



Photos taken in vicinity of  
Osborne Overlook

## Chapter 4 Environmental Consequences



## CHAPTER 4.0

# ENVIRONMENTAL CONSEQUENCES

The environmental impacts associated with implementation of the project alternatives are described in the following sections. All impacts are considered direct impacts, unless noted as an indirect impact. A direct impact is caused by the action and occurs at the same time and place. Indirect impacts result from one or more of the direct impacts of the action, but may occur later in time or be further removed from the Plan Area. In addition, all impacts are considered adverse unless noted as beneficial. Where applicable, mitigation measures are provided to avoid, reduce, or compensate for project impacts.

The following sections detail the anticipated impacts associated with each of the project alternatives, based on 13 distinct, but interrelated, resource categories. These include:

- Recreation (Section 4.1)
- Biological Resources (Section 4.2)
- Law Enforcement and Public Safety (Section 4.3)
- Socioeconomics (Section 4.4)
- Land Use and Land Ownership (Section 4.5)
- Visual Resources (Section 4.6)
- Water Resources (Section 4.7)
- Cultural Resources (Section 4.8)
- Transportation and Traffic (Section 4.9)
- Noise (Section 4.10)
- Air Quality (Section 4.11)
- Hazardous Materials (Section 4.12)
- Geology, Energy, and Mineral Resources (Section 4.13)

## 4.1 RECREATION RESOURCES

This section assesses impacts to recreational resources as a result of implementing the alternatives described in Chapter 2 of this DEIS.

Alternative 1 (No Action) represents the management actions in the 1987 RAMP. The action alternatives (Alternatives 2, 3, and 4) provide different levels of developed recreation settings and improvements in accordance with designated ROS classes for each alternative (see Chapter 2 and Section 3.1, Recreation, for a discussion of ROS classes) and associated characteristics and uses. The visitor use levels are based on resource capabilities, concerns, and opportunities raised by the public, and varying degrees of response to seasonal shortages of such facilities in the area around the ISDRA. The amount, type, and location of facilities, trails, and roads vary for each action alternative in accordance with the ROS.

### 4.1.1 Assumptions and Assessment Guidelines

The management actions that would occur under all action alternatives (e.g., new and improved facilities, improved public safety measures, and public information encouraging off-peak visits) are expected to improve the overall quality of experience at ISDRA. Adverse impacts on the recreation resources of the ISDRA would result if the following conditions exist:

- The mix of activities changes in such a way as to create incompatibility among recreation uses
- The potential to exceed the visitor supply of the management areas

The estimated range of future visits to the ISDRA for the implementation period of the proposed revised RAMP (i.e., approximately 10 years) under each alternative is provided in Table 4.1-1. These estimates are based upon visitor use data from the 1999/2000 season (see Table 3.1-1). As noted in Section 3.1, the 1999/2000 season represents the baseline condition for visitor attendance because it is consistent with the management of ISDRA under the 1987 RAMP (i.e., prior to implementation of the temporary closures).

Since 1985, the number of visits at the ISDRA has approximately tripled (BLM, 2001q). (A “visit” is defined in the footnotes of Table 4.1-1.) This increase in visitor use represents an annual growth rate of approximately 7.5 percent since 1985. In comparison, the State of California Department of Parks and Recreation has estimated growth in statewide OHV activity of approximately 3.5 percent annually (California Department of Parks and Recreation, 1997). These two percentages comprise the high and low ends of the range of projected increases in visitation at ISDRA under the No Action Alternative (Alternative 1), as shown in Table 4.1-1.

Under the action alternatives (2, 3, and 4), law enforcement is proposed to be increased from the No Action condition for the six major holiday weekends. This management action is expected to result in a decrease in visitation by users who engage in unlawful activity. This initial decrease in visitor use, however, would be offset by other management actions intended to improve

the overall quality of experience at ISDRA (e.g., new and improved facilities, improved public safety measures, public information encouraging off-peak visits, etc.), that are expected to attract visitors seeking OHV recreational experiences consistent with legal activities. For the purposes of analysis in this DEIS, the lower end of the projected visitor-use growth range under the action alternatives is assumed to be similar to the statewide average (i.e., 3.5 percent). For each of the action alternatives (Alternatives 2, 3, and 4), the high end of the projected visitor-use growth range limit would be comparable to the historical growth rate experienced since 1985; but the actual increase in visitor use would be constrained by the availability of camping facilities and management actions designed to maintain a recreation experience associated with a specific ROS class.

The high end of the growth range under Alternative 2 is assumed to be 5 percent (i.e., the approximate mid-point of the 7.5 percent growth rate experienced annually at ISDRA since 1985 and the state projection for growth in OHV use of 3.5 percent).

Under Alternative 3, revising the ROS classification of the Adaptive Management Area is expected to limit the growth of OHV-related visitor use because the change in classification would exclude motorized vehicle use. The upper growth limit under Alternative 3 is, therefore, assumed to average 4 percent annually.

Alternative 4 is expected to result in a higher growth in visitation than the other action alternatives because the change in ROS class under that alternative would allow for additional campgrounds in the Glamis Management Area. On this basis, the anticipated high end of the growth range under Alternative 4 is assumed to average 6 percent annually.

**Table 4.1-1 Visitor Use Projections (2002-2003 to 2012-2013)**

	BASELINE VISITS (1999-2000 SEASON)	ESTIMATED VISITS <sup>1</sup> (2002-2003 SEASON) <sup>2</sup>	PROJECTED VISITS (2012-2013 SEASON) <sup>3</sup>	
			LOW RANGE	HIGH RANGE
Alternative 1	867,753	1,005,000	1,418,000	2,071,000
Alternative 2	867,753	1,005,000	1,418,000	1,637,000
Alternative 3	867,753	1,005,000	1,418,000	1,488,000
Alternative 4	867,753	1,005,000	1,418,000	1,800,000

<sup>1</sup>A “visit” occurs when one person visits BLM lands to engage in any recreation activity, whether for a few minutes, full day, or more.

<sup>2</sup>The estimate for the 2002-2003 season is based on an average 5 percent growth rate from the baseline season (1999-2000).

<sup>3</sup>This projection is the expected change in visitation between the 2002-2003 season and the 2012-2013 season. This represents the first season following implementation of a revised RAMP and 10 years later (i.e., the proposed period of implementation for a revised RAMP).

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### 4.1.2 Impacts

For this analysis of recreational resources, the assessment focuses on the ROS classifications as they pertain to the action alternatives. The proposed ROS classifications for the action alternatives (Alternatives 2, 3, and 4) are described in Chapter 2 (see Table 2-2). For Alternative 1, the BLM has not assigned any ROS classifications because a ROS inventory of the lands within the ISDRA has not yet been conducted. The discussion of each action alternative focuses on the following:

- The change in ROS designation, when compared to the baseline condition
- The expected increase in visitation and the visitor supply of the nine management areas

For Alternative 1, the assessment focuses on continued implementation of the 1987 RAMP and baseline conditions (excluding the interim closures).

#### 4.1.2.1 Alternative 1

This alternative would not affect the current status of the North Algodones Dunes Wilderness Area, which prohibits motorized use within its boundaries, but allows nonmotorized recreation use. Alternative 1 is depicted in Figure 2-1 in this DEIS.

Although recreationists would continue to congregate at high-use areas under Alternative 1, it is likely that there would be some change to existing visitor use patterns (i.e., the spatial distribution of recreation visits at ISDRA). As noted above in Table 4.1-1, annual visitation in 2002-2003 is expected to be approximately 1,005,000; by 2012-2013 annual visitation would grow to an estimated 1,418,000 to 2,071,000. This increase in visitation is likely to result in a dispersal of recreationists into less crowded areas, thereby increasing the concentration of visitors in areas that currently maintain a lower number of visitors. As a result, compatibility issues may arise between those users seeking a more solitary experience and those users dispersed into lower-use areas due to overcrowding. This is considered a potentially adverse impact of Alternative 1.

Increased visitation would present various management challenges for ISDRA staff, including those involving public safety. This issue is addressed further in Section 4.3 (Law Enforcement and Public Safety).

Implementation of this alternative would also provide for some recreation improvements, as outlined in the 1987 RAMP. These improvements include installation of signs; development and distribution of brochures; presentation of evening programs in the Gecko, Glamis, or Buttercup areas; development of a vehicle corridor along the Old Coachella Canal; development of a hiker/equestrian trailhead along the Niland-Glamis Road north of Glamis; establishment of Osborne Lookout as an interpretive site (and eventually to a day-use facility); various improvements at the camping areas; improvements to the Cahuilla Ranger Station; and provisions for increasing visitor and staff safety at ISDRA. These improvements would provide a beneficial impact to the recreationists who visit those areas.

**4.1.2.2  
Alternative 2**

**ROS Designations**

Implementation of Alternative 2 would result in the designation of individual ROS categories to each of the nine management areas in the Plan Area, as described previously in Chapter 2. The specific ROS designations associated with this alternative are depicted in Figure 4.1-1. Table 4.1-2 provides a breakdown of the acreage and a description of the type of recreation experience that characterizes each ROS class designation.

**Table 4.1-2 ROS Class Acreage and Description  
Alternative 2**

<b>ROS CLASS</b>	<b>DESCRIPTION</b>	<b>DESIGNATED ACREAGE</b>
Rural	Indicates that the area is characterized by a natural environment that has been modified substantially by development of structures, vegetative manipulation, or pastoral agricultural development. Resource modification and utilization practices may be used to enhance specific recreational activities and maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction among users is often moderate to high. Many facilities are designed for use by a large number of people, and facilities often are provided for special activities. Moderate user densities are present away from developed sites. Facilities for intensified motorized use and parking are available.	29,741
Roaded Natural	Indicates that the area is characterized by a predominantly natural-appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction among users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.	64,389
Semi-Primitive Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that there are minimum onsite controls, and restricted use of local primitive or collector roads with predominantly natural surfaces and trails suitable for motorbikes is permitted.	105,208
Semi-Primitive Non-Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Interaction among users is low, but there is often evidence of other users. The area is managed in such a way that minimum onsite controls; and restrictions may be present, but would be subtle. Motorized recreation use is not permitted, but local roads used for other resource management activities may be present on a limited basis.	27,695
Total		227,033

Under Alternative 2, management actions would be applied to ensure that the recreation experience at ISDRA was consistent with the ROS class designated to each of the nine management areas. In contrast, visitation under the baseline condition would continue to grow unmanaged, such that the possibility of conflicts among competing recreation uses would result. For example, under baseline conditions, opportunities for lower intensity

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recreational activity (e.g., as characterized by the semi-primitive motorized and roaded natural ROS classes) would eventually be diminished due to overcrowding.

Management actions to be applied under Alternative 2 in support of the ROS designations include facility development and actions to ensure that the visitor supply (discussed below) at ISDRA is not substantially exceeded. The anticipated result is the conservation of unique recreation opportunities afforded by ISDRA, such as those associated with the Semi-Primitive Motorized and Roaded Natural ROS classes. This is considered a beneficial impact.

### Visitor Supply

The estimated visitor supply at ISDRA is provided in Table 4.1-3. The visitor supply is defined as the maximum number of visitors that could occur at ISDRA while maintaining the designated ROS class.

**Table 4.1-3 Visitor Supply by Management Area**

AREA	DESIGNATED ROS CLASS	VISITOR SUPPLY <sup>a</sup>
Gecko Management Area	Rural	3,172
Buttercup Management Area	Rural	16,569
Mammoth Management Area	Semi-Primitive Motorized	1,890
Glamis Management Area	Roaded Natural	12,684
Adaptive Management Area <sup>b</sup>	Semi-Primitive Motorized	525
Ogilby Management Area	Roaded Natural	9,702
Dune Buggy Flats Management Area	Roaded Natural	11,340
North Algodones Dunes Management Area	Semi-Primitive Non-Motorized	116 <sup>c</sup>
Total	NA	55,998

<sup>a</sup>The visitor supply presented is based on the acreage available for camping, the number of available campsites, an average number of vehicles per camping party, and an average number of people per vehicle.

<sup>b</sup>The Adaptive Management Area has a supply of 75 groups of OHVs at one time. An OHV group consists of 7 vehicles.

<sup>c</sup>No motorized vehicles allowed at these campsites.

Historically, visitation during major holiday weekends has often exceeded 100,000 visits (BLM, 2001q). This level of visitation far exceeds the visitor supply at ISDRA, as defined above in Table 4.1-3. However, over the course of the recreation season at ISDRA (October 1 through May 31), the total annualized visitor supply is expected to be adequate. For example, assuming that all visits occur on weekends only, the total number of visits that could occur at ISDRA over the entire season while still maintaining the designated ROS classes would be over 2.1 million (39 weekends x 55,998 visits supply). Because the high estimate of future visits under this alternative (see

Table 4.1-1) is just over 1.6 million, the total annual visitor supply would be sufficient to meet the demand over the course of a full season. Therefore, overall access at ISDRA would be maintained.

While management actions can be expected to redistribute visits to weekends other than the major holiday weekends, this does not represent an adverse impact to recreation resources because it would not alter the recreation experience at ISDRA. As noted above, the maintenance of designated ROS classifications through management actions would provide a beneficial impact to recreation by preserving the unique quality of experience provided at ISDRA (e.g., Semi-Primitive Motorized and Roded Natural ROS classes).

### **Other Management Actions**

This alternative would include updating the kiosks at the Wildlife Viewing Area. This would provide a beneficial impact to the public.

Osborne Overlook would be closed to camping with implementation of this alternative. This would eliminate a recreational opportunity that is offered by the baseline condition.

Applying a dust palliative on the Wash Road has the potential to reduce the dust and, therefore, improve the quality of the recreational experience in that area.

This alternative would provide for the development of pit toilet facilities in Glamis Flats, The Washes, and Dune Buggy Flats areas. This would provide an amenity to recreationists and is considered a beneficial impact.

Closing Oldsmobile Hill, Competition Hill, Competition Hill South Dunes, Test Hill, and Patton Valley at night would eliminate a recreational opportunity that is offered in the baseline condition.

In the Buttercup Management Area, interpretive facilities and parking would be developed near Grays Well Road and a law enforcement/ranger station facility would be constructed. These facilities would provide an amenity to recreationists, and would provide a beneficial impact.

### **4.1.2.3 Alternative 3**

#### **ROS Designations**

Implementation of Alternative 3 would result in the designation of individual ROS categories to each of the nine management areas in the Plan Area, as described previously in Chapter 2. The specific ROS designations associated with this alternative are depicted in Figure 4.1-2. Table 4.1-4 provides a breakdown of the acreage and a description of the type of recreation experience that characterizes each ROS class designation.

**Table 4.1-4 ROS Class Acreage and Description  
Alternative 3**

<b>ROS CLASS</b>	<b>DESCRIPTION</b>	<b>DESIGNATED ACREAGE</b>
Roaded Natural	Indicates that the area is characterized by a predominantly natural-appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction among users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.	29,741
Semi-Primitive Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that there are minimum onsite controls, and restricted use of local primitive or collector roads with predominantly natural surfaces and trails suitable for motorbikes is permitted.	64,395
Semi-Primitive Non-Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Interaction among users is low, but there is often evidence of other users. The area is managed in such a way that minimum onsite controls and restrictions may be present, but would be subtle. Motorized recreation use is not permitted, but local roads used for other resource management activities may be present on a limited basis.	132,897
Total		227,033

Under Alternative 3, management actions would be applied to ensure that the recreation experience at ISDRA was consistent with the ROS class designated to each of the nine management areas. In contrast, visitation under the baseline condition would continue to grow unmanaged, such that the possibility of conflicts among competing recreation uses would result. For example, under baseline conditions, opportunities for lower intensity recreational activity (e.g., as characterized by the semi-primitive motorized and roaded natural ROS classes) would eventually be diminished due to overcrowding. Compared to Alternative 2, Alternative 3 would provide an increased area available for semi-primitive recreation experiences, including semi-primitive non-motorized, which would constitute more than half of the ISDRA under this alternative.

Management actions to be applied under Alternative 2 in support of the ROS designations include facility development and actions to ensure that the visitor supply (discussed below) at ISDRA is not substantially exceeded. The anticipated result is the conservation of unique recreation opportunities afforded by ISDRA, such as those associated with the Semi-Primitive Motorized and Roaded Natural ROS classes. This is considered a beneficial impact. Potential impacts relating to the decrease in acreage available for motorized vehicle activity are discussed below under visitor supply.

### Visitor Supply

The estimated visitor supply at ISDRA under this alternative would be lower than that available under Alternative 2. This is due to the increased acreage designated as Semi-Primitive and Rural ROS classes, which are associated with a less intense (i.e., a lower concentration) of visitors.

Historically, visitation during major holiday weekends has often exceeded 100,000 visits (BLM, 2001q). Because the total area available for OHV use under Alternative 3 would be less than half of that available under Alternative 2, the visitor supply is anticipated to be reduced proportionately. Assuming that the visitor supply under Alternative 3 is approximately 50 percent of that available under Alternative 2, the visitor supply would be exceeded on major holiday weekends. Further, the annual visitor supply over the course of the ISDRA season would be just over 1 million visits (i.e., 39 weekends x 55,998 visits x 50 percent). Because both the low and high estimates for the number of future visits under Alternative 3 (see Table 4.1-1) would exceed the annual visitor supply, not all recreationists desiring to attend ISDRA could be accommodated. This represents an adverse impact to recreation resources.

The implementation of management actions designed to maintain the Semi-Primitive Non-Motorized ROS class at ISDRA would provide a benefit to recreationists not engaging in motorized vehicle activity. However, non-OHV activities represent the minority of visits to ISDRA, historically averaging around 10 percent of the total (BLM, 1993)

### Other Management Actions

Impacts related to other management actions (e.g., facility development, nighttime closures, etc.) would be similar to those discussed previously under Alternative 2.

#### 4.1.2.4 Alternative 4

### ROS Designations

Implementation of Alternative 4 would result in the designation of individual ROS categories to each of the nine management areas in the Plan Area, as described previously in Chapter 2. The specific ROS designations associated with this alternative are depicted in Figure 4.1-3. Table 4.1-5 provides a breakdown of the acreage and a description of the type of recreation experience that characterizes each ROS class designation.

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**Table 4.1-5 ROS Class Acreage and Description  
Alternative 4**

<b>ROS CLASS</b>	<b>DESCRIPTION</b>	<b>DESIGNATED ACREAGE</b>
Urban	Indicates that the area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are often used to enhance specific recreation activities. Vegetative cover is often exotic and manicured, and sights and sounds from humans are predominant onsite. Large numbers of users can be expected both onsite and in nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.	29,741
Rural	Indicates that the area is characterized by a natural environment that has been modified substantially by development of structures, vegetative manipulation, or pastoral agricultural development. Resource modification and utilization practices may be used to enhance specific recreational activities and maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction among users is often moderate to high. Many facilities are designed for use by a large number of people, and facilities often are provided for special activities. Moderate user densities are present away from developed sites. Facilities for intensified motorized use and parking are available.	64,389
Roaded Natural	Indicates that the area is characterized by a predominantly natural-appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction among users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.	45,990
Semi-Primitive Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that there are minimum onsite controls, and restricted use of local primitive or collector roads with predominantly natural surfaces and trails suitable for motorbikes is permitted.	59,218
Semi-Primitive Non-Motorized	Indicates that the area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Interaction among users is low, but there is often evidence of other users. The area is managed in such a way that minimum onsite controls and restrictions may be present, but would be subtle. Motorized recreation use is not permitted, but local roads used for other resource management activities may be present on a limited basis.	27,695
Total		227,033

Under Alternative 4, management actions would be applied to ensure that the recreation experience at ISDRA is consistent with the ROS class designated to each of the nine management areas. In contrast, visitation under the baseline condition would continue to grow unmanaged, such that the possibility of conflicts among competing recreation uses would result. For example, under baseline conditions, opportunities for lower intensity recreational activity (e.g., as characterized by the Semi-Primitive Motorized and Roaded Natural

ROS classes) would eventually be diminished due to overcrowding. Compared to Alternatives 2 and 3, this alternative would provide an increased area available for Rural and Urban recreation experiences. Relative to Alternative 2 and 3, Alternative 4 would provide less acreage designated to Semi-Primitive Motorized recreational activity.

Management actions to be applied under Alternative 4 in support of the ROS designations include facility development and actions to ensure that the visitor supply (discussed below) at ISDRA is not substantially exceeded. The anticipated result is the conservation of recreation opportunities characterized by the Rural, Roaded Natural, and Semi-Primitive Motorized ROS classes. This is considered a beneficial impact.

### **Visitor Supply**

The estimated visitor supply at ISDRA under this alternative would be greater than that available under Alternatives 2 and 3. This is due to the increased acreage designated for OHV use (i.e., Urban, Rural, Roaded Natural, and Semi-Primitive Motorized ROS classes) as well as the higher concentration of activity that could be accommodated.

Historically, visitation during major holiday weekends has often exceeded 100,000 visits (BLM, 2001q). While the total area available for OHV use under Alternative 4 would be similar to Alternative 2, the increased intensity (i.e., concentration of OHV users) is expected to increase available visitor supply by at least 20 percent over Alternative 2. Even so, the visitor supply under Alternative 4 may be exceeded under Alternative 4 on major holiday weekends. However, the annual visitor supply would be approximately 2.6 million visitors (39 weekends x 55,998 visitor supply x 1.2). This supply is well above the anticipated high range of future visits expected under Alternative 4 of approximately 1.8 million. Therefore, overall access at ISDRA would be maintained.

### **Other Management Actions**

Impacts related to other management actions (e.g., facility development, nighttime closures, etc.) would be similar to those discussed previously under Alternative 2.

### **4.1.3 Mitigation Measures**

As noted above under Assumptions and Assessment Guidelines, implementation of the management actions under the action alternatives (2, 3, and 4) is expected to result in beneficial impacts to recreation resources. Adverse impacts related to visitor supply noted for Alternative 3 are considered unavoidable as they are based in a management objectives and actions designed to minimize visitor supply and maximize natural and cultural resources conservation. Adverse impacts associated with overcrowding and potential recreational use conflicts under the No Action (Alternative 1) would be best mitigated through implementation of one of the action alternatives.

## 4.2 BIOLOGICAL RESOURCES

This section evaluates the project alternatives in terms of their potential impacts to biological resources. Biological resources are categorized as habitat types, special-status plants, and special-status and endemic wildlife as described in Chapter 3, Affected Environment. The Biological Assessment for the project also addresses specific impacts to, and mitigation for, the Peirson's milk-vetch, desert tortoise, and flat-tailed horned lizard. The Biological Assessment is appended to this DEIS (Appendix B).

### 4.2.1 Assumptions and Assessment Guidelines

Impacts to biological resources, as discussed in this section, are assumed to be adverse unless stated otherwise. The baseline conditions for this analysis are described as Alternative 1 (see Chapter 2). Analysis of the potential impacts focuses on changes in anticipated patterns of recreation use, both location and intensity, that would result from implementing an alternative.

Alternative 1 does not include the designation of management areas and ROS classifications as described for the action alternatives (Alternatives 2, 3 and 4). For Alternatives 2, 3, and 4, the nine management areas described in Chapter 2 will be collectively referred to as the Plan Area. The assessment of changes in the recreation use patterns of these three alternatives is based on changes in ROS classifications as described in Section 4.1, Recreation Resource. The ROS classifications designate the extent and nature of OHV activities that characterize a desired future condition associated with a particular alternative. Impacts considered in this chapter are then based on the extent to which the natural environment is likely to be modified by this level of activity, and thereby will serve as an index to potential changes in impacts to biological resources. The relative importance and sensitivity of biological resources in the vicinity of the proposed activities or development was factored into the impact analysis as described in Section 3.2.1 (Regulatory Framework).

For each of the alternatives, the three predominant habitat types (creosote bush scrub, psammophytic scrub, and microphyll woodland) within the ISDRA were considered. These habitat types would not be impacted by OHV recreation within the North Algodones Dunes Wilderness, which is closed to OHV use. Although canal-influenced vegetation is a fourth habitat type, it was not quantified for any of the alternatives because this habitat type is not anticipated to receive impacts as a consequence of OHV use. Such vegetation is on the margin of canals, in situations that are not suitable for OHV activity, and are consequently avoided by OHV users.

### 4.2.2 Impacts

#### 4.2.2.1 Alternative 1

Under Alternative 1, the No Action Alternative, the ISDRA would continue to be managed based on the existing and approved management policies of the 1987 RAMP. Therefore, recreational facility development identified in the 1987 RAMP would be implemented. In addition, this alternative includes the designation of the North Algodones Dunes Wilderness Area, federal listing of

the Peirson’s milk-vetch as a threatened species, and the release of Wilderness Study Area 362 from further studies.

This alternative does not include the current interim OHV and camping closures. Also, there would be no revised biological monitoring or adaptive management program, new management areas would not be designated, and ROS classifications would not be assigned under this alternative.

Between 1985 and 2000, the number of visits at the ISDRA approximately tripled. This increase in visitor use represents an annual growth rate of approximately 7.5 percent during the period 1985 to 2000. In comparison, the State of California Department of Recreation has estimated growth in statewide OHV activity of approximately 3.5 percent annually. These two estimates represent the range of projected increases in visitation at the ISDRA under Alternative 1.

**Habitat Types**

Potential impacts to habitat types including creosote bush scrub, psammophytic scrub, and microphyll woodland are expected to occur under Alternative 1. This is based on the description of Alternative 1 (see Chapter 2) that includes retaining OHV recreational activities in the entire ISDRA (with the exception of the North Algodones Dunes Wilderness Area), and based on the anticipated effects of increased visitor use over time.

The estimated area of each of the three habitat types potentially impacted under Alternative 1 is shown in Table 4.2-1. As shown in this table, the closure of the area to motorized vehicles would result in retaining 27,695 acres of habitat in an undisturbed setting, which represents 16 percent of the ISDRA. Approximately 139,678 acres would remain available to motorized recreational activities, which represents the remaining 84 percent of the ISDRA. In other words, under Alternative 1, 20 percent or less of each habitat type within the ISDRA would be closed to OHV recreational activities.

**Table 4.2-1 Habitat Types by Estimated Area Closed and Open to Motorized Use under Alternative 1**

HABITAT TYPE	CLOSED (ACRES)	PERCENT WILDERNESS AREA CLOSED	OPEN (ACRES)	PERCENT OPEN
Creosote Bush Scrub	3,188	15	18,668	85
Psammophytic Scrub	16,956	16	91,177	84
Microphyll Woodland	7,551	20	29,833	80

On the basis of the allocation of ISDRA lands shown in Table 4.2-1, at least 15 percent of the affected habitat would be closed to OHV use. Therefore, the habitat fragmentation, soils compaction, and other potential impacts discussed below would not occur in these areas. Anticipated direct impacts to areas not

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closed to OHV recreational use (the remaining approximately 80 percent of the ISDRA) would include loss, degradation, and fragmentation of habitat, particularly creosote bush scrub and psammophytic scrub. These impacts described below are not substantively different than the baseline conditions (see Chapter 3), and, therefore, the only marginal impacts would be those that would occur from increased visitor use.

Under this alternative, facility development in accordance with the 1987 RAMP would still occur and is anticipated to contribute to potential impacts to habitat. This construction, however, is anticipated to occur in areas already heavily used for OHV recreation (as opposed to areas that contribute to maintaining habitat of the affected species). Therefore, impacts to habitat resulting from facility development are expected to be minimal.

