

Chapter 4

Environmental Consequences

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CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

The purpose of this chapter is to determine the potential for significant impact of the federal action on the human environment. The federal action is the disposal and use of public lands managed by the Bureau of Land Management (BLM) within a boundary designated by the Southern Nevada Public Land Management Act of 1998 (SNPLMA) and expanded by the Clark County Conservation of Public Land and Natural Resources Act of 2002 (Clark County Act). As described in Chapter 3, the human environment is interpreted comprehensively to include the natural and physical resources and the relationship of people with those resources.

This chapter discusses the effects the Proposed Action, Conservation Transfer Alternative, and No Action Alternative could have on various environmental, socioeconomic, and land use program areas. The analysis of the alternatives focuses on identifying types of impacts and estimating their potential significance. The direct and indirect impacts of the BLM lands sold since June 2004 were addressed in other National Environmental Policy Act (NEPA) documents.

Types of Impacts

The terms “impact” and “effect” are synonymous. Impacts can be direct, indirect, or cumulative. A direct impact is caused by the action and occurs at the same time and place. An indirect impact occurs later in time or farther removed in distance but is related to the action by a chain of cause and effect. Indirect impacts may reach beyond the natural and physical environment (i.e., environmental impact) to include growth inducing effects and other effects related to induced changes to resource users (i.e., non-environmental impact).

An impact is defined as adverse or beneficial. An impact is considered adverse when the outcome of the action results in undesirable effects. A beneficial impact can result if the current condition is improved or if an existing undesirable effect is lessened. The analysis focuses on those impacts

that were adverse to determine whether the effects were significant or insignificant.

Cumulative impacts can result from individually minor but collectively significant actions taking place over time. Cumulative impacts can also result when the incremental impact of BLM land sales are considered with other past, present, and reasonably foreseeable future actions, regardless of the proponent of those other actions. A cumulative impact analysis considers the interrelationship of spatial and temporal actions.

Implementation of land disposal and development actions within the disposal boundary area (i.e., spatial) would occur over the remaining portion of the current 20-year planning period (i.e., temporal), thus the analysis of impacts of the land disposal alternatives is cumulative in itself. The land disposal action would be implemented with reasonably foreseeable actions by other agencies and private parties within and adjacent to the disposal boundary area. This analysis assesses the potential cumulative effects of those actions.

Determination of Significance

The concept of significance used in this chapter encompasses several factors, including the magnitude of change from existing conditions and the likelihood of the change to occur. The context and the intensity of the impact are also considered. Context relates to the environmental circumstances at the location of the impact, whereas intensity refers to the severity or extent of an impact.

In evaluating context of the impact, the area or quantity of an affected resource relative to the available area or quantity of that resource is considered. The potential for change in growth and reproductive success of a species, maintenance of a population at pre-project levels, and the period of recovery after disturbance are other factors considered. The intensity of an impact is dependent on the potential for violation of laws or regulations; degree of uncertainty and controversy;

degree of adverse effect to specific concerns such as public health and safety, unique resources, or threatened and endangered species; and the resilience of the resource.

Determining significance is complex. The significance of a resource or impact is dynamic and may change over time. Significance can be “real” and is supportable by fact, or “perceived” and perhaps not fully supportable even with rigorous study. For this analysis, the approach for establishing significance criteria is based on legal issues, public perception, and professional judgment. Significance criteria are introduced in the specific resources sections.

Analysis Methods and Assumptions

Impact analysis is a cause and effect process. The analysis methods identified resources that would be considered significant for reasons such as legality, uniqueness, availability, or resilience, and then predicted changes to those resources. The magnitude or scale of the resource change is defined and a judgment as to the significance of that change is made.

The BLM manages public lands for multiple uses in accordance with the Federal Land Policy and Management Act (FLPMA). Once lands are disposed, land use management would be determined by decisions of the new owners, along with any restrictions or requirements enforced by state and local agencies that govern land use. For lands sold at auction to private parties, it is assumed that these lands would be developed based on the commercial interests of the purchaser consistent with local community planning and development restrictions.

Potential impacts are determined by comparing the amount of land disposal, development, and surface disturbance from right-of-way (ROW) grants and recreation and public purpose (R&PP) leases projected to occur under each alternative. The projected quantities of land disposal, development activities, and associated realty actions for the alternatives are listed in Table 4.0-1. The estimated acres were developed from historic land sale and development rates, and historic realty actions (see Sections 2.2 through 2.5).

Direct environmental impacts associated with the alternatives for land disposal are caused by land use activities that would occur subsequent to disposal. The disposal action and subsequent transfer of title do not have direct impacts because these administrative actions do not cause any change in the environment. The transfer of title would directly impact users of the land (i.e., non-environmental impacts) in the resource areas of recreation, range management, and hazardous materials. Once land is disposed, development activities would be undertaken by the new owners that would not have occurred if the land remained under BLM management; therefore, impacts related to changes in land use after development are indirect impacts of the land disposal action.

To determine potential indirect impacts certain assumptions were made regarding the rates of land disposal and development, type of land use activity, resource conditions, and resource responses that would occur as a result of the land disposal action. The analysis considered the following assumptions:

- Current conditions and BLM management directives for resources and land uses in the area.
- Mitigation requirements that prevent or limit direct impacts associated with land use activities, or that reclaim the land after the activity has been completed. These requirements would apply only to direct actions that result in BLM maintaining management responsibility, such as issuance of ROW grants or R&PP leases.
- Standards and requirements that govern land use activity after disposal actions have been implemented.
- Projections of the level of activity for land uses based on historical trends, existing land use patterns, and land use classifications developed by local jurisdictions.
- Impacts of land use activities that occur regardless of location.

**TABLE 4.0-1
PROJECTED DISPOSAL, DEVELOPMENT, AND REALTY ACTIONS BY ALTERNATIVE
(ESTIMATED ACRES)**

Alternative	Land Disposal¹	Land Development²	ROW Grants³	R&PP Leases³
No Action	0	0	2,600	880
Proposed Action	46,700	20,000	4,500	1,500
Conservation Transfer	41,700	17,500	3,500	1,200

¹ Annual average of 4,000 acres sold per year; disposal complete by 2015.

² Annual average of 1,330 acres developed per year; development continues through 2018.

³ Estimated surface acres disturbed through 2015.

- Impacts are dependent on the location of the activity and potentially affected resources.

Impacts to lands not covered by local community development plans are analyzed by the same methodology as all other lands in the disposal boundary.

The continued issuance of ROW grants and R&PP leases would have direct environmental impacts. Management of the realty program would continue in the disposal boundary area until remaining lands are sold or transferred to holders. Public agencies would obtain leases and conveyances of lands to develop and use the properties for a number of public purposes, including schools, libraries, fire and police stations, or for recreation.

To determine potential direct impacts certain assumptions were made regarding the location, size, quantity, and description of potential realty actions (see Sections 2.2 through 2.5). The analysis considered the following assumptions:

- ROW alignments may accommodate transportation and/or utility functions including, but not limited to streets, highways, gas lines, communication lines, water lines, sewer lines, flood control facilities, and above ground and underground power lines. The R&PP leases may include public buildings, such as schools and libraries, and recreation areas (parks).
- Numerous types of utilities may be placed in the same alignment provided the utilities are compatible.

- ROW alignments are typically located along north-south and east-west section lines.

- Location and length of ROW alignments and public facilities are based on city and county land use and development plans.

- ROW alignments would vary in width but would generally not exceed 100 feet from each side of the centerline (total 200 feet wide).

- The maximum amount of ROW alignments on the remaining BLM lands covers approximately 12,700 acres using a grid system with alignments on every north-south and east-west ¼- and ½-section lines. Linear ROWs would be issued consistent with local governments' transportation plans and land use plans. All resources could be impacted within these alignments.

- ROW alignments and R&PP leases would eventually be paved with sidewalks, streets, or other structures with some land within the alignment used for landscaped areas.

Mitigation Measures

Adverse impacts can be mitigated through avoidance, minimization, restoration, reduction, or compensation. Mitigation measures are considered in the determination and comparison of impacts. Impacts may be reduced to less than significant levels if mitigation guidelines and standard practices are implemented. Mitigation measures may be imposed by regulation or

through BLM policies and may be applied broadly or site specifically.

The alternatives evaluated would result in disposal of land, transfer of title, and termination of federal ownership and BLM management control. Land uses that would occur subsequent to disposal would have to comply with existing environmental regulations implemented and enforced by state and local agencies, and these requirements may include mitigation that would reduce or eliminate some impacts that would occur after the land disposal action. Mitigation requirements of indirect impacts prior to land disposal would be limited to BLM's compliance with the Endangered Species Act and National Historic Preservation Act. The BLM may fund and conduct mitigation on lands nominated for sale prior to offering the lands at auction. The BLM may also consider adjusting the fair market value of lands to compensate for voluntary mitigation of the resource. Terms and conditions of the sale and patent of the land would then be subject to completion of the mitigation measures.

Incomplete and Unavailable Information

The Council on Environmental Quality (CEQ) regulations address incomplete or unavailable information in evaluating potential significant adverse impacts. If the incomplete information is essential to making a reasoned choice among alternatives, the agency must include that information in the environmental impact statement (EIS) if the cost of obtaining the information is not exorbitant (40 CFR §1502.22).

The BLM completed an air emission modeling study in April 2004 to determine the impacts of the land disposal actions on air quality, with emphasis on attaining standards for particulate matter and carbon monoxide. The Environmental Protection Agency (EPA) announced on April 30, 2004 that Clark County would be designated as non-attainment for ozone effective June 15, 2004. The EPA revised the standard and monitoring period for ozone which is different than the standard used in the air quality model. Although the model results did not indicate an exceedance of the ozone standard prior to the revision, the BLM has chosen to revise the model and address the new

standard. The final revised ozone results from the air quality model are unavailable for this Draft EIS but will be incorporated in the Final EIS. Certain preliminary results from the model are incorporated into this Draft EIS.

4.1 AIR QUALITY

The disposal of BLM lands would not have direct impacts on air quality but the land sale actions would indirectly affect air quality because of the subsequent development that would occur. Direct impacts resulting from the issuance of ROWs and R&PP leases may occur.

Land disposal actions are not subject to conformity with existing State Implementation Plans (SIPs) because land disposal does not create or increase sources of pollutants or emission rates (40 CFR 93.153(c)(2)(xiv)). Federal agencies are not responsible for ensuring conformity for any activities that occur subsequent to transfer of lands to non-federal entities. However, federal agencies are required under NEPA to disclose potential impacts of potential future use that is most likely to occur on the land surface. This section assesses the air quality impacts of potential future use and development of the BLM lands after disposal. Supporting information is included in Appendix A.

Analysis Methodology

The analysis of air quality impacts for this EIS was based on the results of a comprehensive study completed by the BLM. The BLM obtained the services of Argonne National Laboratory (Argonne) to perform cumulative air quality modeling to provide a quantitative assessment of future air quality trends in the Las Vegas Valley utilizing a state-of-the-art Eulerian dispersion model known as the Community Multiscale Air Quality model. The model was developed by the Environmental Protection Agency (EPA) and a joint partnership with several U.S. Department of Energy national laboratories. To estimate emissions required for the modeling, Argonne reviewed existing emission inventories, developed emission rates for additional sources that exist in the Las Vegas Valley, and developed a method to estimate emissions related to additional development that

would likely occur after land disposal. The geographic distribution of emission sources was also evaluated by Argonne to support air quality modeling.

The air quality analysis included emissions inventories from the Clark County Department of Air Quality and Environmental Management (DAQEM) and emissions rates were developed for other significant sources not included in inventories, primarily particulate emissions from disturbed soils in vacant areas of the Las Vegas Valley. Development scenarios were constructed for land use categories to project future emissions anticipated from undeveloped land. The land use categories were based on the average type and density of development that has occurred on previously disposed BLM lands. Development scenarios included average building sizes, numbers of employees or residents per building, and acreage required for each unit of development. Specific scenarios were generated for nine land use categories that included single family residential, multi-family residential, office buildings, retail development, mid-sized hotel/casinos, industrial, recreational and open space, and religious and public facilities.

The emission rates were combined with projections of land disposal and development activity to determine emissions related to land disposal actions. Historical rates of development on recently disposed lands, community land use plans, and existing patterns of development were used to generate emissions estimates. The model was based on an average annual rate of disposal of 4,000 acres per year with an average rate of development of 1,330 acres per year.

Particulate emissions were estimated for land preparation and building activities. Typical construction activity emissions for particulate matter less than 10 microns in diameter (PM₁₀) were estimated at 0.265 tons per acre per month of construction (Argonne 2004). Because particulate emissions from construction activities are associated with soil disturbance, construction emission rates were developed only for PM₁₀. Emissions of other pollutants during construction were considered to be small volume emissions that would not affect the model results. Energy use requirements

and projected increases in vehicle traffic associated with each type of land use were used to estimate ongoing emissions after development is completed. Operating emissions generally increased for each pollutant type except particulate matter, which decreased to 68 percent of predevelopment emission rates because land that has been developed is less susceptible to wind erosion of soil than vacant land in the Las Vegas Valley (Argonne 2004).

Evaluation of future air quality trends also requires consideration of the geographic distribution of emissions sources and meteorological conditions of the area. Argonne developed extensive meteorological data sets and determined the geographic distribution of current and projected emission sources for input into the air quality model.

Model simulations were executed to evaluate projected air quality trends for the Las Vegas Valley. Argonne performed simulations of baseline conditions based on year 2000 data to assess the accuracy of the model. The baseline emissions inventories and meteorological data were input into the model and the model was used to generate air quality results for those conditions. The results of the baseline modeling were then compared to actual monitoring data for the baseline period. The overall results for air quality parameter concentrations and their geographic distribution were compared for monitoring data and model predictions. Aspects of the model were modified to obtain an acceptable level of agreement between observed and predicted values for the baseline monitoring. The revised model was then executed with the emissions inventory data sets that reflected projected levels of air emissions, including additional sources related to land disposal and subsequent development for out years 2006 and 2018.

The air quality modeling performed to assess the air quality trends for the Las Vegas Valley cannot distinguish changes in air quality related to new home development after land disposal actions from the overall changes in air quality throughout the region. The air quality modeling results reflect projected impacts of development on air quality across the Las Vegas area. The relative size and distribution of emission sources can be

compared to assess the relative contribution of changes in emissions related to land disposal and development.

The analysis focused on projected emissions of the non-attainment parameters (PM₁₀, carbon monoxide, and ozone precursors). Total emission projections were developed from estimates of growth in emission sources and emission rates for each source type. The overall emissions projections were adjusted to account for planned reductions in emission rates and the total emissions budget that has been developed to reach compliance with air quality standards, as required by the approved SIPs. The emissions estimates were used to run model simulations to assess the projected air quality in the area. The model provided estimates of air quality resulting from projected development of lands disposed by the BLM in the Las Vegas Valley as well as ongoing emissions from other sources in the area.

If the analysis indicates that emissions from new development would not comply with existing SIP requirements, local authorities may delay permitting of development activities after the BLM land is patented and the title is transferred. This may reduce demand by potential buyers as the lost opportunity for development or schedule uncertainties may impact sales. Reduced demand may extend the actual schedule of sales and subsequent development.

The PM₁₀ SIP was developed using emission inventories and projected emission rates based on the RMP boundary as amended by SNPLMA. The SIP assumed that construction emissions would decrease as the amount of vacant land within the disposal boundary decreased over time. The increased availability of land within the disposal boundary expanded by the Clark County Act is not addressed in the SIP that was approved by the EPA in May 2004. For BLM to approve direct actions, such as of ROW grants and R&PP leases that result in construction emissions, consideration of conformity must be included in the approval of the proposed action as required by Section 176(c) of the Clean Air Act (CAA). Conformity for direct and indirect impacts of federal actions can be assumed where projected emissions for a proposed action are below the de minimis

threshold for each criteria pollutant (i.e., 70 tons per year of PM₁₀). For individual ROW grant and R&PP lease applications for lands outside the SIP boundary, BLM would review the projected emissions for each project on a case-by-case basis. Projects expected to have estimated emissions below the de minimis emission thresholds would be determined to conform to the CAA and would only be approved if concurrence is obtained from DAQEM that the project would not result in emissions exceeding the limits established in the SIP. This review would continue pending revision of the SIP to cover the expanded BLM disposal boundary.

Significance Criteria

The significance of air quality impacts is determined by comparing projected air quality in the affected area to National Ambient Air Quality Standards (NAAQS). These air quality standards specify acceptable concentrations of air pollutants to protect public health and the environment. A significant impact would be a violation of the NAAQS, the further aggravation of an existing air quality violation, or exposure of sensitive receptors to increased pollutant concentrations. Non-compliance with the SIP would also be considered a significant impact. Because parts of the Las Vegas Valley are currently in non-attainment with respect to particulate matter, ozone, and carbon monoxide, an impact would be significant if additional air emissions prolong non-attainment or prevent achieving attainment for these pollutants.

4.1.1 No Action Alternative

No additional land transfers would be authorized by the BLM under the No Action Alternative; therefore, no further air quality impacts from land disposal actions would occur. Any ongoing development of previously disposed BLM lands would contribute to cumulative emissions.

The ROW grants and R&PP leases would continue to be issued to support development on the BLM lands that have already been disposed and to other private lands. Air quality impacts resulting from these realty actions are considered direct impacts. The PM₁₀ emissions from land disturbance would be the only emissions that can be

distinguished from other ongoing activities in the area which are considered in cumulative impacts.

Based on average rates of realty actions related to development of disposed lands, BLM has issued an average of 1,300 acres of ROW grants and 440 acres of R&PP leases per year to support ongoing development. These rates are projected to decrease without further land disposal actions. For illustrative purposes and to estimate and describe potential impacts to air quality from ROW disturbance, representative ROW alignments were selected throughout the disposal boundary area (see Appendix A). The ROW examples varied in length from 2 miles to 10.5 miles and from 100 feet to 200 feet in width based on the adjoining land ownership.

The air quality (primarily PM₁₀ and carbon monoxide) impacts from construction for infrastructure facilities requiring ROW grants were based on the projected amount of surface disturbance and emission factors. Emissions are estimated on an overall emission rate of 0.265 tons of PM₁₀ per acre per month developed by Argonne and emission rates for carbon monoxide (CO) based on emission factors of typical construction equipment. The typical ROW project size and construction period is based on historical rates of ROW issuance by BLM and a spatial analysis of potential ROW alignments on remaining disposal lands. The scenarios evaluated for typical ROW projects, including project length, acreage, length of construction operations, and total PM₁₀ and CO emissions are provided in Table 4.1-1. Based on these emission estimates, individual ROW grants and associated construction activities would not be subjected to the requirement of a conformity analysis under the PM₁₀ or CO SIPs, as that analysis is required for actions that have projected emissions greater than 70 tons of PM₁₀ per year and 100 tons of CO per year. However, as described above, ROWs and R&PP lease applications for BLM lands outside the SIP boundary would be subject to individual review to ensure emission limits of the SIP are not exceeded pending the revision of the SIP to include the expanded BLM disposal boundary area.

Assuming 1,300 acres for ROWs and 440 acres for R&PP leases are disturbed a year, a total of

approximately 1.3 tons of PM₁₀ would be emitted per day (based on 462 tons per year using the emission rate described above). Thus emission rates for activities related to realty actions currently represent less than 1 percent of the total controlled PM₁₀ emissions (199.25 tons per day) developed for the PM₁₀ SIP (see Appendix A). Under the No Action Alternative, these realty actions would probably occur similar to current levels for the next two years and would then decrease substantially as realty actions are completed to support infrastructure development of previously disposed lands. A quantitative estimate of future realty actions and related land disturbance under the No Action Alternative for projected activities beyond 2006 cannot be made from available information but would probably be much lower than the rate of realty actions under alternatives that include ongoing land disposal.

4.1.2 Proposed Action

Under this alternative additional disposal actions would be carried out until the remaining BLM-controlled land within the disposal boundary has been transferred or sold. Based on the rate of land transfer and development that have occurred for the BLM lands disposed between 1998 and 2003, it is estimated that an average of 4,000 acres of land would be sold per year through 2015 for a total of approximately 46,700 acres of land. Continued build out of disposed property is projected to result in 20,000 acres of additional development by 2018.

4.1.2.1 Particulate Matter

The overall PM₁₀ emissions from this alternative for 2006 and 2018 are shown in Figure 4.1-1 with supporting data in Appendix A. The projected difference between full development and the no action alternative (approximately 40,000 tons per year in 2018) reflects the relative contribution of disposal related emissions to the cumulative emission rates in the area. The Argonne study developed estimates of disposal and overall emission projections for the non-attainment area based on population growth and cumulative development rates, existing emission sources, and projected efficiencies of emission controls. These inventories and projections indicate that disposal-related

**TABLE 4.1-1
PM₁₀ AND CO EMISSIONS OF ROW EXAMPLES**

ROW Alignment	Length (miles)	Acres	Construction Period (months)	CO Emissions (tons)	PM₁₀ Emissions (tons)
Example 1	2	26	2	11	7
Example 2	4	66	4	29	17
Example 3	10.5	250	12	84	66
Example 4	3	60	3	27	16

construction and operation emissions would average approximately 17 percent of the total emissions for Clark County. The total emissions estimated (132,900 tons per year) would be below the controlled PM₁₀ emissions of 138,683 tons per year established in the SIP (see Appendix A).

Figure 4.1-1 also shows the total allowable PM₁₀ emissions specified in the SIP to comply with the NAAQS by 2006. The projected emissions for each alternative are based on projected emission inventories for construction and operation emissions, including implementation of control measures to the degree documented in 1998. For the largest construction category, the Argonne study assumed a dust control implementation rate of 50 percent and controlled efficiency of 25 percent, resulting in a net control efficiency of 12.5 percent. The required SIP control measures are expected to reduce emissions between 35 percent and 72 percent for the major emission source categories in the non-attainment area, which are considerably greater than the control efficiencies used in the Argonne air quality study. The resulting maximum annual emissions projected from the Argonne study are approximately 132,900 tons per year, which is below the required attainment limit of 138,683 tons per year specified in the PM₁₀ SIP (see Appendix A). These control efficiencies are being implemented in a phased manner from 2003 to 2006. Therefore, the projected emissions for 2006 reflect full implementation of control measures needed for ambient air quality to reach attainment conditions at that time.

The SIP requirements were developed using a “rollback” methodology where the amount of emissions reduction required to achieve air quality standards was estimated by determining the proportional decrease in emissions required to produce acceptable air quality. This methodology does not consider the geographic distribution of

emission sources in the non-attainment area and does not incorporate meteorological factors that impact pollutant transport and persistence in the atmosphere. The method also does not account for projected decreases in PM₁₀ emissions that occur when disturbed vacant land is developed and soils are stabilized by buildings, pavement, and landscaping.

Increased emission sources projected after 2006 may require additional control measures or increased performance of existing measures to ensure that air quality remains within the NAAQS as growth continues in the area. Any measures needed to ensure ongoing compliance with ambient air quality standards would be implemented through continued evaluation and modification of SIP-related emission controls as part of the maintenance program for the SIP. In addition, expansion of the disposal boundary area that was specified in SNPLMA and the Clark County Act may also increase the geographic extent of projected emissions. However, provided the total controlled PM₁₀ emissions do not exceed the SIP limits, activities may be approved by local authorities outside the SIP boundary pending the SIP revision.

