DRAFT ENVIRONMENTAL ASSESSMENT

GALLINAS WATERSHED FUELS MODIFICATION AND MANAGEMENT

CITY OF LAS VEGAS, NEW MEXICO

Prepared for
FEMA Region VI
Federal Regional Center
800 North Loop 288
Denton, TX 76209

August 26, 2003

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ACHP	President's Advisory Council on Historic Preservation
AQB	Air Quality Bureau
APE	Area of Potential Effect
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
COC	Chamber of Commerce
CWA	Clean Water Act
dB	Decibels
DBH	Diameter at breast height
DNL	Day-Night Average Sound Level
EDR	Environmental Data Research, Inc.
EA	Environmental Assessment
EMNRD	New Mexico Energy, Minerals, and Natural Resources Department
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ETZ	Extraterritorial Zoning Area
FEMA	Federal Emergency Management Agency
FFPA	Farmland Protection Policy Act
FHBM	Flood Hazard Boundary Map
FHWA	Federal Highway Administration
FMMP	Forest Management and Maintenance Plan
HMGP	Hazard Mitigation Grant Program
MBTA	Migratory Bird Treaty Act
MG	Moreno-Brycan Association
MGD	Million gallons per day
MOA	Memorandum of Agreement
MSO	Mexican Spotted Owl
NAAQS	National Ambient Air Quality Standards
NCA	Noise Control Act
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act
NMAC	New Mexico Administrative Code
NMDGF	New Mexico Department of Game & Fish

NMED	New Mexico Environment Department
NMSHTD	New Mexico State Highway and Transportation Department
NO_2	nitrogen dioxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
OAS	Museum of New Mexico Office of Archaeological Studies
OSHA	Occupational Safety and Health Administration
Pb	Lead
PM_{10}	Particulate Matter less than or equal to 10 microns
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RG	Rocio-Dargol-Stout Association
RH	Rock Outcrop – Haploborolls Association
SEC	Southwestern Environmental Consultants
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
URS	URS Group, Inc.
USACE	U.S. Army Corp of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
VOC	volatile organic compound

1.1 PROJECT AUTHORITY

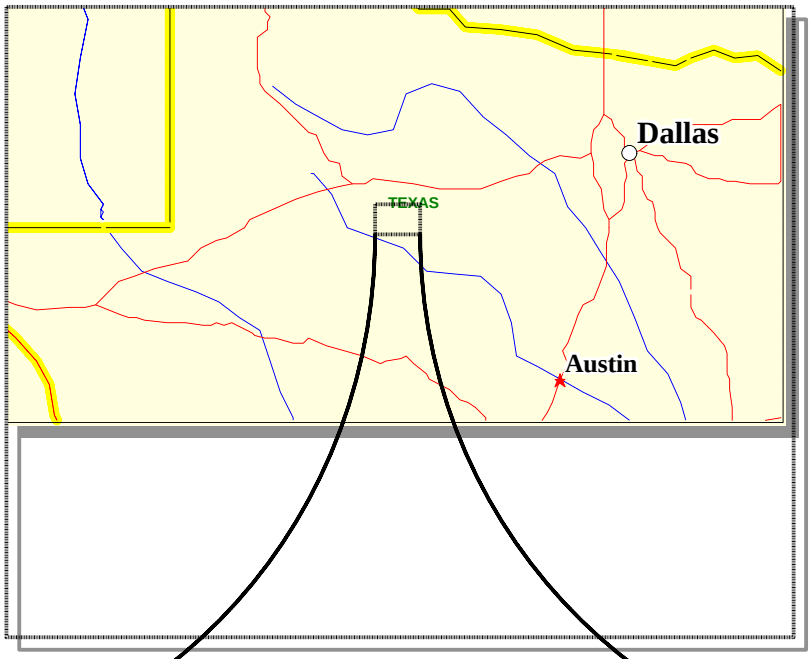
The Viveash fire began on May 29, 2000, as a small human-caused fire in the Santa Fe National Forest of New Mexico. By the time the fire was fully contained on June 23, 2000, it had burned approximately 29,000 acres of private and National Forest lands. The burned lands included a portion of the 84-square mile Gallinas Watershed, which is the municipal water source for the City of Las Vegas, New Mexico.

The Viveash Fire was one of several wildfires that broke out in north central New Mexico within the month of May. In response to the wildfires, a major disaster declaration was issued by the President on May 13, 2000. The disaster declaration, FEMA-1329-DR-NM, provided eligibility to all New Mexico Counties for federal disaster assistance under the Hazard Mitigation Grant Program (HMGP).

The City of Las Vegas, New Mexico, has applied for HMGP Section 404 funding under the Robert T. Stafford Disaster Relief and Emergency Assistance Act for a wildfire fuels management program. Grant funds are provided by the Federal Emergency Management Agency (FEMA) under this program for disaster-related mitigation projects. In accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500 through 1508), and FEMA regulations for NEPA compliance (44 CFR Part 10), FEMA must fully understand and consider the environmental consequences of actions proposed for federal funding. In compliance with NEPA and its implementing regulations, FEMA has prepared this Environmental Assessment (EA) to evaluate potential environmental impacts associated with several alternatives to meet the stated purpose and need as discussed in Section 1.3 of this document.

1.2 PROJECT LOCATION

The City of Las Vegas, population 14,565, is located in the northeastern region of New Mexico approximately 40 miles east of Santa Fe (Figure 1). The proposed project area encompasses approximately 991 acres of City-owned land which consists primarily of ponderosa pine and mixed conifer forests. The project area is located about 5 miles northwest of the City within the Gallinas River watershed in northwestern San Miguel County (Figure 2). The Village of Montezuma and the United World College are located near the northern and eastern borders of the project area. The Gallinas River, a tributary of the Pecos River, flows from west to east through the project area. The Bradner and Peterson water supply reservoirs are located at the eastern end of the project area (Figure 2). A 30-acre noncontiguous tract of forest, located approximately 1.5 miles northwest of the western project area limits, is also included in the proposed project area.



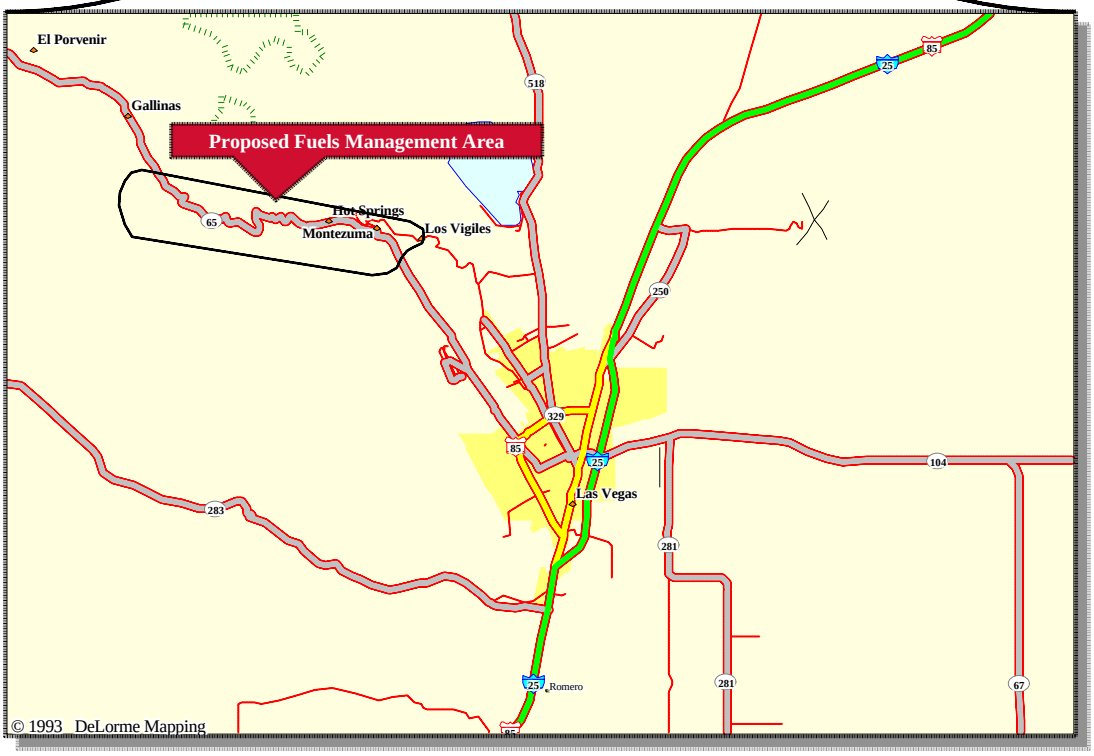


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FIGURE **1**

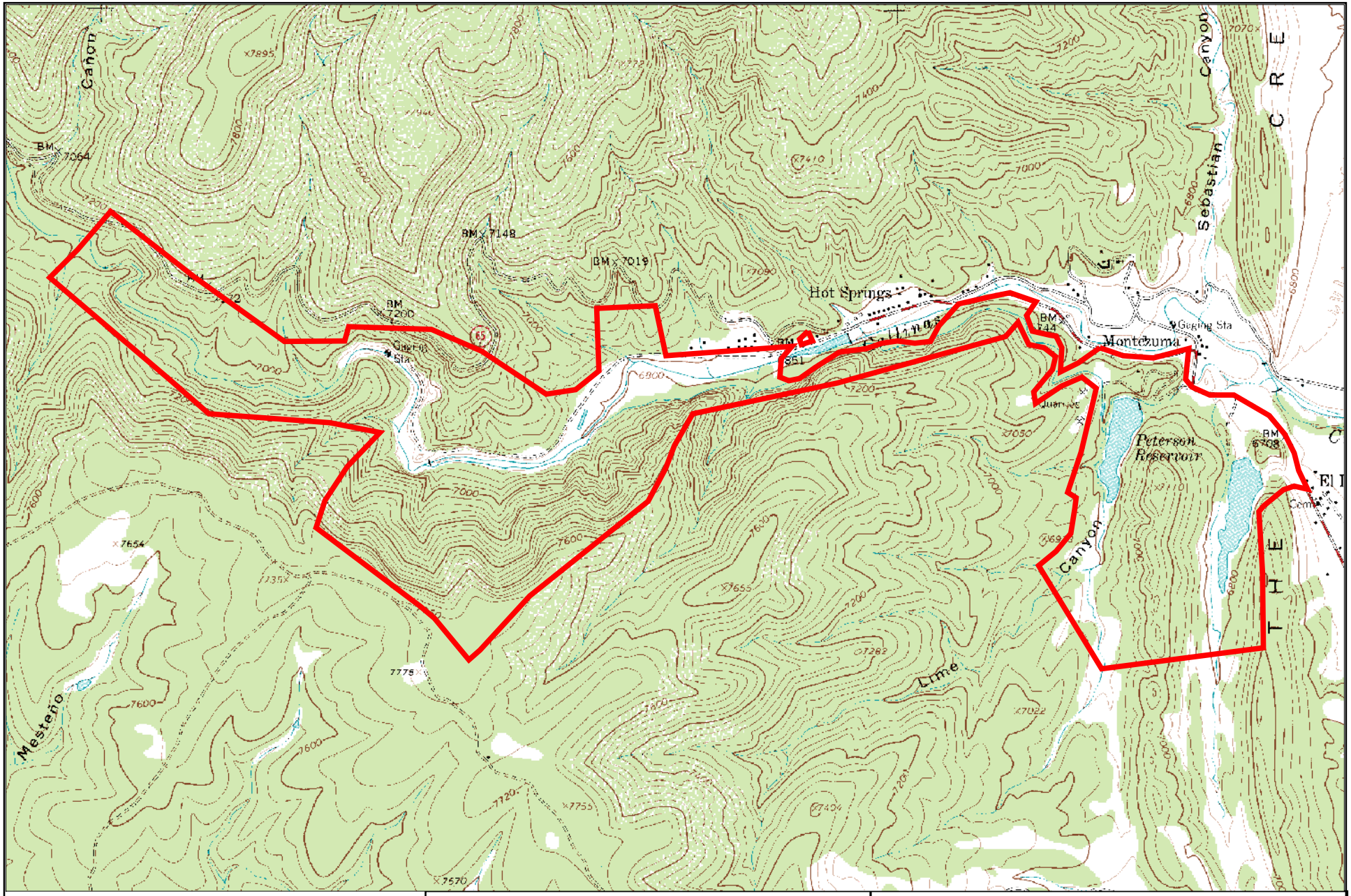

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FIGURE: 2

1.3 PURPOSE AND NEED

The Gallinas Watershed is considered by the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) Forestry Division to be one of the 20 New Mexico communities most vulnerable to fire (EMNRD, 2002). The City of Las Vegas owns approximately 991 acres of primarily forested land within the Gallinas Watershed; these forests are extremely susceptible to wildfires due to high tree densities and available fuel loads. This condition is primarily a result of the decades-long forestry practice of wildfire suppression that has disrupted the natural cycle of frequent, low-intensity fires. Naturally occurring fires periodically remove accumulated vegetation and reduce available fuel loads, thereby preventing larger, catastrophic fires. Trees in poor health, stressed by increased stand densities, also contribute to a greater fuel load.

The City's primary municipal water storage sites, the Bradner and Peterson Reservoirs, as well as the City's water treatment plant, are located within the City-owned areas of the watershed. In addition to the risks of injury and property loss to surrounding communities from a high-intensity fire, the ash and sediment resulting from a catastrophic fire could compromise the City's municipal water supply. This risk became a reality throughout the summer of 2000, when sporadic storm events washed accumulated ash and sediment from the Viveash Fire into Gallinas Creek, preventing the City from diverting a total of approximately 112 million gallons of water to the municipal water supply reservoirs (SEC, 2002; Tafoya, pers. comm.).

Over the past 25 years, in addition to the catastrophic Viveash wildfire, the City of Las Vegas and its water supply have been threatened by 38 smaller wildfires. Low moisture conditions resulting from 20 years of drought have increased the probability of future wildfires. (City of Las Vegas HMGP application, 2001).

According to the City of Las Vegas, control of the 29,000-acre Viveash fire within all affected watersheds indirectly cost taxpayers approximately $12 million. The fire suppression activities are directly covered through a Joint Powers of Agreement between the City of Las Vegas and the State of New Mexico; the State maintains cooperative fire agreements with the U.S. Forest Service (USFS). Additionally, the City estimates that, should a catastrophic fire event occur in the future on or near the municipal reservoirs, only 25 percent of its current users could be provided drinking water, utilizing the Taylor Well Fields. The City also estimates that, should the current water treatment facilities be damaged by fire, replacement of these structures would cost $12 million, negatively impacting the local residents' tax rates.

The primary purpose of this mitigation project is to reduce the risk of a high-intensity crown fire. The City of Las Vegas has identified the need to protect the City's water supply from impacts of an uncontrollable wildfire and has decided to address this risk by reducing fuel loads in the surrounding forests.

2.1 ALTERNATIVE ANALYSIS

Southwestern Environmental Consultants (SEC) has prepared a Forest Management and Maintenance Plan (FMMP) for the City of Las Vegas to address forest management on City-owned lands within the Gallinas Watershed. Wildfire hazard mitigation is encompassed in the primary FMMP goals of reducing the risk of a high-intensity crown fire and maintaining the overall health and productivity of forest and water resources. The FMMP identifies specific areas within the City-owned watershed for fuels management activities. The City of Las Vegas developed, and this EA considers, three alternatives for fuels management activities: no action, manual and mechanical fuels reduction, and manual and mechanical fuels reduction followed by broadcast burning.

2.2 ALTERNATIVE 1 – NO ACTION ALTERNATIVE

Under the No Action Alternative, fuels management associated with mitigating fire hazards in the Gallinas Watershed areas owned by the City of Las Vegas would not occur. Without specific actions to reduce fuel loads in these areas, fuels would continue to accumulate, increasing the risk of a high-intensity fire.

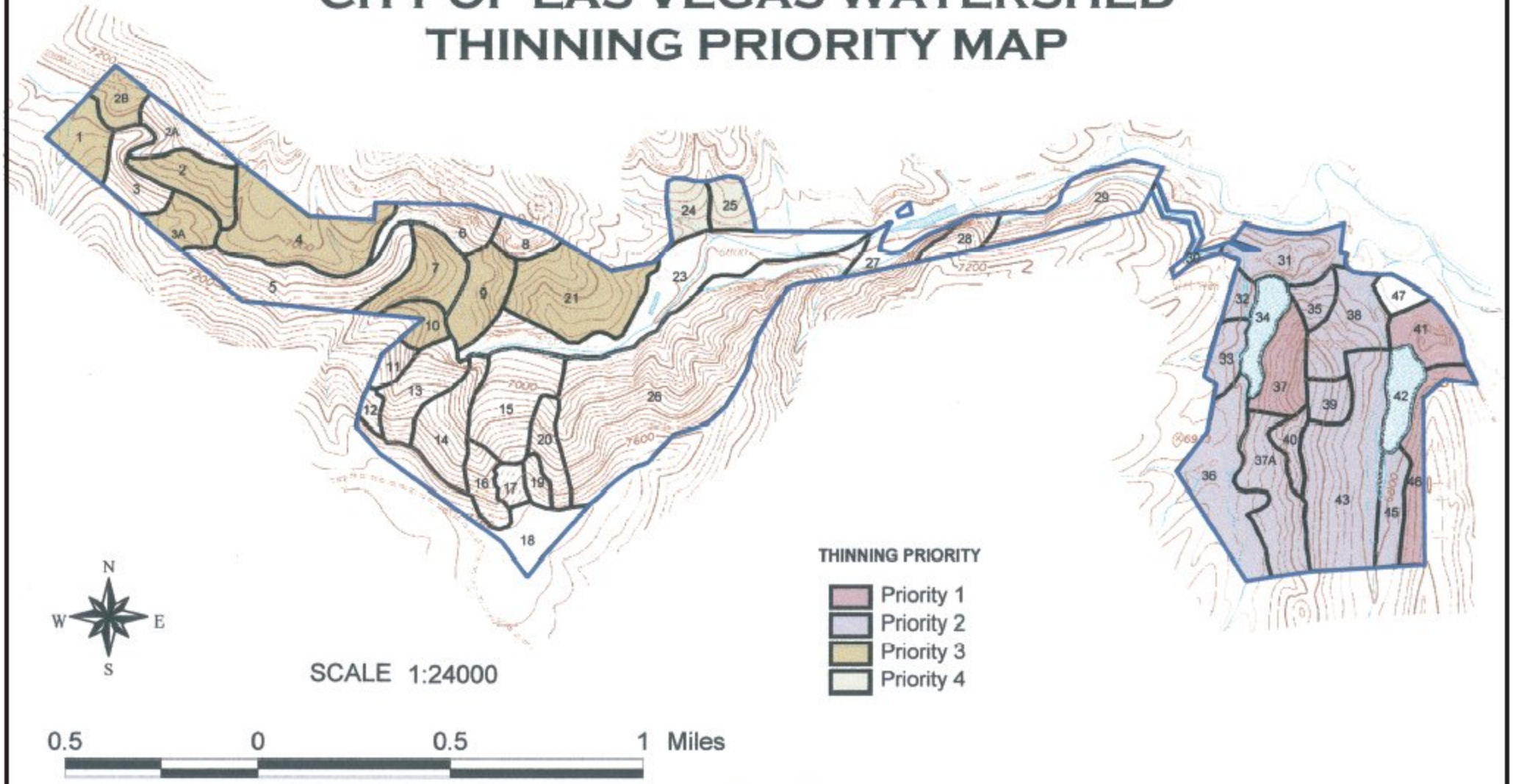
The City estimates that should a catastrophic fire event occur on or near the municipal reservoirs, only 25 percent of its current users could be sustained for drinking water, utilizing the Taylor Well Fields. The City also estimates that, should the current water treatment facilities be damaged by fire, replacement of these structures would cost $12 million, negatively impacting local residents' tax rates.

2.3 ALTERNATIVE 2 – MANUAL AND MECHANICAL FUELS MANAGEMENT (PROPOSED ACTION)

Under the manual and mechanical fuels management alternative, the City of Las Vegas would reduce fuel loading on 478 acres of the 991 acres (roughly 50 percent) of City-owned property in the Gallinas watershed, primarily in those areas with slopes less than 45 percent. The City would follow the management recommendations contained in the FMMP to achieve fuels management goals. The FMMP has divided the City's watershed property into 48 areas or "stands" that include open water (reservoirs), open (non-forested) areas, and forested areas (Figure 3). Initial fuels management activities are proposed for 25 of these stands. The remaining 23 stands primarily include north-facing forested stands on slopes greater than 45 percent, where no fuels management activities would occur. Photographs depicting the project area and examples of the stands to be thinned are in Appendix A.

The thinning prescription for fuels management is to selectively "thin from below" which removes a majority of the smaller trees while leaving many of the larger trees standing. This prescription considers both wildfire fuels management and forest health improvement goals. Under this prescription, the majority of felled trees would be less than 10 inches in diameter and to the extent possible, trees over 16 inches in diameter would be retained. In order of priority from greatest to lowest, cut trees would include those acting as "ladder fuels" (which increase the probability of a crown fire); diseased or insect-infested trees; and trees exhibiting poor form and vigor.

CITY OF LAS VEGAS WATERSHED THINNING PRIORITY MAP



Topography from electronic version of Montezuma USGS topographic map (New Mexico).