Indirect impact is anticipated as a result of the increased visitor use associated with facility expansion. This includes campground and access improvements resulting in increased use and in localized impacts to these habitat types. Indirect impacts include soil erosion and dust generation. Plants smothered by dust may experience reduced photosynthesis and transpiration, ultimately reducing vegetative cover. As desert environments are not generally conducive to rapid perennial plant growth (including regrowth), revegetation could take decades. Although the central deep sand dunes are not vulnerable to invasions of invasive species, reducing vegetative cover and disturbing soils as a result of recreational activities could increase the potential for such invasions. Invasive species in the eastern and western margins of the Plan Area, where underlying substrate is hard packed, may eventually displace some native vegetation.

### **Special-Status Plants**

Potential impacts to special-status plants are expected occur under Alternative 1. This assumes that the entire ISDRA, with the exception of the North Algodones Dunes Wilderness Area, would remain open to OHV recreational activities and projected visitor use would increase over time. Special-status plants that may be impacted from OHV and associated recreational development include: Peirson's milk-vetch, Algodones dunes sunflower, Wiggins' croton, giant Spanish needle, and sand food. Direct and indirect adverse impacts are anticipated to be similar to those described for the habitat types. Each of these species is dependent on psammophytic scrub habitat. Under Alternative 1, approximately 16 percent of this habitat type will be off limits to OHV use in the North Algodones Dunes Wilderness Area and 84 percent would be open to OHV use.

### **Special-Status and Endemic Wildlife**

As with habitat types and special-status plants, potential impacts to special-status and endemic wildlife are expected to occur under Alternative 1. This expectation is based on the assumption that the entire ISDRA, with the exception of the North Algodones Dunes Wilderness Area, will remain open to OHV recreational activities and the projected visitor use would increase over time. Primary impacts to special-status and endemic wildlife include

direct mortality from recreational vehicles. Secondary impacts include destruction of forage and habitat; crushing of burrows; attraction of predators due to improper disposal of food and litter; harassment and illegal collection of wildlife; harassment by unleashed pets; dust, noise, lights associated with OHV and camping activities; and increased potential for invasion of non-native plants.

It has been shown that prolonged noise can adversely affect some lizards and small mammals. Investigations by Brattstrom and Bondello (1983) on the effect of OHV noise included the desert kangaroo rat (*Dipodomys deserti*), desert iguana (*Dipsosaurus dorsalis*), and Mohave fringe-toed lizard (*Uma scoparia*). Desert kangaroo rats and fringe-toed lizards demonstrated an immediate loss of hearing when exposed to OHV sounds of 95 dBA. Recovery of the kangaroo rat hearing took several weeks, during which time they would have been more vulnerable to predation. Effects are more likely where prolonged noise occurs. However, it is not known whether duration of vehicle noise levels anticipate at the ISDRA negatively impact wildlife. A single OHV can generate a noise level of 92 dB(A) at 50 feet, although the duration of the exposure is likely to be quite short as a vehicle passes by. Wildlife exposure to OHV noise is very localized and only at relatively high levels during the six holiday weekend during the year.

OHV activity tends to be concentrated within the psammophytic scrub. As a consequence, some special-status wildlife species such as the Colorado Desert fringe-toed lizard and endemic dune beetles occurring in these dunes would be killed or injured by OHV activity. Access routes through microphyll woodland habitat and open desert wash areas may result in direct impacts to the desert tortoise through running over tortoises or crushing burrows. These activities may also affect Couch's spadefoot toad habitat through disturbance of small ephemeral pools for which this species depends. The tendency for Couch's spadefoot toad to aggregate during breeding season may pose a higher risk from an increase in OHV activity in this area.

For each of the alternatives potential impacts to Colorado Desert fringe-toed lizards and flat-tailed horned lizards were considered in detail. For the Colorado Desert fringe-toed lizard it is assumed that the all areas of psammophytic scrub and creosote bush scrub are occupied habitat. Under Alternative 1, approximately 20,144 acres, or 16 percent, of habitat would be closed to motorized recreation in the North Algodones Dunes Wilderness while approximately 109,845 acres of habitat, or 84 percent, would remain open to OHV use.

To determine the extent to which OHV use may impact the flat-tailed horned lizards, the number of cells (survey units) containing flat-tailed horned lizards observed within the North Algodones Dunes Wilderness Area, and those in the areas open to OHV activities were tallied. The figures used for the analysis of each alternative were derived from 1998 and 2001 data collected by the BLM. The figures reflect the number of cells that contained flat-tailed horned lizards during the surveys, not actual numbers of horned lizards. The number

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and percentage of occupied cells containing flat-tailed horned lizards within the areas closed to OHVs and open to OHVs within the ISDRA are presented in Table 4.2-2. As the table shows, a total of 17 and 67 occupied cells are within closed and open areas, respectively.

**Table 4.2-2 Occupied Cells Containing Flat-tailed Horned Lizards in Areas Closed and Open to Motorized Use the ISDRA under Alternative 1**

<b>CLOSED TO OHV USE (OCCUPIED CELLS)</b>	<b>PERCENT WILDERNESS AREA CLOSED</b>	<b>OPEN TO OHV USE (OCCUPIED CELLS)</b>	<b>PERCENT OPEN</b>
17	20	67	80

Source: BLM 1998, 2001B

### 4.2.2.2 Alternative 2

There are two distinct differences in ROS classifications between Alternative 2 and both Alternatives 3 and 4. Under Alternative 2, the Glamis Management Area and Adaptive Management Area will be designated as Roded Natural and Semi-Primitive Motorized, respectively. The management focus for Alternative 2 would be a combined approach to accommodate continued use of the Plan Area for OHV recreational opportunities as well as protection of natural and cultural resources. The key component contributing to resource protection under Alternative 2 is the establishment of the Adaptive Management Area and implementation of an adaptive management program. Management of this area would include evaluating the effects of and revising management actions, as needed, to achieve a balance of providing a high quality recreation opportunities and conserving high value natural resources. Under Alternative 2, the visitor use is expected to increase from 3.5 to 5 percent annually relative to the low end estimated for the baseline. Additionally, the ROS classification of the Adaptive Management Area is expected to slightly increase overall OHV-related visitor use relative to the baseline. Therefore, this use is expected to be higher than under Alternative 3 (the area would be closed) but lower than Alternative 4.

#### **Habitat Types**

Potential impacts to habitat types including creosote bush scrub, psammophytic scrub, and microphyll woodland are expected to decrease overall under Alternative 2, relative to Alternative 1. This conclusion is based on the designation of ROS classifications, implementation of an adaptive management strategy in the Adaptive Management Area, and projected annual visitor use increase differences.

The area of each habitat type under Alternative 2 is shown in Table 4.2-3. The Plan Area encompasses approximately 51,875 acres of creosote bush scrub, 108,658 acres of psammophytic scrub, and 65,382 acres of microphyll woodland totaling 225,915 acres of these three habitat types. These figures were used for the analysis of all action Alternatives. The North Algodones Dunes Wilderness Management Area would provide a total of 27,695 acres closed to motorized recreation, or 12 percent of the Plan Area. The Adaptive

Management Area would provide a total of 33,952 acres of controlled access, or 15 percent of the Plan Area. The Buffer Zone Management Area would provide a total of 58,542 acres of limited use, representing 26 percent of the Plan Area. These three management areas total 120,189 acres that are provided increased habitat protection through controlled access or closure under Alternative 2, representing 53 percent of the Plan Area. The remaining management areas open to OHV use total 105,726 acres, or 47 percent of the Plan Area. Because the Plan Area encompasses an area of predominantly psammophytic scrub, this habitat type has the largest area amongst the habitat types. Sixteen percent or less of each habitat type within the Plan Area is closed to motorized recreation under Alternative 2.

**Table 4.2-3 Habitat Types by Estimated Areas within Closed , Controlled Access, and Open areas under Alternative 2**

HABITAT TYPE	CLOSED TO OHV USE (ACRES)	PERCENT CLOSED	CONTROLLED ACCESS (ACRES)	PERCENT CONTROLLED ACCESS	OPEN TO OHV USE (ACRES)	PERCENT OPEN
Creosote Bush Scrub	3,188	6	30,019	58	18,668	36
Psammo-phytic Scrub	16,956	16	24,726	23	66,976	61
Microphyll Woodland	7,551	12	37,749	58	20,082	30

Moderate facility development, campground improvements, and road maintenance are anticipated under Alternative 2, and are expected to result in impacts to habitats similar to those described under Alternative 1. However, impacts to habitat within the Adaptive Management Area and the area that is encompassed by the Buffer Zone Management Area under Alternative 2 are expected to substantially decrease relative to Alternative 1. Because OHV use would be monitored and controlled within the Adaptive Management Area, only minor impacts to habitat are anticipated. Enforcement of the Adaptive Management Area and Buffer Zone Management Area use would include installing and maintaining signage. This could produce an edge effect along the boundaries, resulting in some loss of perennial vegetation. Concentrated recreational use is anticipated to continue within adjacent open areas, even within the camping areas, and may occasionally lead to unauthorized activity in closed or restricted areas. Creosote bush scrub and microphyll woodland, characterized by large upright woody plants with sharp branches, are generally avoided by OHV users. Therefore, OHV impacts would likely continue to be primarily within psammophytic scrub, which encompasses 108,658 acres or 48 percent of the Plan Area.

**Special-Status Plants**

Impacts to special-status plants are expected to decrease under Alternative 2. This conclusion is based on adoption of a adaptive management approach

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which entails monitoring special-status plants. Moderate facility development, campground improvements, and road maintenance are anticipated to result in impacts similar to those described under Alternative 1. However, impacts to special-status plants within the Adaptive Management Area and Buffer Zone Management Area are expected to substantially decrease relative as a result of implementing conservation measures. Because OHV use would be controlled within the Adaptive Management Area, disturbance to special-status plants are anticipated on the newly established boundary of the area. Enforcement of the Adaptive Management Area and Buffer Zone Management Area would include installing and maintaining signage. Concentrated recreational use is anticipated within adjacent open areas, and at camping areas, and would result in the disturbance of special-status plants that may occur there. As previously stated, OHV use has been historically concentrated within psammophytic scrub. Therefore, OHV impacts are anticipated to be concentrated within this important habitat type for the five special-status plant species. For Alternative 2, 41,682 acres, or 39 percent, of psammophytic scrub would receive protection either through closed OHV access in the North Algodones Dunes Wilderness or controlled access in the Adaptive Management Area.

### **Special-Status and Endemic Wildlife**

Impacts to special-status and endemic wildlife are expected to decrease relative as a result of adopting adaptive management measures. Moderate facility development, campground improvements, and road maintenance are anticipated to result in impacts similar to those described under Alternative 1. However, impacts to special-status and endemic wildlife within the Adaptive Management Area and Buffer Zone Management Area are expected to substantially decrease. Because OHV use would be controlled within the Adaptive Management Area, negligible impacts to special-status and endemic wildlife are anticipated. Enforcement of the Adaptive Management Area and Buffer Zone Management Area could produce an edge effect along the boundaries, resulting in loss or displacement of special-status and endemic wildlife there. Concentrated recreational use in the open areas may also result in the loss or displacement of special-status and endemic wildlife. Additionally, OHV activities, and therefore impacts, are anticipated to be concentrated within psammophytic scrub which is an important habitat type for the Colorado Desert fringe-toed lizard.

As for all alternatives, potential impacts to Colorado Desert fringe-toed lizards and flat-tailed horned lizards were considered in detail. For the Colorado Desert fringe-toed lizard it is assumed that the all areas of psammophytic scrub and creosote bush scrub are occupied habitat. Under Alternative 2, approximately 20,144 acres, or 13 percent, of habitat would be closed to motorized recreation in the North Algodones Dunes Wilderness, approximately 54,745 acres of habitat, or 34 percent would be under controlled access within the Adaptive Management Area; and approximately 85,644 acres of habitat, or 53 percent, in areas open to OHV use.

The number of occupied cells (survey units) containing flat-tailed horned lizards observed within the North Algodones Dunes Wilderness Area, the Adaptive Management Area, and those in the open areas were tallied. The figures used for the analysis of each alternative were derived from 1998 and 2001 data collected by the BLM. The figures constitute the number of occupied cells during the surveys and do not represent the actual numbers of flat-tailed horned lizards. The number and percentage of occupied cells containing flat-tailed horned lizards within these areas within the Plan Area are presented in Table 4.2-4. As the table shows, a total of 17, 28 and 67 occupied cells are within areas that would be closed to OHV use, controlled access, and open areas, respectively.

**Table 4.2-4 Cells Containing Flat-tailed Horned Lizards in Areas to be Closed to OHV Use, Subject to Controlled OHV Access, or Open to Motorized Use within the Plan Area under Alternative 2**

CLOSED TO OHVS (OCCUPIED CELLS)	PERCENT CLOSED	CONTROLLED ACCESS OCCUPIED CELLS	PERCENT CONTROLLED ACCESS	OPEN (OCCUPIED CELLS)	PERCENT OPEN
17	15	28	25	67	60

Source: BLM 1998, 2001b

**4.2.2.3  
Alternative 3**

Under Alternative 3, the Plan Area would be managed under the same management area designations as Alternatives 2 and 4, but different ROS classifications would apply to those management areas. The management focus for this alternative would be protection of natural and cultural resources through the use of closures. Accordingly, Alternative 3 would designate the Mammoth, Adaptive, and Buffer Zone Management Areas as Semi-Primitive Non-Motorized. Management of these areas would be much the same as the North Algodones Dunes Wilderness Management Area in terms of natural resources protection resulting from the prohibition of OHV activities, although through-traffic would continue to be permitted on existing roads.

Under Alternative 3, visitor use is expected to slightly increase from 3.5 to 4 percent annually relative to the low end of the baseline. However, the ROS classifications of the Mammoth, Adaptive, and Buffer Zone Management Areas are expected to reduce overall OHV-related visitor use in these areas. Therefore, this growth in visitor use is expected to be lower than either Alternatives 2 or 4 within these three management areas.

**Habitat Types**

Potential impacts to the three predominant habitat types are expected to decrease under Alternative 3 based on the projected modest increases in visitor use and on the impacts extrapolated from the ROS classifications previously described.

As shown in Table 4.2-5, the closure of three management areas to motorized vehicles would result in approximately 131,803 acres of the three habitat types being undisturbed by OHV use in the future, or 58 percent of the Plan Area. This represents the combined total of the Mammoth Management Area, North

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Algodones Dunes Wilderness Management Area, Adaptive Management Area, and Buffer Zone Management Area. This is by far the largest area of closure of any of the alternatives. The remaining management areas total of 94,112 acres, or 42 percent of the Plan Area, would remain open to OHV use.

As the table shows, microphyll woodland is provided the greatest percentage of protection from impacts from OHV use under Alternative 3 and compared to the other two habitat types under consideration. Forty-five percent or greater of each habitat type within the Plan Area is provided full protection under Alternative 3.

**Table 4.2-5 Habitat Types by Estimated Areas Closed and Open to Motorized Use within the Plan Area under Alternative 3**

HABITAT TYPE	CLOSED TO OHV USE (ACRES)	PERCENT CLOSED	OPEN TO OHV USE (ACRES)	PERCENT OPEN
Creosote Bush Scrub	34,722	67	17,153	33
Psammophytic Scrub	48,678	45	59,980	55
Microphyll Woodland	48,403	74	16,979	26

Minor facility development, campground improvements, and road maintenance are anticipated to result in similar, but lesser impacts under Alternative 3 than under the other alternatives. The major difference between Alternative 3 and others is that no or negligible impacts to habitats from OHV use are anticipated within the Mammoth, North Algodones Dunes Wilderness, Adaptive, and Buffer Zone Management Areas due to the closures. However, the anticipated edge effect, in the form of crushing of vegetation and soil disturbance along the closed boundaries of these areas, may be substantial relative to that under other alternatives. This may ultimately result in habitat loss along these boundaries. A substantial increase in the concentration of recreational activities in the areas that would remain open to OHV use may also result from a reduction in area available for OHV recreation. Unauthorized activities in the closed areas may also occur. As stated earlier, OHV use has historically been concentrated within psammophytic scrub. However, due to a reduction in area open to OHV recreation under this alternative, increased impacts to creosote bush scrub and microphyll woodland are expected as recreational enthusiasts seek other areas to enjoy their sport. Nonetheless, these potential impacts are considered minor relative to the benefit of protecting habitat within the closed management areas.

### Special-Status Plants

Based on the projected visitor use increases and ROS classifications; impacts to special-status plants are expected to decrease under Alternative 3 relative to the other alternatives. Minor facility development, campground

improvements, and road maintenance are anticipated to result in similar, but lessened impacts relative to other alternatives. The major difference between Alternative 3 and other alternatives is that no OHV impacts to special-status plants are anticipated within the Mammoth, Adaptive, and Buffer Zone Management Areas due to a nonmotorized ROS classification. However, the anticipated edge effect along the closed boundaries may ultimately result in loss of special-status plants along the boundaries. A substantial increase in the concentrated recreational use in the areas still open to OHV use may result in increased losses of special-status plants there. Additionally, OHV impacts are anticipated to be concentrated within psammophytic scrub which is an important habitat type for the five special-status plants. A major feature of the effects of the enactment of this alternative would be that approximately 44,678 acres of psammophytic scrub, or 45 percent of the total habitat type within the ISDRA, would be closed to OHV use.

### **Special-Status and Endemic Wildlife**

Based on the projected visitor use increase and ROS classifications, impacts to special-status and endemic wildlife are expected to decrease under Alternative 3. Minor facility development, campground improvements, and road maintenance are anticipated to result in similar, but lessened, impacts relative to the baseline. The major difference between Alternative 3 and others is that no impacts to special-status and endemic wildlife resulting from OHV use are anticipated within the Mammoth, North Algodones Dunes Wilderness, Adaptive, and Buffer Zone Management Areas due to their closures. However, the anticipated edge effect along the closed boundaries may be substantial. This may ultimately result in loss or displacement of special-status and endemic wildlife along the boundaries. A substantial increase in the concentrated recreational use in the open areas may result in increased impacts to special-status and endemic wildlife. Additionally, OHV impacts are anticipated to be concentrated within psammophytic scrub, which is an important habitat type for the Colorado Desert fringe-toed lizard. Nonetheless, these potential impacts are considered minor relative to the benefit of protecting these species within the closed management areas.

Potential impacts to Colorado Desert fringe-toed lizards and flat-tailed horned lizards were again considered in detail. For the Colorado Desert fringe-toed lizard it is assumed that the all areas of psammophytic scrub and creosote bush scrub are occupied habitat. Under Alternative 3, approximately 83,400 acres or 52 percent of habitat would be closed to motorized recreation; and approximately 77,133 acres of habitat, or 48 percent in areas open to OHV.

As done for other alternatives, the number of cells (survey units) containing flat-tailed horned lizards observed within the areas to be closed to OHV use and those in the open areas were tallied. The figures used for the analysis of each alternative were derived from 1998 and 2001 data collected by the BLM. The figures reflect the number of cells that contained flat-tailed horned lizards during the surveys, do actual numbers of flat-tailed horned lizards within

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the ISDRA. The number and percentage of occupied cells containing flat-tailed horned lizards within these areas within the Plan Area are presented in Table 4.2-6. As the table shows, a total of 70 occupied cells, or 62 percent are within closed areas, and 43 or 38 percent are in open areas.

**Table 4.2-6 Cells Containing Flat-tailed Horned Lizards in Areas to be Closed or Open to Motorized Use the ISDRA under Alternative 3**

<b>CLOSED TO OHV USE (OCCUPIED CELLS)</b>	<b>PERCENT CLOSED</b>	<b>OPEN TO OHV USE (OCCUPIED CELLS)</b>	<b>PERCENT OPEN</b>
70	62	43	38

Source: BLM 1998, 2001b

### 4.2.2.4 Alternative 4

Under Alternative 4, the Plan Area would be managed under the same management areas Alternatives 2 and 3 but different ROS classifications. There are two differences in ROS classifications between Alternative 4 and the other alternatives. Under Alternative 4, the Adaptive Management Area and Mammoth Management area would be designated Roded Natural. These two management areas encompasses a total of approximately 45,566 acres, or 20 percent of the Plan Area.

Glamis Management Area, Dune Buggy Flats Management Area, and Ogilby Management Area would be designated as Rural. These three areas encompasses a total of approximately 64,389 acres or 28 percent of the Plan Area. The Gecko Management Area and Buttercup Management Area would be designated as Urban. These two areas encompasses 29,722 acres, or 13 percent of the Plan Area

The change in ROS classifications under Alternative 4 would result in substantially increased OHV recreational opportunities. The change would also effectively result in implementation of a desired future condition that would accommodate a shift in visitor use from low-moderate under the other alternatives to moderate-high under Alternative 4. The management focus for this alternative would be providing additional facilities to accommodate increased visitation, including new campgrounds, camping, toilets, trash stations, and information kiosks. Under Alternative 4, the visitor use is expected to increase from 3.5 to 6 percent annually relative to the low end of the baseline. Additionally, revising the ROS classifications of the Adaptive Management Area and Glamis Management Area is expected to increase overall OHV-related visitor use. Therefore, this growth rate is expected to be the highest relative to Alternatives 2 and 3.

### **Habitat Types**

Based on the projected visitor use increases and previously described ROS classifications, potential impacts to habitats are expected to increase under Alternative 4.

The area of each habitat type under Alternative 4 is shown in Table 4.2-7. As shown in this table, the continued closure of the North Algodones Dunes Wilderness Management Area would result in retaining 27,695 acres of habitat in an undisturbed setting. The Adaptive Management Area would provide an additional total of 33,952 acres of controlled vehicle access, however, this areas designation as Road Natural would likely result in increase motorized use and thereby increase impacts. The Buffer Zone Management Area would provide a total of 58,542 acres of controlled use, or 26 percent of the Plan Area. These three management areas total 120,189 acres that are managed on controlled OHV use. This represents 53 percent of the Plan Area. The remaining management areas total 105,726 acres or 47 percent of the Plan Area and would be open to OHV use.

**Table 4.2-7 Habitat Types by Estimated Areas Closed, Controlled Access, and Open to Motorized Use within the Plan Area under Alternative 4**

HABITAT TYPE	CLOSED (ACRES)	PERCENT WILDERNESS AREA CLOSED	CONTROLLED ACCESS (ACRES)	PERCENT CONTROLLED ACCESS	OPEN (ACRES)	PERCENT OPEN
Creosote Bush Scrub	3,188	6	30,019	58	18,668	36
Psammophytic Scrub	16,956	16	24,726	23	66,976	61
Microphyll Woodland	7,551	12	37,749	58	20,082	30

Substantially increased facility development, campground improvements, and road maintenance are anticipated to result in increased impacts to habitats as a result of increased OHV activity. With the ROS designation of the Glamis Management Area as Roded Rural and Adaptive Management Area as Roded Natural, impacts to habitat are also anticipated to increase in these management areas as a result of increase recreation. Thus, under this alternative, the greatest difference is the potential increase in impacts to habitats within the Glamis and Adaptive Management Areas. Although the table illustrates the total area of habitat under controlled access as 92,494 acres, impacts to habitat within the Adaptive Management Area are anticipated to be substantially higher than for the other alternatives. As Table 4.2-7 illustrates, microphyll woodland is provided the greatest percentage of closure within the Plan Area. Sixteen percent or less of each habitat type within the Plan Area is closed under Alternative 4.

**Special-Status Plants**

Based on the projected annual growth rate increase and ROS classifications, potential impacts to special-status plants are expected to increase under Alternative 4. Increased facility development, campground improvements, and road maintenance are anticipated to result in increased OHV use in the Plan Area, and therefore increased impacts to special-status plants. With the ROS designation of the Glamis Management Area as Rural and the Adaptive

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Management Area as Roaded Natural, impacts to special-status plants are anticipated to increase in these management areas as OHV activity increases. Under this Alternative only the 16,956 acres of psammophytic scrub within the North Algodones Dunes Wilderness Area would be the only area supporting the special status plant species that would not experience increase OHV use.

### Special-Status and Endemic Wildlife

Based on the projected annual growth rate increase and ROS classifications, impacts to special-status and endemic wildlife are expected to increase for Alternative 4. Additionally, increased facility development, campground improvements, and road maintenance are anticipated to result in increased OHV activity and, therefore, impacts to special-status and endemic wildlife. With the ROS designation of the Glamis Management Area as Rural and the Adaptive Management Area as Roaded Natural, impacts to special-status and endemic wildlife are anticipated to increase in these management areas as level of OHV activity increases.

As for all alternatives, potential impacts to Colorado Desert fringe-toed lizards and flat-tailed horned lizards were considered in detail. For the Colorado Desert fringe-toed lizard it is assumed that the all areas of psammophytic scrub and creosote bush scrub are occupied habitat. Under Alternative 2, approximately 20,144 acres, or 13 percent, of habitat would be closed to motorized recreation in the North Algodones Dunes Wilderness, approximately 54,745 acres of habitat, or 34 percent would be under controlled access within the Adaptive Management Area; and approximately 85,644 acres of habitat, or 53 percent, in areas open to OHV use.

The number of occupied cells (survey units) containing flat-tailed horned lizards observed within the North Algodones Dunes Wilderness Area, the Adaptive Management Area, and those in the open areas were again tallied. The number and percentage of occupied cells containing flat-tailed horned lizards within these areas within the Plan Area are presented in Table 4.2-8. As the table shows, a total of 17, 28 and 67 occupied cells are within closed, controlled access, and open areas, respectively. It should be borne in mind that, under this alternative, use in the Adaptive Management Area (controlled access) is expected to increase.

**Table 4.2-8 Cells Containing Flat-tailed Horned Lizards in Areas to be Closed to OHV Use, Subject to Controlled Access, or Open to Motorized Use the ISDRA under Alternative 4**

	<b>CLOSED TO OHV USE (OCCUPIED CELLS)</b>	<b>PERCENT CLOSED</b>	<b>CONTROLLED OHV ACCESS (OCCUPIED CELLS)</b>	<b>PERCENT CONTROLLED OHV ACCESS</b>	<b>OPEN TO OHV USE (OCCUPIED CELLS)</b>	<b>PERCENT OPEN</b>
	17	15	28	25	67	60

Source: BLM 1998, 2001b

**4.2.3  
Mitigation  
Measures**

No additional mitigation measures are required beyond those management actions incorporated into the action alternatives.

## 4.3 LAW ENFORCEMENT AND PUBLIC SAFETY

The mission of the BLM is “to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations” (BLM, 2002). This section assesses impacts to law enforcement and public safety as a result of implementing the alternatives presented in Chapter 2 of this DEIS.

### 4.3.1 Assumptions and Assessment Guidelines

The majority of visitors to the ISDRA are seeking a recreational experience that is consistent with activities that conform to existing laws and public safety. Other visitors, however, are seeking a recreational experience that is unlawful or contributes to threats to public safety (see Chapter 3). Most of these instances of unlawful behavior occur during the six major holiday weekends during the high-use season (i.e., Halloween, Thanksgiving, New Year’s, Martin Luther King Day, President’s Day, and Easter). During these weekends, illegal behavior increases with the increased visitor use.

The objective of all the alternatives assessed in this DEIS is to provide law enforcement staff<sup>1</sup> (and associated equipment and facilities) in numbers sufficient to curtail illegal behavior, thus providing enhanced opportunities for visitors seeking recreational experiences that comply with public safety and are conducted in accordance with pertinent laws.

