

# 6. Cumulative Impacts<sup>1</sup>

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## 6.1 Introduction

This chapter addresses potential cumulative impacts to the environment that could be associated with implementation of the build alternatives for the Boulder City/U.S. 93 Corridor Study in concert with one or more other past, present, or reasonably foreseeable future actions or projects. Specifically, this chapter is prepared in accordance with the requirements of NEPA and guidance from the federal CEQ, *Considering Cumulative Effects under the National Environmental Policy Act*. The CEQ regulations define a “cumulative impact” for purposes of NEPA as follows:

Cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR §1508.7).

This cumulative impacts chapter gives emphasis to the actions or projects that are likely to cause adverse cumulative impacts (i.e., projects that would occur relatively close to the project site). For other transportation projects in the region, this analysis focuses primarily on the potential impacts of reasonably foreseeable future actions. The impacts of past and present actions are also discussed but in less detail and in a more qualitative manner.

## 6.2 Cumulative Impacts Analysis

### 6.2.1 Other Actions/Projects Included in the Cumulative Impacts Analysis

The following criteria were considered in identifying those past, present, or reasonably foreseeable projects that could result in cumulative impacts to the area’s resources:

- Projects that have an application for construction and/or operation pending before an agency with permit authority
- Projects that are listed on the Nevada STIP
- Projects that have the potential to generate environmental impacts that, when addressed collectively with the proposed project, could result in cumulative impacts to the environment
- Projects that are of a similar character, could affect similar environmental resources (resource base), or are located in geographic proximity to the proposed project

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<sup>1</sup> Major portions of this chapter were excerpted and modified from *U.S. 93 Hoover Dam Bypass Final Environmental Impact Statement* (FHWA, January 2001).

## 6.2.2 Scope of the Cumulative Impacts Analysis

The geographic limits and range addressed in this analysis vary according to the nature and characteristics of each environmental resource. Two geographic areas are defined to categorize this analysis. A description of each follows:

1. The first area is the vicinity of the proposed project and includes the northern portion of Boulder City, covering approximately 85 km<sup>2</sup> (33 square miles), the City of Henderson, and adjacent federal lands and mountainous terrain forming the northern limit of the Eldorado Valley.
2. A second area encompasses the remaining portion of Boulder City land to the south (a total of 344 km<sup>2</sup> [133 square miles]), as well as the surrounding unincorporated desert region of the Eldorado Valley within Clark County, Nevada. This geographic area is used to include a broader range of other projects and environmental resources well beyond the immediate vicinity of the proposed project.

## 6.2.3 Timing and Duration of Other Actions/Projects

For each of the projects addressed in this analysis, the time period in which it would be implemented, including construction and operational phasing, is defined. Information on the timing and duration for the other projects was obtained from applicant proposals, when available. When this information was not available and could not otherwise be obtained through reasonable efforts (e.g., direct contact with applicants), professional judgment was used to estimate a reasonable time frame to complete the regulatory review and permit issuance processes needed for implementation of the other projects.

## 6.2.4 Future Time Horizon of the Proposed Project

Two time horizons are used to discuss potential cumulative impacts of the proposed traffic improvements to U.S. 93 and other reasonably foreseeable projects. The time horizon consists of: (1) Years 1 through 5 and (2) Years 6 through 20.

These time horizons were selected because they reflect the two distinct periods in which different cumulative effects or project interactions could occur. The period of Year 1 through 5 corresponds to the initial construction and operation of the proposed traffic improvements to U.S. 93. Based on professional judgment and understanding of the engineering design and construction process, it is not expected that the proposed project would be completed for at least 5 years (and would possibly take up to 10 years, depending on funding). Years 6 through 20 correspond to the continued operation of the proposed traffic improvements through its approximate 20-year design life.

At this time, it is anticipated that project construction could begin in 2007. With a 20-year project horizon, the proposed project should reach its design life expectancy in 2027.

## 6.2.5 Cumulative Projects Data and Information

Each of the projects addressed in this cumulative effects analysis is supported by different levels of information, depending upon the current status of the particular project. For future projects, this information ranges from a simple project description, identifying its goals and objectives, to a comprehensive environmental review for project approval. For past projects,

appropriate government agencies were interviewed for documentation on the history of the project, including past project impacts. A primary source for the Boulder City/U.S. 93 Corridor Study EIS cumulative impacts analysis is the *U.S. 93 Hoover Dam Bypass Final EIS* (FHWA, January 2001).

This analysis uses the level of information available at the time this EIS was prepared to describe these other projects and their respective potential impacts on the environment. If sufficient data or information on specific aspects of the proposed project were not available to complete an analysis comparable to the evaluation of other projects, and reasonable efforts to obtain that information were unsuccessful (as in the case of the U.S. 95 widening in Nevada), professional judgment was used to estimate the potential impacts.

### **6.2.6 Reasonable Forecast Analysis**

In accordance with CEQ guidance, this analysis assesses future cumulative effects for projects that can be reasonably forecast. This includes those projects that are currently funded or for which other NEPA analysis is being prepared, and those that are being considered but have not reached a funding or environmental document stage.

## **6.3 Methods Used for Identifying Other Past, Present, and Reasonably Foreseeable Actions/Projects**

Several methods were used to identify other past, present, and reasonably foreseeable projects that could, in concert with the proposed Boulder City/U.S. 93 Corridor Study, contribute to cumulative impacts on the environment. For actions or projects occurring on lands administered by federal agencies, the agency with primary land management authority identified projects that could potentially contribute to cumulative environmental effects.

Surveying other land management agencies within the southeast Nevada region identified other projects. These surveys consisted of informal inquiries designed to acquire existing available environmental documentation and project descriptions. Concerning other projects located on private properties in the vicinity of the proposed project, the Clark County Planning Department determined that there are no applications or proposals for specific plans.

## **6.4 Past, Present, and Reasonably Foreseeable Actions/Projects and Respective Environmental Impacts**

The actions or projects that could result in changes to the local environment (and result in cumulative impacts when combined with the proposed project) would include any actions proposed by NPS, NDOW, ACOE and Reclamation, and highway projects proposed by NDOT and FHWA, regional agencies such as RTC, or local jurisdictions such as Clark County, the City of Henderson, or Boulder City.

Past and present activities, in addition to future planned projects, have and will continue to have a variety of impacts on the environment in the vicinity of Boulder City. These projects, shown in Figure 6-1, are described below in chronological order from past to future.

### 6.4.1 Past Actions near and within the Project Vicinity

The overall ecosystem of the lower Colorado River today is quite different from that which existed prior to modern-day use and development. During historic times, the area surrounding Boulder City was used for a wide variety of purposes. Past activities in the project area and vicinity included cattle grazing, hunting, and mining for turquoise, gold, and silver. Mining occurred in the late 1800s and early 1900s in several areas within the Eldorado Valley. Turquoise mining occurred near the location of the Hacienda Hotel and Casino; gold and silver mining occurred in locations on the Arizona side of Hoover Dam. Cattle grazing and hunting historically occurred in the project vicinity (FHWA, January 2001).

#### Development of Boulder City, Hoover Dam, and Associated Transportation Infrastructure

In 1928, Congress passed the Boulder Canyon Project Act authorizing construction of Hoover Dam. Construction began in 1931, and the last concrete was poured in 1935. As part of the necessary infrastructure for the construction of the dam, the Boulder Canyon Project Federal Reservation was created. This 373-km<sup>2</sup> (144-square-mile) area in the Eldorado Valley included the dam site, the lower portion of the future reservoir, the site of Boulder City, and vast stretches of open territory around the town. This area was under federal control and, unlike the surrounding jurisdictions, gambling, the sale of liquor, and other practices deemed injurious to the workers and the orderly progress of work were strictly prohibited. The town, named Boulder City, included eight 172-man dormitories, one 53-man office dormitory, more than 600 family cottages, a mess hall and recreation hall, an office building, company store, laundry, and a 20-bed hospital. Sewer and waterlines were laid out and hooked up, and nearly 32 km (20 miles) of streets were paved. Reclamation spent well over a million dollars constructing the administration building, government residences, and landscaping for streets and parks. Privately financed structures housing various independent businesses sprung up along Nevada Way, the main street in town. The key to this transformation of the Eldorado Valley was a network of elaborate, expensive pumps and pipes that carried water from the Colorado River out of Black Canyon to the town (Stevens, 1988).

Associated with the construction effort at Hoover Dam was the establishment or improvement of a number of roadways and rail facilities to bring equipment and labor to the construction area. On the Nevada side of the river these included the improvement of U.S. 95 and U.S. 93, and the construction of the Boulder City Branch Railroad (see Section 3.8).

After the construction of Hoover Dam was completed, a large portion of Boulder City was razed, as required by the government contract. This included hundreds of cottages, half a dozen dormitories, the mess hall, the recreation hall, and many other structures. The southern half of the city was returned to a state closely resembling its pre-dam condition.

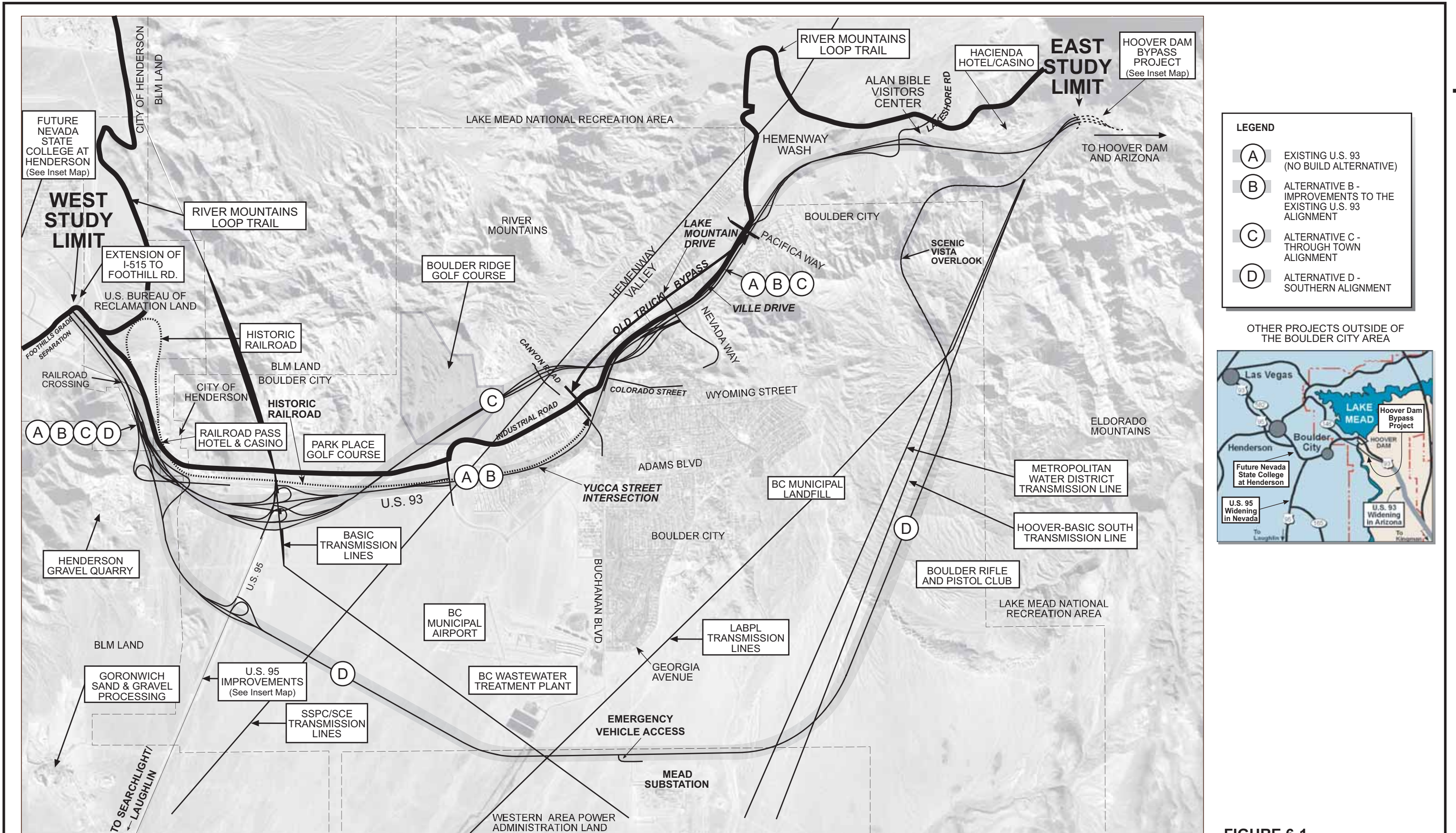


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**FIGURE 6-1  
PAST, PRESENT  
AND FORESEEABLE  
FUTURE PROJECTS**  
BOULDER CITY/U.S. 93 CORRIDOR STUDY  
ENVIRONMENTAL IMPACT STATEMENT

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Two dormitories were set aside to house CCC workers building the Boulder Dam National Recreation Area, and a number of cottages were resold and hauled offsite for other uses. However, the landscaping remained and some of the original buildings are still standing, including the hospital, Grace Community Church, the Boulder Dam Hotel, and a number of enlarged and renovated cottages (Stevens, 1988; see also, Schweigert and Labrum, 2001). Roadways in the vicinity of the dam were either abandoned or, as in the case of U.S. 93, adopted into the federal highway system with the new link across the river.