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CLIENT FEMA				TITLE FOREST STANDS AND THINNING PRIORITY MAP
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FIGURE 3

Post-thinning objectives would include a basal area (the cross sectional area of standing trees) of approximately 50 square feet per acre. Within each thinned acre, approximately 85 of the remaining trees would be equal to or greater than 5 inches in diameter.

Accumulated fuels would be manually felled. In stands that are accessible to a rubber-tired forwarder, felled trees would be transported mechanically to established landing sites. In areas inaccessible to a forwarder, trees would be felled perpendicular to the slope to create a log erosion barrier and help reduce erosion. In all cases, felled trees would be trimmed or "limbed and bucked" in the woods where they are felled. Root systems from the felled trees would not be removed from the ground.

Slash material resulting from limbing and bucking would be lopped and scattered, hand-piled for later burning, or removed from the area. Burning of slash piles is recommended in areas where slash piles would be greater than 2 feet in height, and at certain sites with a high fire risk due to private lands to the south, prevailing winds, or proximity to a highway. Slash piles that are to be burned would be kept small, from 5 feet to 8 feet in height and diameter. A burn plan (detailing burn conditions such as location, weather conditions, fuel moisture, and desired fire behavior), and a smoke management plan (describing smoke-sensitive areas, wind direction, and affected air pollution districts), would be required prior to the burning of slash piles. Burning would also be conducted in accordance with acceptable guidelines and the conditions of a New Mexico Environment Department (NMED) Air Quality Bureau (AQB) permit.

Erosion control measures would be employed throughout the proposed project area. These measures would include lopping and scattering of some slash, placement of log erosion barriers, placing slash in skid trails, and reseeding all disturbed areas. In addition, equipment staging would occur on existing roads wherever possible.

In the forested areas west of the municipal reservoirs, transportation of materials by forwarders would be conducted on small, temporary skid trails that would be rehabilitated and closed after fuels management activities are completed. Around the municipal reservoirs, two low-impact skid trails would be constructed to facilitate removal of fuels: one along the west side of Bradner Reservoir and one along the west side of Peterson Reservoir. Upon completion of fuels management activities at the reservoirs, the Bradner trail would be rehabilitated and permanently closed. The Peterson trail would either be rehabilitated and closed or left open as a fuel break and access route for fire management activities.

Project activities would occur in either the fall or winter season. Implementation of the project would require approximately two seasons, depending on the selected contractor, with work occurring over a period of several weeks (Ball, pers. comm.). Local residents would be notified, via newspaper, radio, or flyers of the timing and location of the activities.

To maintain the wildfire hazard mitigation objective, SEC has recommended that the City implement a long-term monitoring and maintenance plan to maintain watershed health and to evaluate the effectiveness of the management program. During project implementation, it is recommended that periodic on-the-ground thinning inspections and record keeping occur. Following treatment, structured forest health inspections are suggested on an annual basis for 2 years, and then every 3 years thereafter. Inspections are also suggested following site-specific, damaging natural events. The City of Las Vegas would be responsible for funding future monitoring and maintenance, either through City funds or separate grants.

2.4 ALTERNATIVE 3 – MANUAL AND MECHANICAL FUELS MANAGEMENT FOLLOWED BY BROADCAST BURNING

Under Alternative 3, the same fuels management activities and erosion control measures described in the Proposed Action would be followed; however, treatment of slash would differ. Under Alternative 3, following tree removal activities, slash would be lopped and scattered. A low-intensity broadcast burn (across the landscape) would then be used to reduce on-site slash and any other remaining ground fuels (Biswell, 1989).

2.5 ALTERNATIVES CONSIDERED AND DISMISSED

In addition to the alternatives outlined in the previous section, an additional alternative was considered but eliminated from further consideration because it was not technically feasible.

One option considered was the use of prescribed burning within the project area without any prior thinning activities. A prescribed burn alternative would have involved the development and implementation of a burn plan to reduce the total per-acre fuel load by using a low- to moderate temperature burn (approximately 212°-757° F). The use of a prescribed burn without prior thinning activities was considered technically infeasible because of the high tree stocking levels, the steep slopes of some of the project area, and the proximity of the project area to homes of the Village of Montezuma and the United World College.

3.1 PHYSICAL ENVIRONMENT

3.1.1 Geology, Seismicity, and Soils

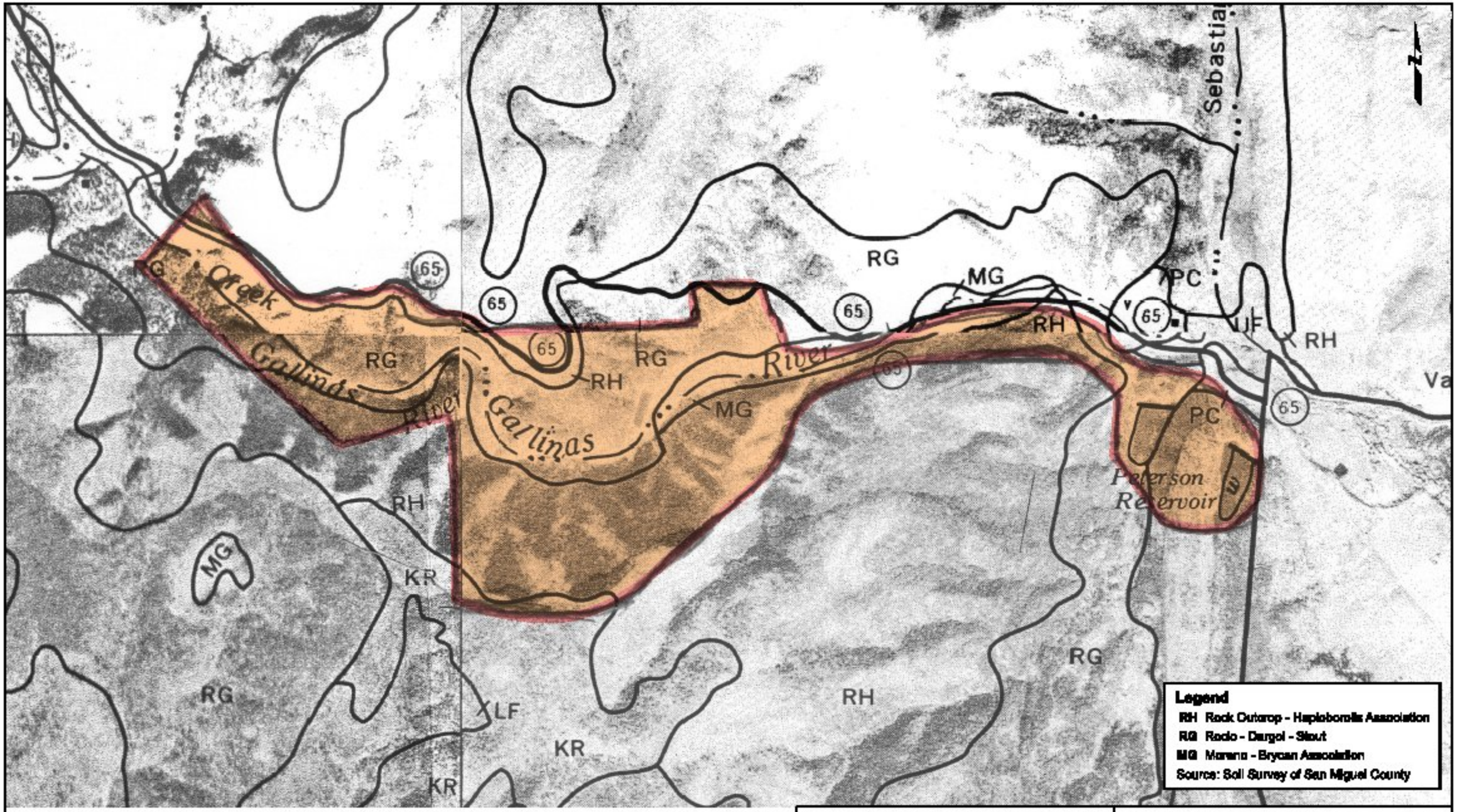
Geology: The proposed project area lies within the Sangre de Cristo Mountains and Las Vegas Plateau physiographic regions, and ranges in elevation from 6,800 to 7,600 feet. Geology of the area consists primarily of Pennsylvanian bedrock and outcrops of pre-Cambrian rocks with some Magdalena group, consisting of gneiss, schist, quartzite, granitic rocks, and pegmatite, that in some places are covered by colluvium (soil moved downslope by gravitational forces) or alluvial fan (soils moved by flooding) deposits. The Magdalena group is a geologic sandstone and arkosic sandstone bed that can be found resting on pre-Cambrian rock with a thickness that varies from vanishing point to more than 2,000 feet in the areas of the upper Pecos valley. Along the canyon of the Gallinas River, hogbacks -- sharp-crested, symmetric ridges formed by the differential erosion of highly tilted and resistant rock layers -- terminate to the west at a thrust fault, bringing the pre-Cambrian rocks to the surface (Griggs and Hendrickson, 1951).

Seismicity: Historical activity is the prominent factor associated with predicting earthquake hazard potential. That is, regions where earthquakes have occurred in the past will likely experience them again in the future. According to the U.S. Geological Survey (USGS) National Earthquake Information Center, most of New Mexico's historical seismicity is concentrated in the Rio Grande Valley (between Socorro and Albuquerque), where about half of the earthquakes of VI or greater on the Modified Mercalli Intensity scale occurred between 1868 and 1973. Since 1973, no earthquakes with an intensity greater than V have been recorded (USGS, 2001). The National Seismic Hazard Mapping Project shows that there is currently a low probability of seismic activity within the Las Vegas area (USGS, 1997).

Soils: Soils in the Gallinas watershed have been mapped by the U.S. Department of Agriculture (USDA). Three soil association are present in the project area: the Rocio-Dargol-Stout, the Rock Outcrop-Haploborolls, and the Moreno Brycan (Figure 4) (USDA, 1981).

Rocio-Dargol-Stout Association (RG)

The predominant soils present in the project area are of the RG Association. RG soils occur on hills and mountains on slopes from 5 to 35 percent, and are found on the mountainsides of the project site. The soils in this association are primarily stony loam and are found at elevations of 7,200 to 9,000 feet. In these areas, permeability of the soil is slow to very slow, run off potential is medium, water erosion hazard is moderate, and soil blowing hazard is moderate. Effective rooting depth is 20 to 40 inches. Annual precipitation in this association is approximately 25 inches. The Rocio soils, the predominant soils in this association, are deep, well-drained soils formed in the colluvial and alluvial deposits derived from sandstone and shale.



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PROJ Floodplain Modification and management, Las Vegas, New Mexico					
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Rock Outcrop-Haploborolls Association (RH)

Soils of the RH Association are found on ridges and steep mountainsides on slopes of 30 to 75 percent. RH soils are found at elevations of 7,200 to 9,000 feet. A large portion of the project area falls within this association, found predominantly on the steep hillsides of the project area. These areas consist of exposed sandstone, limestone, and shale, and can have a dark-colored surface layer of soil. The steep slopes would indicate that run-off potential is high with a moderate to high hazard of water erosion and soil blowing. Annual precipitation in this association is approximately 20 inches.

Moreno-Brycan Association (MG)

Soils of the MG Association are found within the valley bottom of the project area on slopes from 3 to 9 percent. Elevation ranges from 7,000 to 9,000 feet. This loamy soil also includes small areas of wet soils adjacent to streams. The deep and well-drained soils of this association are derived predominantly from sandstone and shale. Run-off potential is medium and the hazard of water erosion and soil blowing is moderate. Permeability is slow and effective rooting depth is 60 inches or more. Annual precipitation in this association is approximately 20 inches. Moreno soils, the predominant soils in this association, are deep, well-drained soils formed in fine-textured alluvium derived from sandstone and shale.

Prime Farmland: The Farmland Protection Policy Act (FPPA) was enacted in 1981 (P.L. 98-98) to minimize the unnecessary conversion of farmland to non-agricultural uses as a result of federal actions. Programs administered by federal agencies must be compatible with state and local farmland protection policies and programs. The Natural Resources Conservation Service (NRCS) is responsible for protecting significant agricultural lands from irreversible conversions that result in the loss of an essential food or environmental resource. Prime farmland, as defined by the NRCS, is land that has the soil quality, growing season, and moisture supply needed to produce an economically sustained high yield of crops. In a letter dated February 20, 2003, the NRCS concluded that there are no prime farmlands within the project area (Appendix B). Therefore the project is in compliance with the FPPA.

Alternative 1 – No Action Alternative

Under the No Action Alternative, the geologic framework of the area would not be directly affected; and no direct impact on soil resources in the project area would occur. Since no action would be taken to conduct fuels management projects required to adequately reduce fire hazards, the potential for future wildfires would remain.

Wildfires may adversely affect the soils of the project area through increasing erosion. The erosion potential of a wildfire depends on the erosion classification of the soils at the burn areas and disturbance of the duff layer, an organic layer of decomposing leaves, needles, and other dead plant material. If the soil erosion classification is moderate to high and the duff layer is disturbed, then erosion may occur after a wildfire. Similarly, depending on the intensity of the wildfire and moisture content of the soils, a hydrophobic (water repelling) soil layer could form below the ground surface, exacerbating surface soil erosion. Some types of vegetation contain hydrophobic substances that reach the soil surface as a result of vegetation decomposition. At soil surface temperatures between 392° to 550° F, these hydrophobic substances are turned into a gas vapor and some vapors move downward into the soil, coming to rest as cooler soil temperatures are reached (Biswell, 1989). This cooled, condensed gas forms the hydrophobic

layer, which can persist for a few years. Meanwhile, soils at the surface remain permeable because the hydrophobic substances have moved downward; and precipitation easily saturates these permeable surface soils. However, as the surface soils become saturated and the hydrophobic layer repels the water, preventing precipitation from percolating into the ground, severe erosion can occur. Saturated surface soils can flow (erode) down-slope. This impact is more likely to occur in areas with coarse-grained soils (Biswell, 1989). The project area contains soils that would be sensitive to erosion. A minimal portion of the project area contains high levels of coarse-grained solids; however, slopes in the project area range from moderate (10 to 35 percent) to very steep (35 to 75 percent) and may become unstable after a wildfire. Roots of remnant vegetation would probably remain in place on the moderate slopes but not on the steepest slopes within the project area, thus adding to the potential for severe erosion.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

Selective manual removal of vegetation in the project area would not affect geology or soils. Soils could become compacted with heavy equipment or if mechanical removal is conducted in wet conditions. Under these scenarios, the stabilizing effect of the retained root crowns would be reduced and the potential for erosion would increase. In addition, use of heavy equipment on wet or even damp soils could substantially compact soils to the extent that infiltration rates decrease, increasing runoff and erosion. Soil productivity would likely decrease under compacted conditions because root systems cannot penetrate the soils sufficiently and gas exchange is similarly reduced. To mitigate the effects of heavy equipment use and compaction, it is recommended the mechanical forwarders be used during dry periods throughout the year. This practice should be followed when precipitation at the sites has been limited to less than 1 inch in the week prior to the use of the equipment or when the ground is frozen, preferably with snow cover.

Slash would be lopped and scattered, piled and burned, or removed. For piles that are to be lopped and scattered, pile height would be kept to a height of 2 feet or less. Slash piles that are to be burned would be kept small, from 5 feet to 8 feet in height and diameter. This small size would help limit the potential for hydrophobic soils that can occur if the heat of the pile becomes too intense. The use of erosion control measures such as lop and scattering of some slash, no vegetation removal on slopes greater than 45 percent, log erosion barriers, placing slash in skid trails, and reseeding of all disturbed areas would be employed throughout the proposed project area. In addition, equipment staging would occur on existing roads wherever possible. If the above mitigation measures are implemented, the risk of substantial erosion would be minimized. Furthermore, adequate vegetative buffer zones parallel to waterways would be retained to provide sediment filtration of runoff (see Section 3.1.2 for a discussion on Water Resources).

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

The proposed project area for Alternative 3 is the same as for the Proposed Action; and the same vegetation thinning methods would be implemented. However, this alternative would dispose of slash by broadcast burning in the project area.

A low-intensity, broadcast burn would be expected to have minimal impact on area soils. In general, if applied correctly, and depending upon the topography, aspect, vegetation type, and weather at the time of the burn, prescribed burns do not noticeably increase soil erosion over

typical amounts in forests, and the protective ground-surface cover is minimally removed during controlled fires (Biswell, 1989). In some cases, fire may improve soil properties by increasing nutrient cycling. Nutrient cycling of nitrogen and ammonium concentrations can increase after a burn and over time infiltrate into deeper soil layers, therefore aiding vegetation regeneration of nitrogen-limited plants (White, 1987). The broadcast burn for this project would be low-intensity; therefore, soils and the plant community would be expected to recover quickly.

Firebreaks would be required to conduct the burn. The firebreaks would be devoid of vegetation, and soil erosion measures such as silt fences, would be installed at these areas. Based on the topography of the area, increased ash runoff would occur with a broadcast burn. The impact of increased ash runoff would be minimal and temporary from a low-intensity burn; therefore, no long-term impacts would be expected. Increased surface runoff may occur until vegetation is reestablished across the burn area. In the long term, broadcast burning would be anticipated to return the area to a more natural state and protect the soil structure by clearing fuel loads that contribute to high-intensity fires.

3.1.2 Water Resources and Water Quality

The proposed project area is located in the Gallinas Watershed of the Santa Fe Mountains, part of the southern Rocky Mountains. This area lies in an extension of the Upper Pecos Groundwater Basin as defined by the New Mexico State Engineer Office. The City of Las Vegas takes its water from the Gallinas River, using approximately 2.1 million gallons of water per day (MGD) depending on the season (Tafoya, pers. comm.). Many of the smaller villages within the watershed, such as Montezuma, obtain their domestic water supplies from local streams and private wells.

Water uses include residential supply, irrigation for agricultural and recreational use, and water for institutional use. The project area has a temperate mountain climate with an annual precipitation of approximately 18 inches. Precipitation sources are typically divided between monsoonal thundershowers in the summer and fall, and snow during the winter and early spring months. Runoff tends to occur during snowmelt and during the monsoon season in July and August.

The project area occurs in pre-Cambrian rocks with some Magdalena group. No wells are known to produce in pre-Cambrian rocks. Water can be obtained from shallow wells in the alluvium in the stream valley. Along the Gallinas River Canyon, weathered pre-Cambrian rock lies immediately below the Magdalena strata. This weathered zone will probably yield some water to wells at locations where it lies below the water table (Griggs and Hendrickson, 1951). According to New Mexico State Engineer Office well records, very few wells are listed in the surrounding areas of the project (NMSEO, 2002). One well in the area has a water depth of 8 feet. The quality of groundwater in the area is generally good, depending upon proximity of wells to recharge zones and the chemistry of the water-bearing sediments penetrated by a given well (Griggs and Hendrickson, 1951).

Surface water impoundments in the area include two City of Las Vegas impoundments at Bradner Reservoir and Peterson Reservoir, and several remnant ice dams located upstream of the City reservoirs along Gallinas River; all structures are located within the project area. The Peterson and Bradner Reservoirs serve as Las Vegas' primary drinking water storage areas, with a combined capacity of 632 acre-feet of water. The surrounding area includes impoundments at

Storrie Lake and Lake Isabel northeast of the project area, Lake McAllister within the Las Vegas National Wildlife Refuge, and other small, unnamed impoundments east of the project area.

A water quality survey of the Pecos and Gallinas Rivers was performed by the New Mexico Environment Department after the Viveash and Manueltias fires of 2000, as a response to citizen complaints of fish kills and heavy ash and sediment loads in local streams (Hopkins, 2001). The stream samples included testing for sodium ferrocyanide, a constituent of the fire retardant slurry used to combat fires. Only a portion of the far upper reach of the Gallinas Watershed burned in the Viveash fire of 2000. One sampling run was conducted on the Gallinas River on July 20, 2000, at the end of Forest Road 263. With the exception of trace amounts of cyanide, the sample yielded no elevated water quality parameters. The amount of cyanide was higher in this sample than any of the samples taken for the survey; however the level was insufficient to kill aquatic organisms. Water samples taken from Gallinas River at the USGS gage near Montezuma and at the end of the Storrie diversion yielded no water quality standard exceedances. This survey found that low levels of ash were carried by the Gallinas River through Las Vegas (Hopkins, 2001).

Wild and Scenic Rivers Act: The Wild and Scenic Rivers Act was established to preserve the free-flowing state of listed rivers or those under consideration for inclusion due to numerous values, such as scenic, recreational, geologic, or historic. With respect to the Wild and Scenic Rivers Act, the nearest federally designated wild and scenic waterway to the project area is the Pecos River, of which the Gallinas River is a tributary. This designation applies to 20.5 miles of the Pecos River—from its headwaters to the town of Tererro. This portion of the Pecos River is located upstream from the confluence with Gallinas River, and is not located within the Gallinas watershed. No further action is necessary under the Wild and Scenic Rivers Act (16 U.S.C. §§1274-1276).