- For all alternatives (including the No Action), the need for additional law enforcement staff would occur mostly during the six major holiday weekends.
- For all the alternatives, temporary law enforcement staff would continue to be used to ensure public safety during the high visitor use weekends.
- For the action alternatives (Alternatives 2, 3, and 4), the use of temporary law enforcement officers would continue; and additional permanent staff would be hired. Other measures for the action alternatives would include:
  - A ban on alcohol use outside designated camping areas
  - A sundown to sunup closure at Competition Hill (North and South), Oldsmobile Hill, Test Hill, and Patton Valley
  - Posting speed limits

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<sup>1</sup> Law enforcement officers at the ISDRA are responsible for all aspects of law enforcement, including drug- and alcohol-related problems; assaults; traffic violations; fee compliance enforcement; resource issues (e.g., littering, natural feature destruction, hazardous materials, and waste); and medical emergency response (see Chapter 3).

- Regardless of the alternative subsequently implemented, the BLM will continue to respond to illegal activities at the ISDRA in a way that ensures public safety.
- Under all the alternatives (including the No Action Alternative), visitor use is anticipated to increase over time (see Table 4.1-1 of this DEIS) as a result of continuing popularity of the dunes and limitations on other OHV recreational opportunities in the CDCA Plan Area (see Chapter 5).
- Under the action alternatives, various ROS classifications (see Chapter 2 and Section 4.1 of this DEIS) are assigned to the proposed ISDRA management areas. Because the existing illegal behavior is concentrated during the six major holiday weekends (and on these weekends at specific high-use locales), this analysis focuses on the effect of management actions designed to curtail such behavior during those high-use periods, regardless of assigned ROS class.

### 4.3.2 Impacts

As discussed above, all the alternatives evaluated in this DEIS are based on the premise that the BLM will provide adequate law enforcement to ensure public safety. Because of this underlying assumption, all the alternatives, including the No Action, are anticipated to improve public safety compared with the existing baseline conditions. Because each of the action alternatives would be assigned a different combination of ROS classes for each of the proposed management areas (see Table 2-2 of this DEIS), the main difference in the level of increased level of public safety would be the areas to which law enforcement staff would be deployed within the ISDRA.

Overall, it is anticipated that increasing law enforcement staff, equipment, and facilities (and implementing the management actions), above, would deter visitation by users who engage in the unlawful and/or dangerous activities discussed in Section 3.3. This initial decrease in visitor use, however, would be offset by management actions intended to improve the overall quality of the recreational experience at ISDRA. It is anticipated that new and improved facilities, improved public safety measures, public information encouraging off-peak visits, and other measures would attract visitors seeking OHV recreation experiences consistent with legal activities. The ISDRA would continue to be a popular OHV destination as a result of: (1) decreasing OHV use in other areas of the desert Southwest (see Chapter 5, *Cumulative Impacts*) and (2) the enhanced recreational experience at the ISDRA when illegal activities are curtailed.

Under Alternative 1, the objective to ensure public safety would be accomplished by continued use of permanent and temporary law enforcement staff at the popular high-use areas. Law enforcement activities in the ISDRA would continue in accordance with measures specified in the 1987 RAMP. Development of facilities to support law enforcement (e.g., new ranger stations and increases to personnel and associated equipment) would occur only to the extent directed by the 1987 plan. Law enforcement staff will continue to be provided on the six major holiday weekends in numbers

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sufficient to ensure public safety, and the existing staffing measures discussed in Section 3.3.1 would remain in effect.

These conditions would be comparable to the baseline conditions and, therefore, would not contribute to a decrease in conditions of public safety at the ISDRA. The BLM would continue to commit to providing adequate law enforcement staff (and would continue to rely on neighboring jurisdictions to provide temporary staff commensurate to meet the anticipated visitor use projected under this alternative (see Section 4.1 for projected visitor use under each of the alternatives).

Under the action alternatives (Alternatives 2, 3, and 4), public safety is expected to improve compared with baseline conditions because of the proposed increases in permanent law enforcement staff and the additional management measures (e.g., restrictions on alcohol consumption, posting speed limits) in combination with the proposed ROS classes for those alternatives. In addition, for all the action alternatives, an increase in the number of permanent law enforcement personnel would allow for more enforcement per square mile throughout the ISDRA, thus increasing public safety compared with baseline conditions.

These measures, in combination with the continued presence of law enforcement staff on the major holiday weekends, would contribute to conditions of public safety at the ISDRA.

## 4.4 SOCIOECONOMICS

This section presents the socioeconomic impacts of implementing the alternatives presented in Chapter 2. No adverse socioeconomic impacts are expected to occur as a result of implementing any of the alternatives.

### 4.4.1 Assumptions and Assessment Guidelines

Regional economic impacts of recreation are typically assessed on the basis of visitor trip expenditures<sup>2</sup>. The money spent by visitors on food, lodging, and transportation is the input into the local economy. Management alternatives that affect the amount or type of money spent would affect the local economy.

Estimates of total trip expenditures were developed from data on the number of visits to the ISDRA under each of the management alternatives in combination with trip-related expenditures based on a 1993 study developed by the OHV Division of the California Department of Parks and Recreation (California Parks and Recreation, 1997).

Trip-related expenditures (e.g., food, lodging, transportation, and activities) are typically divided into three groups: those made at or near home, those made en route to and from the recreation site, and those made at or near the recreation site. Only expenditures made by nonresidents are relevant for determining economic impacts. These expenditures would include all expenditures made at or near the site as well as a portion of the expenditures made en route.

For this analysis, the following assumptions were made:

- The regions of influence for the economic impact analysis are Imperial County, California, and Yuma County, Arizona. Ninety percent of the visitors to ISDRA are nonresidents of Imperial County.
- Of the total nonresident visitors, 86 percent are from other parts of California while the remaining 14 percent are from Arizona.
- Arizona residents spend approximately 60 percent of their trip expenditures at home. Of the remaining 40 percent, 30 percent is spent in Yuma and 10 percent in Imperial County.
- A visit to the ISDRA represents a 3-day (2-night) stay.
- Because mean trip expenditures are on a per-household basis and visitation data are on a per-person basis, household trip expenditures are divided by three (approximately the number of persons per household or the number of persons per family in California (DOF, 2001)).
- Trip expenditures are the same for OHV and non-OHV visitors.

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<sup>2</sup> Expenditures on capital goods are not included because (1) these goods are mostly likely purchased in the visitors' home county /state (in which case none of that money finds its way into the local economy of the recreational area) and (2) there is no easy way of splitting the cost among the various recreation trip destinations.

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- All fees collected by BLM stay within Imperial County.
- The base year of analysis is 1998 for Imperial County and 1997<sup>3</sup> for Yuma County, but the impacts were adjusted to reflect year 2000 price levels.
- Alternative 1 is the same as the baseline condition for comparative analysis.
- Although an initial decrease in visitor use could occur for all the action alternatives (Alternatives 2, 3, and 4), the demand for recreational opportunities at the ISDRA is anticipated to increase; and visitor use is expected to increase commensurately as a result of decreasing OHV recreational opportunities at other desert Southwest sites (See Chapter 5, *Cumulative Impacts*).

For purposes of this analysis, an alternative would have an adverse impact on the economy if it would:

- Cause a temporary or permanent reduction in employment that is substantial (greater than 5 percent) in relation to the existing employment levels
- Result in a decline in total local earnings in the area by 5 percent or more

### 4.4.1.1 Data

Two data sources were used to derive the total trip expenditures by expenditure category. Total number of visits per year to the ISDRA under each alternative was developed from available survey data. A “trip” equates to a 3-day stay at the Dunes and is assumed to be equivalent to the number of visits provided in Table 4.1-1. Trip expenditure data came from the California Department of Parks and Recreation’s Off-Highway Vehicle study. Table 4.4-1 shows the total number of trips under baseline condition and each of the alternatives, while Table 4.4-2 shows the household trip expenditures by expenditure type.

**Table 4.4-1 Estimated Visitor Use and Origination**

ALTERNATIVES	ESTIMATED NUMBER OF VISITS	NUMBER OF HOUSEHOLDS <sup>A</sup>	RESIDENT (IMPERIAL) HOUSEHOLDS	NONRESIDENT HOUSEHOLDS <sup>B</sup>	
				CALIFORNIA <sup>C</sup>	ARIZONA <sup>D</sup>
Baseline Condition	867,753	289,251	28,925	223,880	36,446
All Alternatives – 2002-2003	1,005,000	335,000	301,500	259,290	42,210
2012-2013 Season: Low Estimate					
Alternatives 1, 2, 3 and 4	1,418,000	472,667	425,400	365,844	59,556
2012-2013 Season: High Estimate					
Alternative 1	2,071,000	690,333	621,300	534,318	86,982
Alternative 2	1,637,000	545,667	491,100	422,346	68,754

<sup>3</sup> Available IMPLAN model for Yuma County.

**Table 4.4-1 Estimated Visitor Use and Origination**

ALTERNATIVES	ESTIMATED NUMBER OF VISITS	NUMBER OF HOUSEHOLDS <sup>A</sup>	RESIDENT (IMPERIAL) HOUSEHOLDS	NONRESIDENT HOUSEHOLDS <sup>B</sup>	
				CALIFORNIA <sup>C</sup>	ARIZONA <sup>D</sup>
Alternative 3	1,488,000	496,000	446,400	383,904	62,496
Alternative 4	1,800,000	600,000	540,000	464,400	75,600

Source: BLM, 2001

<sup>a</sup> Based on the assumption of three persons per household

<sup>b</sup> Households that are not residents of Imperial County (90% of households)

<sup>c</sup> California households outside Imperial County (86% of nonresident households)

<sup>d</sup> Arizona households account for 14% of nonresident households visiting ISDRA and spend about 10% of their trip related expenditures in Imperial County.

**Table 4.4-2 Mean Household Trip Expenditures<sup>a</sup> by Expenditure Type**

EXPENDITURE TYPE	BLM FLAT FEE IN 1998 \$	HOUSEHOLD TRIP EXPENDITURE (LOWER BOUND) <sup>C</sup> IN 1998 \$	HOUSEHOLD TRIP EXPENDITURE (UPPER BOUND) <sup>D</sup> IN 1998 \$
Fees	616,007		
Food & Beverage		95.27	317.58
Medical		11.68	23.36
Supplies and Services		128.45	256.9
Transportation		24.58	49.16
TOTAL		259.98	647.00

Source: California Department of Parks and Recreation, 1997; BLM, 2001.

Numbers may not add up due to independent rounding.

<sup>a</sup> These are annual and are expected to grow at 3.5% per year.

<sup>b</sup> All of these fees stay within Imperial County.

<sup>c</sup> Lower bound based on the % of mean expenditures spent in County – thus it is less than 100% and varies (e.g., for expenditures on food, it is 30 percent of the upperbound estimate, whereas for the other expenditure categories it is 50 percent).

<sup>d</sup> Upper bound based on estimated expenditure from OHV study – assumed to be 100% of expenditures.

To perform a sensitivity analysis, two estimates were used for each of the categories. The first estimate is the mean household trip expenditures, while the second estimate represents a lower bound on trip expenditures. The lower bound is assumed to represent the estimated portion of the expenditures spent within the local economy. For this study, the following proportions were applied to the trip expenditures to derive the estimates that remain in the local economy under each expenditure category: 30 percent of food expenditures and 50 percent of the expenditures on gas, medical services, and supplies and services. The preceding proportions represent the local contribution and are partially based on estimates developed by Clawson and Knetch (1966) for economies of rural recreational sites near federal reserves. In the case of the lodging category, total fees that BLM collected were used instead of the estimates from the OHV study. BLM collected \$657,578 in total fees in 2000. This translates to \$616,007 in 1998 dollars. Yuma County in Arizona serves as a starting point for some of the visitors to the ISDRA as well as the route

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from other parts of Arizona. As such, there are a number of small towns whose business communities are highly dependent on recreational activities in the ISDRA. Any changes in the number and frequency of visitors to the ISDRA is likely to impact these towns. Because Yuma County has a high unemployment rate (27.5 percent in 2000), any alternative that reduces the number of visitors will likely raise the unemployment rate. Assuming that Arizona residents visiting the ISDRA spend approximately 30 percent of their trip expenditures in Yuma County, the following trip expenditures were developed under each of the management alternatives. As with the estimates developed for Imperial County, the low ends represent estimates expected to stay within the local area (i.e., Yuma County).

The estimated total trip expenditures (lower and upper bound) associated with each of the action alternatives (as well as the baseline condition) for Imperial and Yuma County are presented in Tables 4.4-3 and 4.4-4. The estimated total trip expenditures were used to analyze the effects on the economies of the two counties. An IMPLAN (Impact Analysis for Planning) regional input-output model was constructed for each of the two counties. IMPLAN is an input-output modeling and software package that allows the modeler to build economic models of regions for impact analysis purposes.

Table 4.4-3 Total Household Trip Expenditures by Expenditure Type, Imperial County<sup>a</sup> (Million 1998 \$)

EXPENDITURE TYPE	BASELINE	ALTERNATIVES					
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES			
		ALL ALTERNATIVES 2002-2003	ALL ALTERNATIVES	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
<i>Lower Bound</i>							
Fees	0.62	0.71	1.01	1.47	1.16	1.06	1.28
Food & Beverage	21.68	25.11	106.27	51.73	40.89	37.17	44.97
Medical	2.66	3.08	13.03	6.34	5.01	4.56	5.51
Supplies and Services	29.23	33.85	143.27	69.75	55.13	50.11	60.62
Transportation	5.59	6.48	27.41	13.35	10.55	9.59	11.60
TOTAL	59.77	69.22	290.99	142.64	112.75	102.49	123.98
<i>Upper Bound</i>							
Fees	0.62	0.71	1.01	1.47	1.16	1.06	1.28
Food & Beverage	72.26	83.69	354.22	172.45	136.31	123.90	149.88
Medical	5.32	6.16	26.06	12.69	10.03	9.12	11.03
Supplies and Services	58.45	67.70	286.54	139.50	110.27	100.23	121.24
Transportation	11.18	12.95	54.83	26.69	21.10	19.18	23.20
TOTAL	147.82	171.20	722.66	352.80	278.87	253.48	306.63

Source: California Department of Parks and Recreation, 1997; BLM, 2001.

Numbers may not add up due to independent rounding.

<sup>a</sup> Imperial County receives all of the expenditures by California residents and 10% of the expenditures by Arizona residents.

**Environmental Consequences**

**Table 4.4-4 Total Household Trip Expenditures by Expenditure Type, Yuma County<sup>a</sup> (Million 1997 \$)**

EXPENDITURE TYPE	BASELINE	ALTERNATIVES					
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES			
				ALL ALTERNATIVES 2002-2003	ALL ALTERNATIVES	ALTERNATIVE 1	ALTERNATIVE 2
<i>Lower Bound</i>							
Food & Beverage	1.03	1.19	5.03	2.45	1.93	1.76	2.13
Medical	0.13	0.15	0.62	0.30	0.24	0.22	0.26
Supplies and Services	1.38	1.60	6.78	3.30	2.61	2.37	2.87
Transportation	0.26	0.31	1.30	0.63	0.50	0.45	0.55
<b>TOTAL</b>	<b>2.80</b>	<b>3.24</b>	<b>13.72</b>	<b>6.68</b>	<b>5.28</b>	<b>4.80</b>	<b>5.81</b>
<i>Upper Bound</i>							
Food & Beverage	3.42	3.96	16.76	8.16	6.45	5.86	7.09
Medical	0.25	0.29	1.23	0.60	0.47	0.43	0.52
Supplies and Services	2.77	3.20	13.56	6.60	5.22	4.74	5.74
Transportation	0.53	0.61	2.59	1.26	1.00	0.91	1.10
<b>TOTAL</b>	<b>6.97</b>	<b>8.07</b>	<b>34.15</b>	<b>16.62</b>	<b>13.14</b>	<b>11.94</b>	<b>14.45</b>

Source: California Department of Parks and Recreation, 1997; BLM, 2001.

Numbers may not add up due to independent rounding.

<sup>a</sup> Yuma County receives 30% of the expenditures by Arizona residents.

**4.4.2  
Impacts**

**4.4.2.1  
Alternative 1**

**Imperial County**

Estimated trip expenditures at the ISDRA would range from \$59.8 million to \$147.8 million. Table 4.4-5 shows estimated total household trip expenditures by expenditure types under the baseline condition. These estimates form the basis of the economic impact analysis.

**Table 4.4-5 Total Estimated Household Trip Expenditures by Expenditure Type under Baseline Condition, in 1998 Dollars**

<b>EXPENDITURE TYPE</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$</b>
Lodging	0.62	0.62
Food and Beverage	21.68	72.26
Medical	2.66	5.32
Supplies and Services	29.23	58.45
Transportation	5.59	11.18
<b>TOTAL</b>	<b>59.77</b>	<b>147.82</b>

Source: BLM, 2001j; California Department of Parks and Recreation, 1997. Numbers may not add up due to independent rounding.

The ISDRA would contribute 1,214 to 3,264 in direct employment and between \$23.8 million and \$56.1 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA also contributes to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 121 to 304 in indirect employment in the region and between 165 and 410 in induced employment.

Visitor expenditures also generate between \$3.6 million and \$8.5 million in indirect personal income to the region, and between \$4.1 million and \$9.7 million in induced personal income. Table 4.4-6 shows the estimates of direct, indirect, and induced employment and income under the baseline condition.

Employment impacts of the ISDRA under the baseline condition represent between 3 and 8 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents about 1 percent of the total regional personal income (here derived as per capita income of \$17,550 multiplied by the Census 2000 population estimate for Imperial County of 142,361).

**Table 4.4-6 Estimates of Direct, Indirect, and Induced Impacts under the Baseline Condition**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	1,214	3,264
Indirect	121	304
Induced	165	410
Total Employment	1,500	3,978
Personal Income		
Direct	\$23.81 million	\$56.13 million
Indirect	\$3.58 million	\$8.54 million
Induced	\$4.08 million	\$9.65 million
Total Income	\$31.48 million	\$74.32 million

Income estimates are in 2000 dollars.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the housing vacancy rate in the county is high (10.3 percent), no adverse impacts on population or housing are expected under the baseline condition.

**Yuma County**

Under this alternative, the estimated trip expenditures range from \$2.8 million to about \$6.0 million. Table 4.4-7 shows estimated total household trip expenditures by expenditure types for the baseline condition.

**Table 4.4-7 Total Estimated Household Trip Expenditures by Expenditure Type under the Baseline Condition, in 1997 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Food and Beverage	1.03	3.42
Medical	0.13	0.25
Supplies and Services	1.38	2.77
Transportation	0.26	0.53
TOTAL	2.80	6.97

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The ISDRA would contribute 58 to 158 in direct employment and between \$1.0 million and \$2.4 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, the ISDRA also contributes to the economic well-being of Yuma County

through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 10 to 24 in indirect employment in the region and between 9 and 23 in induced employment.

The visitor expenditures also generate between \$0.2 million and \$0.6 million in indirect personal income to the region, and between \$0.2 million and \$0.5 million in induced personal income. Table 4.4-8 shows the estimates of direct, indirect, and induced employment and income under the baseline condition.

**Table 4.4-8 Estimates of Direct, Indirect, and Induced Impacts under the Baseline Condition**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	58	158
Indirect	10	24
Induced	9	23
Total Employment	76	205
Personal Income		
Direct	\$0.98 million	\$2.44 million
Indirect	\$0.23 million	\$0.57 million
Induced	\$0.19 million	\$0.48 million
Total Income	\$1.40 million	\$3.49 million

Income estimates are in 2000 dollars.

The employment impacts of the ISDRA under the baseline condition represent between 0.2 and 0.4 percent of the total regional employment of 47,600. Total personal income, on the other hand, represents between zero and 0.1 percent of total regional personal income (here derived as per-capita income of \$18,452 multiplied by the Census 2000 population estimate for Yuma County of 160,026).

**4.4.2.2 All Action Alternatives: 2002-2003 Visitor Estimates**

**Imperial County**

Under this alternative, estimated trip expenditures range from \$69.2 million to \$171.1 million. Table 4.4-9 shows estimated total household trip expenditures by expenditure types for the action alternatives using the 2002-2003 estimates of visitor use.

The ISDRA would contribute 1,406 to 3,780 in direct employment and between \$27.6 million and \$68.2 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and

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induced impacts). Visitor expenditures result in 140 to 353 in indirect employment in the region and between 191 and 475 in induced employment.

**Table 4.4-9 Total Estimated Household Trip Expenditures by Expenditure Type under all action Alternatives, 2002-2003 visitor estimates, in 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	0.71	0.71
Food and Beverage	25.11	83.69
Medical	3.08	6.16
Supplies and Services	33.85	67.70
Transportation	6.48	12.95
TOTAL	69.22	171.20

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The visitor expenditures would also generate between \$4.2 million and \$10.5 million in indirect personal income to the region, and between \$4.7 million and \$11.7 million in induced personal income. Table 4.4-10 shows the estimates of direct, indirect, and induced employment and income under the action alternatives using the 2002-2003 estimates of visitor use.

**Table 4.4-10 Estimates of Direct, Indirect, and Induced Impacts under all Action Alternatives, 2002-2003 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	1,406	3,780
Indirect	140	353
Induced	191	475
Total Employment	1,737	4,607
Personal Income		
Direct	\$27.6million	\$68.2 million
Indirect	\$4.2 million	\$10.5 million
Induced	\$4.7 million	\$11.7 million
Total Personal Income	\$336.5 million	\$90.3 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under represent between 3 and 9 percent of the total regional employment of 49,800. Total personal income, on the other hand, represent between 3 and 4 percent of total regional personal

income. The anticipated increase in regional employment and income in Imperial County, compared to the baseline conditions, represents a beneficial impact.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under all the action alternatives (using the 2002-2003 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

**Yuma County**

Under this alternative, the estimated trip expenditures range from \$3.2 million to \$8.1 million. Table 4.4-11 shows estimated total household trip expenditures by expenditure types for the action alternatives using the 2002-2003 visitor use estimates.

**Table 4.4-11 Total Estimated Household Trip Expenditures by Expenditure Type, Yuma County in 1997 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Food and Beverage	1.19	3.96
Medical	0.15	0.29
Supplies and Services	1.60	3.20
Transportation	0.31	0.61
TOTAL	3.24	8.07

Source: BLM, 2001; California Department of Parks and Recreation, 1997. Numbers may not add up due to independent rounding.

The ISDRA would contribute 67 to 183 in direct employment and between \$1.1 million and \$2.8 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, the ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 11 to 28 in indirect employment in the region and between 10 and 26 in induced employment.

The visitor expenditures also generate between \$0.3 million and \$0.7 million in indirect personal income to the region, and between \$0.2 million and \$0.6 million in induced personal income. Table 4.4-12 shows the estimates of direct, indirect, and induced employment and income under the action alternatives using the 2002-2003 visitor use estimates.

**Table 4.4-12 Estimates of Direct, Indirect, and Induced Impacts under All Action Alternatives, 2002-2003 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	67	183

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**Table 4.4-12 Estimates of Direct, Indirect, and Induced Impacts under All Action Alternatives, 2002-2003 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Indirect	11	28
Induced	10	26
Total Employment	88	237
Personal Income		
Direct	\$1.13 million	\$2.82 million
Indirect	\$0.26 million	\$0.67 million
Induced	\$0.22 million	\$0.56 million
Total Personal Income	\$1.62 million	\$4.05 million

Income estimates are in 2000 dollars

The employment impacts of the ISDRA under the Recreation Resource Alternative represent between 0.2 and 0.5 percent of the total regional employment of 47,600. Total personal income, on the other hand, represents 0.1 percent of total regional personal income under both the high and low expenditure estimates. Therefore, a negligible to beneficial impact on regional employment and income in Yuma County is anticipated.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under all the action alternatives (using the 2002-2003 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

### 4.4.2.3 All Action Alternatives: Low 2012-2013 Visitor Use Estimates

#### Imperial County

Under this alternative, estimated trip expenditures range from \$97.7 million to \$241.6 million. Table 4.4-13 shows estimated total household trip expenditures by expenditure types for all the action Alternatives using low 2012-2013 visitor use estimate.

**Table 4.4-13 Total Estimated Household Trip Expenditures by Expenditure Type under all Alternatives, Low 2012-2013 Visitor Use Estimate, 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	1.01	1.01
Food and Beverage	35.42	118.07
Medical	4.34	8.69
Supplies and Services	47.76	95.51
Transportation	9.14	18.28
TOTAL	97.67	241.56

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The ISDRA would contribute 1,984 to 5,334 in direct employment and between \$38.9 million and \$96.2 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, the ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 197 to 498 in indirect employment in the region and between 270 and 670 in induced employment.

The visitor expenditures would also generate between \$5.9 million and \$14.8 million in indirect personal income to the region, and between \$6.7 million and \$16.5 million in induced personal income. Table 4.4-14 shows the estimates of direct, indirect, and induced employment and income under all action alternatives and using low 2012-2013 visitor use estimates.

Total employment impacts of the ISDRA under this alternative represent between 5 and 13 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents between 2 and 5 percent of total regional personal income. The anticipated increase in regional employment and income in Imperial County under this alternative, compared to existing conditions, represents a beneficial impact.

**Table 4.4-14 Estimates of Direct, Indirect, and Induced Impacts under All Action Alternatives, 2012-2013 Low Visitor Use Estimates**

	<b>LOW EXPENDITURE ESTIMATES</b>	<b>HIGH EXPENDITURE ESTIMATES</b>
Employment		
Direct	1,984	5,334
Indirect	197	498
Induced	270	670
Total Employment	2,450	6,501
Personal Income		
Direct	\$38.91 million	\$96.15 million
Indirect	\$5.85 million	\$14.76 million
Induced	\$6.67 million	\$16.55 million
Total Personal Income	\$51.43 million	\$127.46 million

Income estimates are in 2000 dollars.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under all the action alternatives (using the low 2012-2013 visitor use estimates) are significantly beneficial (based on the significance criteria), no adverse impacts on population or housing are expected.

**Yuma County**

Under this alternative, the estimated trip expenditures range from \$4.6 million to \$11.4 million. Table 4.4-15 shows estimated total household trip expenditures by expenditure types for all the action alternatives using low 2012-2013 visitor use estimate.

**Table 4.4-15 Total Estimated Household Trip Expenditures by Expenditure Type under All Action Alternatives, Low 2012-2013 Visitor Use Estimate, 1997 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Food and Beverage	1.68	5.59
Medical	0.21	0.41
Supplies and Services	2.26	4.52
Transportation	0.43	0.86
TOTAL	4.57	11.38

Source: BLM, 2001; California Department of Parks and Recreation, 1997.  
Numbers may not add up due to independent rounding.

The ISDRA would contribute 94 to 258 in direct employment and between \$1.60 million and \$3.99 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, the ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 15 to 39 in indirect employment in the region and between 15 and 37 in induced employment.

The visitor expenditures also generate between \$0.4 million and \$0.9 million in indirect personal income to the region, and between \$0.3 million and \$0.8 million in induced personal income. Table 4.4-16 shows the estimates of direct, indirect, and induced employment and income under all the action alternatives using low 2012-2013 visitor use estimate.