**Impacts from the Development of Boulder City, Hoover Dam, and Transportation Infrastructure.**

In general, the development of Boulder City, Hoover Dam, and the associated transportation facilities involved construction activities that likely resulted in temporary localized impacts on air quality, ambient noise levels, biological resources, water quality, recreation resources, and aesthetic and visual resources. Impacts on local air quality would have likely occurred from construction equipment and vehicles traveling on dirt roads and during earthmoving activities. The impacts from increases in ambient noise levels would have resulted from the construction equipment, vehicles, and personnel constructing the various projects. Construction of Boulder City likely affected local plant and wildlife species, including the now federally listed and state-protected desert tortoise and bighorn sheep, and habitats by altering desert communities in the construction zone and destroying the natural habitat. Impacts to local water quality and riparian ecosystems could be expected to have occurred where construction activities were conducted near any of the washes in the project vicinity (NDOT, July 2001d). The impacts to aesthetic resources would have occurred from the presence of the construction vehicles, equipment, and personnel, the dust and noise generated, and the change to the landscape that resulted. All of these impacts are construction related and specific to the projects' locations. Once the projects were completed, the impacts ceased; and natural systems (air, water, vegetation, and wildlife) adapted and stabilized.

Furthermore, prior to the development of Boulder City, there were no permanent human receptors or habitations sensitive to noise, air, and aesthetic impacts. Long-term impacts to cultural resources probably occurred during project construction because of both the disturbance to the cultural resource sites and the development imposition of new facilities changing the setting and accessibility of cultural resource sites.

Long-term impacts to protected and sensitive wildlife species, including the desert tortoise and bighorn sheep affected by the proposed project, occurred through fragmentation of habitat and resultant adverse effects on species movement and reproductive viability (Heindl, 2001). The improved roadway corridors in the vicinity of Railroad Pass, Hemenway Wash, and Goldstrike Canyon interfered, and continue to interfere with, the exchange of bighorn sheep between populations in the River, Eldorado, and McCullough Mountains. This is thought to adversely affect the genetic diversity of these populations which, in turn, affects their fitness (Cummings, personal communication). Growth of Boulder City in terms of increasing development and population, albeit at a relatively slow and controlled pace, continues to expand both the area of direct impact on natural desert habitat, as well as the adverse effects of human contact on plants and wildlife. In particular, development in the Hemenway Wash area since the 1980, and continuing to the present, has resulted in a further impediment to the exchange of bighorn sheep individuals between the River Mountains and the Eldorado Mountains.

Substantial long-term visual effects on the environment occurred despite the razing of portions of Boulder City. After construction of the town was completed, the change to the landscape was dramatic (NDOT, September 2001), and it was unlikely to revert to its development conditions.

In contrast, the development of Boulder City contributed in a beneficial manner to the local and regional economy, local recreation resources, transportation and circulation in the area, and public utilities across the southwestern U.S. Hoover Dam and Boulder City, constructed during the Great Depression, employed a large number of previously unemployed workers. This work and the paycheck it provided enabled employees and their families to move from the tents and shacks north of Las Vegas to Boulder City and to forego the soup kitchens in Las Vegas. Beneficial economic effects were realized regionally during construction from the purchase of materials, goods, and services in the local area and region. Construction personnel working on these projects contributed to secondary spending by their individual purchases of goods and services. Additionally, some workers made a large impact to the economy of Las Vegas by gambling away the majority of their paychecks during their days off.

Benefits to recreationists occurred by the development of additional recreation facilities and opportunities in the area. Benefits to commuters, tourists, commercial truck traffic, and local and regional consumers accrued by the development of the local roadway and interstate highway system in the area and construction of Hoover Dam, a major tourist attraction. The development of U.S. 93 provides a more direct route between Las Vegas and Kingman, improving interstate commerce and access to numerous recreation facilities.

**Potential Cumulative Impacts.** The construction of Boulder City, Hoover Dam, and associated transportation corridors has resulted in long-term impacts to the immediate vicinity and surrounding region. The Boulder City/U.S. 93 Corridor EIS build alternatives will have long-term impacts to terrestrial wildlife, desert washes, cultural resources, public parklands, and aesthetics of the Eldorado Valley; therefore, the proposed project will contribute to cumulative impacts in the project area. In the vicinity of Railroad Pass, the additional impacts to bighorn sheep attempting crossings between the McCullough and River Mountains would be much the same among all the build alternatives. For the Hemenway Wash area and the crossing between the River and Eldorado Mountains, Alternatives B and C would have similar impacts, but construction of Alternative D would create a new roadway corridor further to the east. With mitigation, however, cumulative impacts from Alternative D would be lessened due to the reduced traffic flow along the current U.S. 93 corridor.

#### **Existing Power Generation, Substation, and Transmission Facilities in Eldorado Valley**

In 1939, Hoover Dam became the largest hydroelectric generating complex in the world. In order to transfer power to its nearest major markets that were hundreds of miles away, construction of transmission lines and switching yards became necessary. Six major switchyards were constructed near the Nevada rim of Black Canyon between 1935 and 1953, while 18 high-voltage transmission lines were constructed to and from Hoover Dam from 1930 to 1961.



The transmission lines were constructed with either steel towers or wood poles, and they follow four major corridors within the vicinity of Boulder City. The first, Southern Sierras Power Company (SSPC)/SCE corridor, ascends the Eldorado Valley, passes to the north of Boulder City, descends Hemenway Wash, and approaches Hoover Dam from the north. The second corridor, established by three lines of the LABPL, traverses 3 km (2 miles) east of the SSPC/SCE corridor through the Eldorado Valley, runs coincident with the southeasterly limits of Boulder City, and then extends through the Eldorado Mountains to U.S. 93. The Basic South transmission line also uses this corridor to a point 4 km (2.5 miles) southwest of Boulder City, where it then turns northwest to Railroad Pass and connects to the Basic Magnesium Plant in Henderson. A third corridor, established by the Metropolitan Water District of Southern California (MWD), travels along the same route as the LABPL corridor from Hoover Dam to a point 3 km (2 miles) east of Boulder City. From this point the corridor trends southward. Finally, the fourth corridor, which is known as the Pioche corridor, generally follows the SSPC/SCE corridor from Hoover Dam to the eastern edge of Hemenway Wash. It then trends west running parallel and 1.2 km (0.75 mile) from existing U.S. 93 and then crosses the River Mountains.

In 1967, the Mead Substation was constructed 5 km (3 miles) southwest of Boulder City in order to interconnect additional power sources from Davis and Parker Dams. Additionally, the substation took over switching and control functions that were previously performed at six substations near Hoover Dam. It has subsequently become one of the largest electrical substations in the world.

Existing power generation facilities in Eldorado Valley include Saguaro Power, which is a 90 megawatt (MW) power generation facility, and Eldorado Energy, which is a 480-MW power generation facility, both within City of Boulder City lands, approximately 48 km (30 miles) southwest of downtown Boulder City.

Figure 6-2 shows the approximate location of existing power generation facilities, substations, and transmission lines that are located outside the limits of the cumulative impact analysis of the project study area to provide a comprehensive picture of the existing power infrastructure in Clark County. However, because these facilities are outside the project study area for the purposes of this cumulative impact analysis, as defined in Section 6.2.2, they are not considered in this analysis.

**Potential Cumulative Impacts.** Construction of the various power generation facilities, transmission lines, switchyards, and the substation occurred over a period of roughly 40 years, resulting in intermittent short-term impacts to air quality, biological, and visual resources. Possible long-term impacts to vegetation and wildlife can be attributed to numerous maintenance access roads used to service the transmission lines and towers. The prominence of the transmission lines has been a long-term visual impact on the desert landscape, contributing to cumulative impacts.

### **Railroad Pass Hotel and Casino and Hacienda Hotel and Casino**

Boulder City's prohibition of gambling led to the construction of the Railroad Pass Hotel and Casino and the Hacienda Hotel and Casino, just outside of the city limits along U.S. 93. Like its name implies, the Railroad Pass Hotel and Casino is located in the Railroad Pass area. Constructed in 1931, it offered a place for Hoover Dam workers to socialize and

included a gaming hall, bar, and a dance floor. This locale is still in operation today and offers 120 hotel rooms, 21,000 square ft of casino space, 3 restaurants, a pool, and an arcade.

The present day Hacienda Hotel and Casino sits on land that was originally a mining claim owned by P.J. Sullivan near the head of Gold Strike Canyon. The land was later sold in 1954 to three investors who built a small snack bar, gift shop, and bar with slot machines. After a failed attempt at leasing the site to a development company, the property was sold to and jointly owned by three executives with the Mandalay Bay Group (dba Circus Circus Enterprises) and two of the original investors' sons. They managed to expand the property into what is now the Hacienda Hotel and Casino. The Hacienda Hotel and Casino offers 17 stories of hotel rooms, a casino, movie theatre, helicopter rides, and various dining establishments. Currently, there are ongoing discussions between the Hacienda Hotel Owners and the NPS to sell the property to the NPS for park use.

