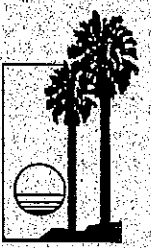
DRAFT ENVIRONMENTAL IMPACT REPORT

FOR THE

DESERT HOT SPRINGS COMPREHENSIVE GENERAL PLAN

(SCH No. 2000021006)

Prepared for



City of Desert Hot Springs
65-950 Pierson Boulevard
Desert Hot Springs, CA 92240

Prepared By

Terra Nova Planning & Research, Inc.®
400 S. Farrell Drive, Ste B-205
Palm Springs, CA 92262

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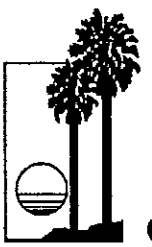

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Table of Contents

	Page No.
List of Exhibits	iii
List of Tables	iii
List of Appendices	v
Environmental Summary/Matrix	M

I. INTRODUCTION AND PROJECT DESCRIPTION

A.	Lead Agency	I-1
B.	Introduction	I-1
C.	CEQA Requirements	I-2
D.	Project Location and Description	I-3
E.	Draft General Plan Goals and Policies	I-8

II. REGIONAL ENVIRONMENTAL SETTING

A.	Existing Land Use	II-1
B.	Surrounding Land Use	II-2
C.	Topography	II-3
D.	Climate	II-4
E.	Hydrology	II-5
F.	Soils and Geology	II-6
G.	Water Quality/Resources	II-7
H.	Biological Resources	II-9
I.	Cultural Resources	II-11
J.	Visual Resources	II-12
K.	Air Quality	II-13
L.	Noise	II-14
M.	Traffic/Circulation	II-14
N.	Public Facilities and Services	II-15
O.	Socio-Economic Resources	II-18

III. EXISTING ENVIRONMENTAL CONDITIONS, PROJECT IMPACTS AND MITIGATION MEASURES

A.	Land Use		III-2
	1.	Existing Conditions	III-2
	2.	Project Impacts	III-6
	3.	Mitigation Measures	III-15
B.	Traffic/Circulation		III-15
	1.	Existing Conditions	III-15
	2.	Project Impacts	III-27
	3.	Mitigation Measures	III-33

C. Soils and Geology III-38
1. Existing Conditions III-38
2. Project Impacts III-53
3. Mitigation Measures III-55

D. Hydrology III-58
1. Existing Conditions III-58
2. Project Impacts III-65
3. Mitigation Measures III-68

E. Water Quality/Resources III-69
1. Existing Conditions III-69
2. Project Impacts III-76
3. Mitigation Measures III-77

F. Biological Resources III-79
1. Existing Conditions III-79
2. Project Impacts III-86
3. Mitigation Measures III-87

G. Cultural Resources III-90
1. Existing Conditions III-90
2. Project Impacts III-95
3. Mitigation Measures III-96

H. Air Quality III-97
1. Existing Conditions III-97
2. Project Impacts III-105
3. Mitigation Measures III-112

I. Noise III-116
1. Existing Conditions III-116
2. Project Impacts III-124
3. Mitigation Measures III-129

J. Visual Resources III-132
1. Existing Conditions III-132
2. Project Impacts III-134
3. Mitigation Measures III-135

K. Public Services and Facilities III-137
1. Existing Conditions
2. Project Impacts
3. Mitigation Measures

L. Socio-Economic Resources III-160
1. Existing Conditions III-160
2. Project Impacts III-168
3. Mitigation Measures III-173

IV. UNAVOIDABLE SIGNIFICANT IMPACTS IV-1

V. PROJECT ALTERNATIVES V-1

VI. SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY VI-1

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF ENVIRONMENTAL RESOURCES VII-1

VIII. GROWTH INDUCING AND CUMULATIVE IMPACTS VIII-1

IX. ORGANIZATIONS, PERSONS AND DOCUMENTS CONSULTED IX-1

List of Exhibits

I-1 Regional Location Map I-5
I-2 City of Desert Hot Springs Vicinity Map I-6
I-3 General Plan Study Area I-7
III-1 Existing General Plan Land Use Map III-5
III-2 Preferred Alternative Land Use Map III-8
III-3 Existing Average Daily Traffic Volumes III-23
III-4 CVAG Proposed System of Non-Motorized Facilities III-26
III-5 Preferred Alternative Buildout Traffic Projections III-31
III-6 City of Desert Hot Springs General Plan Roadway Classification Map III-34
III-7 City of Desert Hot Springs General Plan Street Cross Sections III-35
III-8 Geologic Map of the Planning Area III-41
III-9 Wind Hazard Zones in the Desert Hot Springs Area III-43
III-10 Faults in the Desert Hot Springs General Plan Area III-46
III-11 Seismically Induced Settlement Susceptibility Map III-51
III-12 Seismically Induced Rock Fall and Landslide Susceptibility Map III-52
III-13 Flood Hazards in the Desert Hot Springs General Plan Area III-61
III-14 Geothermal Temperature Contour Map III-73
III-15 Noise Monitoring Sites III-122
V-1 Current General Plan Land Use Map V-4
V-2 More Intense Alternative Land Use Map V-7
V-3 Less Intense Alternative Land Use Map V-10

List of Tables

I-1 Statistical Summary of Land Uses for the GPAC Preferred Alternative I-11
I-2 Preferred Alternative Land Use Buildout Statistical Summary I-12
I-3 City of Desert Hot Springs Draft General Plan Proposed Land Use Designations I-13

III-1	Current General Plan Land Use Buildout Statistical Summary	III-4
III-2	Preferred Alternative Residential Land Use Buildout Statistical Summary	III-9
III-3	Preferred Alternative Commercial Land Use Buildout Statistical Summary	III-11
III-4	Preferred Alternative Industrial Land Use Buildout Statistical Summary	III-12
III-5	Preferred Alternative Open Space Buildout Statistical Summary	III-13
III-6	Roadway Level of Service Descriptions	III-17
III-7	1994 Daily Volume-to-Capacity Ratio and Level of Service Summary	III-18
III-8	Comparison of Year 1994 Versus 1999 Average Daily Traffic Volumes	III-21
III-9	Existing Levels of Service at Key Intersections	III-24
III-10	Preferred Land Use Alternative Daily Traffic Volumes at Buildout	III-28
III-11	Estimated Horizontal Peak Ground Accelerations and Seismic Intensities	III-45
III-12	Major and Minor Drainages in the Desert Hot Springs General Plan Area	III-63
III-13	Mineral Analysis of Representative Surface Waters	III-75
III-14	Desert Hot Springs Species of Special Concern	III-83
III-15	State and Federal Ambient Air Quality Standards	III-100
III-16	Coachella Valley Air Quality Trends, Exceedences of Suspended Particulate Matter (PM_{10}) Standards	III-103
III-17	Coachella Valley Air Quality Trends, Exceedances Ozone Standards	III-104
III-18	Calculations of Fugitive Dust Potential	III-105
III-19	Power Plant Emission Projections for Residential Development at Project Buildout	III-106
III-20	Power Plant Emission Projections for Commercial Development at Buildout	III-107
III-21	Power Plant Emission Projections for Industrial Development at Buildout	III-108
III-22	Emissions Associated with Natural Gas Consumption for Residential Development	III-109
III-23	Emissions Associated with Natural Gas Consumption for Commercial Development	III-109
III-24	Emissions Associated with Natural Gas Consumption for Industrial Development	III-110
III-25	Moving Exhaust Emission Projections at Buildout, Calendar Year 2009	III-111
III-26	Anticipated Cumulative Daily Project-Related Emissions Associated with Buildout of the Proposed General Plan	III-112
III-27	City of Desert Hot Springs Noise Ordinance, Exterior Noise Limits	III-118
III-28	Existing Noise Exposures Adjacent to Planning Area Roadways	III-119
III-29	Noise Monitoring at Selected Locations	III-121
III-30	Preferred Alternative Projected Noise Contours on Major Roadways	III-125
III-31	Public School Enrollment in the Planning Area, School Year 1999-2000	III-138
III-32	Projected School Enrollment at General Plan Buildout	III-139
III-33	Estimated Electricity Usage Rates	III-143
III-34	Natural Gas Consumption Factors	III-145
III-35	Desert Hot Springs Age Distribution - 1990	III-161
III-36	City of Desert Hot Springs Ethnic Characteristics - 1990	III-162
III-37	Occupations of Residents in the City of Desert Hot Springs - 1990	III-163
III-38	Major Employers in the City of Desert Hot Springs - 1998	III-164
III-39	Potential Annual Expenditure Estimates for City of Desert Hot Springs Residents	III-165

III-40	1994-1998 Taxable Sales Trends for the City of Desert Hot Springs	III-165
III-41	Housing Characteristics in the City of Desert Hot Springs - 1999	III-167
III-42	Growth Forecasts for the City of Desert Hot Springs, Years 2000-2020	III-168
III-43	Buildout Cost/Revenue Analysis	III-173
V-1	Current General Plan Land Use Buildout Statistical Summary	V-5
V-2	More Intense Alternative Land Use Buildout Statistical Summary	V-8
V-3	Less Intense Alternative Land Use Buildout Statistical Summary	V-11
V-4	Comparison of Traffic Impacts for Each Project Alternative	V-15
V-5	No Project Alternative: Current General Plan Anticipated Cumulative Daily Project-Related Emissions	V-21
V-6	Alternative I: More Intense Alternative Anticipated Cumulative Daily Project-Related Emissions	V-22
V-7	Alternative II: Less Intense Alternative Anticipated Cumulative Daily Project-Related Emissions	V-23
V-8	Comparison of Anticipated Noise Levels Generated by Each Project Alternative	V-23
V-9	No Project Alternative-Current General Plan, Potential School Enrollment	V-25
V-10	Alternative I-More Intense Alternative Potential School Enrollment	V-26
V-11	Alternative II-Less Intense Alternative Potential School Enrollment	V-26
V-12	No Project Alternative Buildout Cost/Revenue Analysis	V-31
V-13	Alternative I: More Intense Alternative Buildout Cost/Revenue Analysis	V-32
V-14	Alternative II: Less Intense Alternative Buildout Cost/Revenue Analysis	V-33

List of Appendices

A.	Initial Study, Notice of Preparation (NOP) and Responses to NOP Prepared by the City of Desert Hot Springs and Terra Nova Planning and Research, Inc.	A-1
B.	Desert Hot Springs General Plan Update Circulation Background Study Prepared by Endo Engineering, March 2000	B-1
C.	Seismic, Geologic and Flooding Hazards Sections of the Technical Background Report, General Plan Update, City of Desert Hot Springs Prepared by Earth Consultants International, Inc., May 1997	C-1
D.	Biological Assessment for the City of Desert Hot Springs Prepared by John Minch and Associates, July 1995	D-1
E.	Desert Hot Springs General Plan Update Air Quality Background Study Prepared by Endo Engineering, November 1994	E-1
F.	Desert Hot Springs General Plan Update Noise Background Study Prepared by Endo Engineering, March 2000	F-1

ENVIRONMENTAL SUMMARY MATRIX

This Environmental Impact Report (EIR) has been prepared to assess the potential impacts to the environment which may result from the approval of the proposed Desert Hot Springs Comprehensive General Plan. The planning area includes a total of 36,960± acres consisting of a mix of residential densities ranging from affordable apartments to large acreage estates. The City is also host to a variety of commercial uses, ranging from specialty retail to community-scale centers and resort/spa developments. Recreational uses have been incorporated throughout the community and include public and private golf courses and open space.

The proposed land use scenario for the planning area provides for a range of residential densities from one unit per ten acres, to fourteen units per acre. A modest expansion of the planning area's residential lands is proposed, as well as a substantial increase in industrial lands and the introduction of several new land use designations. The land use plan has been developed as a means of broadening land use and economic development opportunities for the City.

The City of Desert Hot Springs is located in the northwest portion of the Coachella Valley, in Riverside County. The incorporated City limits can be described as including: Sections 24, 25 and 36, Township 2 South, Range 3 East; all of Sections 19, 20, 21, 22, 26, 27, 28, 29, 30, 31, 36, and portions of Sections 24 and 25, Township 2 South, Range 4 East; all of sections 29, 30, 31, 32, 33, and portions of Sections 19, Township 2 South, Range 5 East; portions of Section 1, Township 3 South, Range 4 East; and portions of Sections 5 and 6, Township 3 South, Range 5 East of the San Bernardino Baseline and Meridian.

This EIR assesses the environmental impacts that may result as a consequence of approval and implementation of the proposed land use scenario and the Plan's goal, policies and programs. The following discussion briefly summarizes each category of analysis, including existing conditions, project impacts and applicable mitigation measures recommended to reduce impacts to acceptable or insignificant levels. Levels of impact include:

Significant Impacts: Are those impacts which constitute a potentially significant adverse change in the environment.

Insignificant Impacts: Are those impacts, which, by virtue of the environmental conditions, predisposing existing development, or the implementation of mitigation measures, are reduced to acceptable or "insignificant" levels.

Unavoidable Impacts: Are those impacts which occur as a result of project development whose adverse effects cannot be entirely eliminated or reduced to a level of insignificance.

Existing Conditions	Project Impacts	Mitigation Measures
LAND USE COMPATIBILITY The City of Desert Hot Springs is a low density resort residential community located in the Coachella Valley, which is a low desert environment located in central Riverside County. The City has a current population of approximately 15,398. Its incorporated area includes approximately 14,782 acres, and the City's sphere-of-influence (SOI) includes approximately 22,180 acres. Current development patterns are guided by the 1987 Comprehensive General Plan. The existing General Plan allows for the ultimate development of about 70,566 dwelling units, with most of these to occur in the 0 to 5 units per acre density range. It also provides for about 14,604 units at densities ranging from 9 to 14 units per acre. The current Plan also provides for commercial development and visitor-serving commercial, which includes hotels, resorts and spa development. Under the current Plan, the City could realize an estimated 14.8 million square feet of commercial space, as well as about 37.8 million square feet of industrial space. Public and private open space accounts for approximately 8,869 acres.	The proposed General Plan is expected to facilitate the development of approximately 70,452 dwelling units, assuming buildout occurs at only moderate densities. This accounts for about 114 fewer dwelling units than are expected to be developed under the current Plan. The proposed Plan does result in a slight decrease in the potential development of commercial lands, but results in a substantial increase in industrial lands. The Plan also provides for several new land use designations, including the Visitor-Serving Residential category which applies to lands containing both residential and hotel/motel uses, and the Energy-Related Industrial category. Impacts associated with the adoption and implementation of the General Plan Land Use Plan are not expected to be significant. No substantial or significant incompatibilities with internal or external lands uses are expected to result from the proposed plan of development. The potential for traffic noise impacts on existing and/or proposed residential lands is addressed through General Plan policies and programs which address noise mitigation along major roadways.	In order to assure that potential impacts associated with individual development projects are adequately mitigated, individual projects shall be fully assessed during the City's project review process. All future residential development occurring on lands within an existing or projected 65 dBA or higher noise contour shall be required to prepare a noise impact assessment and mitigation plan, which minimizes impacts to outdoor living space and assures a maximum interior noise level of 45 CNEL. To assure land use compatibility, the City shall consult and coordinate with the Bureau of Land Management in reviewing all development proposals located within the boundaries of the Big Morongo Canyon Preserve Area of Critical Environmental Concern (ACEC).

Existing Conditions	Project Impacts	Mitigation Measures
TRAFFIC/CIRCULATION The City is connected to the rest of the region by state and interstate highways, including U.S. Interstate-10 and State Highway 62. The City's roadway system is currently operating at acceptable levels of service (LOS), with the exception of one roadway link, which has recently been upgraded and improved. Most roadways operate at LOS C or better. A detailed traffic study was conducted on the planning area's circulation system and is included in the EIR Appendices.	Based upon the proposed roadway network set forth in the Draft General Plan, the average daily trip volumes projected to result from buildout of the Preferred Land Use Alternative will not result in significant adverse impacts which cannot be mitigated. Total trip generation is expected to be about 18% less than that associated with buildout of the current General Plan. A limited number of links may operate with volumes that exceed their design capacities. However, system upgrades, including additional turn lands at intersections, the retention of adequate right-of-way, the potential construction of an additional interchange at I-10 and Little Morongo Road, and other capacity augmentations are expected to alleviate potentially adverse impacts to the local circulation system.	The proposed General Plan and accompanying traffic report establish a wide range of roadway and intersection improvements and systems management directives which will reduce project impacts to insignificant levels. No new major roadway links are required, and the proposed improvements can be made.

Existing Conditions	Project Impacts	Mitigation Measures
SOILS AND GEOLOGY The Banning and Mission Creek faults of the San Andreas fault zone pass through the planning area and have a relatively high probability of rupturing within the next 25 years. Several other faults are also located in the Coachella Valley area. The City and region are susceptible to a wide range of geotechnical conditions. These include ground rupture, strong ground shaking, collapsible soils, and seismically induced settlement. The southernmost portions of the City are located in a wind hazard erosion zone, which causes the production of suspended dust and blowing sand. The foothills of the San Bernardino and Little San Bernardino Mountains may be susceptible to rock slides and landslides.	Development in the planning area will consist of major and minor projects, ranging from single family addition permits to master planned community developments (Specific Plans) consisting of mixed residential, commercial, and resort uses. The implementation of some development may require extensive site grading and earthwork. Identified active faults will continue to pose problems with potentially significant groundshaking. Development associated with the proposed General Plan is not expected to significantly increase the exposure of people or property to geotechnical hazards of the region.	The proposed General Plan includes a wide range of policies and programs designed to reduce exposure to these hazards to the greatest extent practical. Project specific surveys and analyses are required by provisions of the Plan, the Uniform Building Code and other requirements set forth in the General Plan. The Plan also requires that geotechnical reports and other geotechnical studies be prepared for future projects, where necessary.

Existing Conditions	Project Impacts	Mitigation Measures
HYDROLOGY The City is located in a subtropical desert climate with very low mean rainfall. However, the area is occasionally susceptible to high intensity thunder storms, which can generate substantial runoff and create significant flooding hazards. A substantial portion of the planning area is contained within either the 100-year or 500-year flood zones, as designated by the Federal Emergency Management Agency (FEMA). Major drainages in the planning area include the Mission Creek, Big and Little Morongo Creeks, Blind Creek and Long Creek. The Riverside County Flood Control District, in close coordination with the City, has been involved in the construction of surface and subsurface facilities to convey local drainage and protect lives and property. The Coachella Valley Water District is responsible for flood control planning for a limited portion of the southeastern planning area.	Buildout of the planning area will result in increased runoff associated with impervious surfaces. However, the proposed General Plan is not expected to have any significant adverse impacts on flooding and hydrology hazards. Future channelization and related improvements to the lower extensions of the Mission Creek and Morongo Creek washes could contribute to reductions in natural sand transport to the Willow Hole Preserve. The Plan provides a variety of policies and programs that require the continued development of stormwater control facilities, and encourage the use of on-site retention basins to facilitate percolation of stormwater runoff.	The Plan requires the use of on-site stormwater retention basins to the greatest extent practical. It also encourages maximized drainage capacity of the streets. Development proposals with the potential of generating significant runoff are also required to prepare and submit hydrology studies and mitigation plans. The City will consult and coordinate with the appropriate regulatory agencies to address specific land use controls, potential channelization and design criteria for lands west of the Willow Hole Preserve.

Existing Conditions	Project Impacts	Mitigation Measures
WATER QUALITY/RESOURCES The Mission Creek subbasin aquifer is the source of groundwater for the planning area. Its storage capacity is estimated at approximately one million acre-feet, and it is recharged naturally by natural surface and subsurface runoff. The subbasin is currently in an overdraft condition of about 2 lineal feet per year. Average per capita demand for this resource is about 297 gallons per day. Hot mineral water from the Desert Hot Springs subbasin, which underlies the northeastern portion of the planning area, is used in spa and resort development. The Mission Springs Water District provides domestic water service to the majority of the planning area. A limited portion of the southern planning area is located within the service boundaries of the Coachella Valley Water District (CVWD). Both agencies extract groundwater from the Mission Creek subbasin through wells. Within the next two years, MSWD will begin artificially recharging the Mission Creek subbasin with Colorado River Water transported by an aqueduct which passes through the City.	At General Plan buildout, all consumers in the planning area could raise city-wide total domestic water consumption to approximately 57 million gallons of water per day, or about 176 acre-feet per day. It is estimated that approximately 40% of domestic water consumed, including a percentage of irrigation water applied to landscaping, is returned to the groundwater table and is not lost. Actual impacts may be more or less, depending on the type and extent of future development, density of residential development, and the level and type of landscaping and water-dependent amenities within each project. Buildout of the proposed Plan will result in impacts comparable to those anticipated from the current General Plan. Impacts to water quality are also expected to be equal to or slightly more than those resulting from buildout of the current Plan. The proposed Plan cites the need to implement the National Pollution Discharge Elimination System (NPDES), and in some instances, to require the construction of stormwater intercept and treatment systems that reduce the amount of contaminants flowing into surface and subsurface groundwater resources.	The proposed General Plan promotes and encourages the protection and wise use of the domestic water supply to assure its long-term viability and availability. Policies and programs set forth in the Plan require all future development proposals to be carefully analyzed by the City, MSWD and CVWD to determine the potential impacts of such activities on the local groundwater resource. The Plan facilitates coordination with MSWD and CVWD in requiring the use of low-flush toilets and low-flow shower heads and faucets in all new construction. The Plan also encourages the use of drought-tolerant landscaping in public and private development, as well as the development of on-site stormwater retention basins to enhance filtration of runoff and provide for percolation into the Mission Creek subbasin. MSWD and CVWD will maintain adequate capacities and capabilities at municipal wastewater treatment plans to assure that effluent discharges are sufficiently treated to meet the requirements of the California Regional Water Quality Control Board.

Existing Conditions	Project Impacts	Mitigation Measures
BIOLOGICAL RESOURCES The City and Coachella Valley are located in a low desert environment with high annual temperatures and low precipitation. Conditions has resulted in the evolution of highly specialized species, some of which are unique to the area. Species of concern in the Desert Hot Springs area include the Coachella Valley milkvetch, Little San Bernardino Mountains gilia, Coachella Valley fringe-toed lizard, desert tortoise, Palm Springs pocket mouse and others. As urban development and agriculture have moved into the Coachella Valley, native habitat has been modified or removed. Over time, these changes have reduced the extent of certain plant and animal communities and increased the potential for their endangerment.	The adoption and implementation of the proposed General Plan is not expected to have a significant adverse impact upon biological resources of the area. However, continued urbanization will contribute to ongoing fragmentation and loss of habitat for a number of species. Continued development also has the potential to introduce exotic and other non-native plant species which could be harmful to animals and other plants. Indirect impacts resulting from future development could include increased off-road vehicle use, trash dumping, increased noise, and predation by domestic pets.	The Plan provides a wide range of policies and programs distributed throughout the various elements, which are designed to limit these impacts and take advantage of opportunities for enhancing wildlife habitat whenever possible. The Coachella Valley Association of Governments, in conjunction with the City, other local municipalities and regulatory agencies, is currently developing a Multi-Species Habitat Conservation Plan designed to approach resource preservation from an ecosystem approach. The General Plan strongly supports this effort and others meant to preserve and enhance the City's wildlife resources. The Plan also calls for the payment of developer mitigation fees, where appropriate, in accordance with the Coachella Valley Fringe-Toed Habitat Conservation Plan, to mitigate impacts to this species.

Existing Conditions	Project Impacts	Mitigation Measures
CULTURAL RESOURCES The planning area harbors limited archaeological and historic resources. Where those resources do occur, however, they are important sources of information on the prehistoric culture of the Cahuilla Indians and early settlement of the Desert Hot Springs area. The most important archaeological resources are generally associated with the creosote bush scrub plant community near the foothills of the San Bernardino Mountains, and mesquite hummocks associated with stabilized sand dunes in the southeast planning area. Historic resources are generally associated with the discovery of natural hot mineral water, which provided the impetus for resort/spa development trends that followed.	The adoption and implementation of the proposed General Plan is not expected to result in significant adverse impacts to archaeological or historical resources. Trails, pottery scatters and other resources may be unearthed during construction, however, and should be dealt with on a case-by-case basis.	The General Plan requires the City to develop and maintain a comprehensive cultural resources database utilizing a variety of sources, including data from the Eastern Information Center (EIC) at the University of California at Riverside, General Land Office Survey plats, and future site assessments. Individual development proposals are also required to be reviewed and evaluated to determine potential impacts to identified and suspected cultural resources. If potential resources are discovered during construction, development will cease and professional archaeological shall be employed to examine and document the resources and determine appropriate mitigation measures. The Plan also directs the City to encourage the continuation and expansion of federal and state programs which provide tax and other incentives for the rehabilitation of historically and/or architecturally significant structures.

Existing Conditions	Project Impacts	Mitigation Measures
AIR QUALITY The City and Coachella Valley are primarily impacted by two pollutants: ozone and particulate matter (PM_{10}). Ozone is generated as a product of photochemical smog and relies upon reactive organic compounds for its formation. The Coachella Valley is classified as a "severe-17" ozone non-attainment area under the federal Clean Air Act. Ozone monitoring data indicate that a substantial amount of ozone is produced and transported to the Coachella Valley from communities to the west. PM_{10} is generated by local climatic, geological and mechanical means, including natural sand migration, erosion, grading and site disturbance, and motor vehicle activity. PM_{10} is comprised of fine suspended particles that can pose a significant threat to public health and property. The Coachella Valley is designated a federal "non-attainment" area for PM_{10}. However, monitoring data indicate that PM_{10} emissions have been reduced substantially in recent years, and the region is now being considered for attainment status.	The production of air pollutants is directly associated with the type and extent of development taking place in the community. Site clearing, grading and development are major contributors to the generation of PM_{10}. Traffic, as well as the heating and cooling of homes and businesses also contribute to the emission of air pollutants, both locally and outside the Valley. The proposed General Plan does not appear to result in any significant increases in the generation of air pollutants. Traffic-related impacts, as well as those associated with the development and occupancy of buildings, are comparable to those expected to be generated by the current General Plan. A quantitative analysis of emissions expected to be associated with General Plan buildout is provided in Section III.	The proposed Plan provides for the review of grading and development permits and the provision of all available methods and technologies to assure the minimal emission of pollutants from new developments. The Plan also directs the City to participate with CVAG and SCAQMD in the monitoring of all air pollutants of concern, and to locate air pollution point sources, such as manufacturing facilities, away from residential areas and other sensitive receptors. The Plan also directs the City to pursue programs which reduce construction and operational emissions by regulating project development, and by creating a land use pattern that can be safely and efficiently served by a diversified transportation system. General Plan policies and programs also direct the City to encourage the use of mass transit and carpooling, as well as non-motorized means of transportation.

Existing Conditions	Project Impacts	Mitigation Measures
NOISE The noise environment in the City of Desert Hot Springs can be characterized as relatively quiet, with the primary sources of noise being related to motor vehicle traffic on highways and major arterials. Other sources of community noise include construction and development noise, wind farms, mechanical equipment. To a lesser degree, aircraft traffic associated with the Palm Springs International Airport, and rail traffic on the Southern Pacific rail corridor contribute to the noise environment in the southern portion of the planning area.	The adoption and implementation of the proposed General Plan is not expected to result in significant noise impacts which cannot be adequately mitigated. The major impact will be from roadway traffic, and this impact is limited by the maintenance of a low density and relatively low intensity land use plan. The placement of commercial and industrial uses has been considered in terms of their potential to create adverse noise impacts on adjoining land uses.	The proposed General Plan requires that all existing and proposed development be in compliance with the City's Noise Ordinance, and directs the City to expand the ordinance to include project design guidelines and mitigation measures that can be applied to meet City standards. To address project-specific impacts, the Plan requires that noise attenuation methods be employed where appropriate, including reducing motor vehicle speeds, increasing building setbacks, and constructing noise walls and earthen berms. The Plan also requires that project designs include measures which assure that interior noise levels for residential development do not exceed 45 CNEL, as required by Title 25, California Noise Insulation Standards.

Existing Conditions	Project Impacts	Mitigation Measures
VISUAL RESOURCES The City of Desert Hot Springs and the Coachella Valley are located within a low desert trough or basin created by tectonic forces. Seismic activity continues to spread the valley floor, while raising the surrounding terrain to form the San Jacinto, Santa Rosa, San Bernardino and Little San Bernardino mountain ranges. The two highest peaks that dominate the north end of the Valley are Mt. San Jacinto which rises to 10,804 feet above sea level, and Mt. San Gorgonio which rises to 11,502 feet. The foothills of the San Bernardino Mountains form the western boundary of the General Plan planning area, and foothills of the Little San Bernardino Mountains comprise the northern boundary. The planning area floor consists of small and large-scale alluvial fans, and rocky/sandy washes which drain these mountain ranges. Within the planning area, elevations range from about 580 feet above sea level near the Interstate-10/Palm Drive interchange, to about 2,800 feet in the Little San Bernardino Mountains. Elevated foothill areas in the northern planning area offer excellent views in all directions.	The implementation of the Draft General Plan will have limited impacts on the visual resources of the City and the Coachella Valley. Development that is facilitated by the Plan is largely limited to low density and low elevation residential structures, which will have minimal impact on viewsheds. Under the proposed Plan, the foothills of the San Bernardino and Little San Bernardino Mountains are designated as Open Space/ Mountain Reserve to assure that the natural qualities of these resources is preserved. Although future development in the northwestern planning area could potentially be visible from the I-10 corridor and lower elevations in the valley, much of these lands will be developed as master planned communities, which will benefit from consolidated open spaces and increased building setbacks. The development of Wind Energy Conversion Systems fields in the southwestern portion of the planning area could potentially increase visual clutter. However, these impacts are expected to be limited to short distances and will take a subordinate position in relation to the surrounding landscape.	The proposed Plan mandates continued protection of the City's visual resources and also enhances the City's ability to regulate, control and prevent significant impacts from occurring. It sets in place mechanisms that may reduce the impacts of existing development associated with signage, utility lines and other view-obstructing infrastructure. The Plan also provides for increased control over the development of wind turbines, and recognizes the importance of preserving as open space the surrounding mountainous terrain.

Existing Conditions	Project Impacts	Mitigation Measures
PUBLIC SERVICES AND FACILITIES The City is currently well-served by a full range of public and quasi-public services and facilities. All infrastructure-based services are available in the City, with the exception of portions of the City which are without sewage collection systems. Some unincorporated lands in the planning area are also without sewage and water services. Electrical, natural gas and telephone service is available throughout the City. Police protection is provided by the City, and fire protection is provided through a contract with Riverside County. The Palm Springs Unified School District provides public schools for grades K through 12, and three private schools also serve the community. Domestic water and sewage collection and treatment services are provided by the Mission Springs Water District, and to a lesser extent by the Coachella Valley Water District. The City library is a branch of the Riverside County Library System. Regional healthcare is provided by Desert Hospital, Eisenhower Medical Center and John F. Kennedy Memorial Hospital. Solid waste management services are provided by Desert Valley Disposal.	The adoption and implementation of the proposed General Plan is not expected to generate any significant adverse impacts to public services and infrastructure. Backbone infrastructure and major portions of systems are already in place within the City. Public services such as fire and police protection can be scales up to meet growing demand as the community expands. Area schools have limited available capacity, and are expected to continue to struggle until more secure sources of funding are developed. Continued growth will require the phasing out of septic systems and the expansion of a city-wide sewage system.	The proposed General Plan directs the City to regulate development in such a manner as to encourage the orderly and logical extension of infrastructure. The Plan also encourages close cooperation and coordination between the City and service providers to assure the immediate and long-term availability of facilities and services. The Plan encourages the development and maintenance of impact mitigation programs which assure that development pays its fair share for services and facilities. The City is also directed to assure that development pays all applicable school impact fees prior to the issuance of building permits.

Existing Conditions	Project Impacts	Mitigation Measures
SOCIO-ECONOMIC RESOURCES The City of Desert Hot Springs has developed into an established resort-residential community which provides a variety of affordable housing opportunities, but generally lacks an employment base of adequate size or diversity. The City generally attracts a younger population, and its average household size has increased steadily over the past few decades. The greatest portion of the work force is employed in sales, clerical and administrative, and other service-oriented positions. Analysis of taxable sales data indicates that the City is experiencing a significant leakage of its taxable sales to other communities, which have attracted larger retailers offering a wide range of consumer products. The City's physical isolation from neighboring communities also places it in a unique situation, which will require the City to further evaluate and diversify its economy.	The socio-economic impacts associated with buildout of the proposed General Plan are expected to be positive. To help diversify the local economy, the Plan establishes a mix of commercial, resort-oriented and industrial development scenarios which are intended to optimize existing and planned facilities, services and infrastructure. Inasmuch as future growth will result from continued development and generation of jobs, there is expected to be an overall balance between employment and housing needs.	The proposed General Plan allows the City to maximize its economic development potential, while establishing a balanced and secure economic future. The Plan directs the City to limit leakage of taxable sales by attracting appropriate service providers and large retail chains, to the greatest extent practical. The Plan encourages the City to broaden its tax base by actively soliciting revenue and employment generating development that is compatible with the City's General Plan, and pursuing the expansion of visitor-serving resort sectors, including spa, hotel and golf course resort development. The City is also directed to develop and implement an Economic Development Strategy based on the City's comparative economic advantages. The City's Redevelopment Agency is tasked with continuing to identify and develop strategies to revitalize blighted areas.

CITY OF DESERT HOT SPRINGS

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE COMPREHENSIVE GENERAL PLAN

I. INTRODUCTION AND PROJECT DESCRIPTION

A. Lead Agency

The City of Desert Hot Springs is the lead agency responsible for the preparation of this Environmental Impact Report. The contact person regarding this report is Mr. John D. Criste, AICP, City Planner. The City's mailing address is: 65950 Pierson Boulevard, Desert Hot Springs, California 92240. Telephone (760) 329-6411 or (760) 320-9040.

B. Introduction

This Environmental Impact Report (EIR) has been prepared in conjunction with the preparation of the Comprehensive General Plan for the City of Desert Hot Springs. The EIR is an integral part of the General Plan development process. General Plans and their amendments are considered "projects" under the California Environmental Quality Act (CEQA), and therefore require thorough assessment in the form of an EIR.

This EIR has been prepared to review the environmental constraints and opportunities associated with the adoption of the proposed Desert Hot Springs Comprehensive General Plan. In addition to assessing impacts associated with the City General Plan and instituting mitigation measures, the EIR is designed to be used as an information database to facilitate the streamlining or tiering of the environmental review process for subsequent projects proposed in the City.

This Environmental Impact Report addresses the City, its sphere-of-influence (SOI) and a limited additional planning area. It incorporates technical data collected over a broad area and analyzes General Plan impacts within this context. The EIR summarizes the major goals and policies of the General Plan, as well as the various land use categories set forth therein.
A wide range of environmental issues associated with the implementation of the Desert Hot Springs General Plan are assessed throughout the EIR. These include land use compatibility, traffic and circulation, flooding and drainage, geotechnical and seismic safety, air quality, biological and archaeological resources, and noise impacts. Other areas of concern include the availability of public services and facilities and the socio-economic impacts associated with General Plan implementation.

Section II of this document (Environmental Setting) describes the environmental setting of the region and identifies the environmental resources and constraints within which planning occurs. It also describes existing regional infrastructure, land use patterns and natural resources.

Section III includes a comprehensive evaluation of land and resources specific to the City of Desert Hot Springs and the General Plan study area. It discusses potential impacts to the physical environment associated with the adoption of the General Plan land use designations, and policies and programs. This evaluation includes analysis of population, patterns of development, alterations to the physical environment, and the availability of public services and facilities. Because some aspects of the General Plan may result in significant environmental impacts, mitigation measures are offered, where appropriate, to reduce these impacts to insignificant levels.

The EIR also includes discussions of short-term use and long-term productivity of the affected environment. The irreversible and irretrievable commitment of resources, including water resources, biological habitat and air quality, are assessed to facilitate long-range planning. Growth inducing and cumulative impacts associated with the adoption of General Plan land uses are examined. Possible and appropriate alternative projects are also identified, in addition to other mandated CEQA issues. Finally, in Section IX, persons, organizations and documents consulted or referenced are cited.

C. CEQA and Other Requirements

This Environmental Impact Report has been prepared in accordance with the California Environmental Quality Act (CEQA) Statutes (Public Resources Code Section 21000-21177) and CEQA Guidelines of 1998 (California Code of Regulations Section 15000 et. seq.), as amended. CEQA states that the adoption of a general plan, element thereof, or amendment requires the making of findings concerning the identified significant environmental effects (Title 14, California Code of Regulations Section 15088). The EIR findings must be supported by substantial evidence and must explain how significant effects have been or should be mitigated. Section 15080 of the CEQA Guidelines, 1998 requires the preparation of an initial study (see Appendix A). In the event that potentially significant impacts are identified that may result from the "project," an EIR must be prepared.

This EIR is intended as an informational and analytical document which provides decision-makers, the general public, and other responsible or interested agencies with an objective assessment of the environmental impacts associated with the proposed General Plan. The mitigation measures proposed herein are intended to eliminate or reduce to an acceptable level the environmental impacts associated with the General Plan.
The final EIR and the mitigation measures set forth herein shall become part of the "project" approval and an integral part of the General Plan. If, after completion of the Final EIR, the decision-making body of the City chooses to approve the General Plan without applying any or some of the mitigation measures set forth in the EIR, or in the event of unavoidable significant impacts, then a "Statement of Overriding Considerations" must be prepared, demonstrating that the benefits of the proposed project outweigh the unavoidable significant environmental impacts which may result from implementation of the Plan.

In addition to the City departments responsible for review of the Plan, certain local, state, federal and regional agencies will review and comment on this draft EIR. These agencies include, but are not limited to the California Office of Planning and Research, California Department of Fish and Game, Bureau of Land Management, US Fish and Wildlife Service, Southern California Association of Governments (SCAG), South Coast Air Quality Management District (SCAQMD), and utility providers serving the planning area. Several other public and quasi-public agencies, and private for-profit and non-profit organizations will also review this document.

This EIR is meant to serve at a program level. Additional environmental documentation, such as environmental assessments and environmental impact reports, may be required for specific plans, subdivisions, use plans and other development applications which may be processed by the City.

D. Project Location and Description

1. Project Location

The City of Desert Hot Springs is located in the northwestern extreme of the Coachella Valley in Riverside County (See Exhibit I-1). The City boundaries can generally be described as follows: on the west by the foothills of the San Bernardino Mountains, on the north by foothills of the Little San Bernardino Mountains, on the east by Long Canyon Road, and on the south by Dillon Road, but extending south to Interstate-10 in the central portion of the study area. Also see the Planning Area Map, Exhibit I-3.

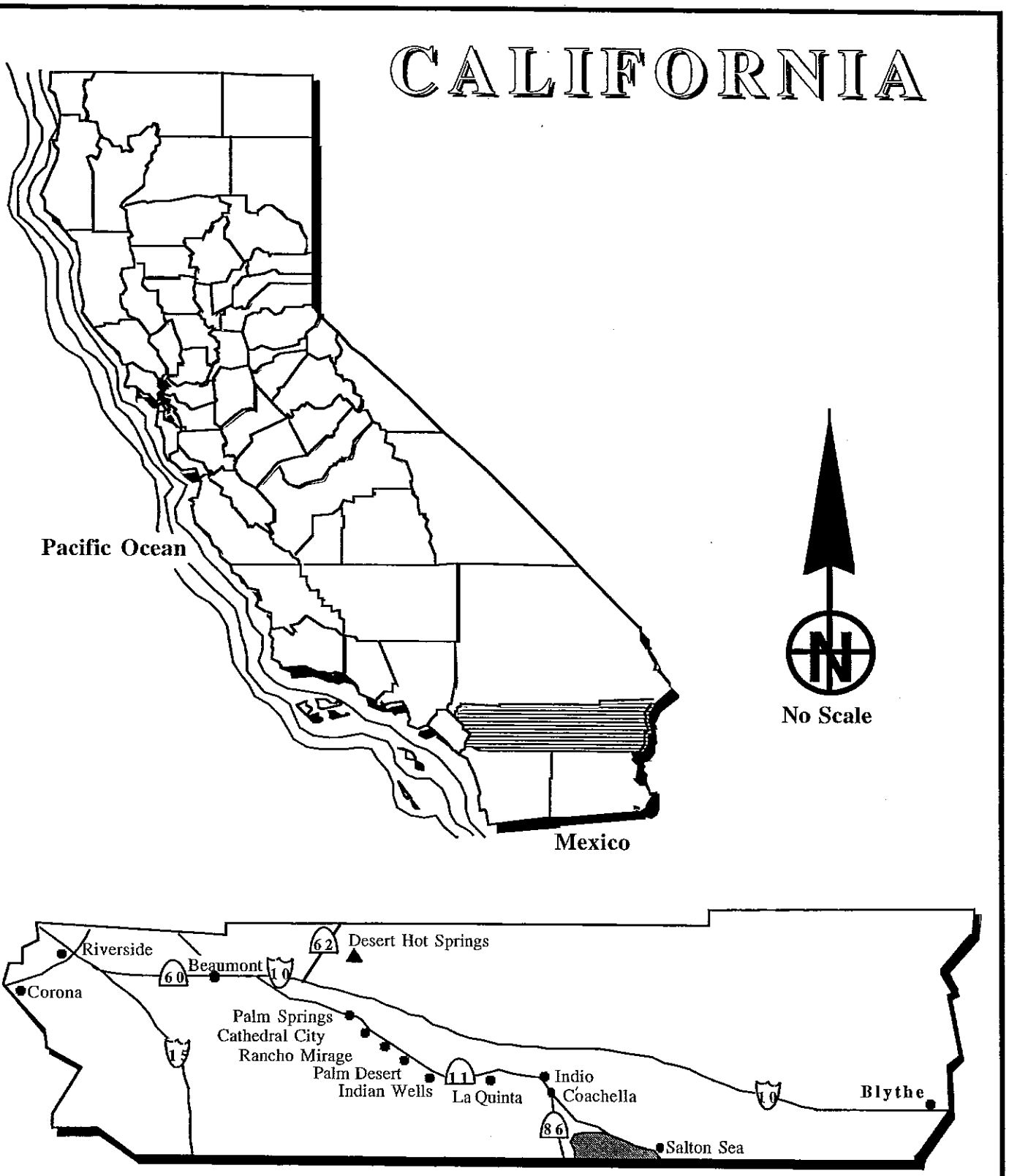
The City of Desert Hot Springs can be specifically described as including: Sections 24, 25 and 36, Township 2 South, Range 3 East; all of Sections 19, 20, 21, 22, 26, 27, 28, 29, 30, 31, 36, and portions of Sections 24 and 25, Township 2 South, Range 4 East; all of Sections 29, 30, 31, 32, 33, and portions of Sections 19, Township 2 South, Range 5 East; portions of Section 1, Township 3 South, Range 4 East; and portions of Sections 5 and 6, Township 3 South, Range 5 East of the San Bernardino Baseline and Meridian.

The General Plan planning area is also comprised essentially of the City's Sphere-of-Influence (SOI), and includes: all of Section 1 and portions of Sections 12 and 13, Township 3 South, Range 3 East; Sections 32, 33, 34, 35, Township 2 South, Range 4 East; all of Sections 2, 3, 4, 5, 6, 11, 12, 13, and portions of Sections 1, 7, 8, 9, 10, 14, 18, 23, 24, 25, Township 3 South, Range 4 East; all of Section 23 and portions of Sections 24 and 25, Township 2 South, Range 4 East; all of Sections 20, 21, 28, 34, and portions of Sections 19 and 27, Township 2 South, Range 5 East; all of Sections 3, 4, 7, 8, 17, 18, 19, and portions of Sections 5, 6, 9, 10, 30, Township 3 South, Range 5 East, San Bernardino Baseline and Meridian. Also see Exhibit I-3.

2. Project Description

The incorporated limits of the City of Desert Hot Springs encompass approximately 23± square miles, with about 32.5± square miles of sphere-of-influence lands. From April through December, 1997, the City's General Plan Advisory Committee (GPAC) held extensive public meetings to discuss overall and specific goals for the community, as well as policies and programs to be included in the Comprehensive General Plan. A detailed assessment of existing land use designations was conducted, and a new set of land use designations was considered in various portions of the City. A final review and approval of the Preferred land Use Alternative was conducted in November, 1999.