**Table 4.4-16 Estimates of Direct, Indirect, and Induced Impacts under All Action Alternatives, Low 2012-2013 Visitor Use Estimate**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	94	258
Indirect	15	39
Induced	15	37
Total Employment	124	334
Personal Income		
Direct	\$1.60 million	\$3.99 million
Indirect	\$0.37 million	\$0.94 million

Induced	\$0.31 million	\$0.79 million
Total Personal Income	\$2.28 million	\$5.71 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under this alternative represent between 0.3 and 0.7 percent of the total regional employment of 47,600. Total personal income, on the other hand, represents between 0.1 and 0.2 percent of total regional personal income. Thus, this alternative would have a negligible to beneficial impact on regional employment and income in Yuma County.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under all the action alternatives (using the low 2012-2013 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

**4.4.2.4  
Alternative 1:  
High 2012-2013  
Visitor Use  
Estimate**

**Imperial County**

Estimated trip expenditures range from \$142.6 million to \$352.8 million. Table 4.4-17 shows estimated total household trip expenditures by expenditure types for Alternative 1 using high 2012-2013 visitor use estimates.

The ISDRA would contribute 2,897 to 7,790 in direct employment and between \$56.8 million and \$140.4 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 287 to 727 in indirect employment in the region and between 394 and 978 in induced employment.

**Table 4.4-17 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 1 with High 2012-2013 Visitor Use Estimates, 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	1.47	1.47
Food and Beverage	51.73	172.45
Medical	6.34	12.69
Supplies and Services	69.75	139.50
Transportation	13.35	26.69
TOTAL	142.64	352.80

Source: BLM, 2001; California Department of Parks and Recreation, 1997. Numbers may not add up due to independent rounding.

The visitor expenditures would also generate between \$8.6 million and \$21.6 million in indirect personal income to the region, and between \$9.7 million and \$24.2 million in induced personal income. Table 4.4-18

## Environmental Consequences

shows the estimates of direct, indirect, and induced employment and income under Alternative 1 with high 2012-2013 visitor use estimates.

**Table 4.4-18 Estimates of Direct, Indirect, and Induced Impacts under Alternative 1 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	2,897	7,790
Indirect	287	727
Induced	394	978
Total Employment	3,578	9,495
Personal Income		
Direct	\$56.83 million	\$140.43 million
Indirect	\$8.55 million	\$21.56 million
Induced	\$9.74 million	\$24.16 million
Total Personal Income	\$75.12 million	\$186.15 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 1 (high 2012-2013 visitor use estimates) represent between 7 and 19 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents between 3 and 7 percent of total regional personal income. The anticipated increase in regional employment and income in Imperial County under this alternative represents a beneficial impact relative to existing conditions.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 1 (using the high 2012-2013 visitor use estimates) are significantly beneficial (based on the significance criteria), no adverse impacts on population or housing are expected.

### **Yuma County**

Under Alternative 1 (high 2012-2013 visitor use estimates), the estimated trip expenditures range from \$6.7 million to \$16.6 million. Table 4.4-19 shows estimated total household trip expenditures by expenditure types for Alternative 1 using high 2012-2013 visitor use estimates.

**Table 4.4-19 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 1 with High 2012-2013 Visitor Use Estimates, 1997 Dollars**

<b>EXPENDITURE TYPE</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$</b>
Food and Beverage	2.45	8.16
Medical	0.30	0.60
Supplies and Services	3.30	6.60
Transportation	0.63	1.26
<b>TOTAL</b>	<b>6.68</b>	<b>16.62</b>

Source: BLM, 2001; California Department of Parks and Recreation, 1997. Numbers may not add up due to independent rounding.

The ISDRA would contribute 137 to 377 in direct employment and between \$2.3 million and \$5.8 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 23 to 57 in indirect employment in the region and between 21 and 54 in induced employment.

The visitor expenditures also generate between \$0.5 million and \$1.4 million in indirect personal income to the region, and between \$0.5 million and \$1.2 million in induced personal income. Table 4.4-20 shows the estimates of direct, indirect, and induced employment and income under Alternative 1 with high 2012-2013 visitor use estimates.

**Table 4.4-20 Estimates of Direct, Indirect, and Induced Impacts under Alternative 1 with High 2012-2013 Visitor Use Estimates**

	<b>LOW EXPENDITURE ESTIMATES</b>	<b>HIGH EXPENDITURE ESTIMATES</b>
Employment		
Direct	137	377
Indirect	23	57
Induced	21	54
Total Employment	181	488
Personal Income		
Direct	\$2.33 million	\$5.82 million
Indirect	\$0.54 million	\$1.37 million
Induced	\$0.46 million	\$1.15 million
Total Personal Income	\$3.33 million	\$8.34 million

Income estimates are in 2000 dollars.

## Environmental Consequences

Total employment impacts of the ISDRA under Alternative 1 (high 2012-2013 visitor use estimates) represent between 0.4 and 1.0 percent of the total regional employment of 47,600. Total personal income, on the other hand, represents between 0.1 and 0.3 percent of total regional personal income. Thus, this alternative would have a negligible to beneficial impact on regional employment and income in Yuma County.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 1 (using the high 2012-2013 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

### 4.4.2.5 Alternative 2: High 2012-2013 Visitor Use Estimate

#### Imperial County

Estimated trip expenditures range from \$112.8 million to \$278.9 million. Table 4.4-21 shows estimated total household trip expenditures by expenditure types for Alternative 2 using high 2012-2013 visitor use estimates.

The ISDRA would contribute 2,290 to 6,158 in direct employment and between \$44.9 million and \$111.0 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 227 to 574 in indirect employment in the region and between 312 and 773 in induced employment.

**Table 4.4-21 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 2 with High 2012-2013 Visitor Use Estimates, 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	1.16	1.16
Food and Beverage	40.89	136.31
Medical	5.01	10.03
Supplies and Services	55.13	110.27
Transportation	10.55	21.10
TOTAL	112.75	278.87

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The visitor expenditures would also generate between \$6.8 million and \$17.0 million in indirect personal income to the region, and between \$7.7 million and \$19.1 million in induced personal income. Table 4.4-22 shows the estimates of direct, indirect, and induced employment and income under Alternative 2 with high 2012-2013 visitor use estimates.

**Table 4.4-22 Estimates of Direct, Indirect, and Induced Impacts under Alternative 2 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	2,290	6,158
Indirect	227	574
Induced	312	773
Total Employment	2,829	7,505
Personal Income		
Direct	\$44.92 million	\$111.00 million
Indirect	\$6.75 million	\$17.04 million
Induced	\$7.70 million	\$19.10 million
Total Personal Income	\$59.38 million	\$147.14 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 2 (high 2012-2013 visitor use estimates) represent between 6 and 15 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents between 2 and 6 percent of total regional personal income. The anticipated increase in regional employment and income in Imperial County under this alternative represents a beneficial impact relative to existing conditions.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 2 (using the high 2012-2013 visitor use estimates) are significantly beneficial (based on the significance criteria), no adverse impacts on population or housing are expected.

**Yuma County**

Under Alternative 2 (high 2012-2013 visitor use estimates), the estimated trip expenditures range from \$5.3 million to \$13.1 million. Table 4.4-23 shows estimated total household trip expenditures by expenditure types for Alternative 2 using high 2012-2013 visitor use estimates.

## Environmental Consequences

**Table 4.4-23 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 2 with High 2012-2013 Visitor Use Estimates, 1997 Dollars**

<b>EXPENDITURE TYPE</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$</b>
Food and Beverage	1.93	6.45
Medical	0.24	0.47
Supplies and Services	2.61	5.22
Transportation	0.50	1.00
<b>TOTAL</b>	<b>5.28</b>	<b>13.14</b>

Source: BLM, 2001; California Department of Parks and Recreation, 1997.

Numbers may not add up due to independent rounding.

The ISDRA would contribute 108 to 298 in direct employment and between \$1.8 million and \$4.6 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 18 to 45 in indirect employment in the region and between 17 and 42 in induced employment.

The visitor expenditures also generate between \$0.4 million and \$1.1 million in indirect personal income to the region, and between \$0.4 million and \$0.9 million in induced personal income. Table 4.5-24 shows the estimates of direct, indirect, and induced employment and income under Alternative 2 with high 2012-2013 visitor use estimates.

**Table 4.4-24 Estimates of Direct, Indirect, and Induced Impacts under Alternative 2 with High 2012-2013 Visitor Use Estimates**

	<b>LOW EXPENDITURE ESTIMATES</b>	<b>HIGH EXPENDITURE ESTIMATES</b>
Employment		
Direct	108	298
Indirect	18	45
Induced	17	42
Total Employment	143	386
Personal Income		
Direct	\$1.84 million	\$4.60 million
Indirect	\$0.43 million	\$1.08 million
Induced	\$0.36 million	\$0.91 million
Total Personal Income	\$2.63 million	\$6.59 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 2 (high 2012-2013 visitor use estimates) represent between 0.3 and 0.8 percent of the total

regional employment of 47,600. Total personal income, on the other hand, represents between 0.1 and 0.2 percent of total regional personal income. Thus, this alternative would have a negligible to beneficial impact on regional employment and income in Yuma County.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under the Alternative 2 (high 2012-2013 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

**4.4.2.6  
Alternative 3:  
High 2012-2013  
Visitor Use  
Estimate**

**Imperial County**

Estimated trip expenditures range from \$102.5 million to \$253.5 million. Table 4.4-25 shows estimated total household trip expenditures by expenditure types for Alternative 3 using high 2012-2013 visitor use estimates.

The ISDRA would contribute 2,081 to 5,597 in direct employment and between \$40.8 million and \$100.9 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 283 to 522 in indirect employment in the region and between 283 and 703 in induced employment.

**Table 4.4-25 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 3 with High 2012-2013 Visitor Use Estimates, 1998 Dollars**

<b>EXPENDITURE TYPE</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$</b>
Lodging	1.06	1.06
Food and Beverage	37.17	123.90
Medical	4.56	9.12
Supplies and Services	50.11	100.23
Transportation	9.59	19.18
<b>TOTAL</b>	<b>102.49</b>	<b>253.48</b>

Source: BLM, 2001; California Department of Parks and Recreation, 1997. Numbers may not add up due to independent rounding.

The visitor expenditures would also generate between \$6.1 million and \$15.5 million in indirect personal income to the region, and between \$7.0 million and \$17.4 million in induced personal income. Table 4.4-26 shows the estimates of direct, indirect, and induced employment and income under Alternative 3 with high 2012-2013 visitor use estimates.

## Environmental Consequences

**Table 4.4-26 Estimates of Direct, Indirect, and Induced Impacts under Alternative 3 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	2,081	5,597
Indirect	207	522
Induced	283	703
Total Employment	2,571	6,822
Personal Income		
Direct	\$40.83 million	\$100.90 million
Indirect	\$6.14 million	\$15.49 million
Induced	\$7.00 million	\$17.36 million
Total Personal Income	\$53.97 million	\$133.75 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 3 (high 2012-2013 visitor estimates) represent between 5 and 14 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents between 2 and 5 percent of total regional personal income. The anticipated increase in regional employment and income in Imperial County under this alternative represents a beneficial impact relative to existing conditions.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 3 (using the high 2012-2013 visitor use estimates) are beneficial, no adverse impacts on population or housing are expected.

### **Yuma County**

Under Alternative 3 (high 2012-2013 visitor use estimates), the estimated trip expenditures range from \$4.8 million to \$11.9 million. Table 4.4-27 shows estimated total household trip expenditures by expenditure types for Alternative 3 using high 2012-2013 visitor use estimates.

**Table 4.4-27 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 3 with High 2012-2013 Visitor Use Estimates, 1997 Dollars**

<b>EXPENDITURE TYPE</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$</b>
Food and Beverage	1.76	5.86
Medical	0.22	0.43
Supplies and Services	2.37	4.74
Transportation	0.45	0.91
<b>TOTAL</b>	<b>4.80</b>	<b>11.94</b>

Source: BLM, 2001; California Department of Parks and Recreation, 1997.  
 Numbers may not add up due to independent rounding.

The ISDRA would contribute 99 to 271 in direct employment and between \$1.7 million and \$4.2 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 16 to 41 in indirect employment in the region and between 15 and 39 in induced employment.

The visitor expenditures also generate between \$0.4 million and \$1.0 million in indirect personal income to the region, and between \$0.3 million and \$0.8 million in induced personal income. Table 4.4-28 shows the estimates of direct, indirect, and induced employment and income under Alternative 3 with high 2012-2013 visitor use estimates.

**Table 4.4-28 Estimates of Direct, Indirect, and Induced Impacts under Alternative 3 with High 2012-2013 Visitor Use Estimates**

	<b>LOW EXPENDITURE ESTIMATES</b>	<b>HIGH EXPENDITURE ESTIMATES</b>
Employment		
Direct	99	271
Indirect	16	41
Induced	15	39
Total Employment	130	351
Personal Income		
Direct	\$1.68 million	\$4.18 million
Indirect	\$0.39 million	\$0.98 million
Induced	\$0.33 million	\$0.83 million
Total Personal Income	\$2.39 million	\$5.99 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 3 (high 2012-2013 visitor use estimates) represent between 0.3 and 0.7 percent of the total

## Environmental Consequences

regional employment of 47,600. Total personal income, on the other hand, represents between 0.1 and 0.2 percent of total regional personal income. Thus, this alternative would have a negligible to beneficial impact on regional employment and income in Yuma County.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 3 (using the high 2012-2013 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

### 4.4.2.7 Alternative 4: High 2012-2013 Visitor Use Estimate

#### Imperial County

Estimated trip expenditures range from \$124.0 million to \$306.6 million. Table 4.4-29 shows estimated total household trip expenditures by expenditure types for Alternative 4 using high 2012-2013 visitor use estimates.

The ISDRA would contribute 2,518 to 6,771 in direct employment and between \$49.4 million and \$122.1 million in direct personal income to the Imperial County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Imperial County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 250 to 632 in indirect employment in the region and between 343 and 850 in induced employment.

**Table 4.4-29 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 4 with High 2012-2013 Visitor Use Estimates, 1998 Dollars**

EXPENDITURE TYPE	TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$	TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$
Lodging	1.28	1.28
Food and Beverage	44.97	149.88
Medical	5.51	11.03
Supplies and Services	60.62	121.24
Transportation	11.60	23.20
TOTAL	123.98	306.63

Source: BLM, 2001; California Department of Parks and Recreation, 1997.  
Numbers may not add up due to independent rounding.

The visitor expenditures would also generate between \$7.4 million and \$18.7 million in indirect personal income to the region, and between \$8.5 million and \$21.0 million in induced personal income. Table 4.4-30 shows the estimates of direct, indirect, and induced employment and income under Alternative 4 with high 2012-2013 visitor use estimates.

**Table 4.4-30 Estimates of Direct, Indirect, and Induced Impacts under Alternative 4 with High 2012-2013 Visitor Use Estimates**

	LOW EXPENDITURE ESTIMATES	HIGH EXPENDITURE ESTIMATES
Employment		
Direct	2,581	6,771
Indirect	250	632
Induced	343	850
Total Employment	3,111	8,252
Personal Income		
Direct	\$49.39 million	\$122.05 million
Indirect	\$7.43 million	\$18.74 million
Induced	\$8.47 million	\$21.00 million
Total Personal Income	\$65.29 million	\$161.79 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 4 (high 2012-2013 visitor use estimates) represent between 6 and 17 percent of the total regional employment of 49,800. Total personal income, on the other hand, represents between 3 and 6 percent of total regional personal income. The anticipated increase in regional employment and income in Imperial County under this alternative represents a beneficial impact relative to existing conditions.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under Alternative 4 (using the high 2012-2013 visitor use estimates) are beneficial, no adverse impacts on population or housing are expected.

**Yuma County**

Under Alternative 4 (high 2012-2013 visitor use estimates), the estimated trip expenditures range from \$5.8 million to \$14.5 million. Table 4.4-31 shows estimated total household trip expenditures by expenditure types for Alternative 4 using high 2012-2013 visitor use estimates.

## Environmental Consequences

**Table 4.4-31 Total Estimated Household Trip Expenditures by Expenditure Type under Alternative 4 with High 2012-2013 Visitor Use Estimates, 1997 Dollars**

<b>EXPENDITURE TYPE</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (LOWER BOUND) IN MILLIONS \$</b>	<b>TOTAL HOUSEHOLD TRIP EXPENDITURES (UPPER BOUND) IN MILLIONS \$</b>
Food and Beverage	2.13	7.09
Medical	0.26	0.52
Supplies and Services	2.87	5.74
Transportation	0.55	1.10
<b>TOTAL</b>	<b>5.81</b>	<b>14.45</b>

Source: BLM, 2001; California Department of Parks and Recreation, 1997.  
Numbers may not add up due to independent rounding.

The ISDRA would contribute 119 to 328 in direct employment and between \$2.0 million and \$5.1 million in direct personal income to the Yuma County economy. In addition to the direct economic impacts of visitor expenditures, ISDRA would also contribute to the economic well-being of Yuma County through secondary economic impacts (indirect and induced impacts). Visitor expenditures result in 20 to 50 in indirect employment in the region and between 19 and 47 in induced employment.

The visitor expenditures also generate between \$0.5 million and \$1.2 million in indirect personal income to the region, and between \$0.4 million and \$1.0 million in induced personal income. Table 4.4-32 shows the estimates of direct, indirect, and induced employment and income under Alternative 4 with high 2012-2013 visitor use estimates.

**Table 4.4-32 Estimates of Direct, Indirect, and Induced Impacts under Alternative 4 with High 2012-2013 Visitor Use Estimates**

	<b>LOW EXPENDITURE ESTIMATES</b>	<b>HIGH EXPENDITURE ESTIMATES</b>
Employment		
Direct	119	328
Indirect	20	50
Induced	19	47
Total Employment	157	424
Personal Income		
Direct	\$2.03 million	\$5.06 million
Indirect	\$0.47 million	\$1.19 million
Induced	\$0.40 million	\$1.10 million
Total Personal Income	\$2.90 million	\$7.25 million

Income estimates are in 2000 dollars.

Total employment impacts of the ISDRA under Alternative 4 (high 2012-2013 visitor use estimates) represent between 0.3 and 0.9 percent of the total

regional employment of 47,600. Total personal income, on the other hand, represents between 0.1 and 0.3 percent of total regional personal income. Thus, this alternative would have a negligible to beneficial impact on regional employment and income in Yuma County.

Because most of the visitors to the ISDRA are temporary visitors (not moving into the area) and the impacts on jobs and income under the Alternative 4 (high 2012-2013 visitor use estimates) are negligible, no adverse impacts on population or housing are expected.

**4.4.2.8  
Summary of  
Impacts**

Alternative 1 (high 2012-2013 visitor use estimates) results in the highest socioeconomic benefits in terms of employment and personal income because it is the alternative that results in the highest number of visits. Tables 4.4-33 through 4.4-36 summarize the employment and personal income impacts for Imperial and Yuma Counties. As discussed in the introduction to this section and in Section 3.1 and 4.1, Recreation, it is important to note that much of the economic activity associated with Alternative 1 is attributable to increased visitor use on six major holiday weekends. Many of these visitors are often engaged in illegal activities and public disturbances. The increased revenues of Alternative 1 (in comparison to the other alternatives) must be assessed in consideration of the basic premise of lawful activity that defines those action alternatives (Alternatives 2, 3, and 4). None of the alternatives would result in adverse impacts to socioeconomics.

**4.4.3  
Environmental  
Justice  
Analysis**

This section was prepared in compliance with Presidential Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898), dated February 11, 1994. The purpose of this section is to determine whether or not disproportionately high and adverse human health or environmental effects would result to minority and/or low-income populations from implementing the proposed alternatives. This analysis focuses on the populations located within the area potentially affected by the alternatives. In accordance with EO 12898, this analysis documents where minority and low-income populations reside and examines where the high and adverse impacts (as reported in the various environmental analysis sections of this EIS) fall relative to these populations. This section also discusses the specific outreach efforts made to involve minority and low-income populations in the decisionmaking process.

**Studies  
Performed and  
Coordination  
Conducted**

**Overview of Executive Order 12898**

EO 12898, issued by President Clinton in 1994, requires that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations...” In his memorandum transmitting EO 12898 to federal agencies, President Clinton

**Environmental Consequences**

**Table 4.4-33 Estimates of Employment Impacts, Imperial County**

EXPENDITURE TYPE	BASELINE	ALTERNATIVES					
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES			
		ALL ALTERNATIVES 2002-2003	ALL ALTERNATIVES	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
<i>Lower Bound</i>							
Direct	1,214	1,406	1,984	2,897	2,290	2,081	2,518
Indirect	121	140	197	287	227	207	250
Induced	165	191	270	394	312	283	343
Total Employment	1,500	1,737	2,450	3,578	2,829	2,571	3,111
<i>Upper Bound</i>							
Direct	3,264	3,780	5,334	7,790	6,158	5,597	6,771
Indirect	304	353	498	727	574	522	632
Induced	410	475	670	978	773	703	850
Total Employment	3,978	4,607	6,501	9,495	7,505	6,822	8,252

Table 4.4-34 Estimates of Personal Income Impacts, Imperial County (Million 2000 \$)

EXPENDITURE TYPE	BASELINE	ALTERNATIVES					
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES			
		ALL ALTERNATIVES 2002-2003	ALL ALTERNATIVES	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
<i>Lower Bound</i>							
Direct	23.8	27.6	38.91	56.8	44.9	40.8	49.4
Indirect	3.6	4.2	5.85	8.6	6.8	6.1	7.4
Induced	4.1	4.7	6.67	9.7	7.7	7.0	8.5
Total Personal Income	31.5	36.5	51.43	75.1	59.4	54.0	65.3
<i>Upper Bound</i>							
Direct	56.1	68.2	96.15	140.4	111.0	100.9	122.1
Indirect	8.5	10.5	14.76	21.6	17.0	15.5	18.7
Induced	9.7	11.7	16.55	24.2	19.1	17.4	21.0
Total Personal Income	74.3	90.3	127.46	186.2	147.1	133.8	161.8

**Environmental Consequences**

**Table 4.4-35 Estimates of Employment Impacts, Yuma County**

EXPENDITURE TYPE	BASELINE	ALTERNATIVES					
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES			
		ALL ALTERNATIVES 2002-2003	ALL ALTERNATIVES	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
<i>Lower Bound</i>							
Direct	58	67	94	137	108	99	119
Indirect	10	11	15	23	18	16	20
Induced	9	10	15	21	17	15	19
Total Employment	76	88	124	1811	143	130	157
<i>Upper Bound</i>							
Direct	158	183	258	377	298	271	328
Indirect	24	28	39	57	45	41	50
Induced	23	26	37	54	42	39	47
Total Employment	205	237	334	488	386	351	424

TABLE 4.4-36 ESTIMATES OF PERSONAL INCOME IMPACTS, YUMA COUNTY (MILLION 2000 \$)

EXPENDITURE TYPE	BASELINE	ALTERNATIVES					
		2002-2003 VISITOR ESTIMATE	2012-2013 LOW VISITOR ESTIMATE	2012-2013 HIGH VISITOR ESTIMATES			
		ALL ALTERNATIVES 2002-2003	ALL ALTERNATIVES	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4
<i>Lower Bound</i>							
Direct	1.0	1.1	1.6	2.3	1.8	1.7	20.3
Indirect	0.2	0.3	0.4	0.5	0.4	0.4	0.5
Induced	0.2	0.2	0.3	0.5	0.4	0.3	0.4
Total Personal Income	1.4	1.6	2.3	3.3	2.6	2.4	2.9
<i>Upper Bound</i>							
Direct	2.4	2.8	4.0	5.8	4.6	4.2	5.1
Indirect	0.6	0.7	0.9	1.4	1.1	1.0	1.2
Induced	0.5	0.6	0.8	1.2	0.9	0.8	1.0
Total Personal Income	3.5	4.1	5.7	8.3	6.6	6.0	7.3

further specified that, “each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the National Environmental Policy Act of 1969.” Guidance on how to implement EO 12898 and conduct an Environmental Justice analysis has been issued by the President’s Council on Environmental Quality (CEQ, 1997).

**Methodology and Approach**

The alternatives were evaluated for compliance with EO 12898. For this type of analysis, three fundamental evaluation measures are used.

1. A determination is made as to which impacts of the alternatives are high and adverse.

The series of environmental analyses prepared for the ISDRA RAMP EIS were reviewed, and discussions with the environmental professionals who prepared these sections were conducted to determine which environmental or human health impacts could reach the level of high and adverse after proposed mitigation measures were implemented. Neither EO 12898 nor any of the environmental justice guidance documents contains official guidance on the definition of “high and adverse.” For purposes of this analysis, adverse impacts identified by the professional analysts working on this EIS as “significant” under NEPA were considered to be synonymous with high and adverse impacts as described in EO 12898.

2. A determination is made as to whether minority or low-income populations exist within the high and adverse impact zones.

For information on the distribution of minority and low-income populations in the vicinity of the Plan Area, both 2000 and 1990 census data were used. Race and income data were reviewed at the finest level available from the census (i.e., Census Block for race, and Census Block Group for income). At the time of this analysis, race data from the 2000 census were available and were reviewed. Income data from the 2000 census were not scheduled to be released until April 2002. In lieu of these newer data, 1990 census data on income were reviewed.

3. The spatial distribution of high and adverse impacts is reviewed to determine if these impacts are likely to fall disproportionately on the minority or low-income population.

Because there is no specific guidance in EO 12898, the test of disproportionality is made on the basis described in the *U.S. Environmental Protection Agency’s (EPA) Draft Revised Guidance for Investigating Title VI Administrative Complaints Challenging Permits* (U.S. EPA, June 2000). This guidance suggests using two to three standard deviations above the mean as a quantitative measure of disparate effect.

While the first two elements of this approach were conducted, no detailed distribution analysis was required to make a final determination. This was because professional analysts in each environmental and human health discipline reviewed for this EIS determined that no high and adverse (i.e., NEPA significant) human health or environmental effects were expected to remain after implementation of proposed mitigation measures.

### **Outreach to Minority and Low-Income Populations**

EO 12898 requires federal agencies to ensure effective public participation and access to information. Consequently, a key component of compliance with EO 12898 is outreach to the potentially affected minority and/or low-income population to discover issues of importance that may not otherwise be apparent. Outreach to affected communities was conducted as part of the decisionmaking process, and this outreach is summarized in Section 1.4 of this DEIS.

## **Impact Analysis**

The ISDRA extends from the central to the southeastern region of Imperial County, California. The area encompassed by the recreation area boundary and the areas immediately adjacent to this boundary are largely unpopulated (see Chapter 3 for a detailed discussion of the affected environment in the vicinity of ISDRA).

### **Distribution of the Minority Population**

Based on the 2000 census, the total population of Imperial County is 142,361. The minority population comprises approximately 50.6 percent of this total population. Several of the Census Blocks in the vicinity of the ISDRA are above 50 percent minority. These Census Blocks have minority population densities high enough (i.e., greater than 50 percent) to be considered minority populations based on the guidance contained in CEQ (1997).

### **Distribution of the Low-Income Population**

Based on the 1990 census (the most recent census for which income data are available), the total population of Imperial County was 109,303. The low-income population comprised approximately 24 percent of this total population. Unlike the CEQ (1997) guidance on minority population, none of the environmental justice guidance documents contains a quantitative definition of how many low-income individuals it takes to comprise a low-income population. In the absence of guidance, for this analysis the density used to identify minority populations (i.e., 50 percent or greater) was also used to identify low-income populations. There is one Census Block Group southeast of the ISDRA with 50 percent or more low-income population.

As discussed in the Methodology and Approach section above, for purposes of this analysis, NEPA significant adverse impacts are considered synonymous with high and adverse impacts as described in EO 12898. As reported in the series of environmental analyses prepared for this DEIS, and further confirmed through discussions with the environmental professionals who prepared these sections, no significant adverse impacts are expected as a result of implementing the alternatives after proposed mitigation measures are

## **Environmental Consequences**

implemented. Consequently, none of the impacts of the vicinity of the Plan Area can be described as high and adverse in the context of EO 12898. Because no high and adverse impacts expected as a result of implementing the alternatives, no high and adverse human health or environmental effects of the alternatives are expected to affect minority or low-income populations disproportionately to the general population. The alternatives are considered to be consistent with the policy established in EO 12898.

