn sheep are remaining (Buechner 1960, Epps *et al.* 2003). Mountain sheep populations as a whole have been on a decline across California since the 1970's when the first formal statewide evaluation of sheep numbers and distribution was made.

Both the Peninsular and Sierra Nevada bighorn sheep populations in California are federally listed as endangered. The causal factors identified as contributing substantially to their demise were loss of habitat, loss of demes within the greater population structure (i.e. within the metapopulation), and disease (USFWS 2000, USFWS 2003).

Substantial evidence in the form of trailing and beds demonstrate that bighorn sheep occurred throughout the Sheep Hole Mountains during the late 1800's and early 1900's before population estimates were available. By 1983, it was evident that sheep had been extirpated from this range. Hence, in 1985 the Department began its efforts to restore sheep to their natural distribution in this range and across the California desert.

While sheep observations have been documented since the 1930's in the Sheep Hole Mountains, a repeatable method of population census was not developed until

the 1990's, so the Department has presented numbers (see Appendix A) from this point forward in the analysis. Therefore, the goal of this project is not to increase populations to some unknown historic level.

Bighorn sheep are an indigenous species found within the Sheephole Valley Wilderness. Bighorn sheep are essentially associated with mountainous areas. Important features of their habitat include topography (elevation, slope aspect, connectivity to other mountain ranges), forage (quality and quantity), the availability of water, visibility and predation, and prevalence of disease and parasites.

Topography

Bighorn sheep use the topography of their mountainous terrain in several ways. First the topographic relief affords them greater visibility to detect predators and provides escape terrain (steep rugged terrain) to climb through to avoid predation. Sheep are seasonally associated with different types of terrain. During lambing season ewes use lambing habitat, (rugged and remote terrain), in which to give birth and sequester their lambs until they are old enough to rejoin their ewe group. During the spring, sheep may use lower areas such as washes and bajadas to forage. Sheep make daily diurnal movements to different types of topography for thermoregulation. Rams and ewes also use topographically differing habitats at different times of the year for behavioral reasons.

One crucial component of bighorn sheep habitat and its persistence are flat terrain, such as valley floors, that are used as movement corridors between adjacent mountainous regions. These corridors provide habitat linkages for intermountain movement allowing sheep access to resources (e.g., water, forage, predation avoidance) in neighboring ranges. This movement allows gene flow to occur between subpopulations and is imperative to sustain the genetic variability within the sheep metapopulation. Mountain ranges not permanently occupied or not used by sheep even yearly, are no less important and must be recognized as potential seasonal habitat and 'stepping stones' for dispersal along migratory corridors within the metapopulation.

Forage

Bighorn sheep are foraging generalists and will consume shrubs, forbs, cacti, and grasses. Their diets vary seasonally, as well as throughout their geographic range. Location, timing, quality, quantity and availability of forage are all affected by the spatial and temporal relationships between environmental factors such as temperature, precipitation, soil type, slope, aspect, and microclimate. Sheep have differing nutritional needs by gender, age, and seasons. For example, pregnant and lactating ewes have greater needs for high quality forage and water than do males. Animals may migrate over long distances seeking appropriate resources. Generally, the poorer the forage quality, the larger the area needed by sheep to meet their nutritional requirements. During times of drought, when plant moisture levels are low, sheep require more water for effective ruminating and are more closely tied to forage near water, which effectively limits their total range. Like all

ruminants, bighorn sheep do best with highly nutritious forage and therefore can be adversely affected by poor range conditions where the quality, quantity, and diversity of forage are low and water is limiting.

Water

Bighorn sheep cannot persist on metabolic water and thus must take water into their system. Taking in preformed water (e.g. dew on rocks or plants, forage moisture) when available may assist sheep in maintaining their internal water balance. However, the vast majority of sheep meet their needs by drinking water. Generally, sheep need more water during the hot, dry times of the year, but may also be found closer to water during any time of the year when environmental conditions and/or their physiological conditions are such that they need water. Numerous studies have shown that desert bighorn sheep select areas closer to water during summer than other seasons. Lactating ewes and lambs often are more dependent on water. However, these patterns have not been observed in all habitats (summarized by Andrew *et al.* 1999). During periods of high rainfall, sheep may be less strongly associated with permanent water sources and may meet a greater proportion of their water requirement with preformed water. However, during these periods, ephemeral water sources (such as tinajas) are also available and may be a more important source of free water. Some small populations apparently exist without permanent sources of water (Krausman *et al.* 1985, Krausman and Leopold 1986), but this does not mean that sheep do not require water. The preponderance of scientific writings indicate that "...most populations of bighorn sheep will drink regularly when water is available and concentrate near water during summer months, and it is likely that lack of water is a limiting factor for some populations" (USFWS 2000).

Visibility and Predation

Sheep have evolved physical and behavioral traits to help them reduce and/or avoid predation. Visibility is an important component of their habitat that affects predation risk. Sheep prefer open habitats with greater visibility and coupled with their keen eye sight, helps them to detect predators from a distance. Sheep avoid habitats (usually dense vegetation) with reduced visibility. Along with keen visual acuity they use open habitats in close proximity to "escape terrain" and use their excellent running and climbing skills to out maneuver and/or outrun predators in steep rugged areas. Predators of sheep include mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), and occasionally golden eagles (*Aquila chysaetos*). The presence of mountain lions is not documented within the proposed project area. The density of the other predators is considered to be low based on animal sightings (aerial and ground) and sign (tracks, scat, burrows). Based on direct observations, coyotes likely are the main predator upon sheep in this range. Golden eagles and bobcats may occasionally prey upon lambs.

Diseases and Parasites

Desert bighorns can suffer from numerous infectious diseases, many of which are

thought to have been contracted from domestic livestock. Diseases include those that are bacterial, viral, fungal, and parasitic in nature. The effect of these diseases on individuals and populations depends upon many factors, foremost the presence of the infectious agent, and the nutritional status of sheep, animal density, and climatic conditions. CDFG completes a wide range of biological sampling on animals that have been captured and maintains an extensive database of the results of these samples.

Sheep in this range show low exposure to diseases. Blood samples were collected from bighorn sheep translocated from the Kelso/Old Dad Peak Management Unit to the Sheep Hole Mountains in 1984, 1985, and 2000. Thirteen percent showed evidence of exposure to parainfluenza-3, two percent to bluetongue, and 39 percent to contagious ecthyma (Clark *et al.* 1985). Tests of exposure to other diseases all were negative, including fecal examinations for lungworm larvae. The availability of more water sources leads to greater animal dispersal and therefore reduces the chance of disease transmission between individuals.

See Appendix C for discussions of the history of the demise of bighorn sheep in California, the Department's implementation of metapopulation principles in order to recover California's bighorn sheep, and specific history about the Sheep Hole Mountains deme.

Survivorship and Mortality

The observed ewe numbers in this range have never met the minimum threshold for a viable deme of 50 adult ewes. Concomitantly, while there has been lamb production, the lambs did not survive to be recruited into the population. For example, as shown in Appendix A, in 2001, 15 lambs were observed. The following year, only 2 yearling ewes and 3 Class I (yearling) rams were observed. Therefore, only 5 of the 15 animals survived.

It is no coincidence that during 2001-2003, a drought period, the Department provided water to the existing guzzlers three times. While the local deme suffered a population decline, clearly the sheep were drinking all available water and having that drinking water available did help attenuate the loss of sheep.

Hunting

Hunting information is fully disclosed in the Final Environmental Document: Section 362, Title 14, California Code of Regulations Regarding Bighorn Sheep Hunting (CDFG 2005). The Sheep Hole Mountains hunt zone was opened for hunting in 2000 (see Table 2 below). Only mature males (3/4 curl or better) can be harvested.

Hunting is highly regulated and scrutinized by CDFG staff. The effect of taking of one or two rams per year from this deme has a minimal impact from a population maintenance perspective.

CDFG maintains strict standards for determining hunting tag allotments. Hunt zones are surveyed every year and the number of observed mature rams (not estimated ram numbers) is used to determine the following year's hunt tag

allotment. Should population numbers change between the survey period and the proposed hunt period (i.e. a die-off), CDFG has the authority to reduce the number of tags and/or close the hunt zone.

Table 2: Hunting Data for Sheep Hole Mountains

Hunt Year	# of Tags Issued	# of Rams Harvested
2000	2	2
2001	1	0
2002	1	1
2003	1	1
2004	1	1
2005	2	1
2006	2 Proposed	

Other Wildlife Species

Wildlife species anticipated for the area include small and large mammals, birds, and reptiles. Small mammals of this area include cottontail rabbits (*Sylvilagus auduboni*) and black-tailed jackrabbits (*Lepus californicus*). Several rodents inhabit the area, including the antelope ground squirrel (*Ammospermophilus leucurus*), and several species of pocket mice (*Perognathus* spp.) The kangaroo rat (*Dipodomys merriami*) is found in the more sandy areas. Carnivores include coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), and badger (*Taxidea taxus*). No ungulate species' sign other than bighorn sheep (*Ovis canadensis*) was noted within the proposed project area.

Avian species of the area include mourning dove (*Zenaida macroura*), Gambel's quail (*Callipepla gambelii*), common raven (*Corvus corax*) Wilson's warbler (*Wilsonia pusilla*), various sparrow species (*Spizella* spp., *Amphispiza* spp.) and other passerines common to creosote scrub and wash communities. Raptor species that may inhabit the area include red-tailed hawks (*Buteo jamaicensis*) and turkey vultures (*Cathartes aura*).

Reptiles such as western whip-tailed lizards (*Cnemidophorus tigris*), desert horned lizard (*Phrynosoma platyrhinos*), side-blotched lizard (*Uta stansburiana*), gopher snake (*Pituophis melanoleucus*), and rattlesnakes (*Crotalus* spp.) have ranges and habitat overlapping the proposed project area. No amphibians are likely to occur at this location.

Plant Species

The plant assemblage is a creosote bush-white bursage series (Sawyer and Keeler-Wolfe, 1995), which is a component of the Sonoran Creosote Bush Scrub characteristic of the Colorado Desert.

Common perennial plants found in the immediate area include creosote bush (*Larrea tridentata*), red three awn (*Aristida purpurea* var. *longiseta*), brittlebush (*Encelia farinosa*), range ratany (*Krameria parvifolia*), desert lavender (*Hyptis*

emoryi), desert milkweed (*Asclepias albicans*), white bursage (*Ambrosia dumosa*), beavertail cactus (*Opuntia basilaris*), pencil cactus (*Opuntia ramosissima*), and cholla (*Opuntia* spp.). The annual plant (wildflower) flora represents a much higher diversity of species, which are present in the spring following sufficient rainfall.

Invasive/Nonnative Plant Species

Several invasive species such as Mediterranean grass (*Schismus* sp.), Sahara mustard (*Brassica tournefortii*), beard grass (*Polypogon monspeliensis*), and red-stemmed filaree (*Erodium cicutarium*) are already established in the vicinity of the proposed project.

Wild and Free-Roaming Horses and Burros

There are no wild and free-roaming horses or burros present in the vicinity of this proposed action.

16.3 Cultural Resources and Native American Religious Values

A cultural resources records and literature search of documents and maps on file at the Needles Field Office (NFO), was conducted by the NFO Archaeologist in August 2001. A records and literature search of the project area was also conducted by the San Bernardino County Archaeological Information Center, San Bernardino County Museum, Redlands, California. The results of both records and literature searches were negative, no historic or prehistoric archaeological resources have been previously identified within, or adjacent to, the proposed project area.

Archaeological pedestrian surveys were conducted by the NFO Archaeologist on the proposed project site area on August 21, 2001 and October 12, 2005. As a consequence of the intensive pedestrian surveys one historic resource, an historic era temporary tent campsite was identified outside of the boundaries of the project area. The campsite, situated on a low-lying ridge within the large drainage at the base of the Sheep Hole Mountains, is comprised of a light metal can and debris scatter, and four to five cleared tent pads. Surface artifacts at the temporary campsite suggest that it may have been utilized sometime between 1920 and 1950. The historic campsite was, in all likelihood, occupied by workers employed at a mine prospect site situated within the unnamed canyon above the proposed water source construction location.