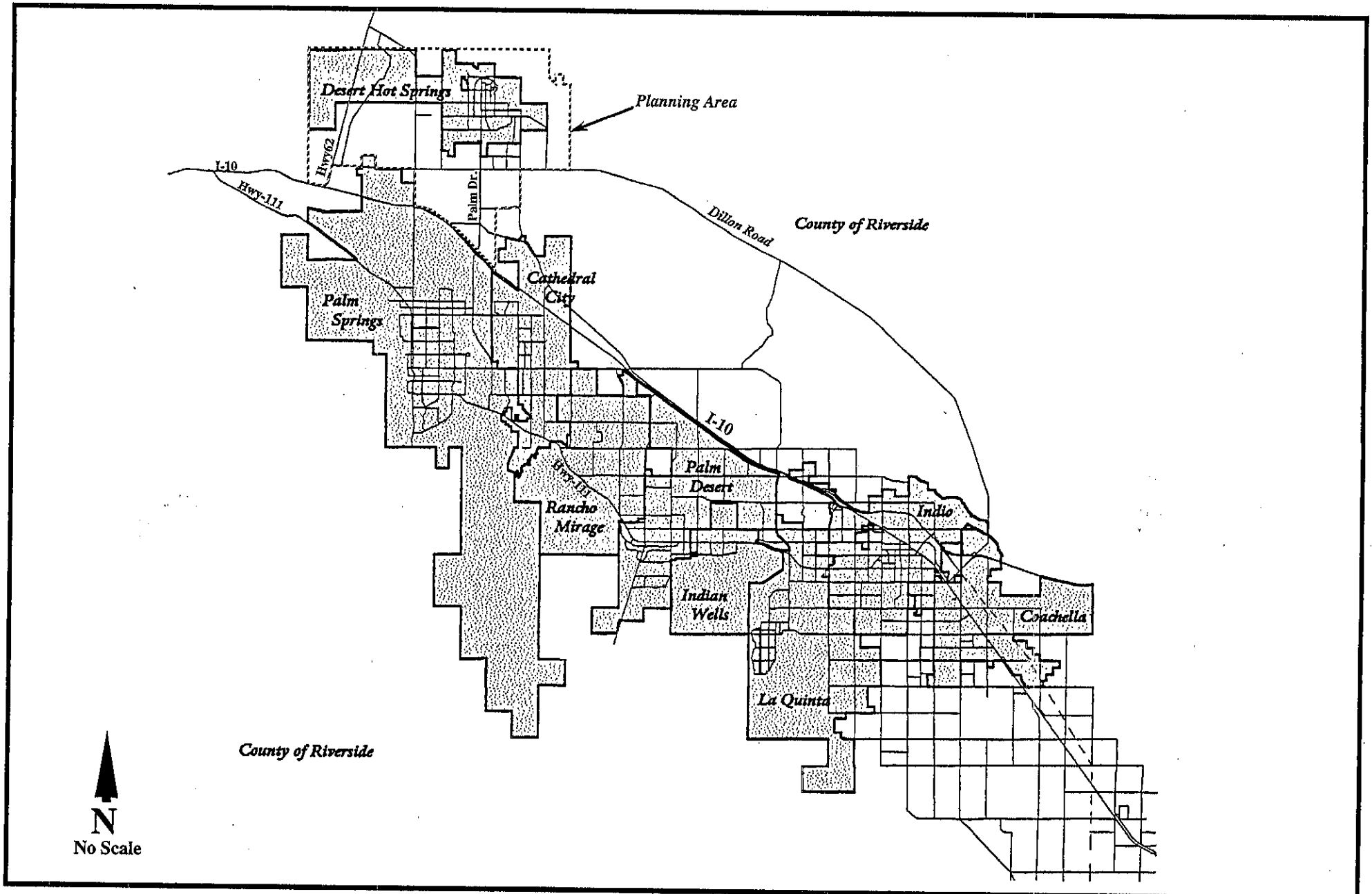
Modifications to the circulation system were also considered to address current and projected traffic volumes on State Highway 62, Pierson Boulevard, Palm Drive, Hacienda Boulevard and other major roadways. The updated Comprehensive General Plan has been conceived as twenty-two (22) elements. Each element includes a purpose and intent statement, essential background and technical information, and relevant goals, policies and programs.



TERRA NOVA®
Planning & Research, Inc.

City of Desert Hot Springs
General Plan
Regional Location Map

Exhibit
I-1

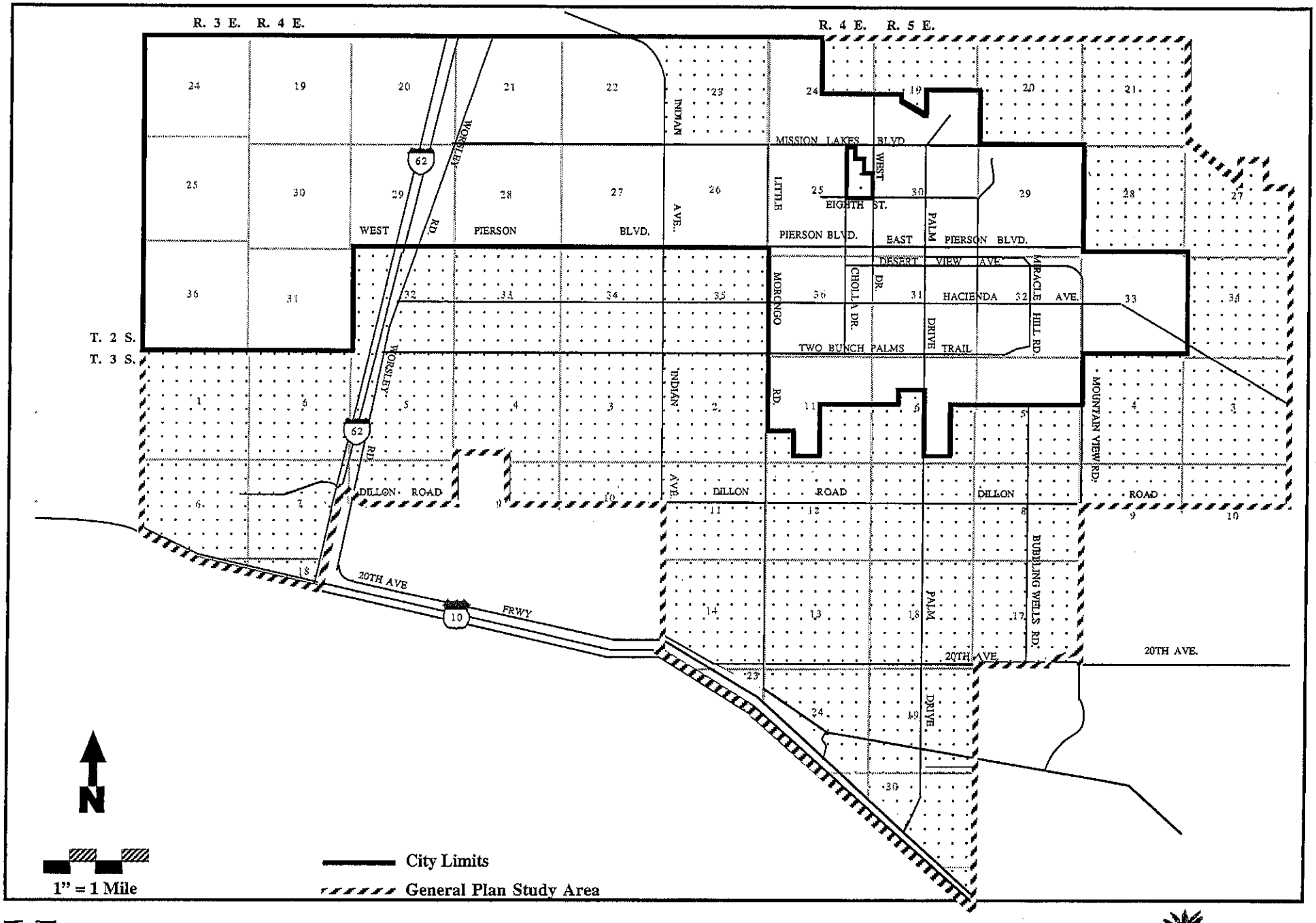


TERRA NOVA®
Planning & Research, Inc.

City of Desert Hot Springs
Vicinity Map

Exhibit

I-2



TERRA NOVA®
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City of Desert Hot Springs
Planning Area Map

Exhibit
I-3

E. Draft General Plan Goals and Policies

The General Plan is designed to provide City officials and the general public with information necessary to make informed decisions. Both the EIR and General Plan serve as the bases for subsequent planning activities, including the preparation of special environmental and planning studies. The following goals and policies set forth the basic parameters for the General Plan.

GENERAL LAND USE GOALS, POLICIES AND PROGRAMS

GOAL 1

A balanced mix of functionally integrated land uses meeting general social and economic needs of the community through simplified, compatible and consistent land use and zoning designations.

GOAL 2

A resort residential community of desirable neighborhoods, a complementary employment base and a variety of community facilities.

Policy 1
The City shall establish and maintain a master land use map designating the appropriate land uses which implement the goals and policies of the Land Use Element and other elements of the General Plan.

Policy 2
The City Zoning Ordinance shall directly correspond to the General Plan land use designations and shall include appropriate zoning regulations that implement the Land Use Element.

Program 2 A
The City shall adopt and maintain a Zoning Ordinance and designations that directly correspond to designations set forth in the Land Use Element, and which guide and regulate development consistent with the General Plan.
Responsible Agency: City Council, Planning Commission, Community Development Department.
Schedule: 2000-01; Revise as needed

Policy 3
The City shall integrate land use analysis and planning as an essential part of development of a master strategic plan for economic development.

Policy 4
Enhance the character and viability of the City's commercial areas, primarily in the Highway 111 corridor, by integrating higher density residential uses with retail and office commercial development.

Program 4 A
The City shall incorporate land use and development standards into the Zoning Ordinance that permit and encourage the appropriate integration of residential uses into mix-use commercial land use areas and zoning districts.
Responsible Agency: City Council, Community Development Department.
Schedule: 2000-01

Policy 5
The City shall assign Specific Plan overlay designations to land located in the City's Sphere-of-Influence to guide and assure an effective and integrated mix of commercial, office, industrial and residential uses.

Policy 6
All land use development proposals shall be consistent with all applicable land use policies and standards contained in the General Plan.

Policy 7
In-fill development shall be encouraged by prioritizing capital improvements in the developed areas of the City.

Program 7 A
The City's capital improvement program shall assign high priority to projects serving the City's developed and developing areas.
Responsible Agency: Public Works Department; Community Development Department.
Schedule: Annually

Program 7 B
The City shall make available maps and other information showing the location of all available infrastructure.
Responsible Agency: Public Works and Community Development Departments, City Council.
Schedule: Continuous

Program 7 C
The City shall utilize Specific Plans to assure the phased, logical and cost-effective extension of infrastructure and buildout in new development.
Responsible Agency: Community Development Department; Public Works Department
Schedule: Continuous

1. Statistical Summary: General Plan Land Use

The General Plan study area and associated environmental analysis address approximately 36,960 acres encompassing the City's corporate boundaries and sphere-of-influence. The General Plan land use maps contained within this document delineate various land use scenarios with different development types and intensities.

The Preferred Alternative land use scenario represents the suggested project alternative, and is addressed in the main body of the EIR. A Preferred Alternative land use map has been prepared, and statistical summaries for this alternative are presented below in Tables I-1 and I-2. Table I-1 identifies the preferred land use designations and defines appropriate development types for each category. Three other land use alternatives, including implementation of the current General Plan (No Project Alternative), a somewhat more intense land use plan, and a less intensive land use plan, are analysed in Section V.

Table I-1
Statistical Summary of Land Uses
GPAC Preferred Alternative

Land Use Category	Density	Acres in City	% Acres in City	Acres in SOI	% Acres in SOI
R-E Residential Estates	0-1 du/varies ac	486	3.3%	3,734	16.8%
R-L Low Density Residential	0-5 du/ac	6,149	41.6%	8,630	39.0%
R-M Medium Density Residential	0-8 du/ac	384	2.6%	88	0.4%
R-MH Residential Mobilehome	0-10 du/ac	48	0.3%	469	2.1%
R-H High Density Residential	0-14 du/ac	1,329	9.0%	0	0.0%
R-VS Residential/Visitor-Serving	0-varies du/ac	797	5.4%	39	0.2%
Residential Subtotal		**9,193**	**62.2%**	**12,960**	**58.4%**
C-N Neighborhood Commercial		73	0.5%	0	0.0%
C-C Community Commercial		40	0.3%	88	0.4%
C-G General Commercial		440	3.0%	401	1.8%
Commercial Subtotal		**553**	**3.8%**	**489**	**2.2%**
I-L Light Industrial		362	2.4%	538	2.4%
I-M Medium Industrial		0	0.0%	1,623	7.3%
I-E Energy-Related Industrial		165	1.1%	1,710	7.7%
Industrial Subtotal		**527**	**3.5%**	**3,871**	**17.5%**
P Public Uses		367	2.5%	286	1.3%
T Transportation		90	0.6%	266	1.2%
Institutional Subtotal		**457**	**3.1%**	**552**	**2.5%**
OS-MR Mountain Reserve		2,432	16.5%	2,884	13.0%
OS-PP Public Parks		223	1.5%	0	0.0%
OS-PV Private Open Space		1,162	7.9%	42	0.2%
OS-FW Floodways		235	1.6%	1,382	6.2%
Open Space Subtotal		**4,052**	**27.4%**	**4,308**	**19.4%**
Total		**14,782**	**100%**	**22,180**	**100%**

Table I-2
Preferred Alternative
Land Use Buildout Statistical Summary

Land Use	Total Acres	Dev. Acres	Exist. Units	Vacant Acres	Potential Units	Bldout Units
R-E Residential Estates (0-1 du/ac)	2,053	375		1,678	1,678	
R-E Residential Estates (0-1 du/2.5 ac)	1,345	148		1,197	478	
R-E Residential Estates (0-1 du/5 ac)	102	0		102	20	
R-E Residential Estates (0-1 du/10 ac)	719	3	3,921*	716	71	48,430
R-L Low Density (0-5 du/ac)	14,779	2,908		11,871	41,548	
R-VSL Vis. Serv. Low (0-5 du/ac)	261	57		204	714	
R-M Medium Density (0-8 du/ac)	472	213		259	1,424	
R-VSM Vis. Serv. Med. (0-8 du/ac)	74	31	2,309**	43	236	19,269
R-H High Density (0-14 du/ac)	1,329	114		1,215	14,580	
R-VSH Vis. Serv. High (0-14 du/ac)	82	22		60	720	
R-MH Mobilehome (0-10 du/ac)	517	275	333	242	2,420	2,753
R-VS Hotel/Motel Rooms (25 rooms/ac)	417	110	[970]	307	[7,675]	[8,645]
Residential Subtotal	**22,150**	**4,256**	**6,563**[1]	**17,894**	**63,889**[1]	**70,452**[1]

	Total Acres	Dev. Acres	Vacant Acres	Existing Sq.Ft.	Future Sq.Ft.	Total Sq.Ft.
C-N Neighborhood Commercial	73	30	43	287,496	412,078	699,574
C-C Community Commercial	128	14	114	134,165	1,092,485	1,226,650
C-G General Commercial	841	180	661	1,724,976	6,334,495	8,059,471
Commercial Subtotal	1,042	224	818	2,146,637	7,839,058	9,985,695
I-L Light Industrial	900	31	869	459,122	12,870,238	13,329,360
I-M Medium Industrial	1,623	116	1,507	1,718,006	22,319,273	24,037,279
I-E Energy-Related Industrial	1,875	906	969	----	----	----
Industrial Subtotal	4,398	1,053	3,345	2,177,128	35,189,511	37,366,639
P Public/Quasi-Public	1,009	581	428	---	---	---
OS-MR Mountain Reserve	5,316	67	5,249	—	—	—
OS-PP Public Parks	223	22	201	—	—	—
OS-PV Private Open Space	1,204	42	1,162	—	—	—
OS-FW Floodways	1,617	214	1,403	—	—	—
Open Space Subtotal	8,360	345	8,015	---	—	—
Total	**36,959**	**6,459**	**30,500**			

* Includes attached and detached single family housing units, as categorized by CA Dept. of Finance, 1999.

** Includes multi-family housing units from two to five-plus, as categorized by CA Dept. of Finance, 1999.

[1] Includes residential dwelling units only; does not include hotel/motel rooms.

Table I-3
City of Desert Hot Springs Draft General Plan
Proposed Land Use Designations

Land Use Designation (Density)	Purpose of Land Use
Residential	
(R-E) Residential Estates (0-1 du/Varies ac)	This designation provides for single-family residential development on lots varying from one to 10 acre minimum in size. This land use provides intermediate steps in development density between more typical open space lands and low residential densities, providing lots sufficient for rural and estate lifestyle yet with room to limit site and environmental impacts.
(R-L) Low Density Residential (0-5 du/ac)	This low density designation provides for single-family residential development on individual lots of not less than 9,000 sq. ft. These lands serve to buffer more dense residential development from estate residential uses and may be appropriate in areas with some site constraints. This designation typically provides for moderately low density single family subdivisions and Planned Residential Developments (PRDs). It serves to transition between lower and more moderate (medium) residential densities. **Planned Residential Developments (PRDs)** are master planned communities which consolidate areas for structures, common open space and recreation areas, and integrate access and private internal roadways. PRDs permit the transfer of densities from open space/recreation areas, thus preserving open space and possibly permitting the development to maximize allowable densities.

	The purpose of PRDs is to promote planned residential development and amenities beyond those expected under conventional development. They are also meant to provide greater flexibility in design and varying ranges in densities, and encourage well planned neighborhoods through creative and imaginative planning. PRDs also provide for an appropriate mix of housing types, which are unique in their physical characteristics to warrant special methods of residential development. A full range of residential development is permitted in PRDs.
(R-M) Medium Density Residential (0-8 du/ ac)	Appropriate residential development under this designation includes single family and PRDs with shared open space, recreation and other amenities. Condominiums, garden apartments and affordable housing may also be appropriate for these lands. The intent of this designation is to encourage development of a wide variety of dwelling unit types.
(R-MH) Residential Mobilehome (0-10 du/ac)	This land use designation is assigned to existing mobilehome parks and subdivisions, and also provides for new mobilehome developments on thoughtfully considered lands. Projects developed under this designation should be integrated, planned developments within a minimum planning area of 2.5 acres, although larger sites are preferred.
(R-H) High Density Residential (0-14 du/ac)	This designation allows for the greatest diversity of residential development, including attached single and multi-family dwellings. This designation is most suitable for planned communities and affordable and senior housing, where smaller units and higher densities may be appropriate. Duplex and multiplex development is the most common and provides for PRD's comprised of a varying range of residential types, including apartments and condominiums. Mobile home parks or

	subdivisions with PRD type development may also be allowed with the approval of a Conditional Use Permit.
(R-VS) Residential-Visitor Serving (Varies du/ac)	This land use designation recognizes the predominant residential character of lands which also include numerous spa-type hotels. It is meant to foster compatible development to serve permanent and seasonal residents, as well as the vacationing public visiting resorts, hotels and motels. To this end, this designation is followed by a suffix (L, M & H) designating permitted residential densities.

Commercial

(C-N) Neighborhood Commercial	This designation provides for neighborhood scale shopping centers conveniently located near residential areas. These developments are typically anchored by supermarkets and super drugstores. A wide range of other uses, including banking, barbers/beauty salons, dry cleaners, restaurants, service businesses, offices and other related activities are typically found in these planned centers. Typical sizes are 8 to 10 acres providing approximately 80,000 to 100,000 square feet of gross leasable floor area.
(C-G) General Commercial	These lands include a wide variety of smaller commercial centers, specialty retail shops, a broad range of clothing and apparel, jewelry stores, and a variety of personal service businesses. Smaller, moderately priced department stores may also be appropriate under this designation. Development may range from free-standing retail buildings, offices and restaurants, to planned commercial centers. Typical sizes range between 2 to 8 acres, with gross leasable square footage varying with uses. Hotels and motels may also be appropriate on these lands.

(C-C) Community Commercial	This designation provides for larger, community scale shopping centers and malls, which may be anchored by several department stores or other large-scale anchors. A variety of retail outlets, and restaurant and entertainment uses are also typical. Hotels and motels may also be appropriate on these lands. Office development may also be an integral part of these developments. Typical sizes range between 100-300,000 square feet or more of gross leasable floor area. This type of development requires approval of a Specific Plan. While smaller than regional facilities, the community commercial center will serve the entire community, as well as the surrounding market area.
(---/SP) Specific Plan Overlay	This designation is used in conjunction with other underlying designations. It requires the development of a Specific Plan of Land Use on parcels or groups of parcels of 40 acres or more. The designation is applied as an overlay on the General Plan Land Use Map and can be added to any land use designation. It is also appropriate as a means of processing community-scale commercial and mixed use development proposals. Specific Plans provide detailed design and analysis of large scale and/or complex projects indicating the distribution, location, and intensity of proposed land uses. They also examine the required level of public facilities and services and their availability, and they should help establish economic viability of proposed developments. Several Specific Plans have been adopted and are be shown on the Land Use Map.

Industrial

(I-L) Light Industrial	This designation provides for business parks and the development of any and all industrial uses operating entirely in enclosed buildings, and those requiring limited and screenable outdoor storage. Examples include clean manufacturing operations, warehousing and distribution facilities, mini-warehouse storage, and a variety of light manufacturing businesses. Siting industrial lands in close proximity to major regional highways is also desirable. Preferred development includes master planned business and industrial parks with integrated access and internal circulation.
(I-M) Medium Industrial	This designation may allow development of more intense industrial uses with the potential to generate substantial levels of noise, smoke, dust, glare, traffic, vibration or other nuisance. Examples include the manufacturing of durable goods such as appliances, furniture, fabricated metal products, and light electrical and transportation equipment. These uses may also have greater dependence on outdoor storage. Proponents will be required to mitigate any adverse impacts to acceptable or insignificant levels, demonstrate conformance with all community environmental standards, and be compatible with existing and planned land uses.
(I-E) Energy-Related Industrial	This land use designation provides for the development of energy producing industries, including windfarms and solar photovoltaic or thermal arrays on an industrial scale. Proposed development must demonstrate compatibility with surrounding uses, and must be especially sensitive to nearby residential development. Other appropriate uses may include those incidental to energy production or

	transmission, as well as those which do not impair development of energy resources, including landscape nurseries and non-structural recreation such as golf courses.
Institutional Services and Facilities	
(P) Public/Quasi-Public	As noted herein and on the Land Use Map, this designation provides for City Hall, other City and governmental offices, libraries, schools, hospitals, police and fire stations, utility substations, as well as other public/quasi-public administrative offices.
Institutional Symbols	
(P/CH)	City Hall
(P/FS) Fire Station	Fire Station
(P/PS) Police Station	Police Station
(P/H) Hospital	Hospitals and similar in/out patient medical services. Also may be assigned to convalescent and skilled nursing facilities.
(P/S)	Provides for educational facilities such as day care, elementary, intermediate, high schools, special schools and technical schools.
(P/L)	Libraries
(P/PO)	Post Offices
(P/U)	Utility Substation- designates electric, gas, telephone, water and other similar facilities.
(T)	Designated major transportation corridors.

Open Space

(OS) Open Space	This designation is assigned to those lands which constitute special, important or valuable natural resources that warrant protection. The designation is assigned to such lands as parks, which carry a designation of OS/PP; golf courses/pool areas/landscaped lands are defined as private open space with a designation of OS/PV. Mountainous areas under public or quasi-public ownership are assigned the designation of Mountain Reserve (OS/MR). The designation allows the discretionary approval of trails, trailheads and associated facilities, but does not allow vehicular access. The Open Space designation may also be used to define special resource areas or those areas that may pose threats or hazards to development. Lands important for their recreational, biological, or regional economic value may also be assigned an open space designation. Examples of resource lands and hazards include ground rupture or liquefaction hazard areas, detention and retention basins, trails, estuaries and large habitat areas for biological resources.
(OS/PP)	Public Parks
(OS/MR)	Mountain Reserve
(OS/PV)	Private Open Space
(OS/FW)	Floodways

CITY OF DESERT HOT SPRINGS

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE COMPREHENSIVE GENERAL PLAN

II. ENVIRONMENTAL SETTING

Introduction

This section of the EIR provides a general introduction to the environmental setting of the Coachella Valley, of which Desert Hot Springs is a part. Issues are discussed from a regional perspective to provide a broad and comprehensive understanding of the issues associated with implementation of the proposed General Plan. Topics discussed include existing and surrounding land use patterns in Desert Hot Springs, regional climate, topography, soils and geology, and biological resources. Also addressed are air quality issues, visual resources, traffic and circulation, cultural resources, and public services and facilities.

The City of Desert Hot Springs conducted an Initial Study in accordance with Sections 15063, 15064, and 15065 of the California Environmental Quality Act (CEQA) Guidelines (see Appendix A). Issues identified as potentially significant in the Initial Study are analyzed in detail in Section III of this document.

A. Existing Land Use

The City of Desert Hot Springs is located in the northwestern portion of the Coachella Valley in Riverside County. The current land use pattern in the City can be best characterized as a low to moderate density residential community, which is traversed east to west by major roads, including Two Bunch Palms Trail on the south and Mission Lakes Boulevard on the north. Major north-south roads include Mountain View Road, Palm Drive and Indian Avenue. The most intense land uses occur along and in the vicinity of Palm Drive and Pierson Boulevard. The incorporated City limits also include an expanse of largely undeveloped desert land which extends west, beyond State Highway 62 to the foothills of the San Bernardino Mountains.

Residential lands comprise the largest land use category in the planning area. Current residential development is predominantly low density attached and detached single family units within planned residential developments and standard subdivisions. A mix of multi-family units, older homes and mobile home parks also comprise part of the existing housing stock. Residential lands of this type (0 to 5 du/ac) encompass approximately 48.8% of incorporated lands, and 39.2% of lands within the unincorporated planning area, which is essentially comprised of the City's sphere-of-influence. Multi-family designations, including mobile home parks, range up to 14 dwelling units per acre, and account for approximately 12% of incorporated lands, and 1.1% of lands in the sphere-of-influence. Very low density residential designations (ranging from 1 du/5 ac to 2 du/ac) comprise the remainder of residential lands, and include approximately 11.3% of lands within the sphere-of-influence.

Commercial lands accommodate a wide range of retail and other commercial services, including retail, hotels, spas, resorts and associated facilities, but account for the smallest number of acres in the planning area. The "Commercial" category comprises the largest block of lands dedicated in this category, totaling about 3.7% of incorporated lands, and 1.5% of sphere-of-influence lands. The next largest category is Spa/Visitor-Serving Commercial, which accounts for about 4% of lands within the city limits. All totaled, commercial lands of every type encompass about 8.3% of incorporated lands, and 1.5% of sphere-of-influence lands.

Lands designated for industrial and manufacturing uses are primarily located along Little Morongo Road, Dillon Road, Indian Avenue, and at the Interstate 10/Palm Drive interchange. These lands account for about 2.4% of incorporated lands and 9.9% of lands within the sphere-of-influence.

Public and Quasi-Public lands include City Hall, the library, schools, fire stations, washes and other public facilities. The current land use designations provides for approximately 3,576 acres in this category, which comprises about 18% of incorporated lands, and 4.1% of sphere lands.

Open Space in the Desert Hot Springs planning area takes several forms, including mountainous and desert areas, private open space including private golf courses, and public parks. The City has approximately 1,567 acres of open space, comprising about 10.4% of incorporated lands. Approximately 7,302 acres of open space are included within the sphere-of-influence.

B. Surrounding Land Uses

Surrounding land uses are under the jurisdiction of Riverside County, with a limited area in the southwest portion of the planning area being under the jurisdiction of the City of Palm Springs. Along the City's western boundary, Riverside County lands are designated as Mountainous Areas within the foothills of the San Bernardino Mountains, and Desert Areas in low-lying areas at the base of the mountains.[1] Lands slightly further west are designated for Water

Resources, a designation which encompasses the Whitewater River. Current land uses west of the planning area are consistent with these designations and include the rugged, undeveloped foothills of the San Bernardino Mountains, the Whitewater River, and desert open spaces. Lands north of the planning area consist of similar undeveloped, mountainous terrain. Riverside County land use designations north of the General Plan planning area include Mountainous Areas within the Little San Bernardino Mountains, Desert Areas at the base of the mountains, and areas designated for Water Resources along Mission Creek and Morongo Wash. Lands to the immediate northwest are designated for Resort Development but are currently undeveloped.

Adjoining Riverside County lands to the northeast of the planning area include Mountainous Areas, with low density residential and limited Commercial lands to the immediate east and southeast. These lands are largely undeveloped, with scattered low density residential development occurring in a rural environment. Lands south of the city limits are designated by the County for commercial, a mix of residential, industrial and water resources

Lands south of Dillon Road, west of Indian Avenue and east of State Highway 62 are incorporated lands of Palm Springs or occur within that City's sphere-of-influence.[2] A quarter-section north of Dillon Road is also located within the Palm Springs city limits. Most of these lands are designated for windfarm, industrial and related development, with the exception of land designated for commercial uses at the northwest corner of Interstate 10 and Indian Avenue, and scattered residential lands.

Palm Springs lands immediately south of Interstate-10 include Highway Commercial at the Indian Avenue/I-10 and Gene Autry/I-10 interchanges. Garnet Hill is designated as Conservation lands, however, lands to the east, between I-10 and the Union Pacific Railroad lines are designated for industrial development. Palm Springs lands further south and including portions of the Whitewater River have limited industrial, Conservation and Desert designations. Current land uses at Interstate-10 interchanges include commercial development, with limited light industrial uses south of the Interstate-10/Indian Avenue interchange.

C. Topography

The physical character of Desert Hot Springs and the surrounding Coachella Valley is significantly affected by extreme topographical features, ranging from a sub-sea level geologic sink to mountain peaks rising two miles above sea level. The Salton Sea is located at the southeast end of the Valley and occurs at an elevation of about 228 feet below sea level. At the northwestern end of the Valley are the San Jacinto and San Bernardino Mountains, with peaks ranging from 9,600 to more than 11,000 feet above sea level. These mountains shield the valley from western maritime wind flows and focus prevailing winds into the narrow San Gorgonio Pass, immediately southwest of the General Plan planning area. This Sonoran desert environment is comprised of large and smaller scale alluvial fans and a valley floor with sand dunes, sand fields, and rocky, sandy washes that drain the surrounding mountains.

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1 "Western Coachella Valley Plan," County of Riverside, adopted December 31, 1995, amended through May 1995.

2 City of Palm Springs General Plan Land Use Map, April 22, 1997.

The planning area varies greatly in elevation and topographic features. Elevations range from approximately 2,800 feet above mean sea level in the extreme northeast portion of the planning area, within the Little San Bernardino Mountains, to about 580 feet above sea level at the southernmost point of the planning area, near the Interstate-10/Palm Drive interchange. With the exception of the foothills of the San Bernardino and Little San Bernardino Mountains, the slope across the planning area is relatively even and consistent.

The topography of the planning area provides a variety of development constraints and opportunities. The higher elevations of developable portions of the planning area provide spectacular views of the Coachella Valley and local mountains. In addition to the San Bernardino and Little San Bernardino Mountains, other mountain ranges visible from the City include the San Jacinto Mountains to the south and southwest, and the Santa Rosa Mountains to the south and southeast.

D. Climate

The Coachella Valley has a subtropical desert climate characterized by high amounts of direct sunshine, high summer daytime temperatures, low rainfall, low relative humidity and cool nights. Maximum daytime temperatures can reach 125° Fahrenheit on the desert floor, while winter nights can fall to sub-freezing temperatures.

The planning area includes the foothills of the San Bernardino and Little San Bernardino Mountains, which are generally cooler than the valley floor, averaging an approximate 5 F° decrease in temperature for every 1,000 foot rise in elevation. Given the varying topography of the planning area, temperatures at higher portions of the planning area will be slightly cooler than temperatures at lower elevations.

The National Oceanic and Atmospheric Administration (NOAA) monitors regional rainfall through gauges located in Palm Springs and Indio. Thirty years of data indicate mean annual rates of precipitation of approximately 3 inches in Indio and 5.33 inches in Palm Springs. The Coachella Valley typically receives rain from weak frontal storm systems which usually occur during winter months, from November through March. The majority of precipitation generated by these storms falls on mountain slopes, resulting in generally higher rainfall in the western and northern portions of the planning area.

Due to its unique physiographic characteristics, the Coachella Valley can experience gusty wind conditions which produce severe dust storms. The extreme aridity of the region and the coastal air masses which are funneled through the San Gorgonio Pass create strong winds that pass through the valley, transporting large quantities of sand. High-wind situations occur primarily in the spring months of April through June. A considerable amount of land in the southern and western portions of the planning area is included within the wind resource area, as designated by the San Gorgonio Wind Resources Study.[3] However, only a limited portion

[3] Wagstaff and Brady with Robert Odland Associates, "San Gorgonio Wind Resource Study,

of the planning area in the vicinity of the I-10/Palm Drive interchange is located within the boundaries of the "Blowsand Hazard Area," as designated in the Riverside County Comprehensive General Plan.[4]

E. Hydrology

Most of the precipitation in the Coachella Valley occurs during the cooler months, from November through March. However, occasional high-intensity thunderstorms and tropical storms can occur between mid-summer and early fall.

Due to the lack of vegetation and the composition of regional soils, high-intensity precipitation events in the desert tend to result in substantial runoff. Although the ground may be generally dry at the beginning of a storm, sufficient amounts of rainfall can saturate the surface, reducing percolation and increasing runoff. Overland flow, which occurs when rainfall intensity exceeds the infiltration capacity of the soil, is especially predominant on hillsides and paved urban areas. Given the hillside terrain in the extreme western and northern portions of the planning area, overland flow and flooding are issues of concern.

The Federal Emergency Management Agency (FEMA) publishes Flood Insurance Rate Maps (FIRM) which depict varying degrees of potential flood hazards for developed or developing areas of communities throughout the United States. FIRM maps serve as the basis for determining the need for federal flood insurance and assist local governments in providing for safe land use and floodplain development. The frequency of flooding on a particular site is often discussed in terms of the "base flood," also referred to as the 100-year flood, which has a one percent probability of occurring in a given year. FIRM maps designate lands located within the 100-year floodplain.

According to FIRM maps for the City of Desert Hot Springs, flooding and inundation may occur in the SOI immediately north of Interstate-10, with varying depths and velocities of flood waters. Extensive portions of the planning area are also located between the 100 and 500-year flood zones and are susceptible to 100-year flooding at depths of less than one foot. These areas occur within much of the City's urban core and outside the major drainages.

The Riverside County Flood Control District is responsible for the management of regional drainage within and in the vicinity of the City of Desert Hot Springs. The still current 1982 Master Drainage Plan for the City was prepared by the District. Major drainages in the planning area include Mission Creek, Big Morongo Creek, Little Morongo Creek, Blind Creek and Long Creek. These drainages are substantial in area and have the potential to convey substantial volumes during major storms. A more detailed discussion of flood control improvements in the planning area is provided in Section III-D of this document.

Environmental Impact Report/Statement #158," Riverside County and the Bureau of Land Management, March 1982.

4 Environmental Hazards and Resources Element, "Riverside County Comprehensive General Plan," Riverside County Planning Department, adopted March 6, 1984 and revised June 3, 1993.

F. Soils and Geology

Seismicity

The Coachella Valley and surrounding region are susceptible to a wide range of hazards associated with geotechnical conditions. The City of Desert Hot Springs is located within and is a part of the northwestern extension of the Salton Trough, which has been formed by the landward extension of the East Pacific Rise ridge and fault system. This spreading ridge is creating new surface crust and is responsible for separating Baja California from mainland Mexico and creating the Gulf of California, the Imperial Valley, and the Coachella Valley. This spreading action is also responsible for moving the Pacific Plate to the northwest relative to the North American Plate, resulting in the generation of earthquakes that occur in Southern California.

Recent analysis indicates that far too few earthquakes have occurred in Southern California in the last 200 years to account for the rate of movement between the Pacific and North American plates. The data suggest that the region will be subject to either numerous moderate earthquakes (such as the Northridge quake of 1994) or a few larger (Magnitude 7.2 or larger) earthquakes.

The City of Desert Hot Springs is located on or near several active faults, including the Mission Creek and Banning branches of the San Andreas Fault. The Mission Creek Fault passes through the eastern and most heavily populated portion of the City, while the Banning Fault is located in the City's southern sphere-of-influence and passes near the extreme southwest corner of the city limits. Historic events along the San Andreas Fault include a magnitude 8.0 event in 1857, a magnitude 6.3 event centered in the Imperial Valley in 1984, and a 5.9 event along the Banning Fault in 1986.[5] In April 1992, a 6.1 event and several large aftershocks occurred along the Dillon Fault, nine miles east of Desert Hot Springs.

In addition to the direct effects of an earthquake, such as ground rupture and ground shaking, portions of the planning area are also vulnerable to other seismically induced geologic effects, including liquefaction, settlement and slope instability. These occurrences will be discussed in more detail in Section III of this document.

Soils

Geotechnical constraints in the planning area are also affected by the characteristics of the rocks and sediments that lie beneath the area. These are primarily comprised of Holocene (deposited within the last 11,000 years) surficial sediments, active channel deposits, and alluvial fan deposits. The prevailing alluvial sediments are underlain by a thick section of semi-consolidated and consolidated sedimentary rock of terrestrial and marine origin. The semi-consolidated units are exposed primarily in the western portion of the planning area, in the Whitewater Hills and Painted Hills.

5 AAKO Geotechnical Consultants, "1989 Geotechnical Engineering Assessment Planned 2,240-Acre Parcel West of Desert Hot Springs, Riverside County California," July 20, 1989.

Valley floor sediments can be classified as either stream-deposited (alluvium) or wind-deposited (aeolian) sand. The windblown deposits consist of reworked alluvium which has been picked up by strong winds and redistributed as silty, fine and medium-grained sands. These deposits have accumulated and formed a broad, elongated, southeast trending ridge in the southeast portion of the planning area. This dune system extends southeast into Willow Hole and rises as much as 130 feet above the surrounding desert floor.

Soils deposited on the valley floor are underlain by consolidated and semi-consolidated sedimentary rock, which are underlain by bedrock similar to that exposed in the Santa Rosa and San Jacinto Mountains. The only exposed semi-consolidated sedimentary unit is the Ocotillo Conglomerate, which can be seen on Edom Hill and Flat Top Mountain, where it has been uplifted as a result of movement along the Banning Branch of the San Andreas Fault and the Garnet Hill Fault. In the Edom Hill area, the Ocotillo Conglomerate is approximately 2,400 feet thick.

Portions of the San Bernardino and Little San Bernardino Mountains within the General Plan planning area are comprised primarily of 6 to 12 million year old deposits of the Painted Hills formation and the Imperial formation. The bedrock which comprises these mountains consists of distorted schist and gneiss, which is intruded by granitoid rock. Additional discussion of the geologic units underlying the planning area is provided in Section III-C.

G. Water Quality/Resources

Analyses by the US Geological Survey and the California Department of Water Resources of groundwater basins underlying the Coachella Valley have determined that these basins are separated into distinct subbasins and subareas within subbasins.[6] However, fault barriers that create constrictions in the basin profile, and areas of low permeability, limit and control the inflow and movement of groundwater. The first 1,000 feet of the Ocotillo Conglomerate and other water-bearing fill that has eroded into the fault-controlled valley floor comprise a storage capacity of more than 39 million acre feet (one acre foot equals about 327,000 gallons).[7]

Domestic Water Resources

Domestic water resources are provided to the City and its sphere-of-influence primarily by the Mission Springs Water District (MSWD). A limited area of the City's southern SOI is located within the service area of the Coachella Valley Water District (CVWD). Both agencies utilize wells to extract groundwater from the Mission Creek subbasin. The subbasin is currently recharged by natural sources, including precipitation and runoff from the San Bernardino and Little San Bernardino Mountains. MSWD, in cooperation with the Desert Water Agency, is actively developing facilities which will provide additional groundwater recharge to the Mission Creek subbasin through imported water transported by the Metropolitan Water District aqueduct, which passes through the west end of the City and its sphere-of-influence.

6 "Engineer's Report on Water Supply and Replenishment Assessment 1998/1999." Prepared by Water Resources Branch, Engineering Department, Coachella Valley Water District. April 1998.

7 Ibid.

That portion of the City and SOI occurring south of the Banning Fault is underlain by the Garnet Hill Subbasin. However, neither the Mission Springs Water District nor the Coachella Valley Water District currently produces water from this subbasin.

Mission Creek Subbasin

The Mission Creek Subbasin is bounded on the south by the Banning Fault and on the north and east by the Mission Creek Fault. On the west are the non-waterbearing rocks of the San Bernardino Mountains, and to the southeast are the Indio Hills. The basin is underlain by water-bearing Ocotillo Conglomerate and Cabazon Fanglomerate deposits.

Within the subbasin, groundwater flows in a generally southeasterly direction, breaking out at or near the surface along the Banning Fault in the vicinity of 20th Avenue and at Willow Hole just east of Mountain View Road. The subbasin is currently in an overdraft condition of about 2 feet per year.

Water levels were determined in 1971 to range from a maximum of 425 feet in the northwestern portion of the subbasin, to flowing wells in a narrow strip along the Banning Fault northwest of Seven Palms Ridge.[8] Historic water level readings indicate that a general rise occurred between 1938 and 1952, while a steady decline of approximately 0.5 to 1.5 feet per year has occurred since 1952.[9]

Garnet Hill Subbasin

Portions of the City and its sphere-of-influence are underlain by the Garnet Hill Subbasin, which is bounded by the Banning Fault on the north and the Garnet Hill Fault on the south. Both faults act as effective barriers to groundwater movement; however, given that the Garnet Hill Fault does not reach the ground surface, it is probably effective as a barrier to groundwater movement only below depths of about 100 feet.[10] The Garnet Hill subbasin is estimated to have a storage capacity of approximately 1 million acre-feet, with an estimated 100,000 acre-feet in storage within the first 60 feet of the water table. Although the subbasin is partially recharged by Mission Creek and other streams, the primary source of recharge is the Whitewater River through the permeable deposits which underlie Whitewater Hill.

Geothermal Resources

Geothermal waters (hot mineral waters) have been an important community asset that has stimulated spa hotel and other development in the City and vicinity. The Desert Hot Springs Subbasin is the primary source of geothermal waters in the City and its sphere-of-influence. Geothermal waters ranging in temperature from 23 to 93° C (76 to 200° F) occur along the San Andreas Fault Zone, specifically along the Mission Creek Fault. These waters are used solely for spas and mineral baths rather than as a source of potable water.

8 Ibid.

9 Ibid.

10 Ibid.

Over time, as the San Andreas Fault Zone shifts and spreads, the valley has widened and extended. This process has generated even higher thermal water temperatures in the Salton Sea area and has allowed for the exploitation of these waters for large-scale electrical power production.

Water Quality

Water quality in the Coachella Valley is generally good to excellent. Groundwater contamination associated with long-term discharge from on-lot septic systems has resulted in some deterioration of water quality in some portions of the Coachella Valley. However, nitrate levels within the Desert Hot Springs area continue to fall within normal limits, and Mission Springs Water District has indicated that water quality in the planning area has not been adversely affected by the use of individual septic systems. Groundwater inflow and surface runoff from the Little San Bernardino Mountains is also known to transport undesirable mineral constituents into the lower southerly portion of the Mission Creek subbasin.[11] Water extracted from the Mission Creek Subbasin has won numerous awards for its outstanding taste.

H. Biological Resources

The Coachella Valley and City of Desert Hot Springs are located at the western edge of the Colorado Desert sub-unit of the Sonoran Desert. The San Jacinto, San Bernardino and Santa Rosa Mountains effectively isolate the Coachella Valley region from moderating coastal influences from the west. As a result, the region is characterized by extremely hot daily temperatures during the summer, mild winters, low humidity and low mean annual rainfall.

The desert floor supports sparse vegetation which is limited by heat and aridity. However, the regional climate becomes milder with increasing elevation, and regional mountain slopes are capable of supporting more vegetation. Canyons and springs support native fan palm communities and a wide variety of other plants and animals. The various habitat types supported in the General Plan planning area are briefly described below.

Habitat Communities

The southernmost portion of the planning area is comprised of sand dune and sand field habitat, which is dominated by shifting, windblown sand that supports sparse vegetation. The most common plant community found in this habitat is the Sonoran Desert creosote bush scrub, which includes creosote bush, burro bush, brittlebush and desert Brickellia. Blowsand habitat is critical to a number of special-status species, including the Coachella Valley fringe-toed Lizard, flat-tailed horned lizard, flat-seeded spurge and Coachella Valley milkvetch.

The majority of the planning area consists of alluvial plain habitat, which occurs on flood-formed fans and bajadas that extend from canyon mouths to the desert floor. These habitat areas are formed by several mountain drainages in the planning area, including Long Canyon, Little and Big Morongo Canyon, Blind Canyon, Mission Creek and smaller canyons which

11 Ibid.

form alluvial fans and terraces. Plants supported by alluvial plain habitat include a variety of cacti and woody and herbaceous plants, including several species of cholla, hedgehog cactus, indigo bush, jojoba, desert lavender, burrobush and the Little San Bernardino Mountains gilia.

Sandy wash habitat is formed as washes emerge from canyon mouths, cutting channels into the alluvial plain, which broaden and branch out into intertwined or braided washes. The largest desert washes in the planning area include Mission Creek, Big and Little Morongo Washes, and Long Canyon Wash. Although a wide variety of species occupy the sandy washes, only a limited number are consistently associated with this habitat. These include palo verde, cat claw, smoketree and honey mesquite.

The Desert Fan Palm Oasis Woodland is a plant community that has been designated as one of the highest inventory priority by the California Department of Fish and Game. This community is characterized by open to dense groves of native desert fan palms (*Washingtonia filifera).* Two impressive examples of this plant community occur within the Two Bunch Palms Resort and Seven Palms Valley Ranch (Desert Dunes Country Club). Wildlife associated with the desert fan palm woodland includes the common kingsnake, western yellow bat, Cooper's hawk and prairie falcon.

Upland and rocky slopes habitat occurs in the extreme western and northern portions of the planning area, within the foothills of the San Bernardino and Little San Bernardino Mountains. Rocky slopes habitat is characterized by unrelieved rock, which has been extensively weathered and fractured. This habitat supports a large number of perennials and annual plant species, including creosote bush, brittlebush, agave and ocotillo.

Sensitive Plant and Animal Species

The Coachella Valley and City of Desert Hot Springs are host to a wide variety of sensitive plant and animal species, some of which have been listed as threatened or endangered by the state and federal governments. Most notable of these are the Coachella Valley fringe-toed lizard, desert tortoise, Little San Bernardino Mountains gilia, and Coachella Valley milkvetch.