The modeling simulation performed for this alternative provides projections of air quality across the non-attainment area and adjacent locations that reflect the cumulative growth and development projected for the area. Emissions evaluated in the model include the projected construction and operation emissions from development of disposed lands through 2018. The model incorporates the interdependence of development patterns, distribution of emission sources, and interaction with meteorological conditions. Model simulations have been performed using data reflecting meteorological conditions that have produced observed high concentrations of PM₁₀,

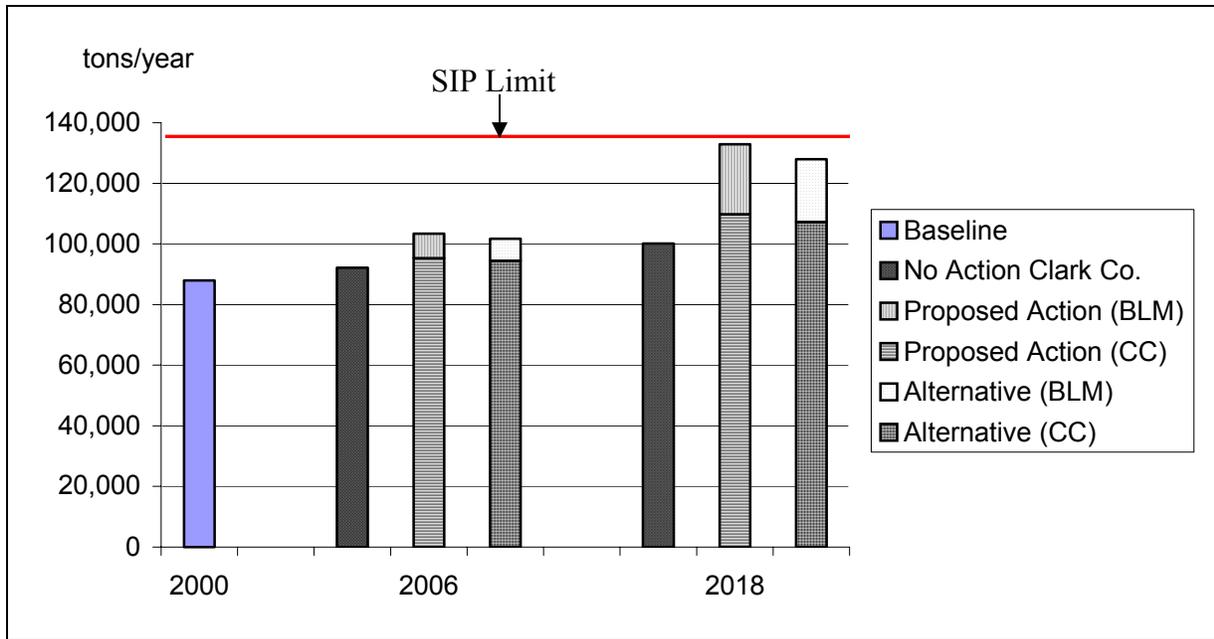


FIGURE 4.1-1
PM₁₀ EMISSIONS BY ALTERNATIVE

along with emissions data that include growth-related development from disposed lands and other sources. The results provide a projection of expected PM₁₀ concentrations for the area based on increased emissions sources, SIP-related emission controls, and unfavorable meteorological conditions that promote high pollutant concentrations in ambient air. The modeling results indicate that adverse weather events for particulate matter would produce ambient concentrations up to 10 µg/m³ lower than were observed under similar conditions in 2000. According to EPA's "natural events" policy, exceedance of the PM₁₀ standard due to weather events are not construed as causing violations of the NAAQS. Therefore, the Proposed Action would not result in an exceedance to the PM₁₀ standards. The largest decreases in PM₁₀ concentrations under adverse conditions were observed in the southwest part of the non-attainment area and adjacent areas to the southwest in the Las Vegas Valley, where historically high PM₁₀ conditions have been measured (see Figures A-4 through A-6 in Appendix A).

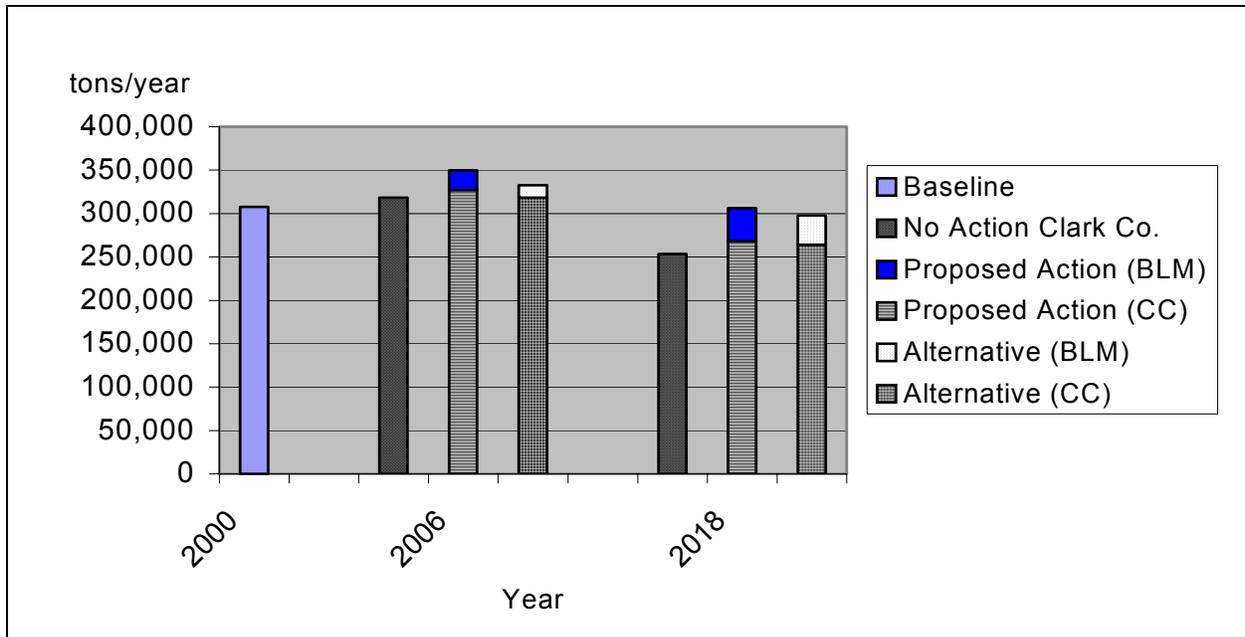
4.1.2.2 Carbon Monoxide

Existing monitoring data, projected emissions increases, and model results indicate that carbon monoxide would continue to be in compliance

with SIP requirements for this pollutant. Historical data show that former conditions resulted in exceedance of NAAQS at certain restricted locations, known as "hot spots" attributed to automobile emissions at high traffic intersections. Maintenance requirements under the SIP for carbon monoxide have successfully produced acceptable ambient concentrations for this pollutant. The projections of carbon monoxide emissions for the Proposed Action indicate that emissions related to development of lands disposed by BLM increase to just over 23,000 tons by 2006. Other Clark County sources are projected to emit 327,000 tons in 2006. The level of carbon monoxide emissions from disposal related sources is projected to increase to 38,000 tons in 2018, while other Clark County emissions are estimated at over 268,000 tons at that time (see Figure 4.1-2). Other emissions in Clark County are projected to decrease because of the projected closure of the Mojave Generating Station, a large coal-fired electrical generation plant, during this period.

4.1.2.3 Ozone

Model results did not indicate that cumulative growth, including development of disposed lands, would result in violations of the 1-hour ozone standard that previously applied to the area.



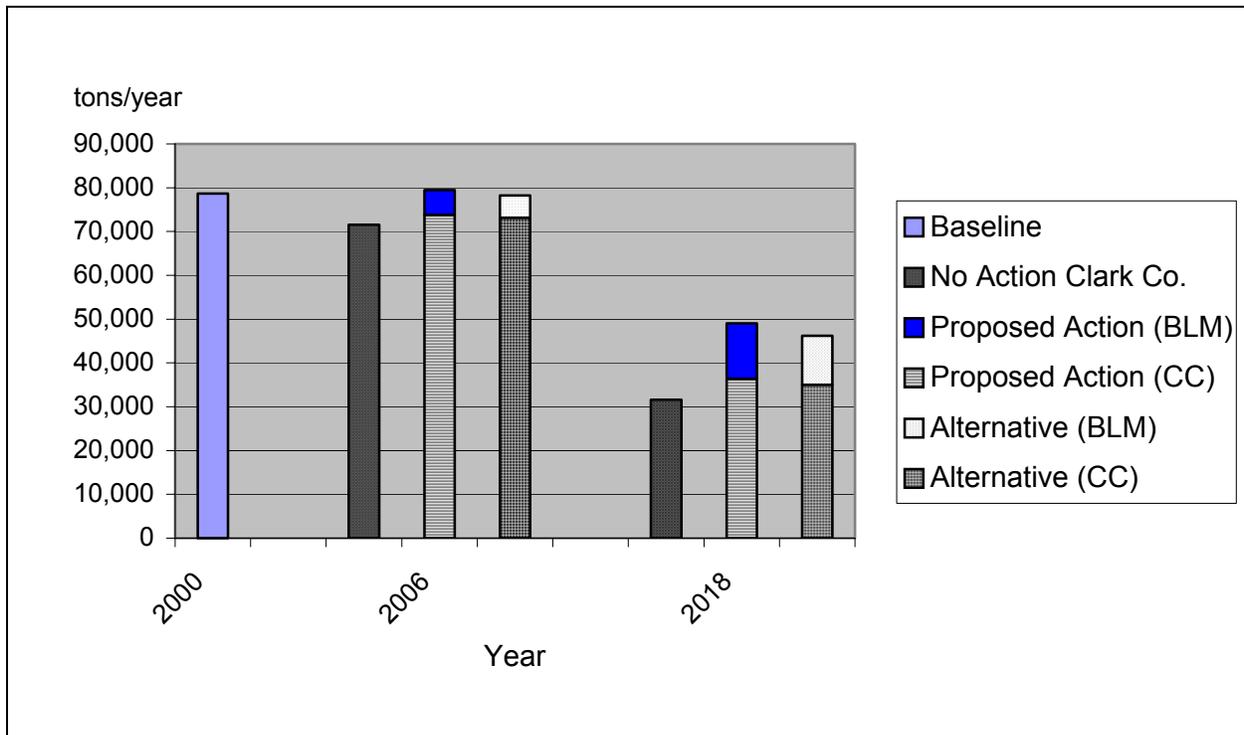
**FIGURE 4.1-2
CARBON MONOXIDE EMISSIONS BY ALTERNATIVE**

However, since the modeling study has been undertaken, EPA has designated the area in “basic” non-attainment for the new 8-hour standard for ozone. This standard is based on potential impacts to human health related to longer term, lower concentration exposures to ozone. Because the area is not in attainment a SIP would be required for this pollutant, including proposed control measures for existing and new emission sources in order to reach attainment in the future.

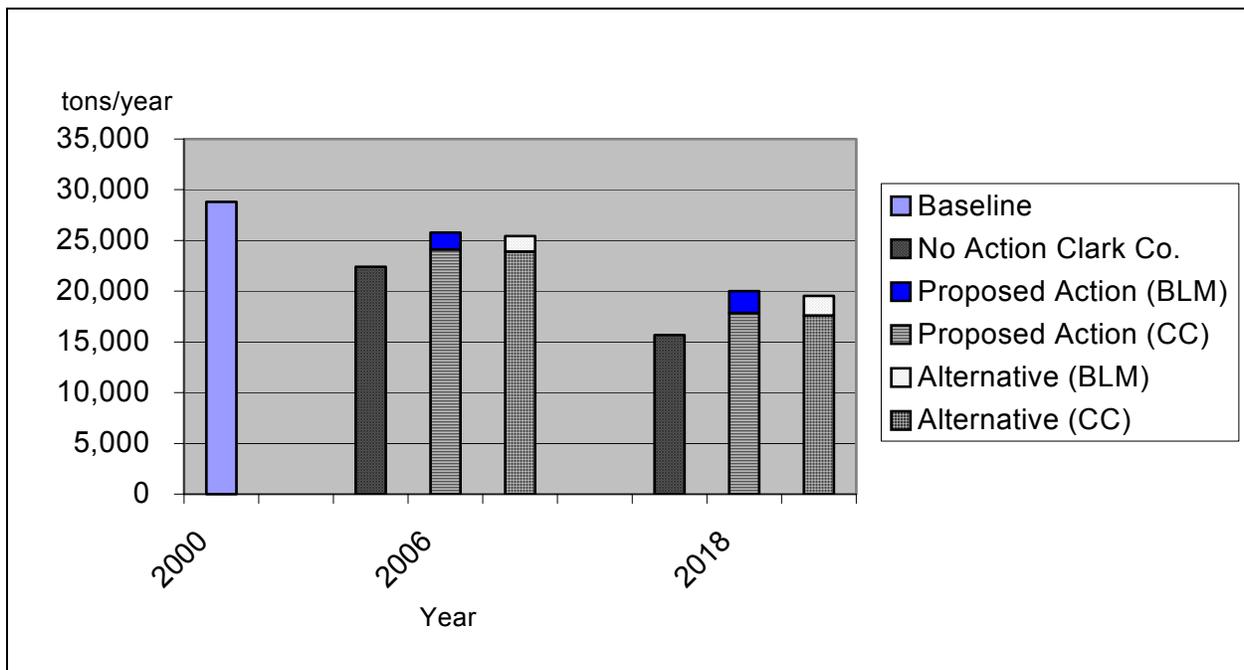
Ozone is not directly emitted by pollution sources; it forms in the atmosphere due to reactions with precursor compounds present in air emissions such as vehicle exhaust. Important ozone precursors that were included in the modeling effort and that would be addressed by future control requirements include oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). Once preliminary emission control requirements for the pollutants have been developed, BLM would direct additional study to assess the projected trends in ozone concentrations that incorporate growth in the activities that emit ozone precursors and reductions in emissions resulting from SIP requirements to be implemented in the future. Projected emission rates for these pollutants are summarized in Figures 4.1-3 and 4.1-4; however, these estimates do not include any reduction in

emissions that would be required under a new SIP adopted for the Las Vegas Valley that would be required to address non-attainment with the 8-hour ozone standard. The current projections show ozone precursor compound emissions in the region in 2006 would be similar to the emissions inventories performed for 2000 and significant reductions in nitrogen oxides would occur by 2018, reflecting the closure of the Mojave Generating plant. Under each of the alternatives VOC emissions decline through 2018 as point source controls reduce emissions of these compounds and as mobile sources such as cars continue to improve in effectiveness of control of VOC emissions.

The results of the Argonne air quality study indicated that the increase in the maximum 1-hour ozone concentration would be no more than 0.003 parts per million (ppm) in 2006 and 0.011 ppm in 2018. The highest predicted baseline (2000) 1-hour average ozone concentration was 0.091 ppm, thus the projected increases from the Proposed Action in 2006 and 2018 would still be below the 1-hour standard of 0.12 ppm. The changes in ozone precursor emissions expected to occur as a result of adoption of a SIP and control measures for these pollutants are not currently known. This



**FIGURE 4.1-3
NITROGEN OXIDES EMISSIONS BY ALTERNATIVE**



**FIGURE 4.1-4
VOLATILE ORGANIC COMPOUNDS EMISSIONS BY ALTERNATIVE**

information would be included in the analysis when it becomes available, consistent with the requirements of Council on Environmental Quality regulations for NEPA analysis when information is unavailable (40 CFR §1502.22). The BLM is finalizing a second air quality model in cooperation with Argonne and Clark County to determine expected ozone emissions with specific mitigation measures included. This model will enable BLM to disclose what the projected emissions would be when mitigation is applied in the future.

Preliminary results of the study estimate a peak increase of 0.09 ppm in the 8-hour ozone standard concentrations from 2000 (baseline) to 2018 with this peak isolated in areas north and west of the center of Las Vegas. It is expected that the average increase would be less than 0.02 to 0.06 ppm over most areas within and adjacent to the disposal boundary area primarily due to the effect of EPA's national new clean engine standards. The preliminary results indicate that the Proposed Action would be in compliance with the 8-hour standard in the out years modeled (2009 and 2018). The estimated emissions would be 0.084 ppm in 2009 and 0.082 ppm in 2018. The 8-hour standard for ozone is 0.085 ppm.

4.1.2.4 Sulfur Dioxide

The SO₂ emissions are projected to decrease by over 80 percent from 2000 levels by 2018 (see Figure 4.1-5). This decrease in total emissions is related to closure of the Mojave plant. It is projected that disposal-related emissions of SO₂ would be approximately 25 percent of total emissions of this pollutant in Clark County in 2018. These disposal-related emissions include vehicle emissions, fuel combustion for building heating, and electricity generation needed to supply power to developed areas. This estimate is based on a very conservative assumption regarding the amount of electricity consumption and related power generation for new residences used in the estimates developed for the air quality study (Argonne 2004). The Argonne study estimated increased SO₂ emissions based on an estimated electricity consumption of 36,000 KWh per year per household, while data from Nevada Power indicated that typical consumption in the area is

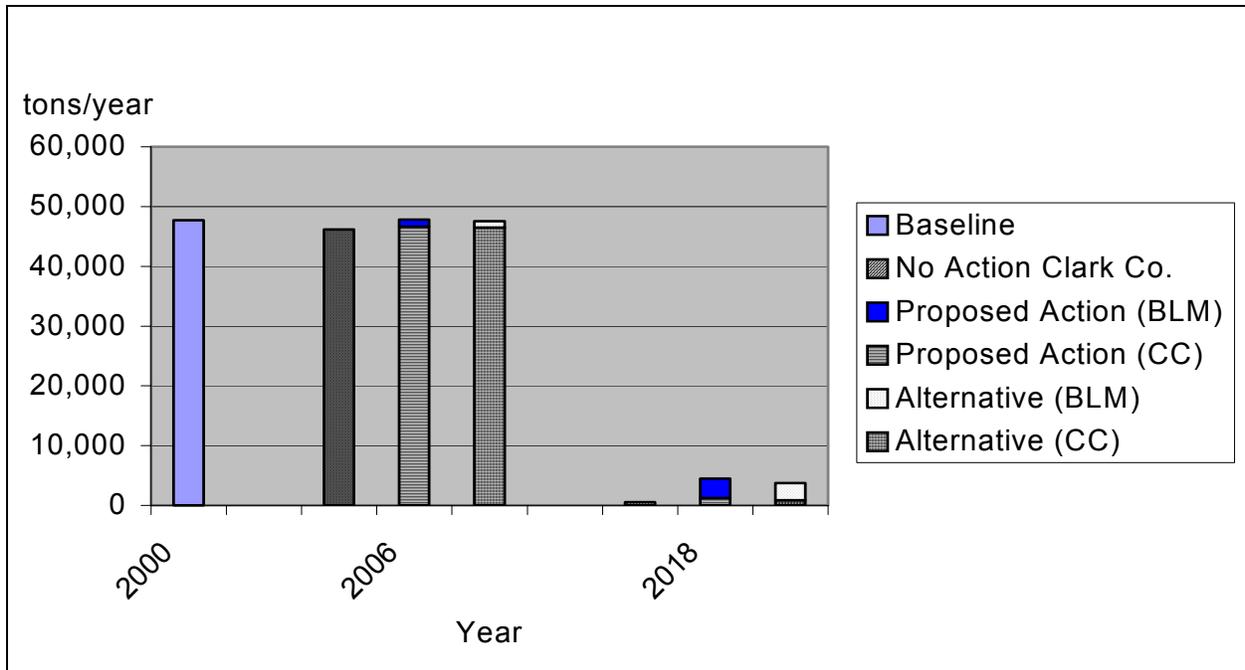
12,000 KWh per year per household. More representative emission rates for electricity generation for residential use will be incorporated in the revised model being prepared by Argonne and presented in the Final EIS.

This alternative would also include issuance of approximately 4,500 acres of ROWs to provide access across BLM-managed lands for infrastructure development to support build out of land that has already been transferred and 1,500 acres of R&PP leases. Based on activity levels over the past four years, BLM has issued an average of 1,300 acres of ROW grants and 440 acres of R&PP leases per year to support ongoing development. Typical construction requirements and associated emission rates for infrastructure development have been developed. Initially, utility construction that would result from these actions would typically be on the order of 462 tons per year for PM₁₀ (based on a typical ROW area size and construction length described for the No Action alternative).

Emission rates for activities related to ROW grants are significantly smaller than anticipated from the remaining development on lands that have already been disposed in the Las Vegas Valley, representing less than 1 percent of total current emissions for the non-attainment area. Under this alternative, fewer ROWs and R&PP leases would be issued over time as land is disposed and the amount of land in the disposal boundary area under BLM control decreases. The PM₁₀ emissions related to construction associated with these realty actions is expected to decrease to approximately 60 tons per year in 2011 and no additional realty actions would be completed in the disposal area after 2015 when all of the land would have been transferred to non-federal ownership. Realty actions would not have a significant impact on air quality as individual actions would likely be much less than the conformity threshold of 70 tons per year PM₁₀.

4.1.3 Conservation Transfer Alternative

Based on the projected areas available for disposal and the expected rates of land disposal and development under this alternative, the projected PM₁₀



**FIGURE 4.1-5
SULFUR DIOXIDE EMISSIONS BY ALTERNATIVE**

emissions related to development and subsequent use of disposal lands are projected to be nearly 90 percent of the emissions projected for the Proposed Action. The disposal related construction and operation emissions are a subset of the cumulative growth in emissions that would occur in the disposal boundary area and this is reflected in the small differences in projected emissions between the Proposed Action and Conservation Transfer Alternative shown in Figure 4.1-1.

Although a model simulation has not been performed for emissions projected to occur as a result of this alternative, the relatively small difference between the conservation transfer and full development emission rates, along with larger cumulative emissions from sources outside disposed lands all indicate that the overall trends in air quality under this alternative would be similar to those projected for the Proposed Action. Locally, lower construction emissions would occur primarily in the north central part of the disposal boundary area along the Las Vegas Wash as this area would be protected from significant land disturbing activity such as construction of buildings. However, this area would be an ongoing source of particulate emissions from vacant lands thus oper-

ating PM₁₀ emissions may locally be greater under this alternative relative to the Proposed Action.

Existing monitoring data, projected emissions increases, and model results indicate that CO would continue to be in compliance with NAAQS for this pollutant. The projections of CO emissions indicate that emissions related to development of lands disposed by BLM increase to just over 14,000 tons by 2006. Other Clark County sources are projected to emit 318,000 tons in 2006. The level of CO emissions from disposal related sources is projected to increase to 34,000 tons in 2018 while other Clark County emissions are estimated at nearly 264,000 tons at that time. Other emissions in Clark County are projected to decrease because of the projected closure of the Mojave Generating Station, a large coal-fired electrical generation plant during this period.

Estimated PM₁₀ emissions from realty actions would be similar to the Proposed Action but would be slightly less because less acres would be granted (3,500 acres of ROWs and 1,200 acres of R&PP leases). Realty actions would not have a significant impact on air quality as individual actions would likely be much less than the conformity threshold of 70 tons per year PM₁₀.

4.1.4 Mitigation Measures

Mitigation measures currently required under the PM₁₀ and CO SIPs ensure that control measures are placed on emission sources that can be reduced to achieve acceptable air quality. These measures include emission controls for stationary and mobile sources, including dust control and stabilization measures for construction sites, control of dust track out onto roadways, and programs to cover unpaved roads and parking areas. Improvements in the highway system and emission control performance for newer cars along with increased mass transit system capacity have reduced carbon monoxide emissions. Measures for control of ozone precursors are under development for the SIP required for this pollutant; however, preliminary identification of control measures has not been completed but would likely include oxygenated fuels and reformulated gasoline, and travel management options.

Mitigation measures would be required for realty actions including compliance with dust control permits issued by DAQEM, which include similar control measures as described above.

4.2 EARTH RESOURCES

Earth resources are limited, non-renewable resources whose characteristics can easily be degraded by physical disturbances. The disposal of land does not directly cause any change in the state of the geologic resources or the status of hazards associated with geologic conditions; however, changes in land use resulting from the transfer of lands affects the availability and potential use of mineral resources. An impact would be considered significant if it would:

- Expose people or property to hazards involving seismic events or subsidence,
- Result in substantial soil erosion or loss of topsoil,
- Substantially alter the topography or ground surface relief beyond that resulting from natural erosion and deposition,
- Be located on expansive soils, creating a risk to people or property,
- Result in the loss of availability of a known mineral resource, or
- Conflict with mining claims or patents.

4.2.1 No Action Alternative

The No Action Alternative would continue current management of the earth (soils and minerals) resources consistent with the RMP objectives for Minerals Management and Soil Resource Management. The lands within the Las Vegas Valley Disposal Area referenced in the RMP and the lands designated for disposal under the Clark County Act have been withdrawn from mineral entry. The BLM would continue to grant ROWs and R&PP leases as specified in the RMP but no additional lands would be available for auction under SNPLMA.

4.2.1.1 Geology

The Las Vegas Valley is located within Seismic Zone 2B, which is defined as an area with moderate damage potential. The potential for damage from seismic activity becomes more severe in Zones 3 and 4. Design practices require facilities to be built to Seismic Zone 4 standards regardless of land ownership. The seismic hazards would not directly impact the continued issuance of ROWs and R&PP leases. Applicants for ROWs and leaseholders would be required to comply with the appropriate building codes thus any indirect impact from seismic activity would be insignificant.

4.2.1.2 Mineral Resources

The No Action Alternative would continue the exclusion of new, locatable mineral development on lands within the disposal boundary area but recognize prior existing rights. Issuance of ROWs and R&PP leases would continue under this alternative and these realty actions would not be impacted by mineral development, nor would mineral development impact the realty program. Excess stockpiles of sand and gravel generated

during construction authorized by ROW grants and R&PP leases would continue to be made available through free use permits or sales. Resources that may be present within the disposal boundary area include locatable minerals, leasable minerals, and salable minerals

Locatable Minerals

Although manganese has been mined in the Las Vegas Valley, there are no active, locatable mining operations within the disposal boundary area. There has been no recent exploration activity or interest by the mining industry; therefore, continued withdrawal of the lands from entry and mineral development would not result in a loss of opportunities for development of locatable minerals and thus no impacts.