The existing vehicle way that provides access from the wash at the base of the Sheep Hole Mountains upslope to the proposed project location was probably constructed to provide access to the historic mining operations deep within the canyon east of the project area. A vehicle "turnout" was constructed at the base of the canyon walls adjacent to the proposed guzzler location. It is theorized that the turnout was graded on a ridge adjacent to the road to provide a means for vehicles going up or down the single lane way to turn out, or pass one another prior to entering the canyon on the single lane road.

The historic campsite is located outside of the project area. The access road and the vehicle turnout adjacent to the project area were determined to be not eligible for nomination to the National Register of Historic Places. No impacts to cultural resources are foreseen as a consequence of this proposed action.

A review of the sacred lands base data revealed no sacred or traditional resources values within the proposed project area. Accordingly, no impacts to Native American religious values are foreseen.

16.4 Environmental Justice

The highly dispersed residential community of Wonder Valley, 5-acre homesteads established in the 1950's, is located approximately five miles west of Sheep Hole Pass, however, no minority communities or low income communities are located within or adjacent to the proposed project area. The proposed action would not impact distinct Native American cultural practices or result in disproportionately high or adverse human health or environmental effects on minority communities.

16.5 Geology, Minerals, and Soils

A pre-Cenozoic sequence of granitic and metamorphic rocks dominates the Sheep Hole Mountains. The metamorphic rocks in this sequence consist of gneiss and schist with scattered inclusions or pendants of marble and quartzite. Many of the mines, prospects and mineralized areas in the Sheep Hole Mountains are associated with contact zones of the Cadiz Valley Batholith where it intrudes meta-igneous and meta-sedimentary rocks. Only small sub-economic base and precious metal vein type deposits are known to exist. Scant past mining was limited to small hydrothermal fissure fill gold veins. There has been no documented production from any mine or prospect in the Sheep Hole Mountains. The area was withdrawn from mineral entry, except for valid existing rights, with the passage of the California Desert Protection Act in 1994. Soils of the area are thin and poorly developed with boulders strewn over much of the proposed project area.

16.6 Hazardous and Solid Wastes

The proposed action is located within the 18,000 square mile Desert Training Center/California - Arizona Desert Maneuver Area, used from 1942 through 1944 for military servicemen training and weapons testing. Unexploded ordnance associated with this training area may be encountered in the project area, but none was observed in the pedestrian surveys of the project area.

16.7 Health and Safety

Numerous safety and health issues are present at the site and in association with the project: remote location and restricted access make an emergency medical

response difficult; heat stress; heavy manual material handling and rough terrain; excavation and trenching operations; chemical hazards associated with concrete operations such as dermal irritation and inhalation, noise, and biological hazards (snakes, spiders, valley fever). The nearest hospital to the proposed project site is located 24 miles to the west in Twentynine Palms.

16.8 Land Use

Livestock Grazing

The Sheep Hole Mountains are not located within a BLM grazing allotment.

Public Services and Utilities

No rights-of-way for public services or utilities are located within the project area. However, a cellular communications tower is located approximately ½ mile north of the project area.

Recreation

Recreation use within the Sheephole Valley Wilderness is dispersed and at low levels. The area is accessible throughout the year for recreation but the use season is typically from September through April. Activities include big and small game hunting, hiking, and camping. There are no developed trails or facilities within or adjacent to this wilderness area. Nearly the entire boundary is defined by vehicle routes including Highway 62, a paved 2-lane highway.

16.9 Noise

Given the proximity of the site to Amboy Road, vehicular traffic can be heard from the project site approximately ½-mile distant. In addition, occasional military and private overflights can be heard at the site at various times.

16.10 Surface and Ground Water Quality

Surface Water

No perennial streams occur in the proposed project area. Stream runoff may or may not occur during periods of precipitation. The nearest rainfall record is from the National Weather Service station in Twentynine Palms, approximately twenty miles from Sheephole Valley Wilderness (Table 3). Precipitation data from the last twelve years range from 0.58 inches to 9.88 inches, demonstrating a high variability of rainfall in the area. While the last three years of rainfall have been substantially above average, according to the Hereford *et al.* (2004), "Recent trends in Mojave Desert precipitation and the PDO [Pacific Decadal Oscillation] suggest that climate of the region may become drier for the next two to three decades in a pattern that could resemble the mid-century dry conditions". Precipitation increases significantly

with elevation in the mountain ranges of the Mojave Desert area during both winter and summer precipitation events.

Table 3 – Precipitation within the Sheep Hole – Calumet Range Area

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Annual Total
1994	0.15	0.47	0.50	0.00	0.31	0.00	0.00	1.06	0.20	0.00	0.16	0.88	3.73
1995	2.13	0.86	0.29	0.18	0.00	0.00	0.07	0.03	0.13	0.00	0.00	0.00	3.69
1996	0.05	0.03	0.12	0.00	0.02	0.00	0.49	0.37	0.00	0.03	0.25	0.06	1.42
1997	0.51	0.01	0.00	0.38	0.64	0.01	1.05	1.34	3.96	0.00	0.17	0.47	8.54
1998	0.25	1.25	0.82	0.01	0.03	0.00	0.65	0.00	0.28	0.04	0.03	0.15	3.51
1999	0.03	0.40	0.00	1.37	0.02	0.02	1.11	0.03	0.39	0.00	0.00	0.00	3.37
2000	0.02	0.33	0.16	0.00	0.00	0.00	0.00	2.28	0.03	0.47	0.00	0.00	3.29
2001	0.86	1.33	0.29	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.01	0.46	3.55
2002	0.00	0.00	0.12	0.14	0.00	0.00	0.00	0.00	0.02	0.00	0.30	0.00	0.58
2003	0.18	0.93	0.24	0.00	0.00	0.00	0.09	3.66	0.50	0.00	1.02	0.29	6.91
2004	0.14	0.92	0.76	0.42	0.00	0.00	0.00	1.02	0.07	0.38	1.32	2.13	7.16
2005	1.14	3.19	0.06	0.00	0.00	0.00	2.77	2.07	0.18	0.47	0.00	0.00	9.88
2006	0.01	0.02	0.04	0.13	--	--	--	--	--	--	--	--	0.20

Source: National Weather Service, California Department of Water Resources, California Data Exchange Center, Twentynine Palms Weather Station.

**A reading of – indicates data is not currently available.

Groundwater

Depth to ground water at the proposed site is unknown. No existing human uses of ground water occur in close proximity to the proposed site. Recharge to ground water occurs during periods of precipitation from runoff along stream courses and washes.

16.11 Visual Resources

The Sheep Hole Mountain range is a steep, boulder-strewn, granite mountain mass.

The highest elevation reaches 4,600 feet. Common landscape features include steep and rocky slopes with boulder strewn washes running down to open, flat and sandy valleys. Vegetation is a sparse and patchy element in the landscape.

The Sheephole Valley Wilderness Area falls within the definition of Visual Resource Management (VRM) Class I according to BLM Policy (H-8410-I – Visual Resource Inventory and H-8431-1 – Visual Resource Contrast Rating dated 1/17/86). The Class I Objective, as stated in H-8431-1, is “to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.” However, no provisions for VRM were incorporated into the existing land use management plan (CDCA Plan 1980).

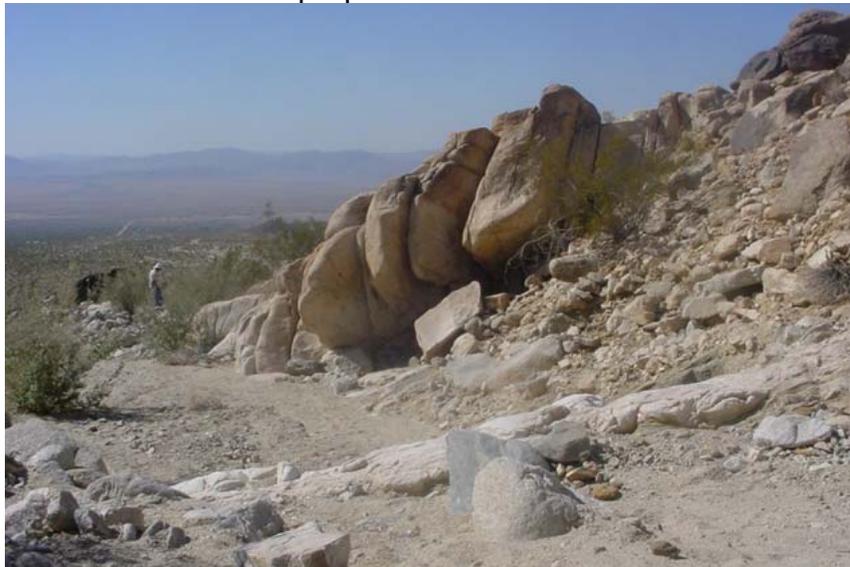
Key observation points for the proposed project include Amboy Road to the west

(Photo 1, below) and in the wash just above the proposed diversion dam (Photo 2, below).

Photo 1: Looking east from Amboy Road.



Photo 2: Above proposed location of diversion dam.



The project area is located in view of Amboy Road on the south side of Sheep Hole Pass. Observation of the site would be from viewpoints in the immediate area. The area has landscape features altered by human activity, which include an historic way to a now-abandoned mine site and the features associated with a small hard-rock mining operation.

16.12 Wilderness

Size

The Sheephole Valley Wilderness is approximately 25 miles east of Twentynine Palms, California. The western boundary follows a combination of section lines and old jeep trails and can be accessed from Amboy Road. The northern boundary is a 50' offset from the right of way of the Four Corners Pipeline. The eastern boundary is generally a 30' offset from an old jeep trail, locally known as 'Patton's Trail' and the southern boundary is a 300' offset from California Highway 62.

The Sheephole Valley Wilderness boundary encompasses 194,847 acres of land including 185,722 acres of BLM administered public lands, 2,396 acres of California State lands and 6,729 acres of private lands. The management provisions identified in the Wilderness Act and the CDPA apply only to those lands administered by the BLM.

Naturalness

This wilderness area is a perfect representation of the basin and range topography typical in the Mojave Desert. The area consists of the northwest to southeast trending granitic boulder-strewn Sheep Hole and Calumet Mountains. The Sheep Hole Mountains, the larger and steeper range, rise to an elevation of 4,613 feet, while the Calumets rise to 3,732 feet above sea level. Sheep Hole Valley lies between the two ranges. At the valley's lowest point, elevation 1832 feet, are two small dry lake beds. Sand dune formations can be found at the southwest end of the Sheep Hole range and northeastern portion of the Calumets. Dominant vegetation is typical of much of the Mojave Desert, consisting of creosote bush scrub that gradually changes into a mixed desert scrub at higher elevations.

The area lacks known permanent springs or other permanent natural water sources.

Presently, there are two large animal artificial water sources and two small animal artificial water sources within the wilderness. There are impacts from pre-wilderness designation mining activities, including approximately 57 miles of pre-designation vehicle tracks within the wilderness. Upon designation (1994) there were a total of 34 individual vehicle access ways into the wilderness of which 28 have received restoration treatments. Restoration efforts occurred on approximately one mile of the vehicle ways bringing the existing distance of vehicle ways within the Sheephole Valley Wilderness to approximately 56 miles. CDFG currently uses approximately 14 miles of these vehicle ways for motorized access to the five existing artificial water sources (two large animal and two small animal water sources). Vehicle use on the remaining 42 miles of un-restored vehicle ways is prohibited. Impacts from mining activity include several adits, mine tailings and at least one abandoned mine site. With the exception of existing vehicle ways, old mining impacts and the five artificial water sources the Sheephole Valley Wilderness is being managed consistent with the definition of wilderness in Section 2c of the Wilderness Act, "...retaining its primeval character and influence, without permanent improvements or human habitation which is protected and managed so

as to preserve its natural condition...”

The proposed artificial water source would be on the northwest side of the Sheep Hole Mountains. It would be located in a narrow granitic rock and sand wash, approximately 80 feet wide, with steep and rocky side slopes that support little vegetation, at an elevation of approximately 2,000 feet. The wash egresses directly onto the bajada above the Dale Lake area. An abandoned mining way exists that leads to a small abandoned mine with features at and within one mile of the proposed site. The site is about 0.5 mile from Amboy Road, a paved two-lane road between Amboy and Twentynine Palms. Vehicular noise can be heard from Amboy Road at the proposed site.