## 4.5 LAND USE AND LAND OWNERSHIP

Land use impacts are evaluated in terms of the potential effects of enactment of the alternatives, including the No Action Alternative, on existing and planned land uses in the vicinity of the Plan Area based on the following:

- Inconsistency with applicable land use plans and policies
- Incompatibility with existing land uses in the vicinity of the Plan Area

Land management practices exercised by the BLM, including those in the Plan Area, must be consistent with the FLPMA, as well as other management guidelines and plans that provide for and direct the avoidance of land use conflicts where ever possible. It is therefore assumed that, per these guidelines, review and approval procedures for specific actions under these alternatives would result in avoidance or reduction of potentially adverse land use impacts.

Rights-of-way and leases would potentially be granted within lands that are currently subject to interim closure subject to appropriate environmental and land use conformity review.

As described in Chapter 2, all the alternatives with the exception of the No Action Alternative incorporate the designation of eight management areas within the ISDRA, and one management area surrounding the Recreation Area (the Buffer Zone Management Area). Impacts of the subsequent management measures unique to each of the nine areas, as they pertain to the individual action alternatives, are described below.

From the point of view of the Purpose and Need of updating a recreation area management plan, it is important to note that rights-of-way and other entitlements relate to recreational activities in two ways. They are either (1) obvious and therefore avoided by OHV enthusiasts (e.g., railroads, roadways, transmission lines) or (2) unobtrusive and therefore with no or minor effects on recreational use (e.g., buried utilities). Therefore, in either case, impacts to recreational uses are negligible.

### 4.5.2 Impacts

#### 4.5.2.1 Alternative 1: No Action Alternative

Under Alternative 1, land use management within the ISDRA would continue to be according to the existing and approved management 1987 *Recreation Area Management Plan*, as well as updated regulations that would constrain full implementation of the 1987 RAMP (e.g., new facilities would not be allowed in the North Algodones Dunes Wilderness Area). The nine management areas common to the action alternatives would not be designated, and associated management actions would not be pursued. Because current practices would continue, this alternative would change land uses only to the extent dictated by the 1987 RAMP. Impacts of these changes on applicable land use plans and policies and existing land uses within the ISDRA are discussed below.

### **Consistency With Land Use Plans and Policies**

Under Alternative 1, the ISDRA would continue to be managed for multiple uses, including recreation and resource protection, as specified in the CDCA Plan and in accordance with other applicable guidelines. No new management areas and associated ROS classes would be designated. The CDPA of 1994 established the approximately 32,240-acre North Algodones Dunes Wilderness, located in the northern portion of the Plan Area. Alternative 1 would result in no change in the management of this area to maintain its wilderness status, as provided for in the CDPA. No land use or zoning changes are proposed for private and other lands not managed by the BLM in the Plan Area under this alternative. Alternative 1 would be consistent with the FLPMA, CDPA, CDCA Plan, and Imperial County General Plan and Zoning Regulations. However, implementation of the No Action Alternative would be inconsistent with applicable BLM recreation area management policies that call for periodic updates of management plans so that management practices can adapt to changing land use patterns and intensity.

### **Compatibility with Existing Land Uses**

Under Alternative 1, nonrecreational land uses would likely remain unchanged. The management agreements of the BLM with Bureau of Reclamation and the U.S. Navy would not change. BLM would continue to administer sand and gravel sales, geothermal leases, and oil and gas leases based on the concept of multiple use. Rights-of-way would be maintained consistent with current policies, and new rights-of-way would be granted subject to environmental review and compatibility with existing land uses.

The geographic distribution of recreational and nonrecreational land uses at the ISDRA would be the same under Alternative 1 than under current conditions, and all currently allowed use types would continue to be permitted. The BLM would continue to manage the Recreation Area for multiple uses, including recreation and resource protection. Therefore, land uses under Alternative 1 would be compatible with existing land uses; and no adverse impacts are anticipated.

#### **4.5.2.2 Alternative 2: Recreation and Resource Protection Alternative**

The management emphasis of Alternative 2 is to assure continued use of the ISDRA for motorized and nonmotorized recreational opportunities, and to provide for the protection of natural and cultural resources. The impacts of changes to applicable land use plans and policies consequent to the enactment of Alternative 2, as well as impacts to existing and future land uses at the ISDRA are discussed below.

### **Consistency With Land Use Plans and Policies**

Under Alternative 2, management areas and associated ROS classifications would be established within the Plan Area that would accommodate both recreational opportunities (see Sec. 4.1), including motorized recreation, as well as the protection of biotic and cultural resources. The incorporation of multiple-use management measures for the Plan Area for this alternative

would be consistent with FLPMA as well as specific recreation area management guidelines.

No change to the MUC designations established by the CDCA Plan would occur under implementation of this alternative. Proposed management area and ROS class designations (see Table 2-2 in this DEIS) would be consistent with allowable use under the existing MUCs with regard to the proposed type and intensity of recreational activities and the preservation of the character of the landscape. Therefore, Alternative 2 would be consistent with the CDCA Plan.

No land use or zoning changes are proposed for private and non-BLM lands in the Plan Area. Alternative 2 recreation and resource protection objectives are in conformance with the respective goals and objectives set forth in both the Land Use Element and the Conservation and Open Space Element of the Imperial County General Plan. The County also has zoned the entire ISDRA as S-Open Space, which permits multiple uses consistent with the Conservation and Open Space Element of the General Plan. Therefore, this alternative is consistent with the Imperial County General Plan and Zoning Regulations.

Under Alternative 2, the North Algodones Dunes Wilderness Area would continue to be managed to maintain its wilderness values, as provided for in the CDPA. Therefore, this alternative would be consistent with the CDPA. Alternative 2 also would be consistent with FLPMA, the CDCA Plan, and Imperial County General Plan and Zoning Regulations. Implementation of this alternative would be consistent with applicable land use plans and policies.

### **Compatibility with Existing Land Uses**

Alternative 2 would not result in changes to existing land use patterns in the ISDRA; and the BLM would continue to manage the ISDRA for multiple uses, including recreation and resource protection. The management agreements of the BLM with BOR and the U.S. Navy would not change. BLM would continue to administer sand and gravel sales, geothermal leases, and oil and gas leases based on the concept of multiple use. Such leases would potentially be granted within lands that are currently subject to interim closure.

The geographic distribution of recreational and nonrecreational uses at the ISDRA would be the same under Alternative 2 as compared to the baseline. Overall, proposed land uses under Alternative 2 would be compatible with existing and future land uses; no land use compatibility impacts would result from implementation of this alternative.

## Environmental Consequences

### 4.5.2.3 Alternative 3: Natural and Cultural Resource Alternative

The goal of Alternative 3 is to implement an adaptive management strategy designed to optimize the protection of habitats and populations of sensitive species, while providing opportunities for continued OHV access and other recreational activities within the Plan Area. The effect of the enactment of Alternative 3 on applicable land use plans and policies, as well as existing and future land uses within the Plan Area, is discussed below.

#### **Consistency with Land Use Plans and Policies**

Under Alternative 3, management areas and associated ROS classes would be designated within the Plan Area that would be generally more restrictive to OHV recreational activities. However, the ISDRA would continue to be managed for multiple uses, including recreation. Based on the concept of multiple use, this alternative would be consistent with the FLPMA.

Because OHV use in certain areas within the ISDRA would not be allowed under this alternative, the proposed management area and ROS class designations (see Table 2-2 in this DEIS) would be inconsistent with the permitted uses of the CDCA Plan for the ISDRA, as indicated by the MUC classification system.

No land use or zoning changes are proposed for private and other lands not managed by the BLM in the Plan Area. Alternative 3 would increase the protections provided to the North Algodones Dunes Wilderness Area by placing more restrictive ROS classifications on surrounding management areas. Therefore, this alternative would be consistent with the CDPA. Implementation of this alternative would be consistent with the FLPMA, CDPA, CDCA Plan, and Imperial County General Plan and Zoning Regulations. However, it would be inconsistent with the CDCA Plan.

#### **Compatibility with Existing Land Uses**

Alternative 3 would result in the closure of some ISDRA areas to motorized recreation and limit the intensity level of OHV use in other areas as compared to the baseline. These land use changes would be compatible with surrounding land uses in the ISDRA as nonmotorized recreational land uses would continue in these areas, motorized recreation would continue in other ISDRA areas, and natural and cultural resources would be afforded maximum levels of protection. Therefore, under Alternative 3, the BLM would continue to manage the ISDRA for multiple uses, including recreation and resource protection.

The management agreements of the BLM with the BOR and the U.S. Navy would not change. The BLM would continue to administer sand and gravel sales, geothermal leases, and oil and gas leases based on the concept of multiple use, although leases would likely not be granted on areas permanently closed to vehicles.

While the geographic distribution of recreational and nonrecreational uses at the ISDRA would change under Alternative 3 as compared to the baseline, all currently allowed use types would continue to be permitted. The BLM would continue to manage the ISDRA for multiple uses, including recreation and

resource protection. Therefore, proposed uses under Alternative 3 would be compatible with existing and future land uses; and no land use compatibility impacts are anticipated from implementation of this alternative.

**4.5.2.4  
Alternative 4:  
Motorized  
Recreation  
Opportunities  
Alternative**

The goal of Alternative 4 is to maximize motorized recreational opportunities within the ISDRA consistent with public scoping comments that had this as a priority. The effect of these changes, as compared to the baseline, on applicable land use plans and policies and existing and future land uses at the ISDRA is discussed below.

**Consistency with Land Use Plans and Policies**

Under Alternative 4, management areas and associated ROS classes would be designated within the ISDRA that maximize motorized recreational opportunities. The ISDRA would continue to be managed for multiple uses, including resource protection. Consequently, this alternative would be consistent with the FLPMA.

Because the intensity of OHV use in certain areas within the ISDRA would increase under this alternative, the proposed management area ROS class designations under this alternative (see Table 2-2 in this DEIS) would be inconsistent with the CDCA Plan uses for the ISDRA, as indicated by the MUC system.

No land use or zoning changes are proposed for private and other lands not managed by the BLM in the Plan Area. Alternative 4 management measures are in conformance with the respective goals and objectives set forth in both the Land Use Element and the Conservation and Open Space Element of the Imperial County General Plan. The County also has zoned the entire ISDRA as S-Open Space, which permits multiple uses consistent with the Conservation and Open Space Element of the General Plan. Therefore, this alternative is consistent with the Imperial County General Plan and Zoning Regulations.

The CDPA of 1994 established the approximately 32,240-acre North Algodones Dunes Wilderness, located north of SR-78 and south of the Mammoth Management Area. Enactment of Alternative 4 would not modify or minimize the protections provided to this wilderness as provided in the CDPA. Therefore, this alternative would be consistent with the CDPA.

**Compatibility with Existing Land Uses**

Although Alternative 4 would result in an increased intensity of motorized recreational use within the ISDRA as compared to the baseline, this alternative would be compatible with existing and planned land uses in the ISDRA. Motorized and nonmotorized recreational land uses would continue. In addition, the management actions that apply to all alternatives, including the public relations, law enforcement, and adaptive management programs, would encourage protection for natural and cultural land uses by reducing the incidence of encroachment of intensive recreation activity to adjacent areas.

## **Environmental Consequences**

Nonrecreational land uses would remain unchanged as a result of implementing Alternative 4. Management agreements of the BLM with the BOR and the U.S. Navy would not change. BLM would continue to administer sand and gravel sales, geothermal leases, and oil and gas leases based on the concept of multiple use, and leases would potentially be granted within lands that are currently subject to interim closure.

While the geographic distribution of recreational land uses at the ISDRA would change under Alternative 4 as compared to the baseline, all currently allowed use types would continue to be permitted. Therefore, proposed uses under Alternative 4 would be compatible with existing and anticipated future land uses; and no land use impacts are anticipated from implementation of this alternative.

### **4.5.3 Mitigation Measures**

No adverse impacts were identified that would require mitigation measures for any project alternative.

## 4.6 VISUAL RESOURCES

All land-disturbing activities have a direct effect on the visual resource. These effects can be either positive or negative, depending on the location, size, color, and viewing location.

Generally speaking, alternatives with high levels of recreation development have the highest potential for decreasing scenic quality. Ground-disturbing activities like road and facilities construction have the potential of not harmonizing with the natural character of the landscape. Dispersed camping opportunities also have the potential to degrade the landscape, but to a much lesser degree.

Alternatives that prescribe management for vegetation and wildlife habitat would have little direct effect on visual resources. In addition, alternatives that remove non-native and other encroaching vegetation would increase the visual variety of a landscape.

Alternatives in which people are encouraged to gather in certain areas have an indirect effect on the visual resource. Vegetation can be trampled, user-built trails tend to appear, and litter detracts from the naturalness of the landscape.

Visual Resource Management classes have been provided for purposes of comparison only to provide a context of potential changes that could occur to the visual landscape. Adverse impacts on the visual resources of the ISDRA would result if the following conditions exist:

- Development proposed as part of an alternative would substantially alter the undisturbed character of the ISDRA landscape, or would be out of character with the landscape.
- View opportunities from established lookouts (e.g., Osborne Lookout or Mesquite Mine Lookout) are obstructed or eliminated.
- View opportunities from known popular areas (other than lookouts) are obstructed or eliminated.

### 4.6.1 Assumptions and Assessment Guidelines

### 4.6.2 Impacts

#### 4.6.2.1 Alternative 1

This alternative would not affect the current status of the North Algodones Dunes Wilderness Area, which prohibits motorized use within its boundaries, but allows nonmotorized recreation use.

It is expected that recreationists would continue to congregate at the popular areas during peak-use times (e.g., major holiday weekends). Due to anticipated increases in visitation (see Table 4.1-1), the visual resources of the landscape during peak periods would appear more crowded at the popular areas when compared to baseline conditions. These additional visitors during peak-use periods will result in temporary (episodic) landscape changes. When the peak-use periods end, use levels and associated visual resources would return to a condition that is similar to the baseline condition. This episodic change in visual resources is not considered an adverse impact.

## Environmental Consequences

Evaluating this alternative as shown in Figure 2-1, in the context of the VRM classes depicted in Figure 3.7-1, indicates that the level of existing development associated with this alternative is generally consistent with the associated VRM classes.

### 4.6.2.2 Alternative 2

#### Change in ROS Designation

When compared to the baseline condition, the ROS associated with this alternative would allow changes in recreation use, in terms of intensity of use, type of use allowed (motorized versus nonmotorized), and level of facility development. Implementation of this alternative would allow more intense use in the following areas, when compared to the baseline condition:

- Dune Buggy Management Area
- Ogilby Management Area

Implementation of this alternative would allow the same to a little more intense use in the following areas, when compared to the baseline condition:

- Adaptive Management Area—allowing motorized use where it potentially does not exist, as part of the baseline condition.
- Gecko Management Area—allowing roughly the same, to a little less, intense recreation use in the northern portion, and more intense use in the southern portion.
- North Algodones Wilderness Area—the ROS change from Primitive to Semi-Primitive Non-Motorized would allow evidence of users to be visible. Also, motorized use of local roads by law enforcement/resource management personnel would be allowed.
- Buffer Zone—allowing motorized use where it potentially does not exist, as part of the baseline condition.

Implementation of this alternative would allow roughly the same level of use in the following areas, when compared to the baseline condition:

- Glamis Management Area, allowing less intense use in the northern portion, and the southern portion would allow more intense use.

Implementation of this alternative would allow the same, to a little less, intense use in the following areas, when compared to the baseline condition:

- Buttercup Management Area

Implementation of this alternative would allow less intense use in the following areas, when compared to the baseline condition:

- Mammoth Management Area

From a visual resources perspective, allowing more intense use in a management area would change the landscape during periods of peak use. Views of areas during peak use periods from the air or from higher elevations

atop the dunes provide a very different image than views of the same areas during mid-week periods. This short-term change in landscape is adverse, but is not considered significant. This conclusion is based in part on the fact that recreationists visiting ISDRA during peak-use periods have the expectation of seeing crowds.

Allowing more intense use in a particular management area provides views of the inner dunes to more recreationists at one time. This is a visual benefit to the public. Conversely, allowing less intense use in a particular management area provides views of the inner dunes to fewer recreationists at one time. Due to the high level of mobility of the recreationists using the dunes, a lower level of allowable use would not adversely affect view opportunities of the OHV enthusiasts.

This alternative would also include updating the kiosks at the Wildlife Viewing Area. This would enhance the viewing experience of visitors and is considered a beneficial impact.

A ranger station would be constructed at Osborne Overlook. This would not alter views from Osborne Overlook. Visitors traveling on SR-78 would experience an altered view of Osborne Overlook. However, this change would not be substantial to the casual observer.

Applying a dust palliative on the Wash Road has the potential to reduce the dust and, therefore, increase visibility during windy or higher use days. This would result in a visual benefit to the public.

This alternative would provide for the development of pit toilet facilities in Glamis Flats, The Washes, and Dune Buggy Flats areas. This would result in the introduction of structures where they currently do not exist. This would be considered an adverse visual impact.

Closing Oldsmobile Hill, Competition Hill, Test Hill, and Patton Valley at night would result in those areas appearing darker at night (less nighttime glow) due to the elimination of vehicle lights.

In the Buttercup Management Area, several changes to the landscape would occur. Interpretive facilities and parking would be developed near Grays Well Road, a law enforcement facility would be constructed, and camping sites would be designated. These facilities would change the character to a more developed area; however, a Rural ROS designation would allow such changes, and such development would be consistent with the associated VRM Class 4.

Evaluating this alternative as shown in Figure 2-1, in the context of the VRM classes depicted in Figure 3.7-1, indicates that the level of existing development associated with this alternative is generally consistent with the associated VRM classes.

### **Change in Visitation**

Visitation is expected to increase over the years; therefore, the concentration of users is also expected to increase. In addition, more concentrated use would

## Environmental Consequences

be allowed in certain areas of the ISDRA with implementation of this alternative. These additional visitors during peak-use periods will result in temporary (episodic) landscape changes. When the peak-use periods end, use levels and associated visual resources would return to a condition that is similar to the baseline condition. This episodic change in visual resources is not considered an adverse impact because it would be temporary in nature.

### 4.6.2.3 Alternative 3

#### Change in ROS Designation

When compared to the baseline condition, the ROS associated with this alternative would affect the intensity of recreation use and the level of facility development.

- North Algodones Wilderness Area—the ROS change from Primitive to Semi-Primitive Non-Motorized would allow evidence of users to be visible. Also, motorized use of local roads by law enforcement/resource management personnel would be allowed.

Implementation of this alternative would allow the same or slightly greater intensity of use in the following areas, when compared to the baseline condition:

- Buttercup Management Area—allowing less intense use.
- Gecko Management Area—allowing less intense use in the northern portion, and more intense use in the southern portion, including a change in allowing motorized vehicles.
- Glamis Management Area—allowing less intense use in the northern portion, and the same, to a little less, level of use in the southern portion, including a change in allowing motorized vehicles.
- Dune Buggy Flats Management Area—allowing less intense use in the northern portion, and the same level of use in the southern portion.
- Buffer Zone—allowing only nonmotorized use where motorized use potentially exists, as part of the baseline condition.

Implementation of this alternative would allow less intense use in the following areas, when compared to the baseline condition:

- Adaptive Management Area, including not allowing motorized vehicles.
- Mammoth Management Area, including not allowing motorized vehicles.

Allowing less intense use in a particular management area provides views of the inner dunes to fewer recreationists at one time. Due to the high level of mobility of the recreationists using the dunes, a lower level of allowable use would not adversely affect view opportunities of the OHV enthusiasts.

This alternative would also include updating the kiosks at the Wildlife Viewing Area. This would enhance the viewing experience of visitors and is considered a beneficial impact.

Applying a dust palliative on the Wash Road has the potential to reduce the dust and, therefore, increase visibility during windy or higher use days. This would result in a visual benefit to the public.

This alternative would provide for the development of pit toilet facilities in Glamis Flats, The Washes, and Dune Buggy Flats areas. This would result in impacts similar to those described above under Alternative 2.

Closing Oldsmobile Hill, Competition Hill, Test Hill, and Patton Valley at night would result in those areas appearing darker at night (less nighttime glow) due to the elimination of vehicle lights.

In the Buttercup Management Area, several changes to the landscape would occur. Interpretive facilities and parking would be developed near Grays Well Road, and a law enforcement facility would be constructed. These facilities would change the character to a more developed area; however, a Roaded Natural ROS designation would allow such changes, and such development would be consistent with the associated VRM Class 3.

Evaluating this alternative as shown in Figure 2-1, in the context of the VRM classes depicted in Figure 3.7-1, indicates that the level of existing development associated with this alternative is generally consistent with the associated VRM classes.

#### **Change in Visitation**

Visitation is expected to increase over the years; therefore, the concentration of users is also expected to increase. However, lower levels of use and development would be allowed in certain areas of the ISDRA with implementation of this alternative. Additional visitors resulting from future growth in attendance during peak-use periods will result in temporary (episodic) landscape changes. When the peak-use periods end, use levels and associated visual resources would return to a condition that is similar to the baseline condition. This episodic change in visual resources is not considered an adverse impact because it would be temporary in nature.

#### **Change in ROS Designation**

When compared to the baseline condition, the ROS associated with this alternative would affect the intensity of recreation use and the level of facility development. Implementation of this alternative would allow more intense use in the following areas, when compared to the baseline condition:

- Dune Buggy Management Area
- Adaptive Management Area, allowing motorized use where it potentially does not exist, as part of the baseline condition.
- Ogilby Management Area, allowing motorized use where it potentially does not exist, as part of the baseline condition.

#### **4.6.2.4 Alternative 4**

## Environmental Consequences

- Gecko Management Area—allowing roughly the same, to a little more, intense recreation use in the northern portion, and more intense use in the southern portion

Implementation of this alternative would allow the same to a little more intense use in the following areas, when compared to the baseline condition:

- Buttercup Management Area
- North Algodones Wilderness Area—allowing the same type of use for the public (i.e., nonmotorized use). However, the ROS change from Primitive to Semi-Primitive Non-Motorized would allow evidence of users to be visible. Also, motorized use of local roads by law enforcement/resource management personnel would be allowed.
- Buffer Zone—allowing motorized use where it potentially does not exist, as part of the baseline condition.
- Glamis Management Area—allowing potentially more intense use in the northern portion, and more intense use in the southern portion.

Implementation of this alternative would allow less intense use in the following areas, when compared to the baseline condition:

- Mammoth Management Area

From a visual resources perspective, allowing more intense use in a management area would change the landscape during periods of peak use. Views of areas during peak-use periods from the air or from higher elevations atop the dunes provide a very different image than views of the same areas during mid-week periods. This short-term change in landscape is adverse, but is not considered significant. This conclusion is based in part on the fact that recreationists visiting ISDRA during peak-use periods have the expectation of seeing crowds.

Allowing more intense use in a particular management area provides views of the inner dunes to more recreationists at one time. This is a visual benefit to the public. Conversely, allowing less intense use in a particular management area provides views of the inner dunes to fewer recreationists at one time. Due to the high level of mobility of the recreationists using the dunes, a lower level of allowable use would not adversely affect view opportunities of the OHV enthusiasts.

The impacts associated with the construction of a ranger station at Osborne Overlook would be the same as the impact discussed previously under Alternative 2. The additional facilities planned in the Glamis Management Area would also result in similar impacts as Alternative 2, but would be marginally greater due to the increased level of facility development provided under this alternative. Applying a dust palliative on the Wash Road has the potential to reduce the dust and, therefore, increase visibility during windy or higher use days. This would result in a visual benefit to the public.

Oldsmobile Hill, Competition Hill, Test Hill, and Patton Valley would not be closed at night if this alternative is implemented. Therefore, the night glow in those areas due to vehicle lights would continue. This represents no change from the baseline condition.

In the Buttercup Management Area, several changes to the landscape would occur. Interpretive facilities and parking would be developed near Grays Well Road, camping sites would be designated, and a law enforcement facility would be constructed. These facilities would change the character to a more developed area; however, an Urban ROS designation would allow such changes, and such development would be consistent with the associated VRM Class 4.

Evaluating this alternative as shown in Figure 2-1, in the context of the VRM classes depicted in Figure 3.7-1, indicates that the level of existing development associated with this alternative is generally consistent with the associated VRM classes.

### **Change in Visitation**

Visitation is expected to increase over the years; therefore, the concentration of users is also expected to increase. In addition, more concentrated use would be allowed in certain areas of the ISDRA with implementation of this alternative. Additional visitors during peak-use periods will result in temporary (episodic) landscape changes. When the peak-use periods end, use levels and associated visual resources would return to a condition that is similar to the baseline condition. This episodic change in visual resources is not considered an adverse impact because it would be temporary in nature.

The following measures should be applied to all new facilities and physical improvements in the ISDRA to ensure they harmonize with the natural landscape. The degree to which an activity harmonizes with the landscape is based on whether its form, line, color, and texture replicate those of the existing landscape.

- Within the North Algodones Dunes Wilderness Areas, no improvements to roadways, new interpretive signs and kiosks, or establishment of vendor areas should occur in this VRM Class 1 area.
- When updating the kiosks at the Wildlife Viewing Area in the VRM Class 1 area (North Algodones Dunes Wilderness Area), use materials that harmonize with the natural landscape.
- Additional interpretive signs, kiosks, and vendor areas should occur in VRM Class 3 or 4 areas only. By definition, interpretive signs, kiosks, and vendor areas should attract attention; therefore, they should not be developed in Class 1 or 2 areas.

### **4.6.3 Mitigation Measures**

## 4.7 WATER RESOURCES

### 4.7.1 Assumptions and Assessment Guidelines

The assessment of impacts assumes that implementation of the project alternatives will include measures required by federal, state, or local law and/or regulation, if applicable. The project alternatives would have an adverse impact on water resources if it would:

- Substantially degrade water quality
- Contaminate a public water supply
- Cause substantial flooding or siltation
- Substantially alter surface flow conditions, patterns, or rates
- Result in water demands that would outstrip supply

The All American Canal, the New Coachella Canal, and ephemeral surface flows are the only surface waters in the project vicinity that have the potential to be affected by planned activities under this alternative. The majority of ephemeral surface flows are located in the eastern portion of the Plan Area.

Some of the OHVs at the ISDRA are expected to leak minor amounts of petroleum products in the normal course of operations. Small amounts of oil and fuel may be spilled or leaked onto the ground surface while refueling OHVs. Although such leakage is considered an adverse consequence of OHV use, it is not expected to affect groundwater quality. This is because leakage would be minor on an individual basis and, as a whole, would occur in a dispersed manner that corresponds to the OHV usage areas in the ISDRA. The potential for oil, grease, and fuel leakage to actually reach groundwater is extremely remote due to the low rainfall levels in the project area, the great depth to groundwater, and the volatile nature of fuel.

The chief impacts on water resources resulting from enactment of any of the alternatives would be to increase or decrease water supply demand by visitors to the ISDRA. Current as well as projected future visitor use levels under any of the alternative scenarios would result in water-use rates that fall well under the available water supply.

The Plan Area is not an area of groundwater recharge, nor would any of the alternatives subject to analysis affect groundwater quality of supplies.

### 4.7.2 Impacts

#### Surface Water Impacts

Impacts to surface waters under Alternative 1 would be negligible. Therefore, significant adverse impacts to surface waters are not anticipated.