In 1999 the BLM Las Vegas Field Office completed a Mineral Potential Report, N-61855, for lands segregated/withdrawn within the Las Vegas Valley. In that report, Table 2 lists 567 active mining claims within the disposal boundary area. The claims consist of 160 millsites, 321 placer claims, and 86 lode claims. They occur mostly on the west and south sides of the Valley. The status of those 567 claims needs updating, but there are still a significant number of claims within the disposal boundary area.

Leasable Minerals

While the RMP assigned the area a moderate potential for oil and gas development, exploration wells drilled throughout the area have only encountered trace quantities of oil and gas. The resource assessment performed by the U.S. Geological Service for Southern Nevada determined that the area is considered speculative for oil and gas development. Based on these conditions and the lack of interest in the area by oil and gas companies, no development is projected for the area. The RMP assigned the area a low to moderate potential for development of sodium and potassium. However, there are no existing leases for sodium and potassium within the valley and the potential is based on geologic inference and the sedimentary basin concept. Therefore, continued withdrawal of the disposal boundary area

would not have an impact to leasable mineral development.

Saleable Minerals

Mineral material extraction has been active in the Las Vegas Valley for many years. There are abundant sand and gravel resources throughout the area because the Las Vegas Valley and the intermountain valleys of the planning area contain thick sequences of alluvial deposits. The BLM would issue permits for mineral development in other parts of the Las Vegas Field Office planning area consistent with the criteria specified in the RMP.

4.2.1.3 Soils

Soils within the disposal boundary are typically poorly developed desert soils with significant components of rock fragments and soluble salts. While soils in most of valley floor are present in areas with gentle slopes and are not highly susceptible to erosion by water, soils present along incised drainage pathways may be eroded by overland and stream flow during storm events. Wind erosion of soils is reduced by formation of soil crusts as discussed in Section 3.2. Surface disturbing activities decrease soil stability and stockpiled soils at construction sites are more susceptible to wind and water erosion.

Under the No Action Alternative no additional BLM lands would be sold or subject to development other than ROWs and R&PP leases. Areas for ROWs and R&PP leases would be subjected to increased erosion during construction and post-development changes in soil conditions that affect vegetation types in these areas. The amount of soil anticipated to be disturbed is approximately 10 acres per realty action. The ROWs for utilities are generally placed adjacent to roads and previously disturbed areas to minimize impacts. Compliance with water quality protection requirements and air quality controls during construction is required throughout Clark County. Therefore, disposal and development of land within the disposal boundary area for realty actions are not expected to have significant impacts on soil resources.

4.2.2 Proposed Action

The remaining BLM land within the disposal boundary area identified by SNPLMA and modified by the Clark County Act would be disposed through sales or other title transfer actions. Rights-of-way would be issued to allow development of roads and utilities and R&PP leases granted for parks and other public facilities. Eventually, all of the remaining land within the disposal boundary area would be transferred from federal control and access rights would transfer with the property. This action would result in the disposal of the remaining 46,700 acres by 2015 with nearly 20,000 acres developed by 2018.

4.2.2.1 Geology

Development activities conducted within the disposal boundary area after BLM patents the lands would be required to comply with the hazard mitigation requirements implemented by the Clark County development code. These restrictions apply to construction activities regardless of land ownership. The BLM lands in the northern part of the disposal boundary area expanded by the Clark County Act have similar geologic features as the lands in the SNPLMA boundary. Steep slopes and unstable areas along the Las Vegas Wash may present additional hazards; however, development in this area would be required to address any associated hazards and would be required to avoid the floodplain. Indirect impacts on building construction from seismic activities would be similar to that described for the No Action Alternative. Design practices require facilities to be built to Seismic Zone 4 standards.

Development and the associated construction activities would not directly affect subsidence. However, increased groundwater pumping to meet the increased water demand may result in subsidence within the disposal boundary area.

4.2.2.2 Mineral Resources

Subject to valid existing rights, lands within the disposal boundary area are withdrawn from entry and mineral resource development. However, there are no economically viable locatable or leas-

able minerals located within the disposal boundary area thus no direct impacts to the realty program are expected and no indirect impacts from subsequent development.

No new sand and gravel operations would be developed within the disposal boundary area under the Proposed Action. Moving sand and gravel development out of the Valley would increase the cost of mineral materials to the consumer; however, there are abundant sand and gravel resources outside the disposal area and throughout Southern Nevada. There are usually excess sand and gravel stockpiles from ROWs involving detention basins and other flood control features. The BLM would sell or issue use permits for this excess. If there is not sufficient storage space on the ROW for the excess stockpiles, the ROW holder is required to find suitable lands for storage and move the materials to those sites for future disposal by the BLM.

4.2.2.3 Soils

Lands would potentially be subjected to increased erosion during construction and post-development changes in soil conditions that affect vegetation types. Gypsiferous and alkaline soils associated with unique vegetation communities in the northern part of the disposal boundary area would potentially be developed under this alternative, and soil disturbance during construction, placement of buildings, pavement, and landscaping could eliminate these soil conditions. Soils that support the Las Vegas buckwheat and Las Vegas bearpoppy may not provide suitable conditions for these plant communities after development has taken place.

Indirect impacts from soil erosion would be similar as described for the No Action Alternative. Construction activities change the character of soils; developed areas typically experience less soil erosion from wind than undeveloped areas. Therefore, following completion of construction activities, soil erosion from wind would be minimal.

Expansive soils are present in various locations within the disposal boundary area as described in Section 3.2. Development in these areas may re-

quire implementation of design, engineering, and construction controls to protect against damage to structures. Geotechnical studies conducted prior to construction would determine whether expansive soils are present. Impacts from expansive soils would be insignificant because appropriate measures would be required to protect structures.

Some impacts of soil disturbance would be controlled by requirements for storm water discharges from construction sites and dust control measures required for air quality management during construction activities, but post-development changes in soil characteristics would not be affected by these requirements. Therefore, issuance of ROWs and R&PP leases and disposal and development of land within the disposal boundary area are not expected to have significant impacts on soil resources.

4.2.3 Conservation Transfer Alternative

Approximately 5,000 acres within the disposal boundary area would be maintained as open space and limited compatible recreation development for trails and interpretive activities. This would protect sensitive vegetation and unique paleontological resources along the Las Vegas Wash within the northern part of the disposal boundary area. The issuance of ROWs and R&PP leases would continue until the remaining lands are disposed or transferred.

4.2.3.1 Geology

The potential impacts from geologic hazards would be similar to those described for the Proposed Action. Because the area identified for conservation to protect vegetation and paleontological resources includes the area along the Las Vegas Wash where the drainage is incised into the Valley floor, this area would not be intensively developed. Conservation and maintenance of open space in this area would result in fewer disturbances to potentially unstable slopes, reducing the need for mitigation measures to address geologic and soil stability hazards.

4.2.3.2 Mineral Resources

The lands within the disposal boundary area have been withdrawn from mineral resource development. The potential impacts to mineral resources would be the same as those described for the Proposed Action.

4.2.3.3 Soils

The potential impacts regarding soil resources would be similar to those described for the Proposed Action; however, the gypsiferous and alkaline soils associated with unique vegetation communities in the Conservation Transfer Area would be managed for resource protection under this alternative. Any surface disturbance in this area would be limited to protect soil conditions that support special status plants and paleontological resources.

4.2.4 Mitigation Measures

Soil erosion from wind and water would increase during development but the implementation of erosion control best management practices and compliance with Clark County permitting requirements would ensure that any impacts are minimized. Building codes requirements would mitigate impacts from geologic hazardous and expansive soils. No other significant impacts to geology and mineral resources would occur thus no further mitigation would be required.

4.3 WATER RESOURCES

The disposal of BLM lands would not have direct impacts on water resources but the land sale actions would indirectly affect water resources because of the subsequent development that would occur. Direct impacts resulting from the issuance of realty actions may occur. Indirect impacts on water resources include increases in water demand resulting from development of disposal lands in the Las Vegas Valley. The projected rates of development for disposal lands derived by Argonne for the air quality study are combined with average water use rates for developed land to calculate increases in water consumption. The projected increases in developed land over the planning pe-

riod are multiplied by the historical average water consumption of 2.5 acre-feet per year (AFY) for every acre of developed land (BLM 2004). The Southern Nevada Water Authority (SNWA) and municipal water utilities have accelerated efforts to reduce water consumption as part of an amended drought plan enacted in February 2004 (SNWA 2004a). Measures enacted under this plan (such as turf grass reduction and restrictions on new landscaping) would permanently reduce water consumption and decrease the historical average water consumption to a value less than 2.5 AFY. However, it is not possible to compute a revised average water consumption rate until data have been collected over a sufficient period of time.

As part of their resource planning process the SNWA estimates projected water demand for Southern Nevada. The SNWA bases their projections of overall demand increases on population projections obtained from the UNLV Center for Business and Economic Research and current per capita water use in the region. The total water demand for the region used in this section relies upon the overall demand estimates prepared by SNWA. The projected demand associated with land disposal and development is a component of the overall demand growth evaluated by SNWA.

The population growth and water use trends evaluated by SNWA include development throughout the region and consider growth in domestic and commercial uses of water. It is important to note that the Nevada State Demographer has issued updated population growth projections for the Las Vegas area that show more rapid population growth than projected by UNLV in 2000 (Nevada State Demographer 2004). While population growth in the past 5 years has been more rapid than previously observed, longer-term trends in population growth are not anticipated to continue to increase at this rate.

The SNWA provides estimated upper and lower limits of projected water demand as described in Section 3.3 and SNWA plans for capacity addition to address the upper limit estimate to ensure adequate water supplies for the future. The SNWA has established a conceptual plan to accelerate development of additional in-state water resources

(SNWA 2004b) as part of its overall resource management plan (SNWA 2004c) to meet increasing water demands resulting from future growth and development in southern Nevada and reduce its overall dependence on Colorado River water. Under this plan, transmission, pumping, and treatment facilities would be constructed to convey water from existing surface-water rights on the Virgin and Muddy Rivers and there are pending applications for groundwater rights in numerous hydrographic basins in southern and eastern Nevada. Potential environmental effects of these projects would be evaluated under separate planning efforts.

The disposal of BLM lands in the Las Vegas Valley would have a significant impact on water resources if development would:

- Substantially alter the existing drainage pattern of the area, including the alteration of the course of a stream or wash in a manner that would result in accelerated erosion or siltation,
- Substantially alter the existing drainage pattern of the area, including increasing the rate or amount of surface runoff in a manner that would result in flooding,
- Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff,
- Substantially degrade water quality, or
- Place structures that would impede or redirect flood flows within a 100-year flood hazard area.

4.3.1 No Action Alternative

Under this alternative no additional land transfers would be authorized by BLM. Water resource impacts would be related to ROW grants and R&PP leases issued to support development of previously disposed lands. Based on the rates of realty actions completed since 2001, BLM anticipates that it would issue up to 1,300 acres of

ROWs and 440 acres of R&PP leases per year to support ongoing development. This amount would decrease as lands are fully developed.

4.3.1.1 Surface Water and Floodplains

The potential impacts to surface water relating to these realty actions are mainly associated with construction activities. The impacts would be temporary and the extent of the impacts would depend on the amount of surface disturbance at any given time.

There is the potential for accidental spills during construction activities that could transport contaminants off the construction site during storm events if required response measures are not implemented. The potential sources are associated with leakages and spills of fuels and lubricants from vehicles and other machinery. In addition to accidental spills, disturbance of surface soils by construction activities could increase the potential for erosion and transport of soil (sediment) during rainfall events where surface water runoff crosses the construction areas. Spills of construction materials and/or erosion of disturbed soils with subsequent transport by surface water runoff to the Las Vegas Wash or other drainages could create adverse impacts to water quality. However, erosion and sediment transport would be insignificant and would be similar to surface water passing over unpaved roads that exist throughout the disposal boundary area. Implementation of best management practices required by storm water construction permitting ensures that runoff during construction does not adversely impact water quality.

Construction of underground utilities including water, gas, and sewer lines would involve trenching. Open trenching and the associated disturbance of existing desert soil and vegetation may impact surface water drainage during construction if a major rainfall/runoff event occurs. However, any construction of underground utilities would require a Storm Water Pollution Prevention Plan that would address mitigation measures resulting from discharge during storm events thereby minimizing potential adverse impacts surface drainage and water quality.

The leaseholder would be required to comply with any Federal Emergency Management Agency (FEMA) requirements for construction in floodplains and thus any impacts to floodplains from ROWs and R&PP leases would be insignificant.

4.3.1.2 Groundwater

The water table ranges from a depth of 0 to 50 feet below the valley floor within the disposal boundary area; the water table typically is at a depth greater than 50 feet below alluvial fan areas adjacent to the valley floor within the disposal boundary area. There is the potential that groundwater would be encountered and intercepted during excavation of trenches for underground pipelines and utilities within some areas of the valley floor. A range of temporary and permanent impacts to the groundwater environment may result from construction activities if groundwater is encountered.

Construction dewatering could temporarily decrease or eliminate discharge from nearby water wells completed in the shallow aquifer. This is unlikely to occur as most wells are completed at greater depths because of the general poor quality of water in the shallow aquifer. Water pumped from the shallow aquifer generally has high concentrations of total dissolved solids and may contain a variety of contaminants. Discharge of this water into the Las Vegas Wash or one of the tributaries could degrade ambient water quality and would require a temporary discharge permit from the Nevada Division of Environmental Protection (NDEP). Permit conditions for monitoring and treatment would be sufficient to mitigate any adverse impacts.

Shallow groundwater in the vicinity of construction activities is susceptible to pollution. Construction activities may create the potential for leakages and spills of fuels and lubricants from vehicles and other machinery, runoff from operations such as concrete placement, and runoff of turbid surface water as a result of topsoil removal and excavation. However, with implementation of best management practices any adverse impacts would be localized and insignificant.

4.3.1.3 Water Use and Demand Projections

Activities associated with the issuance of ROW and R&PP leases within the disposal boundary area would not result in changes to land use that would require a substantial water supply. Therefore, these realty actions would not impact demand for water resources in the area.

Additional public lands would not be disposed under the No Action Alternative and thus no additional revenue from the sale of these lands would be generated. Therefore, the funds that would be allocated to SNWA for identification and development of additional water sources would not be available.

The ongoing evaluation of viable groundwater sources by SNWA would continue and not be affected by the No Action Alternative.

4.3.2 Proposed Action

Under the Proposed Action additional disposal actions would be carried out until the remaining 46,700 acres of BLM lands within the disposal boundary area have been transferred or sold. It is estimated that lands would be sold at an annual average rate of over 4,000 acres per year through 2015 and projected rates of development indicate that approximately 20,000 acres of this land would be developed by 2018.

4.3.2.1 Surface Water and Floodplains

Because all the land currently managed by BLM within the disposal boundary area would be transferred or sold under this alternative, development would eventually result in the alteration of the land area. These alterations would include increased amounts of impervious surface and landscaping associated with urban development. The changes in hydraulic properties would result in increased runoff and higher peak flow volumes. Runoff from developed areas would have high concentrations of contaminants associated with urban runoff including heavy metals and petroleum hydrocarbons (Hollister 2003). Increased soil disturbance and runoff during construction and related development activities may also in-

crease suspended sediment loading to the drainage system; however, these impacts would be minimized by implementing the requirements for storm water permitting and controls for significant construction projects.

Construction and development may result in alteration of the land surface including modification or elimination of ephemeral drainages within the Las Vegas Valley. While modification of drainage pathways could potentially impact surface water systems, including hydrology and riparian conditions of ephemeral streams, the requirements for development in Clark County include preparation of drainage plans for any development that could change drainage pathways, result in construction of new drainage pathways or control structures, or change runoff and channel flow in downstream areas (CCRFCD 2004).

The planned changes to surface drainage and hydraulic calculations must demonstrate that the development would not alter drainage systems in ways that change the flow of downstream drainage courses or cause damage to downstream properties through sheet runoff or point flow discharges. These requirements limit drainage system changes only in the most upstream part of ephemeral stream channels where limited riparian and aquatic habitat is generally present in the desert environment and thus impacts would be insignificant.

Alteration of main segments of the drainage system such as the Las Vegas Wash has already occurred due to discharges of point sources, irrigation runoff, and shallow groundwater seepage. These discharges have converted the stream course from ephemeral to a permanent stream. Environmental conditions related to these changes and management of aquatic, riparian, and the Las Vegas Wash Coordination Committee is addressing wetland conditions.

Impacts may result if development of disposed land occurs in floodplains. Construction in the floodplains would require surface grade elevations to be above the base flood elevation. Changes in the hydraulics would be evaluated prior to construction to ensure that alteration of the floodplain would not change the base elevation and increase

the flood hazard to nearby areas. However, any impact would be insignificant as not many acres of available BLM lands are located in a floodplain (see Figure 3.3-2).

The potential impacts associated with the issuance of ROW and R&PP leases would be similar to those described for the No Action Alternative. Although ROW grants and R&PP leases would decrease from the current average of approximately 1,300 acres and 440 acres per year respectively, the amount of surface disturbance over time would be greater than the No Action Alternative to accommodate development of the disposed lands.

4.3.2.2 Groundwater

The development of lands would change existing hydraulic properties by increasing impervious surface and landscaped areas. The change in hydraulic properties would increase surface water runoff and reduce groundwater infiltration in the developed areas as compared to predevelopment conditions. Available analyses of recharge in the Las Vegas Valley indicate that most of the recharge occurs at elevations greater than 5,000 feet in mountains adjacent to the Valley where rainfall and snowmelt directly infiltrate into rock outcrops or mountain runoff infiltrates into alluvial fan deposits. Only a small amount of runoff infiltrating through ephemeral washes and precipitation falling on the valley floor result in net infiltration, with less than 15 percent of rainfall contributing to recharge in areas below elevations of 5,000 feet (Dettinger 1989). Therefore, groundwater recharge would not significantly decrease from changes in hydraulic properties caused by land development.

Current groundwater withdrawals in the Las Vegas Valley, as described in Section 3.3, would continue under the Proposed Action. The overall impacts to groundwater resources in the Valley associated with the level of development under this alternative are not anticipated to be greater than would occur under the No Action Alternative because the current withdrawals in the area are under established water rights and the Nevada State Engineer is not issuing additional water rights because the basin is in overdraft. The

SNWA plans to meet demands for additional water supplies resulting from future development and growth in Las Vegas Valley as described in its resource management plan (SNWA 2004c).

The potential impacts to groundwater associated with the issuance of ROW and R&PP leases would be similar to those described in the No Action Alternative, but the amount of surface disturbance and potential dewatering of construction sites over time would be greater than the No Action Alternative to accommodate development of the disposed lands.

4.3.2.3 Water Use and Demand Projections

Development of public lands disposed under the Proposed Action would increase demand for public water supplies. The SNWA would be able to meet the increased demand for water by continuing to implement and enforce conservation measures described in their “Drought Plan” (SNWA 2004a) and developing additional water supplies as described in their planning documents “Concepts for Development of Additional In-State Water Resources (SNWA 2004b) and “2004 Water Resource Plan” (SNWA 2004c). Development of additional water supplies is dependent upon the Nevada State Engineer approving water rights applications filed by SNWA in 1989 for groundwater withdrawals in southern and eastern Nevada.

The Proposed Action would result in an eventual water consumption increase of nearly 50,000 AFY by 2018, with this additional demand continuing into the future. This demand is based on the assumption that approximately 20,000 acres of disposed BLM lands would be developed and that the historical average water consumption of 2.5 AFY per acre of developed land. However, this projected increase does not consider potential water conservation that SNWA would attempt to achieve during this period. The SNWA has averaged a 12 percent reduction in water use because of drought conservation measures. Assuming this percent remains constant, the demand anticipated by 2018 from disposed BLM lands would be 44,000 AFY. Given the persistent drought conditions, higher water demands, and the fact that conservation results have previously been lower than

the levels expected, SNWA and its member agencies are developing a regional strategic plan to meet a goal of 25 percent reduction by 2010 (SNWA 2004). Thus, water consumption would likely be much less than anticipated.

The water consumption increase of 50,000 AFY represents approximately 19 percent to 29 percent of the upper and lower demand increases, respectively, anticipated during this time frame. As described in Section 3.3 and shown in Figure 3.3-4, SNWA projects water demand to increase 170,000 AFY to 270,000 AFY by approximately 2018. The SNWA water demand projections are based on population projections and not on acres of developed land, thus a direct correlation is not possible. However, the projected water demands and water consumption are provided here for illustrative purposes.

The projections of future water demand by SNWA and its assessment of the available supplies indicates that additional sources of water would be needed to meet near-term and long-term demand increases. The adequacy of these additional water sources would need to be evaluated and potential environmental impacts of groundwater pumping would also need to be assessed. Acquisition of water from the additional sources depends on approvals or negotiation of new agreements with existing holders of various water rights. However, these evaluations by SNWA for future water sources would continue regardless of the land sale action.

4.3.3 Conservation Transfer Alternative

The Conservation Transfer Alternative is similar to the Proposed Action except that approximately 5,000 acres of land would be maintained as open space to protect sensitive resources. It is estimated that land transfers would continue at a rate of approximately 4,000 acres per year through 2015, resulting in disposal of approximately 41,700 acres of land. The projected rate of development indicates that just less than 17,500 acres of land would be developed by 2018. The BLM anticipates that it would issue 3,500 acres of ROW grants and 1,200 acres of R&PP leases to support ongoing development.

4.3.1.1 Surface Water and Floodplains

The potential impacts to surface water and floodplains under this alternative would be similar to those described for the Proposed Action. However, the areas maintained as open space to conserve sensitive resources are predominantly located in the vicinity of the Las Vegas Wash. Development would not occur on the conservation lands; therefore, impacts to the floodplain within the conservation area would not occur.

4.3.3.2 Groundwater

The potential impacts to groundwater under this alternative would be similar to those described for the Proposed Action.

4.3.3.3 Water Use and Demand Projections

The Conservation Transfer Alternative would result in an eventual 43,750 AFY increase in water consumption by 2018, with this additional demand continuing into the future. This demand is based on the assumption that approximately 17,500 acres of disposed BLM lands would be developed and that the historical average water consumption of 2.5 AFY per acre of developed land. As discussed under the Proposed Action, this projected increase does not consider the potential water conservation that SNWA would attempt to achieve during this period. Assuming a 25 percent reduction, the demand anticipated by 2018 from disposed BLM lands would be approximately 32,800 AFY.

The water consumption increase of 43,750 AFY represents approximately 16 percent to 28 percent of the upper and lower demand increases, respectively, anticipated during this time frame. As described under the Proposed Action, the SNWA water demand projections are based on population projections and not on acres of developed land, thus a direct correlation is not possible. However, the projected water demands and water consumption are provided here for illustrative purposes.

Other potential indirect impacts related to water use and demand would be the similar to those described for the Proposed Action. The SNWA

would continue to evaluate future water sources regardless of the land sale action.

4.3.4 Mitigation Measures

The mitigation measures would be required to minimize adverse impacts resulting from actions related to the issuance of ROW and R&PP leases. Best management practices would be implemented to reduce the potential for accidental spills of hazardous materials at construction sites. Vehicle fueling and maintenance would be done in designated staging areas only and adequate cover would be provided for materials stored outside to avoid impacting surface water and ephemeral washes.

The sequencing of excavation would minimize the amount of time utility trenches would remain open. This would be especially critical during the monsoon season in the summer months when the risk of major storm events is highest.

Dewatering operations and discharges would be conducted in compliance with the applicable dewatering and discharge permits. The discharge of pollutants to the groundwater system from dewatering operations would be prevented or reduced by using sediment controls and by testing the groundwater for pollutants. High sediment content in dewatering discharges is common because of the nature of construction. The use of a sediment trap or basin in conjunction with a filtration system to remove sediment from the trap or basin would minimize the chances of sediment entering the groundwater system. Monitoring of groundwater levels in the vicinity of the dewatering operations would be conducted to avoid harmful groundwater lowering which could cause the surrounding layers to settle and therefore impose hazards to structures in the area.

4.4 BIOLOGICAL RESOURCES

Plant and wildlife species and the habitats they create and inhabit are collectively referred to as biological resources. Resources include species that are protected under the Endangered Species Act (ESA), identified by the BLM as sensitive, and species that are provided a form of protection under the Nevada Revised Statutes (NRS). For

the purposes of this EIS, impacts to biological resources would be considered significant if the viability of a federally protected species is jeopardized or the action would result in the need to list a species under the ESA or NRS. An impact would also be significant if the actions would cause substantial changes to the abundance, diversity, distribution, or habitat value of plants or wildlife.