The Sheephole Valley Wilderness has been difficult to close to illegal vehicle use. Gates, barriers, boundary signing, and restoration treatments have been installed or completed by the Needles Field Office to prevent the illegal use of approximately 57 miles of vehicle ways. In addition, vehicle way restoration has occurred on 28 individual sites removing approximately one mile of vehicle ways along the Wilderness boundaries. These measures have been damaged and/or removed by unknown individuals. Vehicle ways into the wilderness continue to be used illegally. Illegal cross country motorized vehicle use (motorized vehicle use other than on existing vehicle ways) in wilderness also occurs. Education, boundary signing and an active law enforcement presence are the primary tools used to prevent this illegal cross country motorized use.

At least three low level military flight paths exist above the wilderness with military overflights occurring routinely throughout the year. Private and commercial overflights occur on a less frequent basis.

CDFG conducts activities in the wilderness related to desert bighorn sheep management. These activities include the inspection and maintenance of the existing artificial water sources twice annually and an annual aerial overflight for population census. In addition, there have been three releases of translocated bighorn sheep and one bighorn sheep radio collaring operation in the last 20 years.

Opportunities for solitude or a primitive and unconfined type of recreation

The Sheephole Valley Wilderness provides outstanding opportunities for solitude due to its size, few impacts from human use and irregular topography which helps screen and isolate visitors. Low level military overflights occasionally interrupt opportunities for solitude.

Actual wilderness-based recreation is light but there are ample opportunities for a primitive and unconfined type of recreation. Hunting, hiking, target shooting, and rock hounding are the most common recreational activities. A Special Recreational Use Permit for bighorn sheep hunting is issued annually in the area. The area attracts a small number of upland game hunters, primarily hunting for quail. Twelve square miles (approximate) of the area within the wilderness are well-documented as traditional collection and hunting area for the Twentynine Palms Band of the

Chemehuevi Indians.

Special Features

Bighorn sheep and desert tortoises are found in this wilderness and as BLM sensitive species and federally listed threatened species, respectively, are special features within this wilderness. Special features, such as bighorn sheep, are important supplemental wilderness values that help define the area as wilderness. The presence of bighorn sheep is symbolic of the Sheephole Valley Wilderness ecosystem's health.

17. ENVIRONMENTAL CONSEQUENCES: Proposed Action

17.1 Air Quality

The project's excavation activities would generate small amounts of PM-10 emissions for the few day period of construction. The operation of engines to power the backhoe, cement mixer, and trucks would generate unknown levels of particulate and other emissions during the period of construction. However, due to the short period of construction and minimal maintenance activities the quantity of PM-10 and other emissions would be minimal. Control measures are not necessary to reduce emissions. The proposed action would not exceed de minimus emission levels and no further conformity determination is necessary. No impacts are anticipated regarding air quality for the proposed action.

17.2 Biological Resources

Threatened and Endangered Species

The habitat is not optimal for desert tortoises (Category 3), and their densities are low near the project site. Adherence to mitigation measures would avoid or minimize impacts to desert tortoises. If future maintenance activities involve mechanized equipment, most of the same mitigation measures would be applied.

Impacts to desert tortoises due to the creation of a permanent water source are also expected to be minimal. While some tortoise mortalities have been associated with small game water sources (Hoover 1995), CDFG monitoring of DWU-style water sources has revealed no tortoise mortalities (Andrew *et al.* 2001).

It has been speculated that raven densities would increase around artificial water sources in the desert, which may be problematic as some ravens are known to prey on juvenile tortoises (USFWS 1994). However, ravens exist in low densities (approximately 2 per 100 transect miles compared to 40 per 100 transect miles in the West Mojave Desert) in this portion of the desert (FaunaWest Wildlife Consultants 1989a, 1989b). Most ravens in the area were found near a landfill at Amboy which the BLM cleaned and covered in 2002. The observed low density of ravens is also supported by CDFG water source photography data from eastern

Riverside and Imperial Counties. Photographs collected from 1995 to 2005 show the presence of ravens in only 19 of 11,187 wildlife photos (N. Andrew, CDFG, in preparation). Neither is there evidence that raven densities have increased around artificial water sources per se nor that the construction of this water source would result in greater raven numbers.

BLM Sensitive Wildlife and California Species of Special Concern (SSC)

1. Prairie Falcon (*Falco mexicanus*) -- SSC, Le Conte's thrasher (*Toxostoma lecontei*) – SSC.

Temporary disturbance could cause avoidance of the area by prairie falcons during construction. Nesting may be disrupted or nest sites abandoned if noise or activities occur during the breeding season. Project scheduling should be modified if nests are present within ¼ mile of the project area. Frequency and activity levels associated with monitoring and maintenance activities are low and not expected to affect prairie falcons. Desert water developments are known to provide a source of drinking water for lagomorphs and birds (Andrew *et al.* 2001). Availability of this food source could attract prairie falcons.

2. Chuckwalla (*Sauromalus obesus*) – SSC, Rosy Boa (*Lichanura trivirgata*) – SSC, Mojave fringe-toed lizard (*Uma scoparia*) – SSC and BLM Sensitive.

While the proposed project is within the range of these species, habitat is sub-optimal and none of these species were detected during examinations of the site. Should these species be present during construction, temporary displacement could occur. Maintenance and monitoring may have a temporary minimal effect upon individuals. Notable disruptions in foraging and or breeding behavior are not anticipated due to short duration of site visits. The introduction of a water source is not anticipated to affect these species.

3. Pallid bat (*Antrozous pallidus*) – SSC and BLM Sensitive, Townsend's western big-eared bat (*Plecotus townsendii*) – SSC and BLM Sensitive, Pocketed free-tailed bat (*Tadarida femorosaccus*) – SSC, California leaf-nosed bat (*Macrotus californicus*) – SSC and BLM Sensitive, and Fringed myotis (*Myotis thysanodes*) – BLM Sensitive.

Given that construction, monitoring, and maintenance of the water source would occur during the day, and these species are all crepuscular or nocturnal, there would be no impacts to bat species from these activities. The creation of a permanent water source may be beneficial to these species (Rosenstock *et al.* 2004) as it would attract insects and serve as a foraging location for bat species.

4. Desert Bighorn Sheep (*Ovis canadensis*) – BLM Sensitive.

Under the proposed action, the construction phase of this project would last up to five days for the initial placement of the structures. This disturbance may temporarily displace sheep to other portions of the range.

Maintenance and monitoring activities could result in temporary disturbance of bighorn. Monitoring would not entail the use of a vehicle; however, maintenance may require mechanized equipment if an unforeseen problem develops. Human disturbance associated with monitoring would not exceed two days per year. DWU-design water sources infrequently require maintenance. Accordingly, impacts due to maintenance are anticipated to be minimal.

The development of this project would benefit sheep in three ways. The first benefit would be an expansion in the amount of habitat available to sheep. By providing dispersed water sources to bighorn sheep, individual and herd dispersal should occur and allow access to otherwise unused range on varying spatial and temporal scales. This is expected to result in herd expansion with associated beneficial effects such as increased probability of emigration and immigration allowing for more stable demographic conditions. Also, because of more dispersed water sources, sheep will have more access to greater amounts of forage by simply being able to move to additional water sources and their adjacent habitats to forage.

Habitat modeling by Bleich *et al.* in 1992 clearly demonstrates that there is sufficient habitat in the Sheep Hole Mountains area to support more sheep. Marshal *et al.* (2005) quantified forage impacts by ungulates and found that native ungulates do not negatively impact forage near water sources.

A second benefit would be the lessening of adverse effects due to catastrophic water system failure by providing an alternate water source within walking distance to sheep. In addition to greater system reliability, sheep access to more dispersed water sources, during times of poor environmental conditions, will aid in their survival.

A third benefit would result from the sheep's increased ability to more fully digest food as a result of having water available for this purpose. Bighorn sheep require water to digest the material in their rumen. If forage plants have high moisture content it may be sufficient, without additional free water consumption, for efficient digestion. During conditions of poor forage quality (e.g. low forage moisture) sheep need to drink more water to extract greater nutrition (protein) from that forage and to simply maintain their internal water balance to avoid succumbing to dehydration and possible death.

More dispersed populations are less prone to the potential devastating effects of disease outbreaks and other stochastic events. The chance of disease transmission between individuals decreases as the animals become increasingly dispersed across the landscape. As stated previously, water quality of guzzlers is not an issue with regard to disease transmission (Bleich *et al.* 2006).

While negative effects of water sources have been hypothesized by some, they have not been substantiated by research (Rosenstock *et al.* 2004). Misconceptions about water sources regarding predator abundance and predation, competition, water quality, wildlife diseases, wildlife mortality etc. have been addressed by several researchers (Ballard *et al.* 1998, Leslie and Douglas 1979, Rosenstock *et*

*al.*1999, Rosenstock *et al.* 2004, Bleich *et al.* 2006) and have not been born out as problematic. Additional research in these areas is on-going.

The Sheep Hole Pass area on Amboy Road and areas along Highway 62 (to the south of the range) serve as important movement corridors between demes. The corridors facilitate genetic exchange between demes. Encouraging sheep movement is a fundamental purpose of this proposed water development, since intermittent genetic exchange is critical to a metapopulation's viability. However, sheep are occasionally killed crossing highways in the desert, including the Sheep Hole Pass area. Past investigations show that mortality rates on roads in the Mojave Desert are very low (CDFG, unpublished data), and the benefits of genetic exchange outweigh the loss of a few individuals. Moreover, movements among demes in a metapopulation provide opportunities for recolonization if a deme should become extirpated, and fulfill a fundamental requirement for persistence of metapopulations.

Other Wildlife Species

The project may result in mortality and/or displacement of small mammals such as kangaroo rats (*Dipodomys* sp.) and deer mice (*Peromyscus* sp.), which have burrows adjacent to some construction areas. Other small wildlife species, such as snakes, lizards and small bird species could be impacted both directly and indirectly as a result of an increase in vehicular travel associated with the proposed project. Small birds, reptiles, and mammals, especially bats, would be expected to benefit from a permanent water source within an area where no permanent water presently exists or has existed in the past.

Predation

Questions about predator densities and distribution relative to water sources have been addressed and answered by researchers, such as Rosenstock *et al.* (2004). Coyotes are the most likely predators to be found in this range. Rosenstock *et al.* (2004) found that radio collared coyotes were no more likely to be found at water sources than other random points in coyote habitat. The impact of new water sources relative to predation on bighorn sheep is expected to be minimal.

Plant Species

No threatened or endangered plants have been identified at the site. Therefore no significant adverse effects from construction are anticipated. Perennial and ephemeral plants present at the site could be utilized by bighorn sheep as forage. Construction activities, including use of vehicles, could affect existing vegetation along the proposed route. However, as the wash access would be flagged prior to construction activities, plant impacts along the access route are expected to be minimal.

In Africa, where there are thousands of herding ungulates, some investigators recorded high levels of vegetation impacts near water sources. This is not so in

California. Past studies have addressed foraging questions and have found that sheep have little impact on vegetation used as browse and forage (Wehausen and Hansen 1986). Marshal *et al.* (2005) specifically looked at vegetation near water sources in the Sonoran desert in California and failed to measure any impact to vegetation by native ungulates attracted to water sources.

Invasive/Nonnative Plant Species

Seeds of invasive or nonnative species may be introduced during activities involving soil disturbance. Equipment may also inadvertently transport seeds. If invasive or nonnative species become established as a result of this proposal, impacts to native plant communities in the area may reduce natural biodiversity.

Adherence to the mitigation measures would result in minimal impacts.

Wild and Free-Roaming Horses and Burros

The proposed action is not within an established Herd Management Area and no wild and free-roaming horses or burros are known to be present in the area. Accordingly, no impacts are anticipated regarding wild and free-roaming horses and burros in association with the proposed action.

17.3 Cultural Resources and Native American Religious Values

Driving vehicles up and down the access way would not have an effect on the historical integrity of the access. The temporary mining campsite at the base of the Sheep Hole Mountains would be avoided by project design, and would not be impacted as a consequence of the proposed project.

A review of the sacred lands base data revealed no sacred or traditional Native American Values within the proposed project area. No impacts to Native American Religious Values are foreseen.

17.4 Environmental Justice

The proposed action would not impact distinct Native American cultural practices or result in disproportionately high or adverse human health or environmental effects on minority communities.