Alternative 1 – No Action Alternative

Under the No Action Alternative, there would be no impacts to water resources and water quality. However, accumulation of fuel loads under this alternative would increase the risk of a wildfire occurrence. Should a wildfire occur, area vegetation would likely be eliminated and surface soils would be exposed. Depending on the temperature of the wildfire, hydrophobic soils could develop, repelling water and leading to substantial erosion. Soil stability is adversely affected by intense heat due to associated vegetation loss; therefore, unprotected soil would be eroded by wind or water actions and enter area runoff via precipitation. These sediments would eventually be carried into drainage ways and rivers, resulting in water quality deterioration in nearby streams and creeks. Additionally, nutrient spikes have been observed in surface water and groundwater downstream of areas impacted by wildfires (Brooks et al., 1991). Substantial soil deposits could dam or otherwise alter the natural course of drainage. Debris or mud dams may result in ponding of seasonal flows and diversion of river flows. These alterations may be temporary or persist during below-average rainfall years.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

The thinning prescription with this alternative would remove smaller trees to a basal area of approximately 40 to 60 square feet per acre using chainsaws and in some areas, mechanical forwarding equipment. Mobilization and demobilization of equipment and personnel would be

by means of existing roads wherever possible. Two temporary skid trails would be extended from existing roads and travel parallel to the Bradner and Peterson Reservoirs. Use of heavy equipment adjacent to waterways could adversely affect water quality in a number of ways, ranging from exposing soils to enhanced erosion during rainfall-runoff events, to triggering stream bank collapse. Equipment would not be allowed to enter waterways of the project area and a minimum 50-foot buffer would be implemented for equipment to be maintained away from the waterways. The width of this buffer strip increases as the slope of the land above the stream increases. No fuels management activities would be conducted in riparian areas and all equipment would be kept out of any wetland area. Slash would be piled and burned or removed and some slash would be left on the ground for erosion control.

It is anticipated that the Proposed Action would have no adverse effect on the quality of surface water and groundwater resources of the area. Increases in sedimentation of area waterways are unlikely, as long as appropriate erosion control methods are employed and a low-intensity soil surface temperature is maintained throughout the burning of the slash piles. Skid trails or staging areas created would be temporary and would be reseeded and slash would be placed on the trails for erosion control. Water at the City's two public water supply reservoirs must be sampled and analyzed regularly for public health-related contaminants, as well as for non health-related, or aesthetic-related parameters. Information from sampling and analyses of these sources would provide the basis for monitoring water quality during and after the Proposed Action.

The Proposed Action would result in a slightly greater availability of water resources. Removal of dead wood and tree thinning would result in reduced interception of precipitation, greater soil infiltration, and increased groundwater recharge rates. Additionally, tree thinning would result in decreased vegetative evapotranspiration and greater availability of water for groundwater recharge and surface water yield (Brooks et al., 1991). No long-term adverse impacts to water resources or water quality are anticipated as a result of Alternative 2.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

The thinning prescription with this alternative would remove smaller trees to a basal area of approximately 40 to 60 square feet per acre using chainsaws and in some areas, mechanical forwarding equipment. Mobilization and demobilization of equipment and personnel would be by means of existing roads wherever possible. Two temporary skid trails would be extended from existing roads and travel parallel to Bradner and Peterson Reservoirs. Use of heavy equipment adjacent to waterways could adversely affect water quality in a number of ways, ranging from exposing soils to enhanced erosion during rainfall-runoff events, to triggering stream bank collapse. Equipment would not be allowed to enter waterways of the project area and a minimum 50-foot buffer would be implemented for equipment to be maintained away from the waterways. The width of this buffer strip increases as the slope of the land above the stream increases

The use of broadcast burning to remove slash may increase runoff from the burn area. Remaining blackened fuels and heated soils penetrate through snowpack, changing the surface heat and causing earlier and more rapid snowmelt and runoff (Zwolinski, 2000). The increase would be expected to be minimal, however, because it would be a low intensity burn. Runoff would decrease as ground cover vegetation becomes reestablished. There would be an increase in ash runoff into the Gallinas River within the project area, potentially temporarily degrading

water quality in downstream flows. Erosion control measures such as silt fencing would be implemented around fuelbreaks placed to control the burn. Additional measures would be taken to reduce impacts including no thinning above 45 percent slopes, using existing roads wherever possible, and conducting thinning during times when the ground is frozen or during dry seasons to minimize soil compaction.

Water at the City's two reservoirs must be sampled and analyzed regularly for public health-related contaminants, as well as for non-health-related, or aesthetic-related parameters. Information from sampling and analyses of these sources would provide the basis for monitoring water quality during and after the project.

No long-term adverse impacts to water resources or water quality are anticipated as a result of Alternative 3. Reducing fuel loads in the project area similarly reduces the risk of catastrophic fire and the related severe storm runoff associated with a large, high-intensity fire. Alternative 3 would result in a slightly greater availability of water resources.

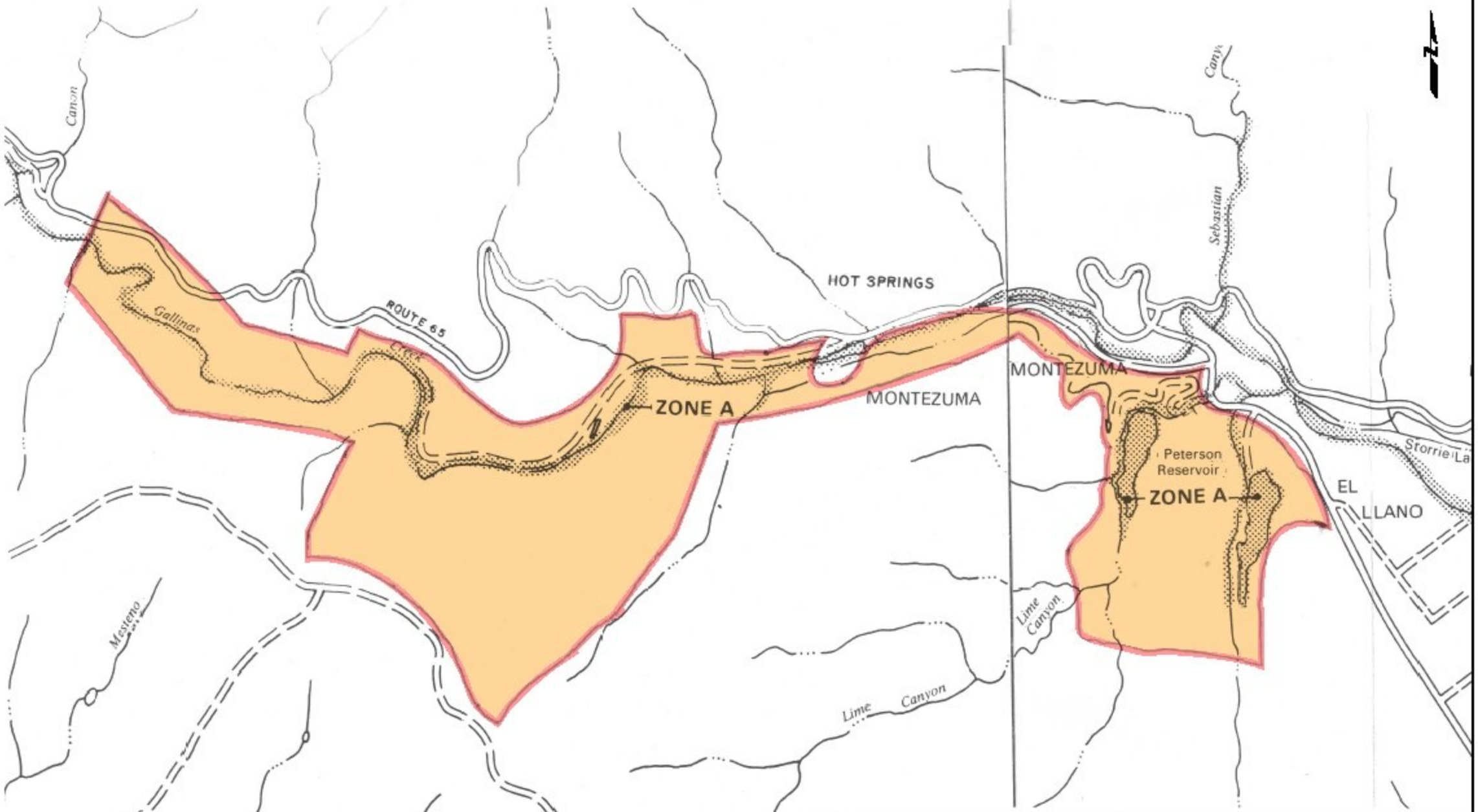
3.1.3 Floodplain Management (Executive Order 11988)

The FEMA-designated 100-year base floodplain indicates the area inundated during a storm having a 1- percent chance of occurring in any given year. FEMA also identifies the 500-year floodplain. The 500-year floodplain designates the area inundated during a storm having a 0.2 percent chance of occurring in any given year.

Executive Order (EO) 11988 (Floodplain Management) requires federal agencies to minimize occupancy and modification to the floodplain. Specifically, the EO prohibits federal agencies from funding construction within the 100-year floodplain unless there are no practicable alternatives. FEMA's regulations for complying with EO 11988 are promulgated in 44 CFR Part 9. FEMA applies the Eight-Step Planning Process as required by regulation to meet the requirements of EO 11988. This step-by-step analysis, as applied to this project, is included in Appendix C of this document.

The project area is located on the hillsides around two City of Las Vegas reservoirs (Bradner and Peterson) and upstream of the reservoirs along the canyon sides of the Gallinas River. According to the Flood Hazard Boundary Map (FHBM) for San Miguel County (Community Panels No. 350132 0011 A and 350132 0012 A), the two City reservoirs and the Gallinas River are within the 100-year flood hazard Zone A (Figure 5). Zone A designates a 100-year flood hazard, but a base flood elevation has not been determined.

Interagency coordination was initiated with the New Mexico Office of Emergency Management requesting project review and for issues concerning floodplains; to date, no response has been received (Appendix B).



CLIENT FEMA				TITLE FLOOD HAZARD BOUNDARY MAP (FHBM) FOR THE PROJECT AREA
PROJ Fords Modification and Management, Las Vegas, New Mexico				
REFERENCE NO		DRAWN BY		URS
SCALE	NOT TO SCALE	DRAWN BY	LAL	5-5-82
FILE NAME	Fig5 FHBM.sl	CHK BY	LD	5-9-82

DRAWING 5

Alternative 1 – No Action Alternative

Under the No Action Alternative, no fuels management or vegetation rehabilitation projects would be undertaken. No adverse impacts to the regulated floodplain would be anticipated as a result of the No Action Alternative. Since funds would not be available to conduct fuels management projects required to adequately reduce fire hazards, the potential for future wildfires remains. If the wildfire were catastrophic, large amounts of vegetative cover would be removed causing exposed and possibly hydrophobic soils, which could lead to severe runoff in a storm event following the fire. Severe stormwater runoff could lead to increased flooding of the area within the floodplain and potentially outside floodplain zones. This condition would persist for several years until vegetation and soil is reestablished to pre-fire conditions. Since there would be no federal funding under this alternative, compliance with EO 11988 need not be considered.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

The thinning prescription with this alternative would remove smaller trees to a basal area of approximately 40 to 60 square feet per acre using manual and mechanical logging equipment. Slash would be piled and burned, removed or loped and scattered for erosion control. Two temporary skid trails would be created, but not within the floodplain zones. The Proposed Action is not likely to result in any direct or indirect impacts to the floodplain in or around the project area. Additionally, streamside buffers would be maintained alongside the Gallinas River, ensuring that a majority of the work would occur outside the floodplain. While work within the floodplain is not anticipated, should any change to final management plans occur and work would be planned within the floodplain, the City would coordinate with the local floodplain administrator regarding applicable permits and/or conditions.

In accordance with 44 CFR Part 9.5, debris removed as part of a fuels management project would not be disposed of within any floodplain zones of the project area. This alternative would be in compliance with EO 11988, as documented in the Eight-Step Planning Process (Appendix C).

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

The thinning prescription with this alternative would remove smaller trees to a basal area of approximately 40 to 60 square feet per acre using manual and mechanical logging equipment. Slash would be treated after thinning by a low-intensity broadcast burn. Two temporary skid trails would be created, but not within the floodplain zones. Alternative 3 is not likely to result in any direct or indirect impacts to the floodplain in or around the project area. Additionally, streamside buffers would be maintained alongside the Gallinas River, ensuring that a majority of the work would occur outside the floodplain. While work within the floodplain is not anticipated, should any change to final management plans occur and work would be planned within the floodplain, the City would coordinate with the local floodplain administrator regarding applicable permits and/or conditions.

In accordance with 44 CFR Part 9.5, debris removed as part of a fuels management project would not be disposed of within any floodplain zones of the project area. Ash runoff would be expected within the floodplain zone, but would be minimal and temporary. This alternative

would be in compliance with EO 11988, as documented in the Eight-Step Planning Process (Appendix C).

3.1.4 Air Quality

The Clean Air Act (CAA), as amended, requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The CAA established two types of NAAQS. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The EPA has set NAAQS for six principal pollutants, which are called "criteria" pollutants. They include: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), particulate matter less than or equal to 10 microns (PM_{10}), and sulfur dioxide (SO_2).

EPA has designated specific areas throughout New Mexico as NAAQS attainment or non-attainment areas. Non-attainment areas are any areas that do not meet (or that contribute to ambient air quality in a nearby area that does not meet) the national primary or secondary air quality standard for a pollutant. Attainment areas are any areas that meet the primary or secondary ambient air quality standard for the pollutant. According to the EPA, San Miguel County is currently in attainment for all six criteria pollutants (EPA, 2002).

In addition to the EPA's standards, NMED has established standards for toxic air pollutants. Toxic air pollutants are chemicals that are generally found in trace amounts in the atmosphere, but that can result in chronic health effects or increase the risk of cancer when present in amounts that exceed established exposure limits. Guidelines used by the NMED for determining if a new or modified source emitting a toxic air pollutant requires air quality permitting are found in 20 New Mexico Administrative Code [NMAC] 2.72. Table 1 lists both the EPA's and the State of New Mexico's air quality standards.

The NMED has jurisdiction for the enforcement of all applicable CAA air quality requirements through a federally approved State Implementation Plan (SIP). This plan outlines all applicable air quality statutes. As such, any increase in criteria pollutants released from the disturbance of soils or the construction of structural measures may have specific regulatory requirements enforced under 20 NMAC 2.72. Under 20 NMAC 2.60, a permit must be obtained for open air burning to reduce combustion impacts on air quality. Some of the specific regulatory requirements are discussed under the Proposed Action and Alternative 3. Interagency coordination was initiated with the NMED AQB for potential air quality issues and permitting requirements associated with the Proposed Action and Alternative 3 (see Appendix B).

Table 1: Ambient Air Quality Standards

CONTAMINANT	AVERAGING TIME	UNIT	NEW MEXICO STANDARD	NAAQS	
				PRIMARY	SECONDARY
Carbon Monoxide	8 hour	ppm[1]	8.7	9	N/A
	1 hour	ppm	13.1	35	N/A
Sulfur Dioxide	Annual	ppm	0.02	0.03	N/A
	24 hour	ppm	0.10	0.14	N/A
	3 hour	ppm	N/A	N/A	0.05
Nitrogen Dioxide	Annual	ppm	0.05	0.053	0.053
	24 hour	ppm	0.10	N/A	N/A
Ozone	1 hour	ppm	N/A	0.12	0.12
PM_{10}	Annual	$\mu g/m^{3}$[2]	N/A	50	50
	24 hour	$\mu g/m^3$	N/A	150	150
Total Suspended Particulate	24 hour	$\mu g/m^3$	150	N/A	N/A
	7 day	$\mu g/m^3$	110	N/A	N/A
	30 day	$\mu g/m^3$	90	N/A	N/A
	Annual	$\mu g/m^3$	60	N/A	N/A
Lead	Quarterly	$\mu g/m^3$	N/A	1.5	1.5
Hydrogen Sulfide	Not applicable to surrounding region.				
Total Reduced Sulfur	Not applicable to surrounding region.				

[1] ppm = parts per million, [2] $\mu g/m^3$ = micrograms per cubic meter

Alternative 1 – No Action Alternative

Under the No Action Alternative, fuels management actions would not occur in the Gallinas watershed. Without specific actions to remove vegetation, a defensible space around the water supply reservoirs for Las Vegas would not be created and the fuel load accumulation would continue to increase. The existing fire hazard would not be mitigated, and could potentially increase with the further accumulation of fuels.

Dense fuel build-up and respective fire risk in prone areas would remain high. Fuel build-up in forests substantially increases levels of most criteria pollutants and many hazardous air pollutants that are released during wildfires. Smoke from a fire consists of carbon dioxide (CO_2), water vapor, particulates (some of which contain volatile organic compounds – VOCs), and CO. In addition, support vehicles used in fighting the wildfire would cause a slight, temporary increase of PM, CO, NO_2, SO_2, and O_3 precursors. Soils exposed by a wildfire would increase PM levels through wind erosion.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

Under the Proposed Action, accumulated fuels on City-owned land would be manually felled, and in some cases, transported mechanically to established landing sites. Forestry equipment would be delivered to work areas via existing roads. The use of vehicles and fuel-powered chainsaws to clear vegetation has the potential to increase the criteria pollutants of concern. When the equipment is initially started, some visible and possibly odorous emissions would be expected. To minimize adverse effects on air quality, the Applicant would keep equipment properly maintained and keep running times to a minimum.

Slash material left from limbing and bucking of downed plant material would be lopped and scattered or removed from the site. Slash greater than 2 feet in height would be piled and burned. Slash pile burning would be conducted by a forestry consultant under acceptable guidelines and would occur in winter or during an extended wet period, with the piles being continuously monitored until they are extinguished. Smoke plumes from this pile burning have the potential to cause short-term adverse impacts to air quality. Prior to the downed vegetation burning, the appropriate permit for open burning (20 NMAC 2.60) would be obtained from NMED AQB. While locations for burning of vegetation have not been selected, such activities would be avoided upwind from sensitive receptors, such as schools, churches, or residential neighborhoods. Piles should be dry and free of soil to speed combustion (EMNRD, 1992).

As part of the permit application, a burn plan must be submitted. General components of this plan include overall planning for the burn, description of the fuel load, smoke management planning, and a contingency plan. In order for a permit to be issued, several conditions must be met, such as: no practical alternative to burning, the health or welfare residents would not be affected by the burn, and ambient air quality of neighboring properties would not be affected. To address these concerns, the following smoke minimization and management procedures are recommended for this alternative:

- Slash pile burning would occur on “burn days” as approved by AQB, and burn permits would be obtained from AQB, with additional monitoring of wind conditions and the fire plume as required by AQB.
- Slash pile burning would not commence until a qualified meteorologist (most likely from AQB or National Weather Service) has predicted favorable atmospheric stability and mixing conditions at the burn site and downwind.
- Slash pile burning would not be conducted at night, when smoke may accumulate in patches at the ground or go into cold-air drainageways, potentially causing problems at lower elevations. Burns will be, to the extent possible, extinguished within the day burns are first initiated.
- In smoke-sensitive areas, fuels will be piled and burned in the understory to reduce levels of smoke going into the atmosphere at one time.
- One or more observers would be posted on site, and downwind when appropriate, to monitor weather and smoke conditions. If there are unexpected changes in weather or dispersion of the plume, the burn would be terminated.
- Burning must occur between the hours of 10:00 a.m. and 4:00 p.m.

Overall, the impacts on air quality as a result of the Proposed Action would be minimal and temporary. The implementation of air emission mitigation methods during construction, soil disturbance, or equipment operation, and the following of appropriate burn guidelines would keep emissions to negligible levels. Examples of mitigation methods for project activities include watering disturbed areas, scheduling the siting of staging areas to minimize fugitive dust, and keeping construction equipment properly maintained.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Under Alternative 3, the use of a broadcast burn would have a temporary adverse impact on air quality by increasing carbon monoxide, PM_{10}, and ozone precursors (oxides of nitrogen and reactive organic gases). The most common effect associated with this alternative would be the occurrence of smog. In the event of unforeseen conditions, the smoke plumes from broadcast burns can cause obscured visibility, complicating automobile and air traffic corridors, and particulate fallout in populated areas. High smoke concentrations may also pose health concerns for nearby residents, particularly those with health and/or respiratory problems, as about 90 percent of particulate emissions from prescribed fire are small enough to enter the human respiratory system (Wade and Lunsford, 1989). Appropriate public notification would occur on burn days, informing local residents of the time and location of project activities. Sensitive receptors, such as asthmatics and the elderly, would be advised to stay indoors during the burn period. Under state regulation 20.2.60 NMAC, the New Mexico Environment Department requires an Open Burning Permit to conduct broadcast burning. As part of the permit application, a burn plan must be submitted. General components of this plan include overall planning for the burn, description of the fuel load, smoke management planning, and a contingency plan. In order for a permit to be issued, several conditions must be met, such as: no practical alternative to burning, the health or welfare residents would not be affected by the burn, and ambient air quality of neighboring properties would not be affected.

To address these concerns, the following smoke minimization and management procedures are recommended for Alternative 3:

- Broadcast burning would occur on “burn days” as approved by AQB, and burn permits would be obtained from AQB, with additional monitoring of wind conditions and the fire plume as required by AQB.
- Broadcast burning would not commence until a qualified meteorologist (most likely from AQB or National Weather Service) has predicted favorable atmospheric stability and mixing conditions at the burn site and downwind.
- Broadcast burning would not be conducted at night, when smoke may accumulate in patches at the ground or go into cold-air drainageways, potentially causing problems at lower elevations. Burns will be, to the extent possible, extinguished within the day burns are first initiated.
- In smoke-sensitive areas, fuels remaining after a broadcast burn will be piled and burned in the understory to reduce levels of smoke going into the atmosphere at one time.