The disposal of BLM lands and the transfer of title would not have a direct impact on biological resources but the subsequent development and change in land use would be an indirect impact. Direct impacts would result from continued issuance of R&PP and ROW grants within the Las Vegas Valley.

To estimate and describe potential impacts to biological resources from ROW disturbance, representative ROW alignments were selected throughout the disposal boundary area. The ROW examples varied in length from 2 miles to 10.5 miles and from 100 feet to 200 feet in width based on the adjoining land ownership. The impacts from construction for infrastructure development were based upon the projected amount of surface disturbance and biological resources documented during field surveys. Table 4.4-1 shows the potential impacts to biological resources from those ROW alignment examples. As described at the beginning of this chapter and in Section 2.3, the BLM generally issues ROWs on a section line grid, thus the following examples were selected for illustrative and analysis purposes. Maps of the ROW alignment examples and resources are included in Appendix B.

4.4.1 No Action Alternative

Under the No Action Alternative land disposals authorized by SNPLMA would not continue. The BLM would continue to implement realty actions in the disposal boundary area for R&PP and ROW grants under the guidelines specified in the RMP and through Section 7 consultation under the ESA.

An average of 1,300 acres of ROW grants and 440 acres of R&PP leases are issued annually to support development of previously disposed lands. It

**TABLE 4.4-1
ROW EXAMPLES AND IMPACTS TO BIOLOGICAL RESOURCES**

ROW Alignment	Length (miles)	Acres	Desert Tortoise Habitat/Density¹	Las Vegas Bearpoppy	Las Vegas Buckwheat	Cacti/Yucca Habitat/Density²
Example 1	2	26	4 acres/very low 22 acres/low	0 acres 0 plants	0 acres 0 plants	26 acres/low
Example 2	4	66	15 acres/very low 51 acres/low	0 acres 0 plants	0 acres 0 plants	50 acres/low 16 acres/moderate
Example 3	10.5	250	200 acres/very low 50 acres/low	0 acres 0 plants	0 acres 0 plants	50 acres/low 200 acres/moderate
Example 4	3	60	60 acres/very low	5 acres 0 plants	13 acres 7 plants	35 acres/low 25 acres/moderate

¹ See Figure 3.4-4

² See Figure 3.4-2

Note: No other biological resources were identified within these alignments; acres are approximate.

is expected that ROW grants and R&PP leases would only need to be issued for the next two years to accommodate previously disposed lands since no additional lands would be sold. Therefore, it was calculated that approximately 2,600 acres of ROW grants and 880 acres of R&PP leases would be issued under this alternative thus potentially resulting in the disturbance of 3,400 acres.

Implementing realty actions would result in direct impacts to biological resources. Surface disturbing activities occurring during installation of utilities and construction of facilities and parks for public purposes would cause direct mortality and/or displacement of individual plants and animals within the construction footprint; direct loss and fragmentation of habitat; and increased potential for illegal kills and harassments of wildlife. The magnitude of impacts would depend on conditions such as the type and duration of the disturbance, the species present, and the time of year. When habitat disturbance cannot be avoided, adverse impacts to species would be minimized through implementation of mitigation measures (see Section 4.4.4).

This alternative would have direct impacts to Las Vegas bearpoppy, Las Vegas buckwheat, and the two-toned penstemon plants and/or habitat within the ROW alignment. The BLM would require mitigation in areas containing these species or their habitat because of the sensitivity of the plants to surface disturbance and limited success in transplanting and reestablishing the plants.

Thus, any disturbance to the bearpoppy or buckwheat would likely result in a long-term loss and permanent reduction of their potential habitat. However, because no additional lands would be disposed under this alternative, the extent of impact would not likely be significant as the need for ROWs and R&PPs would be much less than anticipated with the selected example alignments.

State of Nevada protected cacti species would be directly impacted by activities resulting from new ROW and R&PP leases that fall within the right-of-way alignment area. The Nevada Division of Forestry (NDF) regulates the removal of cacti species but the lead federal agencies are responsible for following the NRS and have jurisdiction over permit requirements and mitigation measures (BLM 2004d). The BLM determines if salvage of cacti and yuccas would be necessary as mitigation for surface disturbing activities within the salvage boundary shown on Figure 3.4-2. There are approximately 30,000 acres of BLM land within this boundary; however, the areas requiring salvage may be expanded to the north and northwest because of availability of recent density data for the plants.

Permanent and temporary loss and fragmentation of habitat resulting from construction activities could affect some species with limited home ranges and mobility, such as small mammals and reptiles. Most of these species are common and widely distributed throughout the area and the loss of some individuals and their habitat would not

have an adverse impact on the species' populations throughout their ranges.

Wildlife may also be indirectly affected by construction and subsequent public use. Increased human activity (such as increased human presence, noise, vibration, and vehicular traffic) may cause wildlife to avoid or move away from the sources of disturbance. This avoidance could result in under utilization of adjacent physically unaltered lands. The net result would be decreased habitat value in adjacent "wildland" areas and altered distribution patterns. Additionally, displaced wildlife may increase densities in adjacent lands leading to some degree of overuse and degradation of those habitats.

The U. S. Fish and Wildlife Service (USFWS) provided a list of federally listed species and species of concern with the potential to occur in the disposal boundary area (see Appendix B). In general, construction and operation activities associated with issuance of ROW and R&PP grants would have similar impacts to special status wildlife species and their habitats as those of the more common wildlife species discussed above. However, the impacts to special status wildlife, if present, can be more severe since the distribution and abundance of many of these species are limited in the Las Vegas Valley and the surrounding region.

Phainopepla and desert bighorn sheep may experience both direct and indirect effects including direct loss of habitat, increased habitat fragmentation, and barriers to movement. Disturbance and displacement affects could also occur as a result of increased noise and human activity. Development of the Las Vegas Valley would also reduce foraging habitat for peregrine falcons. No impacts to bald eagles, spotted bat or western chuckwalla are expected to occur as no habitat for these species was found on public lands within the disposal boundary.

The sensitive wildlife species most likely to be affected by issuance of ROW and R&PP grants and their subsequent development would include the desert tortoise, banded Gila monster and western burrowing owl. Construction activities could directly kill and injure these animals through: vehicle strikes; crushing and burying during con-

struction, digging, and earth moving activities; reducing or eliminating associated habitat; and creation of barriers to movement (which can result in an indirect affect of a barrier to gene flow).

Biological surveys conducted during 2003 and 2004 identified that approximately 41,500 acres of desert tortoise habitat that may support approximately 1,000 desert tortoises may be affected by issuance of ROW and R&PP grants within the disposal boundary. The exact amount of disturbance cannot be quantified, as the locations of ROWs and R&PP leases are unknown. Based on the analysis assumptions, it is estimated that approximately 2,600 acres of ROWs and 880 acres of R&PP leases may be issued under the No Action Alternative and thus the potential for a similar amount of disturbance. Any potential adverse impacts to the desert tortoise would be mitigated through implementation of the specific terms and conditions issued by the USFWS in the biological opinion for the Las Vegas Valley.

In 2001 the USFWS determined that the proposed disposal of up to 125,000 acres of BLM lands consisting of 121,000 acres of suitable and 4,000 acres of previously disturbed, no longer suitable, desert tortoise habitat would represent a loss of approximately four percent of the 4,900 square miles of desert tortoise habitat estimated to occur in Clark County. Effects on desert tortoises within the Las Vegas Valley represent a small impact to the Mojave population of the desert tortoise when total desert tortoise population numbers and geographical extent are considered.

4.4.2 Proposed Action

The continued disposal of BLM lands would not directly impact biological resources but subsequent development of the lands would have indirect impacts to the resources located on those lands. Under the Proposed Action the BLM would make approximately 46,700 acres available for transfer or sale within the disposal boundary area at an average annual rate of over 4,000 acres per year until 2015 and approximately half (up to 20,000 acres) of these lands would be developed by 2018.

No direct impacts to biological resources are expected from the transfer of title when land is sold. Indirect impacts to biological resources would occur when lands sold by the BLM are developed by the private owner. Development construction activities would cause loss of vegetation and wildlife habitat and direct mortality of individual plants and animals through crushing and burying during construction, digging, and earth moving activities.

Direct impacts from issuing ROWs and R&PP leases would be similar to those described under the No Action Alternative. However, under this alternative more ROWs and leases would be issued and more land surface would be disturbed because of an increased need for infrastructure due to the increased amount of BLM land sold for development. Approximately 1,500 acres of R&PP leases and approximately 4,500 acres of ROWs are projected to be granted until the remaining lands are sold. The amount is expected to decrease on an annual basis as the remaining BLM lands are sold or transferred.

The BLM would strive to avoid issuing ROWs or R&PP leases in areas containing the Las Vegas bearpoppy and Las Vegas buckwheat or their habitat. If avoidance is not possible, mitigation such as plant salvage and transplant and/or seed bank salvage would be performed by the BLM or the entity requesting the realty action to reduce impacts to these species. Payments of the \$660 fee (adjusted annually) per acre of desert tortoise habitat disturbance would continue to be collected to compensate for habitat loss in compliance with conservation measures established by the Programmatic Biological Opinion.

The bearpoppy, buckwheat, two-tone penstemon, and the acacia/mesquite bosque habitat would be impacted through direct habitat loss, additional habitat fragmentation, and individual species mortality from development by private parties after the BLM lands are sold. Approximately 60 acres of bearpoppy and related habitat, 400 acres of buckwheat and related habitat, and three sites of penstemon populations may be impacted by this alternative. The extent of the indirect impact over the planning period would be dependent on the rate of habitat loss, which is based on location of

development since it is assumed that approximately half of the sold lands would be developed.

The Las Vegas bearpoppy is found only in Clark County and a few northern Arizona sites but is declining because of the recent development in Southern Nevada. As described in Section 3.4, the plant grows predominantly on gypsum soils which are more common in the northern part of the Las Vegas Valley. The Las Valley buckwheat is being evaluated for listing as a State of Nevada Critically Endangered species, under NRS 527.260-.300. Like the bearpoppy, its distribution is also based largely on gypsum soils and thus its habitat is limited. Therefore, any disturbance to the bearpoppy or buckwheat would result in a long-term loss and permanent reduction of their potential habitat, which would be considered a significant indirect impact of the land sales.

This alternative could potentially cause fragmentation to the bearpoppy and buckwheat habitat and result in a significant impact to those species. Because of the importance of the resource and the proportion of the resource that would be affected relative to its occurrence in the vicinity, disturbance to the bearpoppy and buckwheat habitat from development would be an indirect significant impact of the land sale action. Reduction in buckwheat habitat and population losses may result the species being considered for emergency listing under the Endangered Species Act. Other protected species, such as the two-tone penstemon, would require mitigation prior to the sale of the parcels, such as soil banking and seed collection.

The five penstemon plants found during surveys could be impacted by the Proposed Action. Habitat within the disposal boundary area is not high quality penstemon habitat because it is not associated with elevated spring rain runoff, thus the potential loss of those areas would not be significant.

Under this alternative activities may indirectly affect the special status wildlife species known to occur in the area on lands transferred into private ownership. Construction activities associated with the Proposed Action would displace wildlife species and potentially cause direct mortality of less mobile species (such as reptiles), and impact

desert tortoise through direct habitat loss and individual species mortality. Impacts to actual BLM sensitive wildlife species cannot be accurately quantified because of the mobility of the species.

Estimated acres of impact to cactus/yucca habitat and tortoise habitat from the Proposed Action are listed in Table 4.4-2. The potential impacts were calculated based upon the density percentages within the disposal boundary area. The impacts to Mojave desert tortoise habitat was also based upon the estimated 41,500 acres of potential desert tortoise habitat on BLM land rather than the entire 46,700 acres within the disposal boundary area.

Approximately 850 acres of mesquite/acacia habitat located primarily in the north and southwest would likely be lost to future development. The significance of the impact to wildlife species occurring in this habitat, including migratory birds and the sensitive phainopepla, burrowing owl, and desert tortoise would depend on the availability of similar habitat on adjacent undeveloped private and public lands. It is unknown how many phainopepla would be affected by the potential impacts to the mesquite/acacia habitat.

Impacts to the phainopepla and the desert tortoise are covered by the Clark County Multiple Species Habitat Conservation Plan (MSHCP) and incidental take permit TE-034927-0 for disturbance to private land. Fees would be paid to Clark County for disturbance of tortoise habitat as required under the MSHCP and used for the conservation of higher quality habitat elsewhere. Therefore, impacts to sensitive wildlife species would not be significant. This alternative is not expected to conflict with any species management plans or policies.

The quality of habitat and abundance of wildlife species on the BLM lands have been impacted by fragmentation and increased human disturbance originating from surrounding development within the disposal boundary area. Since most of the land within the disposal boundary area is already fragmented due to existing development, it is unlikely that the Proposed Action would interfere

with the movement of migratory wildlife species or have a significant impact.

4.4.3 Conservation Transfer Alternative

Under this alternative, the BLM would continue to dispose of lands similar to the Proposed Action except approximately 5,000 acres would be maintained as open space with limited and compatible recreation development for trails and interpretive activities. The Conservation Transfer Area identified in Figure 2.4-1 in the northern part of the disposal boundary area would be restricted as to the type of future development that could occur without impacting the resources.

This alternative would protect sensitive biological resources including Las Vegas bearpoppy and Las Vegas buckwheat habitat within the conservation area. The issuance of ROWs and R&PP leases would continue on BLM lands until the remaining lands are disposed or transferred. Potential impacts would be similar to those described under the Proposed Action and No Action Alternatives. However, the BLM would avoid issuing ROWs through areas containing the bearpoppy and buckwheat or their habitat within the Conservation Transfer Area, which would have a beneficial impact to these species. If avoidance is not possible, mitigation measures would be implemented to lessen the potential impacts. If conservation efforts are successful, the Las Vegas buckwheat could avoid being listed under the Endangered Species Act.

Under this alternative, the direct and indirect impacts to biological resources would be similar to the Proposed Action. However, biological resources within the Conservation Area would benefit from the limited development and the preservation of the resources. Sensitive biological resources in the 5,000-acre conservation area are listed in Table 4.4-3. The acres of bearpoppy and buckwheat habitat were estimated based upon the number of plants (83 Las Vegas bearpoppy and 225 Las Vegas buckwheat) and the buffers (50 feet and 100 feet respectively) placed around each plant. No penstemon plants were documented within the Conservation Area. This alternative would provide for the preservation of the sensitive

**TABLE 4.4-2
ESTIMATED IMPACTS TO CACTUS/YUCCA AND TORTOISE HABITAT DENSITIES**

	Disposal Boundary Area (46,700 acres)		Proposed Action Estimated Disturbance (20,000 acres)
	Acres	Percent	
Cactus/Yucca¹			
Low	25,000	53%	10,700
Moderate	16,000	34%	6,800
High	6,000	13%	2,500
Tortoise²			
Very low	23,000	55%	11,000
Low	17,600	42%	8,400
Moderate	920	3%	600

1 See Figure 3.4-2.

2 See Figure 3.4-4. Desert tortoise acres were based upon the estimated 41,500 acres of potential desert tortoise habitat within the disposal boundary area

species within that area especially the bearpoppy and buckwheat, which would be a beneficial impact to biological resources. Mitigation measures for the two-tone penstemon would be the same as for the proposed action. Impacts to cactus/yucca habitat would be similar to the Proposed Action; however there would be limited impact within the Conservation Transfer Area.

4.4.4 Mitigation Measures

The BLM would require mitigation measures for direct impacts to biological resources from ROWs and R&PP leases according to the RMP and Biological Opinion 1-5-96-F-23R.2. Mitigation measures may include pre-construction surveys for protected plant and wildlife species, biological resource construction clearances and monitoring, collection of seed, and salvage and relocation of protected species. Areas with suitable desert tortoise habitat may require additional surveys for location and possible removal of individual tortoises.

Private landowners in the State of Nevada must apply for a permit from the NDF to “take” any plant species protected by the NRS. The NDF uses these permits to quantify numbers of plants taken by disturbance activities in order to fulfill their MSHCP requirements. Once land is transferred, mitigation measures for biological re-

sources would be addressed in the permit requirements of the MSHCP and by the NDF. Disturbance to areas with Las Vegas bearpoppy would require a permit from the NDF. The bearpoppy is covered by the MSHCP and incidental take permit TE-034927-0 for private lands. Prior to ground disturbing activities landowners would notify the NDF if bearpoppy populations are present and appropriate mitigation measures would be implemented, such as stockpiling of the soil, seed collection, etc. The NDF may require relocation of individual plants. The NDF also regulates and issues permits for the removal of cacti species from private lands for commercial purposes and suggests salvage options on private lands that would be disturbed. Salvaged plants are often transplanted to a nursery at the Desert Conservation Center located south of the City of Las Vegas.

Although not currently protected by the State of Nevada, the buckwheat has been proposed for state listing by the NDF. The buckwheat is also not a covered species under the MSHCP but would benefit from protection of the bearpoppy since the plants occur in similar habitat. Upon receiving State protection, disturbance to areas containing buckwheat would require a permit from NDF similar to the bearpoppy.

Mitigation measures for the two-toned penstemon would include soil banking and seed collection prior to land disposal.

**TABLE 4.4-3
BIOLOGICAL RESOURCES WITHIN THE 5,000-ACRE CONSERVATION AREA**

Resource	Estimated Acres of Habitat
Las Vegas bearpoppy ¹	33
Las Vegas buckwheat ²	360
Mesquite/acacia Complex	150
Cactus/Yucca ³	2,600 - low density 1,500 - moderate density 800 - high density
Desert Tortoise ⁴	3,800 - very low density 900 - low density 300 - moderate density

¹ Acres of habitat estimated based upon 83 plants with a 50-foot buffer each.

² Acres of habitat estimated based upon 225 plants with a 100-foot buffer each.

³ See Figure 3.4-2.

⁴ See Figure 3.4-4.

Impacts to desert tortoise habitat after the land is transferred would be mitigated under the MSHCP. Mitigation would include payment of fees to Clark County. Landowners may also contact the Clark County tortoise pick-up service to remove live desert tortoises from private land.

4.5 CULTURAL RESOURCES

Cultural resources are limited, nonrenewable resources whose values may be easily diminished by physical disturbances. As described in Section 3.5, cultural resources are prehistoric and historic archaeological sites that are considered important for scientific, traditional, religious, or other reasons. Federal laws and regulations, including Section 106 of the National Historic Preservation Act (NHPA) require federal agencies to consider the effects of their actions on properties listed or eligible for listing on the National Register of Historic Places (NRHP).

The criteria used to determine the significance of impacts on cultural resources include the effects on NRHP eligibility and future research potential. To be considered significant, resources must meet one or more of the criterion for inclusion on the NRHP. For purposes of this EIS, an adverse impact would be significant if it resulted in the destruction or loss of a resource listed or determined eligible for listing on the NRHP. The physical alteration of a resource in such a way that it no longer meets the eligibility criteria of the NRHP would also be a significant adverse impact.

The BLM has determined that four historic and five prehistoric sites located on BLM lands within the disposal boundary area are eligible for listing on the NRHP. The BLM consulted with the Nevada State Historic Preservation Officer (SHPO) and the SHPO concurred with the BLM via letter dated August 6, 2004 that the nine sites are eligible for the NRHP (see Appendix F).

4.5.1 No Action Alternative

Under the No Action Alternative land disposals authorized by SNPLMA would not continue. This would have a direct beneficial impact on cultural resource sites within the disposal boundary area as there would be no change in land use or loss of resource protection on BLM lands. There would be the potential for indirect impacts to cultural sites because of encroaching development and increased public access. Cultural resources are vulnerable to vandalism, off-highway vehicle use in the area, and other ground disturbing activities. These indirect impacts would be adverse and potentially significant if the sites are physically altered or destroyed. However, the management directions in the RMP would continue to address the data recovery and conservation of cultural resource sites potentially impacted by recreational uses and federal actions.

The BLM would continue to grant ROWs and R&PP leases as specified in the RMP. For analysis purposes it was assumed that approximately

2,600 acres of ROW grants and 880 acres of R&PP leases would be issued under this alternative. Since no additional lands would be sold, the acres of ROWs and R&PP leases issued annually would decrease over time. To estimate and describe potential impacts to cultural resources from ROW disturbance, representative alignments were selected throughout the disposal boundary area. The ROW examples varied in length from 2 miles to 10.5 miles and from 100 feet to 200 feet in width based on the adjoining land ownership. The ROW alignments used to estimate impacts to biological resources (see Appendix B) were also used for this analysis. The impacts from construction for infrastructure development were based upon the projected amount of surface disturbance and cultural resources documented during field surveys. There are no sites eligible for listing on the NRHP or non-eligible sites located within the representative alignments.

Known cultural resources sites would be avoided or mitigated thus any direct adverse impacts associated with construction and operation of the facility requiring the lease would be insignificant. Locations for ROWs would be restricted so as to not have significant impacts on an eligible site. However without further land sales, the projected need for ROWs and R&PP leases is anticipated to be minimal.

4.5.2 Proposed Action

The continued disposal of BLM lands would not directly impact cultural resources but subsequent development of the lands would have adverse impacts to any resources located on those lands. The administrative transfer of title and ownership would have no direct effect to sites but an adverse effect is assumed for purposes of Section 106 compliance (36 CFR §800.5(a)(2)(vii)).

There are nine sites within the disposal boundary area determined eligible for listing on the NRHP and the Tule Springs National Register Site, of which approximately 660 acres of the site are located on BLM lands available for disposal. All of these sites are located in the northern portion of the disposal boundary area. Under the Proposed Action, lands that are not transferred to an R&PP leaseholder would be sold at auction to private

parties and it is assumed that the majority of the lands would be developed for residential, commercial, and industrial uses. Thus the Proposed Action would have potential significant adverse effects to the sites if not first mitigated, as high density development would likely result in a permanent loss of the cultural resource.

Potential impacts from the continued issuance of ROWs and R&PP leases would be similar to that described under the No Action Alternative but the projected need for realty actions in areas of eligible cultural resource sites is anticipated to increase under this alternative. It is estimated that 4,500 acres of ROWs and 1,500 acres of R&PP leases could be issued until the remaining lands are sold but the exact locations are not known. However, areas of known sites would be avoided when possible and if avoidance would not be possible the site would be mitigated (see Section 4.5.4).

4.5.3 Conservation Transfer Alternative

The impacts to cultural resource sites resulting from the Conservation Transfer Alternative would be similar to those described for the Proposed Action; however, sites located within the Conservation Transfer Area would not be affected. There are two sites determined eligible for listing on the NRHP that are within or cross through the Conservation Transfer Area that would be protected because of the restricted type of future development that could occur without impacting the resources. The Tule Springs site would be protected from development by the NRHP designation and would also benefit from this alternative.

Potential impacts from the continued issuance of ROWs and R&PP leases would be similar to that described under the No Action Alternative. It is estimated that 3,500 acres of ROWs and 1,200 acres of R&PP leases could be issued until the remaining lands are sold but the exact locations are not known. Potential direct impacts would be similar to that described under the No Action Alternative and Proposed Action.

4.5.4 Mitigation Measures

The disposal of BLM lands and transfer of title are assumed to have an adverse effect on cultural resource sites because of anticipated subsequent development that could have the potential to physically alter or destroy the site. The BLM consulted with the Nevada SHPO in accordance with the Section 106 process to determine methods to avoid, minimize, or mitigate adverse effects to the sites. The result of this consultation is included in Appendix F.

Because of the uncertain timing of when or if lands containing cultural resources sites may be nominated for sale or transfer, the determination of affect and the extent of appropriate mitigation cannot be fully determined at this time. The BLM would prepare a Historic Properties Treatment Plan in consultation.

4.6 NATIVE AMERICAN RESOURCES

Native American resources are nonrenewable resources whose values may be diminished or lost by physical disturbance. The disposal of BLM lands and the transfer of title would not have a direct impact on Native American resources but the subsequent development and change in land use would be an indirect impact. Impacts to Native American resources would be considered significant if the land disposal action affects the NRHP eligibility of a Traditional Cultural Property (TCP), or affects the suitability of an area for religious or traditional uses. The extent of the impact would also depend on the location of the resource and the importance of it to the tribe.

The BLM consulted with 15 Native American tribes that are located in the vicinity of the Las Vegas Valley or that have a cultural affiliation with the area. The tribes did not provide any comments regarding the significance of any traditional cultural site within or adjacent to the disposal boundary area that could be affected by the land disposal action. The BLM consulted with the Nevada SHPO regarding these findings and the SHPO concurred with the BLM via letter dated August 6, 2004 that the efforts to identify proper-

ties of religious and traditional cultural significance were adequate (see Appendix F).