17.5 Geology, Minerals, and Soils

No impacts are anticipated regarding minerals or the general geology in regard to the proposed action.

Soils

During the construction the B (surface layer) and C soil horizons would be excavated. The subsurface soils would become disturbed by equipment use, and

the very small fine textured soils would be susceptible to accelerated wind erosion and surface runoff from storm events. There would be some change in the soil surface profile, which may increase the potential for soil erosion. Due to the short period of construction activities stabilization of the disturbed area will occur naturally in a short period of time. Erosion is expected to be minimal and mitigation for the disturbance would not be required. Soil contamination by hydraulic fluids, oils, or other lubricants may occur.

17.6 Hazardous and Solid Wastes

The proposed action would utilize construction equipment that uses fuels, oils, and lubricants. While routine use of this equipment should not result in the generation of hazardous wastes, use of the construction equipment presents the potential for a fuel, engine oil or lubricant release to the environment during construction activities. However, the action's proposed spill prevention and containment measures sufficiently address potential impacts.

The site-specific health and safety plan sufficiently addresses measures to be taken in the event that unexploded ordnance is encountered.

17.7 Health and Safety

The proposed action sufficiently addresses health and safety provisions. The proposed action is supported by health and safety procedures and controls addressing hazard recognition and mitigation, communications, and emergency response and California Title 8 Regulations).

17.8 Land Use

Public Services and Utilities

No impacts associated with the proposed action are anticipated regarding public services and utilities.

Recreation

Impacts to recreation visitors are anticipated to be low during and after construction activities due to low visitor use levels. Impacts would be most noticeable to visitors during construction, inspection, maintenance, and re-filling activities. At other times, the low visibility of the completed facility would leave it unnoticed to most observers.

If the proposed action results in increases in wildlife populations within the vicinity of the artificial water sources, it is anticipated that wildlife viewing and hunting opportunities would be improved.

17.9 Noise

Motorized vehicles, heavy excavation equipment, including the associated attachments (such as the hydraulic chisel hammer), hand tools, and the gasoline-powered concrete mixer used in the project's construction would increase noise levels in the wilderness for five days. Sound levels of the vehicles and construction activities would vary according to distance from the site and weather conditions, but could be expected to be in excess of 105 decibels at the site near the operating equipment and cause temporary displacement of wildlife and disrupt the solitude of the area.

Sounds from post-construction activities, such as non-routine maintenance, if needed, would be less than those associated with the construction phase. Routine maintenance would not create substantial noise levels. Monitoring inspections would be non-intrusive, as personnel would walk in to the site.

17.10 Surface and Ground Water Quality

Surface waters

The diversion dam would collect water from less than half of the ephemeral channel width. The maximum volume of water that would be captured at any time would be 12,500 gallons if the drinker and tank were completely empty prior to a precipitation event. Experience with other similar drinkers with storage tanks in similar environments has shown that water collected remains in the drinker and tank for a substantial period of time and they are seldom completely empty. All diverted water in excess of a full drinker and tank would overflow back to the drainage. During small precipitation events little water would be captured by the drinker as little runoff would occur and most would percolate into the stream bed. During larger precipitation events where runoff occurs, only a very small portion (less than 12,500 gallons) of the total runoff of the local watershed would be diverted and captured by the drinker.

The impoundment behind the diversion dam and the drinker tank would allow settling of some sediment from ephemeral flows. The disturbed area would be expected to stabilize naturally in a short period of time and would not contribute appreciably to increased sediment transport. No impacts to stream flow or water quality are anticipated.

Groundwater

Minimal impacts are anticipated.

17.11 Visual Resources

Most of the structures associated with the DWU-style water source are underground or at ground level. The 10,000 gallon water tank will be completely buried with only a small vent tube exposed, the 2,500 gallon drinker will be buried and exposed just above ground level, the diversion dam will be constructed with rocks from the

immediate vicinity and by cement, and any exposed water supply piping will be painted to blend in with the environment. After installation the site is to be reshaped to a natural contour. Vehicle tracks along the access route within the wash are to be raked out once the project is completed. The S.D. water source itself would not be visible from Amboy Road. A visitor to the Photo 2 location may notice a very low level of change to the landscape characteristics. Overall changes to the characteristic landscape will not attract attention. For these reasons the S.D. water source will meet the VRM Objectives as provided by BLM Policy.

A Geographic Information Systems (GIS) viewshed analysis (Figure 2) determined that the proposed project is in the line of sight from 653 acres or approximately 0.3% of the wilderness.

17.12 Wilderness

Size

The size of the Sheephole Valley Wilderness would not be affected as no lands would be added or removed.

Naturalness

The proposed action would impact the naturalness of the Sheephole Valley Wilderness in three ways: 1) the addition of a permanent man-made structure within the wilderness; 2) the additional use of vehicles and motorized equipment within the wilderness, and 3) the addition of an artificial water source to an environment primarily affected by natural processes.

The construction activities would impact naturalness in the immediate vicinity of the project. The proposed project would disturb approximately 0.9 acres of wilderness lands including the access route and construction site. The impact would be greatest during the construction activities where heavy equipment and personnel would disturb vegetation, move rock and earth, construct a water diversion of cement/rock, and compact soils. Once construction has been completed and the post-construction activities implemented as proposed, the installation would be visible from portions of the wilderness but not substantially noticeable as the site would be recontoured and raked to match the surrounding area.

The proposed action would result in the creation of about 0.5 mile of new vehicular tracks on the existing vehicle way. These tracks, especially the 0.25 mile within the wash, would be clear and deep. However, this would only be during the five days of construction. Law enforcement personnel would be present during construction to ensure no illegal vehicle use occurs. After the construction period the vehicle tracks will be raked out. Creation of a well-defined way would not be expected. Overall, illegal vehicle use in the Sheephole Valley Wilderness is not expected to change as a result of this project because the wash tracks would be obliterated and the bajada route would be blocked.

Opportunities for solitude or a primitive and unconfined type of recreation

The construction phase would involve a maximum five day period of impact to the opportunity for solitude within the wilderness 1.4% ($5 \div 360 \times 100=1.4\%$) of the time annually for the first year only. Personnel monitoring the S.D. artificial water source would hike into the site twice annually. Maintenance would occur on an infrequent basis and may include vehicle access. Impacts to opportunities for solitude due to maintenance would therefore be minimal, less than 1% annually. Monitoring by foot is not a wilderness impact, since it is no different from allowable hiking use for recreation.

Legal use of motorized vehicles by CDFG (and/or its agents) in this wilderness reduces opportunities for solitude. Currently, motorized vehicles or equipment are used for monitoring, maintenance/repair and/or refilling of existing artificial waters within this wilderness an estimated 5-10 days per year. The SD site would not require vehicle access for monitoring as CDFG (or their agents) would walk in for monitoring purposes. Vehicle access to the SD site for maintenance and/or repair would be expected to occur once a year on average. Operations to manually refill existing artificial water sources when they are dry have occurred in the past. There have been a total of five helicopter flights to fill existing artificial water sources from 2000 - 2006. Re-filling by CDFG or its agents would be expected to be infrequent (maximum three times per decade) for the SD site. Sheep population surveys and other activities using helicopters impact the opportunity for solitude an estimated additional two days per year.

The current estimate, should the SD site be developed, would be a total of between 10-15 days each year, or 2-4% of the time annually, when opportunities for solitude are impacted by authorized vehicle use in support of all artificial water sources within the Sheephole Valley Wilderness.

Within the Sheephole Valley Wilderness it is estimated that there are at least two unauthorized vehicle incursions per month, or 24 days per year. The proposed project is not expected to contribute to illegal vehicle use as mitigation measures would block the road with boulders as it leaves the wash and CDFG (or their agents) would be required to rake out their vehicle tracks in the wash after any legal vehicle entry. Impacts on opportunities for solitude by illegal vehicle use are an estimated 7% of the time annually.

CDFG generally makes motorized vehicle trips into wilderness for the management of water sources for game species. One exception to this may be to investigate bighorn sheep mortality or monitor the health of a population. Trips of this nature are neither planned nor proposed and seldom ever occur. BLM is prohibited from driving into wilderness unless there is an emergency need involving the health and safety of persons within the area.

A GIS viewshed analysis (Figure 2) determined that the proposed project site is in the line of sight from 653 acres or approximately .3% ($653 \div 194,847 \times 100=.3\%$) of

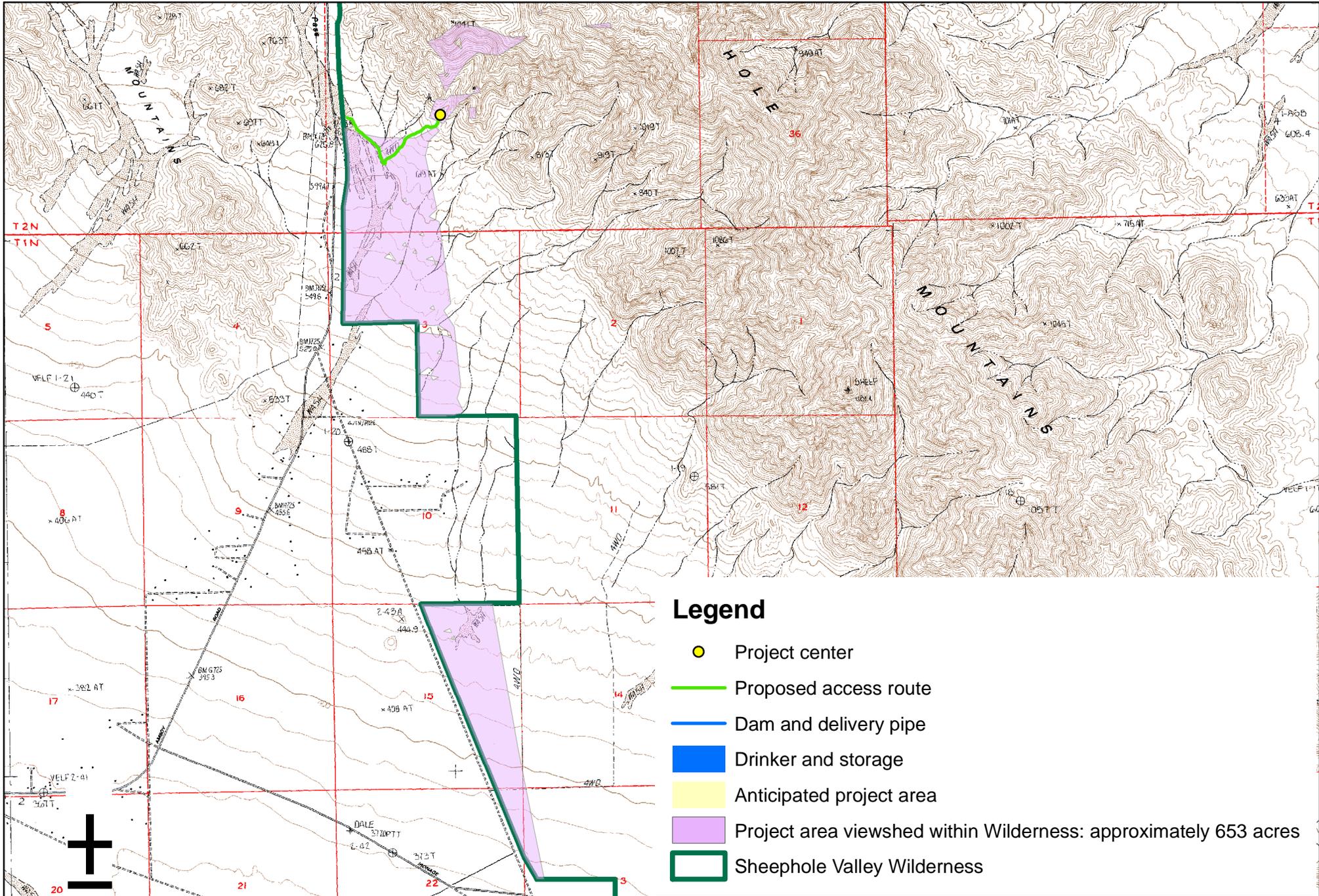
the entire Sheephole Valley Wilderness. The 653 acre viewshed, calculated employing ArcGIS software, represents a maximum acreage of the potential line of sight. If impacts on opportunities for solitude by vehicle use in the wilderness is estimated to total 36 days ($34+39\div 2=36$ average days) a year then the estimated likelihood of vehicle use within the project viewshed (and corresponding impacts on opportunities for solitude) is .03% of the time annually or one day a year (.3% of wilderness in viewshed x 10% of time vehicles are within wilderness).