- One or more observers would be posted on site, and downwind when appropriate, to monitor weather and smoke conditions. If there are unexpected changes in weather or dispersion of the plume, the burn would be terminated.
- Burning must occur between the hours of 10:00 a.m. and 4:00 p.m.

The impacts on air quality as a result of Alternative 3 would be minimal and temporary. The implementation of air emission mitigation methods during construction, soil disturbance, or equipment operation, and the following of appropriate burn guidelines would keep emissions to negligible levels. Examples of mitigation methods for project activities include watering disturbed areas, scheduling the siting of staging areas to minimize fugitive dust, and keeping construction equipment properly maintained.

3.2 BIOLOGICAL ENVIRONMENT

3.2.1 Terrestrial and Aquatic Environment

The biological resources around the City of Las Vegas area are rich in diversity. The City lies along the meeting point of the Great Plains and the southern Rocky Mountains. The plains grasslands around Las Vegas are short-grass prairies that blend into Juniper *(Juniperus monosperma)* and shrub savanna to pinyon *(Pinus edulis)* and juniper woodlands as the elevation rises at the foothills of the Santa Fe mountain range of the Rocky Mountains. The Plains grasses are comprised of perennial species including grama (*Bouteloua spp.)*, buffalo-grass *(Buchloe dactyloides)*, Indian rice grass *(Oryzopsis hymenoides)*, and galleta grass *(Hilaria jamesii)*. Shrubs such as four-wing saltbush *(Atriplex canescens)*, winterfat *(Ceratoides lanata)*, soapweed *(Yucca glauca)*, and snakeweed *(Gutierrezia spp.)* are prominent in the grasslands, especially in areas of heavy grazing (Brown, 1994). As the pinyon-juniper foothills transition into the higher reaches of the Santa Fe Mountains, cold-adapted forests dominate the landscape. The lower reaches of the mountain range are primarily Lower Montane forests of ponderosa pine *(Pinus ponderosa)* and gambel oak *(Quercus gambelii)*. As the terrain increases in elevation, or on cooler, moister, north-facing slopes, mixed-conifer forests are the dominant species. The mixed conifer forests of these reaches include Douglas fir *(Pseudotsuga menziesii)*, white fir *(Abies concolor)*, blue spruce *(Picea pungens)*, ponderosa pine and quaking aspen *(Populus tremuloides)*. The higher reaches of the mountains contain conifer forests of species such as Engelmann spruce *(Picea engelmanni)*, subalpine fir *(Abies lasiocarpa)*, and blue spruce.

Within and adjacent to the montane forests and grasslands of the area are numerous perennial streams, springs and lakes. The mountain streams and wetland areas in and around Las Vegas are part of an intricate and limited system of small watershed areas in the southwest, providing habitat for a rich diversity of species. The Gallinas River, falling within the City of Las Vegas' watershed, brings water down from the Santa Fe Mountains. The vegetation that bounds these waters consists of willows *(Salix spp.)*, narrow-leaf cottonwood *(Populus angustifolia)*, gooseberry currant *(Ribes montigenum)*, wild rose *(Rosa woodsii)* and raspberry *(Rubus spp.)*. Numerous grasses *(Glyceria spp.)*, sedges *(Carex spp.)* and rushes *(Juncus spp.)* occupy the wetlands of the region (Brown, 1994).

The elevation range of the project area varies from approximately 6,760 feet to 7,760 feet National Geodetic Vertical Datum (NGVD). Weather is directly tied to elevation. Precipitation

varies from approximately 15 inches in the City of Las Vegas to as much as 24 inches in the higher elevations of the surrounding mountains (Brown, 1994; DeVelice, et al., 1986).

URS Group, Inc. (URS) biologists performed an ecological field survey at the project area on March 5, 2002. Vegetative cover observed in the area of the proposed alternatives consisted primarily of ponderosa pine and mixed conifer forests. The Gallinas River runs through the project area with a portion of the river diverted underground to two reservoirs located within the project area. The project area and the surrounding pinyon-juniper, ponderosa and mixed conifer forests provide seasonal and year-round breeding, foraging, calving, fawning, denning habitat and migration routes for a variety of resident and migratory wildlife species. The wildlife diversity includes large mammals such as black bear (*Ursus americanus*), mountain lion (*Felis concolor*), elk (*Cervus elaphuis nelsoni*), mule deer (*Odocoileus hemionus*), and coyote (*Canis latrans*). The wealth of small mammals includes many species of bats (*Myotis spp.*), raccoon (*Procyon lotor*), porcupine *(Erethizon dorsatum)*, striped skunk *(Mephitis mephitis)*, squirrels *(Spermophilus spp.)* and chipmunks *(Tamias spp.)*. There are many species of birds including flammulated owl *(Otus flammeolus)*, goshawk *(Accipiter gentilis)*, Clark nutcracker *(Nucifraga columbiana)*, steller jay (*Cyanocitta stelleri*) and wild turkey *(Meleagris gallopavo)*. Species that depend on watercourses and riparian woodlands of the area include Lincoln's sparrow *(Melospiza lincolnii)*, black-headed grosbeak (*Pheucticus melanocephalus*), warbling vireo *(Vireo gilvus)*, mallard duck (*Anas platyrgynchos*), American beaver (*Castor canadensis*) numerous voles (*Microtus spp.*), and mice (*Perognathus spp.)* (Brown, 1994; BISON-M). Rainbow trout (*Oncorhynchus mykiss*) and cutthroat trout *(Oncorhynchus clarki)* are two major species of fish found in the Gallinas River, and other local ponds and lakes stocked for recreational fishing in the area.

The forestlands in the area of the proposed project are experiencing declining forest health. The primary factor of degraded forests in the Southwest is increased tree density and degraded grass and forb cover. Forest fire suppression practices and livestock overgrazing are the primary cause of degraded forests with other factors creating added stress on an already burdened system (Dahms and Geils, 1997). In several forests of ponderosa pine, frequent surface fires, or underburns, kept more shade-tolerant competitors such as Douglas-fir (*Pseudotsuga menziesii*) and white fir (*Abies concolor*) from developing in the understory and eventually replacing the fire-resistant pines (Arno, et al., 1995). Heavy livestock grazing reduces the herbaceous ground layer, promoting the establishment of less palatable trees and shrubs (Madany and West, 1983). Fire suppression and overgrazing resulted in the unnaturally heavy accumulation of live and dead vegetation and has led to "doghair" thickets of ponderosa pine trees. These dense tree stands are impacting the overall forest health and are now becoming a concern in the southern range of the species (Garrett, 1995).

Prior to fire suppression practices the ponderosa pine forest had an open, park-like structure with trees spaced wide apart and thick grass/forb cover knitted between the pines. Fires were estimated to have burned every 7 to 10 years, creating an expanse of low vegetative fuel buildup and large trees. Many early explorers and naturalists give descriptions of a forest vastly different than the ones generally seen today. For example, in 1911, Woolsey, a noted forest specialist of the period wrote:

> "A pure park-like stand made up of scattered groups of 2 to 20 trees usually connected by scattering individuals. Openings are frequent, and vary greatly in

size. Within the type are open parks of large extent whose origin may be due to peculiar soil conditions such as hard pan, or in other cases to periodic flooding."

Presently, some areas of forest in and around the Las Vegas area are over-stocked with high tree densities and fuel loads. This condition impacts resources of the forest ecosystem such as water, forage, and wildlife habitat. The area is also experiencing a 20-year cyclic drought, adding to increased opportunities for wildfires. Abnormally high vegetative densities have resulted in high intensity catastrophic wildfires covering larger areas and contribute to catastrophic insect and disease outbreaks (Garrett, 1995). Furthermore, some biological communities are evolutionarily adapted to periodic fires, and many native species reproduce or forage most effectively several years after a fire. Fire suppression has caused significant changes in diversity of vegetation and wildlife, grasses and forbs have decreased in diversity and wildlife dependent upon open forest stands with large trees has diminished (Dahms and Geils, 1997). Fire-intolerant species have thrived in areas once dominated by fire-resistant and fire-tolerant species, thereby changing the species composition of the community (wildlife and vegetation), the nutrient distribution of the soil, and the spatial and canopy structure of the community. In this light, fire suppression techniques have had a negative impact on these communities.

The project area is approximately 991 acres located around the City's two water supply reservoirs and upstream along the Gallinas River. The area is comprised of approximately 874 acres of forested land and 117 acres of open water, riparian or grassland habitat. The area around the reservoirs varies in topography, aspect and elevation. The area west of the reservoirs follows the Gallinas River within steep canyon sides. The canyon varies in topography and aspect. During the site visit, specific descriptions of the area and vegetation identifications and evidence of wildlife were noted as follows.

Bradner and Peterson Reservoir

Ponderosa pine forest dominates the sloped sides around the two reservoirs along the eastern project area near the City's water supply. Some of the hill slopes around the reservoirs appeared to have been cut previously. Cut logs were left on the ground potentially for erosion control purposes. The cut areas were not recently thinned and much of the area continued to look dense with the surviving ponderosa pines being even-aged and generally small in diameter. Much of the area around the reservoir was a monoculture of ponderosa pine, however gambel oak occurred with the pine in some of the landscape. Some of the drier and warmer slopes around the Bradner Reservoir at the far eastern edge of the project area contained pinyon pine and juniper trees mixed with the ponderosa. Also occurring in these warmer sections were species such as yucca *(Yucca baccata)*, mountain mahogany *(Cercocarpus montanus)*, and grasses such as silver beardgrass *(Andropogon saccharoides)* and blue grama *(Bouteloua gracilis)*. Ephemeral drainages enter the reservoirs from the south along broad, grassy valleys. The drainage coming in to the western reservoir (Peterson Reservoir) is lined with gambel oak. The drainages showed evidence of livestock grazing and were bermed at the mouth of the reservoirs. The berms wrap around the western edges of both reservoirs. An existing road comes in to Peterson Reservoir from the north, ending at the intake diversion of Gallinas River. The diversion supplies the water to the reservoirs. It is piped to within approximately 1/8 mile of the reservoir where it surfaces to a settling pond and continues down a ditch draining into the reservoir. This area contains riparian vegetation of narrow-leaf Cottonwood, willows, and thick

grasses. A bald eagle *(Haliaeetus leucocephalus)* was observed in this area, and at the mouth of the diversion intake, a flock of mallard ducks and Canada geese *(Branta canadensis)* were noted.

Other riparian habitats were observed at the spillway and outlet along the eastern edge of Bradner Reservoir, from the outlet at Peterson to the Highway Road 65, and around edges of the reservoirs. The vegetation in these areas comprises of dense willows, narrow-leaf cottonwoods, alder *(Alnus sp.)*, cattails *(Typha sp.)*, wild rose and thick grasses and rushes.

Evidence of other wildlife observed around the reservoirs included bear, coyote, common raven *(Corvus corax)*, northern flicker *(Colaptes auratus)*, American robin *(Turdus migratorius)* and Steller's jay.

Gallinas River

The City of Las Vegas owns the entire 991-acre project area, or roughly 2 percent, of the Gallinas Watershed upstream of the Peterson and Bradner reservoirs. Portions of this property would be included in this project. The Gallinas River is contained within a canyon of varying width, broad in some areas and narrow in others, with steep canyon walls rising up from the canyon bottom. Canyon aspect determines vegetation associations; the steep, north facing canyon sides were observed to be primarily mixed-conifer forest with species such as white fir and Douglas fir dominating the hillsides along with some patches of shrub oak and gambel oak occurring around rocky cliff areas of the hillside. Ground cover observed within the mixed conifer included species such as kinnickinnick *(Arctostaphylos uva-ursi)* and dwarf juniper *(Juniperus communis)*. The south-facing slopes of the canyon were observed to be primarily ponderosa pine/gambel oak forest mixed with some pinyon pine in the lower elevations. Other species observed along the south-facing slopes included grasses such as Blue Grama, and Three-Awn *(Aristida adscensionis)*, and shrubs such as mountain mahogany. Tree cholla cactus *(Opuntia imbricata)* was observed scattered within the warm, rocky southern slopes.

The Gallinas River was observed to contain thick willows and some narrow-leaf cottonwoods along its banks, along with other riparian species such as three-leaf sumac *(Rhus trilobata)*, wild rose and thick grasses and sedges.

Migratory Bird Treaty Act: The Migratory Bird Treaty Act (MBTA) prohibits the taking of migratory birds, nests, and eggs, except as permitted by the U.S. Fish and Wildlife Service (USFWS). A migratory bird is defined as "any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle." There are currently 836 species of migratory birds protected under the MBTA (USFWS, 2002).

Interagency coordination was initiated with the USFWS and the State of New Mexico, Department of Game and Fish regarding any potential impacts to terrestrial or aquatic habitats and migratory birds associated with the Proposed Action and Alternative 3.

Alternative 1 - No Action Alternative

Under the No Action Alternative, the proposed fuels management project would not be implemented. Therefore, this alternative would have little or no direct impact on biological resources in the project area. However, since funds would not be available to conduct fuels

management projects required to adequately reduce fire hazards, the potential for future wildfires remains.

If a fire were to occur at a future date due to the lack of fuels management, it would result in the loss of terrestrial wildlife habitat. Furthermore, indirect impacts would occur to aquatic habitat and resources as fire residue and eroded soils would be washed into local streams and reservoirs. These indirect impacts associated with the loss of existing vegetation would continue until adequate vegetation was reestablished within the burn area. Without fuels management activities, it is anticipated that fires in the Gallinas watershed would burn hotter and on a larger scale than pre-historic burns, resulting in more tree kills and damage to the natural environment. The immediate impact of a large, high-intensity burn on wildlife would include high individual mortality rates and loss of habitat to a wide range of species. Long-term impacts would include successional alteration of habitat and species composition.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

Fuels management activities would decrease the habitat for some species while increasing habitat for others. Removal of dying, standing dead, and downed timber reduces habitat for species such as woodpeckers, bats, nuthatches, small rodents, and reptiles (Dahms and Geils, 1997).

The habitat of other species would be improved by thinning of smaller trees. The forest canopy would be opened, allowing for better growth of grasses, forbs and shrubs, and subsequently increasing forage for species such as elk, turkey, and deer. The retention of mature gambel oak trees and maintaining diversity in the forest canopy would benefit wildlife by providing cover and forage diversity (Ffolliott, et al., 2000). The vigor and diversity of vegetation normally found in the understory of healthy forest ecosystems would begin to recover. Openings in the forest stands may result in an increase in grasses and forbs in these areas, which would maintain forest soils and decrease soil erosion over time (Dahms and Geils, 1997).

Thinning smaller trees would reduce tree competition, therefore enhancing survivability and growth rates of the older leave trees (Dahms and Geils, 1997). The basal area of the residual trees would be expected to increase following the thinning of smaller trees; however the number of trees per acre would be expected to remain the same for many years (Ffolliott, et al., 2000). The thinning of small trees and diseased trees would also reduce pest and pathogen outbreaks in the forests aiding in the overall health of residual trees (Aber et al., 2000).

The retention of slash on-site should be kept to a minimum as the bark beetle, an exotic insect found within the project area, can infest freshly cut slash and downed material (SEC, 2002). Initial attacks are aimed at diseased trees; therefore, the overall treatment should help reduce bark beetle levels (SEC, 2002). The amount of material maintained at the site should be weighed against the effects that piling slash and either burning or removing the piles can have on nutrient loss in soils, thereby limiting tree growth and potentially leading to a long-term threat to forest health (Aber et al., 2000).

Some wildlife species such as mule deer, birds, and small diurnal mammals such as chipmunks could be temporarily disturbed and displaced during the vegetation removal activities. However, this would be a short-term disturbance.

To minimize potential risks to biological resources, the City of Las Vegas would implement the following mitigation measures where appropriate:

- Using existing roads where possible for logging equipment and reseed any new trails created.
- Per New Mexico Department of Game and Fish recommendations, a minimum of three snags per acre with a diameter at breast height (DBH) of greater than 12 inches and greater than 30 feet in height would be left in place in the thinning areas. The Applicant would also be required to leave a minimum of three downed logs per acre at least 10 inches diameter and 8 feet long for small animal habitat.
- The contractor would be in contact with the New Mexico Department of Game and Fish before commencement of the project and after project completion in order to allow for field visits by Game and Fish personnel (see Appendix B, for contact information).
- Using mitigation standards given in the State of New Mexico Forest Practices Guidelines (see Appendix D).
- No fuels management activities would occur in the perennial stream or spring area and no equipment would be allowed to cross the riparian areas. A minimum 50-foot buffer would be established for equipment and activity within proximity. Buffers would increase with increasing slope of land surrounding the waterways.

To minimize the likelihood of adverse impacts to all birds protected under the MBTA, the USFWS has recommended fuels management activities occur outside the general migratory bird nesting season of March through August. If this does not occur, areas proposed for fuels management activities must be surveyed during nesting season, and when occupied, avoided until nesting is complete.

Invasion of exotic species into newly opened and disturbed areas is a potential long-term impact of this alternative, as invasive, non-native species have the potential to dominate opened areas (Griffis, 2000). Monitoring of the area, as suggested by SEC (2002), would help control invasive species that could establish themselves in the project area as a result of this alternative.

In general, the Proposed Action would be expected to result in long-term beneficial impacts to biological resources. Properly managed forests can restore the ecological integrity and diversity of the ecosystem back to pre-settlement conditions where the forests would have the ability to easily recover after disturbances.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Under Alternative 3, tree thinning would be performed as described in the Proposed Action; however, slash would be left on the ground in place and broadcast burned. Broadcast burning would be a low-intensity burning of slash from forest thinning, understory plants and fallen limbs throughout the project area. Fuels management activities under Alternative 3 would not necessarily disturb the overall biology of the area since the vegetation thinning/removal would decrease the habitat for some species while increasing habitat for others. Removal of dying, standing dead and downed timber reduces habitat for species such as woodpeckers, bats, nuthatches, small rodents and reptiles (Dahms and Geils, 1997). These changes would be expected to be small when compared to the overall habitat in the area.

The habitat of other species would be improved by thinning of smaller trees. The forest canopy would be opened, allowing for better growth of grasses, forbs and shrubs, and subsequently increasing forage for species such as elk, turkeys and deer. The retention of mature gambel oak

trees and maintaining diversity in the forest canopy would benefit wildlife by providing cover and forage diversity (Ffolliott, et al., 2000). The vigor and diversity of vegetation normally found in the understory of healthy forest ecosystems would begin to recover. Openings in the forest stands may result in an increase in grasses and forbs in these areas, which would maintain forest soils and decrease soil erosion over time (Dahms and Geils, 1997).

To minimize potential risks to biological resources, the City of Las Vegas would implement the following mitigation measures where appropriate:

- Using existing roads where possible for logging equipment and reseed any new trails created.
- Per New Mexico Department of Game and Fish recommendations, a minimum of three snags per acre with a diameter at breast height (DBH) of greater than 12 inches and greater than 30 feet in height would be left in place in the thinning areas. The Applicant would also be required to leave a minimum of three downed logs per acre at least 10 inches diameter and 8 feet long for small animal habitat.
- The contractor would be in contact with the New Mexico Department of Game and Fish before commencement of the project and after project completion in order to allow for field visits by Game and Fish personnel (see Appendix B, for contact information).
- Using mitigation standards given in the State of New Mexico Forest Practices Guidelines (see Appendix D).
- No fuels management activities would occur in the perennial stream or spring area and no equipment would be allowed to cross the riparian areas. A minimum 50-foot buffer would be established for equipment and activity within proximity. Buffers would increase with increasing slope of land surrounding the waterways.

Low-intensity broadcast burning after thinning would mimic more natural disturbance patterns of forest events and would be expected to return the area to a more natural state and may favor the growth of fire-tolerant species. Some vegetation would benefit from a low-intensity burn. For example, some plants produce seeds that are released or are able to germinate only after being exposed to the high temperatures or smoke that accompany fires. Understory vegetation would be expected to increase after a low-intensity burn and species richness would increase. However, burning can potentially increase exotic plant species (Crawford et al., 2001; Griffis, 2000). Exotic species are often aggressive and out-compete native species for resources, threatening the biological integrity of native systems. Monitoring of the area, as suggested by SEC (2002), would help control invasive species that could establish themselves in the project area as a result of this alternative.

Broadcast burning after thinning would have a risk of becoming an uncontrolled. If the burn were to escape beyond the project boundaries, it could potentially turn into a widespread fire and the effects of a catastrophic fire would be the same as discussed in the No Action Alternative. To mitigate the risk of a broadcast burn escaping, firebreaks would be created around the perimeter of controlled burn areas. All vegetation would be removed and the potential for increased erosion would exist at the breaks. Erosion control measures such as silt fences would be installed, controlling erosion until vegetation is reestablished. The impact of this alternative on biological resources would be more in line with mimicking natural disturbance processes and would not be expected to have long-term effects of the biological systems of the project area.

To minimize the likelihood of adverse impacts to all birds protected under the MBTA, the USFWS has recommended fuels management activities occur outside the general migratory bird nesting season of March through August. If this does not occur, areas proposed for fuels management activities must be surveyed during nesting season, and when occupied, avoided until nesting is complete.

3.2.2 Wetlands (Executive Order 11990)

The term wetland refers to those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, intrastate lakes, rivers, streams (including intermittent streams), mudflats, sloughs, and similar areas.