#### 4.7.2.1 Alternative 1: No Action Alternative

#### Groundwater Impacts

Negligible impacts to groundwater are anticipated under this alternative. Significant adverse impacts would not occur.

#### Wildlife Guzzler Impacts

Wildlife guzzlers are clearly marked. Potential impacts to the wildlife guzzlers in the Mammoth Management Area and the North Algodones Dune

Wilderness Area would be somewhat greater than under the action alternatives due to the lack of management responses to increased visitor use entailed by the No Action Alternative.

**4.7.2.2  
Alternative 2:  
Recreation and  
Resource  
Protection  
Alternative**

**Surface Water Impacts**

Negligible increases in impermeable surface would result from limited facility development and road improvements. However, no change in the potential for stormwater runoff to reach the All American Canal or the New Coachella Canal would result; runoff would continue to infiltrate into the surrounding sands and soil rather than flow to the canals. Impacts from OHV activities would be marginally greater than Alternative 3 due to a larger area open to OHV use and higher visitor use. Impacts would be less than under Alternative 4 due to less OHV acreage and lower intensity of use. Therefore, impacts to surface waters under this alternative would be negligible. Significant adverse impacts to surface water would not result from implementation of this alternative.

**Groundwater Impacts**

Impacts to groundwater under this alternative would be negligible. Significant adverse impacts to the groundwater would not result from implementation of this alternative.

**Wildlife Guzzler Impacts**

As noted above, wildlife guzzlers are clearly marked. The potential for impacts to the wildlife guzzlers in the Mammoth Management Area and the North Algodones Dune Wilderness Area would be less under this alternative due the application of appropriate management procedures accompanying increased visitor use.

**4.7.2.3  
Alternative 3:  
Natural and  
Cultural  
Resource  
Alternative**

**Surface Water Impacts**

No increase in impermeable surface would result because no facility development and road improvements are proposed under this alternative. No change in the potential for stormwater runoff to reach the All American Canal or the New Coachella Canal would result; runoff would continue to infiltrate into the surrounding sands and soil rather than flow into the canals. Therefore, no impacts to surface water are anticipated from this alternative.

**Groundwater Impacts**

The majority of OHV use under this alternative would occur in the area south of SR-78 (including along Gecko Road) and in the vicinity of I-8.

Further, implementation of this alternative would not result in a substantial change from existing conditions. Significant adverse impacts to groundwater quality are not anticipated and mitigation is not proposed.

**Wildlife Guzzler Impacts**

Under Alternative 3, the wildlife guzzlers would not be affected by OHV use because the areas where the guzzlers are located (Mammoth Management Area and the North Algodones Dunes Wilderness Area) would be closed to OHV use. No adverse impacts to guzzlers would occur under this alternative.

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### 4.7.2.4 Alternative 4: Motorized Recreation Opportunities Alternative

#### Surface Water Impacts

Under this alternative, proposed facility developments and road improvements would increase the area of impermeable surfaces in the Plan Area. However, due to the extremely small scale of these improvements compared to the 213,346-acre ISDRA, as well as the location of the improvements relative to ephemeral surface waters, the potential for substantially increased runoff or degraded water quality is considered negligible. Significant impacts to surface water quality are not anticipated.

#### Groundwater Impacts

Impacts to groundwater under this alternative would be negligible because the increased area open to OHV use and the increased level of intensity are not expected to exceed a threshold beyond which percolation of fuel or oil would be expected to occur to the water table. Therefore impacts, including significant adverse impacts, to groundwater would not occur.

#### Wildlife Guzzler Impacts

The enactment of Alternative 4 would not affect the wildlife guzzlers in the North Algodones Dunes Wilderness Area because that area will remain closed to OHV use under this alternative. The two guzzlers in the Mammoth Management Area are within areas designated open for OHV use under this alternative, but are clearly marked. Typically, OHV users avoid structures and areas of high plant growth. Any substantial disturbance of the guzzler area would be considered an adverse impact.

### 4.7.3 Mitigation Measures

To avoid potential adverse impacts to the two wildlife guzzlers in the Mammoth Management Area, the area in the immediate vicinity of the guzzlers will be closed to OHV use. This mitigation measure is expected to prevent any adverse impact to the wildlife guzzlers in the Mammoth Management Area.

## 4.8 CULTURAL RESOURCES

### 4.8.1 Assumptions and Assessment Guidelines

Direct impacts on cultural resources are typically related to the level of ground disturbance associated with a project. Ground disturbance, whether for facilities improvements or other activities, is the primary factor affecting archaeological sites and sites with Native American heritage values. Indirect impacts are less associated with the intentional changes being produced by the project. These can include such things as changes to or new travel access routes that lead to greater access to an area, thus increasing the potential for looting. Erosion-control measures that alter deposition patterns and lead to greater erosion or sedimentation can also indirectly affect cultural resources.

The following assumptions were made in determining impacts resulting from the Project Alternatives:

- The current cultural resources database for the ISDRA is representative of the range of resources present.
- Ground disturbance that affects cultural resources can cause irreversible damage to these nonrenewable resources.
- Owing to the nature of shifting sands, and particularly their depth, regardless of the level of inventory, some resources may not be identified.
- Greater access to an area through time means more opportunities for unauthorized collection and looting, as well as more ground disturbance.
- Conversely, reduced access over time leads to reduced opportunities for unauthorized collection and looting, and reduced ground disturbance.
- All effects to cultural resources are adverse effects unless otherwise stated.

Employing these assumptions, and what is currently known of the cultural resources of the project area, extrapolations are made below regarding the extent of impact to cultural resources that would result from enactment of each of the project alternatives, including the No-Action Alternative.

### 4.8.2 Impacts

Given the known cultural resources present in the ISDRA, all alternatives have the potential to affect resources that may qualify for the California Register of Historical Resources (CRHR) and the NRHP. The following discussion provides a ranking of the four project alternatives based on their potential for ground disturbance. Under this ranking, the assessment of the relative potential of an alternative to affect cultural resources is based on the premise that the greater the degree of access to OHV use and the greater the area of potential ground disturbance, the greater the potential for effects. Due to **limitations in the existing data**, this approach does not take into consideration resource significance, site type and complexity, or variations in resource densities.

## Environmental Consequences

### 4.8.2.1 Alternative 1

Under Alternative 1, the degree of access and relative area of disturbance, and therefore potential for impacts, would be greater than Alternatives 2 and 3, but less than Alternative 4. Management measures currently in place would continue, such as public educational efforts that stress the importance of not disturbing cultural resources, and therefore some reduced impact to cultural resources would be expected, relative to Alternative 4, below.

### 4.8.2.2 Alternative 2

Alternative 2 would result in a greater area of disturbance than Alternative 3, and, therefore, would have a higher potential for cultural resource impacts. However, Alternative 2 would result in a smaller area of disturbance than Alternatives 1 or 4 (see below) and, therefore, would have a lower potential for cultural resource impacts than these alternatives would.

### 4.8.2.3 Alternative 3

Enactment of Alternative 3, would result in the most restrictive measures being applied to OHV recreational activity in the ISDRA. Therefore, this alternative would have the least potential for ground disturbance, due to the minimal area open to OHV use, compared to the other Project Alternatives and existing conditions. Enactment of this alternative would also restrict access more than any other alternative, and therefore minimize the possibility of unauthorized collection of cultural resources. Therefore, impacts to cultural resources under this alternative would be less than all other alternatives.

### 4.8.2.4 Alternative 4

Enactment of this alternative would open portions of the ISDRA to the highest intensity of use (e.g., the Gecko and Buttercup Management Areas would receive a ROS classification of Urban), and open the widest area to OHV recreational activities, relative to other alternatives. Ground disturbing activities would therefore be more extensive and of higher intensity than any other alternative. In addition, the greater level of access would result in a higher frequency of unauthorized disturbance of cultural resources. Therefore, Alternative 4 would have greater impacts to cultural resources than any of the other alternatives.

### 4.8.3 Mitigation Measures

Potential impacts to cultural resources will be addressed under the 1997 BLM NPA. Supporting the NPA is the State Protocol Agreement between the California Director of the BLM and the State Historic Preservation Officer (SHPO). Under the NPA and State Protocol Agreement, BLM will meet National Historic Preservation Act (NHPA) requirements for addressing effects to historic properties. These include determining the area of potential effect of a given action, performing inventories of the area affected by a proposed action and subjecting any resources encountered to significance evaluation according to the Secretary of the Interior's guidelines, and determining and performing appropriate mitigation if avoidance is not feasible.

## 4.9 TRANSPORTATION AND TRAFFIC

### 4.9.1 Assumptions and Assessment Guidelines

The analysis of potential traffic impact was prepared based on the *Highway Capacity Manual* published by the Transportation Research Board of the National Research Council. In addition, the American State Highway and Transportation Officers' *Geometric Design of Highways and Streets* was considered in determining impact significance.

### 4.9.2 Impacts

Vehicular traffic generated by each alternative is directly proportional to the estimated visits. It is assumed that the average occupancy of vehicles is 3.5 persons per vehicle. Vehicle occupancy for recreational trips is typically higher than that of general traffic. The 3.5 occupancy rate is based on the assumption of three or four occupants in the majority of vehicles and 0.5 percent tour bus use. Table 4.9-1 shows the baseline and projected future annual vehicular traffic for the four project alternatives. Future traffic is projected to the 2012/2013 season, consistent with the assumption that the updated RAMP will be in place at least 10 years. The 2012/2013 traffic is based on the maximum annual growth rates noted previously in Table 4.1-1.

**Table 4.9-1. Project Generated Annual Vehicular Traffic**

PROJECT ALTERNATIVES*	1999/2000 BASELINE		2012/2013	
	VISITS	ANNUAL VEHICLE TRIPS *	VISITS	ANNUAL VEHICLE TRIPS *
Alternative 1	867,753	495,860	2,071,000	1,183,430
Alternative 2	867,753	495,860	1,637,000	935,430
Alternative 3	867,753	495,860	1,488,000	850,290
Alternative 4	867,753	495,860	1,800,000	1,028,570

\* Based on an average vehicle occupancy of 3.5

Annual traffic volume is only a general indicator of traffic impact. The most critical element in highway capacity and LOS is the peak-hour volume (see Section 3.9.2). Based on historical attendance estimates, peak traffic volumes would occur over the six major holiday weekends. Furthermore, for purposes of this analysis, it was assumed that the arrival peak is more critical than the departure peak, that the majority of the arrivals are concentrated in the first 2 days, and that 60 percent arrive on the peak day. Due to the diverse origin of the arriving trips, it is conservative to assume that 20 percent of the peak-day traffic will be concentrated in the peak hour.

As noted previously under Table 3.9-3, the Thanksgiving weekend has historically been the most popular major holiday weekend, with approximately 12 percent of all annual visits. Therefore, the highest volumes of traffic are expected to occur during this period. Potential traffic impacts for each of the alternatives are discussed below, and are based on the worse- case scenario during the Thanksgiving holiday.

## Environmental Consequences

### 4.9.2.1 Alternative 1

As noted above under Table 4.9-1, the highest future (2012/2013 season) annual traffic volumes are projected to occur under Alternative 1. Table 4.9-2 shows the distribution of Alternative 1 peak-hour volumes on major highway segments providing access to the project sites during the Thanksgiving weekend.

**Table 4.9-2. Peak Hour Traffic Distribution and LOS (Alternative 1)**

ACCESS	% DISTRIBUTION	BASELINE				2012/2013			
		HIGHEST ISDRA INBOUND PEAK HOUR	PEAK HOUR INBOUND FOR ISDRA	TOTAL TRAFFIC*	LEVEL OF SERVICE	HIGHEST ISDRA INBOUND PEAK HOUR	PEAK HOUR INBOUND FOR ISDRA	TOTAL TRAFFIC*	LEVEL OF SERVICE
I-8 West	50	3,570	1,790	2,580	C	8,520	4,260	5,550	F
I-8 East	8	3,570	290	1,320	B	8,520	680	2,380	C
SR-78 West	32	3,570	1,140	1,670	E	8,520	2,730	3,590	F
SR-78 East	8	3,570	290	740	C	8,520	680	1,410	D-E
SR-98 West	2	3,570	70	230	B	8,520	170	430	B

\*One-way inbound for I-8, two-way for SR-78 and SR-98

For the highest peak hour on Thanksgiving weekend, SR-78 west of the project site will be operating at LOS E in the baseline year and LOS F in 2012/2013. I-8 west will be operating at LOS F in 2012/2013. LOS E represents a condition near capacity or at capacity and LOS F is the operation condition where capacity is exceeded by demand and a slow moving queue begins to form.

The highest hourly volume of the year is not the criteria for highway design and acceptable LOS. The Association of American State Highway and Transportation Officers (AASHTO) recommends that the 30th highest hourly volume of the year be used as the design capacity of highways. However, for highways with unusual or highly seasonal fluctuation in traffic flow, the 30th hourly volume criterion may not be appropriate. The AASHTO *Geometric Design of Highways and Streets* states that economy dictates a design that results in somewhat less satisfactory traffic operation during seasonal peaks than on rural roads with normal fluctuation, and the public generally will accept such conditions. AASHTO further recommends that it may be desirable to choose an hourly volume for design, which is about 50 percent of the volumes expected to occur during a very few maximum hours of the design year.

Based on the criteria of designing for 50 percent of the highest hourly volume, all segments of highways providing access to the project sites will be operating at LOS D or better. Further, the capacities of I-8 exit ramps will not be exceeded during the design peak hour assuming that the in-bound traffic will be distributed equally to the exits at Grays Well Road and Ogilby Road. Therefore, in the context of normal highway design practice, adverse traffic impacts during a few hours per year would not be considered significant. Adverse (though less than significant) impacts associated with future peak-hour project traffic during major holiday weekends would be mitigated

through implementation of a Traffic Control Plan (TCP), as described below under Section 4.9.3.

**4.9.2.2  
Alternative 2**

The high estimate for future visitation under Alternative 2 is approximately 20 percent less than the high range estimate under Alternative 1. Because traffic volumes are directly proportionate to visitation, future traffic trips to ISDRA under Alternative 2 would be approximately 20 percent less than under Alternative 1. Therefore, traffic impacts under this alternative would be less than under Alternative 1, and would not be significant. Similar to Alternative 1, potential adverse impacts associated with peak-hour holiday traffic will be mitigated through implementation of a TCP.

**4.9.2.3  
Alternative 3**

The high estimate for future visitation under Alternative 3 is approximately 30 percent less than the high range estimate under Alternative 1 and about 10 percent less than under Alternative 2. Because traffic volumes are directly proportionate to visitation, the future traffic trips to ISDRA under Alternative 3 would be less than under Alternatives 1 and 2. Adverse impacts during the peak hour of major holiday weekends would be less under this alternative than under Alternatives 1 and 2, and would not be significant. Peak-hour impacts during major holiday weekends would be mitigated through implementation of a TCP.

**4.9.2.4  
Alternative 4**

The high estimate for future visitation under Alternative 4 is approximately 15 percent less than the high range estimate under Alternative 1. Because traffic volumes are directly proportionate to visitation, future traffic trips to ISDRA under Alternative 4 would be less than under Alternative 1. Therefore, traffic impacts would not be significant. Future traffic volumes under Alternative 4 would be greater than under Alternatives 2 and 3 by approximately 10 and 20 percent, respectively. Therefore, impacts resulting from traffic under this alternative would also be greater than under Alternatives 1 and 2. Similar to Alternative 1, 2 and 3, adverse impacts during the peak hour of major holiday weekends would be mitigated through implementation of a TCP.

**4.9.3  
Mitigation**

The traffic impacts caused by the few hours of exceptionally high hourly volumes could be mitigated by developing a Special TCP. The TCP should include advance portable changeable message signs used on the freeway and local roads to provide motorist information and direct traffic to alternative exits. The TCP should include dispatching Rangers and California Highway Patrol officers to freeway exits and intersections along the access routes to direct traffic and provide quick response to traffic incidents.

## 4.10 NOISE

Management actions for the entire ISDRA Plan Area (see Table 2.1) that would have the potential to result in increased noise exposure include:

- Recreation – the level and locations of OHV activities within the management planning areas would determine the degree to which offsite locations or campgrounds may be exposed to noise generated from such activities.
- Transportation/Traffic - grading and improvement of roads within the areas potentially would result in increases in vehicular movements in some areas that would, in turn, cause elevated ambient noise levels.
- Access and Facilities – development of new facilities in nondeveloped areas would result in heightened human visitation and localized increases in ambient noise levels in such areas.

On the other hand, many management actions throughout the Plan Area could effectively control noise generated from activities in the management areas. Such actions include:

- ROS classifications would eliminate or limit OHV activities within the management areas.
- The adaptive management plan for biological resources would implement adaptive actions based on information gathered through scientific monitoring. Over time, the adaptive management actions would improve the environmental conditions for biological resources, including exposure to noise, where such measures are deemed necessary.
- A number of public safety measures could have curbing effects on noise generated within the management areas. Such measures include law enforcement, posting of speed limits, and closure of certain areas from sundown to sunup.

### 4.10.1 Assumptions and Assessment Guidelines

The assessment of impacts assumes the implementation of measures required by federal, state, and local laws and regulations. Implementation of a project alternative would normally have an adverse noise impact if it would:

- Substantially increase noise levels above the existing ambient noise levels at sensitive receptor sites (e.g., residences, schools, churches, hospitals)
- Exceed local noise standards at sensitive receptor sites

Impacts are delineated as short-term construction noise or long-term operational noise.

**4.10.2  
Impacts**

**4.10.2.1  
Alternative 1**

Under Alternative 1, the ISDRA would continue to be managed according to existing and approved management plans prescribed by the 1987 RAMP. All portions of the 1987 RAMP were not fully implemented and may be implemented in the future. This may include facility development activities that would result in short-term construction noise. However, construction noise levels would be temporary and would not impact any noise-sensitive receptors. Significant noise impacts would not result.

Under Alternative 1, recreational usage (primarily OHV and camping) is expected to increase relative to baseline conditions. Consequently, background noise levels are expected to increase in usage areas. However, the increases in noise levels would not be significant because the ISDRA is remote; and there are no sensitive receptors in the vicinity. Although there are no limitations on OHV activity areas under Alternative 1, significant OHV noise impacts are not anticipated to occur.

Title 9, Chapter 2, Section 90702.00 of the Imperial County Ordinance defines noise level limits based on land use zones. The most stringent noise level criterion applied by the county is a nighttime limit of 45 dBA hourly average noise level ( $L_{eq}$ ) for single-family residences. The County's General Plan establishes a 60 dB Community Noise Equivalent Level (CNEL) standard for single-family residential areas. CNEL is a 24-hour weighted average noise level with more weight given to noise levels occurring in the evening and nighttime periods. The CNEL standard of the county is less stringent than the 45 dBA limit.

As mentioned in the Affected Environment (Section 3.10), the nearest sensitive receptors are approximately 7 miles west of the Plan Area. The reference noise level for a single OHV at 50 feet is 92 dBA. Considering only distance attenuation, the noise level at 7 miles from a vehicle would be 35 dBA. This is a worst-case estimation because other factors such as blocking effects of intervening terrain and atmospheric absorption would also reduce noise levels further. Nevertheless, assuming a 35-dBA noise level from a single OHV, it would take 10 OHVs to operate continuously for 1 full hour at the same location to generate an offsite noise level of 45 dBA. Such a scenario is not likely to occur; therefore, OHV noise exposure would not exceed the Imperial County criteria.

**4.10.2.2  
Alternative 2**

Facility development under Alternative 2 would include grading of entry roads and construction of interpretive facilities, traffic control areas, ranger stations, parking lots, and pit toilets in some of the management areas. Therefore, construction noise exposure under this alternative would be greater than Alternative 1, which involves minimal or no facility development. However, all construction activities would be temporary and would not affect any noise-sensitive receptors. No significant construction noise impacts are anticipated.

Under Alternative 2, the North Algodones Dunes area would be classified as Semi-Primitive Non-Motorized, meaning no OHV activities would be allowed

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in this area. The ROS classification for Mammoth, Adaptive, and Buffer Zone Management areas would be Semi-Primitive Motorized, which limits OHV activities. Therefore, OHV activities would primarily occur in areas south of SR 78. Additionally, Oldsmobile Hill and Competition Hill would be closed from sundown to sun up. OHV activities are not anticipated to cause increased noise levels. Furthermore, no noise-sensitive receptors are located within the project vicinity. OHV activities associated with Alternative 2 would comply with the Imperial County noise standards. Significant OHV noise impacts would not result from the implementation of Alternative 2.

### **4.10.2.3 Alternative 3**

Under Alternative 3, facility developments would include grading of some entry roads and construction of an interpretive facility, traffic control areas, a parking lot, and pit toilets in some of the management areas. Because facility development activity would be less intense, construction noise exposure under this alternative would be lower than under Alternative 2. All construction activities would be temporary and would not be in the vicinity of any noise-sensitive receptors. Therefore, no significant construction noise impacts are anticipated.

Under Alternative 3, the Mammoth, North Algodones, Adaptive, and Buffer Zone Management Areas would be classified as Semi-Primitive Non-Motorized, meaning no OHV activities would be allowed in these areas. The ROS classification for Mammoth, Adaptive, and Buffer Zone Management areas would be Semi-Primitive Motorized, which greatly limits OHV activities. Therefore, OHV activities would be confined to less than half of the overall management area. Additionally, Oldsmobile Hill and Competition Hill would be closed from sundown to sun up. Overall ambient noise levels are not expected to increase as a result of OHV activities. Furthermore, no noise-sensitive receptors are located within the project vicinity. OHV activities associated with Alternative 3 would comply with the Imperial County noise standards. Significant OHV noise impacts would not result from the implementation of Alternative 3.

### **4.10.2.4 Alternative 4**

Under Alternative 4, short-term construction noise exposure would be similar to Alternative 2, which would provide the same level of facility development. All construction activities would be temporary and would not be in the vicinity of any noise-sensitive receptors. Therefore, no significant construction noise impacts are anticipated.

Under Alternative 4, the North Algodones area would be classified as Semi-Primitive Non-Motorized and only the Buffer Zone Management Area would have a Semi-Primitive Motorized ROS classification. Therefore, implementation of this alternative would result in increased OHV activity throughout the ISDRA Planning Area. However, this activity would be more dispersed due to the increase in acreage open to OHV use. Further, no sensitive noise receptors are located within the project vicinity. OHV activities associated with Alternative 4 would comply with all applicable Imperial County noise standards. Adverse noise impacts are not anticipated from implementation of this alternative.

**4.10.3  
Mitigation  
Measures**

Significant adverse noise impacts are not anticipated under any of the project alternatives, including Alternative 1. No mitigation measures are required.

## 4.11 AIR QUALITY

The air quality analysis presented in this section addresses anticipated air quality impacts resulting from implementation of the alternatives presented in Chapter 2 of this DEIS.

### 4.11.1 Assumptions and Assessment Guidelines

The analysis addresses potential local and regional effects from motorized OHV operational sources and on-highway vehicular travel that can be expected as a result of project implementation. A discussion of the methodology used for estimating on-highway vehicle and motorized OHV emissions is provided below.

#### 4.11.1.1 Vehicle Types

Motorized vehicles are the primary source of emissions associated with the proposed four alternative resource management plans. Typically, recreational park and open space land uses do not directly emit significant amount of air pollutants. Vehicular trips to and from these land uses, however, do emit pollutants. Further, an increase in the number of new daily vehicle trips will typically mean an increase in recreational motorized OHV activities at ISDRA.

On-road emissions result from automobile, trucks, and recreational vehicles that travel to and from each site, and are proportional to the distance of vehicle travel. Emissions were calculated based on assumed average round-trip travel distances and EMFAC7G emission factors (CARB, 1997). The emission factors were based on average vehicle speeds, ambient temperature, vehicle weight classification, and engine type. The manufacture of motor vehicles (including OHV models) that do not meet federal and California CAA requirements to reduce tailpipe emissions could be discontinued. The emission estimates do not account for potential emission reductions that would occur if vehicles are converted to clean fuels or if electric vehicles are substituted for gasoline- or diesel-fueled vehicles.

Off-highway emissions result from the operation of mobilized OHVs at the site. Off-road emissions are proportional to the length of activity. All OHV activities can be expected to vary hour-by-hour in their activity. Operational profiles are not available for these OHV activity over the course of an entire day, hour-by-hour. The estimated profiles are based on the concept of peak OHV activity. The peak hour(s) is defined as the hour(s) of the day at which maximum activity occurs. There can be one or more such peaks in a 24-hour period. For the purpose of this air quality analysis, the peak OHV activity levels would occur when an estimated 3.5 person per occupant's on-road vehicle are operating their OHV at the same hour. (Note: the average occupancy rate of on-road vehicle is 3.5 persons per vehicle.) Emissions were calculated by multiplying off-road emission factors by the estimated number of OHVs in operation, and the average operating hour of each piece of OHV. It was assumed that each OHV would operate 6 hours per day. Off-highway emission factors recently published by the CARB were used to calculate emissions.

**4.11.1.2  
Motorized  
Vehicle  
Generated Dust**

The principal pollutant of concern emitted by motorized OHV is PM<sub>10</sub> because of the relatively large quantity of PM<sub>10</sub> dust emissions disturbed by OHVs operating over unpaved surface, and the relatively low ambient air quality standard for PM<sub>10</sub>. Soil disturbance activities, such as motorized vehicle travel on the sand dunes, can represent substantial sources of fugitive dust depending on the level of activity, the specific vehicle activities being conducted, and prevailing meteorological conditions. It should be noted that most of the PM<sub>10</sub> emissions are from wind erosions, which are a major source of PM<sub>10</sub> emissions throughout the ISDRA. In addition, the newly adopted PM<sub>2.5</sub> standard is not yet applicable.

PM<sub>10</sub> dust emissions can adversely affect sensitive receptors (i.e., people who are more susceptible to the adverse impact of air pollutants). These include the elderly, young children, and those individuals suffering from respiratory disorders. Although most dust emissions are readily filtered by human breathing passages, tiny particles can easily bypass this natural filtering system and lodge deep in the lungs. Large-diameter dust, which settles out on nearby foliage and other surfaces, is more a soiling nuisance than a potential health impact. Areas near the OHV sites would be the most susceptible to this nuisance from OHV activities.

Fugitive dust emissions would also be generated from on-highway vehicle travel over paved road that lead to the ISDRA. These fugitive dust emissions were calculated using the methodology in the *CEQA Air Quality Handbook* (SCAQMD, 1993) and *AP-42 Volume I: Stationary Point and Area Sources* (EPA, 1995). Fugitive dust emission calculations are presented in Appendix C, and a summary of emissions is presented in the discussion of alternatives in this analysis.

**4.11.1.3  
Evaluation  
Criteria**

To determine the severity of impacts, a set of criteria is established for peak daily and annual average concentrations for each pollutant. Emissions below these levels are assumed to present no threat to ambient air quality. An alternative that would generate emissions in excess of these limits would result in adverse impacts to air quality in the region.

Although the Imperial County Air Pollution Control District (ICAPCD) has not developed specific guidelines for evaluating air quality impacts for proposed actions undergoing environmental review, the ICAPCD has established peak daily air pollutant emission limits that, when exceeded, indicate that a source could have an impact on ambient air quality. These emission threshold levels are shown in Table 4.11-1.