Special Features

The anticipated affects on bighorn sheep are beneficial. The proposed action would be expected to insure the long term survival of this symbolic desert animal which provides important supplemental wilderness values for the Sheephole Valley Wilderness. Supplemental values in wilderness are defined as "...ecological, geological, or other features of scientific, educational scenic, or historical value." In the Sheephole Valley Wilderness, a viable population of bighorn sheep is a critical supplemental value. Bighorn sheep populations roamed the Sheep Hole Mountains and nearby mountain ranges before human presence and development began to intrude into the area. A visitor to the area could view the vast slopes of the mountain range and catch a glimpse of these large ungulates on the steep slopes. The undisturbed nature of the terrain in the Sheep Hole Mountains, combined with the knowledge of the clear tendency of bighorn to avoid human contact, added to the perception of the area as remote and untrammelled by humans.

The return of the bighorn, in a viable, more consistently viewable population will return the feeling that humans are visitors and that the wilderness area is untrammelled by man. The ability to view bighorn sheep will reinforce the perception that the area is affected primarily by the forces of nature.

SD Guzzler Project Viewshed In Wilderness



Legend

- Project center
- Proposed access route
- Dam and delivery pipe
- Drinker and storage
- Anticipated project area
- Project area viewshed within Wilderness: approximately 653 acres
- Sheephole Valley Wilderness

0 0.5 1 2 Miles

Bighorn populations contribute to the biodiversity of the wilderness, and may play a key role in the ecosystem through their role as large herbivores, their creation of trails, and their occasional availability as prey and food for scavengers. Maintenance and restoration of bighorn in the Sheep Hole Mountains will beneficially impact the adjoining wilderness areas in Joshua Tree National Park and other ranges managed by BLM where the sheep may disperse.

No adverse effects on the desert tortoise are anticipated.

18. ENVIRONMENTAL CONSEQUENCES: No Action Alternative

The Proposed Action would not be undertaken as designed and the existing environment would be unchanged. Existing management and use of the site would continue subject to applicable statutes, regulations, policy and land use plans.

Biology

Bighorn sheep populations are closely related to forage availability, but are also affected by habitat quality, the numbers of breeding adults (especially females), and rates of reproduction, recruitment and mortality. The addition of permanent water sources can increase the range, hence forage availability to the sheep, and in turn partially offset the negative effects of low forage quality. No new water sources would be available under the No Action alternative

Bighorns would continue to use forage resources as available to them. Thus their use of the range would be based on forage condition (quality and quantity), its proximity to accessible drinking water as dictated by their physiological condition, as well as environmental conditions. During periods of higher winter and summer precipitation across the range, more of the habitat would be available to them and presumably ephemeral drinking water sources. During periods of drought, low rainfall and/or "spot rainfall" less of the range would be available, and bighorn sheep would be more closely associated with the two locations of existing permanent water sources.

During longer periods of good range conditions sheep are likely to be of better health and such vigor would translate into greater reproduction and survival, less mortality and could result in an increase in population. With an increase in population, the probability of deme survival is increased. If population criteria were met, this population would be considered as a source for sheep for possible relocation. The likelihood of population increases in the local deme sufficient to become a source for translocation without additional water sources is low.

During periods of low precipitation conditions, sheep would utilize forage that is available in closer proximity to existing water sources. If poor range conditions are related to persisting drought conditions, the likely outcome would be weakened animals, poor or no reproduction, increased mortality and a resultant decrease in

population size. The probability of deme persistence and emigrations would likewise decrease which would affect persistence probabilities for the metapopulation as a whole. As noted earlier, this area of the California desert is expected to become warmer and drier over the next twenty years (Epps *et al.* 2003, Hereford *et al.* 2004).

The BLM, as per current agreement, would remain responsible to ensure that both existing artificial water sources, the Suds Hole and the Bear Claw guzzlers, contain adequate water year round.

The Department's management goals for Sheephole Valley Wilderness to create the opportunity for better utilization of the range, increase the distribution of sheep across the range, and expand the availability of permanent water would not be achieved.

Wilderness

Size

The size of the Sheephole Valley Wilderness would not be affected by adopting this alternative.

Naturalness

The impact on the naturalness of the Sheephole Valley Wilderness would not change in the short term if this alternative is adopted. The long term impacts to naturalness due to a change (reduction or extirpation) in bighorn sheep populations are unknown. Loss of the small extant population of bighorn sheep would mean loss of one of the special features of wilderness.

Opportunities for solitude or a primitive and unconfined type of recreation

The impact to opportunities for solitude would not be affected by adopting this alternative. The impacts to primitive types of recreation (wildlife viewing and hunting opportunities) would decrease according to bighorn sheep population declines.

Special Features

The anticipated effects on bighorn sheep, which are considered a special feature of the Sheephole Valley Wilderness, would be reduced opportunities for utilization of the range and limiting the distribution of bighorn sheep across the range. This alternative could result in higher bighorn sheep mortality during prolonged droughts. The reduction or extirpation of bighorn sheep would diminish supplemental wilderness values of the area. Under the no action alternative there would be no expected impacts to desert tortoise.

Other Resources

No other resources are anticipated to be impacted by the No Action Alternative.

19. MITIGATION: Proposed Action

The activities described in this section are the responsibility of the CDFG unless otherwise specifically noted.

19.1 Air Quality

No mitigation measures are required.

19.2 Biological Resources

Desert Tortoise

Activities associated with the proposed action would comply with the following provisions from the Programmatic Biological Opinion on Small Disturbances in Desert Tortoise Habitat (1-8-97-F-17).

In the following measures, a “qualified biologist” is defined as a trained wildlife biologist who is knowledgeable concerning desert tortoise biology, tortoise mitigation techniques, tortoise habitat requirements, identification of tortoise sign, and procedures for surveying for tortoises. Evidence of such knowledge may include one or more of the following: employment as a field biologist working on desert tortoise or successful completion of a contract dealing with desert tortoise fieldwork. Attendance at the training course sponsored by the Desert Tortoise Council would be a supporting qualification.

An “authorized biologist” is defined as a wildlife biologist who has been authorized to handle desert tortoises. An authorized biologist must be approved by the USFWS, the CDFG and the BLM.

a. The project proponent shall designate a field contact representative (FCR) who will be responsible for overseeing compliance with protective stipulations for the desert tortoise and for coordination on compliance with the BLM. The FCR must be on-site during all project activities. The FCR shall have the authority to halt all project activities that are in violation of the stipulations. The FCR shall have a copy of all stipulations when work is being conducted on the site. The FCR may be a crew chief or field supervisor, a project manager, any employee of the project proponent, or a contracted biologist.

b. All employees and/or volunteers of the project proponent who work on-site shall participate in a tortoise education program prior to initiation of field activities. The project proponent is responsible for ensuring that the education program is developed and presented prior to conducting activities. New employees and/or

volunteers shall receive formal, approved training prior to working on-site. The employee education program must be received, reviewed, and approved by the BLM Field Office at least 15 days prior to the presentation of the program. The program may consist of a class presented by a qualified biologist (BLM or contracted) or a video. Wallet-sized cards or a one-page handout with important information for workers to carry are recommended. The program shall cover the following topics at a minimum:

- distribution of the desert tortoise,
- general behavior and ecology of the tortoise,
- sensitivity to human activities,
- legal protection,
- penalties for violations of State or Federal laws,
- reporting requirements, and
- project protective mitigation measures.

c. Only biologists authorized by the USFWS, CDFG, and the BLM shall handle desert tortoises. The BLM or project proponent shall submit the name(s) of proposed authorized biologist(s) to the USFWS for review and approval at least 15 days prior to the onset of activities. No activities shall begin until an authorized biologist is approved.

d. The area of disturbance shall be confined to the smallest practical area, considering topography, placement of facilities, location of burrows, public health and safety, and other limiting factors. Work area boundaries shall be delineated with flagging or other marking to minimize surface disturbance associated with vehicle straying. Special habitat features, such as burrows, identified by the qualified biologist shall be avoided to the extent possible. To the extent possible, previously disturbed areas within the project site shall be utilized for the stockpiling of excavated materials, storage of equipment, and parking of vehicles. The qualified biologist, in consultation with the project proponent, shall ensure compliance with this measure.

e. No access road shall be bladed to the project site. Access to the project site shall be restricted to the route described in the project description. After project completion the wash route shall be rehabilitated by raking.

f. Desert tortoises may be handled only by the authorized biologist and only when necessary. In handling desert tortoises, the authorized biologist shall follow the techniques for handling desert tortoises in "Guidelines for Handling Desert Tortoises during Construction Projects" (Desert Tortoise Council 1996).

g. The authorized biologist shall maintain a record of all desert tortoises handled. This information shall include for each tortoise:

1. the locations (narrative and maps) and dates of observations;
2. general condition and health, including injuries and state of healing and whether animals voided their bladders;
3. location moved from and location moved to;

4. diagnostic markings (i.e., identification numbers or marked lateral scutes);
5. slide photograph of each handled desert tortoise as described in previous measure.

h. No later than 90 days after completion of construction or termination of activities, the FCR and authorized biologist shall prepare a report for the BLM. The report shall document the effectiveness and practicality of the mitigation measures, the number of tortoises excavated from burrows, the number of tortoises moved from the site, the number of tortoises killed or injured, and the specific information for each tortoise as described previously. The report may make recommendations for modifying the stipulations to enhance tortoise protection or to make it more workable. The report shall provide an estimate of the actual acreage disturbed by various aspects of the operation.

i. Upon locating a dead or injured tortoise, the project proponent or agent is to notify the BLM Field Office. The BLM must then notify the Ventura Field Office of the USFWS by telephone within three days of the finding. Written notification must be made within five days of the finding, both to the appropriate USFWS field office and to the USFWS Division of Law Enforcement in Torrance. The information provided must include the date and time of the finding or incident (if known), location of the carcass or injured animal, a photograph, cause of death, if known, and other pertinent information.

An injured animal shall be transported to a qualified veterinarian for treatment at the expense of the project proponent. If an injured animal recovers, the appropriate field office of USFWS should be contacted for final disposition of the animal.

The BLM shall endeavor to place the remains of intact tortoise carcasses with educational or research institutions holding the appropriate State and Federal permits per their instructions. If such institutions are not available or the animal's remains are in poor condition, the information noted above shall be obtained and the carcass left in place. If left in place and sufficient pieces are available, the BLM (or its agent) shall attempt to mark the carcass to ensure that it is not reported again. Arrangements for disposition to a museum shall be made prior to removal of the carcass from the field.

j. Except on county-maintained roads, vehicle speeds shall not exceed 20 miles per hour through desert tortoise habitat.

k. Workers shall inspect for tortoises under a vehicle prior to moving it. If a tortoise is present, the worker shall carefully move the vehicle only when necessary and when the tortoise would not be injured by moving the vehicle or shall wait for the tortoise to move out from under the vehicle.

l. No dogs shall be allowed at a work site in desert tortoise habitat.

m. All trash and food items shall be promptly contained within closed, raven-proof containers. These shall be removed daily from the project site to reduce the

attractiveness of the area to ravens and other tortoise predators.

n. Project proponents shall stockpile any vegetation grubbed or bladed from the project site and access road. Following completion of the project, the access road and project site (if a temporary disturbance) shall be recontoured to approximate pre-project condition and the stockpiled vegetation randomly spread across the recontoured area.

o. During excavation of trenches or holes, earthen ramps will be provided if possible, given Occupational Safety & Health Administration regulations, to facilitate the escape of desert tortoises or other wildlife species that may inadvertently become entrapped. Periodic inspections of trenches and holes will be made to ensure that desert tortoises have not become trapped. If desert tortoises are found within the trench and will not utilize ramps for escape, an authorized biologist will remove the tortoise from the trench by hand, if possible. Final inspections will be made of open trench segments immediately before backfilling. All open pipe segments will be covered when work activity is not occurring at the site.

p. During monitoring of the artificial water source, any tortoise sign near the water will be noted. Desert tortoise sign and/or any use of the water source by desert tortoises will be reported to the Needles Field Office.