Regional Biological Resource Areas

Various governmental organizations and public/quasi-public agencies have established biological resource areas in the Coachella Valley. The Willow Hole/Edom Hill Area of Critical Environmental Concern (ACEC) is located approximately one mile southeast of the sphere-of-influence and serves as an important land preserve for the Coachella Valley fringe-toed lizard and other sensitive species. This and other resource area is described in more detail in Section III of this document. Other biological resource areas in the planning area include Joshua Tree National Park, which is managed by the National Park Service, and the Big Morongo Canyon Preserve, managed by the U.S. Bureau of Land Management.

I. Cultural Resources

Cultural resources in the Coachella Valley include Native American settlements that were established before and after the arrival of European-Americans, as well as historical structures and features that were built and used as early as the 1700's by European settlers.

Pre-European Period

Based upon the current knowledge of artifacts and habitation sites dating back approximately 12,000 years, archaeologists have divided the pre-European epoch into five periods: Early Man Period, Paleo-Indian Period, Early Archaic Period, Late Archaic Period and Late Prehistoric Period. The earliest prehistoric periods were characterized by the use of large stone points for the hunting and processing of large iceage mammals. As the climate and food resources changed, local inhabitants began using smaller projectile weapons to hunt smaller game. This period involved substantial migration of people. About 4,000 years ago, cultural complexity and variation improved, and stone tools became more sophisticated, thereby allowing for the processing of seeds and grains.

By about 1,500 years ago, the milling of food stuffs continued. The bow and arrow were introduced around this time, facilitating additional hunting opportunities. During the latest period, from around 1200 to just before European contact in the 1700's, local inhabitants traded extensively with tribes of the Colorado River and learned to make pottery for cooking and food storage. Archaeological evidence indicates that numerous settlements and other cultural sites were established throughout the Coachella Valley. Among these sites were villages, milling sites used on a seasonal basis to process food materials, lithic workshops for making stone tools and weapons, and artistic and religious rock sites.

Cahuilla Culture

The Desert Cahuilla are the most recent identifiable native culture to evolve in the Coachella Valley region. They are generally divided into three groups: the Pass Cahuilla of the Banning-Beaumont area; the Mountain Cahuilla of the San Jacinto and Santa Rosa Mountains; and the Desert Cahuilla from the Coachella Valley and as far south as today's Salton Sea. Each clan, or lineage, had its own food harvesting areas, ceremonial house and lineage chief, but a number of lineages are known to have cooperated with one another for political and economic purposes.

The Desert Cahuilla had many villages throughout the Coachella Valley, including those associated with Ancient Lake Cahuilla, which evaporated around A.D. 1500. With the lake's disappearance, mountains and canyons became more important sources of water, food and fiber.

The first Cahuilla contact with Europeans occurred during the 1770's, when Spaniards crossed through Cahuilla territory in search of new land routes between Mexico and northern California.[12] During the 1860's, European disease, to which the Cahuilla had no immunity, decimated the Cahuilla population, which declined from an estimated 6,000 to 10,000 people to only 2,500 individuals.[13] Review of archaeological site surveys indicates that there is evidence of Native American activity in the Seven Palms Valley Ranch and in the Willow Hole area of the Indio Hills, immediately southeast of the General Plan planning area.

The Cahuilla continue to inhabit parts of the Coachella Valley today. A community of Cahuilla lives on the Agua Caliente Reservation, portions of which are located in the cities of Palm Springs, Cathedral City and Rancho Mirage.

European History of the Region

The Coachella Valley region was first explored by Spaniards making forays northward from Mexico to the Pacific Coast and the Colorado River. The earliest documented period of Spanish influence began in 1769 when explorers moved into what was then referred to as Upper California to establish a military, political and religious stronghold. By the 1770's, explorers entered the Coachella Valley region in search of easily passable supply routes from Mexico to colonies in northern California.

The United States defeated Mexico in 1848 in the Mexican-American War and gained control of California. At the same time, the discovery of gold and the appeal of cattle ranching led to an influx of new settlers. California was admitted into the Union in 1850. The first U.S. Government land surveys of the Coachella Valley were made in 1855-56 by surveyors Henry Washington, John La Croze and James McDonald, who observed a number of trails and roads crossing through the region. The arrival of permanent settlers in the Desert Hot Springs area is associated with the discovery of hot mineral waters by Cabot Yerxa. Yerxa was successful in interesting land developers in the resort potential of these hot springs, and the town of Desert Hot Springs experienced most of its early growth in the 1940s.

J. Visual Resources

Among the Coachella Valley's most valuable assets is its exceptional mountain and open space views. The Valley is flanked by the San Jacinto Mountains to the west, the San Bernardino and Little San Bernardino Mountains to the north, and the Santa Rosa Mountains to the south, all of which were created by complex geological forces. The resulting viewsheds include contrasting mountain scenery and vast expanses of desert on the valley floor.

The San Jacinto Mountains are located approximately three miles southwest of the General Plan planning area. This mountain range extends from its highest elevation at Mt. San Jacinto at the extreme north, southward to the Santa Rosa Mountains. Mt. San Jacinto is the highest peak in the range, reaching an elevation of 10,804 feet above sea level.

12 "The Cahuilla," Lowell John Bean and Lisa Bourgeault. Chelsea House Publishers, 1989.

13 Ibid.

The San Bernardino Mountains form the western boundary of the planning area. San Gorgonio peak is the highest peak in the region and rises to an elevation of 11,502 feet. The Little San Bernardino Mountains comprise the northern boundary of the planning area, and the northern and northeastern boundary of the Coachella Valley. This mountain range provides aesthetically attractive viewsheds that give the Coachella Valley its unique character.

Edom Hill, Flat Top Mountain and other features of the Indio Hills are located southeast of the planning area and contribute to the City's visual assets. These hills stand at more than 1,000 feet above the valley floor, and provide a vivid display of color in the late afternoons and, with the exception of the Indio Hills, are occasionally blanketed with snow during winter storms.

K. Air Quality

Regional air quality is measured by the amount of pollutants emitted and dispersed, and climatic conditions that may reduce or enhance the formation of pollutants. In the Coachella Valley, the responsibility for establishing criteria by which air quality is measured lies with the South Coast Air Quality Management District (SCAQMD).

The air quality of the Coachella Valley and City of Desert Hot Springs is generally considered good, particularly when compared to other areas of Southern California. Nonetheless, in the past few decades, noticeable deterioration of air quality has occurred due to increased development and population growth, traffic, construction activity and various other site disturbances. It is apparent that, although some air pollutants are emitted from various sources in the Coachella Valley, the most evident degradation of regional air quality can be attributed mainly to sources outside the area, including the Los Angeles County and San Bernardino/Riverside air basins.

Ozone and PM_{10} (see below) are the most prevalent air pollutants in the Coachella Valley. Other pollutants are not believed to constitute significant threats to public health. Regionally representative air quality measurements are routinely taken for PM_{10} and ozone, with monitoring conducted in Indio and at the Palm Springs International Airport. The Desert Hot Springs area is expected to occasionally exceed the state standard for ozone (0.09 ppm/hr) and to less frequently exceed the federal standard (.12 ppm/hr).
Suspended particulate matter is the most serious air quality issue faced by the City and the region, with levels occasionally exceeding both state ($>50\mu g/m^3$ or 50 micrograms per cubic meter) and federal ($>150\mu g/m^3$) standards for especially small particles of 10 microns or smaller; these pollutants are known at PM_{10}. The Coachella Valley region is currently classified as a federal "nonattainment area" for PM_{10}. However, recent monitoring data indicate that substantial improvements in PM_{10} emissions have been made over the past several years, and the region is now eligible for reconsideration by the U.S. EPA having attained the federal PM_{10} standard. The EPA is expected to issue its opinion regarding attainment status in the year 2000.

L. Noise

Excessive noise levels can cause temporary, as well as permanent physical damage and psychological distress in many people. Some examples of noise related damage are incremental hearing loss, and noise related stress, including sleep disruption and anxiety.

The most common sound range for human exposure is between 40 dB (very quiet) and 100 dB (very loud). Conversation at three feet is roughly at 60 dB, while loud engine noise, which can cause discomfort, equates to about 100 dB. Community noise impacts are commonly evaluated using the Community Noise Equivalent Level (CNEL) noise index, which reduces the combined effect of daily noise exposure to a single number. The value computed by this method is the sum of the decibel values of the sound, averaged over 24 hours, with corrections for time of day.

In general, the existing noise environment in the City is typical of a low density residential development with major vehicular corridors. The principle sources of vehicular noise are local arterials and highways, including but not limited to Interstate-10, State Highway 62, Pierson Boulevard, Palm Drive and Indian Avenue. Lands in the southernmost portion of the planning area, in vicinity of Interstate-10, may experience moderate noise intrusions resulting from freight train operations on the Southern Pacific Railroad and overflights from the Palm Springs International Airport. These impacts are addressed further in Section III.

M. Traffic/Circulation

Several major roadways serve the Coachella Valley, including US Interstate-10 which connects the valley with the Los Angeles, San Bernardino and Riverside metropolitan areas to the west, and the Phoenix region to the east. State Highway 62 is a north/south trending four-lane, divided highway which passes through the General Plan planning area and connects the Coachella Valley to communities in the Morongo Basin and high desert. Other major roadways that accommodate regional traffic include Highway 111, an intra-valley road which extends from Palm Springs to the Imperial Valley to the southeast, and Highway 86 which connects eastern portions of the Coachella Valley to the Imperial Valley. Highway 74 connects the central Coachella Valley with communities in southwestern Riverside County and northern San Diego County.

Primary east-west conveyance through the planning area is provided by Dillon Road, Two Bunch Palms Trail, Hacienda Avenue, Pierson Boulevard and Mission Lakes Boulevard. Major north-south corridors include Palm Drive, Mountain View Boulevard and Indian Avenue.

Major intersections are important to the functionality of Desert Hot Springs' circulation system. Of particular importance are those intersections which provide access to regional arterials, such as Interstate-10, Highway 62 and Palm Drive. The current functionality and future demands of roadways and intersections are discussed in detail in Section III-B of this document.

N. Public Facilities and Services

A wide range of public facilities and services are currently provided in the City of Desert Hot Springs, including local governmental services, special districts and public utilities. Service providers are identified below, and the extent of their services is discussed further in Section III-K.

Domestic Water

Domestic water services are provided to the majority of the General Plan planning area by the Mission Springs Water District (MSWD). The Coachella Valley Water District (CVWD) provides water services to the southeastern portion of the planning area, generally south of Dillon Road and east of Little Morongo Road. These agencies derive water principally from the Mission Creek Subbasin underlying the City and much of the northwestern Coachella Valley. The acquifer is naturally recharged by surface and subsurface discharge from major drainages in the area, including Mission and Big Morongo Creeks.

The MSWD operates seven active wells and twenty above-ground storage reservoirs. Water in storage in the Mission Creek Subbasin is estimated at approximately one million acre-feet. MSWD produces approximately 2.43 billion gallons of water per year from the subbasin, which is currently in an overdraft condition of about 2 feet per year in production wells. Plans to recharge the groundwater basin are discussed in Section III.

Sewage Treatment

Wastewater collection and treatment services and facilities serving the planning area are operated by the Mission Springs Water District. The MSWD maintains two wastewater treatment plants: the Horton plant located on Verbena Road, and the Desert Crest plant located on Sunrise Road, north of Dillon Road. The Horton treatment plant is currently being expanded to increase its capacity from about one million gallons per day to two million gallons per day; the project is expected to be completed by the fall of 2002. The capacity of the Desert Crest plant is 180,000 gallons per day. While there are no plans for the immediate expansion of this plant, long-term expansion is being considered.

In March 2000, there were approximately 5,000 sites in the Mission Springs Water District service area that were not sewered and operated on private septic tank systems. The MSWD has plans to sewer the entire service area, and requires that new development within 200 feet of an existing sewer main be connected to the larger sewer system.

A limited portion of the planning area generally located south of Dillon Road and east of Little Morongo Road is located within the service area of the Coachella Valley Water District. Development in this area is currently sparse, and CVWD does not provide sewer service to them at this time.

Solid Waste

The City contracts with Desert Valley Disposal, Inc. for the provision of solid waste collection and disposal services. Services include weekly pick-up, a curb-side recycling program and services to large waste generators, including hotels, resorts and retailers. Waste collected from the City is currently disposed of at the Edom Hill Landfill, which is operated by Riverside County and is expected to close in 2004. The City and Desert Valley Disposal are currently evaluating alternative landfill sites, including the Eagle Mountain and Badlands Landfills.

Natural Gas

Natural gas is used for space heating, commercial and industrial process heating, cooking and providing domestic hot water, and in some air conditioning applications. Natural gas service is provided to the City by The Gas Company, formerly the Southern California Gas Company. Regional and local distribution lines pass through the City and its SOI. The average household uses an estimated 6,600 cubic feet of natural gas per month. The Sunline Transit Agency has converted all its buses to compressed natural gas, resulting in significant reductions in the emission of air pollutants. It is conceivable that the use of natural gas may become a major motor vehicle fuel.

Electric Power

Electric power services are provided to the planning area by Southern California Edison (SCE). Edison relies upon a broad mix of power sources, including wind, solar, co-gen, nuclear and natural gas. The company also purchases power from hydroelectric and coal generators located outside California. SCE facilities in the Desert Hot Springs area include two substations: the Devers Substation, located north of Dillon Road in the southwestern portion of the SOI, and the Coffee Substation on Camino Aventura, west of Palm Drive and south of the City limits.

The typical household in the SCE service area consumes an estimated 6,000 kilowatt-hours per year. However, the extreme summer heat of the Coachella Valley substantially increases demand for electric power to operate air conditioning and refrigeration systems. SCE offers a variety of incentive programs to reduce consumption and encourage the use of fuel-efficient cooling equipment.

The Federal Energy Regulatory Commission recently required all electrical power utilities, including investor-owned companies like SCE, to open their transmission lines to competitors and to share information about available transmission capacity. With recent deregulation of the electrical industry, the market has opened to a variety of service providers, and customers are no longer bound to buy power from the local utility company. Increased competition is expected to help keep power rates at reasonable levels.

Public Buildings and Facilities

Public facilities are those which provide basic services and installations necessary for the continued and effective functioning of a community. In Desert Hot Springs, such facilities include City Hall, which also houses the City Police Department, and the Carl May Community Center which includes the City Library, Council Chambers, offices of the Chamber of Commerce, and the Senior Center. Other public buildings and facilities include fire stations, schools, public health service facilities, and utility vendors that operate service centers within the City limits. These are discussed briefly below, and in more detail in Section III of this document.

Educational Facilities and Services

Public education is provided to the City by the Palm Springs Unified School District, which also serves the communities of Palm Springs, Cathedral City and Rancho Mirage. The City currently hosts seven public schools, including Bubbling Wells Elementary, Desert Hot Springs Elementary, Edward L. Wenzlaff Elementary, Julius Corsini Elementary, Desert Springs Middle School, Desert Hot Springs High, and Desert Hot Springs Continuation High School. Many of the schools within the Palm Springs Unified School District are currently overcrowded, and efforts are continuing to fund and build additional facilities. At this time, there are no plans to construct new public schools in the General Plan planning area. Three private schools, including Community Childrens Center, Palm Springs Christian Schools, and Storyland Preschool are also located in the City.

Library

The City of Desert Hot Springs Library is located at 11691 West Drive and is a branch of the Riverside Count Library System. The library contains approximately 30,000 volumes, a children's section, and computer lab. Library services also include computer network access to all 25 County libraries, and a bookmobile which contains approximately 10,000 volumes and serves residents in unincorporated Riverside County. The County has identified the need for a larger library facility in Desert Hot Springs within the next five to ten years.

Health Facilities

In addition to a number of private physicians' offices, several large health care facilities are located in the vicinity of Desert Hot Springs. Desert Regional Medical Center is located in Palm Springs, approximately six miles south of Desert Hot Springs. The hospital is a private, non-profit hospital that is licensed for 305 acute-care beds and includes a 24-hour emergency room, Home Health Care department and Hospice of the Desert.

The Eisenhower Medical Center complex is located in Rancho Mirage and encompasses 98 acres. It consists of four facilities: Eisenhower Medical Center, Betty Ford Center for Chemical Dependency, Barbara Sinatra Children's Center, and the Annenberg Center for World Health Sciences. The center is licensed for 261 beds and includes an emergency room, intensive care unit, cardiac care unit and other specialized care units.

Other local health care providers include the Inland Empire Community Health Center, located within the City limits on Mountain View Road, and Desert Rehab Services, Inc., which operates two drug and alcohol treatment facilities in the area.

O. Socio-Economic Resources

The population of the City of Desert Hot Springs has increased steadily over the past three decades. From 1970 to 1990, the City's population increased from 2,738 to 11,200, an increase of more than 300 percent.[14] Population growth slowed somewhat during the early 1990's, with the general slowdown in economic activity in the Coachella Valley and southern California.

By early 1999, the population had reached 15,398.[15] Average household size in 1990 was estimated at 2.52 persons, fractionally higher than that of most of the upper Coachella Valley cities, but below the state of California's average of 2.8 persons. The number of persons per household in Desert Hot Springs was estimated to have risen to 2.78 persons in early 1999.[16]

Since 1970, the median age of the community has decreased rapidly from 59.5 years of age in 1970, to 45.3 years in 1980, to 30 years in 1990. Median age is expected to drop modestly again by the year 2000.

The Coachella Valley economy was based on agricultural activity for much of the past century. However, over the past four decades, the region has become one of the premier destination resort areas in the country. Golf-oriented resort development has generated a tremendous market for taxable sales of all types, including apparel, building materials, automobiles, art, dining and other retail. As a result, retail sales in the resort market area are approximately four times those expected to be generated by the permanent resident population.

Employment in Desert Hot Springs is generally focused on service occupations (sales, administrative support, household and other services), which is related to the more than 60 hotels and motels located within the City that provide resort and spa amenities to tourists. Household income reflects this predominant type of lower-paying occupations, with a 1990 median household income of $20,888, which was considerably lower than the state median household income of $39,598.

From 1985 to 1995, total taxable sales in Desert Hot Springs increased at a steady, if modest rate, with some stagnation and one period of decreased taxable sales in 1994. There are also strong indications of substantial leakage of taxable sales potential out of the City and into other communities. A more detailed discussion of socio-economic conditions in the City can be found in Section III-L.

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14 "Community Economic Profile for Desert Hot Springs," Riverside County Economic Development Agency, 1990.

15 "City/County Population and Housing Estimates," California Department of Finance, January 1, 1999.

16 Ibid.

CITY OF DESERT HOT SPRINGS

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE COMPREHENSIVE GENERAL PLAN

III. EXISTING ENVIRONMENTAL CONDITIONS, PROJECT IMPACTS, AND MITIGATION MEASURES

Introduction

The adoption of the City of Desert Hot Springs General Plan constitutes a "project" under the California Environmental Quality Act (CEQA) Statutes and the State CEQA Guidelines. An Initial Study and Environmental Checklist were completed by the City of Desert Hot Springs, and specific areas of potential significant effect on the environment associated with the adoption and implementation of the proposed General Plan were identified. At that time, it was determined that an Environmental Impact Report was required. On February 3, 2000, a Notice of Preparation was completed and transmitted to local, regional, state and federal responsible agencies, as well as other interested groups. Both the Initial Study and Notice of Preparation can be found in Appendix A of this document.

This section of the Environmental Impact Report addresses those issues which have been identified by the City's Initial Study, those raised in numerous public meetings of the General Plan Advisory Committee, those identified by the environmental consultant and subconsultants, and those raised by local and state agencies in response to the EIR Notice of Preparation. Issues raised are those which potentially constitute significant environmental hazards or impacts to resources, preclude implementation of the General Plan, or constitute potentially significant impacts which may result as a consequence of implementation of the General Plan.

In Section III, existing conditions within the General Plan planning area are discussed. The identified hazards and impacts are then assessed, and proposed mitigation measures and their efficacy are presented. Satisfactory mitigation is measured by the elimination or reduction of hazards or impacts to acceptable or insignificant levels. Where appropriate, mitigation monitoring and reporting programs are recommended in conformance with AB 3180 (California Public Resources Code 21081.6), which shall assure compliance over the implementation life of the General Plan. Inasmuch as the General Plan is a policy and program document, implementation and monitoring are inherent elements of the "project."

A. Land Use Compatibility

1. Existing Conditions

The City of Desert Hot Springs can be best characterized as a resort residential community. The discovery of natural hot mineral waters in the early twentieth century provided the impetus for development in the area, and has become an identifying characteristic of the community. Desert Hot Springs experienced most of its early growth during the 1940s when large parcels of land were subdivided into residential lots, and the community's first health resort was established by L.W. Coffee. Many of the City's residents were, and continue to be attracted to the Coachella Valley's spectacular scenery and rural lifestyle. Residential and spa-related development in the City increased after World War II and served as the foundation for a self-sufficient commercial and business district.

Today, development in Desert Hot Springs continues to reflect these early trends, and the City is generally considered to provide exceptional opportunities for a full range of residential products. Current residential development consists primarily of low density attached and detached single family units within standard subdivisions, with some development occurring within planned residential developments. A mix of multi-family units, older homes and mobile homes also comprise part of the existing housing stock. The City's more than 40 hotels and resorts also constitute an important sector of the local economy.

Current Land Uses

Only about 17% (6,458 acres) of the General Plan planning area is currently developed, with the majority of vacant lands occurring west of Indian Avenue. Residential development is broadly dispersed throughout the planning area, and accounts for approximately 64% (4,134 acres) of developed lands in the planning area. Of the total existing housing stock, approximately 60% (3,921 units) are attached and detached single-family units, about 35% (2,309 units) are multi-family units, and the remaining 5% (333 units) are mobile homes.[1]

Commercial lands provide a wide range of retail commercial services, including neighborhood and community-scale retail, and general commercial. Commercial development currently accounts for about 3% (217 acres) of all developed lands in the planning area. Industrial designations within the city limits accommodate a variety of light industrial activities, including warehousing and distribution operations, light manufacturing, and research and development. Industrial uses currently occupy only about 2.3% (149 acres) of developed lands in the planning area. Public uses, including City Hall and other governmental facilities, fire and police stations, utility substations, major transportation corridors, and other public and/or quasi-public administrative facilities account for about 9% (575 acres) of developed lands in the planning area. Recreational open space, mountain reserves, public parks, and private open space comprise an estimated 21% (1,383 acres) of developed lands.

1 California Department of Finance, January 1, 1999.

Current land use patterns, as set forth in the current General Plan, are illustrated on Exhibit III-1. Table III-1 provides a breakdown of acreages occurring under each land use category, and projects the amount of future development that could potentially occur under the current General Plan. Analysis of existing development in the planning area indicates that development does not typically occur at the maximum densities permitted. Rather, development in the planning area generally occurs at lower to more moderate densities. Buildout projections in Table III-1, therefore, are based on the following assumptions:

- Development on Riverside County 3B Residential lands will typically occur at densities of 0.3 du/ac
- Development on County 3A Residential lands is expected to generate an average of 2 du/ac
- Development on County 2B Residential lands will typically yield 3.5 du/ac
- Low Density Residential (R-L) lands are expected to result in an average of 3.5 du/ac
- Medium Density Residential (R-M) development will typically yield 6 du/ac
- High Density Residential (R-H) development is expected to result in 12 du/ac
- Residential development on Visitor Serving lands (V-S) is expected to occur at an average of 8 du/ac

Table III-1
Current General Plan
Land Use Buildout Statistical Summary

Land Use	Total Acres	Dev. Acres	Exist. Units	Vacant Acres	Potential Units	Bldout Units
3B Residential (0.2-0.4 du/ac)	1,394	106		1,288	515	
3A Residential (0.4-2 du/ac)	1,097	104		993	1,986	
2B Residential (2-5 du/ac)	3,757	435	4,254*	3,322	11,627	50,683
R-L Low Density Resid. (0-5 du/ac)	12,161	2,932		9,229	32,301	
R-M Medium Density Resid. (6-8 du/ac)	672	272		400	2,400	
R-H High Density Resid. (9-14 du/ac)	1,330	113	2,309**	1,217	14,604	19,313
V-S Visitor Serving	669	172				
• Residential (0-14 du/ac)				232	1,856	1,856
• Spas/Hotels/Motels (25 rooms/ac)			[970]	265	[6,625]	[7,595]
Residential Subtotal	21,080	4,134	6,563[1]	16,946	65,289[1]	71,852[1]

	Total Acres	Dev. Acres	Vacant Acres	Existing Sq.Ft.	Future Sq.Ft.	Total Sq.Ft.
C Commercial	882	217	665	2,079,554	6,372,828	8,452,382
I Industrial	990	39	951	577,606	14,084,690	14,662,296
M Industrial/Manufacturing	1,564	110	1,454	1,629,144	21,534,322	23,163,466
Industrial Subtotal	2,554	149	2,405	2,206,750	35,619,012	37,825,762
P Public/Quasi-Public	3,576	575	3,001	—	—	—

	Total Acres	Dev. Acres	Vacant Acres			Bldout Units
MR Mountainous Area (1 du/10 ac)	3,330	318	3,012	—	301	301
DA Desert Area (1 du/10 ac)	3,734	1,043	2,691	—	269	269
W Water Resources	54	1	53	—	—	—
Parks/Forests	184	0	184	—	—	—
OS/R Open Space and Recreation	957	21	936	—	—	—
OS/PV Private Open Space	487	0	487	—	—	—
OS/PP Parks Open Space	123	0	123	—	—	—
Open Space Subtotal	8,869	1,383	7,486	—	570	570
Total	**36,961**	**6,458**	**30,503**	—	**65,859[1]**	**72,422[1]**

* Includes attached and detached single family housing units and mobilehomes, as categorized by CA Dept. of Finance, 1999.
** Includes multi-family housing units from two to five-plus, as categorized by CA Dept. of Finance, 1999.
[1] Includes residential dwelling units only; does not include spa/hotel/motel rooms.

Desert Hot Springs General Plan
(Existing)

LEGEND

- General Plan Designation Boundaries
- Roads
- Township/Range Sections
- Railroads
- City Limits
- City Sphere of Influence

- 3B - 0.2-0.4 du/ac (5-2.5 ac. min.)
- 3A - 0.4-2 du/ac (2.5-.5 ac. min.)
- 2B - 2-5 du/ac
  - O-L/S - Low Density Residential Specific Plan Required
  - R-L - Low Density residential (0-5 du/ac)
  - R-L (1/2.5)
  - R-L/S
  - R-L/SP
- R-M - Medium Density Redsidential (6-8 du/ac)
- R-H - High Density Residential (9-14 du/ac)
- V-S - Spa/Visitor Serving Commercial
  - R-S - Resort Spa
  - S - Spa
  - H-S - Hotel/Spa
- C - Commercial
- I - Industrial
- M - Industrial/Manufacturing
- P-F - Public Facilities
  - CC-PF - Civic Center/Public Facilities
  - P/PO - Post Office
- O-S/R - Open Space and Recreation
  - OS/PP - Parks Open Space
  - PARKS/FORESTS
- OS/PV - Private Open Space
- DA - Desert Area
- MA - Mountainous Areas
- D-R/S - Designation Resort/Spa Specific Plan Req'd.
- W - Water
- T - Transportation

Scale
1:68,000

0 4,000 8,000 12,000
Feet

N
NORTH

Riverside County Vicinity Map

Map Prepared on: March 30, 2000
Map Prepared by: Aerial Information Systems
Map Version No.: 2

TERRA NOVA Planning & Research, Inc.

aerial information systems

Surrounding Land Uses

Development adjacent to and in the vicinity of the City of Desert Hot Springs can be generally characterized as extensions of the low density residential character found within the City. Surrounding lands are under the jurisdiction of Riverside County, with a limited area southwest of the planning area being under the jurisdiction of the City of Palm Springs. Riverside County lands west of the planning area are designated as Mountainous Areas within the foothills of the San Bernardino Mountains, and Desert Areas in low-lying areas at the base of the mountains. Current land uses in this area are consistent with these designations and include the rugged, developed mountain foothills and desert open spaces.

Lands north of the planning area consist of similar undeveloped mountainous terrain. Riverside County designations in this area include Mountainous Areas within the Little San Bernardino Mountains, Desert Areas at the base of the mountains, and Water Resources along Mission Creek and Morongo Wash. The southwest boundary of Joshua Tree National Park occurs northeast of, and adjacent to the planning area. Limited portions of the Big Morongo Canyon Preserve Area of Critical Environmental Concern (ACEC) are located adjacent to and within the City's northern sphere-of-influence (see Project Impacts section below).

Riverside County lands to the east and southeast of the planning area are designated for low density residential and small pockets of commercial development. These lands are largely undeveloped, with scattered single family, low density residential, as well as limited mobilehome park development, occurring in a rural environment. South of Interstate-10, County lands are designated for a variety of land uses, including Desert and Water Resources associated with the watershed of the Whitewater River.

Lands south of Dillon Road and west of Indian Avenue are either incorporated lands of Palm Springs or occur within the Palm Springs' sphere-of-influence. A quarter section north of Dillon Road is also located within the Palm Springs city limits. Most of these lands are designated for windfarm and related industrial development, with the exception of land designated for commercial use at the Interstate-10/Indian Avenue interchange and scattered areas designated for low-density residential development.

2. Project Impacts

The Preferred Alternative Land Use Plan is illustrated in Exhibit III-2. The discussion that follows addresses the land use impacts associated with adoption and implementation of the Preferred Alternative Land Use Map and associated goals, policies and programs. After considering the densities of existing development within the planning area, it was determined that development has not typically occurred at the maximum densities permitted by the current General Plan. Rather, existing development has occurred at substantially lower densities, with an average residential density of about 1.6 dwelling units per acre. Given the City's low intensity development pattern, it is assumed that future development in the planning area will continue to occur at the low to moderate densities reflected in existing development. The land use buildout analysis is, therefore, based on the following assumptions:

- Residential Estate (R-E) development is fixed at one dwelling unit per 1, 2.5, 5, or 10 acre lots. Future development will occur at these fixed densities.
- Low Density Residential (R-L, R-VSL) development will typically yield 3.5 du/ac
- Medium Density Residential (R-M, R-VSM) development will typically yield 5.5 du/ac
- High Density Residential (R-H, R-VSH) development is expected to generate an average of 12 du/ac
- Mobile Home (R-MH) development will typically yield an average of 10 du/ac
- Hotel, motel and resort (R-VSL, R-VSM, R-VSH) development is expected to result in an average of 25 rooms per acre.

Desert Hot Springs General Plan
(Preferred Alternative)

LEGEND

- General Plan Designation Boundaries
- Roads
- Township/Range Sections
- Railroads
- City Limits
- City Sphere of Influence

- R-E Residential Estates (0-1 du/Varies ac)
  - R-E-10
  - R-E-5
  - R-E-2.5
  - R-E/SP
- R-L Residential Low Density (0-5 du/ac)
  - R-L/SP
- R-M Residential Medium Density (0-8 du/ac)
  - R-M/SP
- R-MH Residential Mobile Home (0-10 du/ac)
- R-H Residential High Density (0-14 du/ac)
- R/VS-L Residential Visitor Serving (Low Density)
- R/VS-M Residential Visitor Serving (Medium Density)
  - V-S-M
- R/VS-H Residential Visitor Serving (High Density)
- C-N Neighborhood Commercial
- C-C Community Commercial
- C-G General Commercial
- I-L Light Industrial
- I-M Medium Industrial
- I-E Industrial Energy-Related
- P Public Uses (Institutional)
  - P/F (Fire Station)
  - P/S (School)
  - P/PO (Post Office)
  - P/U (Utility)
- OS/MR Mountain Reserve
- OS/PP Parks Open Space
- OS/PV Private Open Space
- OS/FW Flood Ways
- T Transportation

Scale
1:68,000

0 4,000 8,000 12,000
Feet

N
NORTH

Riverside County Vicinity Map

Map Prepared on: March 30, 2000
Map Prepared by: Aerial Information Systems
Map Version No.: 2

TERRA NOVA Planning & Research, Inc.

aerial information systems

Residential Land Uses

According to the California Department of Finance, there are currently 6,563 dwelling units within the incorporated city limits. At buildout, the proposed General Plan would provide for an additional 63,889 dwelling units, for a total of 70,452 dwelling units at buildout. The proposed General Plan's distribution of residential uses is consistent with existing residential land use patterns. The proposed Plan provides for a decrease of 114 dwelling units, or 0.2%, over the number of units that would result from the buildout of the current General Plan.

Table III-2
Preferred Alternative
Residential Land Use Buildout Statistical Summary

Land Use	Total Acres	Dev. Acres	Exist. Units	Vacant Acres	Potential Units	Bldout Units
R-E Residential Estates (0-1 du/ac)	2,053	375		1,678	1,678	
R-E Residential Estates (0-1 du/2.5 ac)	1,345	148		1,197	478	
R-E Residential Estates (0-1 du/5 ac)	102	0		102	20	
R-E Residential Estates (0-1 du/10 ac)	719	3	3,921*	716	71	48,430
R-L Low Density (0-5 du/ac)	14,779	2,908		11,871	41,548	
R-VSL Vis. Serv. Low (0-5 du/ac)	261	57		204	714	
R-M Medium Density (0-8 du/ac)	472	213		259	1,424	
R-VSM Vis. Serv. Med. (0-8 du/ac)	74	31	2,309**	43	236	19,269
R-H High Density (0-14 du/ac)	1,329	114		1,215	14,580	
R-VSH Vis. Serv. High (0-14 du/ac)	82	22		60	720	
R-MH Mobilehome (0-10 du/ac)	517	275	333	242	2,420	2,753
R-VS Hotel/Motel Rooms (25 rooms/ac)	417	110	[970]	307	[7,675]	[8,645]
Residential Subtotal	**22,150**	**4,256**	**6,563**[1]	**17,894**	**63,889**[1]	**70,452**[1]

* Includes attached and detached single family housing units, as categorized by California Dept. of Finance, January 1, 1999. ** Includes multi-family housing units from two to five-plus, as categorized by California Dept. of Finance, January 1, 1999. [1] Includes residential dwelling units only; does not include hotel/motel rooms.

Under the proposed General Plan, higher density residential development is generally located in close proximity to existing or future commercial areas to facilitate convenient pedestrian, bicycle and mass transit access to professional and commercial services offered along Palm Drive, Pierson Boulevard and State Highway 62. Higher density development may be subject to exterior noise levels which could result in significant impacts on residents if not adequately mitigated. These issues are addressed in detail in Section III-I, Noise Environment.

Progressively lower residential densities are planned further from major roads and service areas, and are near or adjacent to hillsides, and open space reserves. These lower densities provide some assurance against undue impacts to environmentally sensitive areas. A considerable amount of land is designated for Residential Estate development, which accommodates residential development at the lowest densities, and is located primarily in the southwest portion of the planning area, in the vicinity of windfarm development and the Highway 62 corridor.

The proposed land use densities and assignments do not appear to pose any significant land use incompatibilities with existing or planned land uses in adjacent jurisdictions. Riverside County and the City of Palm Springs have similar and complementary adjacent uses.

The Residential-Visitor Serving (R-VS) land use designation is a new and unique category which recognizes the predominant residential character of lands which also include numerous spa-type hotels. It is meant to facilitate compatible development between permanent and seasonal residents, as well as the vacationing public visiting resorts and hotels. Permitted uses include both residential dwelling units (which are permitted at low, medium and high densities), as well as hotels, resorts and motels. For the purpose of calculating acreages and potential buildout units on R-VS lands, it is assumed that half of all R-VS lands will be developed as residential uses, and half will be developed as hotel/motel uses. While actual development patterns may differ, this method provides a useful and appropriate benchmark by which potential development on these lands can be evaluated.

Commercial Land Uses

Under the current General Plan, there are approximately 882 acres designated for commercial development in the planning area, 217 acres of which are developed. The proposed General Plan designates a total of 1,042 acres for commercial development, which accounts for an increase of 160 acres, or 18% over that provided under the current General Plan. Commercially designated lands are located primarily along Palm Drive and Pierson Boulevard, which comprise the predominant commercial corridors serving the City. The proposed Plan utilizes a nodal development pattern for commercial land uses, which optimizes the transportation system and other infrastructure. The proposed Plan provides for commercial development at a number of nodal locations, including the following:

- interchange of Interstate-10 and Palm Drive
- interchange of I-10 and Indian Avenue
- intersection of Pierson Boulevard and State Highway 62
- intersection of Dillon Road and Indian Avenue
- intersection of Dillon Road and Palm Drive
- intersection of Pierson Boulevard and Indian Avenue

Table III-3 describes the total acreage and commercial development potential of the proposed General Plan. For analysis purposes, it is assumed that commercial development will result in 22% building coverage, providing adequate area for parking lots, loading docks and ancillary structures. Single story development is assumed.

Table III-3
Preferred Alternative
Commercial Land Use Buildout Statistical Summary

	Total Acres	Dev. Acres	Vacant Acres	Existing Sq.Ft.	Future Sq.Ft.	Total Sq.Ft.
C-N Neighborhood Commercial	73	30	43	287,496	412,078	699,574
C-C Community Commercial	128	14	114	134,165	1,092,485	1,226,650
C-G General Commercial	841	180	661	1,724,976	6,334,495	8,059,471
Commercial Subtotal	1,042	224	818	2,146,637	7,839,058	9,985,695

The Neighborhood Commercial (C-N) land use designation is a new designation which provides for neighborhood-scale shopping centers conveniently located near residential areas. These development areas are typically anchored by supermarkets and drug stores, and generally range in size from 8 to 10 acres. The proposed land use map designates approximately 73 acres as Neighborhood Commercial. These lands are located at the intersection of Palm Drive and Two Bunch Palms Drive, and on Pierson Boulevard west of West Drive. These areas are designated for General Commercial development under the current General Plan.

General Commercial (C-G) lands include a variety of smaller commercial centers, specialty retail shops, and personal service businesses. These lands comprise the majority of commercial designations under the proposed land use plan, accounting for approximately 841 acres. They are located in the commercial core of the City, along Palm Drive and Pierson Boulevard, as well as the interchanges of I-10/Indian Avenue and I-10/Palm Drive. Other substantial concentrations of General Commercial lands are located at the intersection of Pierson Boulevard and Highway 62, and at scattered locations within the Rancho Royale Specific Plan area in the western city limits.

The Community Commercial (C-C) designation provides for larger, community scale shopping centers and malls which may be anchored by several department stores or other large retail anchors. Although these developments are smaller than regional commercial facilities, the community commercial center is capable of serving the entire community, as well as the surrounding market area. Under the proposed General Plan land use plan, these lands encompass about 128 acres and are located in two areas: at the intersection of Dillon Road and Palm Drive, and the intersection of Pierson Boulevard and Indian Avenue.

Industrial Land Uses

Approximately 2,554 acres in the planning area are designated for industrial development under the current General Plan. The proposed General Plan provides for a total of approximately 4,398 acres of industrial development, which includes an "energy" designation, accounts for an increase of 1,844 acres or about 72 % more acres than are provided under the current General Plan. Under the proposed plan, lands designated for industrial development are largely located in the southwesterly portion of the planning area in close proximity to the Interstate-10 corridor.

As mentioned, the proposed Plan calls for a new Energy-Related Industrial land use designation, which provides for the development of energy producing industries, including windfarms and solar photovoltaic or thermal structures on an industrial scale. These lands occur south of Two Bunch Palms Drive, in the vicinity of Highway 62, where a substantial number of wind energy turbines have been constructed. Light and medium industrial lands generally occur near the I-10/Palm Drive interchange, and the intersection of Dillon Road and Indian Avenue. The following table indicates the total acreage and industrial development potential of the proposed General Plan. It assumes that industrial development will generally result in 34% lot coverage, which includes buildings, parking lots, loading and storage areas, and other ancillary structures.

Table III-4
Preferred Alternative
Industrial Land Use Buildout Statistical Summary

	Total Acres	Dev. Acres	Vac. Acres	Existing Sq.Ft.	Future Sq.Ft.	Total Sq.Ft.
I-L Light Industrial	900	31	869	459,122	12,870,238	13,329,360
I-M Medium Industrial	1,623	116	1,507	1,718,006	22,319,273	24,037,279
I-E Energy-Related Industrial	1,875	906	969	—	—	—
Industrial Subtotal	4,398	1,053	3,345	2,177,128	35,189,511	37,366,639

The Light Industrial (I-L) designation provides for business parks and industrial uses which operate entirely within enclosed buildings. Such uses include clean manufacturing operations, warehousing and distribution facilities, and a variety of light manufacturing businesses. Under the proposed land use plan, Light Industrial lands are concentrated at the I-10/Palm Drive interchange, and along Little Morongo Road between Pierson Boulevard and Dillon Road.

Medium Industrial (I-M) lands include development of more intense industrial uses with the potential to generate substantial levels of noise, smoke, dust, glare, traffic, vibration and other nuisances. Such uses may include the manufacturing of durable goods, including furniture, metal products, light electrical equipment, and appliances. The proposed land use plan provides for Medium Industrial lands at the I-10/Indian Avenue interchange, and along Indian Avenue north of Dillon Road.

As described above, the Energy-Related Industrial (I-E) designation provides for the development of energy producing industries, including windfarms and photovoltaic or thermal arrays on an industrial scale. Other appropriate uses include those incidental to energy production or transmission, as well as those which do not impair the development of energy resources, such as golf courses and landscape nurseries. Under the proposed land use plan, these lands occur in the southwestern portion of the planning area, along Dillon Road, as well as west of Highway 62.

Public/Quasi-Public Land Uses

Public/Quasi-Public designated lands include those currently supporting or planned for future public buildings or uses, including City Hall and other City and governmental offices; libraries, schools, hospitals, and police and fire stations. Others include post offices and utility substations.

Open Space Land Uses

Open Space land use designations are assigned to those lands which constitute an important or valuable natural resource and warrant protection, including private open space, public parks, mountainous areas and floodways. Within the planning area, these designations occur in the foothills of the San Bernardino and Little San Bernardino Mountains, public parks, private open spaces, and drainages of Mission Creek, Big and Little Morongo Creeks, Blind Creek and Long Canyon. Open space land use designations and acreages are provided in the table below.

Table III-5
Preferred Alternative
Open Space Buildout Statistical Summary

	Total Acres	Dev. Acres	Vac. Acres	Existing Sq.Ft.	Future Sq.Ft.	Total Sq.Ft.
OS-MR Mountain Reserve	5,316	67	5,249	---	---	---
OS-PP Public Parks	223	22	201	---	---	---
OS-PV Private Open Space	1,204	42	1,162	---	---	---
OS-FW Floodways	1,617	214	1,403	---	---	---
Open Space Subtotal	8,360	345	8,015	---	---	---

Joshua Tree National Park

Limited lands in the City's northeast sphere-of-influence occur immediately adjacent to the southwest boundary of Joshua Tree National Park, which is administered by the National Park Service. These sphere-of-influence lands are located within the foothills of the Little San Bernardino Mountains and are designated as Open Space/Mountain Reserve (OS/MR) under the proposed General Plan. This designation allows the discretionary approval of trails, trailheads and associated facilities, but does not permit vehicular access or any type of urban development. Furthermore, these Open Space/Mountain Reserve lands provide an open space buffer of approximately one mile between Joshua Tree National Park and urban development within the City. The Long Canyon Channel is designated as Open Space/Floodway (OS/FW) and will also function as open space.

While the potential exists for new trails to occur on these lands, some of which could provide access from the planning area to Joshua Tree National Park, all trail proposals will be thoroughly evaluated by the City, and in conjunction with the National Park Service wherever necessary. The proposed land use designations are intended to preserve the wilderness character of the mountains and their value as an important natural resource. Adoption and implementation of the General Plan is not expected to adversely impact Joshua Tree National Park.

Big Morongo Canyon Preserve ACEC

Limited portions of the Big Morongo Canyon Preserve Area of Critical Environmental Concern (ACEC) are located within and adjacent to the General Plan planning area in the Little San Bernardino Mountains. In 1998, the ACEC was expanded from 3,705± acres to approximately 29,000 acres.[2] The ACEC includes both public and private lands. Public lands are managed by the Bureau of Land Management (BLM) for the protection of a desert oasis and other important natural resources. The southeast portion of the ACEC is contained within the City of Desert Hot Springs sphere-of-influence, including portions of Sections 19, 20, 27, and 28, and all of Section 21, Township 2 South, Range 5 East.

Implementation of the proposed General Plan is not expected to adversely impact the Big Morongo Canyon Preserve ACEC. The majority of lands in the planning area which are contained within the ACEC are designated as Open Space/Mountain Reserve. No development will be permitted on these lands, although the discretionary approval of trails may be permitted. All approvals will be subject to the review by the City, in consultation with the Bureau of Land Management, as necessary. A limited portion of lands within the ACEC are designated for very low density residential estate development (R-E-10), which permits residential development at densities of one unit per 10 acres and preserves, to a great extent, the natural character of these lands. The City will consult with BLM in reviewing development proposals on these lands.

Summary of Impacts

Buildout of the proposed General Plan will not constitute a significant increase in the level of development permitted under the current General Plan. The proposed plan is expected to result in the development of about 1,970 dwelling units less than are expected to be developed under the current General Plan. The proposed Plan will facilitate about 1,533,313 more square feet of commercial space than the existing General Plan. The proposed Plan will accommodate roughly the same amount of light and medium industrial space as the current General Plan, but will also facilitate the development of an additional 1,875 acres for Energy-Related Industrial uses.