EPA sets *de minimis* conformity thresholds, and they refer to the maximum allowable increase in direct and indirect emissions between each projected year and the baseline year for each criteria pollutant in nonattainment and maintenance areas (40 CFR, Section 51.853 [b]). Emissions below these levels are presumed to conform to the SIP within the meaning of the General Conformity Rule. If the total direct and indirect emissions from a federal action would not exceed the thresholds for criteria pollutants in any year, the

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federal action is deemed *de minimis* and exempted from conformity requirements. If the total emissions are equal or greater than the *de minimis* levels for the pollutant in any year, a formal conformity determination is required for that pollutant. EPA *de minimis* levels are provided in Table 4.11-1.

**Table 4.11-1 Pollutant Emission Criteria**

<b>CRITERIA POLLUTANT</b>	<b>ICAPCD CRITERIA (POUNDS PER DAY)</b>	<b>CLEAN AIR ACT DE MINIMIS LEVELS (TONS/YEAR)</b>
CO	550	100
NO <sub>x</sub>	137	100
ROG	137	50
SO <sub>x</sub>	137	100
PM <sub>10</sub>	137	100

Source: ICAPCD, 1993; EPA, 1993.

Note: California defines ROG as VOC (volatile organic compounds)

### 4.11.1.4 Future Baseline

Impacts of the alternatives are assessed by comparison with a future baseline scenario that serves as a benchmark for comparison. This method is used to account for impacts attributed to regional growth, independent of the individual resource management plan alternatives. Development assumptions outside the ISDRA are the same for both the future baseline and all project alternatives. The assumptions are based on current growth forecasts for Imperial County and the SSAB region.

The future baseline is defined as the scenario year 2012-2013 with no changes to interim management, which is the same as the No Action Alternative under Alternative 4. Under the Future baseline, existing attendance for the 1999-2000 season at ISDRA is assumed to increase by 5 percent annually.

Relative to air quality, a notable major emission concern is the PM<sub>10</sub> fugitive dust emissions, both natural and mechanical. Wind-blown dust emission generates approximately 173.35 tons per day (or 346,000 pounds per day) in Imperial County during the year 2000. Entrained dust emission from vehicles on paved and unpaved surfaces generates approximately 3.67 and 38.92 tons per day, respectively, in Imperial County during the year 2000. Any additional construction and off-road recreational activities occurring in the present and near future would increase the PM<sub>10</sub> emission beyond these already significant levels.

Regional air pollutant emissions projected under the future baseline (2012-2013) associated with motor vehicle and OHV operations are shown in Table 4.11-2. A comparison of the future baseline with the existing condition (1999-2000) is also provided.

**Table 4.11-2 Estimated Annual Air Emissions Associated with the Future Baseline**

EMISSION SOURCE	EMISSIONS (TONS/YEAR)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Future Baseline					
On-road Motor Vehicles	149.66	47.42	52.41	1.49	52.94
Off-highway Vehicles	1,086.73	428.57	64.29	9.18	2,568.24
Future Baseline Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Baseline Condition (1999-2000)	599.25	230.21	56.38	5.14	1,263.64

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

Emission estimates for peak daily vehicles were prepared using the EMFAC7G vehicle emission rate model. The estimated number of motor vehicles corresponds to projected traffic volumes for major holiday weekends (refer to Section 4.9). The number of OHVs is proportionate to the total visits provided in Table 4.1-1. Table 4.11-3 summarizes the peak daily vehicle and OHV emissions analyses for year 2012-2013.

**4.11.2  
Impacts**

The following discussion addresses potential air quality impacts from both a peak daily and annual average perspective for each alternative. Peak daily impacts are related to emissions produced during the six major holiday weekends, and typically involve an increase in dust (suspended particulates) as well as OHV and motor vehicle exhaust. Annual emission impacts are related to emissions produced by OHV activities and vehicle trips over a 12-month period.

**4.11.2.1  
Alternative 1**

Annual air pollutant emission estimates for Alternative 1 are provided in Table 4.11-4, along with a comparison to the future baseline. Because annual attendance at the ISDRA is anticipated to increase under this alternative, the annual emission results show that estimated emission levels in 2012-2013 would increase over the emission levels for the future baseline. Therefore, the total net emissions associated with this alternative would exceed the *de minimis* threshold levels. The impacts on air quality would be significant under Alternative 1 scenario.

## Environmental Consequences

**Table 4.11-3 Estimated Peak Daily Air Emissions Associated with the Future Baseline**

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Halloween					
On-road Motor Vehicles	5,658.71	1,793.16	1,981.84	56.27	2,001.80
Off-highway Vehicles	11,413.89	4,501.25	675.19	96.46	11,150.37
Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Thanksgiving					
On-road Motor Vehicles	9,699.12	3,073.50	3,396.90	96.44	3,431.11
Off-highway Vehicles	19,563.57	7,715.21	1,157.28	165.33	19,111.90
Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
New Year					
On-road Motor Vehicles	6,465.91	2,048.95	2,264.54	64.29	2,287.34
Off-highway Vehicles	13,042.03	5,143.33	771.50	110.21	12,740.92
Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Martin Luther King's Birthday					
On-road Motor Vehicles	4,040.41	1,280.34	1,415.06	40.17	1,429.31
Off-highway Vehicles	8,149.68	3,213.96	482.09	68.87	7,961.53
Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
President's Day					
On-road Motor Vehicles	8,080.81	2,560.69	2,830.12	80.35	2,858.62
Off-highway Vehicles	16,299.36	6,427.92	964.19	137.74	15,923.05
Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Easter					
On-road Motor Vehicles	6,465.91	2,048.95	2,264.54	64.29	2,287.34
Off-highway Vehicles	13,042.03	5,143.33	771.50	110.21	12,740.92
Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26

Note: Estimated PM10 emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

**Table 4.11-4 Estimated Annual Air Emissions Associated with Alternative 1**

EMISSION SOURCE	EMISSIONS (TONS/YEAR)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Alternative 1					
On-road Motor Vehicles	172.19	54.57	60.31	1.71	60.91
Off-Highway Vehicles	1,250.35	273.52	41.03	10.57	2,954.91
Alternative 1 Total (2012-2013)	1,422.54	322.51	95.18	7.40	120.67
Future Baseline Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Total Net Emission	<b>186.15</b>	<b>71.66</b>	<b>17.57</b>	<b>1.61</b>	<b>394.64</b>
<i>De Minimis</i> Thresholds	100.00	100.00	50.00	100.00	100.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.  
 Source: CH2M HILL, 2002

Emission estimates for peak daily vehicles were prepared using the EMFAC7G vehicle emission rate model. The estimated number of motor vehicles corresponds to projected traffic volumes for major holiday weekends (refer to Section 4.9). The number of OHVs is proportionate to the total visits provided in Table 4.1-1. Emission estimates for Alternative 1 and a comparison to the Future baseline are presented in Table 4.11-5.

As shown in Table 4.11-5, the peak daily emissions for CO, NO<sub>x</sub> and PM<sub>10</sub> under this alternative would exceed the ICAPCD daily emission threshold limits.

Because Alternative 1 would result in an increase in peak daily emissions for CO, NO<sub>x</sub> and PM<sub>10</sub>, significant air quality impacts would result from implementation of this alternative.

**4.11.2.2  
Alternative 2**

Annual air pollutant emission estimates compared with the future baseline for Alternative 2 are provided in Table 4.11-6. The annual emission results show that emissions in 2012-2013 would be lower under Alternative 2 than under the future baseline because of an anticipated decrease in visitor use under this alternative. The net change in annual emissions that would result from implementation of this alternative would be below the federal *de minimis* thresholds.

Emission estimates for peak daily vehicles were prepared using the EMFAC7G vehicle emission rate model. The estimated number of motor vehicles corresponds to projected traffic volumes for major holiday weekends (refer to Section 4.9). The number of OHVs is proportionate to the total visits provided in Table 4.1-1. Emission estimates for the Alternative 2 and a comparison to the Future Baseline are presented in the Table 4.11-7.

As shown in Table 4.11-7, the net peak daily emissions for Alternative 2 would be below the criteria established by ICAPCD. Therefore, no adverse air quality impact is expected to result under this alternative during major holiday weekends.

Environmental Consequences

Table 4.11-5 Estimated Peak Daily Air Emissions Associated with Alternative 1

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Halloween					
On-road Motor Vehicles	6,508.33	2,062.39	2,279.40	64.71	2,302.35
Off-highway Vehicles	13,127.60	5,177.08	776.56	110.94	12,824.52
Total	19,635.94	7,239.47	3,055.96	175.65	15,126.88
Future Baseline Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Net Emissions	<b>2,563.34</b>	<b>945.06</b>	<b>398.94</b>	<b>22.93</b>	<b>1,974.71</b>
Thanksgiving					
On-road Motor Vehicles	11,158.45	3,535.94	3,907.99	110.95	3,947.35
Off-highway Vehicles	22,507.11	8,876.04	1,331.41	190.20	21,987.48
Total	33,665.56	12,411.99	5,239.40	301.15	25,934.83
Future Baseline Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
Net Emissions	<b>4,402.87</b>	<b>1,623.28</b>	<b>685.22</b>	<b>39.38</b>	<b>3,391.83</b>
New Year					
On-road Motor Vehicles	7,437.31	2,356.77	2,604.75	73.95	2,630.98
Off-highway Vehicles	15,001.39	5,916.04	887.41	126.77	14,655.05
Total	22,438.70	8,272.81	3,492.15	200.72	17,286.03
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	<b>2,930.77</b>	<b>1,080.53</b>	<b>456.11</b>	<b>26.21</b>	<b>2,257.77</b>
Martin Luther King's Birthday					
On-road Motor Vehicles	4,650.12	1,473.55	1,628.60	46.24	1,645.00
Off-highway Vehicles	9,379.50	3,698.96	554.84	79.26	9,162.95
Total	14,029.62	5,172.51	2,183.44	125.50	10,807.95
Future Baseline Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
Net Emissions	<b>1,839.53</b>	<b>678.21</b>	<b>286.29</b>	<b>16.45</b>	<b>1,417.11</b>
President's Day					
On-road Motor Vehicles	9,300.50	2,947.19	3,257.29	92.48	3,290.09
Off-highway Vehicles	18,759.53	7,398.13	1,109.72	158.53	18,326.42
Total	28,060.03	10,345.31	4,367.01	251.01	21,616.52
Future Baseline Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Net Emissions	<b>3,679.86</b>	<b>1,356.71</b>	<b>572.70</b>	<b>32.92</b>	<b>2,834.84</b>
Easter					

**Table 4.11-5 Estimated Peak Daily Air Emissions Associated with Alternative 1**

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
On-road Motor Vehicles	7,437.31	2,356.77	2,604.75	73.95	2,630.98
Off-highway Vehicles	15,001.39	5,916.04	887.41	126.77	14,655.05
Total	22,438.70	8,272.81	3,492.15	200.72	17,286.03
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	2,930.77	1,080.53	456.11	26.21	2,257.77
<b>ICAPCD Criteria</b>	550.00	137.00	137.00	137.00	137.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2001

**Table 4.11-6 Estimated Annual Air Emissions Associated with Alternative 2**

EMISSION SOURCE	EMISSIONS (TONS/YEAR)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Alternative 2					
On-road Motor Vehicles	136.11	43.13	47.67	1.35	48.15
Off-highway Vehicles	988.33	389.76	58.46	8.35	2,335.68
Alternative 2 Total (2012-2013)	1,124.43	432.89	106.13	9.71	2,383.83
Future Baseline Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Total Net Emission	<b>- 111.96</b>	<b>- 43.11</b>	<b>- 10.57</b>	<b>- 0.96</b>	<b>- 237.36</b>
<i>De Minimis</i> Thresholds	100.00	100.00	50.00	100.00	100.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2001

**4.11.2.3  
Alternative 3**

Annual air pollutant emission estimates compared with the future baseline are provided in Table 4.11-8. The annual emission results show that emissions in 2012-2013 would be lower under Alternative 3 than under the future baseline because of an anticipated decrease in visitor use under this alternative. This decrease in annual emissions resulting from implementation of this alternative would be less than under the Alternative 2, and would be below federal *de minimis* thresholds.

Emission estimates for peak daily vehicles were prepared using the EMFAC7G vehicle emission rate model. The estimated number of motor vehicles corresponds to projected traffic volumes for major holiday weekends (refer to Section 4.9). The number of OHVs is proportionate to the total visits provided in Table 4.1-1. Emission estimates for Alternative 3 and a comparison to the Future baseline are presented in the Table 4.11-9.

As shown in Table 4.11-9, the net peak daily emissions for the Alternative 3 would not exceed the criteria established by ICAPCD. Therefore, no adverse air quality impact is expected under this alternative during major holiday weekends. These impacts would be less than those anticipated under Alternative 2.

## Environmental Consequences

**Table 4.11-7 Estimated Peak Daily Air Emissions Associated with the Alternative 2**

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Halloween					
On-road Motor Vehicles	4,616.60	1,462.93	1,616.86	45.90	1,633.14
Off-highway Vehicles	9,311.88	3,672.29	550.84	78.69	9,096.90
Total	13,928.48	5,135.22	2,167.70	124.60	10,730.04
Future Baseline Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Net Emissions	<b>-3,144.12</b>	<b>-1,159.19</b>	<b>-489.32</b>	<b>-28.12</b>	<b>-2,422.13</b>
Thanksgiving					
On-road Motor Vehicles	7,912.40	2,507.32	2,771.14	78.67	2,799.05
Off-highway Vehicles	15,959.68	6,293.96	944.09	134.87	15,591.21
Total	23,872.08	8,801.28	3,715.23	213.55	18,390.26
Future Baseline Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
Net Emissions	<b>-5,390.61</b>	<b>-1,987.43</b>	<b>-838.95</b>	<b>-48.22</b>	<b>-4,152.74</b>
New Year					
On-road Motor Vehicles	5,274.24	1,671.33	1,847.18	52.44	1,865.79
Off-highway Vehicles	10,638.38	4,195.42	629.31	89.90	10,392.77
Total	15,912.62	5,866.74	2,476.49	142.34	12,258.55
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	<b>-3,595.31</b>	<b>-1,325.54</b>	<b>-559.55</b>	<b>-32.17</b>	<b>-2,769.71</b>
Martin Luther King's Birthday					
On-road Motor Vehicles	3,296.07	1,044.47	1,154.37	32.77	1,166.00
Off-highway Vehicles	6,648.33	2,621.88	393.28	56.18	6,494.83
Total	9,944.40	3,666.35	1,547.66	88.96	7,660.83
Future Baseline Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
Net Emissions	<b>-2,245.69</b>	<b>-827.95</b>	<b>-349.49</b>	<b>-20.09</b>	<b>-1,730.01</b>
President's Day					
On-road Motor Vehicles	6,594.50	2,089.70	2,309.57	65.57	2,332.83
Off-highway Vehicles	13,301.41	5,245.63	786.84	112.41	12,994.31
Total	19,895.91	7,335.32	3,096.42	177.98	15,327.15
Future Baseline Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Net Emissions	<b>-4,484.26</b>	<b>-1,653.28</b>	<b>-697.89</b>	<b>-40.11</b>	<b>-3,454.53</b>
Easter					
On-road Motor Vehicles	5,274.24	1,671.33	1,847.18	52.44	1,865.79
Off-highway Vehicles	10,638.38	4,195.42	629.31	89.90	10,392.77
Total	15,912.62	5,866.74	2,476.49	142.34	12,258.55

**Table 4.11-7 Estimated Peak Daily Air Emissions Associated with the Alternative 2**

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	<b>-3,595.31</b>	<b>-1,325.54</b>	<b>-559.55</b>	<b>-32.17</b>	<b>-2,769.71</b>
ICAPCD Criteria	<b>550.00</b>	<b>137.00</b>	<b>137.00</b>	<b>137.00</b>	<b>137.00</b>

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

**Table 4.11-8 Estimated Annual Air Emissions Associated with Alternative 3**

EMISSION SOURCE	EMISSIONS (TONS/YEAR)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Alternative 3					
On-road Motor Vehicles	123.72	39.20	43.33	1.23	43.77
Off-highway Vehicles	898.37	354.29	53.14	7.59	2,123.09
Alternative 3 Total (2012-2013)	1,022.09	393.49	96.47	8.82	2,166.86
Future Baseline Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Total Net Emission	<b>-214.30</b>	<b>-82.51</b>	<b>-20.23</b>	<b>-1.85</b>	<b>-454.33</b>
<i>De Minimis</i> Thresholds	100.00	100.00	50.00	100.00	100.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

**4.11.2.4  
Alternative 4**

Annual air pollutant emission estimates for the Alternative 4 are provided in Table 4.11-10, along with a comparison to the future baseline. Because annual attendance at the ISDRA is not anticipated to change under this alternative, the annual emission results show that emissions in 2012-2013 would be the same as under the Future baseline. Therefore, the total net emission associated with this alternative would be zero, and would not exceed the federal *de minimis* thresholds.

Emission estimates for peak daily vehicles were prepared using the EMFAC7G vehicle emission rate model. The estimated number of motor vehicles corresponds to projected traffic volumes for major holiday weekends (refer to Section 4.9). The number of OHVs is proportionate to the total visits provided in Table 4.1-1. Emission estimates for Alternative 4 and a comparison to the Future baseline are presented in the Table 4.11-11.

As shown in Table 4.11-11, the net peak daily emissions for Alternative 4 would result in the same regional emissions impacts as the Future baseline. Therefore, the estimated net emissions would be zero, and would not exceed the ICAPCD daily emission threshold limits. The air quality impacts would be somewhat less than those anticipated under Alternative 1, and greater than those under the Alternatives 2 and 3.

## Environmental Consequences

**Table 4.11-9 Estimated Peak Daily Air Emissions Associated with Alternative 3**

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Halloween					
On-road Motor Vehicles	4,677.10	1,482.10	1,638.05	46.51	1,654.54
Off-highway Vehicles	9,433.91	3,720.42	558.06	79.72	9,216.11
Total	14,111.01	5,202.52	2,196.11	126.23	10,870.65
Future Baseline Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Net Emissions	<b>-2,961.59</b>	<b>-1,091.89</b>	<b>-460.91</b>	<b>-26.49</b>	<b>-2,281.52</b>
Thanksgiving					
On-road Motor Vehicles	8,016.12	2,540.19	2,807.46	79.71	2,835.74
Off-highway Vehicles	16,168.88	6,376.46	956.47	136.64	15,795.58
Total	24,185.00	8,916.64	3,763.93	216.34	18,631.32
Future Baseline Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
Net Emissions	<b>-5,077.69</b>	<b>-1,872.07</b>	<b>-790.25</b>	<b>-45.43</b>	<b>-3,911.68</b>
New Year					
On-road Motor Vehicles	5,346.26	1,694.15	1,872.41	53.16	1,891.26
Off-highway Vehicles	10,783.65	4,252.71	637.91	91.13	10,534.69
Total	16,129.92	5,946.86	2,510.31	144.29	12,425.95
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	<b>-3,378.01</b>	<b>-1,245.42</b>	<b>-525.73</b>	<b>-30.22</b>	<b>-2,602.31</b>
Martin Luther King's Birthday					
On-road Motor Vehicles	3,339.02	1,058.09	1,169.42	33.20	1,181.19
Off-highway Vehicles	6,734.96	2,656.04	398.41	56.92	6,579.47
Total	10,073.99	3,714.13	1,567.82	90.12	7,760.67
Future Baseline Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
Net Emissions	<b>-2,116.10</b>	<b>-780.17</b>	<b>-329.33</b>	<b>-18.93</b>	<b>-1,630.17</b>
President's Day					
On-road Motor Vehicles	6,681.19	2,117.17	2,339.94	66.43	2,363.50
Off-highway Vehicles	13,476.26	5,314.58	797.19	113.88	13,165.13
Total	20,157.46	7,431.75	3,137.12	180.32	15,528.64
Future Baseline Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Net Emissions	<b>-4,222.71</b>	<b>-1,556.85</b>	<b>-657.19</b>	<b>-37.77</b>	<b>-3,253.04</b>
Easter					
On-road Motor Vehicles	5,346.26	1,694.15	1,872.41	53.16	1,891.26
Off-highway Vehicles	10,783.65	4,252.71	637.91	91.13	10,534.69
Total	16,129.92	5,946.86	2,510.31	144.29	12,425.95
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	<b>-3,378.01</b>	<b>-1,245.42</b>	<b>-525.73</b>	<b>-30.22</b>	<b>-2,602.31</b>
<b>ICAPCD Criteria</b>	<b>550.00</b>	<b>137.00</b>	<b>137.00</b>	<b>137.00</b>	<b>137.00</b>

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

**Table 4.11-10 Estimated Annual Air Emissions Associated with Alternative 4**

EMISSION SOURCE	EMISSIONS (TONS/YEAR)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Alternative 4					
On-road Motor Vehicles	149.66	47.42	52.41	1.49	52.94
Off-highway Vehicles	1,086.73	428.57	64.29	9.18	2,568.24
Alternative 4 Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Future Baseline Total (2012-2013)	1,236.39	476.00	116.70	10.67	2,621.19
Total Net Emission	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<i>De Minimis</i> Thresholds	100.00	100.00	50.00	100.00	100.00

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.  
 Source: CH2M HILL, 2002

**4.11.2.5  
 Conformity  
 Statement**

The 1990 amendments to the federal CAA require federal agencies to ensure that their actions conform to the applicable SIP. The SIP is a plan that provides for implementation, maintenance, and enforcement of the NAAQS, and it includes emission limitations and control measures. Conformity to a SIP, as defined in the CAA, means conforming to the purposes of the SIP to reduce the severity and number of violations to the NAAQS and achieve timely attainment of such standards.

Pursuant to Section 176(c) of the Clean Air Act, as amended by the 1990 amendments, and the General Conformity Rule at 40 CFR Parts 51 and 93, the air quality analysis establishes that the emissions associated with the proposed project are below the *de minimis* levels and are not regionally significant because they do not exceed 10 percent of the total emission inventory for any criteria pollutants in the SSAB. If the difference between emissions of criteria pollutants associated with Alternative 2 and those of Alternative 1 would be below specified the *de minimis* levels and Alternative 2 emissions would not be regionally significant (i.e., greater than 10 percent of the emissions budget of the Air Basin), then no further evaluation is needed for the pollutant in any year. If the net emissions would be equal to or greater than the *de minimis* levels for the pollutant in any year, a formal Conformity Determination is required for that pollutant. For example, if Alternative 1 becomes the preferred action, then the net emissions under Alternative 1 would exceed *de minimis* levels for CO, NO<sub>x</sub> and PM<sub>10</sub>. Implementation of Alternative 1 may adversely impact the attainment of the SIP.

Implementation of the Alternatives 2, 3, and 4 would not adversely affect the attainment of the SIP. Consequently, Alternative 2 for these alternatives is exempt from the conformity determination requirement of the General Conformity Rule.

## Environmental Consequences

**Table 4.11-11 Estimated Peak Daily Air Emissions Associated with Alternative 4**

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Halloween					
On-road Motor Vehicles	5,658.71	1,793.16	1,981.84	56.27	2,001.80
Off-highway Vehicles	11,413.89	4,501.25	675.19	96.46	11,150.37
Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Future Baseline Total	17,072.60	6,294.41	2,657.02	152.72	13,152.17
Net Emissions	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Thanksgiving					
On-road Motor Vehicles	9,699.12	3,073.50	3,396.90	96.44	3,431.11
Off-highway Vehicles	19,563.57	7,715.21	1,157.28	165.33	19,111.90
Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
Future Baseline Total	29,262.69	10,788.71	4,554.18	261.77	22,543.00
Net Emissions	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
New Year					
On-road Motor Vehicles	6,465.91	2,048.95	2,264.54	64.29	2,287.34
Off-highway Vehicles	13,042.03	5,143.33	771.50	110.21	12,740.92
Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Martin Luther King's Birthday					
On-road Motor Vehicles	4,040.41	1,280.34	1,415.06	40.17	1,429.31
Off-highway Vehicles	8,149.68	3,213.96	482.09	68.87	7,961.53
Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
Future Baseline Total	12,190.09	4,494.30	1,897.15	109.05	9,390.84
Net Emissions	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
President's Day					
On-road Motor Vehicles	8,080.81	2,560.69	2,830.12	80.35	2,858.62
Off-highway Vehicles	16,299.36	6,427.92	964.19	137.74	15,923.05
Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Future Baseline Total	24,380.17	8,988.60	3,794.31	218.09	18,781.68
Net Emissions	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Easter					
On-road Motor Vehicles	6,465.91	2,048.95	2,264.54	64.29	2,287.34

Table 4.11-11 Estimated Peak Daily Air Emissions Associated with Alternative 4

EMISSION SOURCE	EMISSIONS (POUNDS/DAY)				
	CO	NO <sub>x</sub>	ROG/HC	SO <sub>x</sub>	PM <sub>10</sub>
Off-highway Vehicles	13,042.03	5,143.33	771.50	110.21	12,740.92
Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Future Baseline Total	19,507.93	7,192.28	3,036.04	174.51	15,028.26
Net Emissions	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>ICAPCD Significance Thresholds</b>	<b>550.00</b>	<b>137.00</b>	<b>137.00</b>	<b>137.00</b>	<b>137.00</b>

Note: Estimated PM<sub>10</sub> emission includes both exhaust and fugitive dust emissions.

Source: CH2M HILL, 2002

### 4.11.3 Mitigation Measures

The following measures would be implemented to reduce potential air quality impacts:

- Apply nontoxic chemical soil stabilizers, according to manufacturers’ specifications, to all active staging areas (unpaved graded areas for OHV and visitors’ parking).
- Pave parking lots and access roads at least 100 feet onto the site from main road or highway.
- Reduce traffic speeds on all unpaved roads to 15 mph or less.
- Suspend all operations when wind speeds (as instantaneous gusts) exceed 25 mph.
- Sweep all paved streets once a day if visible sand materials are carried to adjacent streets (recommend water sweepers with reclaimed water).
- Configure access roads and parking lots to minimize traffic interference and idle exhaust emission.
- Provide temporary traffic control during peak OHV activities to improve traffic flow (e.g., flagperson).
- Suspend all OHV operations during second-stage smog alerts. For daily forecast, to identify second-stage smog alerts, the following number should be called: 1-800-CUT-SMOG (Imperial County APCD).

## 4.12 HAZARDOUS MATERIALS

### 4.12.1 Assumptions and Assessment Guidelines

The assessment of impacts assumes implementation of those measures incorporated into the alternatives or required by regulation that avoid or reduce potential adverse impacts. This assessment evaluates the potential for the alternatives to result in hazardous materials-related impacts to the public or the environment in the vicinity of the ISDRA. An alternative would be expected to have an adverse effect if it would:

- Create a significant hazard by exposing the public to hazardous materials at levels exceeding the range of risk generally considered to be acceptable to EPA or other federal or state agencies as a result of being located on or proximate to a known hazardous materials site
- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials

### 4.12.2 Impacts

The environmental database search discussed in Section 3.12 provided the location of and information on known hazardous materials sites (e.g., underground storage tank) or activities (e.g., spills) that conceivably could cause impacts (e.g., direct, indirect, or both) to human health and the environment. From the standpoint of potential exposures to known sites of hazardous materials accidental releases or contamination, as discussed in Section 3.12, the approximate 20-mile separation of the ISDRA from known hazardous materials sites results in an exceedingly low potential for and probability of affecting public health and safety at or in the vicinity of the ISDRA. This would be true for all alternatives. As a result, specific potential adverse effects associated with these hazardous materials sources are not addressed further in this section.