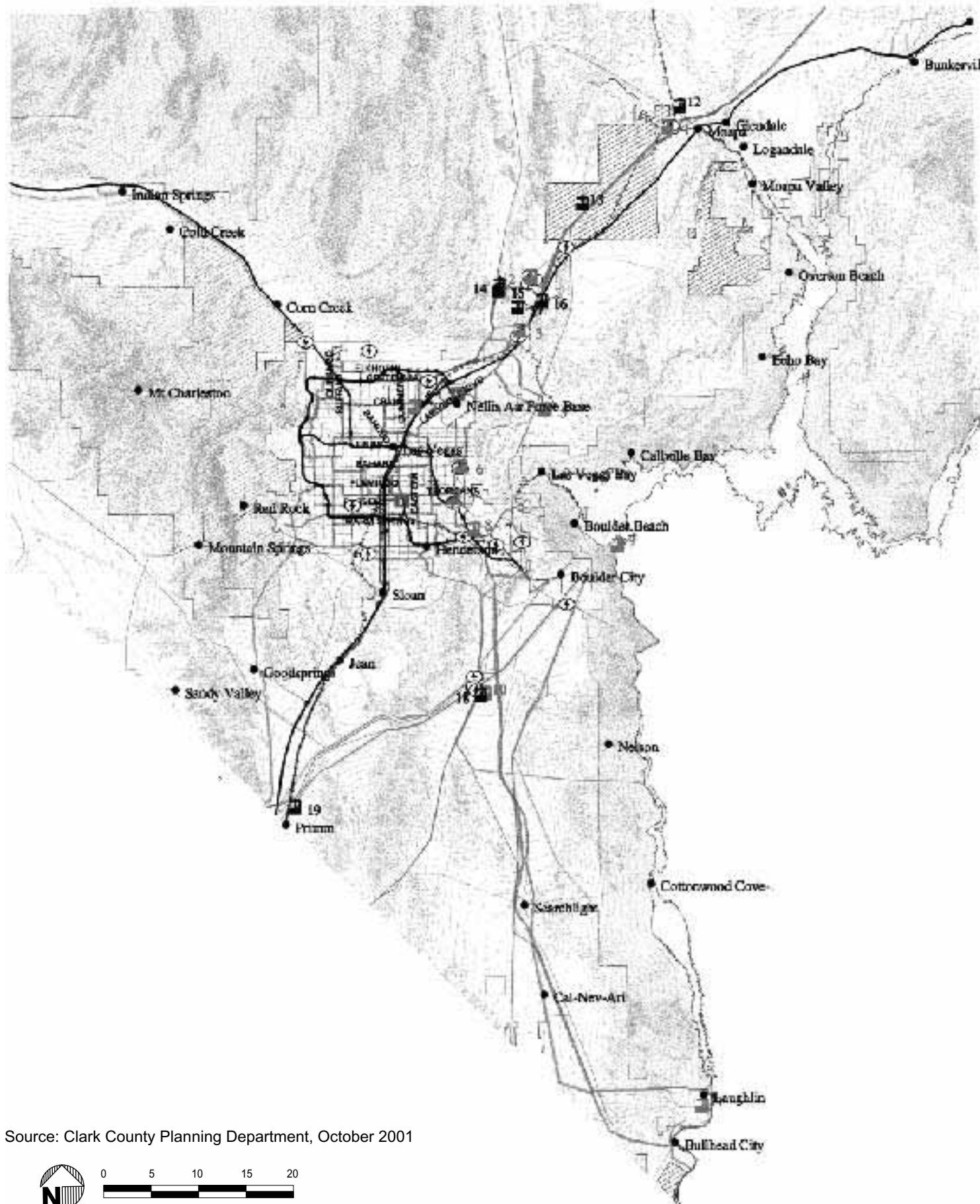
**Potential Cumulative Impacts.** The development of both the Railroad Pass Hotel and Casino and the Hacienda Hotel and Casino contributed to beneficial economic impacts in the area. Cumulative impacts resulting from these projects in conjunction with the Boulder City / U.S. 93 Corridor project include a continued increase in the developed character of the areas in the vicinity of Railroad Pass and Gold Strike Canyon, with consequent impacts to visual resources, noise, air quality, and aesthetics. These impacts in the vicinity of the Hacienda Hotel and Casino lie within the LMNRA.

#### **Boulder City Rifle and Pistol Club Range**











The Boulder City Rifle and Pistol Club is nationally chartered and opened in spring 1933. At that time, various other locations were also used as ranges by the club, such as one in McKeeverville at the base of Red Mountain, another in Hemenway Wash, and a third in the basement of a home on Denver Street. In 1941, the range was taken over by the army in order to train those responsible for safeguarding Hoover Dam from attack. The range was subsequently returned to the club at the end of the war. Twenty years later in 1961, the club asked the city if it could purchase the property. The city declined, but it did offer the club a 20-year lease at a dollar per year, which it accepted.

Currently, there is interest in moving the range to a quarry site on Boulder City land that is leased to a private company. The site is 6 km (4 miles) south of Railroad Pass just west of U.S. 95. As the company mines out land, it would gradually convert those mined-out areas to shooting ranges.

**Potential Cumulative Impacts.** The rifle range is approximately 2.5 km (1.5 miles) away from any development, precluding it from causing any noise impacts. It is located at the base of the Eldorado Mountains in both desert tortoise and bighorn sheep habitat. As described in Section 6.5.2, the rifle range could contribute to cumulative biological resource impacts. The Rifle and Pistol Club range, access road, and service facilities contribute to cumulative land use impacts in this area, as well as impacts to drainages that constitute Waters of the U.S. Continuous access will be required as part of the constructed highway.



**Legend**

-  Existing Power Plants
-  Proposed Power Plants
-  Substations
-  Kern River Pipeline
-  SWG Natural Gas Pipeline (Major)
-  CalNev Pipeline
-  Transmission Lines (Major)  
(Does not include all Valley Electric, Boulder City, Overton power lines)
-  Streets (Major)
-  Highways
-  Railroads

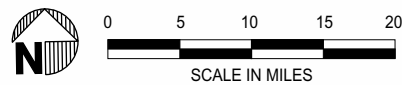
**Existing Power Plants**

- 1 Nevada Power Reid Gardner Plant
- 2 Nevada Power Harry Allen Plant
- 3 Nevada Cogen Assoc Georgia Pacific
- 4 Las Vegas Cogen Enron North America
- 5 Nevada Cogen Assoc Pabco Gypsum
- 6 Nevada Power Sunrise Plant
- 7 Nevada Power Clark Plant
- 8 Saguaro Power Saguaro BMI Complex
- 9 Hoover Dam
- 10 Eldorado Energy Eldorado Plant #1
- 11 S. California Edison Co. Mojave Power Plant

**Proposed Power Plants**

- 12 PG&E Power Meadow Valley
- 13 Calpine Power Crystal Power
- 14 Mirant Las Vegas LLC Mirant Energy
- 15 Genwest LLC
- 16 Reliant Power Republic Services
- 17 Duke Energy Moapa Kerr Mcgee
- 18 Sempra Energy Copper Mountain
- 19 Reliant Power Bighorn

Source: Clark County Planning Department, October 2001



**FIGURE 6-2  
EXISTING AND PROPOSED  
POWER INFRASTRUCTURE  
IN CLARK COUNTY**  
BOULDER CITY/U.S. 93 CORRIDOR STUDY  
ENVIRONMENTAL IMPACT STATEMENT

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### **U.S. 93 Widening between Buchanan Boulevard and Pacifica Way**

In 1982, NDOT completed an Environmental Assessment (EA) for the widening of U.S. 93, from Buchanan Boulevard to Pacifica Way. This section, commonly known as the “truck bypass,” was originally constructed in 1956 by Reclamation to move truck traffic out of downtown Boulder City. Improvements to the 3.8-km (2.4-mile) portion of roadway were made due to the deteriorating condition of the roadway surface, high maintenance costs, and the safety problems it posed.

**Potential Cumulative Impacts.** The construction of the project contributed to short-term localized air quality, noise, and visual impacts. No long-term cumulative impacts are associated with this project.

### **Boulder City Municipal Landfill**

The Boulder City Municipal Landfill is located 2.5 to 3 km (1.5 to 2 miles) east of town at the base of the Eldorado Mountains and serves Boulder City and the LMNRA. The landfill is owned by the city, which in turn contracts out the collection of refuse and operation of the landfill to Boulder City Disposal, Inc. In 1988, the landfill site was approved and 100 acres were designated to accept solid waste. Ten of the 100 acres were permitted as a solid waste disposal facility, which has an expected service life of 25 years.

On an annual basis, the landfill is estimated to receive 23,800 cubic yards of compacted refuse. This converts to approximately 17,850 tons (1 cubic yard =  $\frac{3}{4}$  ton) of compacted refuse a year. Collection of commercial and demolition refuse is more stringent than the collection of residential refuse, as it is only accepted during normal operation hours, Monday through Saturday, 7:00 a.m. to 2:00 p.m. Residential refuse is accepted 24 hours a day via a transfer station just outside the main gate of the landfill. The institution of the transfer station has resulted in a decrease in illegal dumping in the desert.

In addition to solid waste, the landfill also accepts household hazardous waste, which includes paint, motor oil, insecticides, cleaning solvents, and batteries. No other forms of hazardous waste are accepted. All waste loads are checked for hazardous and recyclable materials.

**Potential Cumulative Impacts.** Operation of the Boulder City Municipal Landfill has the potential to impact water quality, as well as biological, cultural, and visual resources. These impacts and their potential to contribute to cumulative impacts are discussed further in Section 6.5.2.

### **Boulder City Municipal Airport**

Construction of the Boulder City Municipal Airport was completed in 1991. The facility is located to the southwest of town, within city limits. It is a small airport, serving only 25,000 to 30,000 flights annually. There are two runways, one of which has a steep gradient with rising terrain and obstacles. Services offered at the airport include flying lessons, skydiving, charter services, helicopter operations, and tours of the Grand Canyon. While there is no restricted airspace, overflights of Boulder City are discouraged.

FAA has recently granted \$1.2 million to Boulder City for airport improvements. Plans for improvements include expansion of the property, which is owned by the city, in order to build 70 to 80 new hangars (John Hoole, pers. comm., 2001).

**Potential Cumulative Impacts.** Airport construction most likely resulted in short-term localized impacts to air quality, noise, biological, and visual resources. Long-term noise impacts from the operation of the airport can also be expected. However, according to a city official, there have only been a minor degree of noise complaints from the community. These complaints are most often due to night flights in the canyons, which are not associated with the Boulder City Airport.

### **I-515 Extension**

In 1995, construction was completed on the final segment of the extension of the freeway leading out of Henderson toward Boulder City and Arizona. The designation of this freeway was modified to I-515 upon completion of construction, and it is signed as I-515/U.S. 93/U.S. 95. The final leg of the project extended freeway status from Lake Mead Drive in Henderson to the Foothills Drive grade separation, which is the Boulder City/U.S. 93 Corridor Study western study limit.

Construction on this final leg of the freeway began in 1991, following 2 years of design by NDOT. The final leg was part of an overall project that constructed a freeway from downtown Las Vegas to Foothills Drive, a process that lasted approximately 20 years. The freeway serves as an alternate route to Boulder Highway, the original means of transportation from Boulder City to Henderson and Las Vegas.

**Potential Cumulative Impacts.** The construction of I-515 to Foothills Drive represents a cumulative impact on the Boulder City/U.S. 93 Corridor Study area, as the two projects share a common study limit at Foothills Drive. The freeway construction project from downtown Las Vegas to Foothills Drive was covered in an EIS that reached a ROD in 1977. In the EIS, noise, visual resource, and biological resource impacts are documented. Potential cumulative impacts in these resource areas are discussed further in Section 6.5.2.

### **Henderson Gravel Quarry**

At the western end of the project area, there is a sand and gravel industrial operation that is large enough to be seen from existing U.S. 93. The operation is contained entirely within BLM land. There are two areas of operation: a 140-acre sand and gravel quarry just off U.S. 93 in the vicinity of Railroad Pass, and the 250-acre Goronwich Sand and Gravel processing site, located about 5 km (3 miles) south of the quarry.

**Potential Cumulative Impacts.** The sand and gravel quarry and operations facility have resulted in environmental impacts within the Boulder City/U.S. 93 Corridor Study project area, specifically to visual resources, biological resources, and water quality, and these are discussed in further detail in Section 6.5.2.

## **6.4.2 Present Actions near and within the Project Vicinity**

This section focuses on federal, state, and local agency management plans and programs affecting the environmental resources in the project area. Detailed references for these plans and programs can be found in Chapter 11.

### Lake Mead General Management Plan

NPS's Lake Mead General Management Plan (GMP), approved in 1986 for a 25-year or longer period, follows a strategy that centers on accommodating increasing visitor use while protecting the most outstanding natural and cultural resources of the area. It also addresses visitor use and flash flood safety problems that face most developed areas. Solving existing crowding/congestion problems and accommodating projected increases in visitation requires expansion and improvement of existing developed areas, circulation improvements, improvement of existing shoreline access points, and establishment of new developed areas.

The GMP establishes maximum levels of development that could accommodate increasing use in the future, while not exceeding reasonable capacity limits. These are maximum levels, not goals; development within the maximum levels would occur only when demand and economic feasibility justify the expansion (NPS, 1986).