It is important to reiterate that the buildout figures cited throughout this discussion are tempered to reflect anticipated levels of development, and to reflect the fact that existing development in the Desert Hot Springs area has typically occurred at densities which are somewhat lower than those permitted under the current General Plan. Actual levels of development could be higher or lower, depending on site-specific environmental constraints and market conditions.

No substantial or significant incompatibilities with existing or proposed land uses are expected to result from the proposed plan of development. The Plan provides for the protection of special, valuable or sensitive resource areas through the application of Open Space land use designations, and buffers them, to a great extent, with low-density and estate residential development. The potential for traffic noise impacts on existing, approved and/or proposed residential lands is reduced by General Plan policies and programs which address noise mitigation along major roadways. Additional mitigation measures may be necessary to reduce impacts to acceptable or insignificant levels.

2 Jim Foote, Bureau of Land Management, personal communication March 20, 2000.

3. Mitigation Measures

- Individual project proposals, especially those involving a mix of residential and other uses, as well as those in close proximity to sensitive land uses, shall be fully assessed during the project review process to assure that all land use compatibility issues are addressed and mitigated, as necessary.

- All future residential development occurring on lands within an existing 65 dBA or higher noise contour shall be required to prepare a noise impact assessment and mitigation plan which minimizes impacts to outdoor living space and assures a maximum interior noise level of 45 CNEL.

- The City shall consult and coordinate with the Bureau of Land Management in reviewing all development proposals on lands located within the Big Morongo Canyon Preserve ACEC.

Mitigation Monitoring/Reporting Program

- The City shall identify potential adverse or unacceptable noise exposures, analyze and assure the efficacy of mitigation programs, and assure construction in accordance with the approved noise mitigation plan. Said plan shall be approved by the Planning Department as part of its review, and the efficacy of the mitigation plan shall be demonstrated as part of the Building Department's inspection process. Results shall be recorded and maintained with building inspection records.
  Responsible Parties: City Planning and Building Departments

B. Traffic/Circulation

1. Existing Conditions

The following discussion is based largely upon the traffic and circulation analysis prepared for the General Plan update by Endo Engineering.[3] This report is included in its entirety in Appendix B of this document.

Regional Roadways
The City of Desert Hot Springs is somewhat geographically isolated from other communities in the Coachella Valley. The City is connected to the rest of the region by state and interstate highways, including U.S. Interstate-10 and State Highway 62. Regional arterials, including Palm Drive/Gene Autry Trail, Indian Avenue, and Dillon Road further connect City traffic to other Valley communities. Intra-community traffic is accommodated by an arterial and collector-sized roadway network, which is built essentially along a north-south grid.

Interstate-10 connects the Los Angeles region with Arizona and other cities and states to the east, while also serving as the major inter-community connector in the Coachella Valley. In the Desert Hot Springs vicinity, Interstate-10 consists of an eight-lane divided freeway accessed from diamond intersections spaced a minimum of one mile apart.

3 "Desert Hot Springs General Plan Update Circulation Background Study," prepared by Endo Engineering, March 2000.

State Highway 62 extends from its junction with Interstate-10 in the City's southwestern sphere-of-influence, northward into San Bernardino County, and connects the upper Coachella Valley with communities of the Morongo Basin. It also provides important regional access to Joshua Tree National Park and the Twentynine Palms Marine Corps Air Ground Combat Center, as well as the Colorado River and Mojave Desert wilderness and recreation areas.

A variety of data were collected to document and evaluate existing traffic conditions, and to assess future transportation impacts within the General Plan planning area. The following discussion of existing traffic conditions and potential impacts is largely based upon technical analyses and studies conducted by Endo Engineering (see Appendix B), which includes traffic counts and other data from the City, Riverside County, CalTrans and the Coachella Valley Association of Governments (CVAG). These various data are from the period of 1994 to 1999 and include mid-block roadway segments, as well as counts of intersection turning movements.

Levels of Service

Roadway capacity is defined as the number of vehicles that pass a section of roadway, or pass through a particular intersection in a given period of time under prevailing conditions. Roadway capacity is determined by a number of factors, including surface conditions, lane widths, alignment, grade and intersection design. For example, raised medians typically reduce the number of traffic conflict points, thereby increasing roadway capacity. Restricted access also increases capacity by minimizing traffic interruptions associated with vehicles entering or leaving the roadway.

The ability of a road to handle different traffic demands is known as Level of Service (LOS). The Level of Service is a qualitative measure used to describe the efficiency of traffic flow. It compares existing traffic volumes with available roadway capacity. LOS values range from "A" through "F," with LOS A representing the best, free-flow conditions and LOS F indicating the worst conditions, or forced flow. LOS values are determined by dividing traffic volumes by roadway capacity. Smaller ratios close to 0.00 indicate better efficiency, and therefore better levels of service. As the ratio approaches 1.12+, the roadway approaches LOS F, which is characterized by extreme traffic congestion. The various LOS classifications and volume-to-capacity ratios are defined below in Table III-6.

Table III-6
Roadway Level of Service Descriptions

Level of Service	Traffic Flow Characteristics	
A	Primarily free-flow operations at average travel speeds. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.	0.00-0.66
B	Reasonably unimpeded operations at average travel speeds. The ability to maneuver within the traffic stream is only slightly restricted, and stopped delays are not bothersome. Drivers are not generally subjected to appreciable tension.	0.67-0.77
C	Stable operations. Ability to maneuver and change lanes in mid-block location may be more restricted than at LOS B. Longer queues, adverse signal coordination, or both may contribute to lower average travel speeds. Motorists will experience some appreciable tension while driving.	0.78-0.88
D	Small increases in flow may cause substantial increases in approach delay and decreases in arterial speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these factors. Average travel speeds are about 40 percent of the freeflow speed.	0.89-1.00
E	Significant approach delays and average travel speeds of one-third the free-flow speed or less. Typically caused by some combination of adverse progression, high signal density of more than 2 signalized intersections per mile, high traffic volumes, extensive queuing and delays at critical intersections, or inappropriate signal timing.	1.01-1.11
F	System failure. Long queues of traffic, unstable flows, stoppages of long duration, traffic volume and speed can drop to zero, traffic volume will actually be less than the volume which occurs at LOS E.	1.12+

Source: "Highway Capacity Manual," Special Report 209, Transportation Research Board, 1985.

Average Daily Traffic Volumes

The total number of vehicles that pass a defined roadway segment in both directions within a 24-hour period is known as the Average Daily Traffic (ADT) volume. ADT provides a useful benchmark number for determining various roadway configurations and design aspects. Peak hour ADT values, which represent the highest volume of traffic to pass over a roadway segment during a one hour period, is also a useful means of determining roadway capacity and intersection levels of service.

To determine existing ADT volumes for major roadway links in the planning area, traffic counts were recorded for these links. Average Daily Traffic volumes (ADT) and Levels of Service (LOS) from 1994 for major roadway links in the planning area are listed in Table III-7. More recent ADT values from 1999, and the percent change in traffic volumes from 1994 to 1999, are provided in Table III-7. ADT values through 1999 are illustrated on Exhibit III-3.

Table III-7
1994 Daily Volume-to-Capacity Ratio and Level of Service Summary

Roadway Link	1994 ADT	Daily Capacity (Veh./Day)	V/C Ratio	Level of Service
Mission Lakes Blvd.				
e/o Indian Avenue	2,200	15,000	0.15	A
w/o West Drive	2,400	15,000	0.16	A
Pierson Boulevard				
w/o State Route 62	200	15,000	0.01	A
e/o State Route 62	1,100	15,000	0.07	A
w/o Indian Avenue	2,100	15,000	0.14	A
e/o Indian Avenue	4,100	15,000	0.27	A
w/o Little Morongo Rd.	4,300	15,000	0.29	A
e/o Little Morongo Rd.	5,500	15,000	0.37	A
w/o West Drive	6,000	15,000	0.40	A
w/o Cactus Drive	6,400	15,000	0.43	B
w/o Palm Drive	7,000	15,000	0.47	B
e/o Palm Drive	5,200	15,000	0.35	A
Hacienda Boulevard				
w/o Palm Drive	3,400	31,000	0.11	A
e/o Palm Drive	6,000	31,000	0.19	A
e/o Ocotillo Road	6,700	15,000	0.45	B
e/o Mesquite Avenue	6,700	15,000	0.45	B
w/o Miracle Hill Road	5,800	15,000	0.39	A
w/o Mountain View Rd.	6,500	15,000	0.43	B
e/o Mountain View Rd.	4,900	15,000	0.33	A
w/o City Limits	1,900	15,000	0.13	A

Table III-7
(Continued)
1994 Daily Volume-to-Capacity Ratio
and Level of Service Summary

Roadway Link	1994 ADT	Daily Capacity (Veh./Day)	V/C Ratio	Level of Service
Two Bunch Palms Trail				
w/o Palm Drive	6,700	15,000	0.45	B
e/o Palm Drive	6,100	15,000	0.41	B
State Route 62				
n/o Pierson Blvd.	19,000	65,000	0.29	A
s/o Pierson Blvd.	15,000	65,000	0.23	A
Indian Avenue				
n/o Mission Lakes Blvd.	6,000	15,000	0.40	A
n/o Pierson Blvd.	7,000	15,000	0.47	B
s/o Pierson Blvd.	8,300	15,000	0.55	B
Little Morongo Road				
n/o Pierson Blvd.	2,100	15,000	0.14	A
s/o Pierson Blvd.	1,900	15,000	0.13	A
s/o Two Bunch Palms Trl.	3,000	15,000	0.20	A
West Drive				
n/o Pierson Blvd.	3,700	15,000	0.25	A
s/o Pierson Blvd.	3,400	15,000	0.23	A
Palm Drive				
n/o Eighth Street	6,300	25,000	0.25	A
n/o Pierson Blvd.	10,500	31,000	0.34	B
s/o Pierson Blvd.	14,600	31,000	0.47	B
n/o Hacienda Avenue	18,800	31,000	0.61	C
s/o Hacienda Avenue	18,800	31,000	0.61	C
s/o Two Bunch Palms Trl.	20,600	31,000	0.66	C
n/o south City Limits	23,400	15,000	1.56	F
Miracle Hill Road				
n/o Hacienda Avenue	1,000	15,000	0.07	A
s/o Hacienda Avenue	400	15,000	0.03	A
Mountain View Road				
n/o Hacienda Avenue	1,400	15,000	0.09	A
s/o Hacienda Avenue	4,400	15,000	0.29	A

Source: "Desert Hot Springs General Plan Update Circulation Background Study," prepared by Endo Engineering, March 2000.

As shown in the table above, most roadway segments in the planning area were operating at LOS A or LOS B, well within acceptable limits. Traffic volumes along Palm Drive, generally south of Hacienda Avenue, were high in comparison to other local roadway segments, and exceeded acceptable limits south of the City limits. Since these traffic counts were taken Palm Drive has been improved to two travel lanes in each direction with a striped center lane. These improvements are expected to have significantly improved the LOS along these roadway segments.

Analysis of 1999 traffic volume data (provided by the Coachella Valley Association of Governments) indicates that traffic on major roadways in the planning area decreased, for the most part, by approximately 8 to 10 percent between 1994 and 1999. Of the twenty-three links for which volumes were available for both years, eighteen links (78%) exhibited a decrease in daily traffic volumes. It is interesting to note that traffic volumes along Palm Drive south of Hacienda Drive, experienced a decrease of about 4 to 5 percent between 1994 and 1999. Volumes on State Route 62 decreased by about 18%

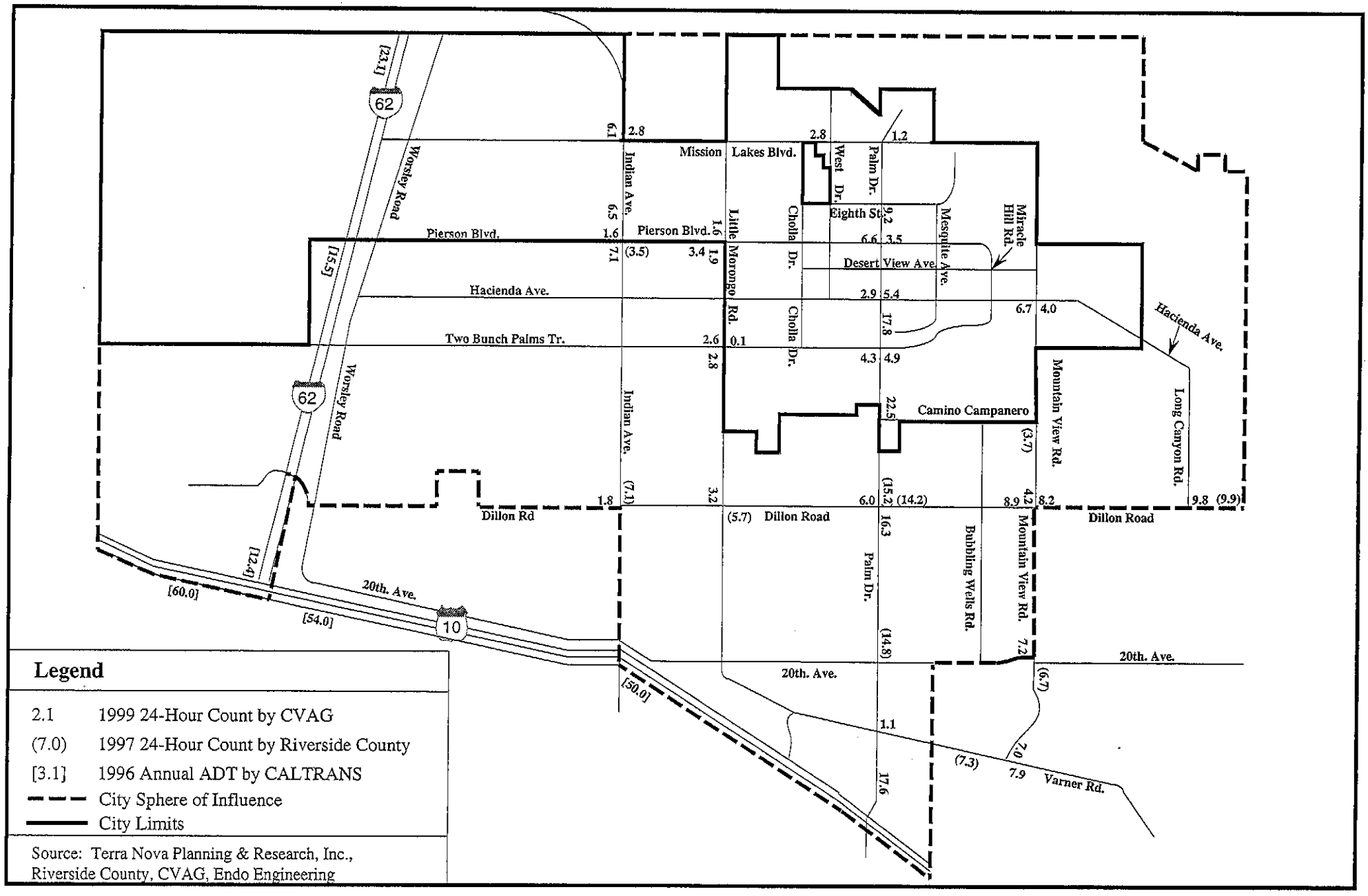
Of the links for which volumes were available for both years, only five links (22%) exhibited an increase in traffic volumes. Significant traffic volume increases (from 17% to 28%) occurred along Mission Lakes Boulevard. Daily traffic volumes on Interstate 10 increased by approximately 13% between 1994 and 1999. Roadway traffic volumes are illustrated below in Table III-3.

Table III-8
Comparison of Year 1994 Versus 1999
Average Daily Traffic Volumes

Roadway Link	1994 ADT	1999 ADT	Change in ADT	Percent Change
Mission Lakes Boulevard				
e/o Indian Avenue	2,200	2,812	612	28%
w/o West Drive	2,400	2,808	408	17%
e/o Palm Drive		1,284		
Pierson Boulevard				
w/o Indian Avenue	2,100	1,615	-485	-23%
w/o Little Morongo Road	4,300	3,491	-809	-19%
w/o Palm Drive	7,000	6,611	-389	-6%
e/o Palm Drive	5,200	3,556	-1,644	-32%
Hacienda Boulevard				
w/o Palm Drive	3,400	2,965	-435	-13%
e/o Palm Drive	6,000	5,431	-569	-9%
w/o Mountain View Road	6,500	6,728	228	4%
e/o Mountain View Road	4,900	4,035	-865	-18%
Two Bunch Palms Trail				
w/o Little Morongo Road		2,638		
e/o Little Morongo Road		135		
w/o Palm Drive	6,700	4,335	-2,365	-35%
e/o Palm Drive	6,100	4,994	-1,106	-18%
Dillon Road				
w/o Indian Avenue		1,862		
w/o Palm Drive		6,033		
w/o Mountain View Road		8,944		
e/o Mountain View Road		8,289		
e/o Long Canyon Road		9,835		
State Route 62				
n/o Pierson Boulevard	19,000	15,500	-3,500	-18%
s/o Pierson Boulevard	15,000	12,400	-2,600	-17%
Indian Avenue				
n/o Mission Lakes Blvd.	6,000	6,182	182	3%
n/o Pierson Blvd.	7,000	6,575	-425	-6%
s/o Pierson Blvd.	8,300	7,106	-1,194	-14%
Little Morongo Road				
n/o Pierson Boulevard	2,100	1,610	-490	-23%
s/o Pierson Boulevard	1,900	1,922	22	1%
s/o Two Bunch Palms Trl.	3,000	2,843	-157	-5%
n/o Dillon Road		3,210		

Palm Drive				
n/o Pierson Boulevard	10,500	9,298	-1,202	-11%
s/o Hacienda Avenue	18,800	17,879	-921	-5%
n/o City Limits	23,400	22,568	-832	-4%
s/o Dillon Road		16,342		
n/o Interstate 10		17,601		
Mountain View Road				
n/o Dillon Road		4,202		
n/o 20th Avenue		7,261		
n/o Varner Road		7,057		
Varner Road				
e/o Palm Drive		1,112		
e/o Mountain View Road		7,953		
Interstate 10				
w/o State Route 62	51,000	60,000		
w/o Indian Avenue	45,500	54,000		
w/o Palm Drive	46,500	50,000		
e/o Palm Drive	46,500	50,000		

Source: "Desert Hot Springs General Plan Update Circulation Background Study," prepared by Endo Engineering, March 2000.
Note: As noted above, recent improvements along Palm Drive from US Interstate-10 to the Two Bunch Palms Trail has significantly improved levels of service.



Legend

2.1	1999 24-Hour Count by CVAG
(7.0)	1997 24-Hour Count by Riverside County
[3.1]	1996 Annual ADT by CALTRANS
— — —	City Sphere of Influence
———	City Limits

Source: Terra Nova Planning & Research, Inc., Riverside County, CVAG, Endo Engineering

TERRA NOVA®
Planning & Research, Inc.

City of Desert Hot Springs
Existing
Average Daily Traffic (ADT) Volumes

Exhibit
III-3

Existing Intersections Analysis

Intersections are generally the most critical and constrained locations within the local street system, and peak hour intersection capacity analyses are useful indicators of worst-case traffic conditions. The 1985 Highway Capacity Manual methodology was used to determine peak hour levels of service at ten key intersections in the project vicinity. These include unsignalized, signalized, and four way stop intersections, as shown in the table below. Most key intersections are operating at acceptable Levels of Service, with the exception of the Pierson Boulevard/State Highway 62 intersection, which is operating at LOS E.

Table III-9
Existing Levels of Service
at Key Intersections

Intersection	Existing Peak Hour LOS
Unsignalized Intersections	
Mission Lakes Blvd. at	
Indian Avenue	C
Pierson Boulevard at	
State Highway 62	E
Little Morongo Road	B
Hacienda Avenue at	
Miracle Hill Road	B
Four-Way Stop Intersections	
Pierson Boulevard at	
Indian Avenue	B
West Drive	A
Hacienda Avenue at	
Mountain View Road	B
Signalized Intersections	
Palm Drive at	
Pierson Boulevard	B
Hacienda Avenue	B
Two Bunch Palms Trail	B

Source: "Desert Hot Springs General Plan Update Circulation Background Study," prepared by Endo Engineering, March 2000. Analysis is based upon the Highway Capacity Manual methodology. LOS E at Hwy 62/Pierson Blvd intersection on west-bound left turn only.

Public Transportation[4]

The Sunline Transit Agency provides public transit service within the City of Desert Hot Springs and the Coachella Valley. The Sunline fleet consists of buses powered by compressed natural gas, which are equipped with are equipped with wheelchair lifts and bicycle racks. Transit service is provided to the City of Desert Hot Springs along one route, Line 14, which proceeds along Palm Drive, Hacienda Drive, Mission Lakes Boulevard, West Drive and Pierson Boulevard and operates on a 50-minute schedule. Sunline also provides "SunDial" service for persons with disabilities. The SunDial fleet consists of several small buses which are wheelchair accessible and provide curb-to-curb access from residents' homes to destinations throughout the Coachella Valley. Reservations for this service are accepted up to 14 days in advance, and are available on a same-day basis.

Bikeways and Pedestrian Corridors

Alternative modes of transportation are important components of an effective circulation system, and the physical facilities necessary to make them safe and comfortable are essential. The use of bicycles as a means of transportation improves health, provides enjoyment, and reduces air pollution, traffic congestion and transportation costs. The General Plan planning area currently includes only 0.6 miles of designated bike lanes, consisting of signed or striped lanes adjacent to the street curb or striped paved shoulder, and no bike paths which are separated from the road right-of-way. Bicycle use is limited in the planning area due to several factors, including extreme heat in summer months and insufficient right-of-way along some roadways. However, the planning area is likely to benefit from the development of additional bike facilities that provide good connections between major commercial and residential areas, schools, parks, employment centers and adjacent communities.

The Coachella Valley Multimodal Transportation Planning Study proposes 4.0 miles of primary bikeways and 5.03 miles of secondary bikeways within Desert Hot Springs.[5] Specific bikeway design standards are provided by CalTrans' "Bikeway Planning and Design" manual, and include Class I bikeways (bike paths), Class II bikeways (bike lanes), and Class III bikeways (bike routes without striped lanes). Pedestrian walkways, signals, crosswalks, lighting, benches and other improvements can encourage walking as an alternative mode of transportation. Traffic calming techniques and reduced vehicle speeds can also be employed to make commercial districts and other areas more pedestrian friendly. The Coachella Valley Non-Motorized Transportation Element, prepared by the Coachella Valley Association of Governments (CVAG) in 1995, addresses the allocation and extent of existing and proposed bicycle, pedestrian, equestrian and other trail facilities and programs in the Coachella Valley.[6] The location of bikeway and trail facilities proposed by CVAG in the Desert Hot Springs area are illustrated in Exhibit III-4.

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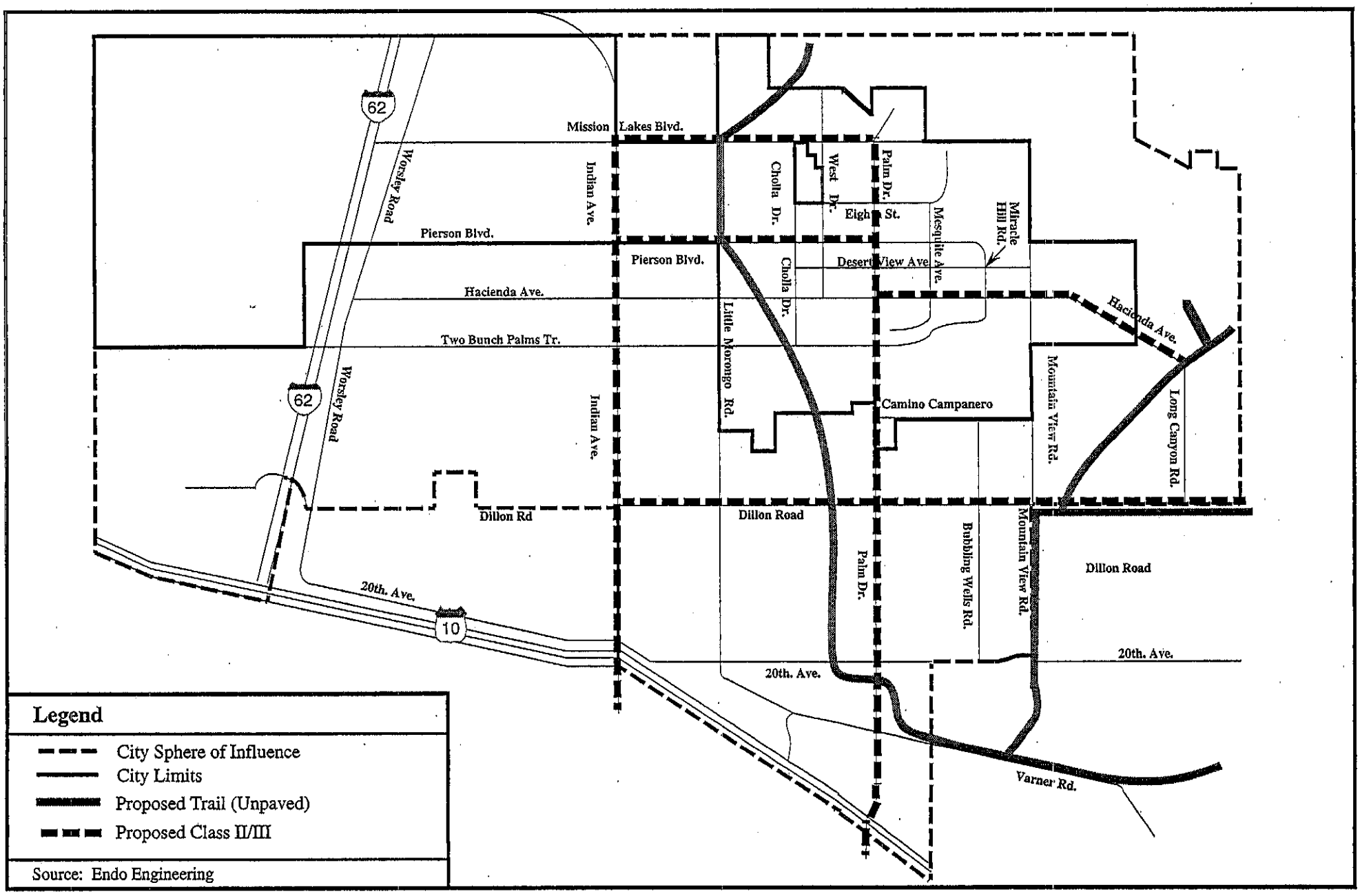
4 Leslie Grosjean, Senior Transportation Analyst, Sunline Transit Agency, letter correspondence dated February 28, 2000.

5 p. 2-62, "Coachella Valley Multimodal Transportation Planning Study," DKS Associates, Gensler and Associates and NBS Lowry, October 1995.

6 "Coachella Valley Association of Governments Non-Motorized Transportation Element," Fehr & Peers Associates, Inc. in association with Mainiero, Smith and Associates, Inc. August 29, 1995.



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City of Desert Hot Springs
CVAG Non-Motorized Transportation

Exhibit
III-4

Aircraft Traffic

The Palm Springs International Airport serves as the primary air transportation link for the Coachella Valley. The airport is located approximately three miles south of the General Plan planning area, and is classified in the National Plan of Integrated Airport Systems (NPIAS) as a long-haul commercial service airport. Major destination cities include Los Angeles, San Francisco, Chicago, Seattle and New York. Passenger traffic is clearly seasonal, with the peak season being late winter months of January through March, and the slowest period occurring during summer months.

Rail Service

Rail freight-hauling and passenger service are integral parts of a multi-modal transportation system. Southern Pacific Railroad (SPRR) lines are located outside of the General Plan planning area, approximately one-half mile south of and parallel to Interstate 10. There is also currently Amtrak passenger service on Southern Pacific's line. These facilities carry between 30 and 40 trains per day, almost all of which carry freight.

2. Project Impacts

Desert Hot Springs General Plan Transportation Model

The Desert Hot Springs General Plan Transportation Model was developed by Endo Engineering to evaluate and refine local growth policies pertaining to circulation and transportation. The model is based upon the Coachella Valley Area Transportation Study 2020 Model (CVATS), which was developed by the Southern California Association of Governments, in conjunction with the Coachella Valley Association of Governments (CVAG) and Riverside County Transportation Commission. The CVATS model is a large area network model used for regional transportation planning. It incorporates the 1995 Coachella Valley Origin-Destination Survey findings and forecasts peak season (winter months) average weekday travel demands for the year 2020.

Using the same procedures as the CVATS model, but on a more refined and focused level, the General Plan modeling process consisted of defining 34 Traffic Analysis Zones (TAZs) and the roadway network. Proposed land use information, socioeconomic and highway network assumptions were utilized to project future traffic demands upon buildout of the General Plan planning area. Based on the land uses within each TAZ, traffic volumes were generated and distributed along the circulation system. The TAZ system produces a forecast of traffic volumes in the planning area, and approximates how actual traffic enters and utilized the roadway network. The TAZ system was specifically tailored to the City of Desert Hot Springs in order to provide the most accurate data possible.

Trip Generation

Trip generation within each TAZ is based on land use data designated by the Preferred Alternative Land Use Plan and General Plan Land Use Element selected by the City's General Plan Advisory Committee (GPAC). The total number of vehicle trips produced in or attracted to a geographic area is directly related to the land use and demographic variables found in each TAZ. The model estimates the number of peak season vehicle trips that will be produced on an average weekday for each analysis zone.

Land uses associated with buildout of the Preferred Alternative are estimated to generate approximately 1,488,770 total trip ends, which represents a 17.8% decrease over the trips associated with buildout of the current General Plan.[7] Table III-10, below, provides a summary of the daily traffic volume projections expected upon buildout of the Preferred Alternative land use scenario. Projected traffic volumes are also illustrated on Exhibit III-5.

Table III-10
Preferred Land Use Alternative
Daily Traffic Volumes at Buildout

Roadway Link	1999 ADT	Buildout of Preferred Alternative ADT	Designation	V/C	LOS
Mission Lakes Blvd.			**Major Collector**		
e/o State Route 62	n/a*	11,900		0.38	A
e/o Indian Avenue	2,812	15,500		0.50	A
w/o West Drive	2,808	13,100		0.42	B
w/o Palm Drive	n/a*	13,100		0.42	B
Eighth Street			**Secondary**		
e/o Palm Drive	n/a*	8,400		0.34	A
Pierson Boulevard			**Major Arterial***		
e/o State Route 62	n/a*	25,600		0.53	B
w/o Indian Avenue	1,615	46,000		0.95	D
e/o Indian Avenue	n/a*	28,200		0.91	D
e/o Little Morongo Rd.	n/a*	20,200		0.65	C
e/o Palm Drive	3,556	24,700		0.80	D
w/o Miracle Hill Rd.	n/a*	18,700		0.75	C
Desert View Avenue			**Secondary**		
w/o Mountain View Rd.	n/a*	11,300		0.45	B
Hacienda Boulevard			**Major Collector***		
e/o Indian Avenue	n/a*	12,900		0.42	B
w/o Palm Drive	2,965	17,000		0.55	B
e/o Palm Drive	5,431	8,200		0.33	A
w/o Mountain View Rd.	6,728	16,700		0.67	C
e/o Mountain View Rd.	4,035	27,800		1.11	E
w/o City Limits	n/a*	19,500		0.78	C

7 "Desert Hot Springs General Plan Update Circulation Background Study," prepared by Endo Engineering, March 2000. Value is based on trip generation rates provided in the Institute of Transportation Engineers "Trip Generation" manual, 6th edition.

Table III-10 (Continued)
Preferred Land Use Alternative
Daily Traffic Volumes at Buildout

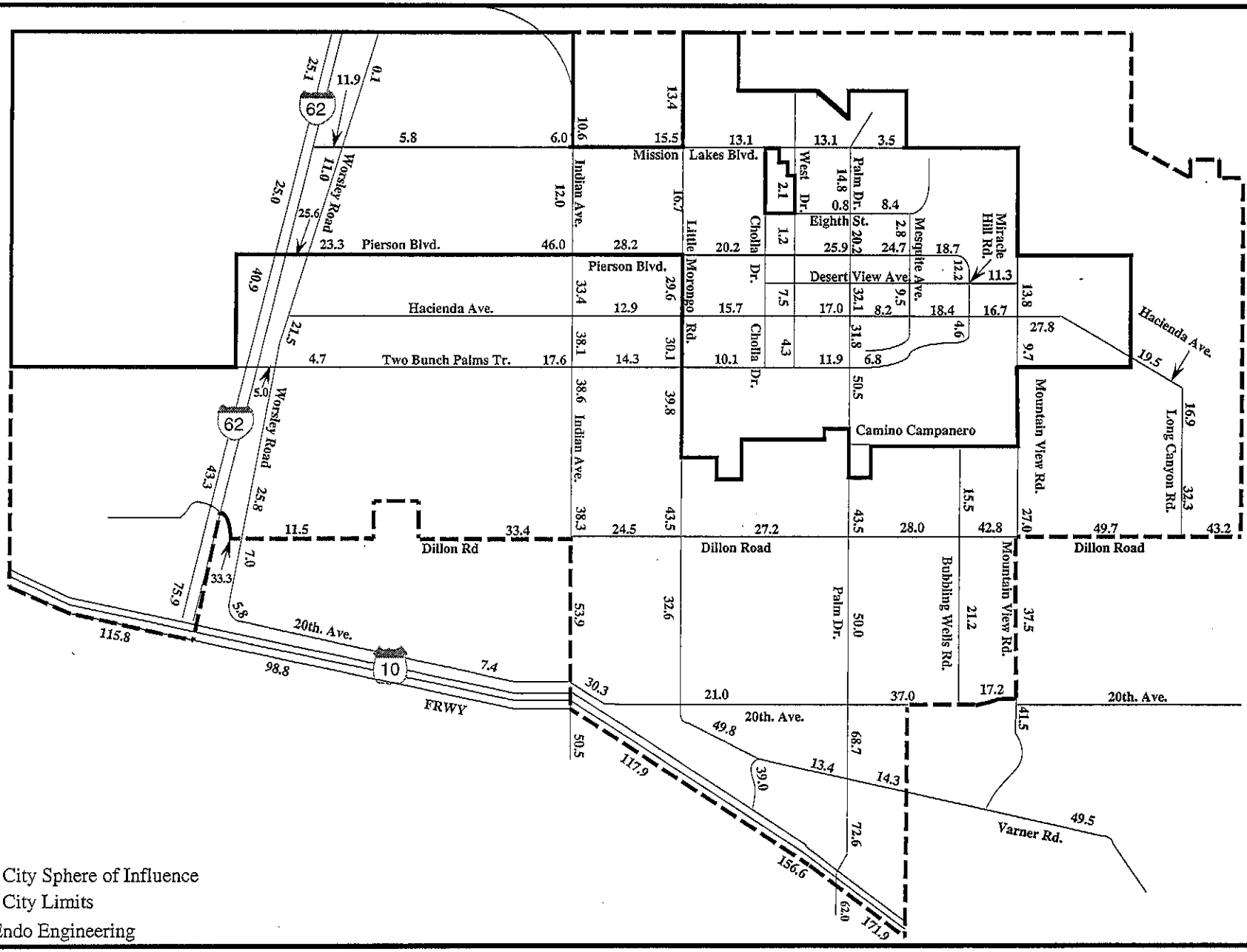
Roadway Link	1999 ADT	Buildout of Preferred Alternative ADT	Designation	V/C	LOS
Two Bunch Palms Trl.			**Minor Collector**		
w/o Indian Avenue	n/a*	17,600		0.70	C
w/o Palm Drive	4,335	11,900		0.48	B
e/o Palm Drive	4,994	6,800		0.27	A
Dillon Road			**Major Arterial***		
e/o State Route 62	n/a*	33,300		0.69	C
w/o Indian Avenue	1,862	33,400		0.69	A
w/o Palm Drive	6,033	27,200		0.88	D
w/o Mountain View Rd.	8,944	42,800		0.88	D
e/o Mountain View Rd.	8,289	49,700		1.02	E
e/o Long Canyon Rd.	9,835	43,200		0.89	D
20th Avenue			**Major Arterial***		
w/o Little Morongo Rd.	n/a*	30,300		0.98	D
w/o Palm Drive	n/a*	21,000		0.68	C
e/o Palm Drive	n/a*	37,000		0.76	C
w/o Mountain View Rd.	n/a*	17,200		0.55	C
Varner Road			**Major Arterial***		
w/o Palm Drive	n/a*	13,400		0.43	B
e/o Palm Drive	1,112	14,300		0.46	B
e/o Mountain View Rd.	7,953	49,500		1.02	E
Interstate 10			**Freeway**		
e/o State Route 62	n/a*	98,800		0.61	B
e/o Indian Avenue	n/a*	117,900		0.73	C
w/o Palm Drive	50,000	156,600		0.97	D
e/o Palm Drive	50,000	171,900		1.07	E
State Route 62			**Freeway**		
n/o Pierson Blvd.	15,400	25,000		0.38	A
n/o Two Bunch Palms Trl.	n/a*	40,900		0.63	B
n/o Dillon Road	n/a*	43,300		0.67	B
Worsley Road			**Major Collector**		
n/o Pierson Blvd.	n/a*	11,000		0.35	B
n/o Dillon Road	n/a*	25,800		0.83	D
Indian Avenue			**Urban Arterial***		
n/o Mission Lakes Blvd.	6,182	10,600		0.34	B
n/o Pierson Blvd.	6,575	12,000		0.39	B
n/o Dillon Road	n/a*	38,300		0.79	D
n/o 20th Avenue	n/a*	53,900		0.82	D

Table III-10
(Continued)
Preferred Land Use Alternative
Daily Traffic Volumes at Buildout

Roadway Link	1999 ADT	Buildout of Preferred Alternative ADT	Designation	V/C	LOS
Little Morongo Road			**Major Arterial***		
n/o Pierson Blvd.	1,610	16,700		0.54	B
n/o Hacienda Avenue	n/a*	29,600		0.95	D
s/o Two Bunch Palms Trl.	2,843	39,800		0.82	D
n/o Dillon Road	3,210	43,500		0.90	D
s/o 20th Avenue	n/a*	49,800		1.03	E
West Drive			**Minor Collector**		
s/o Pierson Blvd.	n/a*	7,500		0.30	A
Palm Drive			**Urban Arterial***		
n/o Hacienda Avenue	n/a*	32,100		0.66	C
n/o Two Bunch Palms Trl.	n/a*	31,800		0.66	C
s/o Two Bunch Palms Trl.	n/a*	50,500		1.04	E
s/o Dillon Road	16,342	50,000		0.76	C
s/o 20th Avenue	n/a*	68,700		1.04	E
s/o Varner Road	n/a*	72,600		1.10	E
Verbena Drive			**Secondary**		
n/o Hacienda Avenue	n/a*	9,500		0.38	A
Miracle Hill Road			**Secondary**		
s/o Pierson Blvd.	n/a*	12,200		0.49	B
Bubbling Wells Road			**Minor Collector**		
s/o Dillon Road	n/a*	21,200		0.85	D
Mountain View Road			**Major Arterial***		
n/o Hacienda Avenue	n/a*	13,800		0.55	B
n/o Dillon Road	4,202	27,000		0.87	D
s/o Dillon Road	n/a*	37,500		0.77	C
n/o Varner Road	7,057	41,500		0.86	D
Long Canyon Road			**Major Collector**		
s/o Hacienda Avenue	n/a*	16,900		0.55	B
n/o Dillon Road	n/a*	32,300		1.04	E

* Roadway designation varies depending on location.

Source: "Desert Hot Springs General Plan Update Circulation Background Study," prepared by Endo Engineering, March 2000.



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City of Desert Hot Springs
Preferred Alternative Buildout
Traffic Projections

Exhibit
III-5

Levels of Service

In recent years, traffic engineers and transportation planners have attempted to bridge the gap between providing ideal roadway operating conditions and the costs of infrastructure to assure those conditions. While LOS C has long been considered the desirable and optimal level of traffic volume, it represents a standard that is progressively more difficult and less cost-effective to achieve in urban areas. For peak operating periods, LOS D and/or a maximum volume to capacity ratio of 0.90 is now considered the generally acceptable service level. Where an LOS of E or worse exists along certain roadway segments, every measure to improve operating conditions shall be considered.

As illustrated in Table III-10, most of the modeled roadway segments in the planning area will continue to operate at acceptable levels-of-service (LOS D or better) at buildout of the Preferred Alternative. None of the links are expected to operate at LOS F. However, nine of the links modeled are expected to function at LOS E on a daily basis upon buildout, including the following:

- Hacienda Boulevard, east of Mountain View Road
- Dillon Road, east of Mountain View Road
- Varner Road, east of Mountain View Road
- Interstate 10, east of Palm Drive
- Little Morongo Road, south of 20th Avenue
- Palm Drive, south of Two Bunch Palms Trail
- Palm Drive, south of 20th Avenue
- Palm Drive, south of Varner Road
- Long Canyon Road, north of Dillon Road

With the exception of Hacienda Avenue, all of the above referenced roadway segments are expected to carry daily traffic demands that exceed their design capacities by five percent or less. Hacienda Avenue is projected to operate with volumes that exceed design capacity by 11 to 15 percent.

A comparison of existing Levels-of-Service; and those expected at buildout of the Preferred Alternative indicate that there will be no change in the daily levels of service along ten links in the planning area. The daily LOS will drop by one level of service along twelve links at buildout of the Preferred Alternative. Daily LOS will drop by two levels along four links, and three levels along six links at buildout of the Preferred Alternative. One roadway link evaluated will improve by one LOS level, and one link will improve by two LOS levels upon buildout of the Preferred Alternative.

Summary of Roadway Impacts

The average daily trip volumes projected to result from buildout of the Preferred Land Use Alternative and projected background traffic will not result in significant adverse impacts which cannot be addressed through the assignment of appropriate roadway classifications and planned roadway improvements. While a limited number of roadway segments may operate with volumes that exceed their design capacities upon buildout of the Preferred Alternative, the total number of vehicle trips generated at buildout of the Preferred Alternative are expected to be about 18% less than those generated by the buildout of the current General Plan.

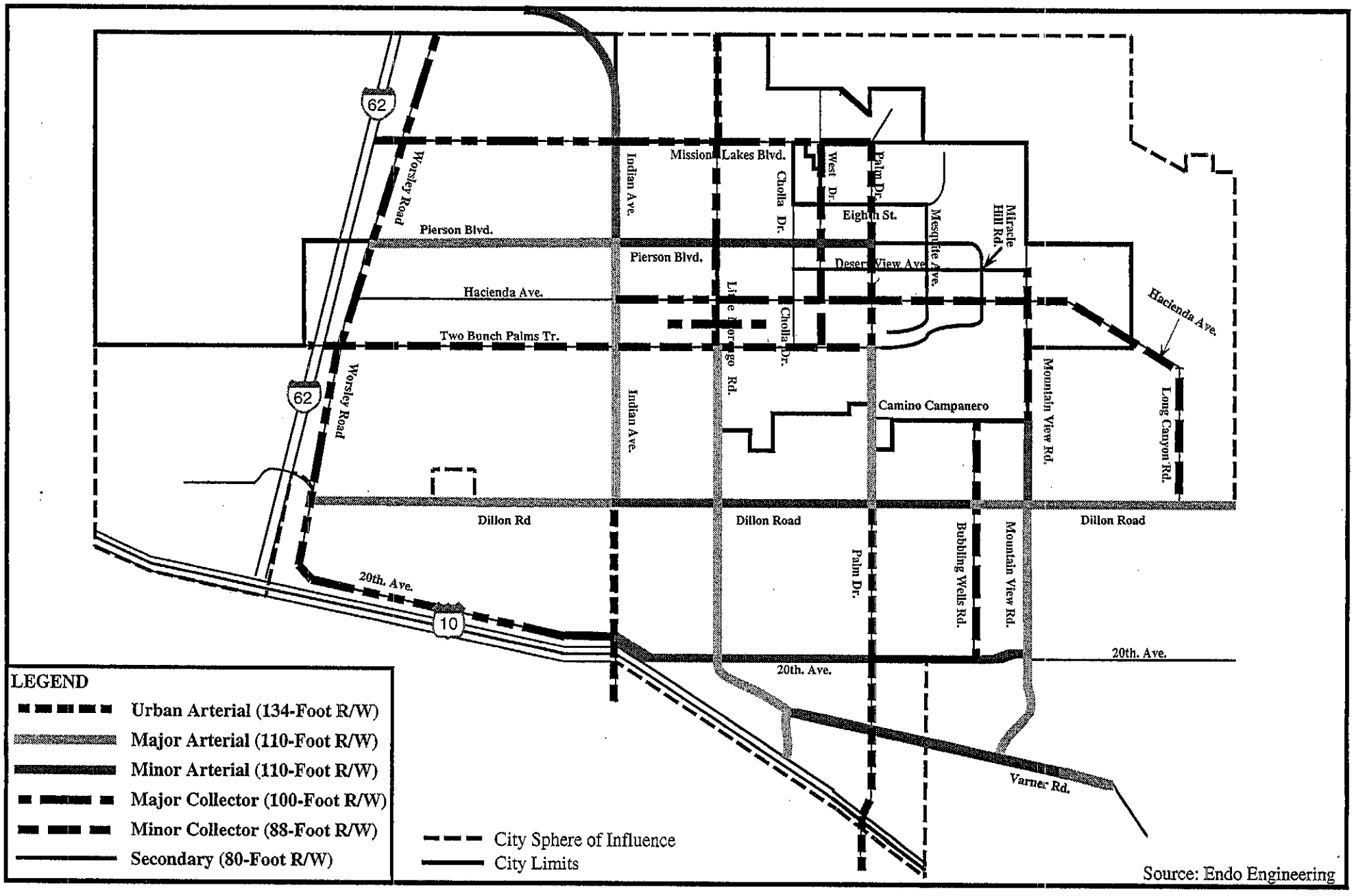
Potential Impacts Associated with Palm Springs International Airport[8]

According to the traffic study prepared for the Palm Springs International Airport Master Plan Update of 1994, heavy roadway congestion is projected for the year 2010 at the Date Palm Drive/Gene Autry/Interstate 10 interchange. The majority of this traffic is expected to result from new development in the Desert Hot Springs planning area. Substantial interchange improvements, including additional traffic lanes on Gene Autry Trail and a southbound loop on Interstate 10, may be required to provide adequate levels of service at this location.