4.6.1 No Action Alternative

Under the No Action Alternative land disposals authorized by SNPLMA and the Clark County Act would not continue. This would have a direct beneficial impact on Native American resources within the disposal boundary area that are located on BLM lands as there would be no change in land use or loss of resource protection. The Southern Paiute villages and garden farm sites that are likely located within the disposal boundary area would not be impacted. However, the exact locations of these habitation sites are unknown thus the sites could still be impacted from ongoing development on private lands. There were no TCPs identified within the disposal boundary area; therefore, no direct or indirect adverse impacts would occur.

The BLM would continue to grant ROWs and R&PP leases as specified in the RMP. Known culturally significant sites would be avoided or mitigated thus any direct adverse impacts associated with construction and operation of the facility requiring the lease would be insignificant.

4.6.2 Proposed Action

The continued disposal of BLM lands would not directly impact Native American resources but subsequent development of the lands could have indirect impacts to any resources located on the those lands. Ground disturbing activities and audible and visual intrusions could disrupt the integrity and value of the resource. The Southern Paiute villages and garden farm sites that are likely located within the disposal boundary area could be indirectly impacted. The exact location of 10 of the 11 habitation sites is not known and their eligibility for listing on the NRHP cannot be determined, thus the significance of any adverse indirect impact is also unknown. However, consultation with the Native American tribes having interest in the area did not reveal the significance of these habitation sites nor identify other cultural areas that could be significantly impacted by the disposal and development of BLM lands.

There were no TCPs identified within the disposal boundary area; therefore, no direct or indirect adverse impacts from the land disposal action would occur. Although no TCPs were identified, their potential existence is not precluded. There is not sufficient information on which to evaluate the culturally significant areas against the National Register criteria to determine eligibility for listing on the NRHP and consultation with the tribes did not reveal any additional information. The Nevada SHPO determined that efforts to identify properties of religious and cultural significance in the disposal boundary area were adequate.

Potential impacts from the continued issuance of ROWs and R&PP leases would be similar to that described under the No Action Alternative.

4.6.3 Conservation Transfer Alternative

The BLM would consider land transfer mechanisms that restrict subsequent use of approximately 5,000 acres of certain lands to protect sensitive resources under this alternative. The conservation transfer area identified in Figure 2.4-1 in the northern part of the disposal boundary area would be restricted as to the type of future development that could occur without impacting the resources. Culturally significant areas that may be located within the conservation transfer area could be indirectly impacted because of the restricted development. However, the extent of any beneficial impact would be dependent on the location of the resource. The Las Vegas Wash is located in this area; however, it is not known if the entire wash itself is culturally significant or only portions of it, thus protection of the wash could potentially be an indirect yet beneficial impact. Indirect impacts to Native American resources outside the conservation transfer area would be similar to those described for the Proposed Action and no direct or indirect impacts would occur to known TCPs.

Potential impacts from the continued issuance of ROWs and R&PP leases would be similar to that described under the No Action Alternative.

4.6.4 Mitigation Measures

The disposal of BLM lands and transfer of title have no direct impacts to Native American resources and thus no mitigation would be necessary. In accordance with the National Historic Preservation Act, the BLM consulted with Native American tribes to identify potential impacts to traditional cultural properties from the land disposal action and to determine what, if any, mitigation measures may be necessary. The tribes did not provide any comments regarding the significance of any traditional cultural site within or adjacent to the disposal boundary area that could be affected by the land disposal action. The BLM consulted with the Nevada SHPO and the SHPO concurred with the BLM via letter dated August 6, 2004 that the efforts to identify properties of religious and traditional cultural significance were adequate and thus no mitigation measures are proposed.

4.7 PALEONTOLOGICAL RESOURCES

Paleontological resources are nonrenewable resources whose values may be diminished or lost by physical disturbance. Fossils are considered to be nonrenewable resources because of the infrequency of fossil preservation. Their rarity and scientific information that they provide can be highly significant records of ancient life.

An impact to paleontological resources would be considered significant if it destroys, disrupts, or results in the permanent loss of the resource for future educational and scientific purposes. Natural events, such as erosion and human-caused events can contribute to this loss.

4.7.1 No Action Alternative

The No Action Alternative for land disposal in the Las Vegas Valley is a continuation of realty management as specified in the RMP. No additional lands would be available for auction under SNPLMA.

Fossils are damaged and eventually destroyed by wind and water erosion, although how quickly

varies according to rock type, climate, topography, and the composition of the fossils. To maximize the scientific and educational value of fossils, the natural processes of erosion must be considered in conserving the resource. Consequently, these fossils would remain subject to the elements of the desert and related erosion processes. However, any indirect impact from natural processes is not significant if compared with impacts associated from encroaching development and human disturbances. The management directions in the RMP address the potential for extraction or preservation of scientific data.

Because of encroaching development, there would be indirect impacts from increased public access to the areas with paleontological resources. Paleontological resources exposed at the surface are vulnerable to vandalism, off-highway vehicle use in the area, and other ground disturbing activities. These indirect impacts would be adverse and potentially significant if the fossils are permanently lost.

The BLM would continue to issue ROWs and R&PP leases as specified in the RMP. An average of 1,300 acres of ROW grants and 440 acres of R&PP leases are issued annually and it is assumed that realty actions would continue at a similar rate for at least two years to support development of previously disposed lands and other private lands. Since no additional lands would be sold, the acres of ROWs and R&PP leases would decrease.

For analysis purposes it was assumed that approximately 2,600 acres of ROW grants and 880 acres of R&PP leases would be issued under this alternative potentially resulting in the disturbance of 3,400 acres. Because the exact locations of potential ROWs cannot be determined, representative alignments for ROWs were selected to estimate potential impacts to paleontological resources. The ROW alignments used to estimate impacts to biological resources (see Appendix B) were also used for this analysis. The ROW examples varied in length from 2 miles to 10.5 miles and from 100 feet to 200 feet in width based on the adjoining land ownership. Table 4.7-1 shows

the potential impacts to paleontological resources from those ROW alignment examples.

The impacts from construction for infrastructure development were based upon the projected amount of surface disturbance (acres) and paleontological resources documented during field surveys. A buffer 500 feet in diameter was placed around each paleontological site to protect potential subsurface fossils. Approximately 40 acres and 5 sites could be impacted based on the representative examples. However, any adverse direct impacts associated with construction and operation of the facility requiring the ROW would be minimized and thus insignificant. Areas of concentrated paleontological resources would be avoided when possible and if avoidance would not be possible the resource would be recovered and conserved. Locations for ROWs would be restricted so as to not have significant impacts on paleontological resources. Without further land sales the projected need for ROWs and R&PP leases in areas of paleontological resources is anticipated to be minimal.

4.7.2 Proposed Action

Under the Proposed Action the remaining BLM lands within the disposal boundary area identified by SNPLMA and modified by the Clark County Act would be disposed through sales or other title transfer actions. Rights-of-way would be issued to allow development of roads and utilities and R&PP leases would be granted for parks and other public facilities until the remaining lands are sold.

The administrative transfer of title and ownership would not have any direct impacts to paleontological resources, but the continued disposal of BLM lands in the areas of concentrated paleontological resources would have an indirect adverse impact on those resources. Lands that are not transferred to an R&PP leaseholder would be sold at auction to private parties and it is assumed that the majority of the lands would be developed for residential, commercial, and industrial uses. No federal or state regulations address the presence, removal, disturbance, or destruction of fossils on private land. As described in Section 3.7, the area of the Upper Las Vegas Wash is recognized as the

**TABLE 4.7-1
ROW EXAMPLES AND IMPACTS TO PALEONTOLOGICAL RESOURCES**

ROW Alignment	Length (miles)	Acres	Resource (acres)	Description
Example 1	2	26	0	---
Example 2	4	66	0	---
Example 3	10.5	250	35	5 sites plus buffer
Example 4	3	60	5	0 sites; buffer only

most abundant, diverse, and significant assemblage of late Pleistocene fossils in the Mojave Desert and from anywhere in the Great Basin. Thus development would have potential significant adverse impacts to 438 previously unrecorded paleontological resources, if not first recovered by qualified paleontologists, as high density development would likely result in a permanent loss of the resource. Ground disturbance associated with developments would also impact those yet undiscovered fossils in the subsurface.

Many of the known paleontologic localities are within the Upper Las Vegas Wash in areas planned to remain natural wash as identified in the Las Vegas Valley Flood Control Master Plan Update (PBS&J 2002). Although fossils would still be subject to erosion, this flood control planning designation would minimize adverse impacts to fossils by restricting ground disturbing development in the area. Future development surrounding the area would increase runoff potential through the Upper Las Vegas Wash, further exposing paleontological resources known to occur in the subsurface. Increasing exposure makes the resource more susceptible to erosion processes and human disturbances. The significance of any adverse impact would be dependent on the geologic conditions and the rate of erosion.

Potential impacts from the continued issuance of ROWs and R&PP leases would be similar to that described under the No Action Alternative; however, the projected need for realty actions in areas of paleontological resources is anticipated to increase under this alternative. It is estimated that 4,500 acres of ROWs and 1,500 acres of R&PP leases could be issued until the remaining lands are sold but the exact locations are not known. The ROW alignment example 3 in Table 4.7-1 represents the longest possible ROW through the area of known paleontologic localities. Approximately 35 acres and 5 sites would be adversely

impacted if this ROW alignment were selected. However, areas of concentrated paleontological resources would be avoided when possible and if avoidance would not be possible the resource would be recovered and conserved.

4.7.3 Conservation Transfer Alternative

The BLM would consider land transfer mechanisms that restrict subsequent use of approximately 5,000 acres to protect unique paleontological resources and sensitive plant species under this alternative. The Conservation Transfer Area identified in Figure 2.4-1 would be restricted as to the type of future development that could occur without impacting the resources. The area would be maintained as open space with limited recreation development for trails and interpretive activities. This alternative would provide for long-term conservation of the known paleontological resources and any as-yet-undiscovered fossils in the subsurface strata.

The limited development proposed for the Conservation Transfer Area would be consistent with the planned flood control facilities identified in the Las Vegas Valley Flood Control Master Plan Update, and impacts to paleontological resources would be similar to those described under the Proposed Action. Construction of flood control facilities other than a natural wash would be subject to the mitigation measures specified in Section 4.7.4, thereby minimizing any adverse impacts to the resources.

The presence of paleontological resources would have an impact on prospective development opportunities in the Conservation Transfer Area. A Conservation Agreement would be developed to address options on management of the lands in the area to ensure conservation of sensitive resources.

Anticipated land development restrictions to conserve paleontological resources would have an indirect adverse impact to developers and some recreation users (e.g., off-highway vehicle users). The significance of this indirect impact would be dependent on the availability of other lands in the vicinity of the Conservation Transfer Area that would be economically feasible to acquire and develop.

The issuance of ROWs and R&PP leases would continue until the remaining lands are disposed or transferred. It is estimated that 3,500 acres of ROWs and 1,200 acres of R&PP leases could be issued until the remaining lands are sold but the exact locations are not known. Potential direct impacts would be similar to that described under the No Action Alternative and Proposed Action; however, the projected need for ROWs and R&PP leases in areas of paleontological resources is anticipated to increase under this alternative but not as much as the Proposed Action.

4.7.4 Mitigation Measures

Paleontological resources exposed to the elements of nature and erosion or impacted by realty actions would be mitigated under the No Action Alternative according to the RMP management directives. Mitigation measures may include recovery of the fossils for preservation or educational and scientific purposes, or conservation of the resource *in situ*.

Under the Conservation Transfer Alternative, appropriate mitigation measures would be stipulated in the Conservation Agreement and transfer of title would be contingent upon implementation of these measures. The Conservation Agreement would address a cooperative program with the Nevada State Museum, local governments, professional vertebrate paleontologists, and local volunteers whereby exposed fossil resources would be recovered and/or preserved. Volunteers and trained amateurs can play an important role in helping to collect and mitigate fossils for preservation in repositories. Training programs that educate the public and involve amateur paleontologists in efforts to mitigate the loss of fossils to erosion and ground disturbing activities can prove beneficial. Areas that would be conserved *in situ*

or recovered would be determined through this cooperative program. Recommended treatment (mitigation) measures proposed in the Paleontologic Resources Assessment and Treatment Plan (SBCM 2004) that would be implemented include:

- Field recovery of exposed paleontologic resources and associated contextual data identified during the field survey.
- Implement data recovery program to identify and permanently preserve the resources including stabilization of large remains and screen washing of fossiliferous sediments to recover microfossil remains.
- Conduct scientific analysis of recovered fossils, including interpretation of species abundance, diversity, and age.
- Preserve and curate recovered significant fossil resources, including all associated contextual data at the Nevada State Museum and/or at a federally recognized, accredited repository with long-term retrievable storage.
- Disseminate information on the paleontological resources including publication in professional journals, public presentations, classes, and other forms of outreach and education.

These mitigation measures would ensure effective recovery and preservation of the exposed resources. However, recovery and preservation of the exposed resources does not reduce the paleontologic sensitivity of the rock units in the Las Vegas Formation. Subsurface fossils would undoubtedly remain and mitigation measures of any subsurface resources would be dependent upon the extent of the resource and ultimate land use.

There would be no requirement to mitigate paleontological resources on BLM lands that are sold. Options that may be considered to minimize the potential loss of the resource would be to inform prospective buyers of the resource localities and to adjust the fair market value of these lands to compensate for voluntary mitigation of the re-

source. Terms and conditions of the sale and patent of the land would then be subject to completion of the mitigation measures. The BLM may also fund and conduct mitigation measures on lands nominated for sale prior to offering the lands at auction.

4.8 VISUAL RESOURCES

Visual resources are the features of the landscape that contribute to the scenic quality of the area. Analysis of potential impacts to visual resources was completed in accordance with the objectives and methods described in the BLM Visual Resource Management (VRM) Guidelines (BLM 1986a). The objective of the BLM VRM guidelines is to manage public lands in a manner that would protect the quality of the scenic or visual values of those lands.

A visual resource analysis was completed for this land disposal project and the results are included in Appendix C. Impacts are described in terms of how a viewer group would be affected by a change to the features of the landscape. The analysis consisted of the selection of key observation points (KOPs) and an assessment of viewer groups. The KOPs (see Figure 3.8-1) were selected based on the viewer groups that may be affected by the action, types of planned improvements that would have varied visual impact consequences, and orientation of the viewers toward the project area. The viewer groups included residents of newly developed areas within the disposal boundary and users of adjacent lands outside the disposal boundary area.

The BLM Visual Contrast Rating Worksheets were completed for the Proposed Action and the Conservation Transfer Alternative at each KOP location. The worksheets provide the tools to determine whether the proposed activity would be compatible with the designated VRM classification. A worksheet for the No Action Alternative was not completed because there would be no further disposal of BLM lands therefore no impacts to the existing visual resources.

For purposes of this EIS, impacts to visual resources would be significant if the action would occur in an area that would be incompatible with

the VRM classifications of adjoining BLM lands or substantially change the overall visual character of the region. Development of private lands, such that VRM classifications on surrounding BLM lands could not be achieved or maintained would be a significant impact.

4.8.1 No Action Alternative

Under the No Action Alternative, no further BLM lands would be sold; therefore, the land would remain in its current condition and no direct impacts to visual resources would occur.

The ROWs and R&PP leases for utilities and public use would continue to be granted by the BLM. Power, gas, and water lines may be constructed that would have temporary visual impacts during the construction activities. Heavy equipment, soil stockpiles, and increased vehicular presence would temporarily disrupt the natural landscape. Permanent visual impacts would include surface scars that remain after construction, maintenance roadways, and the continued presence of above-ground power lines. However, the location of utility lines would be restricted based on the guidelines of the RMP, the land use plan for the area, and in accordance with the VRM classification. Issuance of R&PP leases would be allowed to the extent compatible with VRM classifications.

4.8.2 Proposed Action

The transfer of land ownership would not disturb or alter the existing environment and therefore would not directly affect or adversely impact the existing visual resources.

The development of the disposed lands would have an impact on visual resources. The existing natural environment would be transformed into residential, commercial, and industrial land uses in accordance with local land use plans. Images superimposed on photos taken from the KOP locations were used to simulate the potential appearance of these areas after development (see Appendix C). The VRM classifications would not apply to BLM lands after title is transferred.

Viewer groups in the Tule Springs and Red Rock Canyon areas would experience more impacts to visual resources than similar groups in other parts of the Valley. The BLM lands directly adjacent to these areas would be more sensitive in terms of changes to the visual character of the landscape than parcels located in other areas of the Valley. Development of the parcels located directly adjacent to or within Class III areas would eliminate the rural open character of the landscape and substantially alter the form, line, color, and texture. This development would represent a strong contrast and would alter the existing landscape to the extent that may attract or focus attention of the casual viewer. Private lands adjacent to Tule Springs and along State Route 157 near Red Rock Canyon are being developed, thus future development of the BLM disposed lands visible from Tule Springs and Red Rock Canyon would result in a minimal change to the visual character of the area.

Lands available for disposal located adjacent to the Sloan Canyon NCA in the far southern part of the disposal boundary area are within VRM Class III and Class IV management areas. Development of the Class IV management areas allows activities involving major modification to the existing landscape character. Actions may create significant landscape alterations and would be obvious to casual viewers. Development of the parcels within Class III areas would eliminate the rural open character of the landscape and substantially alter the form, line, color, and texture and would represent a strong contrast and alter the existing landscape to the extent that may attract or focus attention of the casual viewer. However, moderate changes to the characteristic landscape are allowed in Class III management areas. The BLM land within Sloan Canyon NCA and adjacent to the disposal boundary area is classified as VRM Class II. Future development adjacent to Sloan Canyon NCA may have an indirect adverse impact on viewers of this area.

There would be minimal impacts to visual resources in the areas surrounded by development in the southwestern and southeastern part of the Valley. These areas have been designated as Class IV, which is compatible with major modifications of the existing landscape character and may create

significant landscape alterations that would be obvious to casual viewers. Future development of the BLM disposed parcels within these areas would occur in accordance with the guidelines of local land use plans and be compatible with the VRM classification of adjacent lands. Because of the ongoing development throughout the Valley, the Proposed Action would not cause a significant adverse indirect impact to visual resources because it would not result in substantial changes to the overall visual character of the region.

Potential impacts from the continued issuance of ROWs and R&PP leases would be similar to that described under the No Action Alternative.

4.8.3 Conservation Transfer Alternative

The impacts resulting from the Conservation Transfer Alternative would be similar to those described for the Proposed Action, but less land would be intensely developed in the northern portion of the Valley and thus fewer visual resources would be affected.

Viewer groups looking into the Conservation Transfer Area would observe lands in their natural condition. In keeping with Class III management objectives, this alternative could provide for areas near Tule Springs and the Desert National Wildlife Range to be transferred subject to restricted use to protect sensitive resource values and partially retain the existing characteristic landscape. Viewers within the area would observe development of the surrounding land and minimal views of the mountains in the background, which could adversely impact the viewer.

Potential impacts from the continued issuance of ROWs and R&PP leases would be similar to that described under the No Action Alternative.

4.8.4 Mitigation Measures

The BLM lands outside the disposal boundary located in Class IV areas would not be significantly impacted by development expected to occur on disposed lands. Residential and commercial development would be compatible

with VRM Class IV objectives and thus no mitigation would be required for the remaining BLM lands.

Land development after title is transferred would not be subject to the BLM VRM classifications thus any mitigation to the visual landscape would be dependent on local land use planning requirements. Although no mitigation measures are required with title transfer, the impacts to views from within the Conservation Area may be lessened by planting indigenous trees and other shrubs along fence lines and buildings.

Residential and commercial development projected for disposed lands adjacent to Sloan Canyon NCA could indirectly impact the visual quality of the area. In the development of the RMP for Sloan Canyon NCA, the BLM would assess the visual character of the changing landscape and classify the scenic quality accordingly.

4.9 LAND USE

Land use generally relates to how humans utilize land resources for economic values. Community development and land use plans were reviewed to determine impacts and compatible uses. For purposes of this EIS an impact to land use would be considered significant if the land disposal action would:

- Substantially conflict with land use plans and community goals,
- Alter the character and use of the land in relation to surrounding uses,
- Disrupt or divide the physical arrangement of an established community, or
- Create a long-term loss of access for businesses and/or residences.

The type of development and land use projected to occur after disposal was based on developed uses of BLM lands that were disposed of under SNPLMA from October 1998 through December 2000, and on planned development land use categories used by the Regional Transportation Com-

mission of Southern Nevada (RTC) for transportation planning (RTC 2002). The nine land development or end-use groups that were used to project the future use of the BLM lands are described in Section 3.9. The analyses of potential impacts are based on those end-use groups and the projected mix (percentage) of development.

4.9.1 No Action Alternative

Under the No Action Alternative, the BLM lands within the SNPLMA boundary would remain public land and be subject to all applicable laws, regulations, and management directives according to the 1998 Las Vegas RMP. The BLM would continue to grant ROWs and R&PP leases as specified in the RMP. An average of 1,300 acres of ROW grants and 440 acres of R&PP leases are issued annually to support development of previously disposed lands. The need for ROW and R&PP use is generally proportionate to development. Without further land sales, the projected need for these realty actions in the disposal boundary area is anticipated to decrease. It is expected that ROW grants and R&PP leases would only need to be issued for the next two years to accommodate previously disposed lands since no additional lands would be sold. Therefore, it was calculated that approximately 2,600 acres of ROW grants and 880 acres of R&PP leases would be issued under this alternative thus potentially resulting in the disturbance of 3,400 acres. Requests for R&PP leases and ROWs would be granted provided the requests are compatible with the governing agency's land use plan for the area, thus no impact would be anticipated. Impacts to air quality, biological resources, cultural resources, and paleontological resources from this alternative are discussed in thus respective sections.

Most of the BLM lands within the disposal boundary area have a developed land use planned by the cities of Las Vegas, North Las Vegas, Henderson and by Clark County. Discontinuing the land disposal action would substantially conflict with land use plans and community goals, which would be a significant indirect impact to land use.

The vacant BLM lands within the disposal boundary area would remain interspersed with or adjacent to private land, much of which is developed. This scattered pattern of land ownership would continue to fragment the landscape and land use, having a direct adverse impact on the management of these lands. The land would be subject to unauthorized surface disturbance, illegal use by off-highway vehicles, and continued dumping of construction and household debris.

The No Action Alternative would not alter the character and use of the land in relation to surrounding uses. However, continued federal ownership of various parcels would disrupt or divide the physical arrangement of established communities because development would continue on the surrounding privately owned land as intended by the community land use plans. No long-term loss of access for businesses and/or residences would be anticipated because ROWs would continue to be granted to provide access across BLM land to private property.

4.9.2 Proposed Action

The remaining BLM land within the disposal boundary area identified by SNPLMA and modified by the Clark County Act would be disposed through sales or other patent transfer actions. The BLM would continue to manage the lands according to the directives of the RMP until the lands are disposed, thus ROWs would continue to be issued to allow development of roads and utilities and R&PP leases would be granted for parks and other public facilities. Approximately 1,500 acres of R&PP leases and approximately 4,500 acres of ROWs are projected to be granted until the remaining lands are sold. The amount is expected to decrease on an annual basis as the remaining BLM lands are sold or transferred.

The remaining land within the disposal boundary area would be transferred from federal ownership subject to any encumbrances. This action would result in the disposal of the remaining 46,700 acres by 2015 with nearly 20,000 acres developed by 2018.

The SNPLMA requires the BLM to offer lands for disposal based on consultations and nominations

by local governments, the general public and BLM. This selection process and local permitting requirements would ensure that development of the lands would be consistent with community land use plans and zoning requirements. The local governmental entities have the option of acquiring land from BLM for beneficial community uses such as roads, public utilities, flood control, schools, parks and other public purposes. Thus, there would be no adverse indirect impacts to land use planning from the land disposal action.

Development of parcels sold would change the existing land use from predominately vacant lands to residential, commercial, industrial, and recreational uses. However, this would not be a significant impact because development would not conflict with land use plans and community goals. This alternative would not alter the character and use of the land in relation to surrounding uses because existing and current development surrounds or abuts most of the BLM parcels. It is also not expected to disrupt or divide the physical arrangement of an established community or create a long-term loss of access for businesses and/or residences.

The BLM would continue to issue ROWs and R&PP leases on the remaining BLM lands until the acreage is sold or transferred. Potential impacts from these realty actions would be similar to that described under the No Action Alternative. There would be no indirect adverse impact to local land use planning because the leases would be issued only if compatible with the local plan and only after joint selection. The demand for ROWs and R&PP leases would decrease over time as the available BLM lands are sold.