Implementation of the GMP has resulted in, and will continue to result in, the following primary impacts during the 25-year projected life of the plan:

- Improvements in water quality in beach areas
- Limited destruction of or severe damage to soils, causing minor disruptions in drainage patterns that would temporarily increase erosion potential
- Seismic exploration for oil and gas leases would have the potential to cause adverse impacts to bighorn sheep herds, although proposed mitigation measures and the assumption that activity would remain sporadic, as in the past, reduces these impacts

**Potential Cumulative Impacts.** GMP impacts, when considered in conjunction with those from the Boulder City/U.S. 93 Corridor Study, may result in cumulative impacts to the bighorn sheep population. The plan will result in beneficial impacts to water quality, so the proposed project would not contribute to cumulative water quality impacts. Cumulative impacts to the bighorn sheep population are discussed in more detail in Section 6.5.2.

### Boulder City Wastewater Treatment Plant

The Boulder City Wastewater Treatment Plant is located in the southern portion of the project area, closest to Alternative D, the preferred alternative. The facility currently treats approximately 1.1 million gallons per day (mgd) of wastewater and retains a capacity of 1.8 mgd. The plant provides secondary treatment of Boulder City wastewater, and its effluent is discharged south into the alluvial fan area. The original site of the plant was closer to the center of Boulder City, but it was relocated in the 1970s to its existing location.

The effluent from the treatment plant is split between two receptors, with approximately half the flow going to each. One pipe follows the treatment facility/WAPA border (Figure 2-7) and conveys the effluent to the Goronwich Sand and Gravel site, which uses the treated wastewater in their process units. The other effluent stream flows south and splits into two open channels that enter the WAPA property south of Boulder City. At the terminus of these channels, within the WAPA boundary and south of the Mead Substation, this water source and surrounding vegetation have created a treatment wetland area.

In 1996, a 6-acre constructed wetlands park was built northeast of the treatment plant, within Veterans Memorial Park. The park has been designed to handle up to 1.0 mgd of the effluent wastewater from the treatment plant and was constructed with a goal of irrigating the nearby Veterans Memorial Cemetery and providing a habitat for threatened and endangered species. A secondary objective is public education and research on improving water quality of wastewater effluent. The wetlands park receives Colorado River water blended with the treated wastewater. The blended wastewater flows through a wetland system consisting of a stream with shallow marshes and pools, followed by four deep-water ponds. The stream and ponds contain a variety of native and exotic wetland plants and are bordered by native riparian plantings. These wetlands are not considered jurisdictional wetlands because they are not self-sustaining, and rely on a continued flow of treated effluent.

**Potential Cumulative Impacts.** The construction of the Boulder City Wastewater Treatment Plant has beneficially impacted the water quality and the biological resources of the project area. The water quality, as well as quantity, of the discharge is dependent upon the diversion of effluent to the wetlands park. Ideally, to reduce suspended solids and biological oxygen demand, vegetation treats the effluent entering the park, thereby improving water quality.

Reclamation has devised a program of endangered species conservation as part of their ongoing operations and maintenance activities. This program is defined in the *Description and Assessment of Operations, Maintenance, and Sensitive Species of the Lower Colorado River* (Reclamation, 1996). The program has been designed to result in a beneficial impact to the biological resources of the region, including the enhancement and restoration of wetlands, restoration of native riparian plant habitat, and the conservation of threatened and endangered species. Endangered native fish of the Colorado River (mostly bonytailed chub and razorback suckers) are stocked in the wetland ponds, then released back into the Colorado River when they are approximately 20 to 30 cm (8 to 12 inches) long. Therefore, there are no cumulative impacts to water quality or biological resources.

### **Clark County MSHCP**

On November 5, 2000, USFWS approved the Clark County MSHCP. The MSHCP is an extension of the effort that began with the Clark County Desert Conservation Program (CCDCP). The MSHCP addresses the conservation needs of the entire range of biological resources in Clark County, and it supersedes the provisions of the previous CCDCP. The MSHCP and the resultant Section 10(a) Permit are designed to achieve key conservation and planning goals, including:

- Allowing the incidental take of covered species
- Reducing the likelihood of the listing of additional species located in Clark County as threatened or endangered
- Allowing private, local municipal, and state landowners relief from having to process future permits for take of species covered in the plan that are listed under the ESA or protected by the State of Nevada; provide federal agencies and public land users streamlined review under Section 7 of the ESA; and provide assurances that the take



of ESA-listed migratory birds named on the incidental take permit will not be in violation of the MBTA

- Providing substantial recovery and conservation benefits to species and ecosystems and maximizing flexibility in developing mitigation and conservation programs
- Providing comprehensive and coordinated mitigation for species and habitat impacts as a substitute for project-by-project evaluation and mitigation
- Providing for long-term protection of habitats and species on a regional basis with a focus on source population, reduction of threats and/or impacts on key conservation areas, and enhancement of connectivity between conservation areas
- Providing protection of long-term habitat carrying capacity for species by avoiding, minimizing, and mitigating impacts and by assuring that any take allowed will not appreciably reduce the likelihood of survival and recovery of species covered by the MSHCP
- Identification of equitable and effective funding mechanisms to achieve MSHCP goals
- Early involvement of interested agencies, landowners, managers, and other stakeholders prior to development of specific conservation strategies to minimize conflicts

The key purpose of the MSHCP is to achieve a balance between conservation of the natural habitats and native species of Clark County and the beneficial use of land to promote the economy, health, and well-being of the growing population of the county.

**Potential Cumulative Impacts.** Implementation of any of the project build alternatives would impact the federally listed (threatened) desert tortoise. Alternative D, the preferred alternative, would be located through desert tortoise habitat along its course south of Eldorado Ridge (Figures 3-2, 4-3). Alternative D does not encroach into lands covered by the MSHCP with the exception of that portion of the Eldorado Valley near the sewage treatment plant and through the steep Eldorado Mountain canyons northeast of Boulder City (see Section 3.4). Mitigation will include preconstruction surveys, relocation of affected tortoises, construction worker education regarding tortoises, and design and construction of crossings in consultation with appropriate agencies. Additional mitigation for cumulative impacts include those undertaken by NDOT as a responsible party to the MSHCP (see Section 4.4.3), and those described in Section 6.6.1). Refinement of these mitigation measures, and the potential development of additional measures, will occur during consultation with the USFWS and NDOW during preparation of the Biological Assessment for the implementation of Alternative D, and will be provided in the USFWS' Biological Opinion. With implementation of this mitigation, development of the proposed project would not contribute to cumulative impacts on the desert tortoise, nor would it conflict with the goals and objectives of the MSHCP.

### 6.4.3 Reasonably Foreseeable Future Actions

This section focuses on the reasonably foreseeable actions that are proposed or are in the planning stage that would occur near the project area. Provided below is a brief description of each of these projects and their anticipated short-term and long-term adverse impacts on the environment.

#### River Mountains Loop Trail

The River Mountains Loop Trail is a planned 58-km (35-mile) trail encompassing the River Mountains area, which includes the LMNRA, Boulder City, and Henderson. The trail is being developed by a coalition of public agencies, community groups, businesses, and individuals called the River Mountains Trail Partnership Advisory Council. It is the goal of the Advisory Council to provide a recreational trail that links neighboring communities, recreation areas, and multiuse local and regional trail networks. By creating a link, the trail would encourage the use of alternative methods of transportation, such as hiking and biking. This would help alleviate traffic on busy roads and improve air quality. Currently, the trail is only partially complete and is expected to be finished, including trailheads and signage, by fall 2004.

Within the Boulder City/U.S. 93 Corridor project area, the trail will travel through Railroad Pass along BCBRR right-of-way that is to the north of U.S. 93. It will proceed to the railroad maintenance building, where it will then follow Yucca Street and Industrial Road to U.S. 93. From this point, a completed segment of the trail leads to the River Mountains Trail trailhead and continues through the Hemenway Wash, where it ends at Pacifica Way. The trail is planned to continue through LMNRA land and lead to the Hoover Dam parking structure (River Mountains Loop Trail, 2001).

**Potential Cumulative Impacts.** Construction of the River Mountains Loop Trail will result in minor short-term impacts to biological resources due to clearing and grading of the trail. More long-term impacts from the operation of the trail could occur from the introduction of recreationists into wilderness areas. Signage prohibiting rockhounding and the collection of plants and animals, as well as advising users to stay on designated trails, will be placed along the trail route in an effort to keep impacts to a minimum. Interpretive signs educating trail users on the flora and fauna and the history of the River Mountains area will also be placed along the trails, and they should aid in preventing misuse of the trail and its surrounding environment. Potential cumulative impacts to biological resources are not expected from the development of this project.

#### Hoover Dam Bypass Project

FHWA prepared and approved the U.S. 93 Hoover Dam Bypass EIS for a new bridge crossing of the Colorado River near the dam. The purpose of this project is to (1) minimize the potential for pedestrian-vehicle accidents on the dam crest and approaches; (2) reduce traffic congestion and accidents on a segment of a major commercial route; (3) replace an inadequate highway river crossing with one that meets current roadway design criteria; (4) reduce travel time in the dam vicinity; and (5) protect Hoover Dam employees, visitors, equipment, power generation capabilities, and Colorado River waters while enhancing the visitors' experience at Hoover Dam.

In March 2001, FHWA released a ROD for the U.S. 93 Hoover Dam Bypass Project, identifying the Sugarloaf Mountain alignment as the selected alternative. This alternative will take approximately 5 years to construct and is scheduled to be completed in 2007. The new bridge will cross the Colorado River about 457 m (1,500 ft) downstream of Hoover Dam and includes construction of approximately 3.5 km (2.2 miles) of highway approach in Nevada, a 579-m-long (1,900-ft-long) bridge, and approximately 1.7 km (1.1 miles) of highway approach in Arizona.

The preferred alternative was selected on the basis of (1) collectively minimizing environmental impacts, (2) engineering and operational advantages, (3) minimizing harm to Section 4 (f) properties, (4) slightly lower construction costs, and (5) agency and public comments received during the environmental process.

The new highway will begin on the west side of the dam near the Hacienda Hotel and Casino, where it connects with the eastern terminus of the Boulder City/U.S. 93 Corridor project (see Section 2.1). Although adjacent, the two projects are separate with independent utility; each conceived to meet separate needs. The highway will run just south of existing U.S. 93 and cross it in the vicinity of the Reclamation warehouse. The highway will then pass through a gap in the high rock ridge that parallels the river and descend southeasterly to the long span bridge over the Colorado River. From the east end of the proposed bridge, the highway will traverse the northern base of Sugarloaf Mountain and then turn south, crossing a wide ravine, and reconnect to existing U.S. 93 in Arizona, approximately 1.7 km (1.1 miles) from the dam.

Traffic analyses conducted for the Hoover Dam Bypass concluded that the new bridge crossing would result in no appreciable increase in year 2027 forecast traffic volumes west of the dam toward Boulder City. Thus, the project will have no operational effect on Boulder City in terms of traffic and related economics impacts.

**Potential Cumulative Impacts.** Depending on the timing of project development, construction activities associated with the Hoover Dam Bypass Project could overlap with those of the Boulder City/U.S. 93 Corridor project should a build alternative be selected, resulting in cumulative short-term air quality, traffic, noise, visual, or water quality impacts. If this overlap occurs, the logistics of construction for the two projects will be reviewed and mitigated.

If this scenario were to be realized, the cumulative impact of construction would be minor and essentially equivalent to the individual project occurrences. This is partly due to stipulations in the Hoover Dam Bypass ROD (FHWA, March 2001) indicating that:

- FHWA must attempt to attain a balance between cut-and-fill quantities on the Nevada and Arizona approaches so that no waste disposal area will be required.
- All material excavated from the Arizona approach is to be used to build roadway embankments on the Arizona approach.
- No new material sources (borrow sites) will be utilized or required for construction. It is anticipated that the native rock within the right-of-way will be adequate to produce some or all of the aggregate needed for the project. However, other aggregates may

come from readily available commercial sources in Boulder City, Las Vegas, and Kingman, Arizona.