Under Executive Order 11990, federal agencies are required to minimize the destruction, loss, or degradation of wetlands and preserve and enhance their natural and beneficial values. If a federal action has the potential to impact jurisdictional waters of the United States as defined by Section 404 of the Federal Clean Water Act (CWA), the U.S. Army Corp of Engineers (USACE) would be contacted for appropriate permitting requirements. Section 404 of the CWA authorizes the USACE to issue permits, after notice and opportunity for public hearing, for the discharge of dredged or fill material into U.S. waters at specified disposal sites. FEMA applies the Eight-Step Planning Process, required by 44 CFR Part 9, to meet the requirements of EO 11990. This step-by-step analysis, as applied to this project, is contained in Appendix C.

During the visit conducted on March 5, 2002, wetland areas, including the perennial stream of Gallinas River, small ice dams and two settling ponds along the river and two reservoirs were observed in the project area. Beyond establishing the presence of wetland areas within the project area, specific wetland identification and delineation was not conducted as part of this analysis.

Wetlands are also indicated on the USFWS National Wetland Inventory Map of the project area (Figure 6). The Gallinas River runs through the western portion of the project area. A portion of the river is diverted underground to the Bradner and Peterson Reservoirs, located in the eastern portion of the project area.

The Gallinas River is classified as riverine, upper perennial, unconsolidated bottom, permanently flooded. It continuously contains flowing water characterized by a high gradient and fast water velocity. The substrate consists of rock, cobbles or gravel with at least 25 percent cover of particles smaller than stones and a vegetative cover less than 30 percent. Other wetland areas occur along the Gallinas River through the project area where human-made settling ponds and remnant ice dams are located. These small wetlands are palustrine, containing non-tidal wetlands dominated by trees, shrubs, and mosses, and are less than 20 acres in size. One of the noted wetlands along the Gallinas is also classified as emergent, characterized by erect, rooted, herbaceous hydrophytes, dominated by perennial plants and is temporarily flooded. There are three impoundment classifications, one at the Bradner Reservoir, one at Peterson Reservoir and one at the largest remnant ice dam along the Gallinas. These wetlands are palustrine, permanently flooded and are diked or impounded by a man-made barrier obstructing the inflow or outflow of water.

Alternative 1 - No Action Alternative

Under the No Action Alternative, no fuels management projects would be undertaken, and therefore, there would be no direct or indirect impacts to wetlands or other jurisdictional waters in the project area.

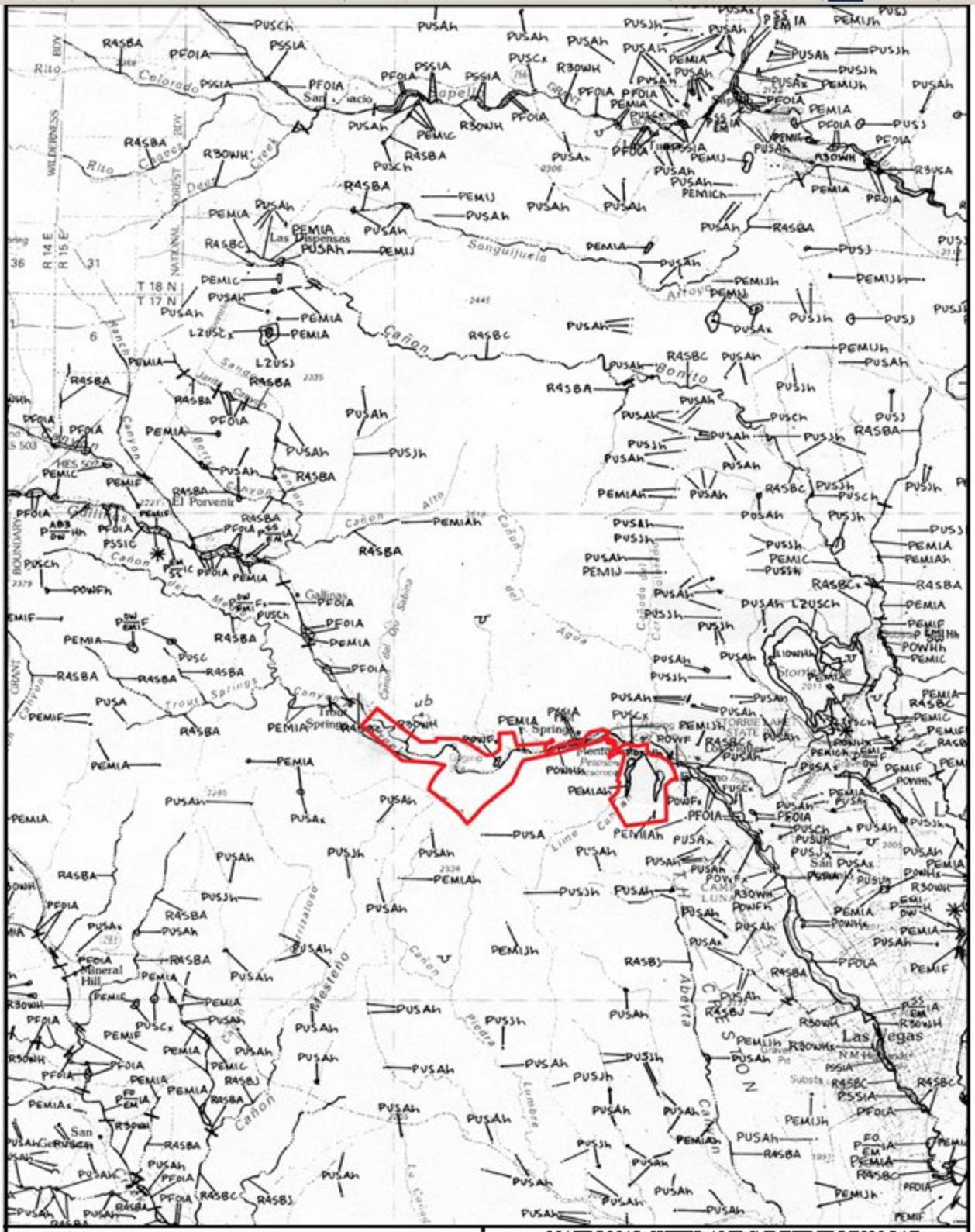
Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

Under this alternative, vegetation would be thinned using manual techniques and mechanical equipment. Existing roads would be used wherever possible for equipment and skid trails. Two temporary skid trails would be created around and parallel to the Bradner and Peterson reservoirs. No roads or skid trail crossings of streams or the Gallinas River are proposed. No thinning would take place in the wetlands of the project area. However, the thinning of vegetation on the slopes of the area around the Gallinas River and the Bradner and Peterson reservoirs has the potential to free erodible soils enough to enter wetland areas resulting in minor soil discharges. Slash from thinning would be piled and either burned on site, scattered in areas that are prone to erosion, or removed to an off site location.

This alternative would be excluded from Section 404 of the CWA because the project does not involve discharges of dredged or fill material into waters of the United States; therefore, no USACE permit would be required.

Two temporary skid trails would be created with this alternative. After completion of the project, the trails would be closed, reseeded, and slash would be scattered over the trails. Heavy equipment would be used near the wetlands of the project area but would be required to use a streamside management zone. This zone is a buffer of minimally disturbed or undisturbed vegetation adjacent to a perennial body of water where heavy equipment would be maintained outside of the zone boundaries. The zone would extend a minimum distance of 50 feet from all sides of perennial streams (SEC, 2002). Erosion control measures would be applied to minimize the impacts of thinning on wetland areas. Measures such as reseeding and selective thinning would be implemented to mitigate the impact of soil erosion on waterways (Tafoya, pers. comm.). In addition, no fuels management activities would occur in the perennial streams or reservoir areas of the project. To minimize the impact of the ingress and egress of project personnel on wetland areas, the project contractor and their employees would be required to avoid walking through these wetland areas.

There may be some indirect impacts to wetlands due to increased soil erosion caused by traffic during removal activities. However, many of the existing downed logs would be left in place to protect against soil compaction and rutting as the machines drive over the project area. Lop and scatter activities would occur in some areas to return nutrients from organic material from downed timber to the soil and minimize soil erosion. Thinning would be conducted during the fall and winter when the ground is frozen, further protecting the soils from compaction.


Las Vegas
Mineral Hill
El Porvenir
Trout Springs
Sanguijuela
Cañon Bonito
Cañon del Agua
Cañon Mestreno
Cañon Piedra
Cañon Lumbre
Cañon Abeyta
Rito Colorado
Rito Chaves
Dead Creek
Cañon Alto
Cañon del Sabina
Cañon Trout Springs
Cañon Gallinas
Cañon Lime
Cañon Arrisaloso
Cañon Jarita
Cañon Berta
Cañon Ranch
Cañon Sangre de Cristo
Cañon Las Dispensas
Cañon Gallinas
Cañon Meseta
Cañon Cañada del Ojo
Cañon Cañada Ancha
Cañon Cañada Larga
Cañon Cañada Cimarron

Slash would be piled and burned, lopped and scattered, or removed under this alternative. The piles would be small, therefore, any impacts from increased soil erosion or ash runoff into wetlands are expected to be minor. No slopes steeper than 45 degrees would be thinned thereby decreasing soil erosion impacts. The impact of a low-intensity thinning prescription would be short-term, as the forest would reestablish itself. This alternative is in compliance with EO 11990, as documented in the Eight-Step Planning Process (Appendix C).

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Under Alternative 3, vegetation would be thinned using manual techniques and mechanical equipment. Existing roads would be used wherever possible for equipment and skid trails. Two temporary skid trails would be created around and parallel to the Bradner and Peterson reservoirs. No roads or skid trail crossings of streams or the Gallinas River are proposed. No thinning would take place in the wetlands of the project area. However, the thinning of vegetation on the slopes of the area around the Gallinas River and the Bradner and Peterson reservoirs has the potential to free erodible soils enough to enter wetland areas resulting in minor soil discharges. Slash from thinning would be piled and either burned on site, scattered in areas that are prone to erosion, or removed to an off site location.

This alternative would be excluded from Section 404 of the CWA because the project does not involve discharges of dredged or fill material into waters of the United States; therefore, no USACE permit would be required.

Two temporary skid trails would be created with this alternative. After completion of the project, the trails would be closed, reseeded, and slash would be scattered over the trails. Heavy equipment would be used near the wetlands of the project area but would be required to use a streamside management zone. This zone is a buffer of minimally disturbed or undisturbed vegetation adjacent to a perennial body of water where heavy equipment would be maintained outside of the zone boundaries. The zone would extend a minimum distance of 50 feet from all sides of perennial streams (SEC, 2002). Erosion control measures would be applied to minimize the impacts of thinning on wetland areas. Measures such as reseeding and selective thinning would be implemented to mitigate the impact of soil erosion on waterways (Tafoya, pers. comm.). In addition, no fuels management activities would occur in the perennial streams or reservoir areas of the project. To minimize the impact of the ingress and egress of project personnel on wetland areas, the project contractor and their employees would be required to avoid walking through these wetland areas.

There may be some impacts to wetlands due to increased soil erosion caused by traffic during removal activities. However, many of the existing downed logs would be left in place to protect against soil compaction and rutting as the machines drive over the project area. Lop and scatter activities would occur in some areas to return nutrients from organic material from downed timber to the soil and minimize soil erosion. Thinning would be conducted during the fall and winter when the ground is frozen, further protecting the soils from compaction.

A broadcast burn would leave less vegetative cover on the ground under this alternative and may cause slight increases in runoff. In addition, an increase in ash runoff into wetland areas may occur. Erosion control measures such as silt fencing would be implemented. This alternative is in compliance with EO 11990, as documented in the Eight-Step Planning Process (Appendix C).

3.2.3 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 requires federal agencies to determine the effects of their actions on threatened, endangered, and candidate species of fish, wildlife, and plants, and their habitats, and take steps to conserve and protect these species.

As part of the preparation of the EA, a list of special status species with the potential to occur in the region was obtained from the USFWS. Telephone consultation was also initiated with the U.S. Forest Service in regards to threatened and endangered species due to the proximity of the thinning project to Santa Fe National Forest. The compiled list of species, status and their habitat needs are listed in Appendix E. The following endangered and threatened species have the potential to occur in the project area: bald eagle, Mexican spotted owl, and southwestern willow flycatcher. Species of Concern and Candidate species, although not afforded full protection under the ESA, are included in this analysis at the request of the USFWS in their coordination letter of December 12, 2000 (Appendix B). One federally listed Candidate species, the yellow-billed cuckoo, has the potential to occur in the project area. Species of Concern that have potential to occur in the project area are fringed myotis, long-eared myotis, Townsend's big-eared bat, spotted bat, occult little brown bat, Pecos River muskrat, New Mexican meadow jumping mouse, New Mexico silverspot butterfly, American peregrine falcon, and northern goshawk. The following descriptions include only species that, after analysis and consultation with individuals familiar with species of the region, have potential to occur in the project area:

Bald Eagle (*Haliaeetus leucocephalus*) was downlisted from endangered to threatened in the lower 48 states (Federal Register, 1995). The bald eagle has since been proposed for removal from the list of endangered and threatened wildlife in the lower 48 states (Federal Register, 1999). The eagle is known to occur in the project area during winter months. An individual was observed during the URS biological survey and sightings were noted in the SEC report prepared for the City of Las Vegas (SEC, 2002). It also is found in the region in lake areas of the northeastern part of New Mexico, the lower Canadian Valley, Las Vegas and Maxwell National Wildlife Refuges (BISON-M, 2002).

Mexican Spotted Owl (*Strix occidentalis lucida*) herein referred to as MSO, is usually found in forested mountains in a diverse range of plant communities. They are usually found in mixed-conifer forests but also occupy broadleaf forests such as gambel oak and box elder *(Acer negundo)*, preferring multi-age, multi-storied canopies. They are also found in canyons with steep sides that have mixed conifer with a multi-storied tree canopy. MSOs nest and roost primarily in closed-canopy forests, rocky canyons on cliff ledges, on debris platforms in trees, old raptor nests or in tree cavities. A wide variety of trees is used for nesting, but Douglas firs are the most commonly used species (Block, et al., 1995). The owls forage over or within several timber types with the majority of their diet consisting of small nocturnal mammals; woodrats (*Neotoma spp.*) being the primary food of owls in northern latitudes, and mice and birds in southern latitudes (Block, et al., 1995). There is suitable habitat in the project area for the MSO. There are two to three known MSO packs upstream of the project area but no known occurrences in the project area (Johnson, pers. comm.).

Southwestern Willow Flycatcher (*Empidonax trailii extimus*) is a federally and state listed endangered bird. The flycatcher is a riparian bird whose population has drastically declined due to the loss, modification and fragmentation of riparian habitat and by factors impacting their survival and reproductive success (Finch and Stoleson, 2000). Habitat of the southwestern

willow flycatcher consists of dense vegetation including willows, arrow weed *(Pluchea sericea)*, alder *(Alnus spp.)* tamarisk *(Tamarix spp.)*, and other riparian vegetation. There are no known occurrences in the project area; however, suitable habitat exists for flycatcher nesting (Johnson pers. comm.). There are areas of still water and thick willows conducive to the flycatcher along the Gallinas River and near the reservoirs of the project area.

Yellow-billed Cuckoo (*Coccyzus americanus*) is federally listed as a candidate species. This bird is slender, approximately 12 inches long, has a brown back and a long tail with large white spots at the tips. It prefers lowland, multi-canopied riparian forest (2,800 feet to 7,500 feet) with riparian thickets. There are no known occurrences in the project area; however, suitable habitat exists in locations around the City reservoirs.

Fringed Myotis (*Myotis thysanodes*) is federally listed as a species of concern. The myotis is a relatively small, brown bat distinguished from other long-eared species of myotis by a fringe of visible hairs on the free edge of tail membrane. In New Mexico, the myotis prefers habitat of ponderosa pine and oak woodlands and mixed conifer forests from 5,000 to 8,000 feet in elevation. Night and day roosts include caves, mines and can be found in ponderosa snags. Winter hibernation patterns are unknown. There are no known occurrences within the project area; however, there is suitable habitat on the forested slopes of the canyon of the Gallinas River and around the reservoirs.

Long-Eared Myotis (*Myotis evotis*) is listed as a species of concern. The myotis bat is distinctive from other myotis by its large black ears. The pale brown bat occupies coniferous forests from 6,000 to 9,600 feet in elevation. Its day roosts include tree cavities under loose bark, caves, mines, and large diameter tree snags. Winter hibernation patterns are unknown. There are no known occurrences within the project area; however, there is suitable habitat on the forested slopes of the canyon of the Gallinas River.

New Mexico Meadow Jumping Mouse (*Zapus hudsonius luteus*) is listed as a species of concern. This olive-yellow mouse is small to medium sized and has an extremely long tail and large hind feet. It occupies permanent streams with dense riparian vegetation including willows, dense grasses, sedges and forbs. It is also found in wet montane meadows. It is primarily nocturnal, feeding on seeds, insects and fruits. Its population numbers fluctuate but are not believed to be high. There are no known occurrences of the mouse in the project area; however, there is suitable habitat around the Gallinas River.

Occult Little Brown Bat (*Myotis lucifugus occultus*) is listed as a species of concern. This species of bat is of medium size, ochraceous in color, and has dark ears. Habitat varies greatly however most specimens have been taken near large water sources. The range of species covers much of North America including Alaska, Quebec, and through central Mexico. It is absent through much of Texas and an eastern portion of New Mexico. In spite of its wide range, it is believed a relatively rare bat, as pesticide use has caused drastic declines for this and other bats. There are no known occurrences within the project area; however, there is suitable habitat for the bat around the reservoirs of the project area.

Townsend's Big-eared Bat (*Plecotus townsendii*) is listed as a species of concern and is of medium size with extremely long ears. The upper parts are colored clove-brown, the sides are wood-brown, and the underside is paler. The distribution of the Townsend's bat is correlated with rocky situations where cave or abandoned mine tunnels are available. It is listed as a species of concern because it is extremely sensitive to human disturbance and vandalism of roost

caves and low reproduction rates have led to its decline in population numbers. There are no known occurrences within the project area; however, there is suitable habitat in the project area around the cliffs within the canyon of the Gallinas River.

Pecos River Muskrat *(Ondatra zibethicus ripensis)* is a species of concern. Muskrats are semiaquatic animals found in practically all aquatic habitats from marshes, ponds and lakes to streams, rivers and drainage ditches. Its fur is dense, rich brown and is overlain with coarse guard hairs. Its tail is a distinguishable naked, scaly and black feature of the muskrat. Little literature is available on the Pecos River muskrat, but it is known that in general, factors such as fire exclusion, drainage control measures, channelization and livestock grazing in riparian habitat are detrimental to muskrat populations (BISON-M, 2002). There are no known occurrences within the project area; however, there is suitable habitat in the project area within the Gallinas River area and possibly within the reservoir areas.

Spotted Bat *(Euderma maculatum)* is a species of concern. Its fur is long and silky, with a white undercoat and black overcoat such that it appears as white spots on the shoulders and rump. It has extremely large ears that are nearly as long as its body. Very little is known about the spotted bat, but it is known to roost in high cliff crevices in areas near water sources. It can be found in a wide variety of habitats and appears to summer in forested areas of Ponderosa Pine to mixed-conifer (BISON-M, 2002). There are no known occurrences within the project area; however, there is suitable habitat located in the project area within the canyon of the Gallinas River.

American Peregrine Falcon *(Falco peregrinus anatum)* is listed as a threatened species by the State of New Mexico and is federally protected under the Migratory Bird Treaty Act. The falcon is 15 to 20 inches in size with pointed wings, narrow tail and quick wingbeats (Peterson, 1990). The species breeds in limited numbers throughout much of North America where suitable habitat exists. Breeding territories are on cliffs with adjacent forested habitats of various types. Its diet is almost exclusively birds. Foraging habitat is present within the project area. Habitat marginally suitable for nesting is found in the project area along some of the high cliffs along the Gallinas River; however, there are no known occurrences in the area (Johnson, pers. comm.).

New Mexico Silverspot Butterfly *(Speyeria nokomis nitocris)* is a species of concern. It has a wing span of approximately three inches. Black-bordered silver spots on its hindwing distinguish this brownish orange butterfly. It occupies moist meadows, seeps, marshes, and streamsides feeding on nectar. Population declines are due to habitat loss or development (USGS, 2002). There are no known occurrences within the project area; however, there is suitable habitat in the project area around the Gallinas River.

Northern Goshawk (*Accipiter gentilis*) is federally listed as a species of concern. The hawk is a resident of northern forests and mountain forests of the west (Clark and Wheeler, 1987). Due to habitat degradation, vulnerability to disturbance, dependence on large stands of old growth forest and the potential for habitat fragmentation as a result of timber harvesting, its populations have declined (BISON-M, 2002). It is known to use mature stands of large trees for nesting. There are no known occurrences within the project area; however, there is suitable habitat within the project area and the hawk would be very likely to occur on the north-facing canyon sides along the Gallinas River (Johnson, pers. comm.).

Alternative 1 - No Action Alternative

Under the No Action Alternative, fuels management activities would not occur. Therefore, this alternative would have no direct impact on biological resources in the project area. However, the potential for future wildfires remains.