Bighorn Sheep

a. The artificial water source should be monitored at least two times per year for water level and maintenance needs. A report of each inspection should be submitted to the BLM California Desert District Office and Needles Field Office.

b. Bighorn mortalities should be necropsied when possible and the results submitted to the BLM California Desert District Office and Needles Field Office.

c. If studies show increased mortalities of bighorn sheep along roadways, CDFG will consider additional management actions (i.e. signs, education).

Prairie Falcon

a. A survey for nesting prairie falcons shall be conducted prior to project initiation. Project scheduling should be modified if nests are present within ¼ mile of the project area.

Invasive/Nonnative Species

To avoid the spread of invasive/exotic plants, tools should be cleaned before use at each site.

To prevent the transport of invasive, non-native plant species to and from the site the following actions should be taken.

- The crew should spray the tires of the vehicle before entering and leaving the site.
- Before entering and leaving the site, all clothing should be checked and any plant material that may contain invasive non-native plant seeds should be removed.

19.3 Cultural Resources and Native American Religious Values

1) Tent pads and associated areas of the temporary mining camp site in proximity to the proposed use areas should be avoided when accessing the site.

2) At locations where there is rock drywall shoring along the access road, it shall be left intact and undamaged.

19.4 Geology and Soils

No mitigation measures are required.

19.5 Hazardous or Solid Wastes

All costs associated with hazardous materials/waste cleanup (including contaminated soils) should be borne by CDFG.

19.6 Health and Safety

Adherence to the site-specific health and safety plan, and California Title 8 Regulations is required.

19.7 Land Use

“Dig Alert” should be contacted (1-800-227-2600) prior to project initiation.

19.8 Surface and Ground Water Quality

Surface Water

No mitigation measures are required.

Groundwater

No mitigation measures are required.

19.9 Wilderness

Availability to the access route utilized during construction shall be blocked and signed from all unauthorized vehicles.

CDFG staff and volunteers shall be trained on the regulations governing wilderness and on the importance of preventing wilderness incursions after installation of the guzzler.

20. RESIDUAL IMPACTS

20.1 Air Quality

No residual impacts are anticipated.

20.2 Biological Resources

The proposed action is anticipated to have a positive affect on bighorn sheep populations by assuring that water levels within the guzzlers are maintained. As bighorn continue to disperse and move throughout the Sheep Hole Mountains due to this water source, the residual effects of increased forage utilization within the area would be minimal. Wehausen and Hansen (1986) found high utilization of forage species by bighorn to be evident only within close proximity of springs preferred by bighorn and insignificant forage utilization only a short distance from the water source.

20.3 Cultural Resources and Native American Religious Values

No residual impacts are anticipated.

20.4 Geology, Minerals, and Soils

No residual impacts are anticipated.

20.5 Hazardous or Solid Wastes

No residual impacts are anticipated.

20.6 Health and Safety

No residual impacts are anticipated.

20.7 Land Use

No residual impacts are anticipated.

20.8 Noise

Displacement of wildlife is expected to be temporary and not expected to last for more than two weeks after completion of the project.

20.9 Surface and Ground Water Quality

Surface Water

No residual impacts are anticipated.

Groundwater

No residual impacts are anticipated.

20.10 Environmental Justice

No residual impacts are anticipated.

20.11 Visual

Due to the design of the DWU-style water source, residual impacts will meet the VRM Objectives as provided by BLM Policy. Visual impacts will be less noticeable over time to the point where the site will not draw the attention of casual visitors.

20.12 Wilderness

Size

Residual impacts will have no effect on the size of the wilderness.

Naturalness

Once construction is completed and the reclamation measures implemented as proposed, the installation would be noticeable, but not dominant. Once the vegetation in the wash and on the re-created slopes covering the underground tank has recovered, the visibility would be considerably reduced. The rock dam, exposed metal-flex pipes at the dam, the vent pipes for the storage tank, and the concrete steps and aprons in front of the walk-in drinkers would remain visible but would be painted to blend in with the existing environment. Although a GIS viewshed analysis (Figure 2) determined that 653 acres of wilderness are in line of site of the artificial water source site, the actual acreage where a visitor could discern impacts would be far less.

The pre-existing vehicle way used to access the artificial water source site will have a residual impact on the naturalness of the wilderness. After installation and reclamation measures are completed vehicular traffic on the access route for maintenance is expected to occur only once or twice every two to three years. This will, to some limited extent, prevent the route from reverting to a truly natural condition, but it is not expected to substantially change from the existing conditions.

Opportunities for solitude or a primitive and unconfined type of recreation

The construction phase would involve up to a 5-day period of impact to the opportunity for solitude within the wilderness. In the second and subsequent years, the proposed action would add no more than an estimated one day per year (on average) of vehicular use for maintenance.

Refill actions are not expected to occur more than once every three years. A water pumping truck parked outside the wilderness with a hose-lay extending to the artificial water source would be used if a refill is needed.

Within the Sheephole Valley Wilderness it is estimated that there are at least two unauthorized vehicle incursions per month, or 24 days per year. The proposed project is not expected to contribute to illegal vehicle use as mitigation measures would block the road with boulders as it leaves the wash and CDFG (or their agents) would be required to rake out their vehicle tracks in the wash after any legal vehicle entry. Impacts on opportunities for solitude by illegal vehicle use are an estimated 7% of the time annually.

After installation the proposed action is not expected to result in more than 1-2 days (less than .5% of the year) when opportunities for solitude are impacted by additional vehicle use, both authorized and unauthorized, within the wilderness.

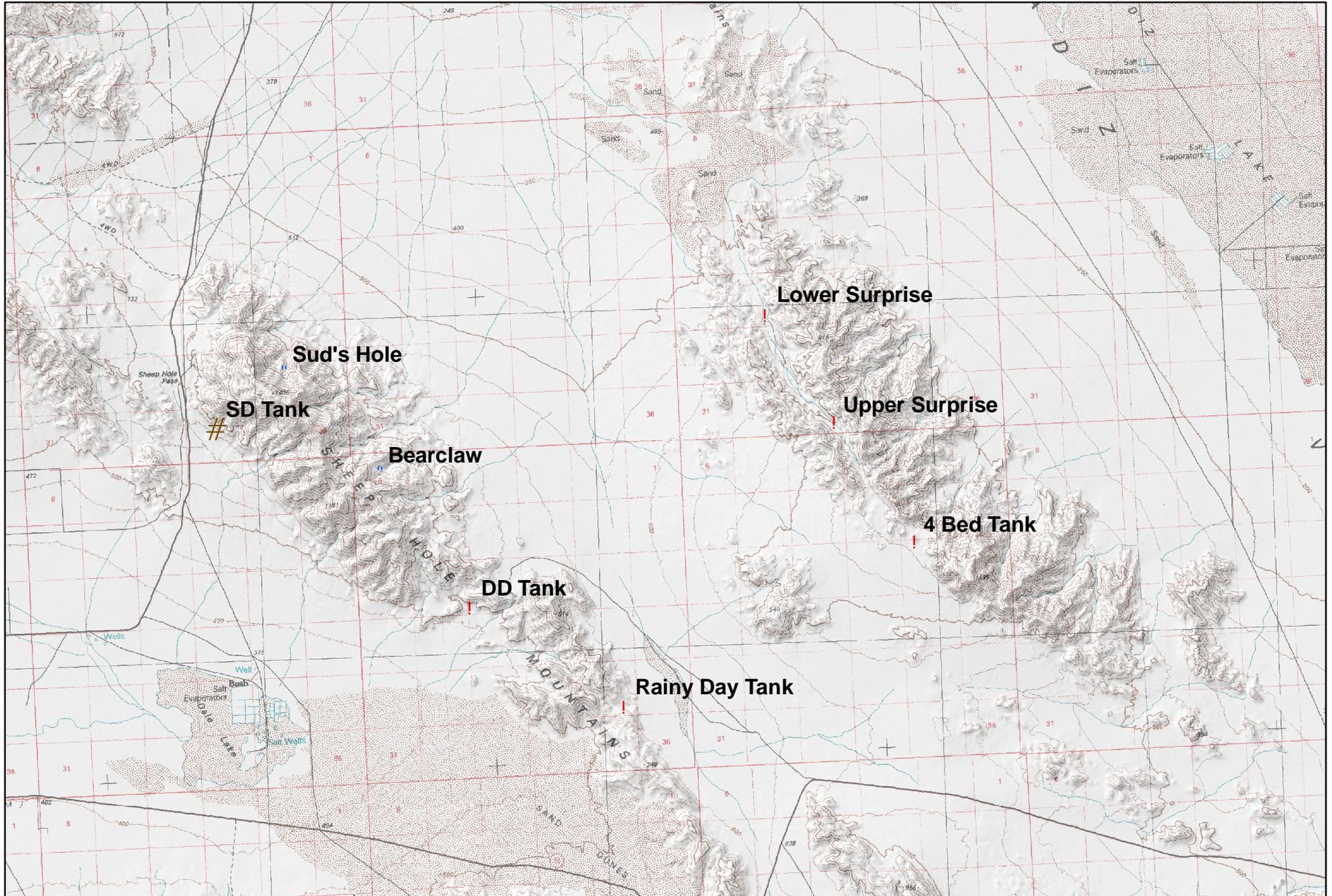
Special Features

Residual impacts to desert bighorn sheep are positive. There are no expected residual impacts to desert tortoise.

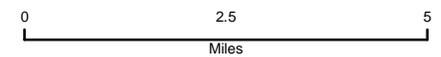
21. CUMULATIVE IMPACTS

Among the past, present and reasonably foreseeable future actions considered in the cumulative effects analysis are the future water sources in the Sheephole Valley Wilderness identified by CDFG as necessary or desirable for maintenance of the local bighorn deme. The number and locations of these potential future projects are illustrated on Map 2 and described in Appendix B to this EA.

Existing, Proposed and Anticipated Water Sources for Sheephole and Calumets Mountains



" Existing guzzler location # Proposed guzzler location ! Anticipated guzzler location



Source: California Department of Fish and Game, 2005

Approval of the SD Guzzler will not foreclose BLM's options with regard to these additional guzzlers which are discussed below. BLM will continue to retain the option of selecting the No Action alternative for any or all of the additional guzzlers. BLM also continues to retain the option of developing ways to mitigate the impacts to wilderness of any future proposed guzzlers.