Therefore, construction traffic for the Hoover Dam Bypass would not increase to the level at which traffic volumes would be inordinately affected in Boulder City. However, construction of the bypass would result in short-term cumulative impacts to portions of the environmental resource base also impacted by the Boulder City Corridor project build alternatives, consisting of biological resources, including desert bighorn sheep and desert tortoise habitat; archaeological and historic properties; Section 4(f) lands; water quality; and visual resources in the U.S. 93 corridor.

Long-term impacts on bighorn sheep and desert tortoise, species also affected by the proposed Boulder City project build alternatives, can be expected. However, NDOT and FHWA are committed to continuing consultation with NDOW relative to the mitigation of the long-term impacts to the bighorn sheep habitat in the McCullough, River and Eldorado Mountains. The Hoover Dam Bypass Project is also expected to impact cultural, visual, and Section 4(f) resources; contributing to cumulative impacts in these resource areas, as discussed in more detail in Section 6.5.2.

### **U.S. 93 Widening in Arizona**

In August 2001, ADOT commenced work on an EA for the U.S. 93 widening project. The U.S. 93 corridor from Phoenix to Nevada has been identified by the Arizona STIP (ADOT, 1994) as one of the top-priority corridors within Arizona. ADOT is programming and constructing various improvements along U.S. 93 in Arizona, from south of Wickenburg to near Hoover Dam. Improvements will be phased consistent with funding levels and highway safety and capacity priorities. Ultimately, U.S. 93 will be widened to a continuous four-lane divided highway from Wickenburg to near Hoover Dam.

ADOT will widen U.S. 93 to four lanes south from the new Hoover Dam Bypass interchange to the improved four-lane divided section 20.9 km (13 miles) to the south at the LMNRA boundary. This segment of roadway is the final link between I-40 near Kingman and the Arizona terminus of the Hoover Dam Bypass Project.

**Potential Cumulative Impact.** The widening of U.S. 93 in Arizona could occur concurrently with the Boulder City/U.S. 93 Corridor Project, potentially resulting in cumulative short-term impacts on air quality, traffic, and water quality. In addition, long-term impacts to biological, cultural, and parkland resources may occur, depending on site-specific conditions. However, these could be reduced by reuse of some of the old highway alignment, which is already disturbed; there are several sections where this is a possibility. Nonetheless, the ADOT U.S. 93 widening project has the potential for cumulative impacts to biological, cultural, and Section 4(f) resources. These impacts are discussed in more detail in Section 6.5.2.

### **U.S. 95 Widening in Nevada**

**Potential Cumulative Impacts.** No cumulative traffic operational impacts are foreseen because the highway users are different; most of the traffic on U.S. 95 is traveling to and from Las Vegas with no intention or need to go through Boulder City. Long-term impacts to biological and cultural resources will occur; however, impacts will be small because all of

the work will be within previously disturbed right-of-way. Therefore, the NDOT U.S. 95 widening project has little potential for cumulative impacts to biological and cultural resources.

### **Future Golf Course Development**

There are plans for the construction of two golf courses within Boulder City. The first is an expansion of the privately owned and operated Cascata Golf Course, located just north and east of the U.S. 95/U.S. 93 interchange. The second is the development of the planned 240-acre public Boulder Ridge Golf Course, located north of the Industrial Road and Veterans Memorial Drive intersection. Both course sites will be situated on what is currently open space and undeveloped land that has been zoned Special Recreation by the city. Enough land for the 18-hole Boulder Ridge Golf Course has been leased by the Red Ridge Golf Company from Boulder City, with possible plans for expansion at a later date (John Hoole, pers. comm., 2002).

**Potential Cumulative Impacts.** The golf courses are expected to have some biological, water quality, and possibly cultural resource impacts. These impacts, in conjunction with those associated with the Boulder City/U.S. 93 Corridor project, will contribute to cumulative impacts in these resources areas, as discussed further in Section 6.5.2.

### **Nevada State College at Henderson**

A new state college named the Nevada State College at Henderson (NSCH) is in the planning stages to be constructed in Henderson, Nevada. In February 2000, the Henderson City Council voted to accept a site recommendation for the college of about 260 acres of land behind the Wagon Wheel Industrial Park, about 0.8 km (0.5 mile) away from existing U.S. 93. This location is just southwest of the Boulder City/U.S. 93 Corridor Study western project limits, and the construction of the facility will affect all alternatives considered in this EIS. The college will be a 4-year institution, and it will offer undergraduate degrees in arts, sciences, education, public administration, and medical fields.

**Potential Cumulative Impacts.** The construction of NSCH will impact the project area predominantly in relation to overall traffic and noise. The proposed project is not likely to affect biological resources, as the site is already disturbed. Potential cumulative impacts associated with traffic and noise are further evaluated in Section 6.5.2.

### **Historic Railroad Reopening at U.S. 93**

The Nevada State Railroad Museum is interested in extending the operation of the historic BCBRR west through Railroad Pass. The plans for the railroad have been outlined in the "Operation Plan for the Nevada State Railroad Museum/Boulder City" (April 2000). The State of Nevada Division of Museums and History (DMHNSR) owns the BCBRR along the 6-km (4-mile) segment between Railroad Pass and the central portion of Boulder City, along with 40 acres of rail yards near the Yucca Street intersection. An excursion train planned for the BCBRR would eventually run three to five times per day, and 6 days a week, paralleling U.S. 93 in the eastern portion and looping around just within the Henderson city limits. Passengers would likely board in downtown Boulder City or at the Railroad Pass Hotel and Casino.

**Potential Cumulative Impacts.** The major impact of this project is the beneficial economic impact to Boulder City. The Operation Plan created by DMHNSR estimates a range, depending on capacity of the trains and cost of tickets, of \$723,341 to \$1,853,779 that would be generated by the excursion tours on a yearly basis. Additionally, the museum complex would generate tourist revenue in the form of gift shops and as an additional tourist destination in Boulder City.

The DMHNSR Operation Plan indicates that an additional segment of railroad would be added to the BCBRR upon construction of the new excursion loop. Environmental impacts of this construction would be minimal, as the segment is within existing railroad right-of-way. The loop portion of the new facility, however, would enter into uninhabited desert land and would have some environmental impacts on biological and visual resources. Noise impacts could also be a concern for the new line, as the intended course of the excursion train passes parallel to existing U.S. 93 and crosses it just west of Railroad Pass. These impacts are evaluated further in Section 6.5.2.

### **Water Infrastructure**

The water infrastructure serving Boulder City and Henderson will be expanded in the future and could produce cumulative impacts. A new potable water line is in the process of being constructed from the River Mountains Water Treatment Facility in Henderson to Boulder City. This line will pass behind the Railroad Pass Hotel and Casino and travel along the eastern and northern portion of U.S. 93 into Hemenway Valley. The line lies within the right-of-way of a segment of the future River Mountains Loop Trail, which will be constructed upon completion of the water line. As of fall 2001, this water line is 50 percent complete.

**Potential Cumulative Impacts.** The water infrastructure development within the project area is expected to contribute to cumulative impacts on biological and cultural resources, as discussed in more detail in Section 6.5.2.

### **Power Infrastructure**

Components of the power infrastructure in the project study area will be expanded or rebuilt in the future and could produce cumulative impacts. Among the proposed power infrastructure is the Copper Mountain facility, which is a 500-MW power generation facility currently proposed by Sempra Energy. If approved, it will be constructed approximately 56 km (35 miles) southeast of downtown Boulder City (see Figure 6-2).

Proposed linear facility projects in the study area include:

- Modifications and additions to the WAPA transmission line system from Hoover Dam to the Mead Substation to accommodate the Hoover Bypass Project
- Harry Allen Substation to Mead Substation 500-kV Transmission Line

Proposed power facilities that are located outside the project study area are shown in Figure 6-2 to provide a comprehensive picture of the proposed power infrastructure in Clark County. However, because these facilities are outside the cumulative impact analysis of the project study area, as defined in Section 6.2.2, they are not considered in this analysis.

**Potential Cumulative Impacts.** The power infrastructure development within the project area is expected to contribute to cumulative impacts on biological, visual, and cultural resources, as discussed in more detail in Section 6.5.2.

### **Future Development in Boulder City and Hemenway Valley**

The location and the restrictive growth control and zoning ordinances of the city dictate the future development of Boulder City. As discussed in Section 3.9, Boulder City's zoning ordinances regulate growth by placing restrictions on the number of residential units and hotel rooms that are developed each year. Additionally, there is an ordinance requiring the vote of Boulder City residences when one or more acres of land are to be sold for development.

Current plans for future development of Boulder City are minimal. In the Hemenway Valley area, construction of planned subdivisions will continue. However, upon completion of these subdivisions, no other development in this area is forecasted (John Hoole, pers. comm., 2001).

**Potential Cumulative Impacts.** Due to its restrictive growth-control policies, Boulder City is not likely to suffer from impacts associated with induced growth. Future development will likely cause short-term impacts associated with construction activities. Continued construction in the Hemenway Valley may result in biological and cultural resource impacts. Evaluation of these impacts can be found in Section 6.5.2.

## **6.5 Cumulative Environmental Impacts**

Certain impacts associated with the proposed Boulder City/U.S. 93 Corridor Study project could arise that, in conjunction with impacts attributable to other projects (either in the immediate vicinity or with similar characteristics), could have the potential to result in collectively adverse effects to the environment that are of greater significance than those generated individually by the proposed project. Cumulative impacts could include those effects considered to be less than significant individually but which could become significant when evaluated in relation to impacts from other projects.

### **6.5.1 Criteria for Determining Cumulative Impact Significance**

NEPA regulations do not provide a specific list of elements that the cumulative impacts analysis must contain. Instead, the courts have adopted a general standard for determining the sufficiency of a cumulative impacts analysis. That is, an EIS must provide a "reasonably thorough discussion" of cumulative impacts to satisfy NEPA (*Resources Ltd. v. Robertson*, 35 F. 3d 1300, 1306, 9<sup>th</sup> Cir. 1994).

### **6.5.2 Potential Cumulative Impacts**

This section describes the cumulative impacts to environmental resources that could potentially arise with implementation of a Boulder City/U.S. 93 Corridor Study alternative in association with the other projects and programs described in this chapter. This discussion is presented by environmental resource areas. The cumulative effect analysis focuses on the major improvements that are planned to occur in the immediate vicinity of

the proposed project and could result in environmental impacts that, when combined with those of the proposed project, have the potential to result in cumulative impacts. A potential project-related effect is determined to be cumulatively significant if, when considered collectively with the impacts of other projects identified, it adversely impacts a particular individual environmental resource area, as defined and described in Chapter 4.

### **Biological Resources and Threatened and Endangered Species**

Biological surveys of the Boulder City/ U.S. 93 Corridor Study project area were conducted to characterize the biological resources of the area, and to determine if the build alternatives would impact any federally listed species, or other species of concern. Upon the completion of more detailed engineering design, detailed studies will be performed to develop a Biological Assessment in consultation with the USFWS and NDOW. As discussed in this EIS, Alternative B would impose the least disturbance on local biological resources because work would occur primarily in disturbed right-of-way. Alternative C would cross desert tortoise habitat from Railroad Pass to where it intersects with U.S. 93. This alternative would also cross bighorn sheep habitat in the vicinity of Railroad Pass and at the base of the River Mountains. The preferred Alternative D would impact the largest area of wildlife habitat. It would traverse through desert tortoise habitat and bighorn sheep habitat in the northern Eldorado Mountains. Based on a 120-m-wide (400-ft-wide) construction zone, Alternative B would disturb a total of approximately 327 acres of new habitat; Alternative C would impact 460 acres; and Alternative D would impact 679 acres.