If a fire were to occur at a future date due to the lack of fuels management, it would result in the loss of terrestrial wildlife habitat, including habitat for protected species. Furthermore, indirect impacts would occur to aquatic habitat and resources as fire residue and eroded soils are washed into local streams and reservoirs. These indirect impacts associated with the loss of existing vegetation would continue until adequate vegetation has been reestablished within the burn area. Without fuels management activities, it is anticipated that these fires would burn hotter, resulting in more tree kills and damage to the natural environment.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

As described in Section 3.2.3, the following endangered and threatened species have the potential to occur in the project area: bald eagle, Mexican spotted owl, and southwestern willow flycatcher. The following candidate or species of concern have the potential to occur in the project area: yellow-billed cuckoo, fringed myotis, long-eared myotis, New Mexico meadow jumping mouse, occult little brown bat, Townsend's big-eared bat, Pecos River muskrat, spotted bat, American peregrine falcon, New Mexico silverspot butterfly, and northern goshawk.

In order to minimize impacts to these species, mitigation measures would be required. The following mitigation measures were developed by URS through consultation with the U.S. Forest Service, Santa Fe National Forest and U.S. Fish and Wildlife.

Measures would ensure adequate habitat remains for wildlife, including species of concern. As recommended by the New Mexico Department of Game & Fish (NMDGF), a minimum of three snags per acre with DBH of greater than 12 inches and greater than 30 feet in height would be left in place in the thinning areas. The Applicant would also be required to leave a minimum of three downed logs per acre, with at least a 10-inch diameter and a length of 8 feet, for small animal habitat. Species-specific measures are listed below.

Bald Eagle The bald eagle has been observed in the project area outside of nesting season during winter months. Thinning would be implemented during the fall and winter months and would cause temporary disturbance to any wintering eagles. Other habitat such as Murphy Lake or Maxwell Wildlife Refuge would be available in the surrounding area for any potential forage and roosting activities. Large snags would be left in place around Peterson and Bradner Reservoirs for eagle habitat. No other mitigation measures would be necessary.

Mexican Spotted Owl Although there are no known occurrences of the Mexican spotted owl within the project area, the canyon sides along the Gallinas River contain suitable habitat for foraging and nesting. In order to minimize potential impacts on the owl the following mitigation measures would be implemented:

- A minimum of three snags would be left in place in the thinning areas.
- The Applicant would be required to leave a minimum of three downed logs for owl prey species habitat.

- No large trees (DBH =16 inches), would be cut unless the tree is determined to be a hazard.
- Thinning would be completed during the fall and winter months, outside of nesting season.
- Slopes steeper than 45 percent would not be thinned. This would keep activities away from potential owl sites as they prefer steep slopes for nest and roost sites (S. Gonzales, pers. comm.).
- During consultation with USFWS, it was determined that if the mitigation measures outlined above are not carried out, presence/absence surveys for the owl must be conducted prior to start of the project (S. Gonzales, pers. comm.).

Southwest Willow Flycatcher There is habitat suitable to the flycatcher within the project area. The vegetation along Gallinas River is very healthy with thick willows and there are remnant "ice dams" used years ago to harvest ice along the river. The dams create still waters favored by the flycatcher. There is also suitable habitat around the riparian zones of the reservoirs. Although there are no known occurrences of the flycatcher within the project area, there is prime habitat and a strong possibility for occurrence (Johnson, pers. comm.). To eliminate the potential impact of activities on the southwestern willow flycatcher the following mitigation measures would be implemented:

- Thinning would be implemented in fall and winter, during the season when the flycatcher has migrated south and is not in the northern breeding grounds.
- No thinning would take place in riparian zones, and a minimum 50-foot buffer would be implemented as a limit for equipment to enter a riparian zone.
- During consultation with USFWS, it was determined that if the mitigation measures outlined above are not carried out presence/absence surveys for the flycatcher must be conducted prior to start of the project (S. Gonzales, pers. comm.).

Yellow-billed Cuckoo *(Coccyzus americanus)* There is suitable habitat for the cuckoo around the reservoirs along the eastern project area. Although there are no known occurrences of the cuckoo within the project area, it is possible that it would nest in the area from June to August. In order to eliminate the potential impact of activities on the cuckoo the same mitigation measures as outlined for the Southwestern Willow Flycatcher would also be implemented for the Yellow-billed Cuckoo.

Fringed Myotis Although there are no known occurrences of the fringed myotis in the project area, it is within suitable habitat. In order to minimize potential impact on the bat the following mitigation measures would be implemented:

- Minimum number of snags would be left in place in the thinning areas.
- No large trees (DBH = 16 inches) would be cut unless the tree is determined to be a hazard.

Long-Eared Myotis Although there are no known occurrences of the long-eared myotis in the project area, it is within suitable habitat. In order to minimize potential impact on this bat, the following mitigation measures would be implemented:

- Minimum of snags would be left in place in the thinning areas.
- No large trees (DBH = 16 inches) would be cut unless the tree is determined to be a hazard

New Mexico Meadow Jumping Mouse Although there are no known occurrences of the mouse in the project area, habitat suitable to the mouse is located along the Gallinas River within the project boundaries. In order to minimize potential impact the following mitigation measures would be implemented:

- No thinning would be conducted in riparian zones, and a minimum 50-foot buffer would be implemented as a limit for equipment to enter a riparian zone.

Occult Little Brown Bat Although there are no known occurrences of the occult little brown bat in the project area, it is within suitable habitat. In order to minimize potential impacts on the myotis the following mitigation measures would be implemented:

- Minimum of snags would be left in place in the thinning areas.
- No large trees (DBH = 16 inches) would be cut unless the tree is determined to be a hazard

Townsend's Big-eared Bat Although there are no known occurrences of the Townsend's big-eared bat within the project area there is suitable habitat for roosting around the cliffs of the canyon of the Gallinas River. To minimize potential impacts on the bat the following mitigation measures would be implemented:

- No thinning would be conducted around the steepest slopes including the cliff areas of the canyon of the Gallinas River
- Thinning would be conducted during the hibernating season of fall and winter months

Pecos River Muskrat Although there are no known occurrences of the Pecos River muskrat within the project area there is suitable habitat for the muskrat around the riparian zones of the Gallinas River and the City reservoirs. In order to minimize potential impacts on the muskrat the following mitigation measures would be implemented:

- No thinning would be conducted in riparian zones and a minimum 50-foot buffer would be implemented as a limit for equipment to enter a riparian zone

Spotted Bat Although there are no known occurrences of the spotted bat within the project area there is suitable habitat for roosting around the cliffs of the canyon of the Gallinas River. In order to minimize potential impacts on the bat, the following mitigation measures would be implemented:

- No thinning would be conducted around the steepest slopes including the cliff areas of the canyon of the Gallinas River.
- Thinning would be conducted during the hibernating season of fall and winter months.

American Peregrine Falcon Although there are no known occurrences of the American peregrine falcon within the project area the canyon sides along the Gallinas River contain marginally suitable habitat for foraging and nesting. In order to minimize potential impacts on the falcon the following mitigation measures would be implemented:

- Thinning would be conducted outside of nesting season, during the fall and winter months

New Mexico Silverspot Butterfly Although there are no known occurrences of the New Mexico silverspot butterfly within the project area there is suitable habitat for the butterfly around the

riparian zones of the Gallinas River. In order to minimize potential impacts on the butterfly the following mitigation measures would be implemented:

- No thinning would be conducted in riparian zones and a minimum 50-foot buffer would be implemented as a limit for equipment to enter a riparian zone.
- Thinning would be conducted during hibernating season of fall and winter.

Northern Goshawk Although there are no known occurrences of the northern goshawk within the project area the canyon sides along the Gallinas River contain suitable habitat for foraging and nesting. In order to minimize potential impacts on the goshawk the following mitigation measures would be implemented:

- A minimum of snags would be left in place in the thinning areas.
- No large trees (DBH = 16 inches) would be cut unless the tree is determined to be a hazard.
- The Applicant would also be required to leave a minimum of downed logs for goshawk prey species habitat.
- Thinning would be conducted outside of nesting season, during the fall and winter months.

Other threatened, endangered or candidate species are not likely to occur in the project area, although some species of concern may occur as transients (see Appendix E for listed species). Mitigation measures outlined above would be beneficial to any potential transient listed species as well.

The thinning prescription would emphasize leaving a diversity of tree and brush species to improve overall forest health. Selective thinning would be implemented; therefore, a multi-age and multi-canopied stand would be left in place. Some trees would be "dead limbed" meaning the tree would remain but the limbs would be trimmed off the ground. This measure would preserve older trees of species other than ponderosa pine and cause fewer disturbances to the overall forest. Existing roads that cross the project area would be utilized for fuels management activities wherever possible, thereby minimizing the need to create new roads for forestry equipment. No large diameter trees would be cut unless deemed to be a hazard. Long-term effects of the proposed thinning activity would reduce fire hazards in these areas reducing the risk of catastrophic fires. Catastrophic fire can have a detrimental effect by creating additional habitat loss for threatened and endangered species such as the MSO (Block et al., 1995).

After a review of the applicable laws, project area, consultation with individuals knowledgeable about the species, and in consideration of the activities proposed under the project, it was determined that with appropriate, project-specific mitigation measures, the Proposed Action would not result in any adverse, direct or indirect impacts to special status species or their habitats. Implementation of these mitigation measures would ensure project compliance with the ESA.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Impacts to special status species with the potential to occur in the project area (i.e., bald eagle, MSO, southwestern willow flycatcher) resulting from the implementation of Alternative 3 would be similar to the Proposed Action.

While mitigation measures with this alternative would be similar to Proposed Action; with broadcast burning it would be more difficult to control the amount of snags and downed logs left for potential prey habitat. No broadcast burning would occur in riparian zones. However, erosion control measures, as mentioned previously, would be needed to prevent ash and sediment loads from entering the waterways. Other mitigation measures discussed in the Proposed Action would be implemented in this Alternative. With the project-specific mitigation measures in place, Alternative 3 would not result in any long-term adverse direct or indirect impacts to special status species or their habitats. Implementation of these mitigation measures would ensure project compliance with the ESA.

3.3 HAZARDOUS MATERIALS

Hazardous wastes, as defined by the Resource Conservation and Recovery Act (RCRA), are "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of or otherwise managed." While the definition refers to "solids," it has been interpreted to include semisolids, liquids, and contained gases as well (Wentz, 1989).

Hazardous materials and wastes are regulated in New Mexico via a combination of federally mandated laws and state laws developed by the NMED. Federal regulations governing the assessment and disposal of hazardous wastes include RCRA, the RCRA Hazardous and Solid Waste Amendments, Comprehensive Environmental Response, Compensation and Liability Act, Solid Waste Act, and Toxic Substances Control Act. The state hazardous waste statutes are contained as part of the New Mexico Administration Code, Titles 7, 11, and 20.

To determine the presence and approximate location of known hazardous materials in the vicinity of the proposed project, Environmental Data Resources, Inc. (EDR), an independent information service, conducted a database search. The database search queries multiple federal, state and local hazardous materials and underground storage tank (UST) databases to identify sites within a specified distance of the proposed project. The EDR search for this project extended 1 mile beyond the boundaries of the 991 acres of City land within the fuels management area. The database search did not identify any hazardous material sites within the search area.

In addition to the database search, URS staff conducted a reconnaissance level survey for hazardous materials and wastes at the proposed project areas, and in the project vicinity, on March 5, 2002. Interagency coordination was initiated with the EPA Region VI in a letter dated January 10, 2002. EPA responded via telephone on January 22, 2002, and indicated that they no longer provide EA project reviews for HMGP projects (Appendix B).

No subsurface hazardous materials testing was conducted in the project areas as a part of this EA. Conclusions are based only on the field reconnaissance, database search, and reported historical use of the properties.

Alternative 1 - No Action Alternative

Under the No Action Alternative, no fuels management activities would be undertaken, and there would be no impacts to hazardous materials.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

Based on the results of the database search for known hazardous materials and wastes, and UST sites, no hazardous materials or wastes sites are anticipated to occur at the project area or be disturbed by the Proposed Action. The Proposed Action presents low risk to human health associated with hazardous materials and wastes.

Although subsurface hazardous materials are not anticipated to be present in the project area, any hazardous materials discovered, generated, or used during implementation of the Proposed Action would be disposed of and handled by the City of Las Vegas in accordance with applicable local, state, and federal regulations.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Based on the results of the database search for known hazardous materials and wastes, and UST sites, no hazardous materials or wastes sites are anticipated to occur at the project site or be disturbed by Alternative 3. Alternative 3 presents low risk to human health associated with hazardous materials and wastes.

Although subsurface hazardous materials are not anticipated to be present in the project area, any hazardous materials discovered, generated, or used during implementation of Alternative 3 would be disposed of and handled by the City of Las Vegas in accordance with applicable local, state, and federal regulations.

3.4 SOCIOECONOMICS

3.4.1 Zoning and Land Use

The City of Las Vegas, a wildland/urban interface community dominated by forested areas, is located within San Miguel County in northeastern New Mexico. The City sits at an elevation of 6,470 feet NGVD, with the Rocky Mountains beginning on its western edge and the Great Plains on its eastern edge. The City encompasses approximately 4,749 acres or 7.42 square miles. The land surrounding the City consists primarily of undeveloped forestland and smaller residential communities. The more densely populated downtown area supports residential, commercial, light industrial, and recreational uses.

The City of Las Vegas is an historic city that served as a major trading location along the Santa Fe Trail. With the advent of the Atchikson, Topeka, and Santa Fe railroad lines, the City of East Las Vegas was established near the railroad depot, and both towns saw a brief period of major growth. An agricultural depression in the 1920s and the depression of the 1930s put an end to the City of Las Vegas' prosperity and resulted in a long period of dormancy. During this time, farming and ranching served as the base of the area’s economy (Worldplaces, 2002).

The current population of Las Vegas is 14,565, a 1.3 percent decrease from the 1990 census figure of 14,753 (U.S. Census Bureau, 2000). This trend was not observed in San Miguel County or the State's census figures, as both the County and State have experienced growth rates of 17 percent and 20.1 percent, respectively (U.S. Census Bureau, 2000).

Major employers in the City of Las Vegas include the Las Vegas Medical Center, the New Mexico Highlands University, and City schools (Las Vegas Chamber of Commerce [COC], 2002). These institutions have helped to stabilize Las Vegas' economy. The high number of retail trade employees highlights Las Vegas' role as a commercial center for neighboring small towns and as a tourist destination for those interested in history or wishing to explore Santa Fe National Forest.

The proposed project would occur on 478 of 991 acres of City-owned land within the Gallinas River Watershed. Of the 991 acres, 874 acres are classified as forest and the remaining 117 acres are classified as either open water, riparian areas, or grassland habitat. The two reservoirs--Peterson and Bradner-- are located within the City-owned land and serve as Las Vegas' primary drinking water storage areas, with a combined capacity of 632 acre-feet of water.

The proposed project area begins approximately 5 miles from downtown Las Vegas and falls within the joint City/County Extraterritorial Zoning Area (ETZ). Under ETZ zoning codes, the proposed project area is classified as an agricultural district "intended to protect and preserve areas of agricultural and agriculturally oriented uses. The standards and densities prescribed for this district are intended to preserve the open character of the area and thereby to protect the business of agriculture." Currently no agricultural activities occur on the City-owned land, as the proposed project area serves as a forested buffer for the City's water supply. The areas around the reservoirs and at a northeast entrance to Gallinas Creek are gated with access to the site limited to City workers, primarily individuals employed with the City of Las Vegas' Water Department. Adjacent to the proposed project area are several areas zoned as neighborhood conservation districts. This zoning ordinance is intended to preserve the character of existing neighborhoods and allows for development that is consistent with neighborhood character at the time of enactment of the zoning ordinance.

The City-owned land accounts for a minor portion of land area in the watershed, with the majority of the land being privately owned as part of the Las Vegas Land Grant. Also located within the Watershed is the Santa Fe National Forest, Las Vegas/Pecos Ranger District.

Alternative 1 – No Action Alternative

Under the No Action Alternative, the accumulation of vegetative material that surrounds Las Vegas and nearby communities would not be removed, and would continue to pose a wildfire risk. However, no direct impacts to land use and zoning would occur. Since no action would be taken, no changes to local zoning ordinances would be required.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

While the harvesting or thinning of forested lands within the ETZ is not specifically listed within the ETZ ordinance, URS has consulted with the planning departments for both the City of Las Vegas and the County of San Miguel regarding the implementation of the Proposed Action. Both planning departments state that the proposed thinning project would not be contrary to the

agricultural zoning ordinance and is a permitted activity (Appendix B). Therefore, land-use designations would not change as a result of the thinning of the densely vegetated areas. Because the land is not currently open to the public, use of the project area would not be affected by the Proposed Action.

In general, the Proposed Action is not anticipated to result in any long-term adverse impacts to land use or zoning.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Harvesting or thinning of forested lands within the ETZ is not specifically listed within the ETZ ordinance, URS has consulted with the planning departments for both the City of Las Vegas and the County of San Miguel regarding the implementation of Alternative 3. Both planning departments state that the proposed thinning project would not be contrary to the agricultural zoning ordinance and is a permitted activity (Appendix B). Therefore, land-use designations would not change as a result of the thinning of the densely vegetated areas. Because the land is not currently open to the public, use of the project area would not be affected by Alternative 3.

In general, Alternative 3 is not anticipated to result in any long-term adverse impacts to land use or zoning.

3.4.2 Visual Resources

The topography of this part of northern New Mexico is scenic and varies from the seemingly endless march of the short-grass prairies along the eastern edge of the Great Plains to the rise of the southern Rocky Mountains on the west. As the elevation increases, the landscape changes from the low-land grassland to pinyon-juniper communities, to ponderosa pine forests and mixed conifer forests and high mountain streams, and finally to subalpine forests and meadows. Tall mountains to the west and vast open landscapes to the east characterize the land surrounding the City of Las Vegas. The area is rich in history and the downtown architecture matches with striking and visually interesting buildings. The City of Las Vegas is approximately 5 miles southeast of the project area. The Village of Montezuma is located northwest of the City of Las Vegas and is adjacent to the project area. Homes in the village are primarily located to the north and east of the project area. The United World College is located in one of New Mexico's most visually striking historical buildings within the Village of Montezuma and is separated from the project area by the Gallinas River and Highway 65, which travels westward up the Gallinas Valley. Naturally occurring hot springs, popular with local people and tourists, are located across the highway from the north and eastern portion of the project area.

The vegetation of the project area and the surrounding area is heavily forested with primarily ponderosa pine and mixed conifer forests. As elevation increases up the valley, scenic views that look out to the south across the valley toward portions of the project area along the Gallinas River can be found along Highway 65. Parts of the project area are visible from the Village of Montezuma, the United World College, the hot springs, and portions of Highway 65. The height and density of trees and the hilly terrain in the area may obscure many views and partially screen others. Photograph 1 in Appendix A is representative of existing conditions.

Visibility related to air quality is an important facet of the visual environment within the area's view-shed. Smoke is produced in the viewshed by residential burning and controlled fuels

management burns. Due to the limited number of light pollution sources within the Village of Montezuma and surrounding communities, the nighttime visual environment has not been significantly impacted.

The visual assets of the proposed project area reflect the region's variety, including residential sites and large expanses of natural and undeveloped mountain areas. The combination of dense ponderosa pine forests and highly varied topography, that includes canyons and ridges, create a unique environment of high scenic value for both visitors and residents of the area. In addition, dense forests adjacent to residential areas create a high degree of privacy.

Alternative 1 – No Action Alternative

Under the No Action Alternative, no impacts would occur to existing visual resources. However, the threat of future wildfires would remain, and should one occur, the landscape would be altered dramatically. Vegetation and wildlife would likely be destroyed. As a result, the overall character and quality of the sites for sensitive viewer groups would be changed. It would take years to re-establish the existing views after a wildfire and there would be a substantial long-term effect on visual resources.

Tourism profits would likely decline given the potential visual impacts and damage to commercial enterprises anticipated after any future wildfires. The community may not be able to shoulder the costs of repair, especially during an economic downturn. Declines in tourism were noted in two nearby towns, Taos and Pecos, following the fires of 2000, primarily a result of the perception of what happened in the area, rather than actual damage from the fires themselves. According to figures kept by the Taos Visitor Center, 18,895 fewer walk-in visitors -- an indicator of tourism traffic -- stopped by the center during the summer of 2000 as compared to the previous summer, a drop of nearly 31 percent (New Mexico Business Journal, 2001). Similarly, Park Rangers from Pecos National Historical Park stated that nearly 800 visitors to the park canceled reservations (USFS, 2001). Similar tourism declines may occur in Las Vegas should another major wildfire occur.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

Vegetation removal activities conducted under this alternative would result in minor impacts to visual resources. Vegetation removal would be selective and there would be more precise control over the degree to which visual resources are impacted. Most of the thinned areas around the City reservoirs would not be visible from the surrounding communities. Visual impacts from the portions of the project immediately adjacent to the village area would likely include those related to reduced vegetation from vegetation removal and equipment use, and increased contrast between stands of vegetation. Homeowners bordering the project area may be impacted under this alternative due to decreased privacy as a result of vegetation removal. However, removal of snags and dead bushes and trees would likely improve the overall visual resources. Smoke from burning of slash piles would be visible from homes and historical buildings surrounding the project area. After the slash piles have been burned, evidence of the burn may be temporarily visible to adjacent properties. The project area visible from Highway 65 is far enough away that the difference in vegetation density after removal would not be easily detected. It is unlikely that the surrounding views would be dramatically altered under this alternative. Residential quality

and recreational values likely would be maintained. No long-term visual impacts would be expected with this alternative.