3. Mitigation Measures

The City of Desert Hot Springs and surrounding planning area are only partially built out, and the existing street system reflects this level of development. To adequately serve projected traffic volumes at General Plan buildout, the local road network will require improvement. The upgraded roadway network that would be necessary for the City to adequately circulate local and regional traffic is illustrated in Exhibits III-6 and III-7. Exhibit III-6 shows the recommended roadway classifications, and Exhibit III-7 details the cross-sections of these roadway classifications.

8 ."Desert Hot Springs General Plan Update Circulation Background Study," prepared by Endo Engineering, March 2000.



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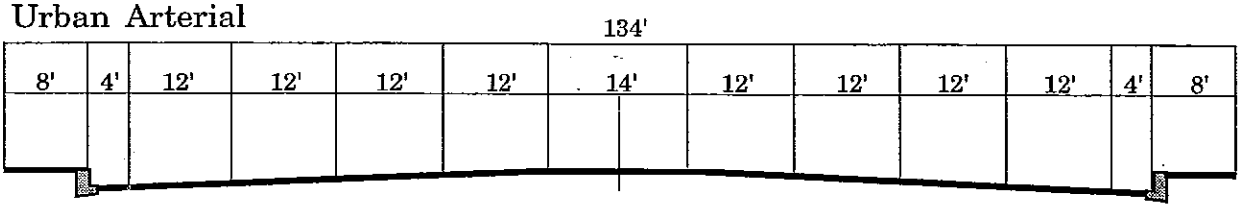
City of Desert Hot Springs
Roadway Classifications Map

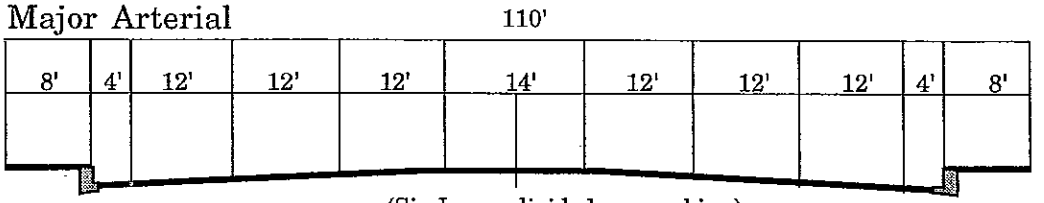
Exhibit
III-6

Urban Arterial



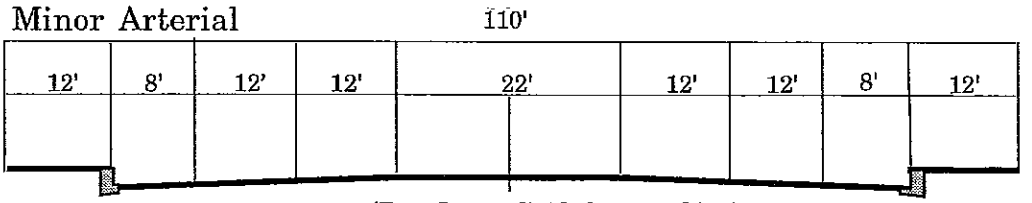
(Eight Lanes divided, no parking)

Major Arterial



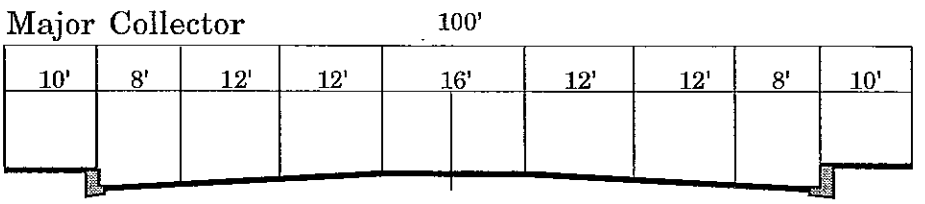
(Six Lanes divided, no parking)

Minor Arterial



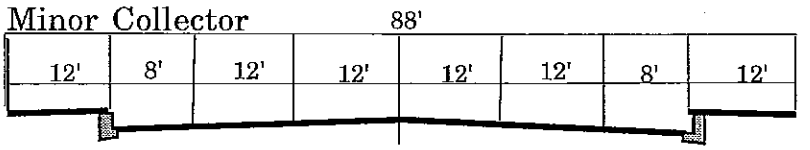
(Four Lanes divided, no parking)

Major Collector



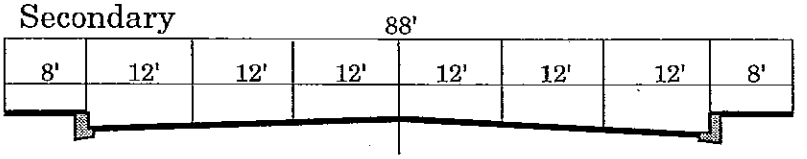
(Four Lanes divided, no bike lane/no parking

Minor Collector



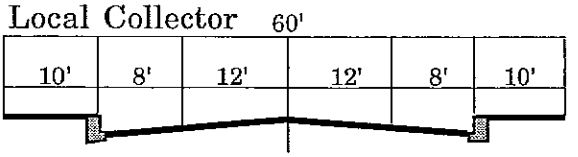
(Four Lanes undivided, w/parking)

Secondary



(Four Lanes undivided, w/parking)

Local Collector



(Two Lanes w/parking)

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City of Desert Hot Springs
Street Cross Sections

Exhibit

III-7

Recommended Circulation System Upgrades

A total of nine roadway links are expected to operate at LOS E at General Plan buildout. Typically, roadway links which operate at LOS E on a daily basis can be adequately mitigated by providing additional turning lanes at the intersections. It is also important to reserve adequate right-of-way at the major intersections to mitigate LOS E conditions.

In the Desert Hot Springs planning area, potential traffic congestion is expected to impact LOS E roadway segments for generally short distances, and parallel routes with available capacity are available if these links become congested. Despite the potential for traffic delays along these roadway segments, no specific intersection or design improvements are deemed necessary at this time. The assignment of appropriate roadway classifications and the preservation of adequate rights-of-way, as depicted in Exhibit III-7, are expected to adequately mitigate traffic congestion at these locations.

Specifically, Little Morongo Road between Two Bunch Palms Trail and Interstate 10 is proposed as a major arterial highway to better serve future development and reduce future traffic volumes at the Palm Drive/Interstate 10 interchange. Additional system upgrades include the improvement of Palm Drive to urban arterial standards south of Dillon Road, and to major arterial standards between Two Bunch Palms Trail and Dillon Road. Indian Avenue, south of Dillon Road, is also proposed as an urban arterial roadway to accommodate buildout traffic.

U.S. Interstate 10

Access to Interstate 10, and across Interstate 10 from the planning area, is currently limited to four locations separated by 3-mile intervals: State Highway 62, Indian Avenue, Palm Drive and Date Palm Drive. This wide separation concentrates traffic onto a few streets near Interstate 10. Palm Drive currently has the highest traffic volumes of any surface street in the planning area, and will continue to carry the highest volumes in the future. As future development occurs in the western portion of the planning area, State Route 62 and Indian Avenue will serve as the primary north-south commuter routes for these areas. Even with the improvement of Palm Drive and Indian Avenue to eight-lane roadways north of Interstate 10, portions of these roadways could operated at unacceptable levels of service.

CalTrans is currently studying the Palm Drive/Interstate 10 interchange to design a facility which will address future traffic volumes. The two design alternatives include an improved diamond interchange and a half cloverleaf.

In more heavily developed areas, freeway interchanges are typically spaced 1 to 1.5 miles apart. A new interchange at Little Morongo Road and Interstate 10 would divert traffic from the Indian Avenue and Palm Drive interchanges. The City should participate, with CalTrans and the Federal Highway Administration, in the development of a new interchange and/or the expansion of existing interchanges serving the planning area. In the meantime, it is critical that adequate right-of-way be reserved near Interstate 10 to accommodate ultimate roadway widths.

Special Study Zones

Special Study Zones have been identified along two arterial highways: Palm Drive and Indian Avenue in the vicinity of Interstate 10. Within these Special Study Zones, a high capacity arterial highway and other capacity augmentations may ultimately be required to provide more efficient access to and from Interstate 10. Where feasible, these roadways should incorporate higher design standards, including synchronized traffic signals, raised medians, controlled access and no parking lanes. Turn lanes at major intersections may be required where there is high demand for turning maneuvers during peak hours. Right-of-way requirements along these arterials should be determined through detailed peak hour corridor studies.

Additional Mitigation Measures

The following mitigation measures will help assure that the City's circulation system functions at its most optimum and efficient, while keeping required improvements as cost-effective as possible.

A. The City shall continue to coordinate and cooperate with CalTrans, CVAG and adjoining jurisdictions with regard to phasing of highway improvements that assure acceptable operating levels along Interstate 10, State Highway 62 and other major roadways.

B. The City shall encourage the utilization of mass/public transit facilities, including those of the Sunline Transit Agency.

C. Prior to the approval of each development phase, the City and developers shall confer with the Sunline Transit Agency to determine where bus turnouts and covered bus stop shelters shall be placed within the project and in the project vicinity.

D. The City shall require, as necessary, project-specific and/or phase-specific traffic impact analyses for subdivision or other project approvals. Such analyses may need to identify buildout and opening year traffic impacts and service levels, and may need to exact mitigation measures required on a cumulative and individual project or phase basis.

E. The City of Desert Hot Springs shall continue to participate in the CVAG Transportation Uniform Mitigation Fee (TUMF) program and shall assure that appropriate fees are assessed for development projects as a means of supporting the financing of regional transportation infrastructure. Impact fees shall be collected prior to the issuance of building permits and may be incrementally assessed in conformance with the TUMF program.

F. All development proposals and circulation projects shall comply with the current Riverside County Congestion Management Program (CMP) in place, as defined by the Riverside County Transportation Commission.

G. All development proposals located within a designated scenic corridor shall be reviewed for compatability with the natural and built environments to assure maximum protection of viewsheds.

H. All project-related or induced roadway upgrades should be considered the sole responsibility of the developer.

I. The City shall continue to coordinate with Sunline Transit Agency to establish transit stops adjacent to medical facilities, major employment areas, shopping centers and parks.

J. The City shall prepare and adopt a Comprehensive Trails System Master Plan which identifies an extensive network of bikeways, pedestrian and/or equestrian trails that provide important connections between existing and proposed regional bikeways and other trails. The Plan shall be coordinated with the CVAG Non-Motorized Transportation Element and Riverside County's Western Coachella Valley Plan, to the greatest extent practical.

K. Phasing of roadway improvements shall assure the necessary level of traffic control and safety.

L. The City shall continue to coordinate and cooperate with the Palm Springs International Airport and Southern Pacific Railroad, as necessary, to assure that the City's transportation and commercial needs are met.

Mitigation Monitoring/Reporting

- Prior to the approval of subdivision maps or other City development permits, developers shall submit detailed development and preliminary roadway improvement plans to the City for approval. The plans shall be reviewed by staff to assure their compatibility with other City circulation improvement plans, the above-referenced mitigation measures, and originally approved development plans.
  Responsible Parties: Developer, Consulting Traffic Engineer, Public Works Department, City Engineer, Community Development Department

- Internal roadway mitigation measures shall be incorporated into development designs, the inclusion of which shall be verified by the Community Development Department.
  Responsible Parties: developer, City Engineer, Public Works and Community Development Departments

- Development approvals shall be withheld until the City Community Development Department verifies that the developer has consulted with the Sunline Transit Agency and that public transit has been incorporated into project design to the greatest extent practical.
  Responsible Parties: developer, Sunline Transit Agency, Community Development Department, City Engineer

C. Soils and Geology

1. Existing Conditions

The following discussion is largely based upon the geotechnical evaluation that was prepared for the Desert Hot Springs General Plan Update by Earth Consultants International.[9] The report addresses geotechnical and seismic conditions in the General Plan planning area and the broader Coachella Valley, and is included in its entirety in Appendix C.

9 "Technical Background Report, General Plan Update, City of Desert Hot Springs, Riverside County, California," Earth Consultants International, May 28, 1997.

Geologic Setting

The City of Desert Hot Springs and adjacent planning area are located at the northwestern extreme of the Salton Trough, a physically contiguous tectonic depression which extends from the San Gorgonio Pass to the Gulf of California. The Salton Trough is the landward extension of the East Pacific Rise spreading ridge and transform fault system. The formation of new surface crust at this spreading ridge is responsible for separating Baja California from mainland Mexico and creating the Gulf of California.

These two plates are sliding past one another at an annual rate of about 50 mm, and the movement between them is responsible for the earthquakes that occur in southern California. Recent studies indicate that far too few earthquakes have occurred in southern California in the past 200 years to account for the rate of movement between the two plates. The data suggest that numerous moderate earthquakes, or a few large earthquakes of magnitude 7.2 or larger may occur in the near-term.

Soils and Surficial Rocks

Rocks and sediments infilling the Salton Trough provide important details about the geologic history of the area. Rocks of the Imperial Formation, which crop out at Painted Hill, are of marine origin, indicating that the trough was underwater during the last Miocene, approximately 10 to 6 million years ago. Since that time, the sediments have been overlain by a thick deposit of terrestrial sediments. Deposition of sediments on the valley floor continues to occur today.

The planning area is comprised of six major geologic units, as illustrated in Exhibit III-8. The engineering properties of each is described below.

Alluvial Sediments (Qa, Qfp)

These soils consist of gravelly fine to coarse-grained sand with variable amounts or cobbles and boulders. Alluvial sediments are typically loose near the ground, but become medium dense with depth. They are generally suitable for use as compacted fill and have medium to high permeabilities, except where silt layers may retard the percolation of water. These soils are typically found on the central valley floor.

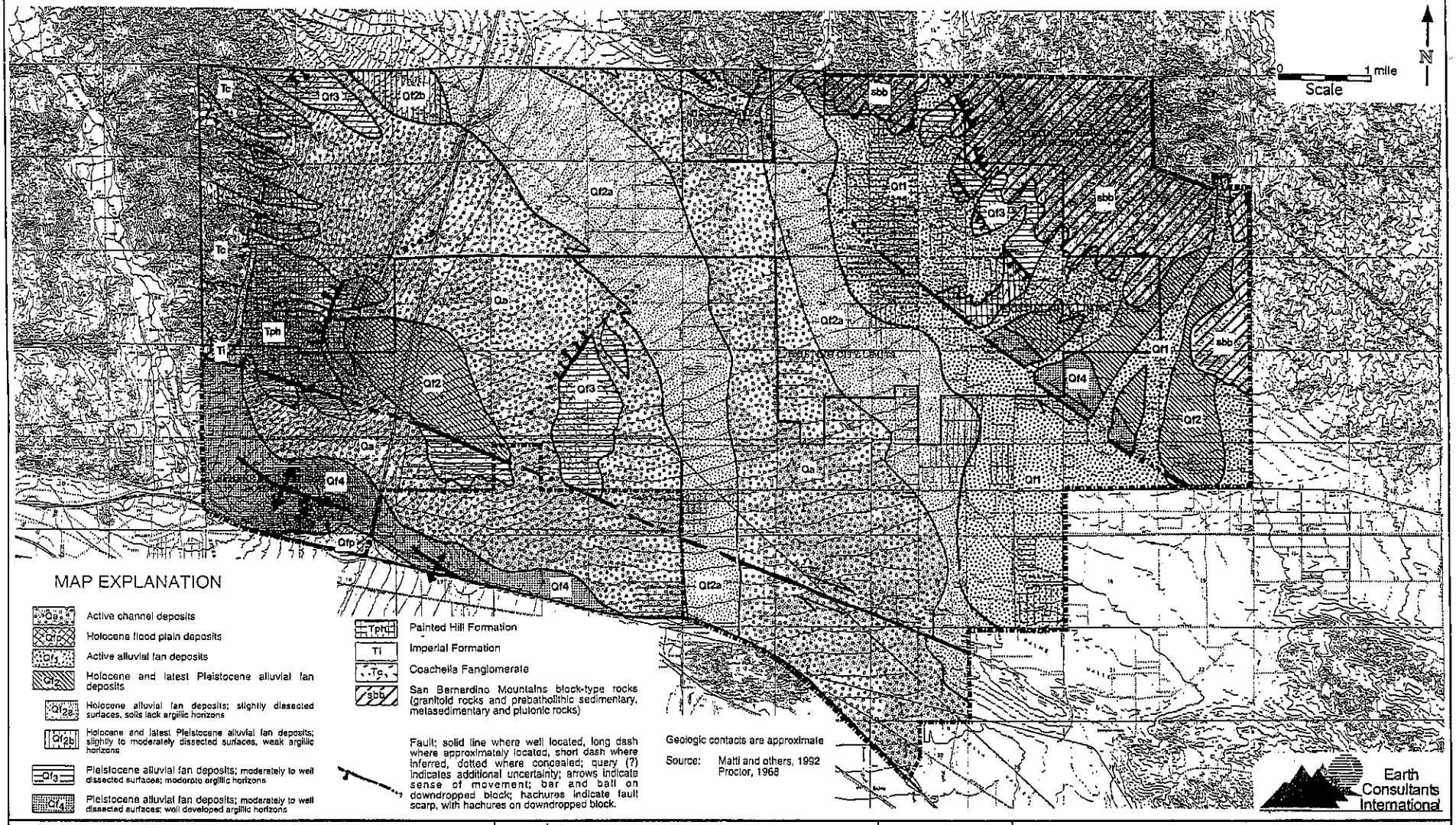
Alluvial Fan Sediments (Qf)
These dry, medium density deposits consist of gravelly to bouldery, fine to coarse-grained sand. They typically occur on elevated fans which form at the mouths of canyons and within alluvial washes in the planning area. Older alluvial fan deposits may have moderate to high expansion potentials near the surface, but permeability is limited. More recent deposits typically have lower expansion potentials and higher permeabilities.

Painted Hills Formation
This unit consists of poorly sorted conglomerate and conglomeratic sandstone and occurs in the Painted Hill area in the western portion of the planning area. Dry density data is not available.

Imperial Formation
The Imperial Formation unit is of marine origin and contains shells and shell fragments. This unit consists of siltstone, claystone or sandstone and may include traces of gypsum. Where surface soils consist primarily of claystone, expansion potential is moderate to high. Where sandstone dominates the surface, expansion potential is considered low. These units occur only in limited quantities at the extreme western portion of the planning area, along the toe of the San Bernardino Mountains.

Coachella Fanglomerate
The Coachella Fanglomerate occurs in the foothills of the San Bernardino Mountains and consists of poorly-sorted, angular clasts of gneiss, granite and basalt as large as 6 feet in diameter, within a coarse sandstone matrix. Locally, these sediments are more than 4,500 feet thick and were deposited by gravity.

Granitic and Metasedimentary Rocks
These soil units consist of foliated schists and gneisses intruded by gabbro, granite and quartz diorite. Granite intrusions are characteristically closely jointed or fractured and have low to moderate permeabilities, except where joints, shears and foliation provide avenues for water penetration. Unweathered rock cannot generally be excavated easily and blasting is frequently required. These units are found in the foothills and higher slopes of the Little San Bernardino Mountains.



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Geology Map of the Desert Hot Springs Area

Geologic Hazards

Each of the geologic units that occur at or near the surface of the planning area pose unique geotechnical and engineering constraints and opportunities, as described below.

Expansive Soils

Expansive soils are those that contain significant amounts of clay particles that have the ability to give up (shrink) or take on (swell) water. When these soils swell, the change in volume can exert significant pressures on loads created by buildings or other structures. Expansive soils are not generally considered a hazard in the Desert Hot Springs area, although older alluvial fan deposits could have moderate to high expansion potentials. These soils typically occur within the upper 10 feet near the ground surface.

Collapsible Soils

Soil collapse typically occurs in recently deposited soils that were deposited in an arid or semi-arid environment. When saturated, collapsible soils experience a loss of cementation, resulting in rapid and substantial settlement under relatively low loads. The weight of a structure, combined with the infiltration of water from irrigation or a rising groundwater table, can initiate settlement and cause cracking of walls and foundations, and tilting or sagging of floors. The alluvial sediments which comprise much of the planning area are prone to collapse, which can result from surface irrigation or a rise in the ground water table.

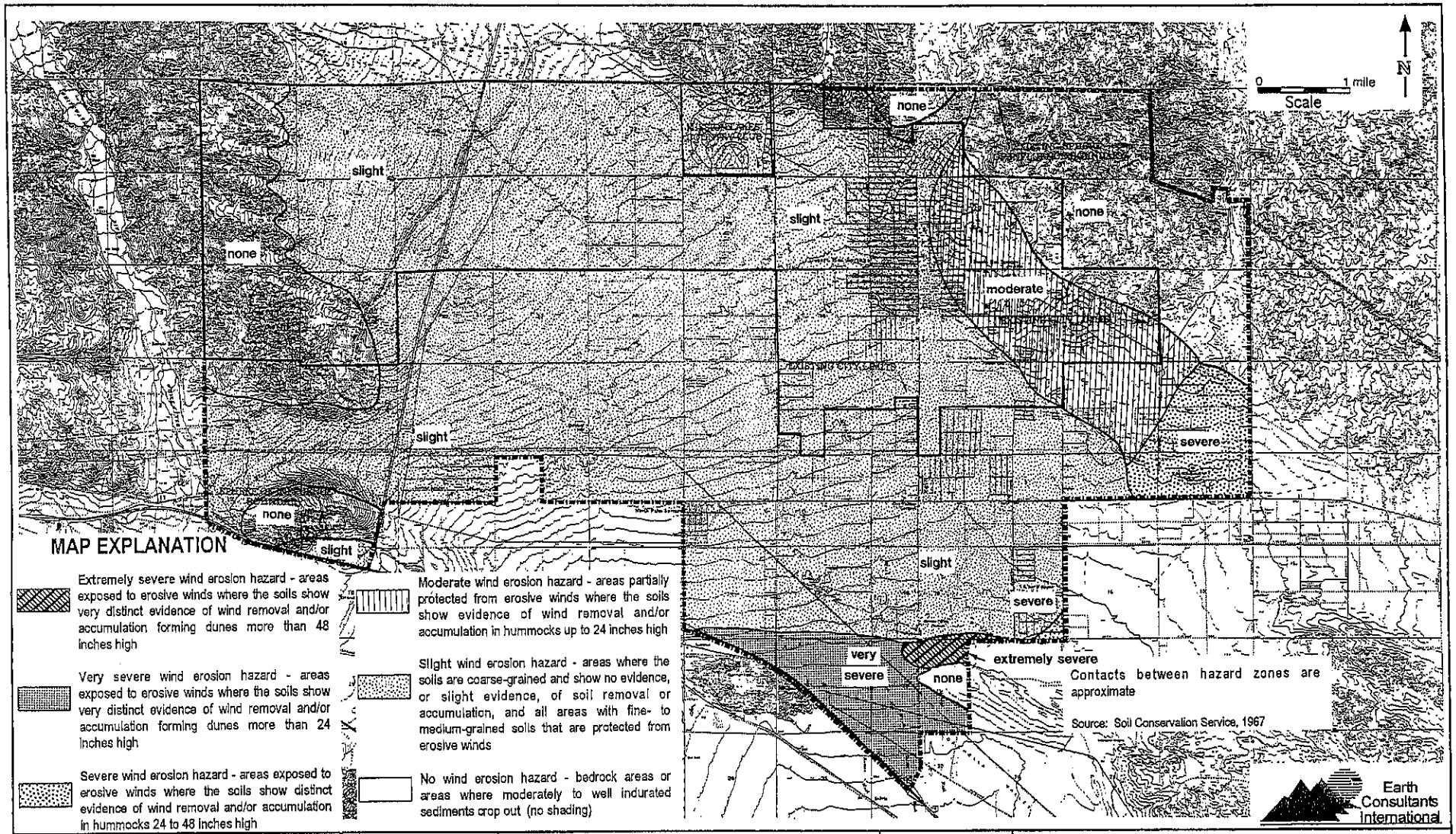
Ground Subsidence

Ground subsidence is the gradual settling or sinking of the ground surface with little or no horizontal movement. This phenomenon is usually associated with the extraction of oil, gas or ground water from below the ground surface, but it may also occur as a result of an earthquake. Subsidence can result in the disruption of surface drainage, reduction of aquifer storage, the formation of earth fissures, and damage to wells, buildings, roads and utility infrastructure. The 4-meter high scarp on the west side of Devers Hill indicates that uplift has occurred within the planning area, probably in response to earthquakes on the San Andreas fault.

Wind Erosion and Blowsand

Much of the Coachella Valley is highly susceptible to wind erosion and the impacts of blowsand. The valley floor, in particular, is largely unprotected from strong winds which blow southeasterly, as they are funneled through the San Gorgonio Pass. Abrasive, sandy soils that comprise the valley floor are easily transported by the wind, and can pose a hazard as they abrade and damage buildings and motor vehicles, fill drainages and yards, and limit visibility on roadways. The strongest wind storms typically occur during spring months.

Wind erosion is most severe in the southern and southeasterly portions of the planning area, while areas to the north are largely protected from the winds by the San Bernardino Mountains to the west. The wind hazard decreases substantially near the mountain front, where gravels and cobbles are too heavy to be transported by the wind. Wind erosion hazard zones in the planning area are illustrated in Exhibit III-9.



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Wind Hazard Zones in the Desert Hot Springs Area

Seismic Activity

About 70 percent of the earthquakes that occur in southern California are accommodated by the San Andreas fault. The rest of the movement occurs along other northwest trending faults west of the San Andreas, and a series of faults east of the San Andreas known as the Eastern Mojave Shear Zone, which were responsible for the 1992 Landers earthquake.

Under the guidelines of the Alquist-Priolo Earthquake Fault Zoning Act, the State of California classifies faults according to the following criteria: active faults show proven displacement of the ground surface within about the last 11,000 years (Holocene); potentially active faults show evidence of movement within the last 1.6 million years. Potentially active faults are considered less likely to be the origin of an earthquake. However, most have been insufficiently studied to determine whether they are truly active. Both active and potentially active faults are addressed in the following discussion.

The severity of an earthquake is determined by its magnitude and seismic intensity, which is an estimate of the damage caused by the earthquake at a given location. The Modified Mercalli Intensity (MMI) scale is commonly used to classify seismic intensity. The scale includes 12 levels of damage; the higher the number, the greater the damage. Given their proximity to the General Plan planning area, several faults have the potential to generate strong ground shaking motions that will impact the entire community. Table III-11 identifies the faults that may potentially generate peak horizontal ground accelerations of about 0.1g and greater. Faults located within the planning area are illustrated in Exhibit III-10.

Table III-11
City of Desert Hot Springs
Estimated Horizontal Peak Ground Accelerations and Seismic Intensities

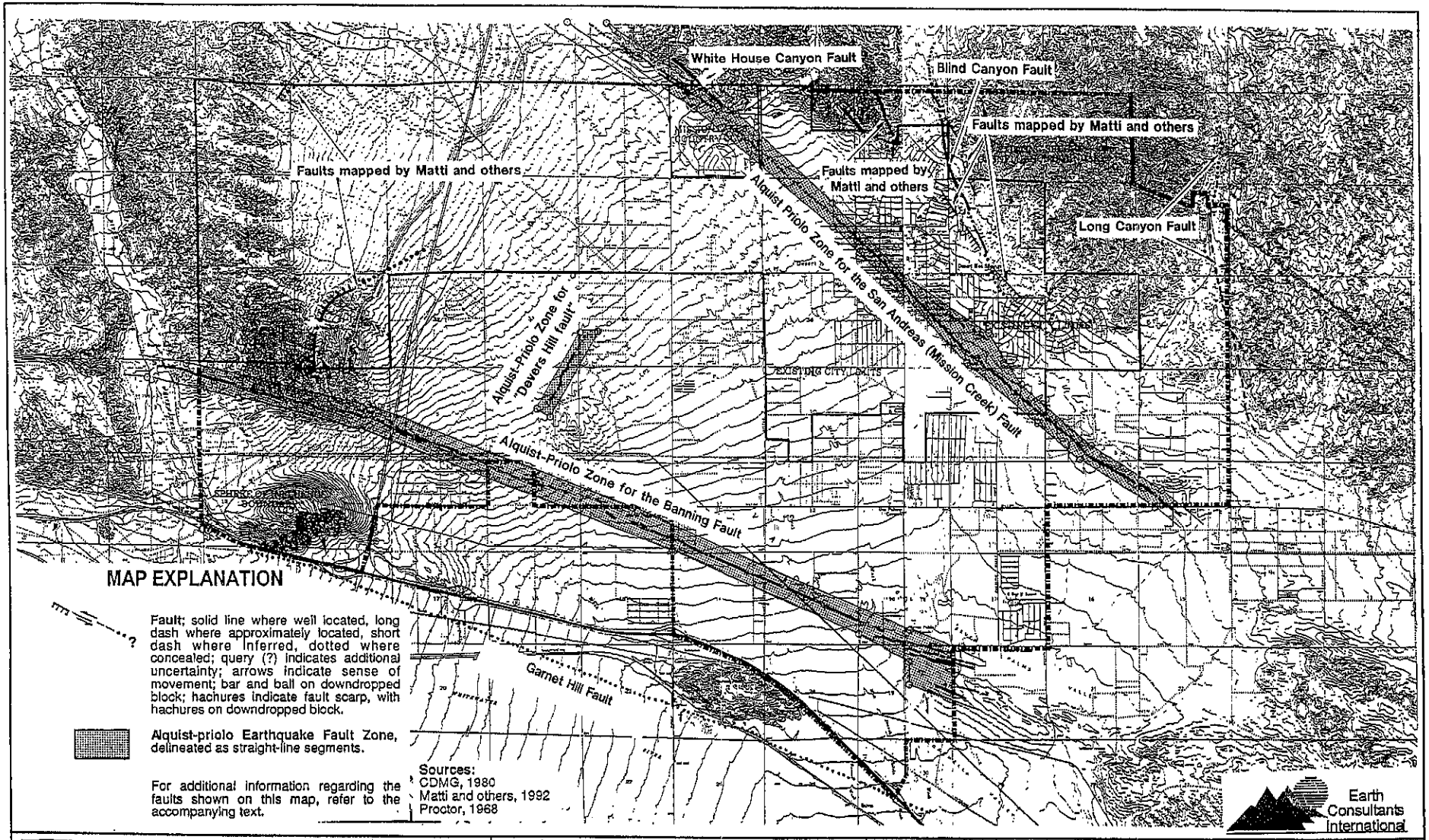
Fault Name	Distance to GP Area (miles)	Magnitude of MCE	PGA from MCE (g)	MMI from MCE
San Andreas				
Coachella Segment	0-5	8.0	0.50-0.75	X-XI
San Bernardino Mtns.	1-10	8.0	0.48-0.66	X-XI
Banning Fault	0-5	7.5	0.48-0.90	X-XI
Pinto Mountain-Morongo	2-13	7.3	0.28-0.60	IX-X
Blue Cut	9-22	7.0	0.10-0.30	VII-IX
Johnson Valley	13-19	7.5	0.20-0.28	VII-VIII
Homestead Valley	21-27	7.5	0.13-0.19	VIII
North Frontal Fault	23-32	7.7	0.11-0.18	VII-VIII
Helendale	19-29	7.3	0.10-0.17	VII-VIII
Lenwood-Old Woman Springs	22-28	7.3	0.10-0.15	VII-VIII
San Jacinto				
Hot Springs-Buck Ridge	18-25	7.0	0.08-0.16	VII-VIII
Casa Loma-Clark	21-28	7.0	0.06-0.13	VI-VII
Glen Helen-Lytle Creek-Claremont	22-30	7.0	0.06-0.12	VI-VII

Notes: GP = General Plan. MCE = Maximum Credible Earthquake; magnitude is given in Moment Magnitude Scale (Mw) in accordance with CDMG Open-File Report 96.08. PGA = Peak Ground Accelerations where g is the acceleration of gravity, equal to 9.8m/sec^2. MMI = Modified Mercalli Intensity

San Andreas Fault Zone

The San Andreas fault is the principal boundary between the Pacific and North American Plates, and is comprised of three segments in southern California: the Mojave Desert, the San Bernardino Mountains, and the Coachella Valley. The Coachella Valley segment is the only segment which crosses the planning area; however, the San Bernardino Mountains fault also poses a significant seismic threat to the study area since its eastern terminus is located at the intersection of the Morongo Wash and the northern boundary of the planning area.

The Coachella Valley segment, also referred to as the Mission Creek fault, bisects the eastern, most heavily populated portion of the City. Paleoseismic studies indicate that the last surface-rupturing quake occurred on this strand around 1680 A.D. Prior to 1680, earthquakes occurred on this fault on an average of every 220 years. The Coachella Valley segment is creeping at a rate of about 2 to 4 mm/year and has a long-term slip rate of approximately 25 ± 5 mm/year. It is estimated that this segment has a 22 percent probability of rupturing in the period between 1994 and 2024. An earthquake of magnitude 8.0 on this segment is capable of generating peak horizontal ground accelerations estimated to be between 0.5 and 0.75g at Desert Hot Springs.



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Faults in the Desert Hot Springs General Plan Area

The San Bernardino Mountains segment extends from the northwest portion of the planning area in a northwesterly direction to the Cajon Pass area. This segment is a structurally complex zone because it makes a left-step to bend in a more westerly direction. Several estimates of movement along the San Bernardino Mountain segment indicate that it has a slip rate of about 24 ± 5 mm/year, with an average occurrence interval of 146 years. The most recent surface-rupturing earthquake along the segment is believed to have occurred in 1812, and it is estimated that it has a 28 percent probability of rupturing between 1994 and 2024. An earthquake of magnitude 8.0 on this segment is estimated to be capable of generating peak horizontal ground accelerations of between 0.48 and 0.66 g in the City.

Banning Fault

The Banning Fault consists of three segments and is considered by some investigators to be the southernmost strand of the San Andreas fault zone. The western and central segments of the Banning Fault are located west of the planning area. The eastern segment extends across the City's sphere-of-influence, from Indio to Cottonwood Canyon west of the Whitewater River. This segment is creeping at a rate of about 2 mm/year and is believed to have caused the 1986 North Palm Springs earthquake. A magnitude 7.5 earthquake on the eastern segment is estimated to be capable of generating peak horizontal ground accelerations between 0.5 and 0.9g in the planning area.

Pinto Mountain-Morongo Fault

The Pinto Mountain-Morongo fault is an east-trending, high-angle strike-slip fault which is traceable for approximately 47 miles, from its junction with the San Andreas fault eastward to just east of Twentynine Palms. The Pinto Mountain fault is considered active, and Holocene movement on some of its fault traces have been documented. Sympathetic ground ruptures associated with the Landers earthquake were also reported. However, the fault has not historically produced a well-defined zone of seismicity, but rather a cluster of epicenters at depth. The fault is believed to be capable of generating a maximum credible earthquake of 7.3 to 7.4, which would result in peak horizontal ground accelerations of up to 0.6g in the northern portions of Desert Hot Springs.

Blue Cut Fault

The Blue Cut fault is an east-west trending fault east of the San Andreas fault that appears to be accommodating some of the north-south compression that results from a bend in the San Andreas fault. The Blue Cut fault is located near the southeast corner of the Mojave Desert, along the northern flank of the Eagle Mountains. Given that the western end of the Blue Cut Fault is relatively close to the City's SOI, an earthquake on this fault is estimated to be capable of generating peak horizontal ground accelerations of between 0.1 and 0.3g. However, it is unclear whether the fault has been active in the last 11,000 years; additional studies are needed to confirm whether and to what extent the fault poses a seismic threat.

Mojave Shear Zone

The Johnson Valley fault is one of several northwest-trending faults in the Mojave Desert, collectively known as the Eastern California or Mojave shear zone. These faults appear to be accommodating between 9 and 23 percent of the motion between the North American and Pacific Plates.

The epicenter of the 1992 Magnitude 7.6 Landers earthquake occurred on the Johnson Valley fault, with surface rupture occurring along several known and previously unknown faults. Although it is unlikely to occur, an earthquake of magnitude 7.5 on the Johnson Valley fault or other fault of the Mojave shear zone is estimated to be capable of generating peak horizontal ground accelerations of about 0.2 to 0.3g in Desert Hot Springs.

The Helendale fault is one of the northwest-trending faults that comprise the Mojave Shear Zone. Trenching studies indicate that the fault has ruptured at least three times during the last 16,000 years, with the last surface rupturing earthquake occurring less than 2,300 years ago. A magnitude 7.3 earthquake on this fault would generate peak horizontal ground accelerations in the planning area of about 0.1 to 0.17g.

The Lenwood-Old Woman Springs faults are two fault segments also considered part of the Mojave shear zone, but are located west of the faults that ruptured in 1992. The Lenwood segment did experience triggered slip during the Landers earthquake. Trenching studies indicate that the Lenwood fault has ruptured at least three times during the Holocene period, most recently about 200 to 400 years ago. The Old Woman Springs fault is the main trace in a complex zone of faulting. A magnitude 7.3 earthquake on this fault zone is estimated to be capable of generating peak horizontal ground accelerations of about 0.1 to 0.15g in the planning area.

San Jacinto Fault Zone

The San Jacinto Fault Zone consists of a series of closely spaced faults that form the western margin of the San Jacinto Mountains. The zone extends southeasterly, from its junction with the San Andreas fault in San Bernardino toward the Brawley area. The San Jacinto Fault Zone has a high level of of historical seismic activity, with at least ten moderate earthquakes (of Magnitude 6 to 7) having occurred on this fault zone between 1890 and 1986. A maximum credible earthquake of magnitude 7.0 on any of the three closest segments of this fault zone to the City of Desert Hot Springs is estimated to generate peak horizontal ground accelerations of between 0.06 and 0.16g in the planning area.

North Frontal Fault

The North Frontal Fault underlies the northern and eastern portions of the San Bernardino Mountains. The fault is not believed to have been studied in detail; however, slip rates have been estimated at about 0.5 mm/year. The North Frontal fault zone is believed to be capable of generating peak horizontal ground accelerations of about 0.1 and 0.2g in the planning area.

Garnet Hill Fault

The Garnet Hill fault extends from the Whitewater Canyon area to possibly as far as Edom Hill, and is located just south of the Desert Hot Springs SOI, south of Interstate-10. Although the fault is not considered active by the California Division of Mines and Geology, ground fractures associated with the 1986 North Palm Springs earthquake were reported along this fault. Its orientation and proximity to the San Andreas fault suggest that the Garnet Hill fault is associated with the San Andreas fault zone.

Other Faults in the Planning Area

The Blind Canyon Fault was mapped in the late 1960s as trending slightly west of north through the Little San Bernardino Mountains. The fault is also known to occur in the Cornerstone area and trends southeast in the vicinity of the intersection of Pierson Boulevard and Miracle Hill Road. The fault may extend further south to connect with the Mission Creek fault. Although recent studies are inconclusive about the activity or inactivity of the Blind Canyon fault, the fault may be subject sympathetic movement as a result of an earthquake on the San Andreas fault. For this reason, it is recommended that site-specific fault investigations be required where development is proposed along the Blind Canyon fault.

The White House Fault has been mapped almost 300 feet north of the main San Andreas fault in the Mission Lakes Country Club area. Where mapped, it closely coincides with the limits of the Alquist-Priolo Earthquake Fault Zone for the Mission Creek Fault. Because the fault is believed to extend upwards into alluvium, building setbacks have been recommended.

A fault on the west side of Devers Hill in the planning area was mapped in 1979. Given its orientation relative to the major faults in the vicinity, the "Devers Hill" fault appears to be a secondary fault that ruptures in response to earthquakes on either the Coachella segment or the Banning fault.

Alquist-Priolo Earthquake Fault Zones

In 1972, the Alquist-Priolo Special Studies Zone Act was enacted to prohibit the location of structures designed for human occupancy across the trace of an active fault. The State Geologist is required to delineate earthquake fault zones along faults which are considered "sufficiently active" (those which show evidence of displacement in the last 11,000 years) and are "well-defined." A fault zone typically extends 500 feet from major faults and 200 to 300 feet from minor faults. Cities and counties are required to withhold development permits until geologic fault investigations show that the site is not threatened by surface displacement caused by future faulting activity.

The California Division of Mines and Geology has designated Alquist-Priolo Earthquake Fault Zones for the strands of the San Andreas (Coachella segment; aka Mission Creek fault) and Banning faults that extend through the City and its SOI, and for a fault on the west side of Devers Hill. Exhibit III-10 identifies the Alquist-Priolo Earthquake Fault Zones that have been designated in the planning area.

Seismically Induced Geologic Hazards

In addition to direct impacts such as ground acceleration and surface rupture, other seismically induced hazards can impact the community and its structures. Some of these hazards include liquefaction, seismically induced settlement, landslides and rockfalls, each of which is discussed below.

Liquefaction

Liquefaction generally occurs when loose, saturated, sandy soils are subjected to ground acceleration greater than 0.2g. Significant ground shaking increases water pressure in the pores between soil particles, causing soils to lose cohesion and to "liquefy." Liquefaction can result in structural failure due to settlement, loss of bearing capacity of foundation soils, the buoyancy of buried structures and water seepage through ground cracks.

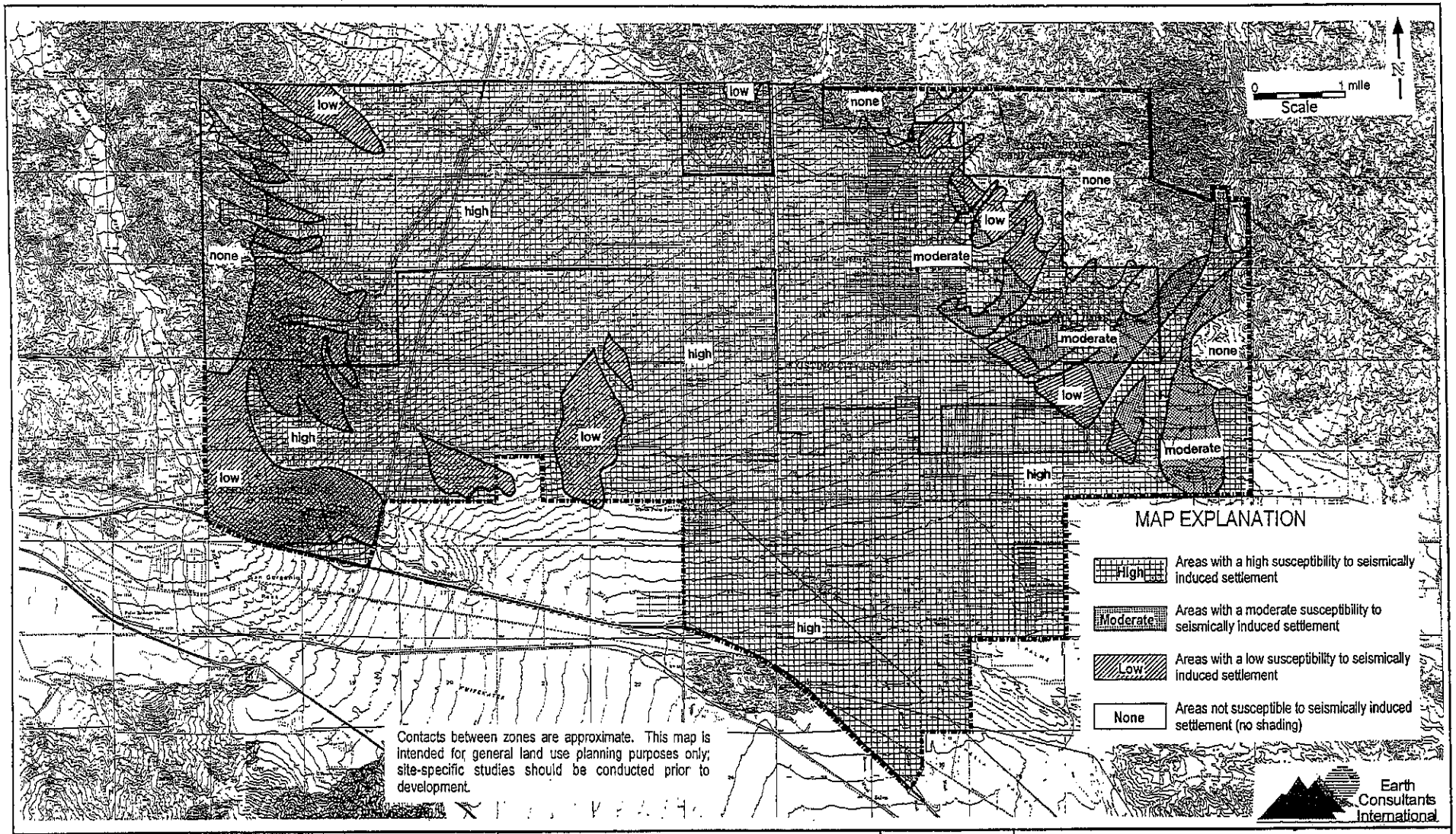
The potential for liquefaction to occur in the planning area is low to none. The only exception is immediately north of, and adjacent to the Mission Creek and Banning faults, where shallow groundwater and ponding water have been reported. Liquefaction could occur if water rises to within 50 feet of the ground surface.