The primary potential source of hazardous materials-related impacts at the ISDRA would derive from the short-term use of varying amounts/quantities of such materials, which typically would be associated with OHV- and camping-related equipment brought onsite by visitors. These amounts would be expected to vary under different alternatives, primarily due to the number of anticipated visitors. The potential hazards typically would include accidental releases of fuels, oil, and grease from camping- or OHV-related equipment or from accidents involving the use of flammable materials for cooking. None of these activities likely would involve a release greater than *de-minimis* conditions. *De-minimis* conditions are those "...that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate government agencies" (Holland and Knight LLP, 2001).

The small quantities of fuel, oil, and grease that may be released from OHV or cooking equipment have low relative toxicity and concentrations, and will be biodegradable. Equipment fueling will be performed away from water bodies to prevent contamination of water in the event of a fuel spill. In the event of a

fire or injury, the local fire department will be called. In conclusion, due to the small quantities of hazardous materials that are handled by visitors to the park, the potential for environmental effects from the use of these is small.

The following subsections briefly address the potential impacts of such hazardous materials use scenarios by alternative.

**4.12.2.1  
Alternative 1**

Alternative 1 is anticipated to have the highest level of future visitation among all of the alternatives (see Table 4.1-1). Assuming that the probability for accidental spill of fuels, oils and grease is proportionate to attendance, Alternative 1 would have the highest potential impact among the alternatives. Mitigation measures provided below in Section 4.12.3 would reduce the potential for such impacts.

**4.12.2.2  
Alternative 2**

Future visitation under Alternative 2 is anticipated to be less than under Alternatives 1 and 4, and greater than Alternative 3 (see Table 4.1-1). Therefore, under this alternative, the potential for accidental spills involving fuels, oil, and grease would be greater than Alternative 3 and less than Alternatives 1 and 4. Measures provided below under Section 4.12.3 would mitigate the potential for impacts related to accidental spills.

**4.12.2.3  
Alternative 3**

Under Alternative 3, future visitation is anticipated to be lower than all other alternatives (see Table 4.1-1). Therefore, the potential for accidental spills involving fuels, oil, and grease would be lower under Alternative 3 than under Alternatives 1, 2, and 4. Mitigation measures described below under Section 4.12.3 would reduce the potential for impacts related to accidental spills that may occur under this alternative.

**4.12.2.4  
Alternative 4**

Future visitation under this alternative is anticipated to be higher than under Alternatives 2 and 3, and lower than Alternative 1 (see Table 4.1-1). The probability of accidental spills of fuels, oil, and grease is expected to be directly proportionate to visitation. Therefore, the potential impact under Alternative 4 is greater than Alternatives 2 and 3, and less than Alternative 1. Mitigation measures provided below under Section 4.12.3 would reduce the potential for impacts related to accidental spills.

**4.12.3  
Mitigation  
Measures**

Alternatives that result in increased visitation at the ISDRA above baseline conditions have the potential to increase the risk of impacts due to spills, leaks, releases, and improper dumping and disposal. Although this impact is not anticipated to be significant, the BLM would provide education materials relating to the storage and use of hazardous materials related to OHV recreational use. Examples include educational materials and/or kiosks for the storage, handling and disposal of hazardous materials in accordance with manufacturers' directions.

## 4.13 GEOLOGY AND SOILS

This section evaluates the potential impacts of Alternatives 1, 2, 3, and 4 on the geology and soils, as well as energy and mineral resources of the Plan Area. Assessment methods are presented for soil and geologic conditions, seismicity, and energy and mineral resources. Impacts due to seismicity and related to energy and mineral resources are also discussed.

### 4.13.1 Assumptions and Assessment Guidelines

#### **Soil and Geologic Conditions**

An impact resulting from implementation of an alternative would be considered adverse if it does not meet the applicable criteria set forth by regulation, as defined in Title 23, CCR, Division 3, Chapter 15, Title 14, CCR, Division 7, and 40 CFR Part 258, Subpart B (Location Restrictions), or if an impact would expose people or workers in the Plan Area to major geologic hazards. This would include the presence of geologic conditions such as unstable or compressible soils and liquefaction that would contribute to the destruction or severe damage (e.g., destabilization) of structures during a geologic event and could endanger the lives of persons in the Plan Area. In addition, impacts would result if implementation of the alternative would affect the continued enjoyment, study, or interpretation of a unique geologic feature, either by degrading or limiting access to the feature.

The geologic effect of OHVs on ISDRA has been discussed by Norris (1995), and is characterized primarily by increased erosion and the creation of vehicle tracks. Vehicle erosion impacts on mobile sand dunes can be repaired naturally in a few years if no further vehicle activities occur in the impacted area. Unvegetated or sparsely vegetated dunes are for the most part active, dynamic systems that will fairly promptly re-establish their pristine form if left relatively undisturbed and if the sources of sand are not adversely affected in some way. Relict or vegetated dunes would take longer to recover their original character than mobile, active dunes. Better-developed soils and stable surfaces within the Buffer Zone Management Area, particularly those of the distal portions of the alluvial fans extending into the Plan Area from the east, would take even longer to regain their natural aspect. In these areas of more stable surfaces, soil compaction would also be an effect of OHV activities. Evidence would suggest that some of these gravelly, stable surfaces may not regain their predisturbance character for centuries (Steiger and Webb, 2000). In this light, it is important to note that impact analyses for this DEIS refer to a baseline that is the current condition of the ISDRA, and current conditions include the plentiful vehicle tracks on these desert surfaces in most areas, with the exception of the North Algodones Dunes Wilderness Area and the Mammoth Management Area. These tracks are part of the current surface geologic conditions of the Recreation Area.

#### **Energy and Mineral Resources**

An alternative would have an adverse impact on leasable or locatable mineral resources if the loss of existing mineral resources could not be offset by

domestic reserves. Impacts to mineral resources would be considered adverse if the alternative would affect the existing or potential future economic production of a mineral resource, either by limiting access to the resource or by degrading the quality of the resource. It would also be an adverse effect if implementation of the alternative would eliminate access to a potential mineral resource that has been determined by a regulating agency to be rare, unique, or regionally significant.

### **Seismic Hazards**

The Plan Area lies within a seismically active area. A seismic hazard in the vicinity of the Plan Area would be considered adverse if, as a result of the occurrence of the maximum probable earthquake event, structures (i.e., bridges or buildings) built within the ISDRA were to fail causing potential injury and property damage. When state and federal regulations conflict, the more stringent regulation will be used to establish impact significance. Severe seismic hazards would include the presence of an active fault onsite or the presence of other geologic conditions that would directly or indirectly endanger the lives of persons in the Plan Area.

### **Geology and Soils**

The same conditions that applied immediately prior to instituting the temporary closures would apply under Alternative 1, the No Action Alternative. A larger area of the ISDRA would be open to OHV activity, and use intensity would be greater than under Alternatives 2 and 3. However, under the No Action Alternative, use intensity and amount of area open to motorized recreational activities would be less than under Alternative 4. Therefore, erosional impacts resulting from OHV activities would be greater for Alternative 1 than under Alternatives 2 and 3 and less than under Alternative 4. The area available for OHV use under Alternative 1 would be comparable to the existing conditions, and the impact would be commensurate; therefore, adverse impacts are not anticipated. Implementation of this alternative would not substantially alter the potential for erosional damage and soil compaction that exists under existing conditions.

### **Energy Resources**

Under Alternative 1, access to portions of the Glamis and Dunes KGRAs would not be limited, creating the potential for conflict between OHV use and geothermal development. However, implementation of this alternative would not substantially alter the potential for conflict that currently applies under existing conditions. Therefore, no adverse impact would result from implementation of Alternative 1.

### **Mineral Resources**

Mining claims and sand and gravel operations will be limited to the Glamis Management Area. However, implementation of this alternative would not substantially alter the potential for mineral operations that exists under existing conditions. Therefore, no adverse impact would result.

## **4.13.2 Impacts**

### **4.13.2.1 Alternative 1**

## Environmental Consequences

### Seismic Hazards

In seismically active regions, the potential exists for seismic damage to existing facilities and structures. Under the No Action Alternative construction of facilities and structures could occur in the future. Consequently, the potential for seismic damage to current and future facilities does exist. Accordingly, any structures will be built according to construction codes of practice for structures in the State of California in seismically active regions.

Implementation of this alternative would not substantially alter the potential for seismic impact that exists under existing conditions, as mitigated. Therefore, no adverse impact would result.

#### 4.13.2.2 Alternative 2

### Geology and Soils

This alternative would open a larger portion of the Plan Area to OHV use than under Alternative 3, and approximately the same area would be opened to OHV use as under Alternatives 1 and 4. However, the intensity of use allowed in those areas opened to OHV recreational activities would be lower than Alternative 4, and higher than Alternative 3. Therefore, the erosional impacts and soils compaction would be greater than under Alternative 3 and less than under Alternatives 1 and 4. The area available for OHV use would be less than existing conditions, and the intensity of use would be more constrained. Therefore, adverse impacts are not anticipated. Implementation of this alternative would not substantially alter the potential for damage that exists under existing conditions; therefore, no adverse impact would result.

### Energy Resources

Under the action alternatives, lease arrangements for energy and mineral resources could be limited or eliminated to eliminate potential conflicting uses of portions of the Plan Area. Access to the portions of the Glamis and Dunes KGRAs within the Plan Area is not limited, creating a potential for conflict between OHV use and geothermal development. However, implementation of this alternative would not substantially alter the potential for conflict under existing conditions. Therefore, no adverse impact would result.

### Mineral Resources

Mining claims and sand and gravel operations will be limited to the Glamis Management Area. However, implementation of this alternative would not substantially alter the potential for mineral operations that exists under interim management conditions. Therefore, no adverse impact would result.

### Seismic Hazards

In seismically active regions, the potential exists for seismic damage to existing facilities and structures. Construction of future facilities and structures is proposed under this alternative; consequently, the potential for seismic damage to current and future construction exists. To ensure public safety, any structures or facilities built will be constructed according to standard construction codes of practice for structures in the State of California in seismically active regions. Implementation of this alternative would not

substantially alter the potential for seismic impact that exists under current conditions, as mitigated; therefore, no adverse impact would result.

**4.13.2.3  
Alternative 3**

**Geology and Soils**

This alternative would open a smaller area of the ISDRA to OHV use and would limit the intensity of that use more than under Alternatives 1, 2, or 4. Therefore, the impact resulting from OHV activities, erosion and soil compaction, would be less under this alternative than under any of the other alternatives. Because the impacted area and intensity of use would be less than existing conditions, significant adverse impacts are not anticipated. Implementation of this alternative would decrease the potential for damage due to erosion and soil compaction under existing conditions. Therefore, no adverse impact would result.

**Energy Resources**

Under this alternative, as with all the action alternatives, lease arrangements for energy and mineral resources could be limited or eliminated to minimize the potential of conflicting uses of the Plan Area. Access to portions of the Glamis and Dunes KGRAs would not be limited, resulting in the potential for conflict between OHV use and geothermal development. However, implementation of this alternative would not substantially alter the potential for conflict that exists under baseline conditions. Therefore, no adverse impact would result.

**Mineral Resources**

Mining claims and sand and gravel operations will be limited in the Glamis Management Area. However, implementation of this alternative would not substantially alter the potential for mineral operations that exists under existing conditions. Therefore, no adverse impact would result.

**Seismic Hazards**

In seismically active regions, the potential exists for seismic damage to existing facilities and structures. Construction of future facilities and structures are proposed under this alternative; consequently, the potential for seismic damage to current and future construction exists. To ensure public safety, any structures or facilities built will be constructed according to standard construction codes of practice for structures in the State of California in seismically active regions. Implementation of this alternative would not substantially alter the potential for seismic impact that exists under existing conditions, as mitigated; therefore, no adverse impact would result.

**4.13.2.4  
Alternative 4**

**Geology and Soils**

This alternative would open a larger portion of the Plan Area to OHV use than under Alternative 3, and approximately the same area as under Alternatives 1 and 2. However, the intensity of use as would be allowed by the ROS classes would be greater under Alternative 4 than under any of the other alternatives, including the No Action Alternative. Therefore, impacts to soils and erosion would be greater than under any of the other alternatives. The area available for OHV use would be as great as under existing conditions, and the impacts

## Environmental Consequences

would be greater due to a higher level of use allowed in the open areas. Therefore, adverse impacts are anticipated under Alternative 4.

### **Energy Resources**

As with the other alternatives, portions of the Glamis and Dunes KGRAs would not be protected, creating the potential for conflict between OHV use and geothermal development. However, implementation of this alternative would not substantially alter the current potential for conflict under existing conditions. Therefore, no adverse impact to energy resources would result.

### **Mineral Resources**

Mining claims and sand and gravel operations will be limited in the Glamis Management Area. However, implementation of this alternative would not substantially alter the potential for mineral operations that exists under existing conditions; therefore, no adverse impact would result.

### **Seismic Hazards**

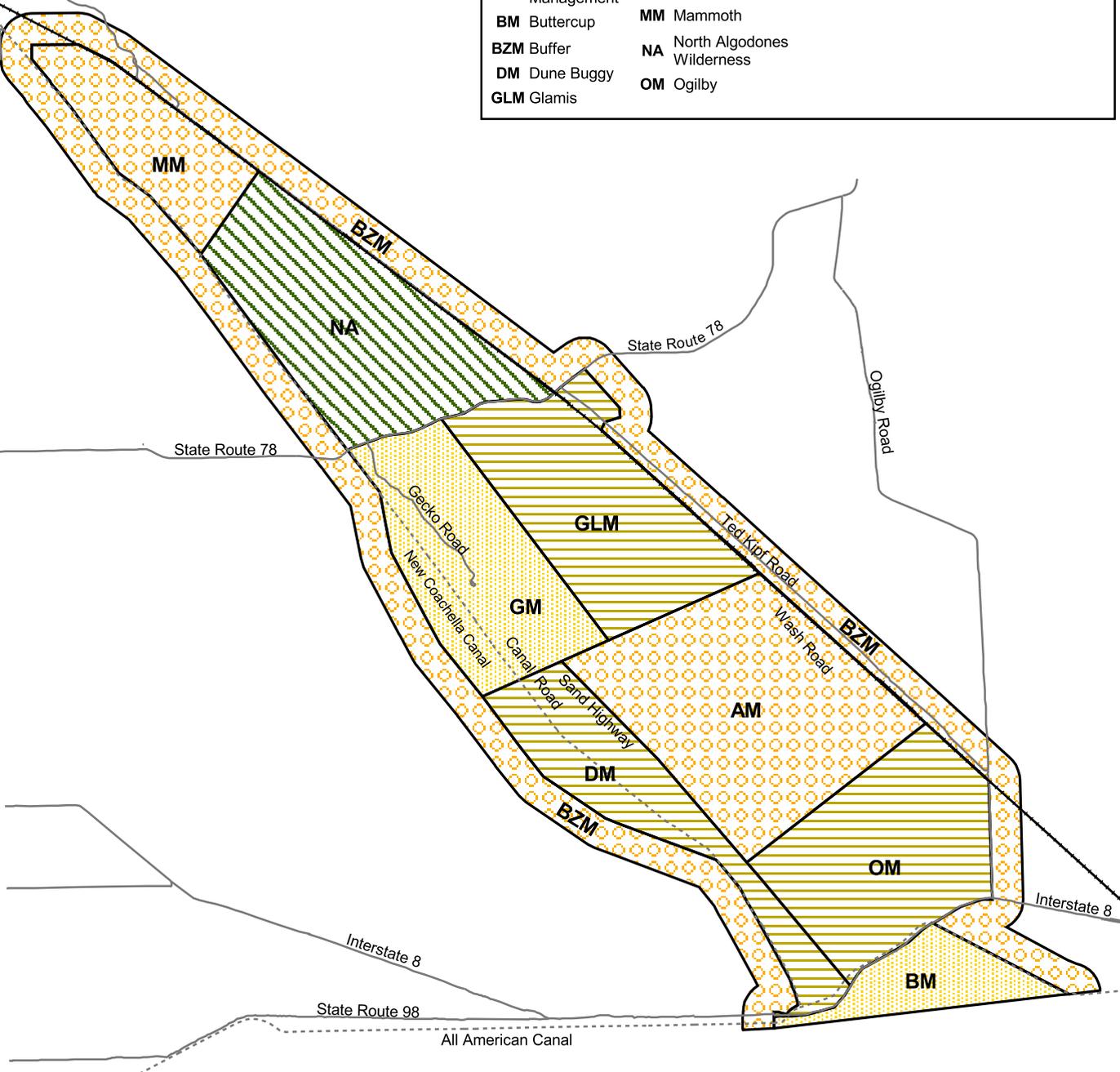
In seismically active regions, the potential exists for seismic damage to existing facilities and structures. Construction of future facilities and structures are proposed under this alternative; consequently, the potential for seismic damage to current and future construction exists. To ensure public safety, any structures or facilities built will be constructed according to standard construction codes of practice for structures in the State of California in seismically active regions. Implementation of this alternative would not substantially alter the potential for seismic impact that exists under existing conditions, as mitigated; therefore, no adverse impact would result.

### **4.13.3 Mitigation Measures**

Mitigation measures that are applied to all alternatives, including the No Action Alternative, address earthquake hazards in this seismically active region. To ensure public safety, any facilities built will be constructed according to construction codes of practice for structures in the State of California in seismically active regions.

**Legend**

-----	Southern Pacific Railroad		
—	Major Road		
- - - - -	Canal		
—	Plan Area Boundary		
		<b>Alternative 2</b>	
			Semi-Primitive Non-Motorized (SPNM)
			Semi-Primitive Motorized (SPM)
			Roaded Natural (RN)
			Rural (R)
<b>Recreation Management Areas</b>			
<b>AM</b>	Adaptive Management	<b>GM</b>	Gecko
<b>BM</b>	Buttercup	<b>MM</b>	Mammoth
<b>BZM</b>	Buffer	<b>NA</b>	North Algodones Wilderness
<b>DM</b>	Dune Buggy	<b>OM</b>	Ogilby
<b>GLM</b>	Glamis		



**Figure 4.1-1**  
**Alternative 2**  
**Recreation Opportunity Spectrum Class by Management Area**  
 Imperial Sand Dunes Recreation Area - DEIS



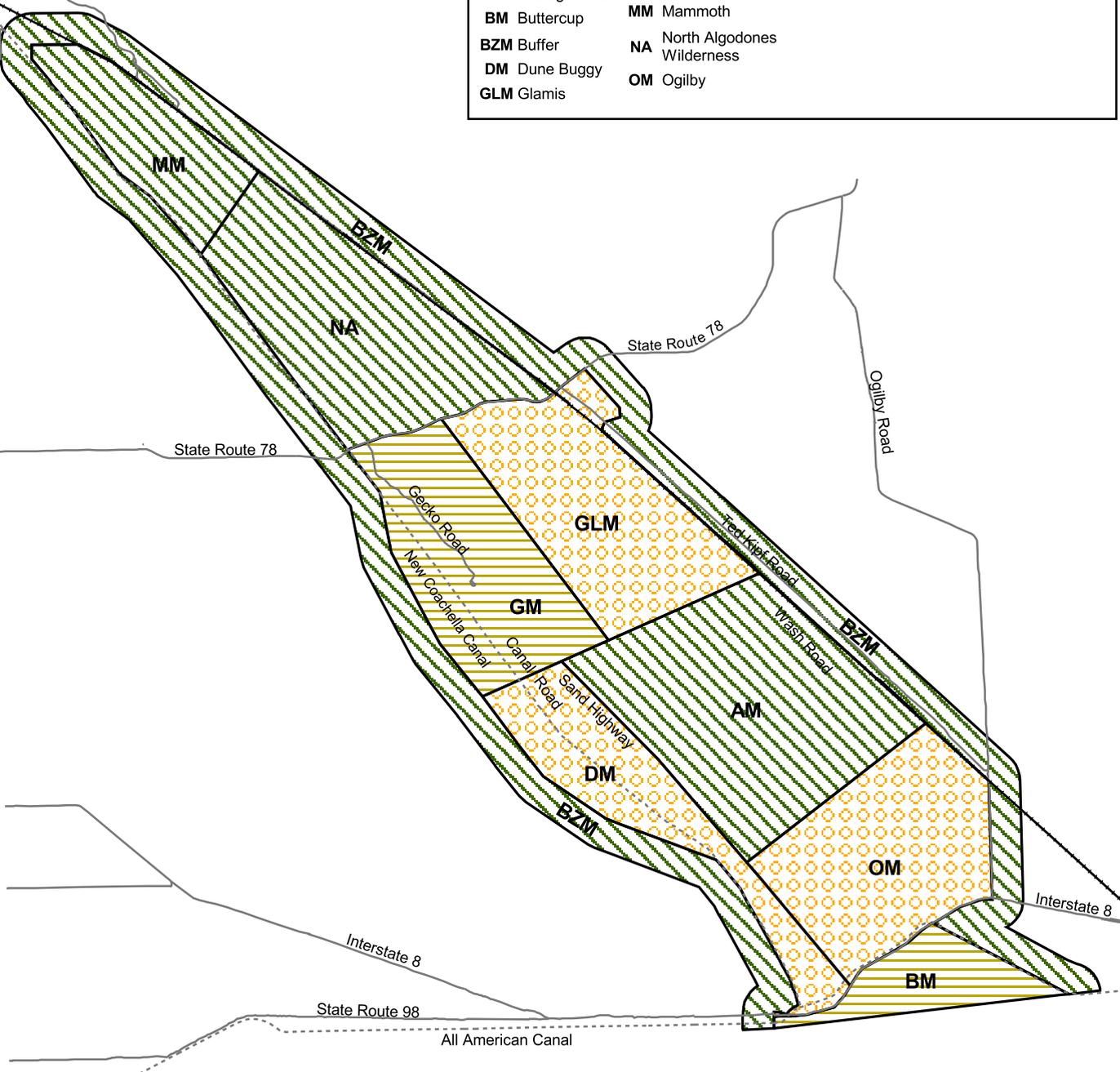
**Legend**

<ul style="list-style-type: none"> <li>----- Southern Pacific Railroad</li> <li>— Major Road</li> <li>- - - Canal</li> <li>— Plan Area Boundary</li> </ul>	<p style="text-align: center;"><b>Alternative 3</b></p> <ul style="list-style-type: none"> <li> Semi-Primitive Non-Motorized (SPNM)</li> <li> Semi-Primitive Motorized (SPM)</li> <li> Roaded Natural (RN)</li> <li> Rural (R)</li> </ul>
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**Recreation Management Areas**

<b>AM</b> Adaptive Management	<b>GM</b> Gecko
<b>BM</b> Buttercup	<b>MM</b> Mammoth
<b>BZM</b> Buffer	<b>NA</b> North Algodones Wilderness
<b>DM</b> Dune Buggy	<b>OM</b> Ogilby
<b>GLM</b> Glamis	

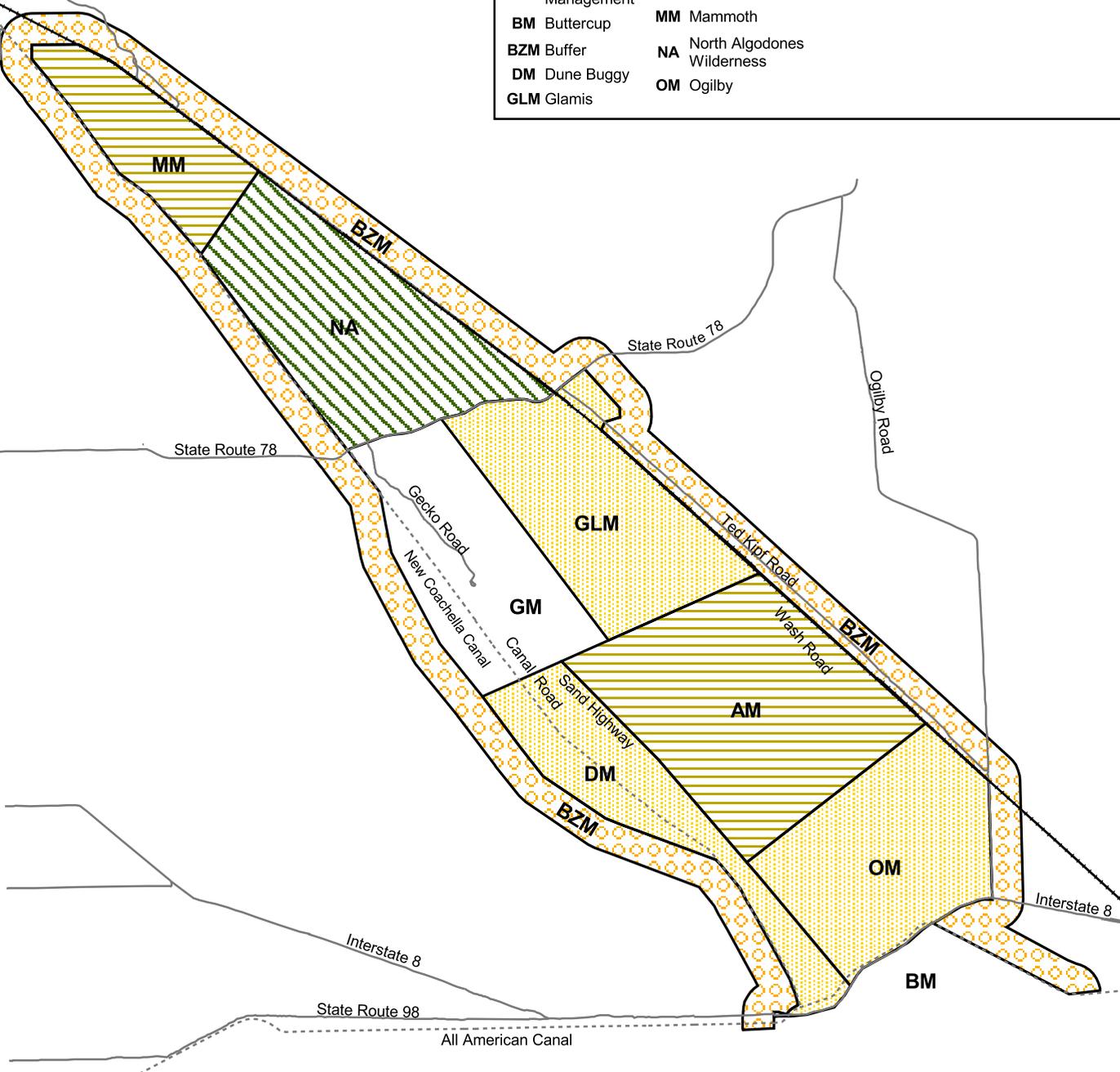


**Figure 4.1-2**  
**Alternative 3**  
**Recreation Opportunity Spectrum Class by Management Area**  
 Imperial Sand Dunes Recreation Area - DEIS



**Legend**

-----	Southern Pacific Railroad		
—	Major Road		<b>Alternative 4</b> Semi-Primitive Non-Motorized (SPNM)
- - - - -	Canal		Semi-Primitive Motorized (SPM)
—	Plan Area Boundary		Roaded Natural (RN)
<b>Recreation Management Areas</b>			Rural (R)
<b>AM</b>	Adaptive Management	<b>GM</b>	Gecko
<b>BM</b>	Buttercup	<b>MM</b>	Mammoth
<b>BZM</b>	Buffer	<b>NA</b>	North Algodones Wilderness
<b>DM</b>	Dune Buggy	<b>OM</b>	Ogilby
<b>GLM</b>	Glamis		



**Figure 4.1-3**  
**Alternative 4**  
**Recreation Opportunity Spectrum Class by Management Area**  
Imperial Sand Dunes Recreation Area - DEIS