Implementation of any of the project alternatives would contribute to the barrier that the existing roadway corridor poses to the free movement of bighorns between mountain ranges to the north and south of the project area, contributing to cumulative impacts to this big game species. With mitigation in the form of bighorn sheep and other wildlife crossings, as well as other measures described in Section 6.6, and with the operational reduction of traffic along the current U.S. 93 corridor, cumulative impacts from the construction of Alternative D would be lessened, although they would remain adverse. Expansion of residential and public facilities within the Hemenway Valley can be expected to continue, and to contribute to the cumulative effects of the barrier to bighorn migration between the River and the Eldorado Mountains.

The Boulder City Rifle and Pistol Club range is located at the base of the Eldorado Mountains in desert tortoise and bighorn sheep habitat. The site cannot be used by these species due to its dangerous nature. Although unlikely, should these species find themselves within or near the vicinity of the range, they may accidentally be shot, resulting in mortality and possible cumulative impacts on the species.

Nearby, the Boulder City Municipal Landfill has also been developed within desert tortoise habitat. The landfill has also attracted large numbers of ravens, which feed upon desert tortoise hatchlings. In order to control the influx of ravens, the U.S. Department of Agriculture has been trapping and removing the birds from the site. The landfill, in conjunction with the Boulder City/ U.S. 93 Corridor, contributes to cumulative impacts on the desert tortoise due to the loss of individuals and their habitat, as well as increased raven predation. The project also contributes to cumulative impacts on bighorn sheep due to the loss of habitat and the disruption of sheep movement, especially in the Eldorado Ridge area.



Existing and proposed power infrastructure in Eldorado Valley has, in the past and is proposed to be, developed within desert tortoise and gila monster habitat. Power infrastructure, in conjunction with the Boulder City/ U.S. 93 Corridor, contributes to cumulative impacts on the desert tortoise and the gila monster due to the loss of individuals and their habitat.

The gravel quarry and processing sites west of Boulder City are both located within concentrated desert tortoise habitat. Past and current operations of the quarry have impacted tortoise habitat, likely causing migration and mortality, and thereby contributing to cumulative biological impacts on the desert tortoise. I-515 also runs through desert tortoise habitat, likely resulting in direct impacts and contributing to cumulative impacts on the desert tortoise.

On June 3, 1999, USFWS issued its Biological Opinion for the Hoover Dam Bypass Project. This document represents the opinion of USFWS on the potential effects of the proposed bypass project on federally listed species under the *Endangered Species Act of 1973*. The Biological Opinion concluded that construction of the Sugarloaf Mountain Alternative may result in the direct loss of five individuals of the federally listed Mojave Desert tortoise and 80 acres of desert tortoise habitat in Nevada. However, USFWS found that the project is not likely to jeopardize the continued existence of the desert tortoise or adversely impact designated critical habitat. USFWS stipulated “reasonable and prudent” measures to minimize project effects on the desert tortoise, including payment of \$46,960 to Clark County for offsite mitigation for the loss of 80 acres of desert tortoise habitat. The Hoover Dam Bypass EIS also concluded that the Sugarloaf Mountain Alternative will impact 20 acres of known habitat of desert bighorn sheep, which is a USFWS species of concern, as well as a State of Nevada protected species. The Boulder City/ U.S. 93 Corridor project, in conjunction with the Hoover Dam Bypass, is expected to have cumulative biological impacts on desert tortoise and bighorn sheep.

The future U.S. 93 and U.S. 95 highway improvement projects will also contribute to cumulative impacts on endangered, threatened, or protected species also affected by the Boulder City/U.S. 93 Corridor project. However, since these two future projects will primarily involve widening of existing highways, it is assumed that additional adverse impacts can usually be avoided with environmentally sensitive design, including continued use of protected game crossing structures, right-of-way fencing to minimize animal mortality, and other measures, including roadside signing for wildlife areas. Lands immediately adjacent to major highways are generally low-value biological habitats because of their disturbed nature.

Development of the Park Place and Boulder Ridge Golf Courses will occur along the base of the River Mountains to the north of existing U.S. 93. This area is habitat for desert tortoise and bighorn sheep; both are special-status species impacted by the Boulder City/U.S. 93 Corridor project. Similarly, continued construction in the Hemenway Valley area will impact desert tortoise and bighorn sheep habitat. Any impacts from these projects would contribute to cumulative impacts on these species.

The reopening of the remainder of the historic BCBRR is unlikely to impact the threatened desert tortoise. A majority of the operation of the railroad will occur within existing railroad right-of-way. However, an additional segment will be constructed on currently

undeveloped land. Construction and operation of this segment would disrupt this habitat, thereby contributing to cumulative impacts on the desert tortoise. Reopening of the BCBRR is likely to contribute further to the barriers preventing exchange of individuals between bighorn sheep populations in the McCullough Range in the south, and the River Mountains in the north. However, given that trains are expected to pass only periodically, and that they are highly visible, the contribution to cumulative impacts to bighorn sheep from this action is expected to be minor.

Excavation required for the completion of the new potable water line serving both Henderson and Boulder City will adversely affect biological resources during construction. Habitat would be disturbed causing species to relocate. However, once the pipe is buried and construction is complete, species would be able to reinhabit the area. Therefore, the project is not expected to contribute to long-term cumulative impacts.

### **Cultural Resources**

Archaeological and historic site surveys were conducted within the APE of the Boulder City/ U.S. 93 Corridor Study project, resulting in the identification of both archaeological sites and historic structures eligible for inclusion in the NRHP. Of the archaeological and historic structures eligible for the NRHP, Alternative B could impact a total of three archaeological sites and 26 historic structures or groups of structures, Alternative C could affect five archaeological sites and 25 historic structures or groups of structures, and the preferred Alternative D could impact 3 archaeological sites and 9 historic structures. Impacts to the power transmission lines eligible for the NRHP are due to their association with Hoover Dam. It would result in cumulative impacts on the Hoover Dam National Historic Landmark (HDNHL) (see Sections 4.9 and 4.10).

A Native American consultation plan has been implemented between FHWA and appropriate Native American representatives to determine if there are TCPs of significance within any of the proposed alignments.

The U.S. 93 Hoover Dam Bypass will not impact significant prehistoric archaeological resources. However, it was determined to have an adverse effect on the HDNHL, eight related historic properties primarily associated with construction and operation of Hoover Dam, and the Gold Strike Canyon and Sugarloaf Mountain TCP.

There is also potential for additional NRHP-eligible properties that may exist along the portions of U.S. 95 and U.S. 93 (in Arizona) to be impacted by future widening. There are no presently known NRHP-eligible properties along U.S. 95 or U.S. 93 in Arizona that would result in cumulative impacts from these projects. However, until cultural resource surveys are completed, detailed information regarding such resources will not be known.

The reopening of the Boulder City Branch Railroad, an NRHP-eligible structure, may impact cultural resources. While a majority of the operation would occur on existing railroad right-of-way, the loop portion would be constructed on currently undeveloped land. This area, specifically along the railroad, is known to be rich in archaeological and historic resources. Any impacts to cultural resources by this project would contribute to cumulative impacts.

The Eldorado and Las Vegas Valleys contain prehistoric and historic artifacts and sites. Any past or future development, such as the landfill, the golf course developments in

Boulder City, the housing developments in Hemenway Valley, and the development of water and power infrastructure, runs the risk of impacting cultural resources, especially if excavation is required.

### **Section 4(f) Resources**

The Boulder City/U.S. 93 Corridor Study alternatives may impact three designated public park and recreation lands, consisting of the LMNRA, the historic Boulder Branch Railroad, Old Highway 41, historic transmission lines, River Mountains Loop Trail, and the planned Boulder Ridge public golf course. Alternatives B and C would permanently use approximately 58 and 93 acres of Section 4(f) land, respectively. This estimate is based on an assumed 100-m (328-ft) right-of-way width. Using the same right-of-way assumptions, it is estimated that the preferred Alternative D would require the use of approximately 59 acres of Section 4(f) lands. Alternative C would permanently require 47.8 acres from the proposed Boulder Ridge Golf Course development and approximately 1.9 acres from the planned segment of the River Mountains Loop Trail where it crosses east of the existing U.S. 93/U.S. 95 interchange. In addition to park and recreation lands, the three proposed alternatives also have the potential to impact historic structures (see Chapter 7).

The Hoover Dam Bypass will permanently use approximately 92 acres of Section 4(f) lands from the LMNRA and the HDNHL. It was determined that there are no feasible and prudent alternatives to the use of Section 4(f) land and that the proposed action includes all possible planning to minimize harm to the Section 4(f) lands resulting from their use.

Widening of the 21-km (13-mile) two-lane segment of U.S. 93 in Arizona, from the future Hoover Dam Bypass interchange to the boundary of the LMNRA, would use Section 4(f) recreation land administered by NPS. In some areas, ADOT has 120 m (400 ft) of existing highway right-of-way; however, at this predesign stage, it is unknown what portions of the widening would be on LMNRA or ADOT land. If ADOT did the widening on the existing alignment of U.S. 93, it is estimated that an additional 15 m (50 ft) of right-of-way would be required. Assuming all the new highway right-of-way would be on LMNRA land, this ADOT project could result in the permanent use of approximately 80 acres of Section 4(f) land.

Although the precise location of the new transmission line has not been determined, the relocation of the WAPA transmission line from Hoover Dam to Mead Substation will likely affect LMNRA lands. Thus, these two projects, in conjunction with the Hoover Dam Bypass, could result in a cumulative impact to public recreation and historic lands.

Due to the location of existing U.S. 93 through the LMNRA, it is assumed that there will be no feasible and prudent alternative to the use of Section 4(f)-protected land for either the proposed Boulder City Corridor or the U.S. 93 widening in Arizona. Thus, these two projects, in conjunction with the Hoover Dam Bypass, could result in a cumulative impact to public recreation and historic lands.

### **Visual Resources**

All of the Boulder City Corridor alternatives, including the preferred alternative, are expected to contribute to short-term as well as long-term visual impacts to the local landscape. Construction activities associated with each build alternative will result in

common short-term visual impacts, such as the generation of fugitive dust from earthmoving activities and construction vehicles, view degradation from the presence of construction equipment, and the emission of light from construction sites due to possible nighttime construction. Because of the close proximity of sensitive receptor sites, Alternatives B and C would be greater contributors of visual impacts than Alternative D. In addition to short-term impacts, long-term impacts on sensitive receptor sites by the two alternatives include adverse impacts on views of Lake Mead from residences along Laguna Lane in Hemenway Valley. Further, the two alternatives would also visually impact several historic residences along Valley View Lane, Donner Way, and Lakeview Drive. Unlike the other alternatives, the preferred Alternative D would not adversely impact any visual resources. However, because it would result in the most new development in an undeveloped area, it would contribute to the greatest landscape modification. Cumulative impacts on visual resources would vary from minor to adverse, depending on the alternative that is selected.

Existing power facilities, including the Mead Substation and transmission towers and lines have become prominent features in the Eldorado Valley. These massive structures dominate the landscape, adversely impacting views of the surrounding desert environment. Some may find the structures interesting and consider them visual resources; however, their presence still impacts the desert landscape and contributes to cumulative impacts. Proposed power facilities will further impact views of the desert landscape; however, the Copper Mountain Power facility will be located adjacent to an existing power generation plant. Therefore, it is not likely to significantly disturb the visual setting of the desert area. Furthermore, the relocation of transmission lines from Hoover Dam to Mead Substation would result in minimal visual impacts given the prominence of existing transmission lines in the area.

While not as prominent as the transmission towers, construction of I-515 has contributed to long-term visual impacts on the desert environment by converting undeveloped land to a six-lane freeway. Visual impacts associated with this project would contribute to cumulative impacts.

Operation of the Boulder City Municipal Landfill has increased the visual contrast of the site with the existing landscape. Impacts on the views from fugitive dust are minimal, as dirt roads and other work areas are watered daily.