The Tule Springs National Register Site would impact the planned land use within the area. The site covers approximately 960 acres of which 660 acres are located on BLM land that would be disposed and 300 acres on State of Nevada land. Of the BLM lands available for disposal approximately 510 acres are designated in the land use plan for residential development and 150 acres are designated for open space/recreation use. Development within the Tule Springs site would be restricted due to the site's listing on the NRHP thus impacts to planned land use would be adverse and

possibly significant. However, much of the site is located within an area planned by the CCRFCD to remain as natural wash for flood control purposes. This flood control designation would also affect other planned land use. Locations of ROWs and R&PP leases would avoid the Tule Springs site or would be required to mitigate any potential impacts.

4.9.3 Conservation Transfer Alternative

Approximately 5,000 acres within the disposal boundary area would be maintained as open space with limited recreational development for trails and interpretive activities. This would protect sensitive vegetation, cultural resources, and unique paleontological resources along the Upper Las Vegas Wash within the northern part of the disposal boundary area. The issuance of ROWs and R&PP leases would continue until the remaining lands are disposed or transferred, as discussed in Section 4.9.2. However, the potential for ROWs and R&PP leases within the Conservation Transfer Area would be limited.

Approximately 1,300 acres of the 5,000 acres in the Conservation Transfer Area are planned residential housing developments in the City of North Las Vegas community land use plan. Approximately 1,900 acres are designated as open space and approximately 1,800 acres do not currently have a planned land use designation because the land was released from wilderness designation in the Clark County Act. The planned land use within the Conservation Transfer Area is shown in Figure 4.9-1. However, as stated in Section 3.9.4, the City of North Las Vegas is revising its land use plan and is expected to designate the released WSA with a developed planned use such as residential rather than open space.

Approximately 1,400 acres within the Conservation Transfer Area are designated as flood control facility in the 2002 Clark County Regional Flood Control Master Plan. That includes 530 acres of existing natural channel, 123 acres of existing basin facility, 730 acres of existing floodway, and approximately 25 acres of existing dike or unlined channel. Approximately 440 acres of the desig-

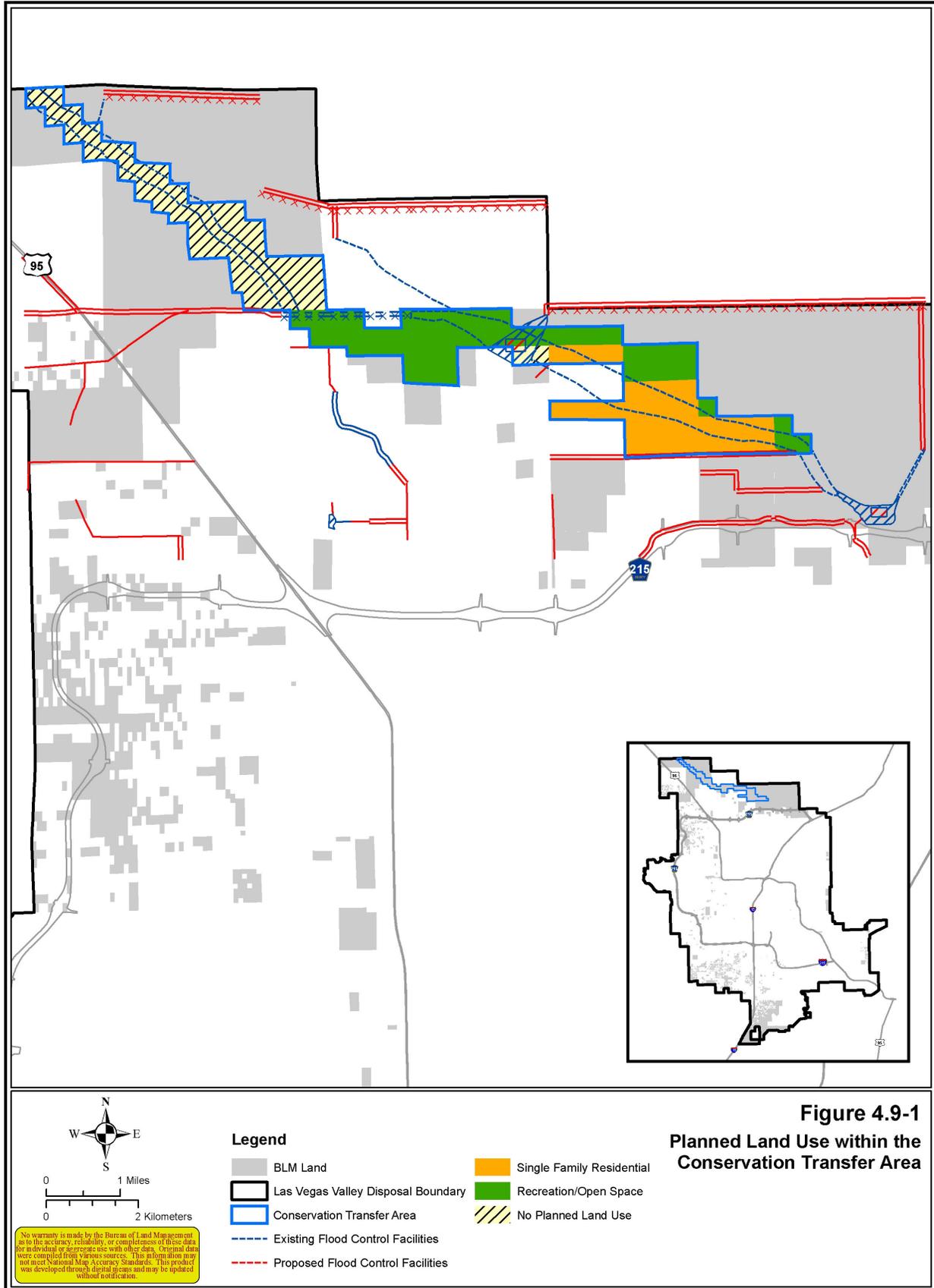
nated floodway overlap the area also designated for residential use.

Disposing of the land in the Conservation Transfer Area with restrictions on the type of development that could occur would have an indirect adverse impact on the land use planning by the local communities, particularly the cities of North Las Vegas and Las Vegas. The impact would be significant if this alternative would substantially conflict with community goals. This alternative would conflict with the planned land use of the 1,300 acres of residential housing and with the 1,800 acres of released wilderness study area that are expected to be assigned a developed use by the City of North Las Vegas. Although the existing and planned flood control facilities (including natural wash and floodway) conflict with planned residential use, flood control would be included and amended through development design and therefore would not be adversely impacted.

The Tule Springs National Register Site is within the Conservation Transfer Area and lands under the State of Nevada ownership. Regardless of community land use designation, the Tule Springs site would be protected from development by the NRHP designation and would benefit from this alternative.

Although the total amount of land proposed for conservation (5,000 acres) is not significant compared to the remaining amount of land to be disposed (46,700 acres), the location and orientation of the Conservation Transfer Area could potentially fragment the future development of communities. Preserving the designated area would not alter the character and current use of the land but would alter the intended character of the area in relation to the surrounding uses. Some of the Conservation Transfer Area would not disrupt or divide the physical arrangement of an established surrounding community but it may impact future planning of the area.

This alternative would not have a direct impact to land management. Under this alternative the BLM would transfer the area, subject to a conservation agreement, to entities that would manage the area and protect its resources. Therefore the BLM would not have long-term challenges of



managing this area. The land would be transferred with restrictions appropriate for conservation of the paleontological and biological resources and as decided upon by the inter-agency steering committee.

The R&PP Act allows any political subdivision of a state to acquire up to 6,400 acres for recreational purposes in any one calendar year. The county and/or local governments could acquire the entire Conservation Area for a regional park with a trail system or other recreational uses under an R&PP lease/conveyance and potentially receive SNPLMA funding for management of the area.

4.9.4 Mitigation Measures

There would be no significant direct impacts to planned land use that would require mitigation. The BLM would continue to issue ROWs and R&PP leases subject to restrictions that protect sensitive resources. The indirect adverse impact to the Tule Springs National Register Site would be addressed by BLM in consultation with the SHPO prior to disposing of those lands (see Section 4.5). Mitigation of this site may include patent restrictions to limit the type of development that would be allowed. After the BLM lands are sold and title is transferred, the purchaser of the land would be required to comply with the local governing agency's permitting and development requirements. Under the Conservation Transfer Alternative, the inter-agency steering committee in conjunction with the BLM would establish a Conservation Agreement that defines appropriate measures to conserve and/or mitigate the sensitive resources.

4.10 RECREATION AND WILDERNESS

The BLM lands are managed to provide broad opportunities for many different types of recreation uses and users. Typical dispersed recreation uses on the vacant BLM lands within the disposal boundary area include biking, hiking. Also, unauthorized casual off-highway vehicle (OHV) use occurs throughout the disposal area. No organized recreation events that generally require a special recreation use permit from the BLM have

been scheduled on lands within the disposal boundary area. The Clark County Act released certain Wilderness Study Areas (WSAs) within and adjacent to the disposal boundary area from wilderness designation.

For the purposes of this EIS, impacts on recreation and wilderness uses and users would be considered significant if the land disposal action would eliminate or reduce open lands available for recreation use, compromise public health or safety, or conflict with local land use plans.

4.10.1 No Action Alternative

Under the No Action Alternative land disposals and public auctions authorized by SNPLMA would not continue. The BLM lands within the disposal boundary area would remain open and available for dispersed recreation uses. There would be no direct impact to the recreation users of these lands. The released WSAs in the northern part of the disposal boundary area (see Figure 3.10-3) would be available for other dispersed uses, such as motorized recreation, pending land management decisions by the BLM.

The SNPLMA allocated 85 percent of the revenue from the sale of BLM lands to be deposited into a special account and expended for certain uses. These uses include the development of parks, trails, and natural areas in Clark County, and capital improvements at Red Rock Canyon National Conservation Area (NCA), Desert National Wildlife Refuge Complex, Lake Mead and Spring Mountains National Recreation Areas, and other areas administered by the BLM in Clark County. No additional BLM land sales would have an indirect adverse impact on recreation opportunities by eliminating the source of funding for recreation purposes and improvements. Because of the amount of revenue that would be anticipated from continued land sales, loss of funds from this special account would be significant.

The realty program for the Las Vegas Field Office as specified in the RMP, including the issuance of R&PP leases would continue under the No Action Alternative. The R&PP leases are for various public facilities with many leases for community parks and recreation facilities. Growth and devel-

opment on private lands in the Las Vegas Valley would result in the continued requests by local governments to lease BLM lands for recreation purposes. This would have a beneficial impact for users of modern urban recreation facilities. Issuance of the leases would be compatible with the local government land use plan for the area.

Locations for ROWs would be restricted so as to not have long-term adverse impacts on recreation. Because there are no BLM lands within the disposal boundary area that have high recreation use or users, any adverse impact from construction of the facility requiring the ROW would be insignificant.

4.10.2 Proposed Action

The continued disposal of vacant BLM lands would have an indirect impact on recreation uses and users. Lands that are not transferred to an R&PP holder would be sold at auction to private parties and it is assumed that the majority of the lands would be developed for residential, commercial, and industrial uses. Most of the BLM lands are vacant and undeveloped but have been used extensively by the public for various recreation activities, including horseback riding, bicycling, walking, and some hiking. Illegal activities include casual target shooting, trash dumping, auto stripping, and driving on unpaved roads and lots not under the jurisdiction of Clark County in the non-attainment area. Non-attainment of federal and county air quality standards has resulted in the BLM imposing an indefinite moratorium on any dust generating organized activity requiring a Special Recreation Permit within the Las Vegas Valley.

The Resource Management Plan OHV Designations within the disposal boundary area is limited to existing roads, trails, and dry washes (see Figure 3.10-1). Disposal and development would eliminate the public access to these roads and trails for recreation uses, having an indirect adverse impact to the user. Any adverse impact would be insignificant as there would remain large areas of public lands adjacent to the disposal boundary area for recreation opportunities (see Table 3.10-1). Based on the projected end use of the disposed lands (see Section 3.9.4), approxi-

mately seven percent of the lands developed annually would be for recreation and open space uses.

Illegal activities would likely continue and would move outwards onto adjacent public lands as the Valley is developed. These illegal activities would have an adverse impact on lands that are relatively undisturbed.

Recreation areas in the Valley can be accessed from the BLM lands within the disposal boundary area. In some instances this access represents unauthorized use of non-designated roads or trails. Disposal and subsequent development of these lands would limit the access to these recreation areas. The managing agencies may perceive the lack of open access as a beneficial impact because recreation users would be required to access these recreation areas via designated roadways or trail systems, thereby controlling any adverse impacts to resources from illegal OHV use. This loss of open access could be perceived as a negative impact to the population that currently uses the BLM parcels for entry to adjacent recreation areas; however designated access roads would still be available for use thus any impact would be insignificant.

Trails connecting the Las Vegas Valley Trail System with Red Rock Canyon NCA have been proposed. Funds received through the SNPLMA special account would be applied to develop these trails, which would represent a beneficial impact to recreation opportunities for valley residents, and in the NCA.

Planning for the Sloan Canyon NCA would address urban interface and public access for recreation. Until land management decisions are finalized, the OHV designation for the area that encompasses Sloan Canyon NCA limits motorized and non-motorized vehicles to existing roads, trails, and dry washes. In designated wilderness portions of Sloan Canyon NCA, mechanical transport is prohibited.

Access to the Desert National Wildlife Range is through the Corn Creek Field Station located approximately 25 miles northwest of Las Vegas and management rules of the range require that all

vehicles remain on designated roads. Access from the BLM lands adjacent to the range is not authorized thus future development of these lands could potentially control unauthorized access, having an indirect beneficial impact to the range. Continued expansion into the northern portions of the disposal boundary area could also have an indirect adverse impact on the range because of increased urban interface issues.

The SNPLMA allocated 85 percent of the revenue from the sale of BLM lands to be deposited into a special account and expended for certain uses, including the development of parks, trails, and natural areas in Clark County. Funds are also available for capital improvements at Red Rock Canyon NCA, Desert National Wildlife Range, Lake Mead and Spring Mountains National Recreation Areas, and other areas administered by the BLM in Clark County. The revenue from the BLM land sales has an indirect impact on recreation opportunities by providing a source of funding for recreation purposes and improvements. Capitol improvement projects in recreation areas would include facilities designed for the expected increase of visitor use with the population growth in the Valley. Because of the amount of revenue that would be anticipated from continued land sales, funds from this special account would have a significant beneficial impact.

Issuance of new R&PP leases for recreation purposes would continue and the BLM lands that are under R&PP leases would be transferred to the leaseholder. Any indirect impacts from the transfer of title are not expected to change the recreation patterns of these lands or reduce or eliminate any recreation or public use. Potential impacts from the continued issuance of ROWs and R&PP leases would be similar to that described under the No Action Alternative.

4.10.3 Conservation Transfer Alternative

The BLM would consider land transfer mechanisms that restrict subsequent use of approximately 5,000 acres of certain lands to protect sensitive vegetation and paleontological resources under this alternative. The Conservation Transfer Area identified in Figure 2.4-1 in the northern part

of the disposal boundary area would be restricted as to the type of future development that could occur without impacting the resources. The area would be maintained as open space with limited recreation development for trails and interpretive activities. This would be a beneficial impact for the recreational user by maintaining the open space and improving the recreational value of the area.

The other direct and indirect impacts of this alternative to recreation uses and users would be similar to that described for the Proposed Action. The issuance of ROWs and R&PP leases would continue until the remaining lands are disposed or transferred. Potential impacts would be similar to that described under the No Action Alternative and Proposed Action.

4.10.4 Mitigation

The transfer of title would not have any significant direct impacts to recreation uses and users thus no mitigation would be required.

The Southern Nevada Regional Planning Commission (SNRPC), established by the Nevada State Legislature, designated a standard of 2.5 acres of programmable park space per 1,000 people. The disposal of BLM lands is to be conducted consistent with local land use plans which provide for recreation development. These land use plans outline development and encourage the designation of areas for local parks and trails based on standards recommended by the SNRPC. Implementation of the SNRPC standards would minimize any adverse impact to recreation users because of the loss of vacant BLM lands used for recreation purposes.

4.11 HAZARDOUS MATERIALS

This section provides an analysis of direct impacts on land disposal actions from the presence of hazardous materials, as well as the potential for indirect impacts that may result from anticipated development activities after land disposal. An impact would be significant if the type and/or quantity of hazardous materials on BLM lands:

- Prevented the disposal of lands,
- Required remediation prior to disposal, or
- Created a potential health hazard or the use, production, or disposal of materials posed a hazard to people or animal populations in the area affected.

The BLM conducted a modified Phase I Environmental Site Assessment to identify the presence of hazardous substances and petroleum products within the disposal boundary area. The purpose of the assessment was to identify any parcels that may not be suitable for disposal or may impact the transfer of title without first conducting additional investigations or some type of remedial action. The information from the modified Phase I was used to analyze potential impacts on land disposal actions for this EIS. Site assessments for specific parcels offered for sale would be completed within 30 days of title transfer.

4.11.1 No Action Alternative

The No Action Alternative to land disposal as directed by SNPLMA is a continuation of realty management for the Las Vegas Field Office as specified in the RMP. Land disposals authorized by SNPLMA and the Clark County Act would not continue.

There are no direct impacts from hazardous materials associated with the No Action alternative. All group activities on BLM managed lands and facilities (such as claimants, concessionaires, contractors, permittees, and lessees) would be held responsible for compliance with federal, state, and local waste management requirements. The abundance of dump piles and miscellaneous debris on BLM managed lands may increase as the population of the Las Vegas Valley continues to increase and development encroaches closer to BLM lands. However, dump piles of predominantly household and landscaping waste and construction debris are generally not hazardous nor present a significant environmental concern.

Continued issuance of ROW grants and R&PP leases would be minimally impacted by the pres-

ence of hazardous materials. The likelihood of encountering hazardous materials from past releases during construction in a ROW or R&PP lease that could impact worker safety is minimal. Construction equipment and associated activities have the potential to spill or release hazardous materials onto the ground; however, the quantities would likely be small because of the anticipated size and duration of the realty actions. Any adverse impact to soils, groundwater, or workers would be insignificant provided appropriate spill control and clean up measures are followed.

4.11.2 Proposed Action

An environmental regulatory database review was conducted to ascertain the location of existing hazardous materials and the impact that those release materials may have on the environment. A number of regulatory sites were identified within a one-mile radius of BLM managed lands. However, these sites are not of concern because they are either closed (i.e., not requiring any further corrective action) or have a low probability of adverse impact based on the distance of the release from BLM lands or the lack of a likely contamination pathway.

The presence of hazardous materials on BLM lands would have a direct impact to the sale of lands and transfer of title. The extent and significance of any impacts would be dependent upon the amount of contamination. No warranty of any kind, express or implied, is given by the U.S. as to the title, physical condition or potential uses of the parcels of land proposed for sale. The conveyance of any parcel with hazardous materials present would not be on a contingency basis. To the extent required by law, all such parcels are subject to the requirements of Section 120(h) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This section requires the BLM to take any remedial action to protect human health and the environment before transfer of title or after transfer if additional remedial action is found to be necessary. However, if title is transferred to a potential responsible party, such as a leaseholder of the parcel, the BLM is not subject to conducting remediation of any contamination caused by the leaseholder.

The BLM conducted a modified Phase I Environmental Site Assessment to identify the presence of hazardous substances and petroleum products within the disposal boundary area. There were five recognized environmental conditions (RECs) identified during the modified Phase I (see Figure 3.11-1) that are recommended for further investigation prior to transfer of title or designation for some other use, such as R&PP.

The Lone Mountain Plant identified as REC 2 in Table 3.11-3 is currently operated under a long-term lease with the BLM. The abundance of quarry activities would make this site unsuitable for other use and it is assumed that title would transfer to the current leaseholder, Nevada Ready-Mix. If title were transferred to some other buyer, Nevada Ready-Mix would be responsible for further environmental investigations or any necessary remedial actions. The quantity of hazardous materials and extent of any contamination at the other four RECs (see Table 3.11-3) are unknown. The BLM would be required to investigate environmental conditions at these four locations prior to title transfer.

Potential future indirect impacts associated with hazardous materials would include items such as lubricants, oils, cooling fluids, and diesel fuel used during construction activities on lands after title is transferred. It is assumed that spills and releases would be likely but the quantity and type of substances cannot be determined, thus the significance of indirect impacts associated with these activities is not known.

Some BLM lands have the potential to present hazardous materials concerns from adjacent properties; however, the Nevada Division of Environmental Protection does not typically hold landowners responsible for contamination that originated from an offsite source. The BLM is required to disclose of any information that may present environmental hazards, but would not be responsible for recommended sampling efforts. If concern exceeds risk tolerance, a Phase II Environmental Site Assessment can be performed by a prospective buyer to determine presence of contamination.

The abundance of miscellaneous dump piles consisting mainly of household waste, concrete, and

landscape debris located throughout the disposal boundary area may present an unforeseen hazardous materials condition. Based on the modified Phase I these sites do not require additional investigations or future remediation prior to title transfer. However, over the duration of the planning period the abundance or quantity of dump piles may increase and present a significant hazardous materials condition.

Potential direct impacts from the presence of hazardous materials because of issuance of ROW grants and R&PP leases would be similar to the impacts described under the No Action alternative. The potential for impacts from spills or releases of hazardous materials would decrease as the volume of grants and leases decrease with continued land sales.

4.11.3 Conservation Transfer Alternative

Under this alternative the BLM would consider land transfer mechanisms that restrict subsequent use of certain lands to protect sensitive resources. The conservation transfer area identified in Figure 2.4-1 in the northern part of the disposal boundary area would be restricted as to the type of future development that could occur without impacting these resources.

There is one REC identified in the Conservation Transfer Area that may require further investigation prior to title transfer. The REC identified as Number 3 in Table 3.11-3 is steel pipes protruding from the ground. The pipes could act as a conduit for contamination into the soil and/or groundwater beneath the site. There is no available information on the pipes or their prior use identified in the modified Phase I. A hazardous materials condition may be present but the extent or significance of any contamination is unknown. It is recommended that further investigations be performed by the BLM similar to those identified for the Proposed Action.

Indirect impacts from hazardous materials associated with subsequent future development activities outside the conservation transfer area would be similar to that described under the Proposed Action.

Potential direct impacts from the presence of hazardous materials because of issuance of ROW grants and R&PP leases would be similar to the impacts described under the No Action alternative. The potential for impacts from spills or releases of hazardous materials would decrease as the volume of grants and leases decrease with continued land sales.

4.11.4 Mitigation Measures

It is anticipated that the remaining BLM lands would be completely disposed by the year 2015. Because of this length of time and the likely change to conditions noted in the modified Phase I, BLM lands nominated for disposal would require site-specific investigations for hazardous materials prior to title transfer. The BLM policy requires an environmental site assessment be updated within 30 days of title transfer.

The issuance of ROW grants and R&PP leases are conditioned on the holder taking responsibility for remediation of any hazardous substances emanating from the ROW or lease area. The BLM or leaseholder attempts to minimize releases of hazardous materials through compliance with current regulations and implementation of best management practices during construction. The BLM reports releases of hazardous materials, assesses the impacts on resources, and takes the appropriate response, removal, or remedial actions.

If the BLM conducts further investigation on the BLM parcels with identified RECs or further investigation is conducted by a prospective buyer to determine if contamination has migrated to a BLM parcel, the handling and disposal of hazardous materials would be done in accordance with state and federal regulations to ensure potential impacts would be minimized.

4.12 SOCIOECONOMICS

The socioeconomic analysis focused on Clark County, Nevada. The impact methodology included a qualitative and quantitative analysis of various sources of data and an input-output (I-O) computer model to predict project related impacts within Clark County. The specific details regarding the methodology and assumptions used in the

analysis and the completed data are presented in Appendix E.

The potential economic impacts were estimated using the IMPLAN Pro® I-O model. Input-output modeling is a mathematical accounting of the flow of dollars and commodities through an area's economy. The model provides an estimate of how a given amount of a particular economic activity translates into jobs and income in the area. It predicts how expenditures would affect specific industries within the area as dollars are spent and re-spend locally. The IMPLAN results are expressed as a culmination of construction and other commercial industries and are discussed in terms of total output.

The BLM action under the Proposed Action or Conservation Transfer Alternative is the sale of lands and transfer of title to the purchaser. The impact to the economy would be from the subsequent development of the disposed lands, thus the results of the IMPLAN model reflect the indirect impacts of the BLM land disposal action. Specific assumptions regarding future development scenarios were used for the IMPLAN model to estimate economic impacts. These assumptions include:

- The annual average rate of land disposal is 4,000 acres per year and all remaining lands would be sold by 2015.
- Approximately 1,330 acres per year would be developed based on development rates for land disposed between 1998 and 2000.
- Output was calculated through 2018 which is the end of the planning period.
- All project construction expenditures are assumed to occur in Clark County.
- Construction costs or expenditures were organized by the three major land use categories of single family housing units, multiple family housing units, and non-residential development.