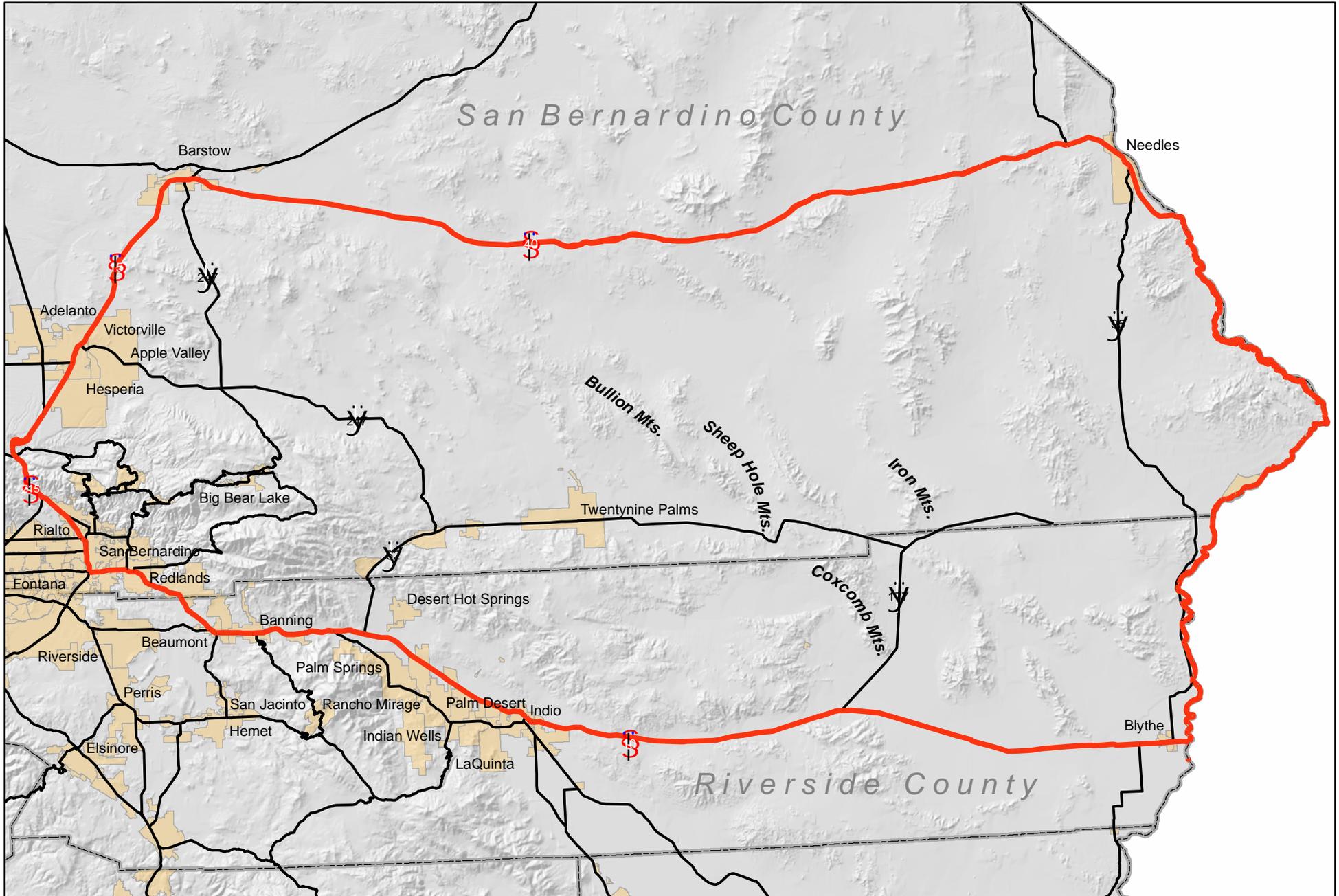
The impacts analyzed in this section are conceptual as impacts from a reasonably foreseeable development scenario because the site-specific details of each additional guzzler are not yet completed. The purpose and need of these additional guzzlers would continue to be to support restoration and enhancement of bighorn sheep in the cumulative effects area, as defined below. As these new projects are proposed in detail by CDFG, BLM will analyze potential ways to mitigate the impacts of each of the proposed guzzlers on a site-specific basis in a separate EA and reanalyze cumulative impacts based on the SD guzzler as an existing facility. The results of new bighorn and wilderness monitoring would also be included in a revised cumulative impacts analysis.

Regional Perspective

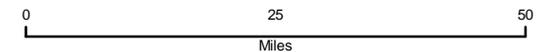
Cumulative effects analysis for the SD guzzler begins with analysis of the Southern Mojave Sheep Metapopulation (SMSM) area. The metapopulation area includes approximately 7.7 million acres of land located within San Bernardino and Riverside Counties in Southern California (Map 3). Almost all (80%) of the SMSM is publicly owned and managed by a federal or state agency. The Bureau of Land Management (BLM) is the primary agency responsible for management of public lands containing the SMSM and has stewardship for 55% of these lands. Other federal agencies with management responsibilities include the National Park Service – Joshua Tree National Park (10%), the Forest Service – San Bernardino National Forest (5%), Department of Defense – Marine Corps Air Ground Combat Center (MCAGCC) - Twentynine Palms (8%), and the Fish and Wildlife Service (0.1%). Each agency manages according to its long-term plan. The BLM-managed lands in the metapopulation area are governed by several separate regional land use plans or plan amendments. Twenty-eight percent of the SMSM is within federally designated wilderness areas established by the California Desert Protection Act (CDPA) in 1994.

The biological justification for the proposed action is summarized in Appendix B of this EA, "South Mojave Metapopulation Overview and Management Objectives for the Sheep Hole - Calumet Mountain Subpopulation." Although CDFG has suspended work on the bighorn sheep metapopulation plans, this appendix will serve as the equivalent of a metapopulation plan.

South Mojave Bighorn Sheep Metapopulation Boundary



- South Mojave Bighorn Sheep Metapopulation Boundary
- Major Road
- Major City



Source: California Department of Fish and Game, 2005

The SMSM area contains 25 mountain ranges and/or mountain range complexes that historically supported sheep populations. Sheep populations in 7 of these ranges have been extirpated, 2 populations have been restored, and 1 has been augmented. Fifteen mountain ranges contain native populations (Epps, *et al.* 2003).

In 2003, the SMSM was estimated to be between 738 and 1396 sheep (Epps, *et al.* 2003).

Five of the twenty-five mountain ranges within the southern portion of the SMSM area provide the most likely opportunities for dispersal and intermountain movement of sheep as a result of the proposed action and other reasonably foreseeable projects. These ranges include Sheep Hole, Calumet, Bullion, Pinto and Coxcomb Mountains as identified in the West Mojave Plan (page 3-168). The five-mountain portion of the SMSA is referenced in this EA as the SD Cumulative Effects Area (SDCEA).

The remaining 20 mountain ranges within the SMSM are too far removed from the Sheep Hole Mountains, and future CDFG guzzler projects beyond the five identified in this EA on Map 2 and in Appendix B are too uncertain to include in the cumulative effects analysis. Prior to considering any future CDFG guzzler proposals in these 20 ranges, however, BLM will review the cumulative impact analysis of this EA and update as necessary to reflect new information.

The geographic boundary for the biological analysis of cumulative effects on the SDCEA was defined using data of occupied and unoccupied bighorn sheep mountain ranges provided by CDFG (NECO page H-4 and WEMO Evaluation Report). These maps were developed using radio telemetry and other field data. Corridors between these five mountain ranges were also included for this analysis. This area includes 402,789 acres of public lands.

Time Frame for Analysis

Implementation of the proposed and reasonably foreseeable actions would achieve the purpose and need of the CDFG objectives for this cumulative effects area within a 5-10 year period; 5-10 years is the length of time needed to detect an increase in sheep populations to reach target numbers. This time frame is based in part on the fact that female sheep, in general, produce only one lamb per year and do not become sexually mature until their second year of life.

Many factors affect population growth including forage availability and quantity, mortality rates (disease, predation) and weather condition (especially drought). Any one of these conditions could overwhelm and /or negate the positive impacts of water and thus population growth would take longer to detect than the 5-10 years used as a time frame for this analysis.

The construction of the water sources would affect the population of sheep in the Sheep Hole Mountains first and then the Calumet Mountains. Over the next 5-10 years, given good conditions, an increase in the Sheep Hole population would encourage dispersal into Bullion and Coxcomb Mountains.

Sheep Populations in SDCEA

The 2006 helicopter survey of the Sheep Hole Mountains tallied 44 animals. In the past five years, the number of bighorn sheep counted has ranged from 44 to 77; the estimated number ranged from 62 to 125. Estimates were not available in two years (Appendix A). Prior to November, 1984, the population was estimated at 12 bighorn sheep. In 1984, CDFG, with the assistance of BLM personnel, transplanted 11 sheep from the Old Dad Mountains into the Sheep Hole Mountains. Sixteen additional sheep were transplanted in 1985 and four more were transplanted in 1992. Current populations could increase 5% annually under the proposed and reasonably foreseeable actions (Nancy Andrew, CDFG, personal communication).

Sheep were extirpated from the Pinto Mountains and the Bullion Mountains. In 1992, CDFG reintroduced 20 sheep into the Bullion Mountains. The current number of animals (25) would increase 15% during the 10 year time period. The Coxcomb Mountains support a native population of less than 25 sheep and would increase 15% in the ten year time period. While no new bighorn sheep water developments are proposed for the Pinto and Coxcomb Mountains within Joshua Tree National Park (Michael Vamstad, JTNP, personal communication), plans to refurbish the drinkers in the Coxcomb Mountains (Coxcomb Adit and Coxcomb Guzzler), within the Park are being prepared for 2007 (Nancy Andrew personal communication). The CDFG will be working with Twentynine Palms MCAGCC to develop plans for installation of a new guzzler in the Bullion Mountains in 2007-2008 (Nancy Andrew, personal communication).

Past and Present Activities

Past and presently on-going actions and activities within the SDCEA include past and present mining activities. The Minerals Industry Location System, MILS, lists 145 mining claims, of which 37 are within SDCEA wilderness areas. Past and present military training and weapons testing include: California Arizona Maneuver Area – Desert Training Center circa 1942-44 and Desert Strike circa 1964; and the active Marine Corps Air Ground Combat Center at 29 Palms, California); and military over-flights. Other past and presently on-going actions and activities include: rural development in Wonder Valley, civilian aircraft over-flights, on and off highway vehicle use on designated routes (~303 miles within the SDCEA of which ~172 were within wilderness areas and are presently closed), concentrated and dispersed recreational use (i.e. camping, hiking, hunting), 7 artificial large animal water sources of varying design, 6 artificial small animal water sources, CDFG vehicle access to monitor and maintain the artificial water sources, CDFG helicopter use for game management purposes, NPS and BLM aircraft use, limited or restricted access to military, National Park Service, BLM and private lands, and wildland fire suppression activities.

Past and presently on-going actions and activities within the Sheephole Valley Wilderness Area more specifically include: historic mineral exploration, World War II

military training and weapons testing, two large animal artificial waters consisting of above-ground plastic storage tanks with a New Mexico style drinker (Bear Claw and Suds Hole), two artificial small animal water sources, vehicle access (14 miles of vehicle ways) by CDFG and volunteers to monitor and maintain the artificial water sources, military and civilian aircraft over-flights, CDFG helicopter use to conduct population census, capture bighorn sheep for data collection and radio collar installation, and monitoring and maintenance (including refilling) of existing artificial water sources, dispersed and group recreational use (i.e. camping, hiking, hunting), limited access and use of 6,729 acres of private lands, and BLM aircraft use for wilderness monitoring. The historical disturbances were present prior to wilderness designation and do not contribute to the cumulative effects on naturalness.

Individual effects of each of these past actions are difficult to reconstruct, but most had the effect of disturbance to bighorn in their formerly secure lambing, foraging, watering and dispersal behavior. Direct persecution may have resulted from early miners or later poachers. The net effect of past and present activities has been a deterioration of the natural environment. However, portions of former roads have become obscured by natural processes and by restoration activities. Bighorn sheep have established a tenuous foothold in the wilderness, aided by the re-introductions and existing guzzlers. Few manmade structures or old roads are visible. To today's recreational user, nearly the entire Sheephole Valley Wilderness appears relatively pristine.

Foreseeable Future Activities

Aside from the construction and maintenance of five additional artificial large animal water sources within the Sheephole Valley Wilderness and the one additional guzzler in the Bullion Mountains (Twenty-nine Palms MCAGCC) there are no other reasonably foreseeable future actions projected in the SDCEA.

Cumulative Effects

The primary cumulative impacts of past, present and reasonably foreseeable future activities would be on biological resources and on wilderness values.

Biological

There are six artificial small animal water sources in the SDCEA, three in the Sheep Hole Mountains, and three in the Pinto Mountains. These waters are used primarily by quail, doves, passerines, and small mammals. The design of small animal guzzlers precludes access to larger animals, including bighorn sheep.

Two artificial large animal water sources (Bear Claw and Suds Hole) are present in the Sheephole Valley Wilderness. Suds Hole was constructed in 1983, and Bear Claw was constructed in 1994, prior to the wilderness designation. These artificial water sources took, on average, two days to construct with approximately 50 people and involved the use of helicopters and other motorized equipment. The construction impacts (i.e. use of motorized equipment, personnel camping in the

area, soil disturbance) of these projects are no longer visible at either site. Both water sources are used extensively by bighorn sheep, as indicated by pellet transects, ground observations, and aerial telemetry, and have also been utilized by other wildlife species in the area. These artificial waters have been instrumental in sustaining bighorn sheep and have encouraged some dispersal of this deme by expanding habitat use. Differences between these two artificial waters include storage capacity, location, microclimate, and collection ability. Bighorn sheep have at times been concentrated around Suds Hole during periods when Bear Claw had no water. The additional S. D. big game guzzler is anticipated to aid in sheep dispersal and lessen or temper the effects of poor habitat during dry conditions. This water source would also be used by other wildlife species in the Sheep Hole Mountains.