The mining activity occurring in the Railroad Pass area has produced a scarring effect on the foothills of the River Mountains. Additionally, industrial machinery and vehicles are regularly present on the site contributing to visual impacts on the landscape. The Goronwich Sand and Gravel processing site is further away from existing U.S. 93 and is nearly 3 km (2 miles) from Alternative D, but the facility does have a visual impact on the U.S. 95 corridor and also contributes to the cumulative visual impact on the landscape of the area.

The Hoover Dam Bypass will be located approximately 457 m (1,500 ft) downstream from Hoover Dam and about 77 m (254 ft) higher than the crest of the dam. This new bridge crossing over Black Canyon will be in full view from the dam. Consequently, it was found that the bridge would have an adverse effect on the historic landmark owing to the introduction of visual elements that diminish the integrity of the property's significant

historic features. It has been determined that other visual effects of the Hoover Dam Bypass on the surrounding environment could be mitigated.

NDOT's planned U.S. 95 highway improvements and ADOT's planned U.S. 93 widening will likely have both short-term and long-term visual impacts on the surrounding desert environment. However, the planned U.S. 93 and U.S. 95 improvements will all be within existing highway corridors, which have been a part of the desert landscape for many decades; therefore, they may not have adverse visual impacts. Therefore, cumulative effects from these projects would be minimal.

The reopening of the Boulder City Branch Railroad will occur primarily on existing railroad right-of-way and would not result in visual impacts. However, a small loop portion of track will be laid on undeveloped land resulting in some minor visual impacts on the desert landscape.

### **Air Quality**

Construction of the Boulder City/ U.S. 93 Corridor project would contribute to short-term localized air quality impacts. These impacts can be attributed to the construction vehicles and equipment used during construction activities. Most are powered by diesel fuel, which emits more NO<sub>x</sub>, SO<sub>x</sub>, and PM<sub>10</sub> than gasoline-powered equipment. Activities, such as grading, are a source of fugitive dust emissions that can also impact local air quality. In order to control the impacts created by construction, these activities would be regulated under DAQEM air pollution permit requirements. As part of the requirements, in order to avoid adverse impacts, mitigation measures would be adhered to.

Construction activities associated with the Copper Mountain Power facility, the WAPA relocation of transmission lines from Hoover Dam to Mead Substation, Hoover Dam Bypass, the NDOT U.S. 95 improvements, and the ADOT U.S. 93 widening are also expected to contribute to short-term localized air quality impacts. Should these projects undergo construction during the same time period as the Boulder City Corridor project, short-term cumulative impacts to air quality can be expected. No long-term air quality impacts have been identified for any of these projects.

Because of their location largely within the City of Boulder City, localized cumulative, long-term air quality impacts would result from the implementation of Alternative A (the no-build alternative) or Alternative B (the through-town alternative) as a result of the increase in regional traffic within the city combined with increases in local traffic and other emissions over time. This cumulative effect would be less for Alternative C, and negligible for Alternative D because it avoids the City.

### **Noise**

The Boulder City/U.S. 93 Corridor project and construction of the preferred Alternative D are expected to contribute to noise impacts due to the proximity of sensitive receptor sites to the proposed build alternatives (NDOT, August 2001b). Because Alternative D is not located near any noise-sensitive land uses, no adverse noise effects are expected. In fact, noise-sensitive receptor areas along the existing U.S. 93 would experience a decrease in traffic noise levels upon construction of the roadway. Construction of Alternatives B and C would result in short-term noise impacts due to construction activities, which would be regulated

by local noise control rules, regulations, and ordinances. Under Alternative A (No Build), long-term adverse impacts from an increase in traffic noise would result; traffic noise levels would approach or exceed NAC levels and would not be mitigated. Construction of Alternative B, on the other hand, would result in decreased noise levels at some locations and increased levels at others. Similar to Alternative B, future traffic noise levels associated with Alternative C would decrease near the Railroad Pass Hotel and Casino and the Hacienda Hotel and Casino, and would increase for the Boulder Oaks RV Park and residences south of Lakeview Drive and Ridge Road. Adverse noise impacts associated with the construction of Alternative B or C would be mitigated by the construction of noise barriers, which would reduce peak-hour noise levels to below the NAC.

Operation of I-515 has produced increased noise levels in the U.S. 93/95 corridor. To mitigate these effects on nearby sensitive receptor sites, NDOT recently constructed soundwalls. This project, in conjunction with the Boulder City/U.S. 93 Corridor project, would not contribute to cumulative noise impacts on nearby sensitive receptor sites.

Noise associated with the operation of the Boulder City Municipal Airport has impacted the city very little. Infrequent complaints about noise from the community are usually associated with aircraft overflights not affiliated with the Boulder City Airport. Cumulative impacts due to an increase in noise levels are not expected with the construction of the preferred alternative.

The Hoover Dam Bypass project will result in short-term noise impacts due to construction activities. However, there will be no long-term noise impacts associated with the operation of the new bridge over the Colorado River. Construction of the project will not affect sensitive receptor sites associated with the Boulder City Corridor project. At this predesign stage, it is unknown if the Nevada U.S. 95 or the Arizona U.S. 93 improvement projects will contribute to cumulative long-term noise impacts along these highway corridors.

The construction and operation of the NSCH is expected to generate increased noise. This is due, in most part, to the elevated traffic levels that are anticipated for this area.

Operation of the Boulder City Branch Railroad will mostly occur on existing railroad right-of-way running along U.S. 93. A majority of this area, as well as the loop portion, do not have nearby sensitive receptor sites. However, roughly 1.6 km (1 mile) of the rail runs through the commercial district of Boulder City, terminating at Buchanan Boulevard. Train travel is only anticipated to occur up to five times a day and is not expected to cause adverse noise impacts. Alternatives B or C would contribute to cumulative noise impacts with the reopening of the railroad.

### **Water Resources**

Development of the Boulder City/U.S. 93 Corridor is expected to result in impacts to surface water quality in the receiving waters of Lake Mead and the Colorado River. Degradation would occur during construction of the project, as well as during its operation, due to stormwater runoff and erosion. Because of shorter drainages, Alternatives B and C would retain runoff from receiving waters for a shorter period of time, resulting in greater negative impacts than Alternative D. As for erosion impacts, Alternative D would pose greater impacts due to the continuous steep slopes associated with the roadway profile.

Implementation of mitigation measures outlined in the SWPPP and NPDES permit would work to reduce long-term impacts to water quality.

Groundwater contamination from landfill leachate is a common concern, usually mitigated by the use of a landfill liner system. However, because the Boulder City Municipal landfill is located in an arid climate with a deep groundwater table (180 m [600 ft] below the surface) and contamination of groundwater is very unlikely, the current landfill site was not required to have a liner. Specific guidelines, such as not watering the refuse, are adhered to by landfill staff. No groundwater contamination has resulted from the operation of the landfill.

The operations of the sand and gravel quarry and processing area have altered the drainage and water quality of the project area. In the quarry near Railroad Pass, cuts in the terrain have disturbed the natural desert wash formation, and channels have been formed to direct surface runoff away from the site. This runoff, both in the quarry and in the processing site, is likely to be high in suspended and dissolved solids. The surface runoff, however, is conveyed to the Dry Lake Basin, which is not a navigable water body. Therefore, no water quality standards are adversely impacted.

Relocation of the transmission lines from Hoover Dam to Mead Substation and the Hoover Dam Bypass project will have impacts on water quality in the Colorado River due to potential stormwater runoff and erosion. Mitigation measures, such as the construction of roadway channels that resist erosion, construction of energy dissipating structures at all culverts whose discharge velocity will cause downstream erosion, and building sediment trapping basins that also act as chemical spill containment structures, will aid in making those impacts minimal.

Despite limited information, the U.S. 95 project in Nevada and the U.S. 93 project in Arizona may also affect desert washes, thereby resulting in localized water quality impacts and contributing to cumulative water quality impacts. However, the cumulative effects from these projects would be minimal.

Operation of the Park Place and Boulder Ridge Golf Courses may result in localized water quality impacts. Runoff, possibly containing pesticides, from irrigation of the golf course greens may contaminate desert washes and contribute to cumulative water quality impacts.

### **Wetlands/Waters of the U.S.**

There are no wetland resources within or adjacent to the Boulder City/U.S. 93 Corridor project area; therefore, construction of any of the build alternatives would not contribute to cumulative impacts on these resources.

However, the Boulder City/U.S. 93 Corridor project would have construction, as well as operational, impacts on waters of the U.S., as defined in 33 CFR 328.3. Total waters of the U.S. impacted by construction of the various alternatives are 3.58 acres with Alternative B, 3.82 acres with Alternative C, and 5.68 acres with Alternative D. Impacts resulting from the operation of the alternatives to jurisdictional waters would be less. Alternative B would impact a total of 1.70 acres, while Alternative C would impact 1.72 acres and Alternative D would impact a total of 3.12 acres. Temporary impacts will be avoided or minimized by designating construction staging areas and materials stockpiling outside of the limits of

waters of the U.S. Permanent impacts will be minimized through the use of sound bridge and culvert design at the wash crossings.

The Hoover Dam Bypass project will have minimal effects on waters of the U.S.: 0.66 acres will be impacted temporarily, while 0.11 acre will be permanently affected by the project.

Depending on site-specific conditions, the U.S. 95 project in Nevada and the U.S. 93 project in Arizona may affect waters of the U.S. Such impacts will not be known until sufficient environmental and engineering information becomes available.

## Community Resources

**Land Use and Population.** Cumulative land use impacts in Boulder City due to the Boulder City/U.S. 93 Corridor project and all other related projects are expected to be limited. This is due in part to the city's distance from other areas in the region and established growth controls. Because Boulder City is situated amid federal lands, it is buffered from induced growth by surrounding communities. Strict growth control measures within the city act to limit the number of housing units, keeping the population low.

Although the Copper Mountain power facility would improve electricity services to Boulder City, as stated above, it is anticipated that the Boulder City strict growth control measures will prevent impacts associated with induced growth. Due to the nature of the remaining surrounding projects, none would promote development or conflict with the land uses within Boulder City; therefore, they would not contribute to cumulative impacts in those areas.

**Socioeconomics.** Similar to land use impacts, cumulative social and economic impacts would also be limited due to the location of Boulder City and its growth control measures. Although some of the projects in the cumulative impact analysis, including the proposed Copper Mountain power facility, ongoing redevelopment in the historic downtown, and the Boulder City proximity to the fast-growing areas of Henderson and Las Vegas, have the potential to spur increased economic development in and around Boulder City, the net socioeconomic impact is dependent on the extent to which the City chooses to lease land for development or proposes sales of land for approval by city voters. The preferred alternative (Alternative D) would have both positive and negative socioeconomic impacts (see Section 4.11); therefore, it would not contribute to cumulative socioeconomic impacts. No cumulative socioeconomic impacts are expected from the Boulder City/U.S. 93 Corridor project in conjunction with related projects in the area.

**Traffic.** Indirect cumulative impacts associated with traffic growth from related projects could potentially affect the project area by degrading local circulation, exacerbating the barrier effect created by U.S. 93, and impacting public safety. Such an impact would be worse under the No Build Alternative, as it provides no relief to the continuing increase in traffic congestion.

Construction of the NSCH will produce a greater traffic demand at the Boulder City/U.S. 93 Corridor western limits, especially during peak hours. Therefore, in order to alleviate the anticipated congestion, the founders of the NSCH and the Henderson City Council would like to preserve the option for construction of an interchange at Foothills Drive in Henderson. A new interchange at this location, as well as an upgraded Wagon Wheel interchange to the



north, would provide greater access to the college and relieve anticipated traffic congestion, thereby not contributing to cumulative impacts.