Significance criteria for socioeconomic impacts were determined by analyzing fluctuations in Clark County employment. This analysis allows a county specific determination of the thresholds beyond which changes in employment would noticeably affect individuals and communities. Employment in Clark County has increased every year from 1983 to 2003. The trend in the metropolitan Las Vegas area employment shows that the average annual percent increase in the total labor force over this time period was 6 percent. The lowest annual percentage of increase in the labor force occurred between 2002 and 2003 (0.6 percent) and the highest increase in labor force occurred between 1994 and 1995 (10.3 percent).

The annual deviations between actual change and average change are the basis for determining a threshold of significance. The deviations yield threshold values are -5.4 percent and 4.3 percent, wherein these values are the upper and lower limits of a range of change within which the Las Vegas Valley would have the capacity to absorb increases or decreases. Thus, a significant impact would be an increase of more than 4.3 percent or a decline of more than 5.4 percent from the average projected level of employment (see Figure 4.12-1).

4.12.1 No Action Alternative

Under this alternative no additional lands would be sold by the BLM. Accordingly, no additional land sale revenue would be received and therefore no additional funds would be available for the Clark County School District, SNWA, and for the acquisition, conservation, and maintenance of environmentally sensitive lands and recreation areas.

The IMPLAN modeling program does not predict population impacts. Therefore, predictions for population impacts were based on past population fluctuations and assumptions of the area's past ability to absorb growth or recover from reduction in population numbers. Annual population in Clark County increased every year from 1983 to 2004 with the average annual increase over this time period being 5.9 percent. The lowest percentage of population increase occurred between 1993 and 1994 (2.7 percent) and the highest in-

crease occurred between 1989 and 1990 (8.7 percent).

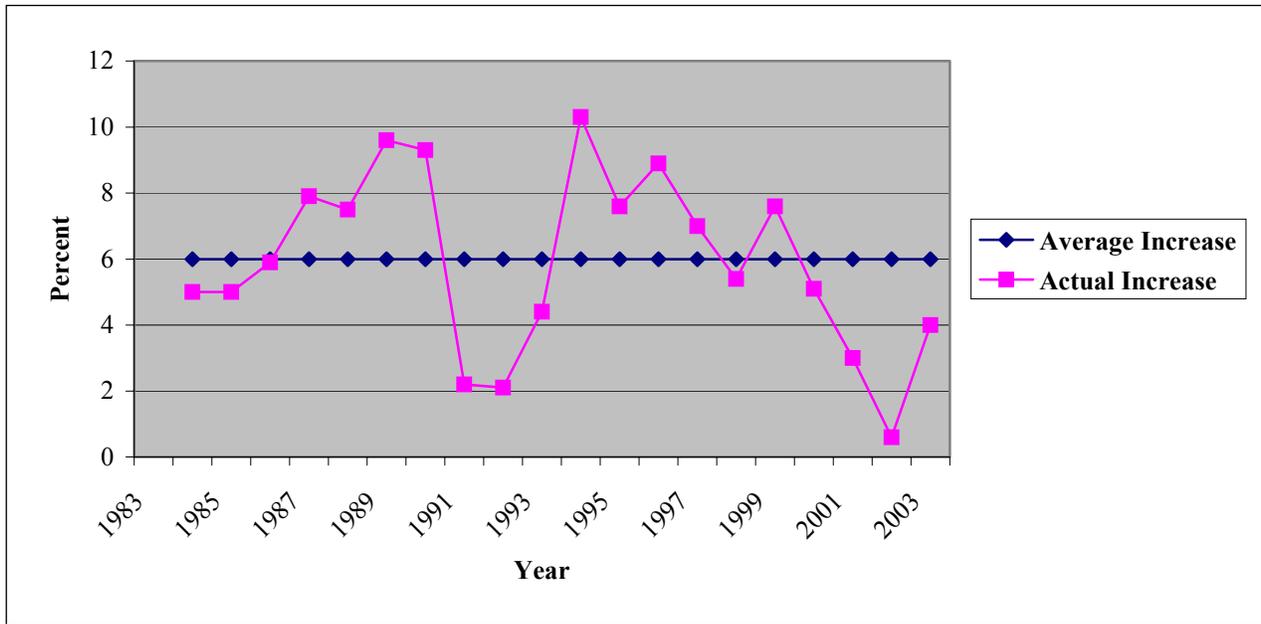
Increases in population are projected to be between 2.0 percent and 3.8 percent throughout the planning period (see Table 4.12-1). This deviation of increase in population represents a decrease in the growth rate in relation to the previous 20-year annual increase of 5.9 percent. The change in rate of population growth is expected to occur with or without the land sale action and subsequent development. Therefore, the No Action Alternative is not expected to contribute to population increases that would have a substantial adverse effect on community resources or services. Predictions of population growth are less accurate farther in to the future. Numerous variables are dynamic including housing demand, real estate prices, interest rates, economic conditions, building technology, transportation systems, etc. In considering these factors, the maximum or build-out population forecast would change over time (Clark County Comprehensive Planning 2001).

4.12.2 Proposed Action

The remaining BLM land within the disposal boundary area would be disposed through sales or other title transfer actions. This action would result in the disposal of the remaining 46,700 acres by 2015 with nearly 20,000 acres developed by 2018. As described in the No Action Alternative, the change in rate of population growth is expected to occur with or without the land sale action and subsequent development. Therefore, the Proposed Action is not expected to directly contribute to population increases that would have a substantial adverse effect on community resources or services.

4.12.2.1 Impacts to the Economy

Land development activities associated with the BLM land sales are expected to generate positive economic benefits within Clark County. Most of the benefits would be due to the construction of residential units and to a lesser degree from construction of non-residential development. Impacts to the construction industry are presented



**FIGURE 4.12-1
AVERAGE AND ACTUAL ANNUAL EMPLOYMENT INCREASE,
METROPOLITAN LAS VEGAS**

**TABLE 4.12-1
POPULATION PROJECTION AND PERCENT CHANGE, CLARK COUNTY**

Year	Total Population	Percentage Change
2004	1,686,827	
2005	1,751,608	3.8%
2006	1,815,303	3.6%
2007	1,877,843	3.4%
2008	1,939,097	3.3%
2009	1,999,250	3.1%
2010	2,058,063	2.9%
2011	2,115,551	2.8%
2012	2,171,538	2.6%
2013	2,225,668	2.5%
2014	2,277,967	2.3%
2015	2,328,564	2.2%
2016	2,378,317	2.1%
2017	2,427,325	2.1%
2018	2,475,641	2.0%

Nevada State Demographer 2004

**TABLE 4.12-2
TOTAL ECONOMIC OUTPUT IMPACTS – PROPOSED ACTION**

Impact Group	Construction Industry	Other Commercial Industry	Total Impacts*
Annual dollars**	\$858,825,534	\$538,612,990	\$1,397,438,718
Total through 2018 with Annual Inflation Adjustment	\$14,761,181,508	\$9,294,458,899	\$24,114,599,852
*Dollars expressed reflect proportional inflation rate, thus the total amount (impacts) is not a sum figure			
** Expressed in 2004 dollars			

separately because this industry is expected to benefit the most. All other industry impacts have been combined in this discussion. Wholesale trade, new residential units, and owner-occupied dwellings would contribute the most in terms of business and property taxes. Construction of single-family, multi-family, and non-residential development would occur under the Proposed Action.

Table 4.12-2 shows the construction industry, other commercial industries, and total impacts that would occur within Clark County as a result of the construction that would occur under the Proposed Action. Other commercial effects would take place as dollars spent on project construction are re-spent within Clark County.

4.12.2.2 Employment

Construction employment would be a beneficial impact in Clark County. Table 4.12-3 depicts the construction, other industries and total impacts to employment with the Proposed Action. Employment for project construction and other commercial industries would consist of approximately 12,462 workers per year during the planning period, of which more than half would be construction jobs. This represents an overall 2 percent increase in annual employment. But, the number of workers required each year does not reflect an additional 12,462 workers per year, rather it is expected that this is the total level of employment required per year to sustain the construction and other commercial growth rate. Many employees would retain their employment year after year; therefore, based on the significance criteria of a deviation amount of increase of no more than 4.3 percent, there would be minimal impacts to overall employment. From July 2003 to July 2004 the construction industry realized a 12 percent in-

crease and currently has difficulty filling all construction job positions (Las Vegas Review Journal 2004). Based on the significance criteria of a deviation amount of not more than a 4.3 percent increase, the 2 percent increase associated with the Proposed Action represents an insignificant impact to the construction industry. As with other industries, the number of workers required each year does not reflect an additional 6,793 workers per year (see Table 4.12-3), rather it is expected that this is the total level of employment required per year. Many employees would retain their employment year after year and therefore the employment numbers would likely be less.

4.12.2.3 Housing

The Proposed Action has a relatively low demand for additional housing because most of the workers are already located within Clark County. Currently, rental units are the largest type of single-family units advertised in Henderson, Las Vegas, and North Las Vegas. Therefore, there are an adequate number of available housing units in Clark County to accommodate the temporary workforce associated with the Proposed Action and employment that would occur within other industries as an indirect result of the action.

4.12.2.4 BLM Land Sales

The BLM lands are appraised prior to sale based on fair market value and this appraised value sets the beginning bid for the sale. As of June 2004 the total appraised value of parcels for sale was \$769,040,950 which represents an average appraised value of approximately \$94,000 per acre. However, as of June 2004 approximately \$1.4 billion have been received from land sales. This represents a difference of approximately \$631 million between the appraised value and the actual

**TABLE 4.12-3
EMPLOYMENT IMPACTS (NUMBER OF NEW JOBS CREATED) – PROPOSED ACTION**

	Construction Industry	Other Industries	Total Impacts
Annual Employment	6,793	5,669	12,462
Through 2018	101,891	85,035	186,926

sales outlay which corresponds to a 45 percent increase over appraised value paid for the previously disposed lands.

Annual proceeds from sales would be approximately \$376 million based on the average appraised value of \$94,000 per acre and disposal of 4,000 acres per year. However, this amount would vary based on the actual number of acres sold and the actual sale price over appraised value. There are approximately 6,500 acres of BLM land being held under R&PP leases; therefore, the approximate appraised value received would be adjusted annually according to the amount of R&PP acreage transferred.

4.12.2.5 Schools

The overall population is expected to increase between 2.0 percent and 3.8 percent per year through 2018. The Clark County School District currently plans for overall growth in the district to be approximately 5 percent per year (see Section 3.12). Increases in school enrollment resulting from the additional populations moving into the Las Vegas Valley would be incorporated into the school district’s projected growth plans.

4.12.2.6 Property Valuation and Taxation

Table 4.12-4 depicts the construction industry,

other industries, and total impacts to indirect business taxes from the Proposed Action. These indirect business taxes consist of excise taxes, property taxes, fees, licenses, and sales taxes paid by businesses. These taxes occur during the normal operation of businesses but do not include taxes on profit or income. The taxes include both State and major local taxing jurisdictions (county and city taxes). Indirect business tax numbers are derived from U.S. Bureau of Economic Analysis Gross State Product data.

There are 88 tax districts in Clark County and in the Las Vegas Valley the tax rates vary from \$2.4719 to \$3.4286 per one hundred dollars of assessed value. Given the range of tax rates and values an average of \$2.950 per one hundred dollars of assessed value was used. The IMPLAN model uses the same set of assumptions that was used to determine the amount of homes that would be constructed and used the average value per acre based on BLM land sold in Clark County as of April 2004. Land values were assumed to appreciate by 7 percent per year, which is a very conservative assumption for Clark County. Tax revenue was calculated through 2018 (see Table 4.12-5).

The overall economic dollar impacts resulting from the Proposed Action are shown on Table 4.12-6.

**TABLE 4.12-4
INDIRECT BUSINESS TAX IMPACTS – PROPOSED ACTION**

Impact Group	Construction Industry	Other Commercial Industry	Total Impacts*
Annual dollars**	\$7,290,845	\$34,722,644	\$42,013,489
Through 2018 with Annual Inflation Adjustment	\$125,312,369	\$599,183,817	\$724,996,695

*Dollars expressed reflect proportional inflation rate therefore, the total amounts are not a sum figure

** Expressed in 2004 dollars

**TABLE 4.12-5
REAL PROPERTY TAX IMPACTS – PROPOSED ACTION**

Land Use Category	Total Collected Through 2018	Average Annual Collected
Undeveloped Land	\$1,521,539,143	\$101,435,943
Single-Family Residential Units	\$2,178,741,922	\$145,249,461
Multi-Family Residential Units	\$570,682,716	\$38,045,514
Non-Residential Development	\$273,139,349	\$18,209,290
Total	\$4,544,103,130	\$302,940,209

**TABLE 4.12-6
OVERALL DOLLAR IMPACTS – PROPOSED ACTION**

Sector	Annual*	Through 2018*
Construction	\$858,825,534	\$14,761,181,508
Other Commercial Industry	\$538,612,990	\$9,294,458,899
Government and Taxation Revenue	\$42,013,489	\$724,996,695
Property Valuation and Taxation **	\$302,940,209	\$4,544,103,130

* Expressed in 2004 dollars

** Reflects land value increase of 7 percent annually

4.12.3 Conservation Transfer Alternative

Approximately 5,000 acres within the disposal boundary area would be maintained as open space with limited recreation development for trails and interpretive activities. The issuance of ROWs and R&PP leases would continue until the remaining lands are disposed or transferred.

4.12.3.1 Impacts to the Economy

Future economic effects associated with this alternative are expected to remain consistent with historic trends of the local economy. Table 4.12-7 shows the direct, construction, other commercial industries, and total impacts that would occur within Clark County as a result of the construction under the Conservation Transfer Alternative. Other commercial effects would occur as dollars spent on project construction are re-spent within Clark County.

4.12.3.2 Employment

Table 4.12-8 depicts the construction, other commercial industries, and total impacts to employment with the Conservation Transfer Alternative. Employment for project construction and other commercial industries would consist of approxi-

mately 11,212 workers per year of which 6,112 would be construction jobs. This represents an overall 1 percent increase in annual employment. But the number of workers required each year does not reflect an additional 11,212 people per year, rather it is expected that this is the total level of employment required per year to sustain the construction, construction support, and other commercial growth rate. Many employees would retain their employment year after year. Based on the significance criteria of a deviation of no more than 4.3 percent above the expected increase in employment, there would be minimal impacts to overall employment.

4.12.3.3 Housing

Impacts to housing under this alternative would be similar to those described for the Proposed Action.

4.12.3.4 BLM Land Sales

Proceeds from the land sales under this alternative would be similar to those described for the Proposed Action. However, there may be less sale revenue received because of the limited development that would be allowed that could impact the fair market value of this area.

**TABLE 4.12-7
TOTAL ECONOMIC OUTPUT IMPACTS – CONSERVATION TRANSFER ALTERNATIVE**

Impact Group	Construction Industry	Other Commercial Industry	Total Impacts*
Annual dollars**	\$723,150,456	\$452,297,898	\$1,175,448,354
Through 2018 with Annual Inflation Adjustment	\$12,429,244,713	\$7,804,981,130	\$20,283,870,995

*Dollars expressed reflect proportional inflation rate; therefore, the total amounts are not a sum figure

** Expressed in 2004 dollars

**TABLE 4.12-8
EMPLOYMENT IMPACTS (NUMBER OF NEW JOBS CREATED) – CONSERVATION TRANSFER ALTERNATIVE**

	Construction Industry	Other Industries	Total Impacts
Annual Employment	6,112	5,101	11,212
Through 2018	91,676	76,511	168,186

**TABLE 4.12-9
INDIRECT BUSINESS TAX IMPACTS – CONSERVATION TRANSFER ALTERNATIVE**

Impact Group	Construction Industry	Other Commercial Industry	Total Impacts*
Annual dollars**	\$6,139,054	\$29,452,928	\$35,591,982
Through 2018 with Annual Inflation Adjustment	\$105,515,508	\$508,248,100	\$614,185,344

*Dollars expressed reflect proportional inflation rate therefore, the total amounts are not a sum figure

** Expressed in 2004 dollars

4.12.3.5 Schools

Impacts to schools would be the same as those described for the Proposed Action.

4.12.3.6 Property Valuation and Taxation

Table 4.12-9 depicts the construction, other commercial industries, and total tax revenue benefits for local, county, and state governments as a result of the Conservation Transfer Alternative. The indirect business taxes consist of excise taxes, property taxes, fees, licenses, and sales taxes paid by businesses. The taxes that occur include the normal operation of businesses but do not include taxes on profit or income. The taxes include both State and major local taxing jurisdictions (county and city taxes). Indirect business tax numbers are

derived from U.S. Bureau of Economic Analysis Gross State Product data.

The County would realize more additional funds under the Conservation Transfer Alternative than the No Action Alternative, but less than the Proposed Action. The IMPLAN model uses the same set of assumptions that was used to determine the amount of homes that would be constructed (which reflects the conservation of 5,000 acres) and used the average value per acre based on BLM land sold in Clark County as of April 30, 2004. Land values were assumed to appreciate by 7.0 percent per year, which is a very conservative assumption for Clark County. Tax revenue was calculated through 2018 (Table 4.12-10).

The overall socioeconomic dollar impacts resulting from the Conservation Transfer Alternative are shown in Table 4.12-11.

**TABLE 4.12-10
REAL PROPERTY TAX IMPACTS – CONSERVATION TRANSFER ALTERNATIVE**

Land Use Category	Total Collected Through 2018	Average Annual Collected
Undeveloped Land	\$1,539,936,734	\$102,662,449
Single-Family Residential Units	\$1,960,156,055	\$130,677,070
Multi-Family Residential Units	\$513,410,629	\$34,227,375
Non-Residential Development	\$245,756,856	\$16,383,790
Total	\$4,259,260,274	\$283,950,685

**TABLE 4.12-11
OVERALL DOLLAR IMPACTS – CONSERVATION TRANSFER ALTERNATIVE**

Section	Annual	Through 2018*
Construction	\$723,150,456	\$12,429,244,713
Other Commercial Industries	\$452,297,898	\$7,804,981,130
Government and Taxation Revenue	\$35,591,982	\$614,185,344
Property Valuation and Taxation**	\$283,950,685	\$4,259,260,274

*Expressed in 2004 dollars

** Reflects land value increase of 7percent annually

4.12.4 Mitigation Measures

None of the alternatives are expected to cause a level of economic change in the Las Vegas Valley that would push the level of employment beyond the historic capacity of the Valley to accommodate growth. Overall increase in employment for the Proposed Action and the Conservation Transfer Action would not be significant when compared to the deviations absorbed historically by the economy. The construction industry would realize the greatest impacts; however, this industry has historically shown ability to absorb large increases thus it is not expected that either alternative would represent a significant impact employment. Therefore, mitigation for socioeconomic impacts is not necessary.

4.13 ENVIRONMENTAL JUSTICE

An environmental justice (EJ) analysis determines whether a disproportionate share of adverse environmental or social impacts from implementing a federal action would be borne by minority or low income populations. The first step in the analysis was to identify EJ populations or communities in the disposal boundary area. The area of potential effect was defined as the incorporated cities and unincorporated planning areas in the Las Vegas

Valley because the BLM lands available for disposal are scattered throughout the Valley (see Figure 3.9-1). The second step of the analysis was to determine if any impacts of the land disposal action would occur in EJ communities, and if so, to determine if these communities would experience high and adverse impacts in comparison to other communities.

For the purpose of this EIS, impacts are considered significant if the health, safety, social structure, or economic viability of an EJ population or community is disproportionately and adversely impacted by the land disposal action. The impact would be significant if reasonable and feasible measures could not mitigate or eliminate the disproportionate impact. However, there are no EJ populations identified in the area of potential effect. Although the minority status in the Las Vegas Valley is greater than Clark County and the State of Nevada, it does not meet the definition of an EJ population as being at least half minority status or 10 percentage points greater than the general population.

4.13.1 No Action Alternative

No additional land sales under SNPLMA would not result in any direct adverse environmental or

socioeconomic impacts, thus, there would be no disproportionate adverse impacts to minority or low income status communities, regardless that no EJ populations were identified. The construction industry employs minority and low income workers. There could be potential indirect impacts to these workers if construction would decrease over the planning period. However, any indirect impact would be insignificant because growth in the Valley and development on available private land is not projected to significantly decrease.

Under the No Action Alternative the BLM would continue to grant ROWs and R&PP leases. Any adverse direct impacts associated with construction and operation of the facility requiring the lease would not have a disproportionate adverse impact on EJ populations as none were identified in the disposal boundary area. Rights-of-way for aboveground utilities on BLM lands could have an impact to any nearby community regardless of minority or income status; however, because no EJ populations were identified, no disproportionate adverse impacts are anticipated. Most R&PP leases are issued for parks, schools, and public facilities that would have an indirect beneficial impact if located in minority or low income neighborhoods.

4.13.2 Proposed Action

There were no EJ populations identified in the disposal boundary area, thus the continued disposal of BLM lands through public auction and the transfer of title would not have any disproportionate adverse impacts to EJ communities. The construction industry employs minority and low income workers. The subsequent development anticipated to occur on the disposed BLM lands could have potential indirect beneficial impacts to these workers; however any indirect impact would be insignificant because growth in the Valley and development on available private land is not projected to significantly decrease.

The City of Las Vegas has requested that approximately 470 acres of BLM lands be made available for affordable housing as allowed under SNPLMA. Upon approval of a nomination of these lands for affordable housing, the BLM would offer this land for sale for such purposes.

Although there are no EJ populations identified in the disposal boundary area, the subsequent development of affordable housing units would have an indirect beneficial impact on low income individuals.

Potential impacts from the continued issuance of ROWs and R&PP leases would be similar to that described under the No Action Alternative.

4.13.3 Conservation Transfer Alternative

The Conservation Transfer Alternative would restrict the type of development that could occur on approximately 5,000 acres in the northern part of the disposal boundary area. These lands would be transferred to entities that would conserve and mitigate the sensitive resources. The type of development in this conservation area subsequent to transfer would be open space and limited recreation and trails, whereas the remaining BLM parcels would be fully developed. Potential direct and indirect impacts would be similar to that described under the Proposed Action. Because no EJ populations were identified in the disposal boundary area, this alternative would not have any disproportionate adverse impacts to any EJ population.

Potential impacts from the continued issuance of ROWs and R&PP leases would be similar to that described under the No Action Alternative.

4.13.4 Mitigation Measures

There were no EJ populations identified in the disposal boundary area. There were also no adverse direct or indirect impacts identified that would disproportionately affect minority and low income communities, thus no mitigation measures are necessary. The issuance of ROWs for aboveground utilities would address mitigation measures, as necessary, if a site specific disproportionate adverse impact is identified.

4.14 RANGE MANAGEMENT

Range management includes livestock grazing operations and wild horse and burro herds. There

are no herd management areas in the disposal boundary area therefore no impacts from land disposal actions would occur, nor would the disposal of BLM lands affect the management of wild horses and burros.

Approximately 3,000 acres of BLM land available for disposal are in the Hidden Valley grazing allotment. Impacts to livestock grazing operations and range resources would be considered significant if the land disposal action would disrupt livestock movement, result in loss of forage such that the livestock operator/permittee would have to reduce their operations, or increase human disturbance/harassment of livestock.

4.14.1 No Action Alternative

Under the No Action Alternative land disposals and public auctions authorized by SNPLMA would not continue. The grazing permit within the Hidden Valley allotment would continue. However, the management direction in the RMP for livestock grazing was to close all land disposal areas to livestock grazing.

The BLM would continue to grant ROWs and R&PP leases as specified in the RMP. However, without further land sales, the projected need for ROWs and R&PP leases in the area within the grazing allotment is anticipated to be minimal. Regardless, the area is closed to grazing and whatever forage available that would be disturbed for construction of the facility requiring the lease would be insignificant.

4.14.2 Proposed Action

Land disposal for urban and residential development would result in the permanent loss of about 3,000 acres of ephemeral rangeland in the Hidden Valley grazing allotment. However, the management direction in the RMP for livestock grazing was to close all land disposal areas to grazing, thus any adverse direct impact on the permittee would be insignificant. Although this represents approximately 11 percent of the total allotment, the permittee communicated to the BLM that the lands proposed for disposal are not grazed because no water source exists in the area and there have been no range improvements on these lands.

Therefore, disposal of the BLM lands within the Hidden Valley allotment would not result in an adverse impact on livestock operations and no financial profit or loss to the permittee.