There are three artificial large animal water sources in the Coxcomb Mountains: Coxcomb Guzzler, Coxcomb Adit, and Russi's Rock Guzzler. The Coxcomb Adit, and Russi's Rock Guzzler are functional. Coxcomb Guzzler is non-functional. Joshua Tree National Park has been monitoring bighorn sheep use of these water sources for the past two years. No use has been documented (Michael Vamstad, JTNP, personal communication). CDFG is currently working on a plan to refurbish Coxcomb Guzzler and Coxcomb Adit. Although no proposal is under consideration at present, refurbishment of these guzzlers is anticipated to facilitate population growth of the Coxcomb Mountain deme and aid in future dispersal of sheep within the SDCEA.

There are two artificial large animal water sources in the Bullion Mountains, Guzzler 1 Cleghorn built in 1991 and modified in 1999 and Guzzler 2 Bullion built in 1999, on lands administered by the Twentynine Palms MCAGCC. Both guzzlers have remote sensor cameras installed to document use. Numerous sheep have been documented using the Cleghorn 1 guzzler, including a collared sheep that originated from the Sheep Hole Mountains. No photos of have been taken of sheep utilizing the Guzzler 2 Bullion. Other wildlife using the guzzlers includes doves, bobcats, coyotes, roadrunners, and ravens (Martin Husung, MCAGCC, personal communication). CDFG is working with the Marine base to develop one additional artificial large animal water source within this mountain range. This guzzler is anticipated to facilitate population growth of the Bullion Mountain deme and aid in future dispersal of sheep within the SDCEA.

The incremental impact of the S. D. guzzler, when added to the past actions concerning water sources (seven guzzlers in three mountain ranges, of which five are used by bighorn) would be beneficial because it will reduce the demand on the existing water sources and will distribute the bighorn within the mountain ranges. This will allow the sheep to utilize additional forage and is expected to increase dispersal. Past construction of highways, spread of disease from domesticated sheep, and unregulated hunting has limited the ability of the bighorn sheep to disperse and has limited their numbers, and the additional water source will serve to mitigate the negative cumulative effects of these past actions.

The incremental impact of the S. D. guzzler, when added to the reasonably

foreseeable future actions concerning water sources (five additional guzzlers within the Sheephole Valley Wilderness) is also beneficial to bighorn sheep because these water sources would be dispersed, allowing for utilization of forage throughout the Sheep Hole and Calumet Mountains, and would create increased opportunities for dispersal.

Biological degradation, including substantial ground disturbance, increase of non-native plants, or increase of ravens or non-native wildlife has not been documented at any of the water source locations in the Sheep Hole, Bullion, or Coxcomb Mountains. Therefore, biological degradation is not anticipated from the incremental impact of one additional guzzler. Degradation is not expected from the S. D. guzzler even with the potential installation of the five future projects slated for the Sheep Hole and Calumet Mountains, or the one project slated for the Bullion Mountains.

Wilderness Impacts

The long-term survival of desert bighorn sheep is important in the SDCEA. Desert bighorn sheep are a symbol of the desert wilderness for many people both past and present (prehistoric rock art depicts desert bighorn sheep). The loss of desert bighorn sheep would diminish the wilderness character of the area. The cumulative impacts associated with the development of artificial large animal water sources would be consequential, both as a benefit to wilderness from the restoration of bighorn sheep and from the cumulative impacts to opportunities for solitude.

Wilderness lands within the SDCEA fall under the jurisdiction of the National Park Service (Joshua Tree National Park) and the BLM. Management of wilderness lands differs between the two agencies because of small differences in the language of the California Desert Protection Act governing each agency. The BLM allows CDFG (and/or its agents) motor vehicle use in wilderness to access artificial water sources for monitoring and maintenance while the NPS does not. In the SDCEA the number of existing big game guzzlers is five (two in the Sheephole Valley Wilderness Area (BLM) and three in Joshua Tree National Park Wilderness). These artificial water sources were developed prior to wilderness designation in 1994.

The presence of permanent man-made structures within wilderness is prohibited unless they are “necessary to meet minimum requirements for the administration of the area” under purposes of the Wilderness Act. The proposed action has been determined to meet BLM guidelines for the minimum necessary requirement to administer the wilderness because the persistence of bighorn sheep cannot be assured without the supplemental water. The CDFG assessment of the habitat requirements necessary for a viable deme in this metapopulation and the need to mitigate the effects of past human disturbances on bighorn sheep in the region necessitate the man-made structure. The bighorn sheep are a special feature of wilderness that provides important supplemental values to the Sheephole Valley Wilderness.

The reasonably foreseeable future projects could result in six structures in the Sheephole Valley Wilderness. The use of the DWU design would place the majority of structures below ground. This design along with the remote location would allow the landscape to appear in a natural state and unaltered by human activity after the impacts associated with initial construction have faded. BLM would determine the minimum necessary requirement for any future water source installations separately, based on the site-specific situation.

Currently, 14 of the 57 miles of existing vehicle ways are used in the inspection and maintenance of artificial waters in the Sheephole Valley Wilderness. The proposed action would add 0.5 mile of existing vehicle tracks that would be used by vehicles an estimated average of once a year for maintenance purposes. The monitors will walk in to the site. The way will be blocked with rocks to help insure that vehicle access occurs only for necessary maintenance purposes. Such necessary maintenance trips, utilizing motor vehicle access, would require advance BLM approval.

Each additional artificial large animal water source would require construction activities similar to that of the proposed action. If design and construction are conducted in a manner similar to the SD proposal the total area of disturbance for the 5 additional large animal water sources would be approximately 30 acres (24.2 miles of access route [27.8 acres] plus 1.5 acres to include all construction sites).

Each would require regular inspection and maintenance and may require water delivery during extended periods of drought. This would result in increased operation of ground vehicles or aircraft within the wilderness and the establishment of additional intermittently used vehicle ways within the wilderness. Construction equipment may be needed at the sites to repair damage by natural events. Construction of five additional large animal water sources would result in use of vehicles on an estimated 24 miles of new or existing vehicle tracks. The cumulative total would be an estimated 37 miles of vehicle tracks used by motorized vehicles within the wilderness on at least a semi-annual basis. Therefore, the use of vehicles in wilderness is anticipated to increase over time. In addition, each additional artificial water source would require approximately 5 days for construction and installation. Cumulatively this would amount to a minimum of 25 days where heavy equipment and work crews would be working in wilderness and interrupting opportunities for solitude.

If a total of eleven artificial large animal water sources (five existing, the S.D. proposal, and five potential future sites) were established in wilderness within the SDCEA, the authorized vehicle use in the two (NPS and BLM) wilderness areas would be expected to more than double to approximately 22-34 trips a year (two monitoring trips per guzzler, one maintenance trip per guzzler per year and an unknown number of refill trips during drought years). The total number of unauthorized vehicle entries into wilderness may also increase. If each access route was signed, barricaded, gated or disguised, illegal vehicle access could be limited; however, it is still estimated that illegal access would occur approximately 2-4 times a month or 24 - 48 days a year, assuming no illegal access occurs in the

Park. This estimate is based on anecdotal information provided by BLM rangers, BLM staff and volunteers. No estimates are available for illegal use within JTNP. Illegal access is not necessarily for the purpose of visiting the guzzlers.

Past weather patterns and management actions indicate it is likely that there would be future refill actions for the artificial water sources. If a total of eleven big game guzzlers were ultimately installed, refill actions could increase to a level four times greater than at present. Opportunities for solitude are currently compromised for approximately 35-39 days each year. Construction of five more guzzlers would result in additional activity for 12-18 days per year for inspection and maintenance. Activity resulting from additional research or management activities regarding bighorn sheep is estimated to add four days per year. Refill actions (expected to be an infrequent activity, i. e. 3 refills per guzzler every decade) for the eleven artificial large animal water sources are anticipated to add 3 to 15 days per year. However, it is not known if the guzzlers in Joshua Tree National Park would be refilled. It is estimated that there would be 2-4 illegal vehicular incursions per month overall or 22-48 days a year. As a result, it is estimated that the cumulative impacts could reduce opportunities for solitude from between 78-124 days, or between 21% - 34% of each year. This impact would apply where visitors may encounter evidence of or actual vehicle use within the boundaries of the Sheephole Valley or Joshua Tree National Park Wilderness Areas. These impacts are limited to specific locations and times and would not impact all visitors.

The potential cumulative impacts to unconfined or a primitive type of recreation are varied. The existence of eleven water sources within wilderness areas may detract from the naturalness of specific areas but may increase opportunities for wildlife viewing and hunting. Additional water sources may encourage visitors to explore new areas and increase time spent within wilderness.

Within the SDCEA, if all six of the potential large animal artificial water sources within the Sheephole Valley Wilderness were constructed, there would be a consequential cumulative effect on the area's wilderness characteristics. To the extent that the structures and access routes are visible, this effect is detrimental. The additional opportunity to view bighorn sheep in the wilderness areas as a result of the additional water sources is a very beneficial cumulative impact.

The adverse impacts to wilderness described above will not be realized with the construction of the first water source, the S. D. guzzler. They are based on the completion of the fifth additional guzzler, which would result in the realization of all of the access and activities that are projected. The incremental impact of the S. D. guzzler is small, since it involves a short access way that will be closed, walk-in monitoring, a short construction period, and it is not very visible. Construction of the remaining identified water sources in the Sheep Hole Wilderness is far from certain because of the potential for consequential impacts identified above. As these new guzzlers are proposed in detail by CDFG, BLM will analyze potential ways to mitigate the impacts of each on a site-specific basis in a separate EA and will reanalyze cumulative impacts to wilderness values.

22. CONSULTATION AND PUBLIC NOTIFICATION

22.1 Agency Consultation

The BLM is applying the Programmatic Biological Opinion for Small Disturbances in Desert Tortoise Habitat in the California Desert 1-8-97-F-17 (BO) to the S.D. artificial water source project, which has a disturbance of 1.4 acres, most of which is along a primitive historic roadway and on a rocky slope, which are unsuitable as desert tortoise habitat. Suitable habitat is found along the access route, which traverses 0.25 mile of desert tortoise habitat, before accessing the primitive way. The Small Disturbance BO form and Location Map were mailed to the USFWS on May 20, 2003 from the District Office for a 30 day review. Following their review, no response to the Bureau's application of the BO was received from USFWS. Accordingly, pursuant to the biological opinion's section D, Project Reporting, the project is approved.

22.2 Public Notification

Notification of the proposed action and analysis has been prominently posted in the Needles Field Office public area and on the Field Office web site during the environmental review process. Both the public area posting and the office web site home page note that public participation is the cornerstone of the National Environmental Policy Act process and encourage public involvement in the office's review of uses proposed on public lands. The web site main page provides a link to projects currently under environmental review.

A Notice of Proposed Action (NOPA) CA690-05-0 was mailed to members of the public and other agencies who have expressed interest in proposals affecting wilderness. The NOPA was mailed on September 2, 2005 and generated seven responses. One response from the California State Lands Commission expressed no comment. One individual commented on the need for more environmental documentation. Support of the proposed project was expressed by the Foundation for North American Wild Sheep and one individual. Two individuals responded with opposition. Another letter of opposition was received from California Wilderness Coalition, Center for Biological Diversity, Defenders of Wildlife, Desert Survivors, Natural Resources Defense Council, The Wilderness Society, and Wilderness Watch.

The Proposed Action was mailed to other agencies and members of the public who expressed interest in proposals affecting wilderness. The Proposed Action was mailed on March 21, 2006 and generated 11 comment letters or electronic messages, of which nine were in favor and two were opposed. The comment letters were received from:

- Eight individuals – Seven letters in favor, one opposed.

- One bighorn sheep volunteer group – In favor. Society for the Conservation of Bighorn Sheep.
- One recreation group – In favor. Gear Grinders 4WD Club, Inc.
- One coalition of environmental groups – Opposed. California Wilderness Coalition, Center for Biological Diversity, Defenders of Wildlife, Desert Survivors, Desert Protective Council, Natural Resources Defense Council, Sierra Club, The Wilderness Society, Wilderness Watch.

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25. APPENDICES

Appendix A: Sheep Hole Mountains Sheep Survey Data 1997-2005

Appendix B: South Mojave Metapopulation Overview and Management Objectives for the Sheep Hole-Calumet Mountains Subpopulation

Appendix C: The Demise of Mountain Sheep: A Brief History of California's Bighorn Sheep Populations and Department Efforts in the Sheep Hole Mountains