## **6.6 Mitigation Measures for Cumulative Impacts**

### **6.6.1 Biological Resources and Threatened and Endangered Species**

The mitigation proposed in this EIS for biological resources impacts includes, but is not limited to, monitoring construction activities, scheduling construction activities to avoid nesting and brooding seasons, constructing barriers to prevent species mortality, and including bridges and/or culverts in the highway design to allow cross-highway species migration. These are described in more detail in Section 4.4.3, and include NDOT mitigation measures under the MSHCP. Implementation of these measures would reduce the contribution of the build alternatives to adverse cumulative effects on biological resources. NDOT and FHWA will continue coordinating with state and federal resource agencies and Clark County representatives to ensure reduction of cumulative impacts during construction and operation activities as described below.

#### **Additional Support to Bighorn Sheep Management Efforts**

The FHWA and NDOT will support NDOW, NPS, and other affected agencies in their efforts to assure the continued viability of bighorn sheep populations in southern Nevada. FHWA and NDOT will coordinate with NPS, ACOE, NDOW and affected agencies and municipalities during the design phase to support the refinement of avoidance, minimization, and mitigation commitments related to Alternative D. If FHWA and NDOT determine during the course of design that deviations from the agreed upon refinements are necessary, then the affected agencies will be consulted to confirm the avoidance, minimization, or mitigation measures remain adequate. FHWA and NDOT will confirm the avoidance, minimization, and mitigation measures with the affected agencies prior to application to the ACOE for a permit pursuant to Sections 401 and 404 of the Clean Water Act (CWA).

NDOT and FHWA will coordinate with the NPS and NDOW in the development and implementation of a bighorn sheep management plan as it relates to existing U.S. 93. This plan will be intended to facilitate interconnection of bighorn populations in the River and Eldorado Mountains.

NDOT commits to assisting the NPS and NDOW, to the extent feasible, should those agencies identify substantive safety concerns along U.S. 93 involving vehicle/bighorn collisions. NDOT will focus on human safety concerns through minimizing existing and future automobile-bighorn accidents, should the need be identified, and will seek to implement remedies consistent with the management objectives of the LMNRA and the objectives of a future bighorn sheep management plan.

#### **Bighorn Sheep Monitoring**

NDOT will provide funding for monitoring of bighorn sheep during the design phase of Alternative D to include the most up-to-date information on bighorn demography and habitat-use patterns into the design of bighorn sheep crossing features. This monitoring will

be extended through the construction phase and 1 year beyond to provide NDOW and NPS information for their management of bighorn sheep populations in the area.

One year prior to the termination of the bighorn monitoring program currently being conducted for the Hoover Dam Bypass project, NDOT, FHWA, NDOW, NPS, and any other affected agency will determine whether or not the timeframe for the Boulder City/U.S. 93 Corridor design and construction will allow for a seamless continuation of bighorn monitoring. If it is determined that NDOT and FHWA will not be able to proceed with the monitoring program such that there will be no lapse in data collection, then all parties will discuss options for continued monitoring until NDOT and FHWA can commit to fully funding the monitoring program more proximate to the construction of Alternative D.

### **Wildlife Preserve**

As discussed above, infrastructure and facilities associated with Hoover Dam, the Lake Mead National Recreation Area (LMNRA), Boulder City, the present U.S. 93 corridor, among others, have already contributed to cumulative impacts in part through the fragmentation of bighorn habitat. Construction of Alternative D would lead to further bighorn habitat fragmentation. To reduce this long-term trend, the FHWA and NDOT have entered into discussions with the City of Boulder City for the City to establish a Wildlife Preserve in the Eldorado Ridge area (Figure 4-3) where recent demographic data show a high degree of utilization by bighorn sheep (Figure 3-4B). The Wildlife Preserve will be established through the City zoning process in consultation with NDOW and NPS, and will encompass an area of approximately 500 acres. Its long axis will be generally parallel to the crest of Eldorado Ridge, and it will encompass the rugged terrain currently frequented by bighorns from about 310 m (1,000 feet) east of the current limits of the City's developed residential area in Hemenway Wash, to the boundary east/west boundary line of LMNRA land and east of the proposed Alternative D route (Figure 4-3). The establishment of this Wildlife Preserve will preclude development by the City, and provide a buffer to help maintain continuity of bighorn sheep utilization in this area that extends along the Eldorado Ridge west from the northern Eldorado Mountains and Black Canyon Wilderness Area. In a letter dated February 15, 2005 (Appendix A), the City indicated that it is prepared to take this step in support of the development of the preferred Alternative D.

## **6.6.2 Cultural Resources**

As stated in Section 4.8, measures to mitigate impacts to historic properties will include documentation. Other specific measures will be developed in consultation with the affected agencies and SHPO as part of the effects assessment performed subsequent to the completion of the 30 percent design of the preferred alternative. These could include excavation, artifact analysis and curation, and additional archival research. It is anticipated that some towers that are components of a historic transmission line will need to be relocated after full recordation in consultation with the SHPO. Development of the effects assessment itself is one of the specific measures included in the PA. Consultation with appropriate Native American groups and other interested parties will continue when the effects assessment is complete; and this consultation will provide additional guidance regarding the mitigation of effects to historic properties, including any that may be of particular Native American concern. Implementation of these measures would avoid

and/or minimize any contribution to adverse cumulative effects on cultural resources from any of the build alternatives.

### **6.6.3 Section 4(f) Resources**

As stated in Section 6.5.2, the build alternatives would contribute to a cumulative impact on LMNRA lands. The measures proposed in this EIS for mitigating this project-related impact include, but are not limited to, scheduling construction activities in cooperation with NPS; ongoing public information; and special design of cuts, fills, and other land modification to minimize impact to scenic values. These and other measures appropriate for this project, including topsoil and plant salvage, revegetation with native species, preconstruction surveys for species of concern, and biological and archaeological fieldwork during construction, will be incorporated into the design and construction of the project. (Cumulative impacts to cultural resources that are considered Section 4(f) resources are discussed above under Section 6.6.2. Cumulative impacts to biological resources are discussed above under Section 6.6.1.)

Although implementation of these measures would minimize adverse cumulative effects on Section 4(f) lands contributed by the build alternatives, NDOT and FHWA will continue coordinating with the public agencies that have jurisdiction over Section 4(f) lands crossed by the build alternatives, including NPS, City of Boulder City, Nevada State Railroad Museum, Reclamation, WAPA, and the City of Los Angeles Department of Water and Power, to further minimize and/or avoid cumulative impacts to Section 4(f) resources during construction and operation activities.

### **6.6.4 Visual Resources**

As stated in Section 6.5.2, all build alternatives would contribute to short- and long-term cumulative visual impacts. Alternative D would have fewer visual impacts than Alternatives B and C; however, implementation of Alternative D would contribute to the greatest cumulative visual impact on the landscape in the project area.

Implementation of any of the build alternatives will include mitigation measures to minimize visual impacts during construction and operation activities. Proposed mitigation measures include, but are not limited to, dust suppression and installation of glare shields to direct night lighting fixtures away from residences and ensure that light is not emitted from the site during construction, corridor landscaping, trash collection, and construction of a roadway pull-out to provide scenic views of Lake Mead (Alternative D only). Although implementation of these measures would minimize adverse cumulative effects contributed by the build alternatives on visual resources, project-related and cumulative visual impacts are adverse and unavoidable.

### **6.6.5 Air Quality**

Although implementation of any of the build alternatives would result in a minimal contribution to cumulative short-term air quality impacts, mitigation measures to reduce severity of such impacts will be implemented in accordance with DAQM permit requirements; and the project will comply with all applicable air quality regulations. Similarly, other construction activities in the project area will be required by DAQM to implement mitigation measures to avoid and/or minimize short-term air quality impacts.

Therefore, no adverse cumulative air quality impacts will occur with implementation of the project and other concurrent construction activities in the project area.

### **6.6.6 Noise**

As stated in Section 6.5.2, Alternatives A, B, and C would contribute to short- and long-term cumulative noise impacts. It is assumed that Alternative D would result in reduced traffic noise levels at all noise-sensitive receptors located along the current U.S. 93 alignment (see Section 4.3). Implementation of Alternative B or C will include mitigation measures to minimize and/or avoid noise impacts during construction activities. (For example, during the construction phase, all equipment will be required to comply with applicable noise standards; stationary equipment will be located as far from noise-sensitive receptors as possible; and temporary noise barriers will be installed around stationary noise sources. During operation, noise impacts will be avoided by installing noise barriers near noise-sensitive receptors. Additional mitigation measures are discussed in Section 4.3. Implementation of these measures would avoid a contribution to adverse cumulative noise effects that could result from implementation of Alternative B or C.

### **6.6.7 Water Resources**

As stated in Section 6.5.2, all build alternatives would contribute to short- and long-term cumulative water resources impacts due to stormwater runoff and erosion. Because of shorter drainages, Alternatives B and C would retain runoff from receiving waters for a shorter period of time, resulting in greater negative impacts than Alternative D. As for erosion impacts, Alternative D would pose greater impacts due to the continuous steep slopes associated with the roadway profile.

Implementation of mitigation measures outlined in the SWPPP and NPDES permit would work to reduce short- and long-term impacts to water quality. Proposed mitigation measures include installation of soil stabilization measures, treatment of surface runoff contamination, and installation of sediment basins along the proposed alignment. Additional mitigation measures are discussed in Section 4.5. Although implementation of these measures would minimize adverse cumulative effects contributed by the build alternatives on water resources, project-related and cumulative visual impacts are adverse and unavoidable.

### **6.6.8 Wetlands/Waters of the U.S.**

As stated in Section 6.5.2, temporary construction impacts to waters of the U.S. shall be minimized and/or avoided through the implementation of mitigation measures (see Sections 4.5.2 and 4.6.3) to the extent feasible and practicable. Aquatic resources associated with jurisdictional waters of the U.S. are not present within the vicinity of any of the build alternatives, and the potential for measurable downstream impacts is negligible. Given this, and given the limited area of impact this project will have a negligible contribution to adverse cumulative impacts to waters of the U.S. during construction and operation.

During operation, all build alternatives will result in fill to waters of the U.S. Alternatives B and C would permanently fill 1.70 and 1.72 acres of waters of the U.S., respectively, while the preferred Alternative D would result in 3.12 acres of fill. Under Section 404 (b)(1)

guidelines, a Section 404 permit will require justification that the proposed fill into the Waters of the U.S. is unavoidable (see Section 4.6.4). For unavoidable impacts, the guidelines also require appropriate and practicable mitigation subsequent to measures to avoid impacts. Avoidance of some waters is provided by bridges spanning deep arroyos to the north of Eldorado Ridge (wash crossings D-12 and D-13; Figure 4-3). Prior to submittal of an application under Section 404 of the CWA for a permit, NDOT will compensate for any remaining unavoidable impacts to waters of the U.S. at a ratio of 1:1. The Section 404 permit application will require review of a number of regulatory agencies, including EPA, USFWS, NDEP, NDOW, Nevada SHPO, and the Nevada Division of State Lands. Coordination and consultation with the appropriate agencies will ensure that the project is mitigated to the maximum extent practicable such that project contributions to cumulative impacts remain minimal.

Mitigation measures that will be implemented include using bridge designs at the crossings that will minimize the erosional and hydrological effects of structures on the washes. Structural piers and retaining walls shall be protected to prevent erosion and deposition of material into the washes. Energy dissipaters may be installed at the bridge crossings to reduce the energy of floodwaters at the crossings and minimize natural deposition into the wash crossings throughout the life of the facility. Related operational water quality mitigation measures are described in Section 4.5.2.

### **6.6.9 Community Resources**

As stated in Section 6.5.2, none of the projects listed in Section 6.4 would cause the project to contribute to cumulative impacts on community resources, with the exception of the traffic impacts due to NSCH construction. However, implementation of the mitigation measure described in Section 6.5.2 will provide greater access to the college and relieve anticipated traffic congestion, thereby avoiding project contributions to an adverse cumulative impact on community resources.

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