Seismically Induced Settlement

Seismic ground shaking can cause the compaction or densification of soils, resulting in local settlement and damage to structures and foundations, or regional damage to water and sewer lines. The potential for this to occur is dependent upon the intensity and duration of ground shaking and the density of subsurface soils. Loose sediments, including windblown or recently deposited alluvial sands in the planning area are potentially subject to seismically induced settlement. As shown in Exhibit III-11, much of the valley floor in the planning area is comprised of these windblown deposits and is susceptible to seismically induced settlement.

Seismically Induced Slope Instability

It is believed that ground accelerations of at least 0.10g in steep terrain are required for seismically induced rock falls to occur. With several faults capable of generating peak ground accelerations of over 0.10g in the planning area, there is a high potential for such events to occur in the area. Seismically induced landslides, rock falls and rock slides can be expected to occur on both the northern and western portions of the General Plan planning area, particularly along the toe of the San Bernardino and Little San Bernardino Mountains. Fractures and landslides are likely to occur on elevated mountainous terrain in these two ranges, especially where the bedrock is intensely jointed and fractured. Intense ridge-top shattering can also be expected at the top of Painted Hill. The 1986 North Palm Springs earthquake triggered numerous landslides, debris slides and rock falls in the western reaches of the planning area. Exhibit III-12 identifies those areas within the planning area that are vulnerable to seismically induced slope instability.



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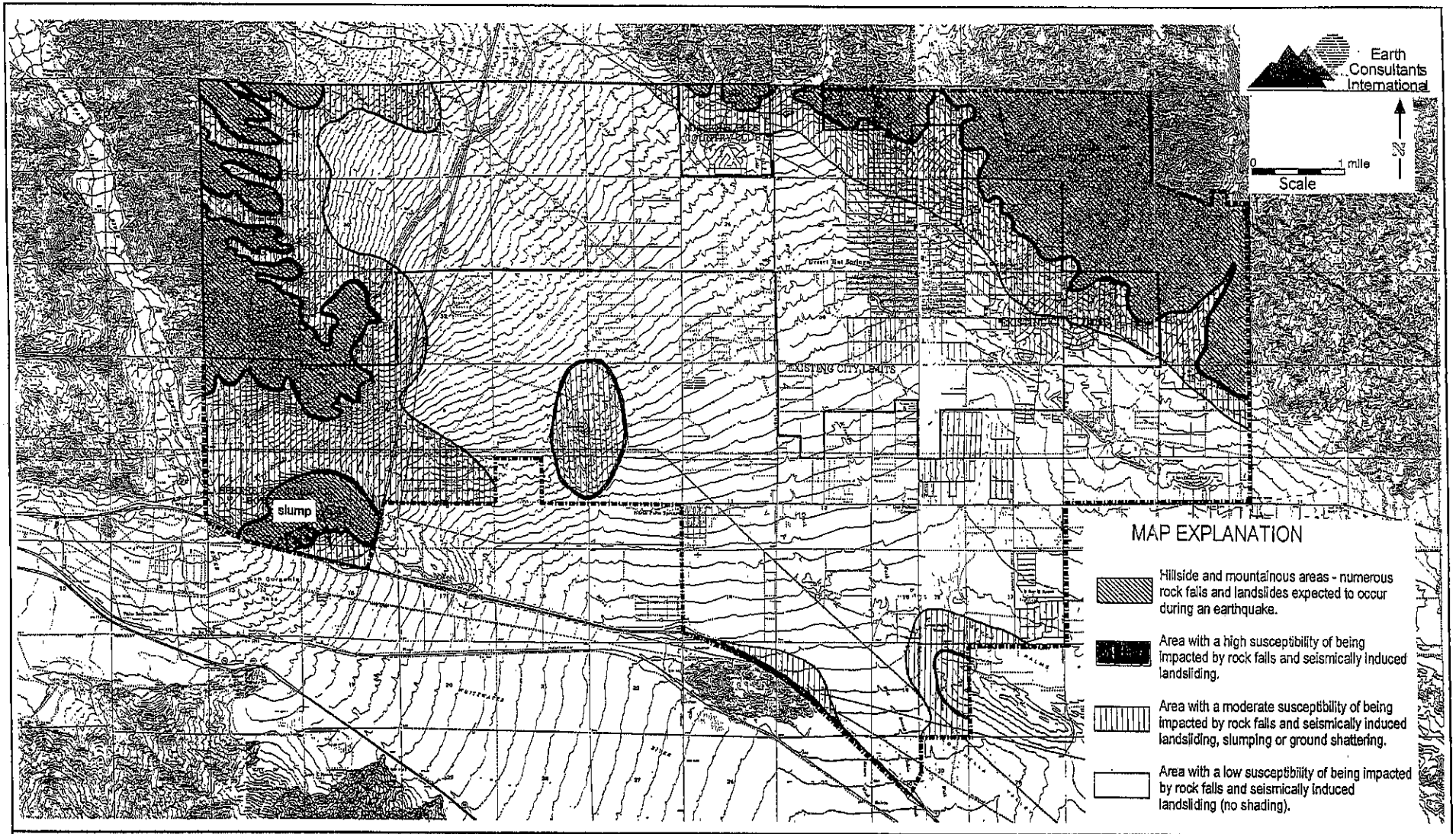
Areas Susceptible to Seismically Induced Settlement



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Seismically Induced Rock Falls and Landslide Susceptibility Map

Seismically Induced Inundation

Localized flooding can result from the structural failure of water tanks, reservoirs, recharge basins and other water retention structures during a seismic event. The Colorado River Aqueduct, operated by the Metropolitan Water District, skirts the City on the north, and passes through the western portion of the planning area. This facility could be damaged, and large volumes of water released, during a surface-rupturing earthquake on either the Coachella or San Bernardino Mountains segments of the San Andreas fault.

Smaller flood control improvements, including levees, canals, culverts, retention basins and groundwater recharge basins could suffer cracking and other structural damage during an earthquake, and could pose an inundation hazard if they contain water at the time of the earthquake.

The twenty above-ground water storage tanks within the planning area may also suffer structural damage during an earthquake, including damage to the roof and shell, bulging at the bottom of the tank, and the shearing off of pipes leading to the tank. Damage to these structures could hinder fire suppression efforts and limit the supply of potable water after an earthquake. Water released from above-ground tanks, especially the larger High Northridge, Terrace and Mission Lakes tanks, could potentially impact structures downgradient. None of the tanks in the City are baffled; however, most of them are fitted with flexible coupling on the pipes, which can accommodate some movement.

2. Project Impacts

General Plan buildout will involve the development of major and minor projects, ranging from permits for single family additions to master planned developments (Specific Plans) consisting of mixed residential, commercial, resort and industrial land uses. Some development may require extensive site grading and earthwork which could impact existing topography. Groundshaking associated with active faults will continue to pose a threat to future development. Other potential impacts associated with development of the planning area are discussed below.

Soils

Recently deposited alluvial and aeolian soils within the City and SOI may be susceptible to collapse, consolidation and/or hydrocompaction. When saturated, these soils could experience a rearrangement of their individual grains, resulting in a loss of cementation and damage to structures and foundations that are built upon them. Older alluvial surfaces may contain significant amounts of clay in the near surface, and could therefore be moderately to highly expansive. In areas proposed for development, site-specific studies need to be conducted to evaluate the settlement and expansion potentials of these soils.

The southern and eastern portions of the planning area is highly susceptible to wind erosion. Increased development, and surface disruption resulting from grading and construction loosens soils, thereby increasing the amount of dust and other small particles in the air. However, in the long-term, the installation of landscaping associated with new development may also contribute to the stabilization of drifting sand. Project-specific erosion control measures should be implemented to protect on-site soils. The potentially adverse health impacts associated with suspended dust and blowsand are further discussed in Section III-H.

Seismicity

Ground shaking during an earthquake is the most significant seismic hazard that will impact the Desert Hot Springs planning area. The intensity of seismic ground shaking is dependent upon several factors, including the magnitude of the earthquake, the distance between the epicenter and development, and local and topographic conditions. In general, as the distance from the causative fault increases, peak ground accelerations and seismic intensity decreases. However, local topographic features, such as the mountain peaks and ridges, may amplify the seismic waves generated by an earthquake and result in higher ground accelerations.

Geologic analysis of the San Andreas Fault Zone indicates that a seismic event on either the Coachella or San Bernardino segments, the two closest segments to the City, could generate peak ground accelerations of between 0.48 and 0.75g in the planning area. These segments have a moderate probability (22 to 28 percent) of generating a moderate to large earthquake before year 2024. An earthquake on the Banning Fault, which passes through the General Plan planning area, is capable of generating peak horizontal ground accelerations of up to 0.9 g. These ground shaking levels fall within intensity zones X to XI, as defined in the Modified Mercalli Intensity Scale.

Other faults in the vicinity of the City, including the Mojave Shear Zone and the San Jacinto fault, also have the potential of significantly impacting the City. The Pinto Mountain-Morongo fault has the capability of generating in peak ground accelerations of 0.6g in the planning area. The two segments of the San Jacinto fault closest to the City could potentially generate ground accelerations of between 0.06 and 0.16g in the planning area. Although minor in comparison to that associated with the San Andreas fault zone, these ground accelerations could be damaging to older buildings, particularly unreinforced masonry and "soft-story" buildings (having large expanses of display windows or those with garages on the first floor).

The Garnet Hill fault is not considered an active fault. However, ground fractures observed along the fault after the North Palm Springs earthquake in 1986 indicate that this fault can move co-seismically with an earthquake on an adjoining fault. Roadways, utilities, pipelines and other improvement built across the fault could be damaged if ground rupture occurs on the fault during an earthquake.

Liquefaction

Liquefaction is the total or substantial loss of shear strength of saturated, fine-grained, sand soils. It typically occurs in the presence of ground accelerations greater than 0.2g and can result in structural distress or failure, a loss of bearing capacity in foundation soils, or the buoyant rise of buried structures. Liquefaction potential in the planning area is considered low to none. However, if the ground water table rises in the future and loose and unconsolidated soils are saturated, isolated areas could liquefy during an earthquake. In these locations, site-specific geotechnical studies should be conducted to evaluate the liquefaction potential.

Slope Instability

Landslides and rock falls may occur during a seismic event with ground accelerations greater than 0.1g. The potential for slope instability is primarily limited to the northern and western portions of the planning area, and in the Painted Hill area. Sections of Highway 62 and Interstate-10 in the San

Gorgonio Pass area could be blocked by fallen rock debris following an earthquake, which could hinder rescue and evacuation operations. Rock falls could also impact development adjacent to the mountain front, especially those at the mouth of Little Morongo Canyon and Blind Canyon.

3. Mitigation Measures

A. The City shall require the preparation of soils and/or geotechnical studies for future development proposals in the community. Analyses shall include evaluation of seismic and soil conditions and provide recommendations that mitigate soils and geotechnical hazards or constraints.

B. Proper structural engineering, which takes into account the forces that will be applied to structures by anticipated ground motions, shall provide mitigation for ground shaking hazards. Seismic design shall be in accordance with the most recently adopted editions of the Uniform Building Code and the seismic design parameters of the Structural Engineers' Association of California.

C. Development proposals within mapped Alquist-Priolo Fault Zones shall be required to conduct fault investigations that follow Alquist-Priolo Fault Zoning Act guidelines.

D. A seismic hazard reduction program should consist of the identification and mapping of geologic and seismic hazards, the expedient retrofitting and rehabilitation of weak or damaged structures, and the enforcement of fire and building codes. Programs that help City residents provide for themselves after a seismic event should also be developed.

E. Development on wind or stream-deposited sediment on the valley floor should include site-specific subsurface geotechnical investigations that address seismic settlement potential. This hazard can be mitigated by proper excavation, compaction and foundation design.

F. Blowing dust and sand during grading operations shall be mitigated by adequate watering of soils prior to and during grading, and limiting the area of dry exposed soils during grading. To mitigate against the effects of wind erosion after site development, a variety of measures shall be provided including maintaining moist surface soils, planting stabilizing vegetation, establishing windbreaks with non-invasive vegetation or perimeter block walls, and using chemical soil stabilizers. Also see mitigation measures set forth in Section III-H.

G. Where development is proposed adjacent to or in close proximity to steep slopes, site-specific geotechnical studies shall be conducted to evaluate the potential for rock falls and landslides, and to establish mitigation measures which minimize these hazards.

H. During site grading, all existing vegetation and debris shall be removed from areas that are to receive compacted fill. Any trees to be removed shall have a minimum of 95% of the root systems extracted. Man-made objects shall be overexcavated and exported from the site. Removal of unsuitable materials may require excavation to depths ranging from 2 to 4 feet or more below the existing site grade.

I. All fill soil, whether from on site or imported, shall be approved by the individual project soils engineer prior to placement as compaction fill. All fill soil shall be free from vegetation, organic material, cobbles and boulders greater than 6 inches maximum diameter, and other debris. Approved soil shall be placed in horizontal lifts of appropriate thickness as prescribed by the soils engineer and watered or aerated as necessary to obtain near-optimum moisture content.

J. Fill materials shall be completely and uniformly compacted to not less than 90% of the laboratory maximum density as determined by ASTM test method D-1557-78. The project soils engineer shall observe the placement of fill and take sufficient tests to verify the moisture content, uniformity, and degree of compaction obtained. In-place soil density should be determined by the sand-cone method, in accordance with ASTM Test Method D-1556-64 (74), or equivalent test method acceptable to the City Building Department.

K. Finish cut slopes generally shall not be inclined steeper than 2:1 (horizontal to vertical). Attempts to excavate near-vertical temporary cuts for retaining walls or utility installations in excess of 5 feet may result in gross failure of the cut and may possibly damage equipment and injure workers. All cut slopes must be inspected during grading to provide additional recommendations for safe construction.

L. Finish fill slopes shall not be inclined steeper than 2:1 (horizontal to vertical). Fill slope surfaces shall be compacted to 90% of the laboratory maximum density by either over-filling and cutting back to expose a compacted core or by approved mechanical methods.

M. Retaining walls shall be constructed to proper building code standards and inspected by the building inspector.

N. Foundation systems that utilize continuous and spread footings are recommended for the support of one and two-story structures. Foundations for higher structures must be evaluated based on structure design and local soil conditions.

O. Positive site drainage shall be established during finish grading. Finish lot grading shall include a minimum positive gradient of 2% away from structures for a minimum distance of three (3) feet and a minimum gradient of 1% to the street or other approved drainage course.

P. All roof and canopy drainage shall be conveyed to the street or off-site in an approved, non-erosive manner. Drainage from development sites shall be conveyed in an approved manner so as to prevent erosion or instability. Water from off-site sources shall not be allowed to discharge onto development sites or should be conducted in a non-erosive manner.

Q. An adequate subdrain system shall be constructed behind and at the base of all retaining walls to allow for adequate drainage and to prevent excessive hydrostatic pressure.

R. All projects within the City limits shall construct storm drainage and hydrologic improvements to conform to the City's adopted master hydrology and storm drain improvement program, where applicable.

S. Utility trench excavations in slope areas or within the zone of influence of structures should be properly backfilled in accordance with the following recommendations:

a) Pipes shall be bedded with a minimum of 6 inches of pea gravel or approved granular soil. Similar material shall be used to provide a cover of at least 1 foot over the pipe. This backfill shall then be uniformly compacted by mechanical means or jetted to a firm and unyielding condition.

b) Remaining backfill may be fine-grained soil. It shall be placed in lifts not exceeding 6 inches in thickness or as determined appropriate, watered or aerated to near optimum moisture content, and mechanically compacted to a minimum of 90% of the laboratory maximum density.

c) Pipes in trenches within 5 feet of the top of slopes or on the face of slopes shall be bedded and backfilled with pea gravel or approved granular soils as described above. The remainder of the trench backfill shall comprise typical on-site fill soil mechanically compacted as described in the previous paragraph.

Mitigation Monitoring/Reporting

- During any project site preparation, the City Engineer and Building Department staff shall visit the site to ensure compliance with applicable City ordinances and conditions of approval, as well as any additional erosion control mitigation measures specified in this document.
  Responsible Parties: City Engineer, Building Department, Developer, Grading Contractor.

- Subsequent to preparation of final development plans and specifications, but prior to grading and construction, the foundation plans shall be reviewed by the geotechnical consultant and/or the City Engineer to verify compatibility with site geotechnical conditions and conformance with recommendations contained herein. The need for additional subsurface exploration will be determined on a project by project basis.
  Responsible Parties: City Engineer, Geotechnical Consultant.

- When appropriate, rough grading of a project site shall be performed under geological and engineering observation of the geological consultant and/or the City Engineer. Rough grading includes, but is not limited to, grading of overexcavation cuts, fill placement, and excavation of temporary and permanent cut slopes.
  Responsible Parties: City Engineer, Geotechnical Consultant.

- As determined appropriate by the City Engineer and consulting geologist, the geotechnical consultant and/or the City Engineer shall perform the following observations during site grading and construction of foundations to verify or modify, if necessary, conclusions and recommendations in this report:

1. Observation of all grading operations.
2. Geologic observation of all cut slopes.
3. Observation of all key cuts and fill benching.
4. Observation of all retaining wall back cuts, during and following completion or excavation.
5. Observation of all surface and subsurface drainage systems.
6. Observation of backfill wedges and subdrains for retaining walls.
7. Observation of pre-moistening of subgrade soils and placement of sand cushion and vapor barrier beneath the slab.
8. Observation of all foundation excavations for the structure or retaining walls prior to placing forms and reinforcing steel.
9. Observation of compaction of all utility trench backfill.

Responsible Parties: City Engineer and/or geotechnical consultant.

D. Hydrology

1. Existing Conditions

The upper Coachella Valley and the City of Desert Hot Springs are effectively isolated by regional mountain ranges from moist, cool air masses transported from coastal shores west of the valley. The resulting environment is a subtropical desert climate with very low mean annual rainfall, ranging from 4 to 6 inches on the desert floor. Precipitation generally occurs during winter months, between December and March. Rainfall near the foothills of the Little San Bernardino Mountains averages about 5 to 6 inches per year. In some years, no measurable rainfall has been reported. Rainfall on surrounding mountain slopes generally increases with elevation, while temperatures generally drop about 5° F with every 1,000 foot increase in elevation.

Although average rainfall in the region is low, occasional high-intensity thunderstorms and tropical storms, which occur primarily during late summer and early fall, are capable of creating flash floods. Rainfall of sufficient intensity and quantity is capable of saturating dry ground surfaces, substantially reducing percolation rates and increasing runoff. Impervious surfaces associated with development also contribute to rainwater runoff. In the Coachella Valley, flash flooding is generally limited to washes extending from mountain canyons, floodway and floodplains adjacent to rivers and low-lying drainages. Flooding on alluvial fans can be particularly damaging because floodwaters move a high velocities and spread across wide, unchannelized areas. Given that much of the City and SOI are located on alluvial fans, the hazard posed by flooding is significant.

Flooding can also result when unusually warm conditions in early spring cause the snow pack on adjacent mountains to melt quickly. In fact, most of the surface water in the Coachella Valley is derived from snow melt off the slopes of the San Bernardino, Little San Bernardino and San Jacinto Mountains. The water is usually absorbed by porous sands and gravels on the valley floor and continues to flow underground. However, if surface sediments are already saturated, additional runoff can remain on the surface and result in minor to major flooding.

Historic data indicate that major storm events have occurring the Coachella Valley. The Army Corps of Engineers' benchmark storms include the storm of September 24, 1939. The thunderstorm preceded a major storm off the western coast of Mexico, was centered over Indio, and generated 6.45 inches of rain in a 6-hour period. Tropical storm Kathleen, which occurred on September 9 - 11, 1976, generated very heavy rainfall over a three county area. As much as 14 inches of rain fell onto surrounding hills and mountains, draining into the valley and contributing to excessive flood damage in desert communities. The flood hazard in the City of Desert Hot Springs planning area is primarily associated with storm flooding on the alluvial fans that drain the San Bernardino and Little San Bernardino Mountains.

Regional Stormwater Management

Regional drainage for the majority of the Desert Hot Springs area is the responsibility of the Riverside County Flood Control District (RCFCD). The District's management efforts are primarily focused on rivers, major streams and their tributaries, and areas characterized by significant sheet flows. Specifically, it is empowered with flood control planning, the construction of drainage improvements for regional flood control facilities, and watershed and watercourse protection.

The Coachella Valley Water District is responsible for flood control planning and regional stormwater management for a small portion of the General Plan planning area. This area includes the portions of Sections 23 and 25, Township 3 South, Range 4 East, which are located north of Interstate-10, as well as the portion of Section 30, Township 3 South, Range 5 East which is located north of I-10.[10]

Local Drainage Management

The Riverside County Flood Control District also has the primary responsibility, in close cooperation and coordination with the City, for managing local drainage affecting the community. On-site management and flood prevention mechanisms are actively incorporated into City drainage system designs to effectively manage drainage and to reduce the complexity and costs of future flood control facilities.

The planning area is located within the District's Desert Hot Springs and Garnet Wash Master Drainage Plan areas. The Garnet Wash Master Drainage Plan was developed in 1963, and addresses flood control in the western portion of the planning area, within Garnet Wash and its tributary drainages.[11] This watershed encompasses a total area of approximately 21.2 square miles, including the southernmost four miles of the current Highway 62. The plan recommended construction of two lined channels immediately east of Highway 62, the Garnet Wash and Devils Garden channels, to control storm runoff in the drainage area. Neither channel has been constructed.

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10 "Storm Water Unit Boundary Map," Coachella Valley Water District, revised September 18, 1986.

11 "Master Plan for Flood Control and Drainage, Garnet Wash and Tributaries, Zone Six," prepared by Riverside County Flood Control and Water Conservation District, February 1963.

The still current Desert Hot Springs Master Drainage Plan, prepared by the District in 1982, addresses flooding and drainage problems within the eastern portion of the planning area. The Plan's drainage area encompasses a total of 13.9 square miles, and extends from West Drive on the west to Long Canyon on the east, and from about Two Bunch Palms Trail on the south to the upper slopes of the Little San Bernardino Mountains (beyond the boundaries of the General Plan planning area).[12] The plan proposes a debris basin, several levees and a network of open channels and underground storm drains which are designed to collect and convey storm runoff through the City's most developed areas. Detailed descriptions of these and other drainage improvements are provided in Table III-12.

Lands that are constrained by topography, including deep canyon slopes, alluvial plains and drainage channels, are often rich in vegetative cover and absorb the majority of runoff before it reaches developed areas. Preservation of these areas helps conserve the capacity of downstream facilities and reduces the potential for flooding. On-site storm drains and other detention facilities are incorporated into such areas, where possible and appropriate, to divert and convey drainage in a controlled manner and to reduce the need for downstream facilities.

FEMA Flood Hazard Areas

The Federal Emergency Management Agency (FEMA) is responsible for the analysis and mapping of areas prone to flooding in the United States. FEMA has developed a series of Flood Insurance Rate Maps (FIRM) that identify areas subject to flooding from 100-year and 500-year storm events and serve as the basis for determining the need for federal flood insurance. A 100-year flood event is defined as a flood which has a 1% chance of occurring in any one year, and a 500-year flood has a 0.20% chance of occurring in a given year. The recurrence interval represents a long-term average period between floods of a given magnitude, but floods could and do occur at shorter time intervals, occasionally within the same year. Flood zones designated on the FIRM maps include the following:

Zone A: Areas of 100-year flood; base flood elevations have not been determined.

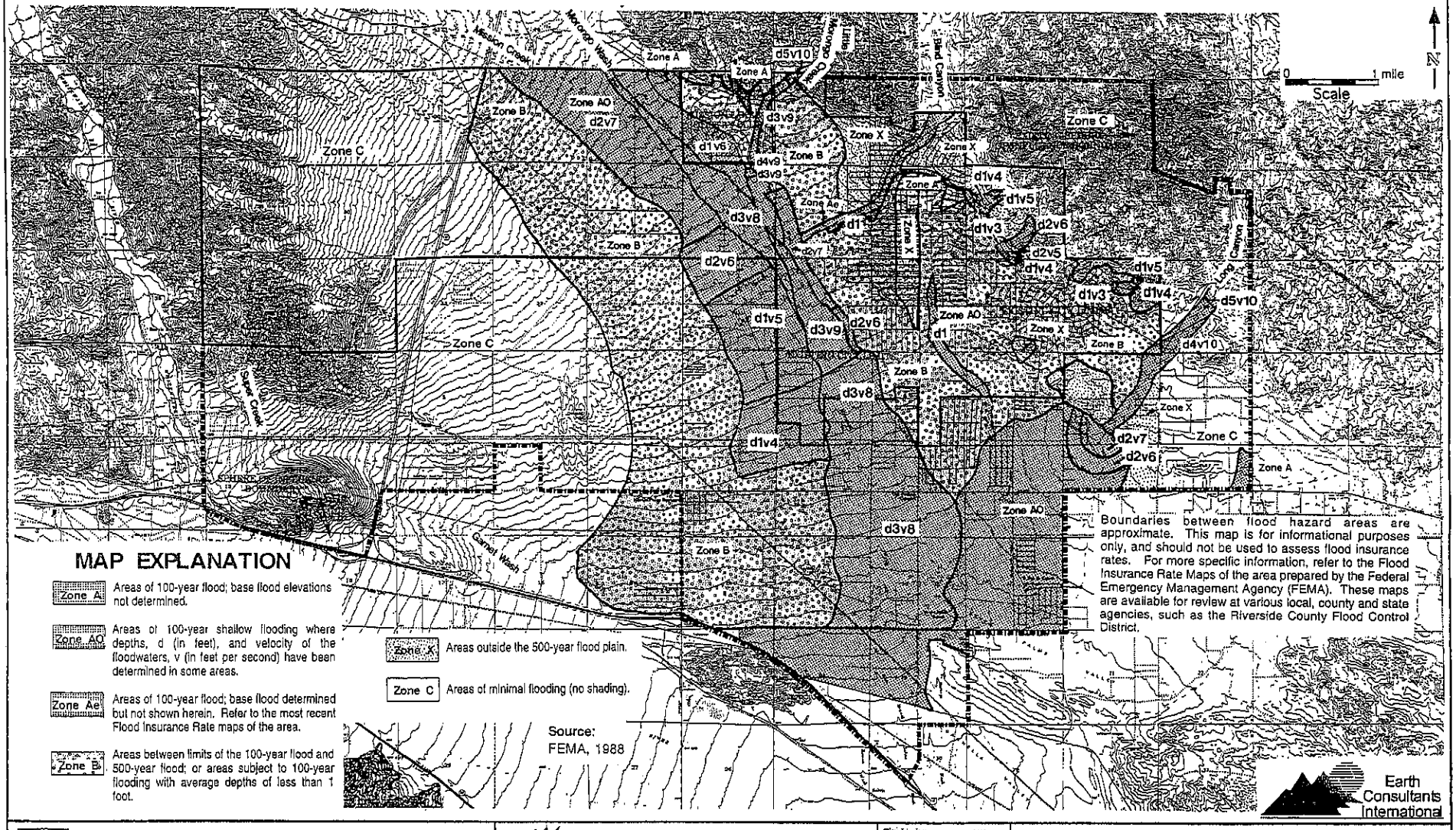
Zone AO: Special Flood Hazard Areas inundated by types of 100-year shallow flooding where depths are between 1.0 and 3.0 feet; depths are shown, or areas of 100-year alluvial fan flooding, depths and velocities are shown, but no flood hazard factors are determined.

Zone B: Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot, or where the contributing drainage areas is less than one square mile; or areas protected by levees from the base flood.

Zone C: Areas lying outside the boundaries of the 100-year and 500-year flood plains and generally considered safe from flooding.

FIRM maps have been developed for the entire Desert Hot Springs planning area, and a compilation of the data from FIRM Community Panels dated 1988 and 1996 is presented in Exhibit III-13.

12 "Master Drainage Plan for the Desert Hot Springs Area, Zone Six," prepared by the Riverside County Flood Control and Water Conservation District, February 1982.



MAP EXPLANATION

- Zone A: Areas of 100-year flood; base flood elevations not determined.
- Zone AO: Areas of 100-year shallow flooding where depths, d (in feet), and velocity of the floodwaters, v (in feet per second) have been determined in some areas.
- Zone Ae: Areas of 100-year flood; base flood determined but not shown herein. Refer to the most recent Flood Insurance Rate maps of the area.
- Zone B: Areas between limits of the 100-year flood and 500-year flood; or areas subject to 100-year flooding with average depths of less than 1 foot.
- Zone X: Areas outside the 500-year flood plain.
- Zone C: Areas of minimal flooding (no shading).

Source: FEMA, 1988

Boundaries between flood hazard areas are approximate. This map is for informational purposes only, and should not be used to assess flood insurance rates. For more specific information, refer to the Flood Insurance Rate Maps of the area prepared by the Federal Emergency Management Agency (FEMA). These maps are available for review at various local, county and state agencies, such as the Riverside County Flood Control District.

Earth Consultants International

TERRA NOVA®
PLANNING & RESEARCH, INC.
400 South Farrell, Suite B-205, Palm Springs, Ca. 92262 (619) 320-9040

CITY OF DESERT HOT SPRINGS GENERAL PLAN

City Limits:
Sphere of Influence:
Date: 2/18/97
Base Map: Desert Hot Springs, and Seven Palms Valley USGS 7.5' Quad Maps

Flooding Hazards in Desert Hot Springs and its Sphere of Influence

The FEMA maps indicate that areas down-gradient from major canyons are generally contained within the 100-year floodplain. Flood hazard factors determined for Little Morongo Wash indicate that flows originating at the wash can be as much as 5 feet deep and have a velocity of up to 10 feet per second (fps).[13] Surface waters within Morongo Wash, where the flow is not contained, can be as much as 3 feet deep with velocities as much as 9 fps during a 100-year flood.[14] Given these relatively high velocities, flooding in these areas has the potential to do considerable damage.

FEMA maps also show that the eastern and central portions of the planning area, where extensive urbanization has occurred, are located within either the 100-year or 500-year flood zones. A large area west of Morongo Wash is also located between the limits of the 100-year and 500-year flood, or where 100-year flood waters are not expected to be more than 1 foot deep. All of the western portion of the planning area is designated as an area of minimal flooding. Some areas at the toe of the Little San Bernardino Mountains, not within or adjacent to the creeks draining the mountains, are located outside the 500-year floodplain.

Major Flood Control Facilities

A number of flood control projects have been constructed to manage regional and site-specific drainage in the community, while others are planned for development in the long-term. Such improvements may include dikes, levees, stormwater channels, debris basins and detention/retention basins. New developments often create their own runoff management problems and require the construction of site-specific flood control improvements. The costs and methods of planning and constructing flood control projects are weighed against the economic impacts likely to result from major flood events.

The main drainages in the planning area include the Mission Creek, Big and Little Morongo Creeks, Blind Creek and Long Creek. These drainages are rather substantial in area and are discharged onto relatively steep alluvial fans. Flows resulting from major storms may generate forces of several thousand cubic feet per second and have tremendous scouring potential. Table III-12 lists the major and minor drainages in the planning area.

13 Ibid.

14 Ibid.

Table III-12
Major and Minor Drainages
Desert Hot Springs Planning Area

Creek/Channel	Construction Status	Cost (Mil[1])	Funding
Mission Creek	Partial	$ N/A	FEMA[2]/District/ADP[3]
Big/Little Morongo Creeks	None	$9.0+	FEMA/District/ADP
Blind Creek (8th Street)	Partial	$2.16	FEMA/District/City
Long Creek	None	$ N/A	FEMA/District/ADP
Foxdale Drain (Line B)	None	$4.7	District/City/Development
Line A (Two Bunch Palms Drain)	Partial	$4.8	District/City//Development
Line C	None	$1.5	District/City/Development
Line D	None	$0.64	District/City/Development
Desert Hot Springs Drain	Partial	$ N/A	District/City/Development

Source: Master Drainage Plan for the Desert Hot Springs Area, Riverside County Flood Control and Water Conservation District, February 1982. **Note:** N/A indicates that costs have not yet been calculated.

[1] All cost estimates are in 1982 dollars, except Morongo Washes.

[2] Federal Emergency Management Agency funds availability depends on funding policies.

[3] Area Drainage Plan: benefit area development fee.

Mission Creek

The Mission Creek Wash drains approximately 36 square miles of the San Bernardino Mountains and has the potential to generate major storm flows within the planning area. Braided patterns of drainage dominate the wash for approximately 2 miles east of Highway 62, where flows are consolidated and somewhat controlled at about Mission Creek Boulevard (extended). The potential for these flows to break out of established channels, and to flow unpredictably on the wide alluvial fan, has prompted FEMA to designate a large 100-year flood plain associated with the Mission Creek drainage.

Big and Little Morongo Creeks

The Big and Little Morongo Creeks drain the western portion of the Little San Bernardino Mountains. The mouth of Big Morongo Creek is located about one mile east of Highway 62, from which the creek flows in braided channels and sheetflows down the alluvial plain. The creek crosses Indian Avenue in two locations and crosses the southwest corner of Mission Lakes Country Club.

The mouth of Little Morongo Creek is located approximately two miles east of Big Morongo Creek. Its discharges are confined by a concrete-lined channel located immediately north of Little Morongo Road (extended), which discharges flows into the channelized fairways of Mission Creek Country Club.

Little Morongo crosses Mission Lakes Boulevard and continues south, to its confluence with Big Morongo Creek located about one-half mile south of Mission Lakes Boulevard and immediately west of Little Morongo Road. The combined flows have a projected 100-year peak volume of more than 17,000 cubic feet per second. The largely unconfined flows from Big and Little Morongo Creeks has prompted FEMA to designate a large 100-year flood plain associated with these drainages.

Blind Creek/8th Street Levee
The Blind Creek Channel and 8th Street levee are part of a system that conveys Blind Creek and other local drainage southwest, where it joins the combined Morongo Creek Channel just north of Pierson Boulevard. These facilities are partially improved and include an earthen levee. Additional proposed improvements include five feeder lines which will drain developed areas in the northernmost portion of the City.

Line A/Two Bunch Palms Drain
Line A is planned for construction adjacent to the Two Bunch Palms Trail right-of-way. Two major feeder lines and associated collectors are planned to capture drainage as far north as Third Street and convey it to Line A. Near the intersection of Two Bunch Palms Trail and Ocotillo Road, Line A will proceed southeast to the natural drainage of the Desert Hot Springs Creek.

Line B/Foxdale Drain
Line B is primarily intended to drain lands east of Foxdale Drive and extends as far northeast as the junction of Mountain View and Monterico Roads. Line B is planned to extend south where it will connect with Line A in the natural drainage of Desert Hot Springs Creek.

Lines C and D
Line C is planned to begin west of Mountain View Road, just north of San Gorgonio Street. The drain will extend west, then southwest to its junction with Line A. An associated feeder line (Line C-1) is intended to drain lands northeast of Hacienda Avenue and Mountain View Road and would extend from Spruce Street, southwest to the southernmost point of Avenida Serena (extended). Line D would also capture drainage in the vicinity of Hacienda Avenue via two levees and convey it southeast to the floodplain of Long Canyon.

All-Weather Crossings
The planning area includes numerous channels and washes, including Mission Creek and Little and Big Morongo Washes, which drain local mountains and require the construction of all-weather crossings to assure accessibility during major flooding. At this time, a bridge is provided over Mission Creek at Pierson Boulevard, but this wash does not benefit from armored channel improvements which would assure the effectiveness of the crossing during a major storm event. Low-flow crossings of numerous washes, including Mission Creek, are also provided along Highway 62, but these do not address potential flooding associated with major storm events. As traffic volumes increase within the planning area, it may be necessary to construct all-weather bridges at these and other locations. These and other projects which result in the fill of federal jurisdictional waters require a federal Clean Water Act Section 404 permit from the Army Corps of Engineers and a Section 1603 Streambed Alteration Permit from the California department of Fish and Game.

Stormwater Runoff Pollution Control

Stormwater runoff from developed lands has the potential to contaminate or otherwise pollute surface and ground waters. Runoff from streets, parking lots, building roofs, fertilized golf courses and other landscaped and hardscaped surfaces can also contribute to runoff contamination if not properly managed.

The City participates in the National Pollutant Discharge Elimination System (NPDES), which implements the federal Clean Water Act adopted in 1990. The program requires the adoption and implementation of stormwater management plans and programs that reduce the discharge of pollutants from storm water systems into waters of the United States. This issue is discussed further in the Water Resources Element of the General Plan and in Section III-E of this Draft EIR.

2. Project Impacts

Buildout of the General Plan planning area will result in increased runoff associated with impervious surfaces, such as structures, sidewalks, parking lots, paved roads and other improvements. Future development also has the potential to alter existing drainage patterns and, in some areas, to result in the accumulation of a significant amount of debris during large storms. Portions of the approved Rancho Royale and Olympus Specific Plans, for example, are located within and adjacent to Mission Creek and other smaller watersheds. The City's Conditions of Approval for these project require that detailed hydrology analyses be conducted prior to the submittal of subdivision and/or development plans. The findings of required hydrology studies shall be incorporated into project master drainage plans, where appropriate, and the City may require additional on-site flood control facilities.

Land use planning is one of the most effective methods of limiting or precluding flood damage and protecting lives and property in flood-prone areas. The adoption and implementation of the Desert Hot Springs General Plan and certification of this EIR will facilitate the regulated development of various land uses and roadways. The implementation of policies, programs and mitigation measures, which directly address flood hazards facing the City, will also preclude or limit potential impacts. These programs and mitigation include on-going coordination with the Riverside County Flood Control District in the updating of the City's Master Drainage Plan, and the implementation of drainage controls and improvements that are consistent with the Master Drainage Plan. The General Plan also directs the City to establish financing mechanisms, such as Benefit Assessment Districts, necessary for funding drainage improvements.

The General Plan includes policies which require and/or encourage the integration of on-site stormwater retention/detention facilities to reduce peak flows and sedimentation of flood control facilities, and encourage and promote stormwater percolation and groundwater recharge. General Plan policies and programs help assure the on-going assessment of flooding and hydrology issues, and the close and coordinated sharing of management responsibilities between the City and Riverside County Flood Control District. They also encourage continued cooperation with the Federal Emergency Management Agency in securing map amendments, as appropriate, for redesignated 100-year flood plains within the City and its SOI.

The potential for multiple uses of major drainage facilities is also an integral part of the General Plan, including the use of these facilities for enhanced wildlife habitat, community open space and hiking and equestrian trails, consistent with the primary function of these facilities for stormwater management.

Potential Impacts on Existing and Proposed Stormwater Facilities

Buildout of the planning area is not expected to have significant adverse impacts on existing or proposed stormwater management facilities set forth in the Riverside County Flood Control District's Master Drainage Plans. Lands addressed in the District's Desert Hot Springs Area Master Drainage Plan are, to a great extent, already developed. New development in this area of the City will be largely limited to infill and small scale development, the runoff from which is not expected to inundate or adversely affect RCFCD facilities.

Although buildout of the Cornerstone Specific Plan may increase impacts to the proposed Pierson Control Levee, on-site drainage controls are planned to assure these impacts are minimized. New development in the southwest portion of the planning area could generate additional runoff, which could impact the two channels proposed in RCFCD's Garnet Wash Drainage Plan. These potential impacts, however, are expected to be limited as future development in this vicinity will be largely comprised of low density residential estate development, industrial and wind energy development, which are expected to generate limited amounts of runoff. The City will have responsibility for reviewing the potential impacts of proposed projects and requiring site specific improvements where necessary.

Potential Impacts to Willow Hole Preserve

The Willow Hole-Edom Hill Preserve is managed by the Bureau of Land Management (BLM) and designated as an Area of Critical Environmental Concern (ACEC). The entire Preserve consists of approximately 1,863 acres and is comprised of two separate areas, Willow Hole and Edom Hill, which are 2 to 3 miles apart. The Willow Hole portion of the Preserve is located approximately one mile east of the planning area and could potentially be impacted by the channelization of Mission Creek and Morongo Wash drainages in the vicinity of Palm Drive, especially south of 20th Avenue.

The Willow Hole Preserve contains wind-blown sand accumulations, which occur on mesquite covered dunes and sand sheets up to 0.5 km wide and extending 5 km along the San Andreas Fault.[15] Wind-blown sand, which originates from the San Bernardino and Little San Bernardino Mountains and alluvial fans in the planning area, is transported by large storms and deposited in a sand accumulation corridor in the vicinity of Palm Drive and south of 20th Avenue. Strong, sustained winds blow eastward and carry fine-grain sands from the lower extensions of Mission and Morongo Creeks, to the Willow Hole area, where they are trapped by mesquite hummocks. The resulting sand dunes provide important habitat for several common and special-status species, including the Coachella Valley fringe-toed lizard, Coachella Valley milk vetch, Palm Springs pocket mouse, Palm Springs ground squirrel and others.

15 "The Coachella Valley Preserve System Management Plan and Decision Record," Bureau of Land Management, November 1995.

Future development along the Palm Drive corridor, in the vicinity of 20th Avenue and Varner Road, and flood control channelization and related activities in the lower extensions of the Mission and Morongo washes, have the potential to disturb the natural aeolian process discussed above. Specifically, new buildings, fences, walls, landscaping and other structures could function as barriers which limit or prevent wind-blown sand from reaching Willow Hole. Paved surfaces, including driveways, parking lots and sidewalks, as well as flood control improvements and channel revetments, could replace soils and natural groundcover with hardscape, thereby reducing the amount of sand made available for transport to Willow Hole and reducing runoff absorption areas. Conversely, new development also has the potential to increase the amount of runoff in the area of concern. The City will be responsible for reviewing project proposals to assure that adequate on-site stormwater management improvements and pollution control mechanisms are installed, as appropriate.

The proposed General Plan limits development in this area ranging from low density residential (0-5 unit/acre) to estate residential (1 unit/2.5 acres). Light Industrial designations are also assigned to lands immediately east of Mission Creek and south of 20th Avenue, which may also increase runoff in this area. Individual property owners will have the potential to install on-site fences, landscaping treatments and other improvements which could adversely impact sand transport. Actual impacts to the Preserve will depend largely upon the intensity and specific location of future development. The impacts associated with low density development are likely to be substantially less than those of a planned residential development that is built out at the maximum permissible density. Development which occurs in the immediate vicinity of the Mission and Morongo Creek washes may inhibit the transport of more sand than development which occurs adjacent to existing structures and paved surfaces.

The Mission and Morongo Creek channels are reserved as open space/floodway, in which no development is permitted. Given that the area of concern is located within the 100-year floodplain, channel revetment and other improvements are a possibility in these floodways to provide protection to downstream properties. However, no channel improvements are proposed at this time.

As part of the preparation of the Coachella Valley Multiple Species Habitat Conservation Plan (see also Section III-F of this document, Biological Resources), the City will have the opportunity to consult and coordinate with the Bureau of Land Management, U.S. Fish and Wildlife Service, California Department of Fish and Game, and other regulatory agencies to address specific land use controls, potential channelization of washes, and design criteria alternatives for lands in this area of concern.

Summary of Impacts

Overall, the adoption and implementation of the proposed General Plan is not expected to result in significant adverse impacts. Rather, it is expected that the land use management and regulatory mechanisms set forth in the Plan will facilitate the development of effective on-site, local and regional drainage plans, and enhance inter-agency planning and cooperation.

3. Mitigation Measures

While the proposed General Plan is not expected to result in adverse impacts to the environment, the implementation of the measures set forth below will further enhance General Plan policies and programs.

A. In coordination with the County Flood Control District, the City shall prepare an expanded Master Drainage Plan which addresses local drainage issues, identifies improvements needed to connect local and regional drainage facilities, and establishes requirements for drainage impact fees and on-site drainage facilities to address existing and future flooding issues.

B. Development proposals encompassing one-half acre or greater and with the potential of generating significant runoff shall be required to prepare and submit a hydrology study and mitigation plan, which implements local and regional requirements, policies and programs.

C. Development proposals affecting City rights-of-way or easements, or facilities of the Riverside County Flood Control and Water Conservation District, shall be require to secure encroachment permits from the City or the District.

D. Development proposals involving the fill of federal jurisdictional waters may be required to obtaining a Section 404 Permit under the federal Clean Water Act from the Army Corps of Engineers.

E. Flood control plans required of developers shall include specific pollution control measures and/or designs which meet the requirements of the National Pollution Discharge Elimination System, and to keep pollutants, including sediment, herbicides, pesticides and oils, out of surface and groundwaters.

F. On-site stormwater retention basins shall be used to the greatest extent practical to enhance opportunities for groundwater recharge, provide additional open space and wildlife habitat value, and reduce the necessity for and costs associated with off-site stormwater conveyance facilities.

G. Prior to the construction of any drainage improvements on private lands, project developers shall obtain an authorization letter from the agency which will assume responsibility for maintenance of improvements. Said letter shall clearly identify the sources funding for long-term maintenance of these facilities.

H. Improvements which address potential ponding at roadway intersections shall be engineered and constructed to maximize drainage capacity of the streets and eliminate associated driving hazards.