The pre-settlement ponderosa pine forest, prior to fire suppression and livestock grazing, was an open park-like structure with trees spaced wide apart and thick grass/forb cover knitted between the trees. It is anticipated that a mitigative impact or benefit of the Proposed Action is the restoration of the forest to one more closely resembling pre-settlement conditions.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Vegetation removal activities conducted under this alternative would result in minor impacts to visual resources. Vegetation removal would be selective and there would be more precise control over the degree to which visual resources are impacted. Most of the thinned areas around the City reservoirs would not be visible from the surrounding communities. Visual impacts from the portions of the project immediately adjacent to the village area would likely include those related to reduced vegetation from vegetation removal and equipment use, and increased contrast between stands of vegetation. Homeowners bordering the project area may be impacted under this alternative due to decreased privacy as a result of vegetation removal. However, removal of snags and dead bushes and trees would likely improve the overall visual resources. Smoke from burning of slash piles would be visible from homes and historical buildings surrounding the project area. Under Alternative 3, the project area would be broadcast burned. Smoke from the broadcast burn would be heavier and more widespread than the Proposed Action, as more vegetation would be burned over a larger area. The visual impact from the smoke of a broadcast burn would be temporary. Similarly, Biswell (1989) observes that the black charring on ponderosa pines usually lasts a “few weeks,” and charred land in grasslands is usually washed away by a few good rains, and replaced by the green of new growth stimulated by the rains.

No adverse long-term visual impacts would be expected with this alternative.

3.4.3 Noise

Sound is most commonly measured in decibels (dB) on the A-weighted scale, which is the scale most similar to the range of sounds that the human ear can hear. The Day-Night Average Sound Level (DNL) is an average measure of sound. The DNL takes into account the volume of each sound incident, the number of times each incident occurs, and the time of day each incident occurs (nighttime sound being weighted more heavily because it is assumed to be more annoying to the community). The DNL descriptor is accepted by federal agencies as a standard for estimating sound impacts and establishing guidelines for compatible land uses.

Noise, defined herein as unwanted or unwelcome sound, is regulated by the federal Noise Control Act of 1972 (NCA). Although the NCA gives the EPA authority to prepare guidelines for acceptable ambient noise levels, it only charges those federal agencies that operate noise-producing facilities or equipment to implement noise standards. The EPA’s guidelines (and those of many federal agencies) state that outdoor sound levels in excess of 55 dB DNL are “normally unacceptable” for noise-sensitive land uses such as residences, schools, and hospitals. There are no established noise ordinances for the City of Las Vegas (Garcia, pers. comm.).

Alternative 1 – No Action Alternative

Under the No Action Alternative, FEMA-funded fuels management efforts for fire hazard reduction would not be conducted and, therefore, would not generate noise. Noise levels are expected to remain at current levels.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

Most noise associated with fuels management projects is emitted from mechanical equipment used in vegetation removal and transport from the project area. For the Proposed Action, the use of forwarders, chainsaws, and other mechanized forestry equipment represents the equipment with the potential to generate the most noise. At 50 feet from the project area, it is anticipated that noise related to the project (from chainsaws, forwarders, and vehicles) would range from 78 to 91 dB, higher than acceptable noise levels as defined by the EPA. However, most residences are located upwards of 200 feet from the project area, and as the noise would attenuate at a rate of 6 dB for each doubling of distance from the noise source, noise impacts would be minimal. Additionally, the dense vegetation at the project area would slightly reduce perceived noise levels.

However, to mitigate potential impacts to any nearby residences, the City of Las Vegas would be responsible for adequately notifying the public of fuels management projects and conducting these activities during normal business hours. Methods of notification could include posting fliers at information centers, trailheads, and restrooms of recreational areas and updating recorded telephone and radio information. Overall, these noise impacts are anticipated to be minor and short term and would occur during the daylight hours only, lasting no longer than one week in any specific location.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

For Alternative 3, the use of forwarders, chainsaws, and other mechanized forestry equipment represents the equipment with the potential to generate the most noise. At 50 feet from the project area, it is anticipated that noise related to the project (from chainsaws, forwarders, and vehicles) would range from 78 to 91 dB, higher than acceptable noise levels as defined by the EPA. However, most residences are located upwards of 200 feet from the project area, and as the noise would attenuate at a rate of 6 dB for each doubling of distance from the noise source, noise impacts would be minimal. Additionally, the dense vegetation at the project area would slightly reduce perceived noise levels.

However, to mitigate potential impacts to any nearby residences, the City of Las Vegas would be responsible for adequately notifying the public of fuels management projects and conducting these activities during normal business hours. Methods of notification could include posting fliers at information centers, trailheads, and restrooms of recreational areas and updating recorded telephone and radio information. Overall, these noise impacts are anticipated to be minor and short term and would occur during the daylight hours only, lasting no longer than one week in any specific location.

3.4.4 Public Services and Utilities

Public services provided to residents of Las Vegas include emergency fire, rescue, and police operations as well as educational, medical, and recreational services. The Las Vegas Police Department, with 42 full-time officers, and the City's Fire Department, with 19 full-time fire fighters and 30 volunteers, are responsible for fire, emergency medical services, and general public safety (Las Vegas COC, 2001). There are 13 public education institutions within Las Vegas: 8 elementary schools, 2 middle schools, 2 high schools, and 1 community college, as well as a private university and a World College of America (Las Vegas COC, 2001). The largest providers of medical care within Las Vegas are the Northeastern Regional Hospital, a 62-bed acute-care facility and the Las Vegas Medical Center, a 626-bed mental health facility. Two senior care centers are also located in Las Vegas, as are physical rehabilitation and substance abuse treatment centers. City recreational facilities include nine public parks and a local golf course (Worldplaces, 2002). Nearby Santa Fe National Forest also offers recreational opportunities for residents.

Public utilities provided by the City of Las Vegas include natural gas, water, and sewer services (Las Vegas COC, 2001). The Peterson and Bradner Reservoirs, located near the eastern boundary of the Gallinas watershed, serve as the City's primary water storage sites. Water stored in these reservoirs is diverted from Gallinas River into a settling basin and then gravity fed through a pipeline into the reservoirs. The water treatment facilities are located nearby. Additional utilities, such as electricity and telephone service, are provided through the Public Service Company of New Mexico and Qwest Communications, respectively (Las Vegas COC, 2001).

Alternative 1 – No Action Alternative

Under the No Action Alternative, fuels management efforts for fire hazard reduction would not be conducted and fire-prone areas would remain vulnerable to future fires. There would be no immediate impact on the public services and utilities under this alternative. However, future fires could compromise or disable the essential public services and utilities. Facilities that provide public services such as schools, police stations, and hospitals could sustain future damage from fires. In addition to monetary cost of damage, future fires could compromise the ability of these services to perform their duties adequately. Impacts could include the temporary or permanent closure of schools, hospitals, police stations, and recreational facilities (including forests and parks). Fire and police departments could also be strained due to participation in fire assistance efforts; emergency medical services could be delayed in accessing emergency sites or hospitals.

Protection of Las Vegas' Peterson and Bradner water storage reservoirs is of prime concern for the City. Increased ash and sediment from catastrophic fires could have negative impacts on water quality and quantity. Ash contamination from the Viveash Fire of 2000, which affected only 1.5 percent of the Gallinas watershed, prevented the City from diverting 112 million gallons of water to the reservoir (Tafoya, pers. comm.). A larger, more intense fire in this watershed could have a greater impact on the City's water resources. The City estimates that should a catastrophic fire event occur on or near the municipal reservoirs, only 25 percent of its current users could be sustained for drinking water, utilizing the Taylor Well Fields. Based on current

census data, this could require nearly 11,000 residents to relocate until drinking water supplies are restored, drawing away a large portion of the area's businesses and tax base.

Essential public services could also be disabled. Fire and police departments would likely be strained due to participation in fire assistance efforts, and emergency medical services could be delayed in accessing emergency sites or hospitals if fire damage was severe.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

The Proposed Action would utilize manual and mechanized vegetation removal. Risk of future fires and resulting damage to public services would be greatly reduced under this alternative. However, the use of heavy machinery, removal of vegetation, and other activities associated with this alternative has the potential to adversely impact public services and infrastructure in the project area. Timber cutting has the potential to damage power lines and the use of heavy-wheeled machinery could disrupt pipelines that may be located near ground surface. Vegetation removal may also result in temporary closure of a public facility and delays on public roads. School buses, police vehicles, fire vehicles, and ambulances could be forced to take alternate routes or experience delays. These impacts are expected to be temporary and last for no more than a few days in any area.

To minimize impacts to public services and infrastructure the Applicant would be required to coordinate with the Public Works Department prior to start. In addition, employees would be required to identify, mark and/or avoid utilities such as power lines, or underground pipelines that potentially could be impacted by the proposed activities.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Risk of future fires and resulting damage to public services would be greatly reduced under Alternative 3. However, the use of heavy machinery, removal of vegetation, and other activities associated with this alternative has the potential to adversely impact public services and infrastructure in the project area. Timber cutting has the potential to damage power lines and the use of heavy-wheeled machinery could disrupt pipelines that may be located near ground surface. Vegetation removal may also result in temporary closure of a public facility and delays on public roads. School buses, police vehicles, fire vehicles, and ambulances could be forced to take alternate routes or experience delays. A broadcast burn has the potential to produce enough smoke to cause temporary road closures. These impacts are expected to be temporary and last for no more than a few days in any area.

To minimize impacts to public services and infrastructure the Applicant would be required to coordinate with the Public Works Department prior to start. In addition, employees would be required to identify, mark and/or avoid utilities such as power lines, or underground pipelines that potentially could be impacted by the project activities.

3.4.5 Traffic and Circulation

Several agencies are responsible for the development, construction, and maintenance of roads in the study area. These include: the Federal Highway Administration (FHWA) for roads on the National Highway System and other roads; the New Mexico State Highway and Transportation

Department (NMSHTD) for state routes and funding for local projects; and San Miguel County's Roads Division, which is responsible for the design, construction, and maintenance of county roads. In addition to highway transportation, Amtrak has daily passenger trains and Texas, New Mexico & Oklahoma Coaches Inc. has daily buses in and out of Las Vegas. Municipal bus service is available to residents of Las Vegas and is provided by Meadow City Express.

Las Vegas is located off of Interstate 25, which goes directly from Las Vegas to all north and south directions. Highway 8, located 5 miles from Las Vegas, joins Interstate 40 to all east and west directions. The primary road located within the proposed project area is State Highway 65, running east to west. Annual average daily traffic counts from 1999 for this highway recorded a traffic flow of 7,223 vehicles prior to the turnoff to Luna Community College, located roughly 2.4 miles south of the project area. Past this point, traffic flow lessens considerably to 3,615 vehicles and lowers even further at the junction of State Highway 65 and County Road A11A, where an average of 698 vehicles were counted (Trujillo, pers. comm.).

Alternative 1 – No Action Alternative

Under the No Action Alternative, no federally funded fuels management actions would take place. Due to the continued high risk of wildfires, certain residential areas would continue to have limited evacuation routes. The potential for delayed response times for emergency vehicles due to closure of roads as a result of wildfire would continue. The degree of congestion, delays, and detours would depend upon the location, magnitude, and extent of the fire. Additionally, roads would potentially be closed due to mudslides that could occur following loss of vegetation on steeper slopes. Road closures during fire events would also delay the movement of fire-fighting equipment and firefighters into and out of the affected area, thus slowing attempts to control the fire.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

The Proposed Action would reduce fuel accumulations, which would reduce the risk to future wildfires and the potential for damage to roadways and evacuation routes. The ingress and egress of machinery, along with other project-related activities has the potential to cause temporary congestion, delays, and detours to roads in Las Vegas, most significantly State Highway 65. The degree of congestion, delays, and detours would depend upon the location, extent, and time of project activities; however, given the low level of traffic flow within the project area, no significant, long-term impacts are anticipated. To minimize potential adverse impacts to traffic and circulation, the Applicant would be required to implement the following mitigation measures:

- Adequate safety provisions (e.g., signage, traffic cones, flag personnel) would be provided as needed to identify potential fire hazard, staging and/or work areas during fuels management activities.
- Traffic along adjacent roadways would be temporarily re-routed as necessary during fuels management activities. Traffic lane closures, if necessary, would be coordinated with appropriate fire and community officials.
- To the maximum extent feasible, construction related vehicles would be prohibited from parking on residential streets.

- Fuel management equipment and vehicle staging would be located so as not to hinder the traffic flow of the project burn areas.
- Adjacent residential neighborhoods would be notified in advance of fuels management activities and any re-routing of local traffic. Notification would identify a contact person at the local fire department.
- The Applicant will coordinate with the NMSHTD and the local Department of Transportation to avoid implementing project activities during peak travel periods.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Alternative 3 would potentially affect vehicles in the project vicinity during the burn phase of the project. Impacts may include decreased visibility, slower traffic speeds, and temporary road closures to ensure public safety. The final burn plans for the site would address traffic coordination issues in cooperation with local road departments. To minimize potential adverse impacts to traffic and circulation, the Applicant would be required to implement the following mitigation measures:

- Adequate safety provisions (e.g., signage, traffic cones, flag personnel) would be provided as needed to identify potential fire hazard, staging and/or work areas during fuels management activities.
- Traffic along adjacent roadways would be temporarily re-routed as necessary during fuels management activities. Traffic lane closures, if necessary, would be coordinated with appropriate fire and community officials.
- To the maximum extent feasible, construction related vehicles would be prohibited from parking on residential streets.
- Fuel management equipment and vehicle staging would be located so as not to hinder the traffic flow of the project burn areas.
- Adjacent residential neighborhoods would be notified in advance of fuels management activities and any re-routing of local traffic. Notification would identify a contact person at the local fire department.
- The Applicant will coordinate with the NMSHTD and the local Department of Transportation to avoid implementing project activities during peak travel periods.

3.4.6 Environmental Justice (Executive Order 12898)

EO 12898 requires federal agencies to make achieving environmental justice part of their mission. Agencies are required to identify and correct programs, policies, and activities that have disproportionately high and adverse human health or environmental effects on minority and low-income populations. EO 12898 also tasks federal agencies with ensuring that public notifications regarding environmental issues are concise, understandable, and readily accessible. Socioeconomic and demographic data were studied to determine if a disproportionate number (greater than 50 percent) of minority or low-income persons have the potential to be adversely affected by the alternatives.

Data from the 2000 Census has a recorded population for the City of Las Vegas of 14,565 that is 54.2 percent white, 1 percent African American, 2 percent American Indian, 0.6 percent Asian, and 0.1 percent Native Hawaiian/other Pacific Islander and 42.2 percent of some other race or two or more races. Of the total population, 82.9 percent classified themselves as Hispanic or Latino, persons of this category can be of any race.

For comparison, the State of New Mexico's population as a whole is 66.8 percent white; 1.9 percent African American; 9.5 percent American Indian or Alaska native; 1.1 percent Asian or Pacific Islander; 0.1 percent Native Hawaiian/ other Pacific Islander; and 20.6 percent of some other race or two or more races. Approximately 42.1 percent of New Mexico residents classified themselves as of Hispanic origin (U.S. Census, 2000).

Major employers in Las Vegas include the Las Vegas Medical Center, the New Mexico Highlands University, and City schools (Las Vegas COC, 2002). These institutions have helped to stabilize Las Vegas' economy. The high number of retail trade employees, highlights Las Vegas' role as a commercial center for neighboring small towns and as a tourist destination for those interested in history or wishing to explore Santa Fe National Forest.

According to the 2000 U.S. Census, the median household income for this area is $24,214. Of those persons for whom poverty status is determined, 27.8 percent are below the poverty threshold. At the state level, the median household income is $30,836, with 19.3 percent of the state population below the poverty threshold. Of the 5,985 individuals in the civilian labor force in Las Vegas, roughly 88 percent are employed. Educational, health, and social services employ nearly 40 percent of the available workforce. Other major industries include retail trade (accounting for 15 percent), and public administration (accounting for 8.6 percent).

Based on the socioeconomic statistics regarding Hispanic and Latino residents, the requirement to evaluate this project relative to EO 12898, Environmental Justice is triggered.

Alternative 1 – No Action Alternative

Under the No Action alternative, fuels management actions would not occur. Therefore, EO 12898 is not applicable to this alternative. However, fire-prone areas would remain subject to damages from future wildfires, and risks to the area's water supply and human safety would remain.

Residences, businesses, and local governments would rely on insurance or other sources as compensation for property damage. The need to rebuild, repair, or relocate damaged structures, roads, or utilities would cause adverse financial impacts to residents, businesses, and governments that have no or inadequate insurance. The loss of sales due to infrastructure damage, migration of customers, and temporary closings for repairs or replacement of inventory would also impact businesses.

If a large number of residents and businesses are affected to a substantial degree, entire communities could feel the indirect economic consequences. Residents and businesses that suffered financial hardships from fire damage are likely to alter their purchasing habits by reducing expenditures, especially on nonessential goods and services. Residents and businesses that migrate out of the area would likely terminate financial transactions in the community. The profitability of businesses providing these goods and services would then decrease, potentially leading to the lay off of employees, thus increasing unemployment. Failing businesses, reduced

expenditures, and migration of residents would decrease local tax revenues, either increasing tax rates or decreasing budgets for local government services. The local population as a whole would experience these impacts.

Private contractors would receive economic benefits from repairing fire-damaged facilities under this alternative. Provided local companies would be used for labor and materials, some economic benefits would accrue to other sectors of the community. Except for unusually large projects, these beneficial impacts would have a negligible effect on the local economy as a whole.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

Implementation of the Proposed Action would require the use of manual and mechanized equipment to reduce fuel loads in the Las Vegas area. Additionally, limited slash pile burning would occur at the project area. Most notably, this will likely result in temporary decreases in air quality (refer to Section 3.1.4), increases in ambient noise levels (refer to Section 3.4.3), a change in visual resources for some user groups (refer to Section 3.4.2), and traffic delays (refer to Section 3.4.5). The impacts of the Proposed Action would affect the surrounding community as a whole, and it is unlikely that certain populations would be disproportionately affected by project activities. Additionally, the majority of impacts affecting area residents are expected to be short-term in nature.

Overall, it is anticipated that the actions associated with this alternative would reduce the risk of fire hazard in the vicinity of Las Vegas and protect the City's water supply. The project activities would provide equal protection for all members of the community and protection of the water supply would benefit all current and future users of the City's drinking water, and is therefore in compliance with EO 12898.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Under Alternative 3, in addition to vegetation thinning, the Applicant would develop and implement a broadcast burn plan to reduce fuel and slash loads to protect the safety of the residents of the City of Las Vegas and surrounding environs and their water supply. Most notably, this alternative will likely result in a temporary reduction in air quality (refer to Section 3.1.4), a temporary increase in noise levels (refer to Section 3.4.3), a change in visual resources (refer to Section 3.4.2**),** and temporary traffic delays or road closures (see Section 3.4.5). The impacts of Alternative 3 would affect the surrounding community as a whole, and it is unlikely that certain populations would be disproportionately affected by project activities. Additionally, the majority of impacts affecting area residents are expected to be short-term in nature.

It is anticipated that the actions associated with Alternative 3 would reduce the risk of fire hazard in the vicinity of Las Vegas and protect the City's water supply. The project activities would provide equal protection for all members of the community and protection of the water supply would benefit all current and future users of the City's drinking water, and is therefore in compliance with EO 12898.

3.4.7 Safety and Security

Safety and security issues considered in this analysis include the health and safety of the area residents, the public at-large, and the protection of personnel involved in activities related to the implementation of the proposed fuels management alternatives.

Alternative 1 – No Action Alternative

Under the No Action Alternative, the high risk of wildfire would remain. Without mitigating the fire risk, the potential for adverse impacts to public safety due to future wildfire in the City of Las Vegas area would persist.

As the No Action Alternative does not involve the employment of personnel to perform fuels management activities, there would be no potential risks to the personal safety of those who would otherwise be performing the fuels management activities.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

One of the primary goals of the Proposed Action is to directly address potential safety and water quality impacts associated with the risk of wildfire. This alternative would reduce the fuel loads in forests adjacent to the City of Las Vegas, and as such, it is anticipated that the safety of area residents would increase as the risk of a future wildfire were decreased.

Vegetation removal presents safety risks to those people performing the fuels management activities. The operation of chippers, chainsaws, and other types of equipment and machinery, and likewise, bundling, loading, and transporting downed material may be hazardous for the construction personnel. To minimize risks to safety and human health, all fuels management activities would be performed using qualified personnel trained in the proper use of fuels management equipment including appropriate safety precautions. Additionally, all activities would be conducted in a safe manner in accordance with the standards specified in Occupational Safety and Health Administration (OSHA) regulations. Appropriate signage would be posted and appropriate public notification would occur on burn days, informing local residents of the time and location of project activities. Burning of slash piles presents a risk that the fire could escape from the pile area or cause excessive smoke levels, potentially affecting human health and safety. These risks and effects would be mitigated as discussed in Section 3.1.4.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Under Alternative 3, mechanical thinning and broadcast burning would be conducted at the identified project areas. Similar to the Proposed Action, management of fuel load levels in the area of the City of Las Vegas would reduce the likelihood of a catastrophic wildfire, improving the overall safety of area residents and their water supply.