The BLM would continue to grant ROWs and R&PP leases as specified in the RMP. Regardless, the area is closed to grazing and whatever forage available that would be disturbed for construction of the facility requiring the lease would be insignificant.

Fences or any other mechanism to control livestock from accessing adjacent lands does not enclose the grazing allotment. Urban expansion to the far south end of the disposal boundary area may indirectly impact any livestock operations that would occur in the northern part of the Hidden Valley allotment through increased human activity and domestic animals. Any indirect impact would likely be insignificant because of the small number of cattle in the area during times of permitted use.

4.14.3 Conservation Transfer Alternative

Direct and indirect impacts to the Hidden Valley allotment and grazing operations from the land disposal action under the Conservation Transfer Alternative would be the same as those discussed for the Proposed Action. The BLM lands proposed for transfer to conserve sensitive resource values are in the northern part of the disposal boundary area and thus would not affect the disposal of BLM lands within the allotment.

Potential impacts from the continued issuance of ROWs and R&PP leases would be similar to that described under the Proposed Action.

4.14.4 Mitigation Measures

The permittee has a right to reasonable compensation not to exceed fair market value for approved range improvements made on public land within an allotment that is disposed. Because the permittee has not made any range improvements to the lands within the disposal boundary area, no compensation is anticipated. Nevada Revised Statute

113.065 addresses mitigation for any potential indirect impacts from urban encroachment. The statute requires disclosure to prospective purchasers of property adjacent to open range on which livestock are permitted to graze that the private landowner is responsible for constructing a fence that will prevent livestock from entering the property.

4.15 CUMULATIVE IMPACTS

The definition and analysis of cumulative impacts were introduced at the beginning of this chapter. As described previously, cumulative impacts can result from individually minor but collectively significant actions taking place over time. Cumulative impacts are most likely to arise when a relationship exists between a proposed action and other actions that have or are expected to occur in a similar location, time period, or involving similar actions. Projects in close proximity to the proposed action would be expected to have more potential for cumulative impacts than those more geographically separated. In addition to private projects, various agencies may be the proponents for these projects.

Implementation of land disposal and development actions within the disposal boundary area would occur over the remaining portion of the current 20-year planning period. As lands are sold through 2015 and subsequently developed through 2018, the analysis of impacts of these actions is, in and of itself, considered cumulative. The land disposal action would be implemented with reasonably foreseeable actions by other agencies and private parties within and adjacent to the disposal boundary area. This analysis assesses the potential cumulative effects of those actions. If the geographic boundary of the cumulative analysis is different than the disposal boundary area, the geographic area is described in the appropriate resource section.

Cumulative impacts can also result when the incremental impact of BLM land sales are considered with other past, present, and reasonably foreseeable future actions, regardless of the component of those other actions. The environmental impacts addressed in Chapter 4 consider future development on BLM land through the planning

year 2018. This section analyzes the cumulative impacts that may result from privately funded projects constructed on private or public lands, or those outside the jurisdiction of the BLM throughout the planning period (2004 to 2018) and beyond 2018, in addition to those previously described. The cumulative impacts assessment in this EIS focuses on addressing two fundamental questions: (1) Does a relationship exist such that the impacts from the proposed action might affect or be affected by the impacts of the other actions; and (2) If such a relationship exists, does this assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

The types of actions occurring in the Las Vegas Valley that have the potential to contribute to cumulative impacts would be similar land development projects. Approximately 5,000 acres have been developed annually in Clark County from the years 1970 to 2003, which includes private and public lands (Wardlaw 2004). This is an annualized average for Clark County. There was more development in some years than others. For example, in 1996 over 10,000 acres were developed, whereas in other years only 2,000 acres were developed. It is assumed that the majority of this development has occurred within the disposal boundary area. Therefore, cumulative impacts to all resources in the following subsections are analyzed assuming approximately 5,000 acres of development would occur each year in the Las Vegas Valley through 2018. This cumulative analysis of the annual 5,000 acres includes the estimated 1,330 acres per year of BLM disposed land that is expected to be developed.

It is important to consider the impacts projected to 2018 for 70,000 acres of development will be the same even if the 70,000 acres are developed sooner than projected. It is more meaningful to assess impacts to the sale of all remaining BLM lands and future projected development instead of dealing with peaks and valleys as development continues in the Las Vegas Valley. Should the development rate continue to exceed our expected average development rate, additional NEPA and air quality modeling may be required. There is a high probability that additional lands may be added through additional amendments to

SNPLMA, which again would require additional NEPA analysis before lands could be offered for sale.

4.15.1 Air Quality

Cumulative impacts from development and ongoing air quality emissions have been estimated for all land available within the disposal boundary area, including BLM lands that had previously been sold or transferred since 1998. The assessment of air quality impacts through quantitative modeling included projections of emissions from existing sources and from new sources related to development and use of privately owned lands. The assessed cumulative impacts accounted for known and foreseeable public and private development in the Valley from 1998 through 2018, and were based on the total acreage of development permits issued by Clark County in 2000 and projections on population growth.

The estimated rate of development of 5,000 acres per year falls well within the model parameters. Because development is expected to continue at least through 2018, construction activities and associated disturbances are considered as temporary but cumulative.

The design and execution of the air quality model completed by Argonne provided cumulative results of air quality impacts. The geographic coverage of the air model included the lands within the disposal boundary area and modeled pollutants transported from the Los Angeles area. The estimated cumulative pollutant emissions are shown graphically in Section 4.1 and supporting data is included in Appendix A.

Under all the alternatives, model results indicate that the area would be in attainment for PM_{10} by the projected compliance date of 2006. Decreased emissions from replacing vacant disturbed lands to developed property would contribute to declining particulate emissions. The development of 5,000 acres per year through 2018 would result in temporary cumulative impacts relating to PM_{10} . However, implementation of dust control best management practices would minimize the overall impact. Additionally, developed areas have less soil erosion from wind than undeveloped areas,

thus following completion of construction activities soil erosion from wind (dust) would be minimal.

Operating emissions would increase proportional to the completion of development based on each alternative, but are projected to be well within the carbon monoxide standards. Increases in operating emissions reflect the relationship of these emissions to overall energy consumption from stationary sources such as gas furnaces and increased electrical energy generation and consumption, and from mobile sources, primarily additional vehicular traffic. Emissions of carbon monoxide, sulfur dioxide, and nitrogen oxides in Clark County are projected to decrease because of the anticipated closure of the Mojave Generating Station, a large coal-fired electrical generation plant and because of new controls on vehicle engine exhaust emissions.

Predictive modeling is being performed that incorporates emission controls that would be required for the SIP that will address non-attainment for ozone. Emission inventories, control measures, and operating efficiencies would be specified in the SIP to support reductions in emissions of ozone precursors to achieve acceptable air quality under the new 8-hour ozone standard. Once preliminary emission inventories and budgets have been developed, additional simulations may be performed to provide projections of air quality trends for this parameter. The results of this modeling effort will be presented in the Final EIS. The preliminary results of the study indicate that ozone would be in compliance with the 8-hour standard in the out years modeled (2009 and 2018).

4.15.2 Earth Resources

Over 95 percent of BLM managed land has less than 20 percent soil disturbance. Future development of BLM disposed land and private land, and the associated disturbance of soils, increases the potential for erosion. However, once construction is completed developed areas typically experience less soil erosion than undeveloped areas. Therefore, cumulative impacts to soils in relation to each alternative may occur during simultaneous construction of multiple development areas

through 2018. Compliance with erosion, storm-water, and water quality best management practices and air quality requirements during construction is required throughout Clark County and would minimize the impacts. The cumulative impacts to this resource are not expected to be significant.

Under all the alternatives, the BLM would continue to issue permits for mineral development in other parts of the Valley consistent with the criteria specified in the RMP; therefore no reasonably foreseeable future actions associated with new development of locatable or saleable minerals in the disposal boundary area would have an adverse cumulative impact to these resources. Existing saleable mineral operations would continue to operate. The withdrawal of the disposal boundary area from mineral resource development would not significantly affect the availability and use of similar materials on privately owned lands.

4.15.3 Water Resources

The development of the BLM lands within the disposal boundary area that were previously sold and transferred would contribute to the cumulative indirect impacts to water resources. The total 5,000 acres per year of development would result in a water demand increase of 175,000 AFY by 2018. This amount assumes that 70,000 acres would be developed over the next 14 years and water consumption is estimated at 2.5 acre-feet per acre of developed land.

The estimated increase in water consumption would be within the increased demand projections by the SNWA. Demand projections developed by SNWA are based on projected population growth in the area. Their projections include demand increases based on overall population growth and related development in the Las Vegas Valley. The SNWA's projections increase from the current source of 500,000 AFY to 760,000 AFY in 2018, thus the cumulative increase of 175,000 AFY from land development would be within this range.

The development of 5,000 acres per year of land would increase the potential for runoff and erosion. Implementation of best management prac-

tices during construction would minimize adverse impacts. Cumulative impacts to groundwater may occur if extensive dewatering is required during development of these lands.

Future land development within the disposal boundary area is considered during the master planning process conducted by the CCRFCD. The construction of flood control structures and drainage improvements would not have adverse cumulative impacts to surface water and groundwater. The drainage improvements would have a beneficial impact to the Las Vegas Valley, particularly in and near natural drainage channels and floodplains.

4.15.4 Biological Resources

Cumulative adverse impacts to biological resources are likely as growth continues and development increases throughout the Las Vegas Valley. Under all the alternatives, the development of 5,000 acres of land per year would result in the permanent loss of the natural vegetation on these lands and the wildlife that inhabit that vegetation. This cumulative impact would be significantly adverse for the Las Vegas bearpoppy and Las Vegas buckwheat as the known concentrations of these species remaining in the Valley are in areas planned for development. The BLM estimates past actions have removed 80 percent of the known Las Vegas Buckwheat habitat, and that under this alternative approximately 20 percent of all known Las Vegas buckwheat and 20 percent of Las Vegas bearpoppy would remain within the Las Vegas Valley. The Proposed alternative would include the North Las Vegas Valley sale and an additional 5 percent of the known habitat for the buckwheat would be lost, making the total habitat loss 85 percent.

Development on the remaining BLM lands and private lands throughout the Valley would result in the permanent loss of potential desert tortoise habitat. Approximately 70,000 acres of land are estimated for development through 2018 assuming a rate of cumulative development of 5,000 acres per year. This amount of habitat loss would be greater over time as the remaining disposed BLM lands are developed. Although most of the land is considered very low-to-low density habitat

(Table 4.4-1), the cumulative loss would be adverse. Under this alternative, the loss to tens of thousands of plants would be possible as land is disposed and developed. The impacts of land sales on the Mojave desert tortoise were addressed under the 2001 Programmatic Biological Opinion on Implementation of the Las Vegas District Resource Management Plan within the Las Vegas Valley (File No. 1-5-96-F-023R.2). That biological opinion concluded that the loss of approximately 125,000 acres of potential desert tortoise habitat to development in the Las Vegas Valley would not jeopardize the continued existence of the species. Because there are no large areas of potential habitat remaining that could support a viable population of tortoise, the cumulative impact would not be significant.

4.15.5 Cultural Resources

Cumulative adverse impacts to cultural resources are likely as growth continues and development increases throughout the Las Vegas Valley. There were 117 previously recorded archaeological sites on the BLM lands within the disposal boundary area prior to the 2004 field survey, of which 31 sites were relocated during the field survey. The sites that were not relocated were isolated occurrences, and may have been destroyed. There are nine sites determined eligible for listing on the NRHP and the previously designated Tule Springs National Register Site, which is located within the disposal boundary area. There were 91 archaeological sites identified that do not meet the criteria for nomination or listing, but contain archeological artifacts that provide information regarding the prehistory and history of the area. It is also likely that additional archaeological resources are present on private lands adjacent to the BLM lands. The No Action alternative would have a direct beneficial impact on cultural resources as there would be no direct change to the land. However, the potential for increased public use to these lands could represent an adverse cumulative impact through possible vandalism, OHV use or other ground disturbing activities. Development of the 5,000 acres of land per year is likely to have an adverse cumulative impact on cultural resources in the Valley. Additionally, any undocumented cultural resources present in the subsurface strata that have not been recorded are

likely to be lost or destroyed from future developments. Sites located within the Conservation Transfer Alternative would be protected, which would represent a positive cumulative impact to the resource.

4.15.6 Native American Resources

Cumulative impacts to Native American resources could result from ground disturbance, noise, visual intrusions, or access limitations to traditional cultural areas. The development of 5,000 acres per year in the Las Vegas Valley may impact Native American resources as several habitation sites are known to exist in the Valley. Under all the alternatives the exact locations of these sites are unknown, therefore determining the extent and significance of any cumulative impacts are not possible at this time with the limited information available.

The planning for resource protection in the Sloan Canyon National Conservation Area would be a beneficial cumulative impact to Native American resources adjacent to the disposal boundary area. The Sloan Canyon petroglyphs site is listed on the NRHP and is considered a TCP.

4.15.7 Paleontological Resources

Geologic formations and alluvial deposits were determined to have high paleontologic sensitivity in the Las Vegas Valley. These formations outcrop in the northern portion of the Valley and disposal boundary area. Fossils are damaged and eventually destroyed by wind and water erosion, although how quickly varies. However, any indirect impact from natural processes is not significant if compared with impacts associated from encroaching development and human disturbances. Within the last five years additional fossil localities have been identified from sites in and around the disposal boundary area. Although it is unknown how many paleontological sites have been mitigated or destroyed from previous growth, development in the Las Vegas Valley is expected to continue and because of this encroaching development, under all the alternatives there would be cumulative impacts in the form of both direct and indirect effects to the upper Las Vegas Wash vertebrate paleontological localities.

The 438 sites of extinct megafauna; including 200 mammoth sites are located in the 5,000 acre conservation transfer area in the northwest portion of the Las Vegas Valley. These sites will be subject to ongoing consumption of the overall Pleistocene assemblage through time. Presently this collection of 438 sites consists of many different species of mega fauna; including horse, camel, sloth, mammoth, lion, etc. Through time, development would greatly diminish the scientific, interpretive and educational potential of the total database. It is likely that additional significant paleontological resources are present on private lands adjacent to the BLM lands. Therefore, development of 5,000 acres of land per year will impact paleontological resources in the areas where the geologic formations are present. Additionally, any undocumented fossils and those present in the subsurface strata that have not been recorded are likely to be lost or destroyed from future developments. Complete development of the northern Valley would have significant adverse cumulative impacts on the resource without implementation of adequate recovery and conservation measures.

4.15.8 Visual Resources

Development of previously disposed parcels and privately owned land is expected to continue. The vacant, open spaces would change to an urban-landscaped-dominant viewshed as development continues in the Las Vegas Valley. This would effectively increase the visual absorption capacity thus decreasing the overall visual sensitivity in these areas. The majority of the land to be developed is located in areas considered low in viewer sensitivity. As such, the expected ability to visually absorb change to the viewshed is considered high and cumulative impacts would not be significant.

All parcels of previously disposed BLM land are within Class IV VRM areas and as such, development on these parcels would not contribute to a cumulative adverse impact to visual resources. Under the action alternatives, the development of 5,000 acres of land per year would change the views observed from Red Rock Canyon and other mountainous areas surrounding the Las Vegas Valley. The views into the Valley would include more urban-landscape and less open space and

natural desert. However, the majority of people using mountainous areas for viewing purposes are generally focused on the views provided into the mountain ranges rather than toward the Valley and thus impacts to viewer sensitivity would not be significant.

4.15.9 Land Use

Under the No Action alternative, the continued federal ownership of various parcels would disrupt or divide the physical establishment of communities. As development continues on private parcels, this division would contribute a cumulative negative impact to local government and community land use plans. Under the two action alternatives, development of the lands in the Valley would conform to local government and permitting conditions, and community land use plans; therefore, cumulative impacts to land use under the action alternatives would not be significant.

4.15.10 Recreation and Wilderness

Under the No Action alternative, loss of funding through the disposal of additional parcels would represent a cumulative negative impact because the expected funding would allow for improvements to existing recreation and wilderness areas. Under the two action alternatives, the development of 5,000 acres per year would reduce the amount of vacant land in the Valley that may be used for dispersed recreation. However, the majority of the lands to be developed each year are privately owned and therefore not available for recreational purposes. Therefore, no adverse cumulative impact to casual, dispersed recreation would occur. The development of community parks and recreation areas would be a beneficial cumulative impact for users of modern, urban facilities in the Las Vegas Valley. As lands are developed, illegal activities including casual target shooting, trash dumping, auto stripping, and driving on unpaved roads and lots is expected to continue on outlying areas that would still be under BLM management. These illegal activities are expected to occur in magnitude in relation to the growth in the Valley.

Although the projected population growth cannot be directly linked to land disposal actions, the pro-

jected growth in the Valley would increase the number of visitors using the recreation areas adjacent to the disposal boundary area, including Red Rock Canyon NCA, Sloan Canyon NCA, and Lake Mead National Recreation Area. This would likely have adverse cumulative impacts on facilities and resources, and on visitors' recreation experiences. The availability of SNPLMA funds to improve and maintain recreation areas would help mitigate any cumulative impacts.

4.15.11 Hazardous Materials

Based on past events of illegal dumping on vacant land, with future land development and the increased use of the area the abundance and concentration of dump piles would likely continue to increase on vacant parcels. Under all the alternatives, the type of materials present in these dump piles is not considered a significant hazardous materials concern, but a nuisance. As lands within the disposal boundary area are developed dumping would likely increase on adjacent vacant lands.

The increased rate of development would increase the amount of hazardous materials used, stored, and transported throughout the disposal boundary area in support of construction activities. This could have an adverse cumulative impact on the environment with the potential increased risk of spills. Future industrial development use would be subject to state and federal hazardous materials storage and use regulations thus cumulative impacts associated with these activities would be considered insignificant.

4.15.12 Socioeconomics

The No Action alternative could represent a negative cumulative impact in the Las Vegas Valley through the loss of funding to the Clark County School District and SNWA. However, the population is expected to continue to grow and funding received through tax dollars and use fees would most likely negate any cumulative economic loss. Under the two action alternatives, the development of 5,000 acres of land per year would increase the total dollars spent for construction, add dollars to the economy, employ additional workers, and generate more tax dollars. There would

be increased opportunities for employment. There would be no significant cumulative adverse impact to the economy in the Las Vegas Valley because the disposed BLM lands comprise approximately 25 percent of the total lands being developed within the Valley. The cumulative economic impact from ongoing development could conservatively be threefold more than the amount estimated for the land sale action. It is unknown at this time if there would be significant cumulative impacts to employment, because the construction industry has just begun to have difficulty in filling vacant positions

The increase in development would provide additional housing to the Valley and would thus increase school enrollment. The Clark County School District plans accommodate the increased school enrollment and additional schools would be constructed as part of the overall annual development. Therefore, no significant cumulative adverse impacts to housing and schools would occur.

4.15.13 Environmental Justice

Under all alternatives development in the Las Vegas Valley would continue. The development in the Las Vegas Valley is not anticipated to have a disproportionate high and adverse impact on EJ populations in the disposal boundary area. Under the two action alternatives, minority and low income populations could indirectly benefit over time by the continued development because of anticipated long-term employment opportunities in construction and other commercial services.

4.15.14 Range Management

Population growth in Clark County has resulted in increased demand for conversion of public land to urban and residential developments. This population growth trend is expected to continue and disposal of additional public lands used for grazing may occur in response to increasing demands for land in other areas of Clark County. However, only one grazing allotment in the Las Vegas Valley is within the disposal boundary area. The SNPLMA closed approximately 4,000 acres of this allotment, and the County Act will close approximately 3,000 additional acres. However the

allotment is no longer grazed because of lack of a water source. Thus the development of 5,000 acres of land per year would have no cumulative impact on range management. Planning for the Sloan Canyon NCA may further restrict grazing on the Hidden Valley allotment that may have a cumulative impact to the grazing operator.

4.16 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

A commitment of resources is irreversible when its primary or secondary impacts limit the future option for a resource. An irretrievable commitment refers to the use or consumption of resources neither renewable nor recoverable for later use by future generations.

The granting of ROWs and R&PP leases under the Proposed Action and Conservation Transfer Alternative prior to title transfer would cause direct impacts to the environment. Based on past development practices most ROWs and R&PPs would be paved or covered in some way, thus leading to complete disturbance of the native desert.

The Proposed Action and Conservation Transfer Alternative involve the transfer of title of BLM lands to public or private entities and as such, there would be no direct commitment of resources. However, once the transfer of title is complete it is expected that the lands would be developed. Development of the lands would require a commitment of natural, physical, and cultural resources. The commitment of resources focuses on:

- The use of nonrenewable resources, which include fossil fuels, electricity, water, and labor during development of the lands.
- The changes expected to occur as a result of development including the commitment of land, physical changes in the environment, effects on human populations, and fiscal changes.

Construction and development on the disposed lands would require the use of fossil fuels for electricity and for vehicles and equipment associated with construction activities. The use of raw building materials for construction would be an irretrievable use of resources from which these materials are produced. The use of water for construction activities (primarily dust control) would be irreversible.

Development of the lands would require labor that would be otherwise unavailable for other projects. The commitment of labor and fiscal resources to develop the land is considered irretrievable.

There would be irreversible and irretrievable loss of existing resources within the disposal boundary area. These resources would include the permanent loss of soils, vegetation, cultural and Native American sites, fossils, and wildlife. The visual quality of the area and the elimination of part of a ranching operation would also be irreversible impacts. The loss of the Hidden Valley Allotment from livestock grazing due to transfer of title and subsequent development is an irreversible commitment of resources.

The biological resources that would be permanently lost include individual plants and animals and habitat. The bearpoppy, buckwheat, and desert tortoise that inhabit the BLM lands would be destroyed or displaced as development occurs. Habitat for these species would also be lost. Because of the limited success in transplanting these sensitive plant species, the impact would be irreversible.

The National Historic Preservation Act would protect the cultural resources that are eligible for listing on the NRHP. However, numerous archaeological sites were identified that do not meet the criteria for listing. These sites contain archeological artifacts that provide information regarding the history of the area. The development of the disposal lands would destroy these archeological sites and the information that they provide would be irretrievably lost. Native American resources are nonrenewable; once they are destroyed or altered they cannot be replaced. Thus the loss of any cultural or traditional properties would be considered irreversible and irretrievable.

The paleontological resources located within the disposal boundary area would be irretrievably lost during development of the lands. The fossils and the scientific and education information that they provide would be irreversibly destroyed.

4.17 UNAVOIDABLE IMPACTS

Certain adverse impacts cannot be avoided even with application of mitigation measures. Implementation of the land disposal action would have direct unavoidable impacts on the continued availability and federal ownership of BLM managed lands within the Las Vegas Valley. Other unavoidable adverse impacts would be indirect and include:

- **Air Quality:** Fugitive dust and exhaust emissions from construction activities; operations emissions from residential, commercial, and industrial sources.
- **Earth Resources:** Soil erosion from wind and water. Soil displacement/loss from construction of ROWs.
- **Water Resources:** Water quality impacts from storm water runoff; increased impervious surface impacting groundwater infiltration.
- **Biological Resources:** Displacement of wild-life species; reduction of desert tortoise habitat; disturbance or complete removal of plant associations and communities.
- **Cultural Resources:** Disturbance of archaeological sites not determined eligible for listing on the NRHP. Potential removal of eligible cultural sites from the landscape.
- **Native American Resources:** Loss or disturbance of previously unknown sites of traditional or cultural significance.
- **Paleontological Resources:** Loss of scientific information and ability to recover unknown subsurface fossils.
- **Visual Resources:** Transition from rural, open areas to urban landscapes.

- **Land Use:** Planned land use that is incompatible with Tule Springs National Register Site.
- **Recreation and Wilderness:** Decreased opportunities for open space recreation.
- **Hazardous Materials:** Increased dumping of household waste and landscaping debris in concentrated areas or in other open lands because of encroaching development.
- **Socioeconomics:** No unavoidable adverse impacts identified.
- **Environmental Justice:** No unavoidable adverse impacts identified.
- **Range Management:** Sale of land in the Hidden Valley Allotment would preclude grazing.

4.18 RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Management of BLM lands is primarily for the long-term productivity of sensitive plant and animal species, paleontological resources, cultural resources, and certain dispersed recreation opportunities. For purposes of this EIS, short-term is defined as the remainder of the planning period through 2018 and long-term is the full build out of all disposed BLM lands. The administrative process of land disposal would result in the short-term indirect uses of the physical, natural, and cultural resources; however, the long-term productivity of these resources would be lost to the subsequent land development activities. The short-term use of the labor force for land development would result in the long-term productivity of the economic environment including increased employment, personal income, and tax revenue.