I. The City shall coordinate with the County Flood Control District, CVAG and CalTrans, as appropriate, in facilitating the development of all-weather crossing that prevent the City's isolation during major storm events.

Mitigation Monitoring/Reporting

- The City shall regularly confer and coordinate flood control planning activities with the Riverside County Flood Control District, and shall establish a strategy for updating and expanding the scope of the current Master Drainage Plan and financing future facilities.
  Responsible Parties: City Engineer, County Flood Control District, Planning Department

- All development proposals shall be reviewed to assure that potential drainage issues are adequate addressed and that developers comply with City and District flood control policies and programs.
  Responsible Parties: City Engineer, Planning Department, Flood Control District

- The City shall continue to monitor the activities of the Coachella Valley Transportation Uniform Mitigation program, especially as it relates to the possible future funding of all-weather crossings at major drainages affecting the City.
  Responsible Parties: City Engineer, Planning Department, CVAG Executive Committee Representative

E. Water Resources/Quality

1. Existing Conditions

The Coachella Valley has been formed by tectonic forces that continue to create a subsiding basin, which has progressively filled with sands and gravel eroded from surrounding hills and mountains. Over millions of years, this sediment-filled basin has functioned as a repository for rainfall, mountain runoff and occasional inundation from the Colorado River. Although the Coachella Valley is one of the driest desert regions in the United States, its groundwater basin has grown into a large underground repository of fresh water.

Although there has been some inflow of groundwater from subsurface groundwater basins outside the region into the basin underlying the Coachella Valley, fault barriers, constrictions in the base profile and areas of low permeability have restricted the movement of groundwater. Analyses conducted by the U.S. Geological Survey and California Department of Water Resources have determined that groundwater basins in the valley are separated into four distinct subbasins, with boundaries that are generally defined by faults that restrict the lateral movement of water.[16] These subbasins are further divided into subareas based on geologic and/or hydrologic characteristics.

Mission Creek Subbasin

The Mission Creek Subbasin underlies the majority of the General Plan planning area. The subbasin is bounded on the south by the Banning Fault, on the north and east by the Mission Creek Fault, and on the west by the non-waterbearing rocks of the San Bernardino Mountains. Water depths below ground surface, as determined in 1971 by the U.S. Geological Survey, range from a maximum of 425 feet in the northwestern portion to flowing wells, as a minimum, in a narrow strip along the Banning Fault.[17] Movement of water within the basin is generally to the southeast.

16 "Engineer's Report on Water Supply and Replenishment Assessment 1998/99," prepared by Water Resources Branch, Engineering Department, Coachella Valley Water District, April 1998.

17 Ibid.

The total storage capacity of the Mission Creek Subbasin is estimated at one million acre-feet.[18] It is naturally recharged by surface and subsurface discharge, most of which is from Mission Creek, and Little and Big Morongo Creeks. The subbasin experienced a general rise in water levels between 1938 and 1952, but water levels have steadily declined by approximately 0.5 to 1.5 feet per year since 1952.[19] It is currently in an overdraft condition of approximately 2 feet per year.[20]

Garnet Hill Subbasin

The portion of the planning area occurring south of the Banning Fault overlies the Garnet Hill Subbasin. The Garnet Hill Subbasin is bounded by the Banning Fault on the north, the Garnet Hill Fault on the south, Edom Hill on the east and the San Bernardino Mountains on the west. While some recharge to the Garnet Hill Subbasin may come from Mission Creek and other streams during high flood flows, the primary source of recharge is the Whitewater River through permeable deposits which underlie Whitewater Hill.[21]

At this time, no water from the Garnet Hill Subbasin is pumped for usage in Desert Hot Springs. However, Mission Springs Water District has indicated that it could potentially produce domestic water from this subbasin in the future, as demand warrants, and will evaluate the capacity of the subbasin at that time.[22]

Desert Hot Springs Subbasin

The northeastern portion of the General Plan planning area is underlain by the Desert Hot Springs Subbasin. Although this subbasin is quite extensive and extends across the northern portion of the Coachella Valley, only the Miracle Hill subarea underlies the General Plan planning area. Water from the Miracle Hill subarea is the primary source of geothermal waters in the City and sphere-of-influence. This subarea generates water temperatures of up to 200°F with a somewhat differing water chemistry from waters in the Mission Creek Subbasin. Water from the Miracle Hill subbarea is somewhat lower in calcium and bicarbonate, and higher in sodium and sulfate. These waters are used for hot mineral spas rather than as a source of potable water, and are extracted through private wells.

Domestic Water Services

Domestic water is provided to the majority of the General Plan planning area by the Mission Springs Water District (MSWD). The Mission Springs Water District produces an average of 2.43 billion gallons of water per year from the Mission Creek subbasin.[23] MSWD operates seven active wells in the planning area, and the depth to groundwater is estimated at between 400 and 1,085 feet below the surface.[24]

18 Don Coleman, Mission Springs Water District, personal communication, March 29, 2000.

19 ."Engineer's Report on Water Supply and Replenishment Assessment 1998/99," prepared by Water Resources Branch, Engineering Department, Coachella Valley Water District, April 1998.

20 Don Coleman, Mission Springs Water District, personal communication, March 29, 2000.

21 "Engineer's Report on Water Supply and Replenishment Assessment 1998/99," prepared by Water Resources Branch, Engineering Department, Coachella Valley Water District, April 1998.

22 George Thacker, Mission Springs Water District, personal communication, March 29, 2000.

23 Don Coleman, Mission Springs Water District, personal communication, March 29, 2000.

MSWD also has twenty above-ground storage tanks within the planning area, with capacities ranging from 50,000 gallons to 2.5 million gallons. Water mains generally range in diameter from 2 to 16 inches. Water mains are currently provided to the most developed portions of the City, but are also provided to a limited degree to development as far south as the Interstate-10//Indian Avenue interchange, and as far west as the Painted Hills.

Lands generally south of Dillon Road and east of Little Morongo Road are located within the service boundary of the Coachella Valley Water District (CVWD). CVWD provides domestic water to limited development in this area, including portions of Palm Drive, Bubbling Wells Road between Dillon Road and 20th Avenue, and limited portions of Mountain View Road.[25] Water mains serving this area range in diameter from 8 to 12 inches. Services will be expanded as warranted by future demand.

Groundwater Replenishment Program

In an effort to further assure an on-going supply of domestic water service to expanding development occurring in the City and sphere-of-influence, the Mission Springs Water District, Desert Water Agency and Coachella Valley Water District have contracted for State Water Project resources to meet anticipated demand. Under this plan, water from northern California would be transported to the valley via the Coachella Aqueduct. Construction of the aqueduct, however, has not yet been undertaken.

Until the system is constructed, the CVWD and DWA have entered into an agreement with the Metropolitan Water District (MWD). The agreement allows CVWD and DWA to exchange their State Water Project entitlements for Colorado River water supplied through MWD's Colorado River Aqueduct, which passes through the northwest portion of the Coachella Valley in the vicinity of the Whitewater River. From 1973 through 1997, more than 1.4 million acre-feet of Colorado River water contributed to recharge of the Whitewater River subbasin groundwater supply.[26] More than 113,000 acre-feet were transported in 1997 alone. Occasionally, the quantity of water transported to the Coachella Valley fluctuates when inadequate rain or snowfall requires that the water be directed toward the Los Angeles basin.

Mission Springs Water District has negotiated with Desert Water Agency to facilitate recharge of the Mission Creek subbasin with Colorado River water through the MWD aqueduct. Recharge water will flow into recharge basins which will be constructed east of Worsley Road and south of Indian Avenue, in the upper Mission Creek wash. Construction of the recharge basins is expected to be completed in late 2001, and percolation of recharge waters will begin soon thereafter. MSWD is expected to receive between 5,000 and 15,000 acre-feet of Colorado River water per year.[27]

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24 George Thacker, Mission Springs Water District, personal communication, March 29, 2000.

25 Mike Tanner, Coachella Valley Water District, personal communication, March 16, 2000.

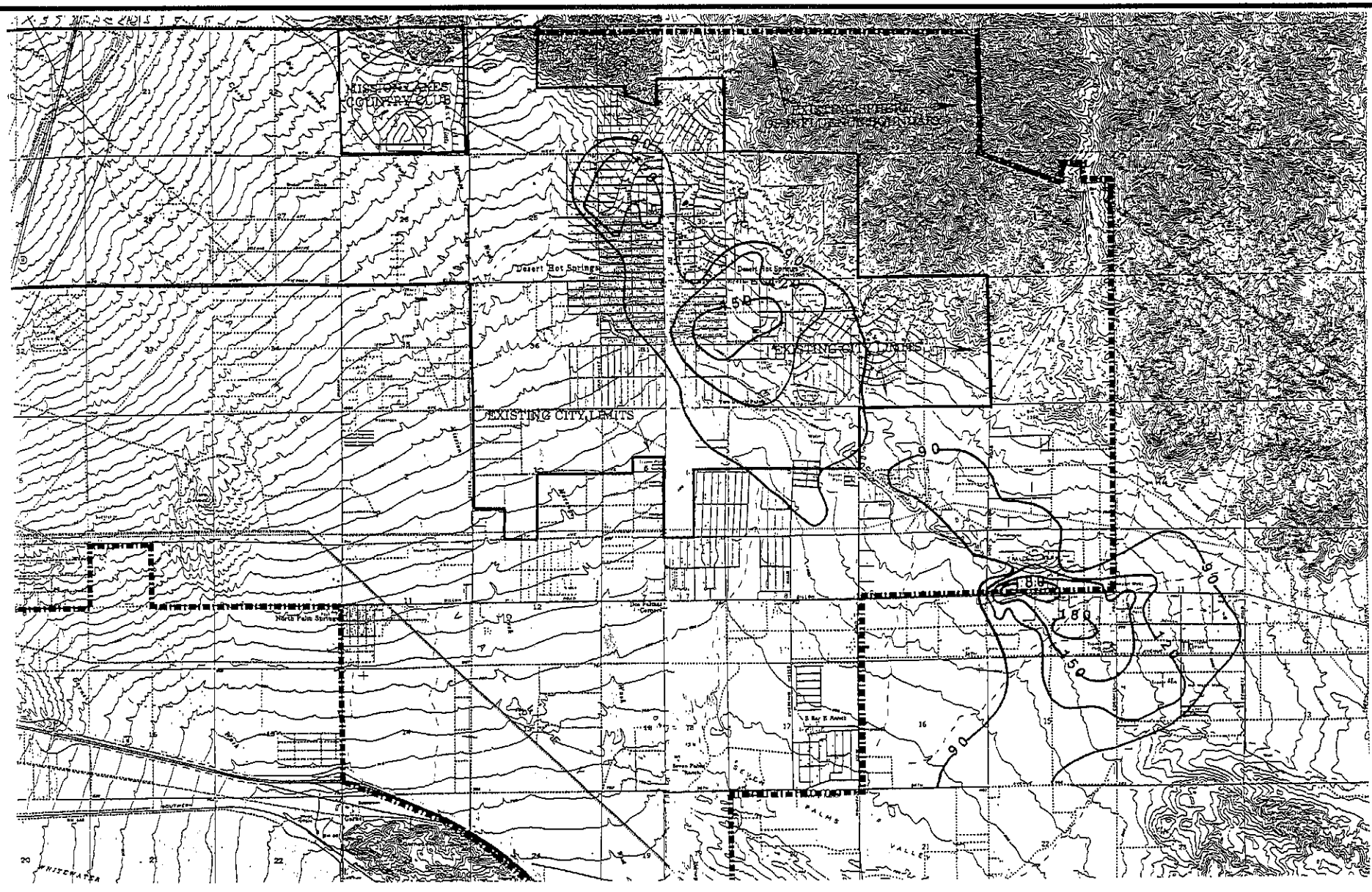
26 "Engineer's Report on Water Supply and Replenishment Assessment 1998/99," prepared by Water Resources Branch, Engineering Department, Coachella Valley Water District, April 1998.

27 George Thacker, Mission Springs Water District, personal communication, March 29, 2000.

Water Quality

Ground water quality is dependent upon a number of factors, including the source of water, the type of water-bearing materials in which it occurs, hydrologic factors such as groundwater recharge, and the quality of well maintenance. Water quality in the Coachella Valley is generally good to excellent, with the exception of water from the Desert Hot Springs subbasin. The hot waters found in this subbasin have dissolved various ions out of the granitic basement and sedimentary aquifer, and have historically contained potentially unhealthful concentrations of fluoride, sulfate and total dissolved solids.[28] As stated previously, water from this subbasin is used only for hot mineral spas and is not used for potable water.

28 "Hydrologic Investigation of Mission Creek Subbasin Within the Desert Hot Springs County Water District," prepared by Geotechnical Consultants, Inc., November 1979.



Source: US Department of Energy, Geothermal Energy and The California Energy Commission
Final Report, May 23, 1977 - July 31, 1978 Vol. II: Appendices/List of Illustrations, Plate 1

Limits of available data

TERRA NOVA®
Planning & Research, Inc.

City of Desert Hot Springs
Geothermal Temperature
Contour Map

Exhibit

III-14

Another more recent, but less extensive impact on area groundwater is contamination associated with long-term discharge from on-lot septic systems. Waste water contains contaminants, such as nitrogen, bacteria and organic chemicals that may degrade the quality of groundwater and render it unsuitable for human consumption. In 1993, the Desert Water Agency published a report indicating that a virus which infects E coli bacteria was found in limited quantities within groundwater supplies in the southern portion of Cathedral City.[29] This impurity was determined to be related to the heavy use of septic systems south of the Whitewater River channel.

The City of Desert Hot Springs planning area currently supports approximately 5,000 septic systems[30], which could potentially contribute to groundwater contamination. However, Mission Springs Water District has indicated that water quality in its service area has not been adversely impacted by increasing nitrate levels.[31] Nonetheless, MSWD is taking steps to prevent such impacts from occurring in the future. Over time, and as demand warrants, the Mission Springs Water District plans to provide sewer service to the entire planning area, thereby eliminating potential threats of groundwater contamination associated with individual septic systems. MSWD currently requires that all new development occurring within 200 feet of an existing sewer main be connected to the sewer system.[32] In accordance with SB 1852, which addresses the development of residential subdivisions, all parcels less than one-half acre in size must be connected to a sewer system.[33] Parcels greater than one-half acre are permitted to operate on individual septic systems. The City of Desert Hot Springs is a member of the Groundwater Guardian Program, which seeks to address threats of groundwater contamination and to preclude increased threats through a variety of management strategies.

The anticipated importation of Colorado River water via the MWD aqueduct could potentially affect the quality of water supplied from the Mission Creek subbasin. The following table indicates the relative quality of surface waters recharging groundwater basins in the Coachella Valley.

29 "The Effects of Subsurface Wastewater Disposal Systems on Groundwater within Cathedral City," prepared by Desert Water Agency, February 1993.

30 Mark Derhock, Mission Springs Water District, personal communication, March 13, 2000.

31 George Thacker, Mission Springs Water District, personal communication, March 29, 2000.

32 Ibid.

33 Ibid.

Table III-13
Mineral Analysis of Representative Surface Waters

Source	Whitewater River (North)	Snow Creek	Colorado River	Whitewater River (South)
Constituent	epm[1]/ppm[2]	epm/ppm	epm/ppm	epm/ppm
Ca	1.75/35	0.50/10	3.97/79	9.08/181
Mg	0.90/11	0/0	2.31/28	3.74/45
Na	0.62/14	0.47/11	4.78/110	32.58/749
K	0.108/4.2	0.04/1.6	0.11/4.3	0.39/15
Cl	0.1/4	0/0	6.01/213	15.96/566
Total Dissolved Solids	201 ppm	55 ppm	727 ppm	2,983 ppm

Notes: [1] epm = chemical equivalents per million; [2] ppm = parts per million by weight
Source: DWR Bulletin No. 108: Coachella Valley Investigation. California Dept. of Water Resources, July 1964.

As shown in the table above, imported Colorado River water is about three times higher in total dissolved solids (TDS) than the upper Whitewater River source. Recharge water is not expected to have a significant impact on water quality in the Desert Hot Springs area. Within the Mission Creek subbasin, there is good potential for vertical mixing of recharge and deeper portions of the water table, and the quality of groundwater can be expected to remain relatively high.

Water Quality Regulation

A number of federal and state laws have been established to assure adequate planning, implementation, management and enforcement of water quality control efforts. Federal water quality legislation includes the Clean Water Act and the National Environmental Policy Act (NEPA). California statutes and administrative laws that are applicable to water quality include, but are not limited to the California Water Code, California Environmental Quality Act (CEQA), California Code of Regulations and other codes such as the Health and Safety Code, Fish and Game Code and Public Resources Code.

The California Regional Water Quality Control Board (WCQB) implements federal and state laws pertaining to water quality. The primary issues addressed by the WQCB in the Coachella Valley are agricultural drainage, geothermal power impacts, the New River, Salton Sea, Tahquitz Creek and other sources of surface water. Other locations monitored by the WQCB include sites where inappropriate disposal of hazardous and toxic materials have threatened to contaminate groundwater. These include leaking fuel storage tanks, illegal discharges or human or animal waste, and the dumping of waste oils and other hazardous liquids.

National Pollutant Discharge Elimination System (NPDES)
The NPDES implements the federal Clean Water Act and was adopted in 1990. Under the NPDES, plans and programs for stormwater management must be developed, adopted and implemented to assure than municipalities "effectively prohibit non-storm water discharge into the storm drain and require controls to reduce the discharge of pollutants from storm water systems to waters of the United States to the Maximum Extent Possible." The legislation also makes the implementation of pollutant control measures exempt from CEQA.

2. Project Impacts

Buildout of the proposed General Plan is expected to result in the development of 114 fewer dwelling units, or a 0.2% decrease over the number of dwelling units anticipated under the current General Plan. Nonetheless, buildout of the General Plan will contribute to the cumulative impacts of urban development on groundwater resources in the Coachella Valley.

Future Consumptive Demand
A number of standardized water consumption rates have been published and can be used to estimate future water usage associated with buildout of the General Plan. It is important to note that consumption figures are offered as guides, and each should be evaluated for its appropriateness to specific projects.

The Environmental Impact Analysis Handbook estimates that water consumption for private residential dwelling units is approximately 50 to 75 gallons per person per day.[34] While this figure may provide a reasonable estimate of future water demand generated by residential lands in the planning area, it does not account for water consumed by commercial, industrial, recreation or other uses.

The Coachella Valley Water District has calculated domestic water demand for its urban service area, which is representative of residential, commercial and industrial users, as well as golf course resorts, irrigation and other uses in the Coachella Valley. This total demand has been converted to a per capita consumptive figure that is used by the District to estimate future water demand, and yields a per capita consumptive demand of 550 gallons per day (gpd).

The domestic water consumption rate in the Mission Springs Water District service area is 297 gallons per day per capita.[35] This factor is used in the following analysis because it best reflects local water consumption conditions.

34 Table 6.11, "Environmental Impact Analysis Handbook," edited by John G. Rau and David G. Wooten, McGraw-Hill Book Company, 1980.

35 George Thacker, Mission Springs Water District, personal communication, March 29, 2000.

Buildout of the General Plan is expected to result in approximately 63,889 potential new residential units. Based on the City's average of 2.787 persons per household[36], these new units would yield a population of about 178,058 residents. When combined with the existing City population, the total buildout population is expected to be about 193,456 residents. Based on the MSWD water consumption factor of 297 gpd, General Plan buildout could raise the city-wide total domestic water demand to approximately 57 million gallons, or about 176 acre-feet per day. This estimate includes water consumed by existing and future residents.

The CVWD estimates that approximately 40% of domestic water consumed is reintroduced into the groundwater table and is not lost. This includes a percentage of irrigation water applied to residential and other landscaping. Impacts may vary depending on the actual number of persons per household at buildout, and the level and type of landscaping and water-dependent amenities within each project.

Increases in water consumption will occur gradually, as new development occurs. As stated above, implementation and buildout of the proposed General Plan will contribute to the cumulative impacts of urban development on groundwater resources in the upper Coachella Valley. Development in the Coachella Valley is expected to continue to reduce the amount of potable groundwater in storage.

Impacts to water quality are expected to be comparable to, or slightly greater than those resulting from buildout of the current General Plan. The proposed Plan cites the need to implement the requirements of the National Pollutant Discharge Elimination System (NPDES).

3. Mitigation Measures

Water Conservation

Continued urbanization in the General Plan planning area and elsewhere in the Coachella Valley has resulted in increased demands on water supplies, and efforts to reduce per capita water consumption have become increasingly important. Water conservation is an essential short-term and long-term management strategy. One of the best opportunities for water conservation is the implementation of water efficient landscaping design and management. General Plan policies and programs promote water conservation through the use of oasis and desert landscaping materials, and other drought tolerant landscaping materials. The Plan provides for the continued implementation of the City's water conserving landscape ordinance, which requires that new landscape plans incorporate natural and drought-tolerant planting materials and efficient irrigation systems. The City will continue to encourage water conservation through the development of public educational materials and programs.

The City's groundwater resource is located within the Mission Springs Subbasin, which is managed by the Mission Springs Water District. The MSWD, Coachella Valley Water District and Desert Water Agency have contracted for State Water Project water to meet anticipated demands for groundwater resources. Until the Coachella Aqueduct is constructed to convey State Water Project water to the Coachella Valley, Colorado River water is transported to the valley via the Colorado River Aqueduct to recharge groundwater supplies.

36 California Department of Finance, January 1, 1999.

The City will continue to coordinate and negotiate with MSWD and DWA to use Colorado River water to recharge the Mission Creek Subbasin. The City will also encourage Riverside County Flood Control and Mission Springs Water District to design future flood control facilities in such a manner that they contribute to groundwater replenishment in the Mission Creek, Garnet Hill and Desert Hot Springs subbasins.

As set forth in the General Plan, one of the primary methods of complying with the provisions of NPDES is the use of project-specific stormwater retention or detention basins within new developments. These facilities can include, where appropriate, artificial wetlands that use biological processes to break down potential pollutants before they contaminate surface runoff of reach the water table through percolation. These structures are also important in intercepting sand and sediment before it is discharged into drainage facilities. To further protect water quality, the City shall encourage existing and new development to connect to the sewage treatment system operated by the Mission Springs Water District and Coachella Valley Water District, thereby reducing the threat of water contamination from septic tanks and seepage pits.

In addition to those mitigation measures cited above, the following measures are expected to reduce potential adverse impacts to water resources.

A. All future development projects shall be carefully reviewed by the City, Mission Springs Water District and/or Coachella Valley Water District to determine potential impacts of development activities on local groundwater resources.

B. The City shall promote and encourage the protection and conservation of local domestic water supplies to assure the long-term viability and availability of clean, healthful water resources.

C. Where feasible, the City shall require the development of on-site stormwater retention or detention basins to enhance filtration of runoff and the replenishment of groundwater subbasins.

D. The City, Mission Springs Water District and Coachella Valley Water District shall encourage the use of drought tolerant landscaping in public and private development as a means of reducing water consumption. All development plans shall be required to adhere to the City's landscape ordinance.

E. The City shall encourage and/or require the installation of low-flush toilets, and low-flow showerheads and faucets in all new construction, in conformance with Section 17921.3 of the Health and Safety Code, Title 20, California Administrative Code Section 1601(b), and applicable sections of Title 24 of the State Code.

F. The Mission Springs Water District and Coachella Valley Water District shall maintain adequate wastewater treatment plant facilities to assure that discharges of effluent are sufficiently treated to meet the standards of the California Regional Water Quality Control Board. The MSWD and CVWD shall also ensure that adequate treatment capacities are available to treat wastewater generated within its service boundaries.

G. The Mission Springs Water District shall continue to require that all development within 200 feet of an existing sewer main be connected to the larger sewer system. The City and MSWD shall continue to encourage the connection of all development to the sewer system, to the greatest extent practical.

Mitigation Monitoring/Reporting Program

- All development proposals shall be reviewed by the Community Development Department to assess the potential for adverse effects on water quality and quantity. All development proposals shall be required to mitigate any significant impacts.
  Responsible Parties: Community Development Department, City Engineer, developers, Mission Springs Water District, Coachella Valley Water District

- The Mission Springs Water District and Coachella Valley Water District shall coordinate and cooperate with local, state and federal agencies to assure the protection of groundwater aquifer from excessive extraction.
  Responsible Parties: Mission Springs Water District, Coachella Valley Water District

F. Biological Resources

1. Existing Conditions

Information pertaining to the occurrence of biological resources in the City of Desert Hot Springs and vicinity came from a variety of sources, including the biological resource assessment prepared by John Minch and Associates, Inc.[37], which is included in Appendix D of this document. Other sources of information included the U.S. Fish and Wildlife Service, California Department of Fish and Game, The Nature Conservancy and technical materials associated with the Coachella Valley Multiple Species Habitat Conservation Plan. In addition to a comprehensive literature review of numerous biological assessments conducted within the General Plan planning area, the biological consultant performed field surveys of the planning area and reviews of the California Natural Diversity Data Base Rare Find records.

Regional Biological Setting

The City of Desert Hot Springs is located at the western edge of the Colorado Desert subdivision of the Sonoran Desert. The San Jacinto, San Bernardino and Santa Rosa Mountains effectively isolate the Coachella Valley region from moderating coastal influences from the west. As a result, the region is characterized by extremely hot daily temperatures during the summers, mild winters, low humidity and low mean annual rainfall.

The unique geographic and geophysical composition of the Coachella Valley has created an environment for many diverse and occasionally highly specialized communities of plants and animals. The desert floor supports sparse vegetation, limited by heat and aridity. The regional climate becomes milder with increasing elevation, and regional mountain slopes are capable of supporting more vegetation. Canyons and springs support native fan palm communities and a wide variety of other plants and animals.

37 "Biological Resources Assessment for the City of Desert Hot Springs and Sphere of Influence, Riverside County, California," prepared by John Minch and Associates, Inc., July 1995.

The General Plan planning area lies at the northwestern end of the Coachella Valley and is bounded by the San Bernardino Mountains on the west and northwest, and the Little San Bernardino Mountains on the north and northeast. Elevations in the planning area range from approximately 2,800 feet above mean sea level in the extreme northeast, in the Little San Bernardino Mountains, to about 580 feet above sea level in the southeast portion of the planning area, near the Interstate-10/Palm Drive interchange. The planning area consists primarily of gently sloping, alluvial fan terrain with numerous washes, gullies and drainages which dissect the fan terrain. Lands to the northeast, north and west include the foothills of the San Bernardino and Little San Bernardino Mountains and are comprised of steep, rugged slopes. The various habitat types supported throughout the planning area are discussed below.

Sonoran Creosote Bush Scrub

The predominant habitat type within the General Plan planning area is Sonoran Creosote Bush Scrub, which generally occurs below elevations of about 3,000 feet on well-drained slopes, alluvial fans and valleys. Indicator plant species include brittlebush, ocotillo, desert brickellia, and creosote bush. Due to the limited availability and value of nesting sites, food, water and other biological resources, the Sonoran Creosote Bush Scrub habitat supports a rather low diversity of animal species. Common mammals include the antelope ground squirrel, little pocket mouse, black-tailed jack rabbit, kit fox, coyote, and mountain lion.

Sonoran Mixed Woody and Succulent Scrub

This plant community is similar to the Sonoran Creosote Scrub, but generally denser and more varied. It occurs on rocky, well drained slopes and alluvial fans at the base of mountains, in areas with a greater moisture content than those vegetated by Sonoran Creosote Bush Scrub, and is dominated by cacti and other succulents. The habitat value for Sonoran Mixed Woody and Succulent Scrub is generally low, as it provides limited water and other biological resources. Within the planning area, this habitat occurs west of State Highway 62, north of Two Bunch Palms Trail (extended), and east of Little Morongo Wash, north of 8th Street.

Native Succulent Stands

Two gardens of native succulents occur within the planning area: 1) Devil's Garden, located about one mile west of State Highway 62 on Pierson Boulevard, and 2) an unnamed stand located west of West Avenue, north of Mission Lake Boulevard, and east of Little Morongo Road. The most abundant plant species in this habitat type include beavertail cactus, California barrel cactus, cholla, bladderpod, brittlebush, creosote bush and dalea. During seasons with heavy rainfall, the desert floor can be dominated by numerous understory grasses and ground covers, including Mediterranean Grass, red pigmy weed and native fluff grass. Native succulent stands do not support a high diversity of wildlife species; however, several bird species, including the black-tailed gnatcatcher and western meadowlark, have been observed in the two succulent gardens in the planning area.

Desert Dry Wash Woodland

The Desert Dry Wash Woodland is considered a "community of the highest inventory priority" by the California Department of Fish and Game, and is therefore considered to be a sensitive, though not legally protected habitat. This community occurs as an open to dense riparian woodland which provides low to moderate habitat for watershed wildlife and often supports a high diversity of

wildlife species. A variety of shrubs and relatively tall trees, ranging from 30 to 60 feet in height, provide important nesting, foraging and perching sites for raptors.

Desert Fan Palm Oasis Woodland

The desert fan palm oasis woodland is a unique and relatively rare woodland plant community that occurs in areas having high groundwater tables often associated with geologic faults. It typically occurs at springs or in steep-sided canyons with perennial streams. This habitat is characterized by often dense groves of California fan palm (*Washingtonia filifera)* that can grow to heights of more than 60 feet. Other plants typical of this community include desert baccharis, arrowweed, willows and mulefat. The palm oasis woodland has been designated a "Community of Highest Inventory Priority" by the CDFG and is therefore considered to be a sensitive environmental habitat. The two palm groves at the Two Bunch Palms Resort and Spa are the only naturally occurring palm oases remaining in the General Plan planning area.

The fan palm oasis is an extremely important habitat as it provides critical cover and food supplies for a variety of desert wildlife. Some of these include the desert slender salamander, common kingsnake, California treefrog, Least Bell's vireo, barn owls, common flicker, carpenter bee and the giant palm boring beetle.

Desert Dunes and Sand Fields

Three major types of blow sand deposits have been identified in the planning area: 1) stabilized and partially stabilized desert dunes, 2) desert sand fields, and 3) wind shadow "dunes." The primary distinction between these habitat types is the level of water that is retained within the sand and the subsequent ability to support dense vegetation and more diverse wildlife. Sand fields and plains lack distinct dune formation and consist of flatter sand accumulations.

The largest dune and sand accumulation area in the planning area is located within and in the vicinity of the southern portion of the Seven Palms Valley, generally trending northwest to southeast, and extending across Palm Drive, south of 20th Avenue. Desert dunes also occur in the Painted Hills Road area, north of Interstate-10 and west of State Highway 62. Both areas are relatively small and well stabilized by vegetation, including mesquite, saltbush, indigo bush and creosote bush. Desert sand dune habitat is critical to a number of special-status wildlife species, including the Coachella Valley fringe-toed lizard, flat-tailed horned lizard, flat-seeded spurge and the Coachella Valley milk-vetch.

Desert Dry Wash and Drainage Areas

Dry washes are best described as well-developed drainage areas created by periodic flooding and run-off from higher ground. The planning area contains numerous major and minor dry washes and drainage areas, including Mission Creek, Big and Little Morongo Washes, Blind Canyon and Long Canyon. Due to the occurrence of periodic flooding, scouring and sedimentation, and a high water table, desert washes are capable of supporting a greater variety of wildlife than surrounding creosote bush scrub communities. Dominant plant species include palo verde and ironwood, and typical wildlife include Gamble's quail, road runner, loggerhead shrike, northern flicker, and verdin. Desert dry washes and drainage areas may also function as important wildlife movement corridors for coyote and other mammals.

Rocky Slopes Habitat

The foothills of the San Bernardino and Little San Bernardino Mountains extend into the northeastern and northwestern portions of the planning area. This habitat occurs on the weathered and fractured bedrock of slopes and ravines, some if which has been broken and displaced and occurs as loose debris of stone, pebbles and sand. The rocky slopes offer suitable habitat for a wide variety of shrubs, common perennials, annuals and succulents. Plant species and sizes generally become more diverse as elevation increases. Perennials commonly found on rocky slopes include creosote bush, brittlebush, burrobush, agave, ocotillo, spike moss, rushpea, and pigmy cedar. Although the abundance of annuals fluctuates each year, common annuals include wooly plantain, crenulate phacelia, rock daisy and crypantha. Nelson's bighorn sheep (*ovis canadensis nelsoni*) may occur in the northeastern part of the planning area, within the rocky slopes of the Little San Bernardino Mountains.

Sensitive Species

The Desert Hot Springs General Plan planning area is host to a wide variety of sensitive plant and animal species, some of which have been listed as threatened or endangered by federal and state governments. The U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) maintain lists of these species and provide information in where they are known to be present or where they could potentially occur. In addition, the California Native Plant Society, a non-profit conservation organization, maintains a listing of native flora which it believes to be rare and/or endangered.

"Endangered" species are those with such limited numbers, or those that are subject to such extreme circumstances that extinction is a real possibility. "Threatened" species are those whose numbers have declined to such low levels, and/or whose populations are so isolated that the continuation of the species could be jeopardized in the near future. "Rare" and "sensitive" species are those that are particularly sensitive to the impacts of urban development, are naturally rare, or whose habitat is declining, but where perpetuation does not appear to be significantly threatened. The following table identifies sensitive species known to occur or likely to occur in the planning area. A more comprehensive listing is provided in the Biological Resources Assessment in Appendix D of this document.

Table III-14
Desert Hot Springs Species of Special Concern

Animal and Plant Species	*Scientific Name*	Status
Plants		
Coachella Valley milk-vetch	*Astragalus lentiginosus var coachella*	FE/ND
Triple-Ribbed milk-vetch	*Astragalus tricarinatus*	FE/ND
Little San Bernardino Mtns. gilia	*Gilia maculata*	FPE/ND
California ditaxis	*Ditaxis californica*	FSC/ND
Flat-seeded spurge	*Chamaecyce platysperma*	FSC/ND
Payson's jewelflower	*Caulanthus simulans*	FSC/ND
Invertebrates		
Coachella giant sand treader cricket	*Mecrobaenetes valgum*	FSC/ND
Coachella Valley Jerusalem cricket	*Stepopelmatus cahuilaensis*	FSC/ND
Reptiles		
Coachella Valley fringe-toed lizard	*Uma inornata*	FT/SE
Flat-tailed horned lizard	*Phrynosoma mc'calli*	FSC/ND
Desert tortoise	*Gopherus agassizi*	FT/ST
Birds		
Burrowing Owl	*Athene cunicularia*	ND/CSC
Crissal Thrasher	*Toxostoma dorsale*	ND/CSC
LeConte's Thrasher	*Toxostoma lecontei*	ND/CSC
Loggerhead Shrike	*Lanius budovicianus*	FSC/ND
Golden eagle	*Aquila chrysaetos*	ND/CSC
Prairie falcon	*Falco mexicanus*	ND/CSC
Least Bell's Vireo	*Lireo bellii pusillus*	FE/SE
Black-tailed gnatcatcher	*Polioptila melanura*	ND/CSC
Southwest Willow Flycatcher	*Empidonax trailli extimus*	FE/SE
Yellow-Breasted Chat	*Icteria virens*	ND/CSC
Yellow Warbler	*Dendroixa petechia brewsteri*	ND/CSC
Summer Tanager	*Piranga rubra*	ND/CSC
Mammals		
Southern Yellow Bat	*Lasiusus ega (xanthinus)*	ND/CSC
California leaf-nosed bat	*Macrotis californicus*	FSC/CSC
Spotted Bat	*Euderma maculatum*	FSC/CSC
California mastiff bat	*Eumops perotis californicus*	FSC/CSC
Palm Springs pocket mouse	*Perognathus longimembris* ssp.*bangsi*	FSC/ND
Palm Spr. round-tailed ground squirrel	*Spermophilus tereticaudus chlorus*	FSC/CSC

Status Definitions:
FE = Federally listed as "Endangered"
FT = Federally listed as "Threatened"
FPE = Federally proposed/petitioned as "Endangered"
FSC = Federal Species of Concern
SE = State listed as "Endangered"
ST = State listed as "Threatened"
CSC = State species of Concern
ND = Not designated

Palm Springs (Round-tailed) Ground Squirrel
The Palm Springs round-tailed ground squirrel has no federal designation but is a California Species of Special Concern. It is also a target species for the Coachella Valley Multiple Species Habitat Conservation Plan (CV MSHCP). This subspecies of round-tail ground squirrel is associated with sandy soils, including sand fields, sand hummocks and dune formations, within the planning area and elsewhere in the Coachella Valley. Within the planning area, this species is found in the northern and southern reaches of the Mission Creek drainage, and in the southern portions of the planning area affected by the Morongo Wash. Threats to the ground squirrel in the planning area include urbanization, off-road vehicles, domestic pets and invasive plant species competing with native food sources.

Palm Springs Pocket Mouse
The Palm Springs pocket mouse is a federal species of concern but is not designation by the state. It is one of seven subspecies occurring in Southern California. Preferred habitat is level to gently sloping topography, sparse to moderate vegetation cover, and loosely packed or sandy soils. This species is known to occur within the Mission Creek drainage and in the vicinity of Willow Hole. Threats to the Palm Springs pocket mouse include urbanization, construction of roads, off-road vehicle use and predation by domestic pets.

Coachella Valley Milkvetch
The Coachella Valley milk-vetch is a federally endangered plant species which occurs in dunes and sandy flats and along the disturbed margins of sandy washes, and may occur in localized pockets where sand has been deposited by wind or by active washes. The species tends to occur in coarse sands at the margins of dunes, rather than in the most active blowsand areas, and appears to be dependent upon sand dune ecosystems. The milk-vetch has been identified in scattered locations in the southern portions of Desert Hot Springs, including the vicinity of the wastewater treatment plant, in the Edom Hill/Willow Hole Preserve located southeast of the planning area[38], and near the intersection of Palm Drive and Varner Road.[39] However, it could potentially occur in numerous locations in the planning area, particularly the low-lying valley floor and in active washes.

The primary threat to the Coachella Valley milk-vetch is habitat destruction due to continuing urban development. Other impacts may also result from off-road vehicle use, foot traffic and the intrusion of non-native plants, including russian thistle and Saharan mustard.[40]

Little San Bernardino Mountains Gilia
The Little San Bernardino Mountains gilia, which is proposed for federal listing as endangered, is a small endemic plant found in a restricted range in the vicinity of the Little San Bernardino Mountains, which has been found within the planning area within the Mission Creek and Morongo Wash drainages, and in the vicinity of Dry Morongo Wash. The gilia's preferred habitat is in loose soft sandy soils on low benches along washes which are occasionally affected by flowing water.

38 "Preliminary Draft, Biological Analysis of Three Conservation Alternatives for the Coachella Valley Multiple Species HCP/NCCP," prepared by the Coachella Valley Mountains Conservancy, December 1999.

39 "Biological Resources Assessment for the City of Desert Hot Springs and Sphere of Influence, Riverside County, California," prepared by John Minch and Associates, Inc., July 1995.

40 Ibid.

The primary threat to the Little San Bernardino Mountains gilia is urbanization within its habitat. It may also be impacted by off-road vehicle use and flood control maintenance activities.

Desert Tortoise

The desert tortoise is listed as a "threatened" species by both the U.S. Fish and Wildlife Service and the California Department of Fish and Game. Occupied habitats include desert alluvial fans, washes, canyon bottoms and rocky hillsides, but tortoises are known to occupy a wide range of habitats. Within the General Plan planning area, tortoises have been found north of Pierson Boulevard and east of Highway 62, as well as in the foothills of the Little San Bernardino Mountains[41]; potential tortoise habitat covers much of the planning area, particularly lands north of Dillon Road and west of West Drive.

Threats to desert tortoise include predation from coyotes, bobcats, ravens, golden eagles and possibly other mammals and birds. Tortoise habitat has also been lost to urbanization and associated human activities, including off-highway vehicle use and the construction of roadways and utility corridors. The proliferation of exotic annual grasses and other non-native plant species, disease, and wildland fires have also impacted tortoise populations.[42]

Coachella Valley Fringe-toed Lizard Habitat Conservation Plan

The Coachella Valley Fringe-toed Lizard Habitat Conservation Plan (HCP) was adopted in 1985 by Riverside County and nine Coachella Valley cities, including the City of Desert Hot Springs. The principal goal of the HCP is to protect and manage the habitat of the Coachella Valley Fringe-toed Lizard (CVFTL), which was federally listed as threatened and state listed as endangered in 1980.[43]

The HCP called for the establishment of three preserves, each of which contains sand dune habitat which is considered vital to the survival and propagation of the CVFTL. The Coachella Valley Preserve, located near Thousand Palms, is the largest of the preserves and encompasses nearly 15,000 acres.[44] The Indian Avenue Preserve is located in Palm Springs within the Whitewater River floodplain and contains approximately 1,175 acres. The Willow Hole/Edom Hill Preserve is located north of Interstate-10 at the western extreme of the Indio Hills and consists of about 1,863 acres. The preserve system is managed by a combination of private and non-profit organizations and federal regulatory agencies.

41 Ibid.

42 Ibid.

43 "The Coachella Valley Preserve System Management Plan and Decision Record," prepared by the US Bureau of Land Management, November 1995.

44 Ibid.

The HCP originally required a $600 per acre mitigation fee as compensation for the development of private lands located within a prescribed mitigation fee area. The fee has recently been reduced to $100 per acre, when a monetary threshold was reached. Some lands within the Desert Hot Springs General Plan planning area are located within the boundaries of the HCP mitigation fee area, and developers of these areas are subject to payment of the prescribed fee.

The California Department of Fish and Game (CDFG) was not a signatory to the HCP, and therefore, the HCP does not cover the "incidental take" of the Coachella Valley fringe-toed lizard under the California Endangered Species Act. Recent revisions to Section 2081 of the Fish and Game Code require a permit for incidental take of the species. New development projects in the historical range of the CVFTL are now required to obtain a 2081 take permit from CDFG. However, the administrative compliance with the California Endangered Species Act could be achieved on a regional basis, rather than a project-by-project basis, with a programmatic 2081 take permit, which could be obtained by the City from CDFG. The City should consider applying for such a permit to streamline the development approvals process.

Coachella Valley Multi-Species Habitat Conservation Plan

Habitat conservation plans that address the needs of more than one species or habitat have become an increasingly popular management strategy for protecting unique and valuable biological resources. The City of Desert Hot Springs and other members of the Coachella Valley Association of Governments (CVAG) are currently in the process of preparing the Coachella Valley Multiple Species Habitat Conservation Plan (MSHCP), which is designed to conserve large, contiguous undeveloped habitat areas for a wide range of plant communities and special-status animal species. The Plan will cover more than one million acres in the Coachella Valley and surrounding mountains.[45] Approximately 24 natural plant communities and 31 plant and animal species are expected to be addressed in the MSHCP.

The Plan is intended to standardize mitigation and compensation measures for species of concern on a regional basis, and to satisfy the requirements of federal and state endangered species protection laws. Once adopted, the Plan is also expected to limit the need for project-by-project review of the potential effects of development activities on species of concern.

2. Project Impacts

Development facilitated by implementation of the proposed General Plan will result in direct and indirect impacts to biological resources in the planning area. The primary impacts are expected to be habitat loss, fragmentation and degradation. Additional impacts include the removal of breeding and foraging habitat, the removal of native vegetation and its inherent wildlife habitat value, and the associated loss of wildlife species. Where new landscaping is introduced, exotic and other non-native plants which may be potentially harmful to humans and animals may prevail. During site grading and construction, a number of native animal species will be displaced and/or eliminated; however, those capable of adapting to human disturbance may be attracted to newly developed parcels.

45 "Background Information for the Coachella Valley Multiple Species Habitat Conservation Plan/Natural Communities Conservation Plan," prepared by the Coachella Valley Mountains Conservancy, March 20, 1998.

Indirect impacts resulting from future development could include off-road vehicle use, trash dumping, and predation by domestic pets. Increased noise, lighting and vehicular activity, reduced air quality, and encroachment into undeveloped areas by residents may also reduce and/or degrade natural habitat types and value occurring in the planning area.

Potential Impacts to Plant Communities
Entire populations of common and sensitive plant species may be destroyed when sites are graded and developed. This could constitute a significant impact to species with extremely limited distribution, such as the Coachella Valley milk-vetch, Little San Bernardino Mountains gilia, and California ditaxis. Native plant species could be replaced by, or be subject to competition for water, nutrients and space with exotic, non-native species. Portions of the planning area are considered "Communities of the Highest Inventory Priority," and this habitat will also be impacted by continued development.

Potential Impacts to Invertebrates and Reptiles
Increased urbanization has the potential to affect special-status invertebrates and reptiles. The flat-tailed horned lizard and the Coachella Valley fringe-toed lizard are special-status species known to rely upon desert dunes and sandy field habitats. The sandy habitat that supports these species could be disrupted or fragmented by urban development, and permanent loss of this habitat will impact individual animals as well as entire populations. These species are also particularly susceptible to the impacts of off-highway vehicles and crushing from grading and construction activities.

Potential Impacts to Birds
Continued development in the planning area will result in habitat degradation and the direct loss of foraging and nesting sites for a variety of special-status bird species. Indirect impacts could include increased predation by domestic pets, increased competition for limited nesting sites, the introduction of additional parasites, and breeding failure associated with human disturbance. Certain birds, which are capable of tolerating human disturbance, will continue to inhabit developed areas and may be attracted to newly landscaped areas.

Potential Impacts to Mammals
Direct habitat loss and fragmentation, and other human disturbances may impact a full range of common and special-status mammals. A number of sensitive bat species, including the spotted bat and California mastiff bat, are associated with the region and are known to roost in palm oases, rock outcrops, and in caves and mines. Continued development could potentially result in the loss and/or abandonment of roosting and/or foraging habitat. Small mammals, including the Palm Springs little pocket mouse and round-tailed ground squirrel, are expected to occupy habitat that is subject to future development, and are also susceptible to the impacts of off-road vehicles, predation by domestic pets, and surface disturbances that could crush their burrows.