Broadcast burning poses safety concerns, most notably, the reduction in visibility due to smoke, which could affect vehicular safety of area residents and visitors. Appropriate smoke management methods would be implemented during the broadcast burning (e.g., burn on days when weather conditions allow smoke to rise into the atmosphere and avoid mixing dirt with piles). High smoke concentrations may also pose health concerns for nearby residents, particularly those with health and/or respiratory problems, as about 90 percent of particulate

emissions from prescribed fire are small enough to enter the human respiratory system (Wade and Lunsford, 1989). Appropriate public notification would occur on burn days, informing local residents of the time and location of project activities. Sensitive receptors, such as asthmatics and the elderly, would be advised to stay indoors during the burn period. To minimize impacts to public health and safety as a result of Alternative 3, Las Vegas would develop and implement specific measures to protect public well being as part of its burn plan. Appropriate signage would also be posted to prevent recreational users and residents from entering the project area during fuels management activities.

Fire management personnel exposed to high smoke concentrations can also suffer eye and respiratory irritation. To minimize risks to safety and human health, all management activities would be performed using qualified, experienced individuals specifically trained in performing broadcast burns. Additionally, the burn plan developed under this alternative would include measures to protect the health and safety of personnel involved in implementing this alternative. All activities would be conducted in a safe manner in accordance with the standards specified in OSHA regulations.

Under this alternative, it is possible that the broadcast burn could escape causing a larger, uncontrolled fire. While this possibility exists, it is relatively small. According to the Boise Interagency Fire Center, approximately 1 percent of fires on federal lands required suppression activities. Of this 1 percent, over 90 percent were successfully controlled, and primarily consisted of handing a fire that jumped a fire line. Statistically, only 0.1 percent of fire activities on federal lands required major actions (Stevens, 2000). To mitigate the risk of an escaped fire, firebreaks would be created around the perimeter of broadcast burn areas.

3.5 CULTURAL RESOURCES

In addition to review under NEPA, consideration of impacts to cultural resources is mandated under Section 106 of the National Historic Preservation Act (NHPA), as amended, and implemented by 36 CFR Part 800. Requirements include identification of significant historic properties that may be impacted by project alternatives. Historic properties are defined as archaeological sites, standing structures, or other historic resources listed in or eligible for listing in the National Register of Historic Places (NRHP) (36 CFR 60.3).

As defined in 36 CFR Part 800.16(d), the Area of Potential Effect (APE) “is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist.”

In addition to identifying historic properties that may exist in the proposed project’s APE, FEMA must also determine, in consultation with the appropriate State Historic Preservation Officer (SHPO), what effect, if any, the action would have on historic properties. Moreover, if the project would have an adverse effect on these properties, FEMA must consult with SHPO on ways to avoid, minimize, or mitigate the adverse effect.

The Museum of New Mexico, Office of Archaeological Services (OAS) was retained to conduct an archaeological study of the project area. In their report entitled “Water, Ice, and Lime: A Cultural Resource Inventory of the Gallinas Watershed, City of Las Vegas, New Mexico,” the Museum stated that a total of 35 archaeological sites and 73 isolated occurrences were identified

during their survey of the project area. Of the sites identified, two have been previously recorded during other archaeological surveys.

In general, the project area contains six broad categories of sites, most related to the extraction of natural resources. These categories consist of: 1) a prehistoric lithic quarry; 2) a late 1800s to early 1900s Hispanic homestead complex; 3) a late 1800s to early 1900s lime quarry and processing facility, an early to mid 1900s commercial lime quarry and processing complex, and numerous water-control features constructed from 1880 to the present (e.g., a diversion channel, reservoir, Peterson Dam); 4) a late 1800s to early 1900s ice manufacturing complex including nine dams used to form ponds, and a spur line of the Santa Fe Railroad constructed in 1882 all utilized by Agua Pura Company; 5) a Penitente morada; and 6) post-1930s temporary campsites.

Prehistoric lithic quarry: Prehistoric activities appear to be limited to the western portion of the project area, and are limited to one lithic quarry and several isolated chipped stone artifacts.

The late 1800s to early 1900s Hispanic homestead complexes: Evidence of Hispanic occupation is present in two locations: an isolated residence along a tributary of Gallinas Creek and a habitation complex located in Peterson Canyon. The isolated residences consist of a small structure with dispersed artifact scatter indicating occupancy at the turn of the 20th century, and a portion of a road. The structure may have functioned as a rest stop. The habitation complex consists of three habitation locations, one or two coral areas, and five stone enclosures. Each habitation area appears to contain evidence of a structure, activity area, privy, and midden. The corral locations are identified by broad, treeless areas in which grass is slow to come back. The stone enclosures are constructed by stacking up to four courses unshaped rock. Three of the five stone structures are round and all range from 4 by 6 meters to 5 by 7 meters. A low wall surrounding activity areas may have served as a gate.

Lime quarry and processing complexes: Evidence of lime prospecting and quarrying is present throughout the area, mainly concentrated around Peterson Canyon (a.k.a. Lime Canyon). The first mineral extraction operation is likely related to the Hot Springs Lime Company, which probably operated from 1890 to 1912. Quarries associated with this company were small scale, ranging from single prospects, 2 meters in diameter, to broad areas of quarried seams over 100 meters long and 3 meters deep. Two kiln locations associated with the lime quarry activities were identified in the project area. The lime kilns are oxidized pits excavated into the side of a ridge with evidence of rough masonry flues constructed at grade, limestone tailings, and spoil areas of processed lime. Numerous wagon roads connect the various quarry locations with the kiln sites. The Canyon Lime Company, which operated from 1907 to 1940, is associated with the two large quarries that are located to the west of the Peterson Reservoir. Commercial rock crushers and a kiln complex are located near these quarries. Additionally, a 1930s commercial kiln is located within the project area and was recorded as part of the New Mexico Historic Building Survey in 1977.

The Agua Pura Company: From 1880, when the Agua Pura Company was formed, to the present, the Gallinas Creek has provided water to the City of Las Vegas. Within Gallinas Canyon, the company constructed two reservoirs and 18 miles of mains to provide water to City residents and other local organizations. The Peterson Dam, and associated reservoir, were built and filled during 1911. Water from Gallinas Creek was diverted to the reservoir by a series of open canals and flumes. A second concrete dam was built in 1922 and is still in use. The Agua Pura Company also managed a large ice harvesting and storage operation. Ice was cut from

ponds formed by nine dams and shipped via the Santa Fe Railroad across New Mexico and west Texas. Several of the dams and building foundations are present in the project area. In addition, several features and structural foundations associated with the railroad, including a possible roundhouse location, are also present within the project area. The railroad line was abandoned in 1937. The ice pond site and Peterson Reservoir are registered as Historic Cultural Properties with the State of New Mexico.

The morada: The morada is a chapel used by the Penitente Brotherhood, a sect of the Catholic Church in Northern New Mexico. Moradas are often windowless and located in inconspicuous settings. They were constructed in many Hispanic communities between 1870 and 1920. This structure and its associated features are still in use.

Post-1930s campsites: Three, possibly four, post-1930 limited activity campsites were located east of the ridge separating the Peterson and Bradner Reservoirs. Hearths and low-density can scatter were recorded at these sites.

In addition to these sites, 73 isolated occurrences of artifacts were recorded, ranging from beverage and food cans, glass bottles, and lithic flakes.

A total of 32 sites and associated features were identified as part of the OAS archaeological study to be potentially eligible for inclusion in the NRHP under Criterion C or D. Three remaining sites (LA136109, LA136110 and LA136111) were found to be ineligible based on their limited data potential. The OAS archaeological study was submitted to the SHPO in February 2003. In a letter dated March 13, 2003, the SHPO replied that it concurs with the eligibility recommendations for all sites except for two of the three sites that were initially found to be ineligible (LA136109 and LA136111). The SHPO requested that LA136109 and LA136111 be considered "of undetermined eligibility." FEMA replied in a letter dated June 12, 2003, that the agency accepts the SHPO's recommendations of undetermined eligibility for sites LA136109 and LA136111 (Appendix B). With this change, 34 sites are considered eligible and could be impacted by the proposed project.

Pursuant to Section 106 of the NHPA, the following Tribal groups were notified of the proposed fuels management project: Wichita and Affiliated Tribes, the Kiowa Tribe of Oklahoma, Pawnee Tribal Business Council, Comanche Indian Tribe, Apache Tribe of Oklahoma, Hopi Tribal Council, Jicarilla Apache Nation, Navajo Nation, Pueblo of Zuni, Pueblo Santo Domingo, Pueblo of Jemez, Kiowa Tribe of Oklahoma, and the Mescalero Apache Tribe (Appendix B). Each Tribe was requested to identify the presence of potential Traditional Cultural Properties or sensitive sites within the project area. No response has been received from any of the Tribes.

Alternative 1 – No Action Alternative

Under the No Action Alternative, there would be no project-related effect on cultural resources within the project area and physical disturbance would not occur near any of the sites. However, if a wildfire were to occur, the potential exists that some of the sites in the project area, particularly some of the wooden ice dams and the morada, could suffer direct and irreversible damage. Stone structures would not be destroyed, but could be subject to damage, such as charring, should a wildfire occur.

Alternative 2 – Manual and Mechanical Fuels Management (Proposed Action)

The Proposed Action includes vegetation removal by hand or by use of chainsaws and hand and mechanical clearing of vegetation as part of a low-intensity prescription. Vegetation management activities would likely have minimal or no effect to the 34 potentially eligible sites identified during the archaeological surveys, due to the localized nature of vegetation removal activities. To avoid any trampling or disturbance of the 34 identified sites, flagging would be used to clearly mark off these areas and the sites would be located on a project map. Prior to starting work, cultural resource sites would be clearly flagged and avoided. The Applicant would coordinate with Steve Lakatos of OAS to delineate the exact location of the 34 sites to be flagged. Mr. Lakatos will instruct the Applicant in monitoring procedures for which the Applicant would then be responsible for the duration of project activities. The Applicant would be responsible for removing the flagging at the termination of project activities. Potential impacts to cultural resources would be mitigated by avoidance.

Should any additional potentially significant historic or archaeological materials be discovered during project activities or equipment staging, all activities on the site would be halted immediately and the City would consult with FEMA and the SHPO or other appropriate agency for further guidance.

Alternative 3 – Manual and Mechanical Fuels Management Followed by Broadcast Burning

Alternative 3 includes vegetation removal by hand or by use of chainsaws and hand and mechanical clearing of vegetation followed by broadcast burning. Vegetation management activities would likely have minimal or no effect to the 34 potentially eligible sites identified during the archaeological surveys, due to the localized nature of vegetation removal activities. To avoid any trampling or disturbance of the 34 identified sites, flagging would be used to clearly mark off these areas and the sites would be located on a project map. Prior to starting work, cultural resource sites would be clearly flagged and avoided. The Applicant would coordinate with Steve Lakatos of OAS to delineate the exact location of the 34 sites to be flagged. Mr. Lakatos will instruct the Applicant in monitoring procedures for which the Applicant would be responsible for the duration of project activities. The Applicant would then be responsible for removing the flagging at the termination of project activities. Potential impacts to cultural resources would be mitigated by avoidance.

Should any additional potentially significant historic or archaeological materials be discovered during project activities or equipment staging, all activities on the site would be halted immediately and the City would consult with FEMA and the SHPO or other appropriate agency for further guidance.

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

Current forest conditions at the project area are a result of decades of fire suppression. Fire suppression has allowed a dense forest to develop, one that is highly flammable and could jeopardize the health and safety of residents of the City of Las Vegas and their water supply if a wildfire occurs. If left unmanaged, forest health would continue to decline and the potential for wildfires would increase.

In addition to the City of Las Vegas' proposed fuels management project, the USFS has also proposed a forest thinning project on Santa Fe National Forest lands within the Gallinas watershed for which a USFS EA is being prepared. Roughly 700 acres of the land grant area bordering the Santa Fe National Forest has also been proposed for thinning and burning treatment. The Santa Fe National Forest comprises 1.6 million acres and the USFS is proposing treatment on roughly 9,000 acres (Appendix H). Under the Proposed Action, approximately 2,115 acres would be thinned from below with a retention of 30 to 40 percent of canopy cover. Slash treatment would include broadcast burning, chipping or pile burning. An additional 550 acres would be thinned to open up natural meadows, 1,875 acres would be thinned and have a retention level of 50 to 100 large trees, and a shaded fuelbreak leaving 20 to 30 large trees per acre would be created on 745 acres. The largest treatment would occur on roughly 3,280 acres and would consist of a broadcast burn only (USFS, 2002).

Multiple fuels management projects within the same watershed may increase the amount of sediment input to local waterways. However, these impacts would likely be less substantial than those that could occur should a high-intensity wildfire take place within the area. The use of erosion control measures would help mitigate for potential erosion from project sites. Additionally, burning and thinning activities on the national forest lands would be scheduled to occur over a period of 5 to10 years, reducing the amount of ash and sediment that could potentially enter local waterways at one time (SEC, 2002). Increased sediment would be more likely to occur as a result of the construction of 4.1 miles of temporary roads and the improvement of 4.3 miles of existing roads to conduct project activities on the national forest lands. Again, this input would likely be less substantial than levels that would occur should a high-intensity wildfire occur. Proper road maintenance, erosion control measures, and the staggering of project activities would help reduce sediment loads associated with these roads.

Habitat for local wildlife may increase for some and decrease for others, though the small area to be treated in comparison to the overall acreage of the Santa Fe National Forest is unlikely to have any significant impact. Fauna would be able to inhabit other areas of the national forest.

A very slight risk exists for a broadcast burn to escape its boundaries (see Section 3.4.7). An escaped burn could pose similar threats as a wildfire, potentially affecting the City's water supply, the safety of local residents, and natural resources within the area. While the threat of a burn escaping is low, the USFS has proposed to burn in smaller blocks of 200 to 500 acres to help ensure that the prescribed fire is manageable (SEC, 2002).

Coordination between the City of Las Vegas and the USFS, which is already underway, ensures that the projects are timed an adequate distance apart, that threatened and endangered species

requirements are met, and that concerns of local residents are properly addressed. Overall, management of the USFS land and land grant area would increase the beneficial effects of the City of Las Vegas' thinning project, as it would further reduce the chances of a catastrophic wildfire occurring with the Gallinas watershed.

FEMA is the lead federal agency for conducting the NEPA compliance process for vegetation management, City of Las Vegas, New Mexico. The lead agency's goal is to expedite the preparation and review of NEPA documents to be responsive to the needs of the community and the Applicant, while meeting the intent of NEPA and complying with all NEPA provisions including NHPA, EO 11988, and EO 11990.

A public notice advertising the availability of the draft EA for public review has been published in the *Las Vegas Daily Optic* on August 28, 2003 and September 2, 2003, and is available for review online at the FEMA website: http://www.fema.gov/ehp/docs.shtm (Appendix F). The public will be provided the opportunity to review the EA from August 28, 2003 to September 26, 2003, and comment on the Proposed Action.

At the conclusion of the public review period a summary of comments received will be inserted here and the comments will be provided in Appendix G.

The following mitigation measures would be required for the implementation of the Proposed Action:

1. The Applicant shall employ erosion control measures, including lopping and scattering some slash, the use of log erosion barriers, placing slash in skid trails, and reseeding of all disturbed areas.
2. Equipment would be staged in existing developed or previously disturbed areas and, if feasible, existing paved areas. Existing roads would be utilized, where possible, for project equipment.
3. Equipment would not be allowed to enter waterways of the project areas.
4. A minimum 50-foot vegetative buffer zone shall be retained parallel to waterways. Buffers would increase with increasing slope of land surrounding the waterways.
5. Results from water quality testing at the City's two water-supply reservoirs shall be analyzed during and after implementation of the Proposed Action to monitor for any changes to water quality.
6. No fuels management activities shall be conducted in riparian areas and all equipment shall be kept out of wetland areas. Project contractor and employees shall be required to avoid walking through wetland areas.
7. Debris removed as part of the fuels management project shall not be disposed of within any floodplain zones of the project area.
8. Should work be planned within the floodplain, the City shall coordinate with the local floodplain administrator regarding applicable permits and/or conditions.
9. Prior to any burning, the appropriate permit for open-burning (20 NMAC 2.60) shall be applied for and obtained from NMED Air Quality Bureau. Permit conditions must be strictly adhered to, and all smoke minimization and management procedures must be implemented.
10. Appropriate smoke management methods shall be utilized to reduce the effects to the surrounding community.
11. The Applicant shall be required to water down construction areas to reduce dust, when necessary.
12. Running time of fuel-burning equipment shall be minimized and engines would be properly maintained to reduce emission of criteria pollutants.
13. Contractor shall contact the New Mexico Department of Game and Fish prior to commencement of the project and after project completion in order to allow for field visits by Game and Fish personnel (see Appendix B for contact information).
14. A minimum of three snags per acre with a DBH greater than 12 inches and 30 feet in height shall be left in place in thinning areas.
15. A minimum of three downed logs per acre with a DBH of at least 10 inches and 8 feet in length shall be left for animal habitat.
16. Mitigation standards given in the State of New Mexico Forest Practice Guidelines (Appendix D) shall be followed.

17. Thinning shall be conducted during the fall and winter months.
18. Mature gambel oaks would be retained where feasible.
19. Large snags shall be left in place around Peterson and Bradner Reservoirs.
20. No large trees with a DBH of 16 inches or greater shall be cut unless the tree is determined to be a hazard.
21. No slopes over 45 percent shall be thinned.
22. If appropriate mitigation measures cannot be carried out by the Applicant, presence/absence surveys for the MSO and the southwest willow flycatcher shall be conducted prior to the start of the project.
23. Should any hazardous materials be discovered, generated, or used during implementation of the proposed project, they shall be disposed of and handled by the City of Las Vegas in accordance with applicable local, state, and federal regulations.
24. The Applicant shall coordinate with the Public Works Department prior to project implementation to minimize any potential impacts to public services and infrastructure.
25. If applicable, project employees shall be required to identify, mark, and avoid utilities such as power lines and underground pipes that could potentially be impacted by proposed activities.
26. The Applicant will coordinate with the NMSHTD and the local Department of Transportation to avoid implementing project activities during peak travel periods.
27. Adequate safety provisions shall be provided as needed to identify potential fire hazard, staging or work areas during fuels management activities.
28. Traffic along adjacent roadways shall be temporarily re-routed, as necessary, during fuels management activities. Lane closures, if necessary, shall be coordinated with appropriate fire and community officials.
29. To the maximum extent possible, construction-related vehicles shall be prohibited from parking on residential streets.
30. Fuels management equipment and vehicle staging shall be located so as not to hinder traffic flow around project area.
31. The City of Las Vegas shall adequately notify the public of the time and location of fuels management activities and conduct these activities during normal business hours. Residential neighborhoods shall be notified in advance of fuels management activities and any re-routing of local traffic. Notification would identify a contact person at the local fire department.
32. All fuels management activities shall be conducted by qualified personnel trained in the proper use of project equipment. Additionally, all activities shall be conducted in a safe manner in accordance with standards specified in OSHA regulations.
33. Appropriate signage shall be posted to prevent individuals from entering the project area during fuels management activities.

34. Prior to starting work, cultural resource sites would be clearly identified with flagging. These sites must be avoided during implementation of all project activities. The Applicant would coordinate with Steve Lakatos of OAS to delineate the exact location of the 34 sites to be flagged. Mr. Lakatos will instruct the Applicant in monitoring procedures for which the Applicant would then be responsible for the duration of project activities. The Applicant would be responsible for removing the flagging at the termination of project activities.
35. Should any additional potentially significant historic or archaeological materials be discovered during project activities or equipment staging, all activities on the site would be halted immediately and the Applicant would consult with FEMA and the SHPO or other appropriate agency for further guidance.

The following agencies were consulted during preparation of this EA:

Federal Agencies Consulted

Federal Emergency Management Agency

U.S. Department of the Interior, Fish and Wildlife Service

U.S. Army Corps of Engineers

Environmental Protection Agency, Region 6, Compliance Assurance and Enforcement Division

U.S. Department of Agriculture, Natural Resources Conservation Service

Bureau of Land Management

U.S. Forest Service, Pecos-Las Vegas Ranger District

State, City, and Local Agencies Consulted

State of New Mexico, Department of Game and Fish

New Mexico Environment Department, Air Quality Bureau

New Mexico Environment Department, Groundwater Protection

New Mexico Environment Department, Surface Water Quality Bureau

City of Las Vegas, Planning Department

City of Las Vegas, Water and Gas Department

Native American Groups Consulted:

Apache Tribe of Oklahoma
Henry Kostzuta, Chairman

Cochiti Pueblo
Governor Andrew Quintana

Comanche Indian Tribe
Johnny C. Wauqua, Chairman

Hopi Tribe
Wayne Taylor, Jr., Chairman

Jemez Pueblo
Governor Paul Tosa

Jicarilla Apache Nation
President Claudia J. Vigil-Muniz

Kiowa Tribe
Earl Yeahquo, Chairman

Mescalero Apache Tribe
President Sara Misquez

Navajo Nation
President Kelsey A. Begaye

Pawnee Tribe
Robert Chapman, President

Santo Domingo Pueblo
Governor Ernes Lovato

Wichita and Affiliated Tribes
Gary McAdams, President

Zuni Pueblo
Governor Malcolm B. Bowekaty

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Laura Dunleavy, Senior Environmental Scientist – Technical researcher. Author of sections on: Floodplain Management, Air Quality, Hazardous Materials and Wastes, Zoning and Land Use, Noise, Public Service and Utilities, Traffic and Circulation, Environmental Justice, Safety and Security, and Cultural Resources.

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