3. Mitigation Measures

A. Development occurring within the mitigation fee boundaries of the Coachella Valley Fringe-toed Lizard Habitat Conservation Plan shall pay the mitigation fee in effect prior to the issuance of building permits.

B. The City shall consider requesting from the California Department of Fish and Game a programmatic Section 2081 incidental take permit for the Coachella Valley fringe-toed lizard for all lands within the boundaries of the Coachella Valley fringe-toed lizard Habitat Conservation Plan. Alternatively, the City may require applicants to secure individual Section 2081 permits prior to the issuance of building permits, as required by law.

C. The City shall continue to support and actively participate in the development and implementation of the Coachella Valley Multi-Species Habitat Conservation Plan.

D. The City shall consult and coordinate with the U.S. Bureau of Land Management regarding development proposals for lands located within the boundaries of the Big Morongo Canyon Preserve ACEC (please refer to Section III-A, Land Use, for a detailed discussion of this preserve).

E. The City shall encourage the maintenance of major drainage features, including but not limited to the Mission Creek, Long Canyon and Morongo Washes, as sandy bottomed facilities which allow the maximum level of native vegetation consistent with their flood control function.

F. The City shall support and promote the integration of biological resource and open space/conservation principles into the design and development of roadways and highways, stormwater detention/retention basins, and public parks and private open space areas.

G. On low density, large lot residential lands, the City shall encourage limited site disturbance, fencing and windrow planting to the greatest extent practical.

H. To protect and further enhance native desert habitat in the built environment, the City shall encourage developers to salvage naturally occurring desert plant materials for incorporation into project landscaping to the greatest extent possible, and shall indicate utilization of these indigenous materials on project landscape plans, which provide or enhance wildlife habitat and serve to extend the local desert environment into the urban design of the City. Plans shall be submitted to the City for approval.

I. A comprehensive planting materials list shall be prepared by the City, which shall include native and non-native, drought tolerant trees, shrubs and groundcovers that complement the local environment, provide habitat for local wildlife, and extend the desert into the built environment. A list of prohibited plant materials shall also be prepared.

J. The General Plan Land Use, Circulation, and Open Space and Conservation Elements shall recognize, reflect and provide an effective buffer between urban-type development and other incompatible uses, and the San Bernardino and Little San Bernardino Mountains, and other sensitive wildlife and open space and conservation lands.

K. The City shall encourage and cooperate in the establishment of multiple use corridors that use drainage channels and utility easements to provide wildlife corridors and public interconnection between open space areas in the community and vicinity.

L. The City shall consult and coordinate with the Riverside County Flood Control District, Southern California Edison and other appropriate public and quasi-public agencies, to encourage the establishment of a system of multiple use corridors for wildlife and public interconnection between open space areas in the community and vicinity.

M. The City shall provide developers with information on preservation and re-use of valuable top soils, use of locally appropriate xeriscape design concepts, and shall discourage unnecessary clearing of native desert landscape.

N. The City shall investigate the possibility and appropriateness of establishing an interpretive trail system in the City's mountain and open space areas, consistent with appropriate resource protection, to educate users and enhance their appreciation for wildlife communities in the City and vicinity.

O. The City should conscientiously work to preserve blowsand habitat near, within and tributary to the Willow Hole/Edom Hill Reserve, and should support efforts to preserve essential sand sources and groundwater resources in this preserve.

Mitigation Monitoring/Reporting

- Potential impacts of development projects on biological resources shall be evaluated through the Initial Study review process. Impacts shall be clearly documented and mitigation measures recommended where appropriate.
  Responsible Parties: Community Development Department, Developer/Consulting Biologist.

- Prior to the issuance of building permits, the City shall assure that all required biological resource mitigation actions, including but not limited to off-site mitigation and/or the payment of impact fees, have been satisfied.
  Responsible Parties: Community Development Department, Building Department, Developer/Consulting Biologist.

- Inspections during development grading and construction shall be monitored to assure conformance with grading limits, and to assure the preservation and integration of native and other appropriate desert landscape materials into all areas of the project in conformance with the approved landscape plan.
  Responsible Parties: Community Development Department, Building Department, Developer/Consulting Biologist.

- City staff shall review biological resources reference materials and update City records and inventories on an annual basis to assure timely and adequate maintenance of a resource database.
  Responsible Parties: Community Development Department, Consulting Biologist

G. Cultural Resources

1. Existing Conditions

Cultural resources are an integral part of a community and provide residents with a meaningful sense of history and heritage. Cultural resources within the General Plan planning area include Native American settlements that were established before and after the arrival of European-Americans, as well as historical structures and features that were built and used as early as the 1700's by European settlers. The following discussion is based on historical background research as well as an archaeological records search of the planning area.

The earliest prehistoric periods were characterized by the use of large stone points for the hunting and processing of large iceage mammals. As the climate and availability of food resources changed, local inhabitants began using smaller projectile weapons to hunt smaller game. This period involved substantial migration of people. About 4000 years ago, cultural complexity and variation improved, and stone tools became more sophisticated, thereby allowing for the processing of seeds and grains.

By about 1500 years ago, the milling of food stuffs continued. The bow and arrow was introduced around this time, facilitating additional hunting opportunities. During the latest period, from around 1200 to just before European contact in the 1700's, local inhabitants traded extensively with tribes of the Colorado River and learned to make pottery used for cooking and food storage. Archaeological evidence indicates that numerous settlements and other cultural sites were established throughout the Coachella Valley. Among these sites are villages, milling sites used on a seasonal basis to process food materials, lithic workshops for making stone tools and weapons, and artistic and religious rock sites.

Native Americans in the Coachella Valley

Two native American groups, the Cahuilla and Serrano tribes, occupied portions of the General Plan planning area during late prehistoric and historic times. Both groups were members of the Takic linguistic family of the Uto-Aztecan stock.[46] The Serrano occupied a settlement territory generally located in the Mission Creek area in the northeastern planning area, while the Cahuilla occupied a district located in Whitewater Canyon, near the present Whitewater Trout Farm. It is likely that portions of the General Plan planning area were used by members of both groups from time to time.[47]

Archaeologists believe that the Cahuilla Indians traveled from the north to the Coachella Valley region approximately 2,000 to 3,000 years ago.[48] The Cahuilla were generally divided into three groups: the Pass Cahuilla of the Banning-Beaumont area; the Mountain Cahuilla from the San

46 "Cultural Resources Assessment for the Cornerstone Project, City of Desert Hot Springs, Riverside County," prepared by Bruce Love, Archaeological Research Unit, University of California-Riverside, December 17, 1990.

47 Ibid.

48 The Cahuilla. Bean, Lowell John and Lisa Bourgeault. Chelsea House Publishers, 1989.

Jacinto and Santa Rosa Mountains; and the Desert Cahuilla who inhabited the Coachella Valley as far south as the Salton Sea. Each clan, or lineage, had its own food harvesting areas, ceremonial house, and lineage chief; however, a number of lineages are known to have cooperated with one another for political and economic purposes.

The Desert Cahuilla established many villages throughout the Coachella Valley, including settlements around ancient Lake Cahuilla, which evaporated around A.D. 1500. The desert environment was often harsh, with extreme variations in rainfall, wind and temperature, and occasional flash flooding and faulting activity that altered available water resources. However, the mountains, canyons, and desert floor of the Coachella Valley also provided a wide variety of plants and animals and served as important sources of food, water, and supplies.

The first Cahuilla contact with Europeans occurred in the 1770's, when Spaniards crossed through Cahuilla territory in search of new land routes between Mexico and northern California.[49] As time passed, relations between European settlers and the Cahuilla became strained due to conflicts over land ownership and exploitation, and religious and cultural practices. European disease, to which the Cahuilla had no immunity, furthered the gap between Indian and non-Indian relations. A smallpox epidemic in the early 1860's decimated the Cahuilla population, which declined from an estimated 6,000 to 10,000 people to only 2,500 individuals.[50] Reservations were established beginning in the 1870's and allowed the Cahuilla to preserve their cultural traditions in relative isolation from Anglo-Americans.[51] The Cahuilla Indians continue to inhabit parts of the Coachella Valley today. A community of Cahuilla lives on the Agua Caliente Reservation, portions of which are located within Cathedral City, south of the General Plan planning area.

Documentation of Cultural Resources

Archaeological studies and surveys are prepared to satisfy the requirements of current county, state (CEQA), and federal (NEPA) laws and guidelines pertaining to the identification and preservation of prehistoric and historic sites on property proposed for development. These studies and surveys include a review of records contained within the California Archaeological Inventory (CAI) for Riverside County. The Eastern Information Center (EIC) at the Archaeology Research Unit of the University of California-Riverside has conducted a number of literature searches and field surveys within the planning area, and several cultural sites have been identified. The most common types of archaeological and historic sites identified in the planning area and surrounding region are briefly described below.

Archaeological Sites

1. Village sites: Villages are the most significant sites identified. They are generally located in areas that offer optimal climate, food, water, and materials. Occupied for extended periods of time, village sites are recognized by rich deposits of organic, ashy soil often containing artifacts and plant and animal remains.

49 Ibid.

50 Ibid.

51 Mukat's People: The Cahuilla Indians of Southern California. Bean, Lowell John. University of California Press, 1972.

2. Campsites and Temporary Habitation Sites: These sites are similar to villages but are shallower and contain fewer artifacts.
3. Milling Stations: These are sites in which grinding, pounding, and processing was performed on food materials.
4. Lithic Quarries: Quarries are outcrops of certain types of rock used in tool-making.
5. Lithic Reduction Sites/Lithic Workshops: Lithic workshops are areas in which rocks were reduced and shaped into tools and other useful materials.
6. Aboriginal Trails: The remains of Indian trails that were likely used as important travel corridors.
7. Sparse Lithic Scatters: These sites include the remains of stone-making activities.
8. Pot Drops: Areas in which pottery fragments from the breakage of a single vessel are identified.
9. Rock cairns and rock art sites: A rock cairn is a collection or mound of stones that served as a memorial or landmark. Rock art sites include pictographs, petroglyphs, and cupule boulders.

Historic Sites

(A historic site includes any area more than 45 years old that contains evidence of human activity.)

1. Homes/Ranches: These sites include intact structures or the remnants of house foundations, wells, fences and rock walls, out buildings, and other features associated with living activities.
2. Roads/Trails: Corridors that were important transportation and/or trading routes.
3. Mining Sites: Mining sites include mine shafts, equipment associated with mining, and shallow pits in which minor prospects may have occurred.
4. Trash Dumps/Can Scatters: These sites contain trash that can be accurately dated.

Archaeological Resources in the Planning Area

Review of archaeological field survey records indicates that there is evidence of Native American activity in the planning area. Findings include rock cairns, several circular and rectangular arrangements of rocks, and a prehistoric milling slick (bedrock metate) located in the western portion of the planning area, west of State Highway 62.[52] These resources were located in an area dominated by the creosote bush scrub plant community near the foothills of the San Bernardino Mountains.

An archaeological site has also been documented within one mile of the Cornerstone Specific Plan area in the northeast portion of the planning area. This site consists of potsherds, lithic and ground stone fragments, a projectile point and bone, some of which is burnt.[53] Field survey records indicate that additional artifacts could possibly occur at this site and may be hidden from view by dense mesquite.

52 "Cultural Resources Assessment of 2267 Acres of Land Located Near Mission Creek in Riverside County, California," prepared by Brooke S. Arkush, Archaeological Research Unit, University of California-Riverside, June 1989.

53 "Cultural Resources Assessment for the Cornerstone Project, City of Desert Hot Springs, Riverside County," prepared by Bruce Love, Archaeological Research Unit, University of California-Riverside, December 17, 1990.

A total of nine archaeological sites have been identified in the southeast portion of the planning area, on lands known as Seven Palms Ranch.[54] These sites are largely located on stabilized sand dunes and consist of a variety of surface artifacts, including fire-cracked rock, pottery sherds, ceramics, charcoal, burnt bone, and debitage (waste material from the manufacturing of stone tools). Several of the sites may be remains of seasonal campsites or "village" sites.

Two archaeological sites on the Seven Palms Ranch may be of particular significance in that they could represent the relatively undisturbed prehistoric occupation of a desert oasis. Both sites are located just north of a natural, fresh water seep which, in historic times, has served as a standing, perennial water source. One site is located atop a stabilized sand dune dominated by low-growing mesquite. This site may have functioned as a multi-purpose habitation site, in which tools and other materials were processed. It contains fire-cracked rock, fragments of millingstone, ceramics, bone fragments, and charcoal-stained soil.[55] The other site is located on a low sand hill with nearby tamarisk and mesquite, both of which are often indicative of subsurface water. This site seems to reflect a food preparation and production area and includes ceramics, debatage, fire-affected rock and fragments of animal bone.[56]

The planning area may contain additional potentially sensitive archaeological sites. The area was frequently traveled by aboriginal peoples, and the possibility of heretofore undiscovered resources of significance should not be ignored. The planning area is transected by several earthquake faults, including the Mission Creek, Banning, Blind Canyon and others. In some locations, faults support dense vegetation, particularly fan palms and mesquite. These areas are typically indicative of high water tables and/or the presence of surface water, and may have been a valuable resource for native inhabitants. Canyons and canyon mouths which offer edible plants, game animals, a shaded climate and dependable water supplies, may also contain significant archaeological resources and should be considered as potentially sensitive resources.

Historic Resources

European Settlement in the Coachella Valley

By late 18th century, Spanish explorers sought to colonize California before other European nations, and established religious missions and military strongholds along the California coast. Mission San Diego, the first permanent mission established by the Spanish, was built in 1769. By the 1770's, explorers entered the Coachella Valley region in search of easily passable supply routes from Mexico to colonies on the northern Monterey Peninsula of California.

In 1822, Mexico secured its independence from Spain under the Treaty of Cordova, and Spanish forces were driven out of Mexico and California. Mexican exploration of the Coachella Valley region continued, and numerous ranches and agricultural enterprises were established. In many cases, Mexican land owners relied upon Cahuilla Indians for ranch management and labor.

54 "An Archaeological Assessment of Desert Dunes Resort (Seven Palms Ranch), Desert Hot Springs, Riverside County, California," prepared by Christopher Drover, Ph.D., June 10, 1989.

55 "Archaeological Test Phase of Riv-1825 and 1827, Seven Palms Ranch, Desert Hot Springs, California," prepared by Christopher Drover, Ph.D., October 1982.

56 Ibid.

The United States defeated Mexico in 1848 in the Mexican-American War and gained control of California. At the same time, the discovery of gold and the appeal of cattle ranching led to an influx of new settlers. California was admitted into the Union in 1850.

Ocean-to-Ocean Highway

The National Highway System was established by the federal government in 1926 and included the Ocean-to-Ocean Highway, which ran along the Southern Pacific Railroad. Although the exact date of construction is unclear, archival records indicate that the road was built in the late 1930's. The federal government granted rights-of-way for the highway in November, 1938 and designated it U.S. Route 60/70/99. Segments of present-day Varner Road were part of the original Ocean-to-Ocean Highway.[57]

Historic Desert Hot Springs

Early government surveys recorded very little evidence of settlers in the Desert Hot Springs area before 1917, and the arrival of permanent settlers is believed to have begun around the 1920s. Cabot Yerxa is credited with discovering the first hot mineral waters in the Desert Hot Springs area. After serving as Postmaster of Sierra Madre, California from 1906-1913, Yerxa moved to the Desert Hot Springs area and began homesteading a 160-acre tract near the Two Bunch Palms oasis. In 1913, he discovered the hot springs that gave the community its name. He encountered natural hot water and, fearing that it might contain arsenic, he used it only for bathing. Yerxa later named the area around the well "Miracle Hill." After returning from World War I, Yerxa tried to interest developers in the resort potential of his hot springs.

It was not until 1932 that L.W. Coffee and Aubrey Wardman ventured to develop the springs. After digging two test wells and striking hot mineral water, Coffee subdivided and sold the surrounding property. Additional acreage was later purchased by Wardman, and Coffee was able to develop the area into a promising health resort. Partially as a result of Coffee's efforts, the town of Desert Hot Springs witnessed most of its early growth in the 1940s.

Historic Resources in the Planning Area

Several historic sites have been identified in the planning area and are documented in records maintained by the Eastern Information Center at the University of California at Riverside Archaeological Research Unit. Among these sites are the ruins of a historic house constructed of local cobbles and mortar, a historic camp possibly related to livestock or mining activities, a historic well or mine shaft, various trash dumps, and a habitation or field work station and associated artifacts. Most of these historic sites occur in the western portion of the planning area, in the vicinity of Highway 62, and date between 1910 and 1040.[58]

57 "Cultural Resources Report for the Rancho Mirage General Plan." Prepared by Bruce Love and Bai Tom Tang, CRM Tech, January 5, 1996.

58 Review of Archaeological Site Survey Records, from records search conducted by Eastern Information Center, University of California at Riverside, October 24, 1994.

According to the Eastern Information Center's 1994 cultural resources records search, there are no National Register listed properties or California Historic Landmarks recorded within the planning area.[59] Furthermore, there are no properties listed on the California Inventory of Historic Resources.

The City does include, however, one California Point of Historical Interest, a site known as "Yerxa's Discovery." A bronze plaque commemorating Cabot Yerxa's 1913 discovery of hot well water is located in front of Cabot's Old Indian Pueblo. The pueblo is located at 67-616 Desert View Avenue. This 35-room Hopi-style pueblo was constructed by Yerxa of salvaged lumber and adobe bricks mixed with cement. Yerxa worked on constructing the pueblo for over twenty years. At the time of his death in 1965, the pueblo was still unfinished. The pueblo served for many years as a museum, art gallery, and trading post. The pueblo is owned by the City of Desert Hot Springs. It has been closed to the public for the last four years for renovations and other improvements, but is expected to re-open during the summer of 2000.

2. Project Impacts

Historically significant sites and structures are those that are 45 years of age or older and provide evidence of past human activities. Appendix K of the California Environmental Quality Act (CEQA) Guidelines articulates that cultural resources must be evaluated for their importance or significance.[60] An important archaeological resource is defined by CEQA as one which:

A. Is associated with an event or person of:
1.Recognized significance in California or American history, or
2.Recognized scientific importance in prehistory;

B. Can provide information with distinctive characterists of a type, period, region, or method of construct, or represents the work of an important creative individual, or possesses high artistc value;

C. Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind;

D. Has yielded, or may be likely to yield , information important in prehistory or history;

After reviewing the findings of the records and literature searches presented in this discussion, it is clear that the Desert Hot Springs planning area has a number of important archaeological and historic resources. It is possible that additional Cahuilla sites and other historic structures may be discovered during future development. Lands which are dominated by creosote bush scrub at the base of the San Bernardino Mountains have been known to harbor rock cairns, milling implements, and other signs of prehistoric occupation. Stabilized sand dunes and mesquite hummocks have been shown to contain artifacts associated with habitation and food preparation.

59 Ibid.

60 "California Environmental Quality Act - Statutes and Guidelines," Section 15064.5. Prepared by the Governor's Office of Planning and Research, State of California. As amended, February 1, 1999.

Future development projects in these and other portions of the planning area could potentially result in direct and/or indirect disturbance or destruction of sensitive archaeological and historic resources. Impacts may include grading activities, site excavation, construction, and increased foot and vehicular traffic. Site surveys should be conducted on all future development projects, if deemed necessary, to determine the presence and significance of archaeological and historic resources. In addition, a variety of mitigation measures are recommended for reducing potential impacts to these important resources.

3. Mitigation Measures

The protection and preservation of prehistoric and historic resources is an important step in maintaining the Coachella Valley's cultural heritage. The City of Desert Hot Springs is responsible for assuring that every reasonable effort is made to identify and evaluate cultural sites within its jurisdiction. The City must determine which development activities will potentially adversely affect historically significant sites. Appendix K of the 1992 California Environmental Quality Act (CEQA) Statutes and Guidelines defines the manner in which the City must address issues related to archaeological and historic resources. Projects involving a federal agency, federal funding, or some other federal assistance must conform to Section 106 of the National Historic Preservation Act of 1966 (NHPA). The following mitigation measures are recommended for implementation.

A. Individual development proposals shall be evaluated on a case-by-case basis to determine potential impacts to identified and suspected significant cultural resources in order to determine appropriate mitigation measures.

B. The City shall work in conjunction with a local historical society to identify and assess important historical sites and shall assure that they are properly recorded and catalogued as necessary.

C. The City shall develop and maintain a comprehensive cultural resources database using a variety of data, including resources from the Eastern Information Center (EIC) at the University of California-Riverside, the General Land Office Survey, and future records and site assessments. Information concerning specific archaeological sites should remain confidential and should not be made available indiscriminately so as to protect the sites from disturbance and vandalism.

D. In the event that archaeological resources are unexpectedly identified during construction, the City shall require that development cease, and a professional archaeologist shall be employed to examine and document the site to determine subsequent activities and appropriate mitigation measures.

E. The City shall support the continuation and expansion of state and federal programs that provide tax and other incentives for the rehabilitation of historically and/or architecturally significant structures.

Mitigation Monitoring/Reporting Program:

- Potential impacts of development projects on cultural resources shall be evaluated through the Initial Study review process. Impacts shall be clearly documented and mitigation measures recommended where appropriate.
  Responsible Parties: Community Development Department, Developer/Consulting Archaeologist, UC-Riverside Eastern Information Center.

- City staff shall review cultural resources reference materials and update City records and inventories on an annual basis to assure timely and adequate maintenance of the database.
  Responsible Parties: Community Development Department, UC-Riverside Eastern Information Center.

H. Air Quality

1. Existing Conditions

The air quality of a particular locale is based upon the amount of pollutant emitted and dispersed, and climatic conditions that may reduce or enhance the formation of pollutants. While air quality continues to be a major concern in southern California and the Coachella Valley, regional air quality levels have shown marked improvement in recent years. In relation to other southern California communities, Desert Hot Springs has essentially good air quality. Continued implementation of air quality management programs and a local commitment to reducing air pollutants will have long-term beneficial impacts on regional air quality.

Climatic Conditions and Air Quality
The Coachella Valley is located within a meteorologically and geographically unique area. The surrounding mountains isolate the valley from coastal influences from the west, and create a hot, low-lying desert environment. The valley is susceptible to air inversions, in which a layer of stagnant air is trapped near the ground where it is further loaded with pollutants. This process, when combined with chemical aerosols and other pollutants emitted by automobiles, furnaces and other sources, can result in substantial haziness.

The Coachella Valley is also subject to strong and sustained winds. As the desert floor heats up, it draws cooler coastal air masses through the narrow San Gorgonio Pass, generating strong winds which cross the most erosive areas of the valley. These winds suspend and transport large quantities of sand and dust, which can reduce visibility, damage property and constitute a significant health threat.

Air Quality Management and Regulation
Both the federal and state governments have established air quality standards for a variety of pollutants. In 1971, the U.S. Environmental Protection Agency established the National Ambient Air Quality Standards (NAAQS). The California Clean Air Act (CCAA) became effective on January 1, 1989 and mandated health-based air quality standards at the state level. State implementation plans (SIPs) may also be prepared to help regional air quality management districts meet the ambient air quality standards by the deadlines specified in the federal Clean Air Act (CAA) and emission reduction targets set forth in the California Clean Air Act.

Regional and local agencies have assumed some responsibility for assuring that air quality standards are achieved. The City of Desert Hot Springs and the surrounding Coachella Valley are located within the Salton Sea Air Basin (SSAB). The South Coast Air Quality Management District (SCAQMD) is responsible for establishing air quality measurement criteria and relevant management policies for the SSAB and neighboring air basins. The City of Desert Hot Springs is subject to the 1997 SCAQMD Air Quality Management Plan, which sets forth policies and other measures designed to help the District achieve federal and state ambient air quality standards. The 1997 Plan is intended to satisfy the planning requirements of both the Federal Clean Air Act and the California Clean Air Act.

The SCAQMD also monitors daily pollutant levels and meteorological factors throughout the District. Over the past 30 years, ozone levels have been reduced by half, sulfur dioxide and lead standards have been achieved, and other pollutants have declined considerably.[61] However, ozone, carbon monoxide and particulate matter levels within the limited portions of the District continue to exceed federal and state ambient air quality standards.

Primary and Secondary Pollutants

Pollutants are generally classified in two categories: primary and secondary. Primary pollutants are those which are a direct consequence of energy production and utilization. These pollutants typically affect only local areas and do not undergo chemical modification or further dispersion. Primary sources and their pollutants are mostly a direct consequence of the combustion of petroleum and other fuels resulting in the production of oxides of carbon, sulphur, nitrogen and a number of reactive hydrocarbons and suspended particulates.

Secondary pollutants are those which undergo chemical changes after emission. These pollutants disperse and undergo chemical changes under conditions of high ambient temperatures and high rates of solar insulation. Principal secondary pollutants are termed oxidants and include ozone (O_3), peroxynitrates, nitrogen dioxide (NO_2) and chemical aerosols.

Pollutants and Associated Health Effects

In an effort to protect public health, federal and state ambient air quality standards have been established for the following pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, lead and suspended particulate matter. A description of each pollutant and associated health impacts is provided below.

Ozone (O_3) is formed when byproducts of the internal combustion engine react in the presence of ultraviolet sunlight. Ozone is a pungent, colorless, toxic gas which is the main component of photochemical smog. Although ozone is produced within the Coachella Valley, most ozone pollutants are transported by coastal winds from Los Angeles County and the Riverside and San Bernardino areas into the Coachella Valley, thereby contributing to high ozone concentrations in the valley.[62] Exposure to ozone can result in diminished breathing capacity, increased sensitivity to infections, and inflammation of the lung tissue.

61 "1997 Air Quality Management Plan," South Coast Air Quality Management District.

62 Ibid.

Carbon Monoxide (CO) is a colorless, odorless gas emitted by automobiles and other motor vehicles. In high concentrations, carbon monoxide can contribute to the development of heart disease, anemia, impaired psychological behavior, and reduction in birth weight.[63]

Nitrogen Dioxide (NO_2) is a byproduct of fuel combustion which acts as an irritant. Because it absorbs blue light, high concentrations of nitrogen dioxide leave a brownish-red haze in the atmosphere, thereby reducing visibility. Short-term exposure to nitrogen dioxide can result in airway contraction in healthy individuals, and diminished lung capacity in individuals with asthma or chronic obstructive pulmonary disease.

Sulfur Dioxide is a colorless, pungent, extremely irritating gas which results from the combustion of high-sulfur content fuels, such as coal and oil. Short-term exposure to sulfur dioxide can result in airway constriction and severe breathing difficulties in asthmatics. High levels of exposure can cause fluid accumulation in the lungs and lung tissue damage.[64]

Lead (Pb) occurs in the atmosphere as particulate matter resulting from leaded gasoline and the manufacturing of batteries, paint, ink and ammunition. The elimination of leaded gasolines in recent years has reduced the hazards associated with airborne lead. Exposure to lead can result in anemia, kidney disease, gastrointestinal dysfunction and seizures. In severe cases, neuromuscular and neurologic disorders can occur.[65]

Particulate Matter (PM10) consists of fine suspended particles of ten microns or smaller in diameter, which are byproducts of road dust, sand, diesel soot, wind storms and the abrasion of tires and brakes. PM10 is one of the most prevalent forms of pollution in the Coachella Valley and is associated with strong desert winds, as discussed in more detail below. State and federal ambient air quality standards have been directed at reducing particulate matter of 10 microns or smaller. However, new standards are being considered for particles of 2.5 microns or smaller.

Fine particulate matter poses a significant threat to public health. The elderly, children and adults with pre-existing respiratory or cardiovascular disease are most susceptible to the effects of PM10. Elevated PM10 levels are associated with an increase in respiratory infections and occurrences of asthma attacks.

State and Federal Air Quality Standards

State and federal ambient air standards for ozone, particulate matter and other primary and secondary pollutants are shown in Table III-15. State standards are generally more restrictive than federal standards.

63 Ibid.

64 Ibid.

65 Ibid.

Table III-15
State and Federal Ambient Air Quality Standards

Pollutant	State Standards		Federal Standards	
	Averaging Time	Concentration	Averaging Time	Concentration
Ozone	1 hour	0.09 ppm	1 hour	0.12 ppm
Carbon Monoxide	1 hour	20.0 ppm	1 hour	35 ppm
	8 hours	9.0 ppm	8 hours	9.0 ppm
Nitrogen Dioxide	1 hour	0.25 ppm	annually	0.053 ppm
Sulfur Dioxide	1 hour	0.25 ppm	annually	0.03 ppm
	24 hours	0.04 ppm	24 hours	0.14 ppm
Suspended Particulate Matter	24 hours	50μg/m^3	24 hours	150μg/m^3
	AGM	30μg/m^3	AAM	50μg/m^3

Notes: ppm = parts per million
μg/m^3 = micrograms per cubic meter of air
AGM = Annual Geometric Mean
AAM = Annual Arithmetic Mean
Source: "1997 Air Quality Management Plan," prepared by South Coast Air Quality Management District.

Pollutants of Regional Concern

Of the pollutants described above, ozone and PM10 are the most prevalent in the Coachella Valley and the City of Desert Hot Springs. Air pollution in the Coachella Valley is the result of a variety of regional activities, including grading and construction, automobile traffic, and the operation of furnaces and other heating, cooling and ventilation equipment. However, a substantial amount of the pollution in the Coachella Valley can be attributed to local geographic and climatic conditions.

The Coachella Valley is a low-lying desert basin characterized by low annual rainfall and low humidity. The valley is surrounded on the north, west and south by mountain ranges that physically isolate it from coastal influences. Temperatures can exceed 120°F during summer months. As daily temperatures rise, cooler coastal air is drawn through the narrow San Gorgonio Pass to the west, generating strong winds that cross the most active erosion zones in the valley. Large quantities of desert sand and dust are transported through the valley, reducing visibility, damaging property and threatening public health.

Ozone Emissions

The Coachella Valley has a history of exceeding prescribed ozone standards, although the number of days and months exceeding the federal one-hour ozone standard have dropped steadily over the past decade. The Coachella Valley is classified as a "severe-17" ozone non-attainment area under the federal Clean Air Act. The area must comply with federal ozone air quality standards by November 15, 2007, which is 17 years from the date the Clean Air Act was enacted.[66]

Although some ozone is produced locally by motor vehicles and other sources in the Coachella Valley, ozone monitoring data indicate that federal ozone exceedances in the Coachella Valley are largely the result of pollutant transport from the South Coast Air Basin, through the Banning Pass, into the Coachella Valley.[67] Although it is difficult to quantify the total amount of ozone pollutants contributed from other regions, improved air quality in the Coachella Valley is partly dependent upon reduced ozone emissions in the South Coast Air Basin.

PM10 Emissions

The process of natural sand migration, also known as "blowsand," generates two types of PM10 emissions: 1) natural PM10 produced by direct particle erosion and fragmentation, and 2) secondary PM10 in which sand is deposited on road surfaces, ground into smaller particles by motor vehicles, and resuspended in the air by those vehicles.

The Coachella Valley has a history of elevated PM10 levels, which are closely associated with local fugitive dust emissions. In 1990, the South Coast Air Quality Management District adopted the "State Implementation Plan for PM10 for the Coachella Valley" (90-CVSIP) which outlined "reasonably available control measures" for PM10, and established a future attainment date for areas previously unable to meet federal PM10 standards.

In January 1993, the Coachella Valley was reclassified from a "moderate" to "serious" non-attainment area for PM10 by the U.S. EPA.[68] The Coachella Valley Association of Governments (CVAG) and its member cities have worked closely with one another to implement the measures set forth in the 90-CVSIP, including the adoption of city-based dust control ordinances, street cleaning programs, and the use of chemical stabilizers, site watering techniques and landscape treatments designed to reduce fugitive dust.

Recent PM10 monitoring data indicate that, with few exceptions, the Coachella Valley has attained the federal PM10 air quality standard and is now eligible for reconsideration by the U.S. EPA as having attained this standard. In 1996, the SCAQMD prepared and submitted to the EPA the "Coachella Valley PM10 Attainment Redesignation Request and Maintenance Plan," which requested reconsideration and included a maintenance plan designed to help the region achieve attainment for a 10-year period.[69] The Valley was required to demonstrate that it could meet federal PM10 emission standards for three consecutive years; this time period expired in 1999. The EPA is expected to issue its opinion on attainment status during the year 2000.[70]

66 Ibid.

67 Ibid.

68 "Coachella Valley PM10 Attainment Redesignation Request and Maintenance Plan," prepared by the South Coast Air Quality Management District, September 1996.

69 Ibid.

70 Aurora Kerr, Coachella Valley Association of Governments, May 18, 2000.

Air Quality Monitoring Stations

The South Coast Air Quality Management District operates and maintains regional air quality monitoring stations at numerous locations throughout its jurisdiction. The City of Desert Hot Springs is located within Source Receptor Area (SRA) 30, which includes monitoring stations in Palm Springs and Indio.

Table III-16 shows the maximum concentrations of PM10, and the number of days exceeding state and federal standards in the Coachella Valley between 1989 and 1998. Ozone levels at the Palm Springs and Indio air quality monitoring stations for the same period are illustrated in Table III-17.

Table III-16
Coachella Valley Air Quality Trends
Exceedances of Suspended Particulate Matter (PM_{10}) Standards

Monitoring Station	Year	Max. Concentration ug/m^3/24 hours	Days (%) Standard Exceeded Federal[1]	State[2]
Palm Springs	1989	292	2 (3.3%)	17 (28.3%)
	1990	83	0 (0.0%)	9 (15.3%)
	1991	197	1 (1.8%)	14 (25.0%)
	1992	175	1 (1.7%)	4 (6.7%)
	1993	58	0 (0.0%)	1 (1.7%)
	1994[3]	97	0 (0.0%)	23 (38.3%)
	1995[3]	199*	1 (1.6%)*	27 (44.3%)*
	1996	130	0 (0.0%)	2 (3.3%)
	1997	63	0 (0.0%)	1 (1.8%)
	1998	72	0 (0.0%)	3 (5.2%)
Indio	1989	712	4 (6.9%)	39 (67.2%)
	1990	520	4 (6.8%)	41 (69.5%)
	1991	340	3 (5.1%)	37 (62.7%)
	1992	117	0 (0.0%)	18 (30.5%)
	1993	125	0 (0.0%)	25 (41.0%)
	1994[3]	97	0 (0.0%)	23 (38.3%)
	1995[3]	199*	1 (1.6%)	27 (44.3%)
	1996	117*	0 (0.0%)	29 (50.0%)
	1997	144*	0 (0.0%)	23 (42.6%)*
	1998	114	0 (0.0%)	32 (40.0%)

1 >150 ug/m^3 in 24 hour period

2 > 50 ug/m^3 in 24 hour period

3 Includes high-wind natural event days.

* Less than 12 full months of data; may not be representative.

Source: Annual air quality site monitoring reports, prepared by South Coast Air Quality Management District.

Table III-17
Coachella Valley Air Quality Trends
Exceedances of Ozone Standards

Monitoring Station	Year	Max. Concentration in 1 Hour	No. Days Standard Exceeded Federal[1]	State[2]
Palm Springs	1989	.19 ppm	37	108
	1990	.17 ppm	27	73
	1991	.18 ppm	22	72
	1992	.15 ppm	21	69
	1993	.17 ppm	20	79
	1994[3]	.17 ppm	13	71
	1995[3]	.16 ppm	9	49
	1996	.16 ppm	12	60
	1997*	.16 ppm*	4*	45*
	1998	.17 ppm	8	40
Indio	1989	.16 ppm	16	76
	1990	.16 ppm	10	47
	1991	.18 ppm	13	48
	1992	.14 ppm	8	45
	1993	.16 ppm	3	25
	1994[3]	.17 ppm	13	71
	1995[3]	.16 ppm	9	49
	1996	.12 ppm	0	26
	1997	.11 ppm	0	3
	1998	.13 ppm	2	16

1 >.12 parts per million in 1 hour

2 >.10 parts per million in 1 hour prior to 1989, >.09 ppm beginning 1989

3 Palm Springs and Indio ozone levels represented as a single Coachella Valley data value in SCAQMD annual report. Values recorded are the highest recorded at either station.

* Less than 12 full months of data; may not be representative.

Source: Annual air quality site monitoring reports, prepared by South Coast Air Quality Management District.

2. Project Impacts

The continued urbanization of the City of Desert Hot Springs can be expected to result in an increased potential for air quality degradation in the Coachella Valley. The most significant impacts will come from the emission of pollutants generated by vehicular traffic. Another important source of pollutants will be site disturbance, grading and construction activity. The consumption of natural gas and the use of electricity will also contribute to the degradation of regional air quality. The following discussion describes the major sources of air pollutants associated with buildout of the proposed General Plan and calculates emissions where possible.

Fugitive Dust

Fugitive dust generation is associated with the disturbance, grading and development of undeveloped acreage in the planning area. It is beyond the scope of this study to accurately quantify the potential impacts of fugitive dust associated with General Plan buildout; however, the following formula can be applied to provide an estimate of these emissions.

Table III-18
Calculations of Fugitive Dust Potential

Total Area to be Disturbed at Buildout*	Factor	Total Potential Dust Generation
22,485± acres	26.4 lbs./day/acre	593,604 lbs./day

* Includes vacant acres remaining to be developed through buildout of the Draft General Plan. Does not include vacant Open Space acreage.

Source: Table A9-9, "CEQA Air Quality Handbook," prepared by South Coast Air Quality Management District, April 1993.

The calculations provided in the above table represent total emissions generated during buildout of the proposed General Plan, and do not provide a meaningful analysis of short-term projects. Fugitive dust is expected to be produced on a short-term, project-specific basis, and will be spread over the life of General Plan buildout. Given the limited and staged growth experienced in the City, it is realistic to assume that the area disturbed on an annual basis will generate considerably less fugitive dust. Nonetheless, the formula presented in the table above provides a benchmark by which the potential of phased development to generate fugitive dust can be measured.

Stationary Source Emissions

Calculations of stationary source emissions include emissions from electrical power plants outside the City of Desert Hot Springs and the consumption of natural gas for space and water heating, cooking and related activities. Power plant emissions consist primarily of combustion products, such as carbon monoxide, oxides of nitrogen, sulfur oxides, particulate matter and reactive organic gases (ROG).

Table III-19 shows potential power plant emissions associated with annual electricity consumption by residential development upon buildout of the proposed General Plan. Residential electricity usage is determined by applying the Southern California Edison electrical power usage rates to potential development on a per unit basis. These figures are multiplied by the emission generation factors set forth in the South Coast Air Quality Management District (SCAQMD) EIR Handbook.[71]

Table III-19
Power Plant Emission Projections
for Residential Development at Project Buildout
(Lbs. per 1000 kwh)

Annual Electric Energy Usage (per unit)		Total Number of Dwelling Units		Total Annual Electric Usage
5,626.50 kwh/unit/year	x	70,452 units	=	396,398,178 kwh

Pollutant	Carbon Monoxide	Nitrogen Oxides	Sulfur Oxides	Particulates	Reactive Organic Gases
	396,398	396,398	396,398	396,398	396,398
Factor	x 0.20	x 1.15	x 0.12	x 0.04	x 0.01
Lbs./Year	79,279.6	455,857.7	47,567.7	15,855.9	3,963.9

Source: CEQA Air Quality Handbook, prepared by South Coast Air Quality Management District, April 1993. Appendix to Chapter 9, Tables A9-11-A and A9-11-B. Assumes continued availability and use of natural gas in power plants and an average contribution from hydro-electric sources. Represents total pounds emitted per year at buildout.

The tables are generated in the same manner for commercial and industrial land uses, except different annual usage factors are applied. The electrical power factors are given on a per square foot basis, and the SCAQMD Handbook separates the commercial and industrial uses by type.

The commercial uses selected for this analysis include the "retail," "restaurant," and "office" and "food store" categories provided in the CEQA Handbook.[72] It is assumed that retail uses will comprise approximately 70% of all commercial development at buildout, restaurants will comprise about 10%, offices 15%, and food stores 5%.

71 Table A9-11-A, "CEQA Air Quality Handbook," prepared by the South Coast Air Quality Management District, April 1993.

72 Ibid.

Table III-20
Power Plant Emission Projections
for Commercial Development at Buildout
(Lbs. per 1000 kwh)

Estimated Total Annual Electric Usage: 188,205,312 kwh/year*

Pollutant	Carbon Monoxide	Nitrogen Oxides	Sulfur Oxides	Particulates	Reactive Organic Gases
	188,205	188,205	188,205	188,205	188,205
Factor	x 0.20	x 1.15	x 0.12	x 0.04	x 0.01
Lbs./Year	37,641.0	216,435.7	22,584.6	7,528.2	1,882.0

* Usage factor based on the following breakdown of commercial square footage, kwh/square foot usage and emission factors: Retail - 6,989,986 square feet @ 13.55 kwh/sq. ft.; Restaurant - 998,569 sq. ft. @47.45 kwh/sq. ft.; Office - 1,497,854 sq. ft. @ 12.95 kwh/sq. ft.; Food Store - 499,284 sq. ft. @ 53.50 kwh/sq. ft., as provided in Appendix A9-11-A of the CEQA Air Quality Handbook, April 1993.

Source: CEQA Air Quality Handbook, prepared by South Coast Air Quality Management District, April 1993. Appendix to Chapter 9, Tables A9-11-A and A9-11-B. Assumes continued availability and use of natural gas in power plants and an average contribution from hydro-electric sources. Represents total pounds emitted per year by all commercial development at buildout.

The industrial uses selected are categorized as "warehouse" and "miscellaneous" in the CEQA Handbook. For the purposes of this analysis, it is assumed that warehouse development will account for approximately 25% of all industrial development at General Plan buildout. The remaining 75% of industrial development can be best categorized as "miscellaneous" uses. Energy-Related Industrial land uses are not included in the following calculations, considering that wind turbines are energy generators, not consumers.

Table III-21
Power Plant Emission Projections
for Industrial Development at Buildout
(Lbs. per 1000 kwh)

Estimated Total Annual Electric Usage: 334,898,495 kwh/year*

Pollutant	Carbon Monoxide	Nitrogen Oxides	Sulfur Oxides	Particulates	Reactive Organic Gases
Factor	334,898 x 0.20	334,898 x 1.15	334,898 x 0.12	334,898 x 0.04	334,898 x 0.01
Lbs./Year	66,979.6	385,132.7	40,187.7	13,395.9	3,348.9

* Usage factor based on the following breakdown of commercial square footage, kwh/square foot usage and emission factors: Warehouse - 9,341,659 sq. ft. @ 4.35 kwh/sq. ft.; Miscellaneous - 28,024,979 sq. ft. @ 10.50 kwh/sq. ft., as provided in Appendix A9-11-A of the CEQA Air Quality Handbook, April 1993.

Source: CEQA Air Quality Handbook, prepared by South Coast Air Quality Management District, April 1993. Appendix to Chapter 9, Tables A9-11-A and A9-11-B. Assumes continued availability and use of natural gas in power plants and an average contribution from hydro-electric sources. Represents total pounds emitted per year by all commercial development at buildout.

Natural gas emissions are calculated using the average monthly consumption factor established by The Gas Company, formerly the Southern California Gas Company, and applied by the SCAQMD. The same pollutants projected for power plant emissions are calculated for natural gas emissions. As with power plant emissions, the consumption factors vary with the type of land use.

Table III-22
Emissions Associated with Natural Gas Consumption
for Residential Development at Buildout
(Lbs. per 10^6 Cu. Ft.)

Single Family DUs = 6,665.0 cf/unit/mo	x	51,183 du	= 341,134,695 cf/mo
Multi-Family DUs = 4,011.5 cf/unit/mo	x	19,269 du	= 77,297,593 cf/mo
		TOTAL	= 418,441,288 cf/mo

Pollutant	Carbon Monoxide	Nitrogen Oxides	Sulfur Oxides	Particulates	Reactive Organic Gases
	418.4	418.4	418.4	418.4	418.4
Factor	x 20.0	x 80.0	negligible	x 0.20	x 5.3
Lbs./Month	8,368.0	33,472.0	negligible	83.6	2,217.5

Source: CEQA Air Quality Handbook, prepared by South Coast Air Quality Management District, April 1993. Tables A9-12-A and A9-12-B, Appendix to Chapter 9.

Table III-23
Emissions Associated with Natural Gas Consumption
for Commercial Development at Buildout
(Lbs. per 10^6 Cu. Ft.)

Estimated Total Monthly Natural Gas Usage: 27,610,441 cf/mo*

Pollutant	Carbon Monoxide	Nitrogen Oxides	Sulfur Oxides	Particulates	Reactive Organic Gases
	27.6	27.6	27.6	27.6	27.6
Factor	x 20.0	x 120.0	negligible	x 0.20	x 5.3
Lbs./Month	552	3,312	negligible	5.52	146.3

* Usage factor based on the following breakdown of commercial square footage, cf/sq. ft./month and emission factors: Retail - 8,487,839 sq. ft. @ 2.9 cf/sq. ft./month (includes retail, restaurant and food store land uses); Office - 1,497,854 sq. ft. @ 2.0 cf/sq. ft./month, as provided in Appendix A9-12-A and A9-12-B of the CEQA Air Quality Handbook, 1993.

Source: CEQA Air Quality Handbook, prepared by South Coast Air Quality Management District, April 1993.

Table III-24
Emissions Associated with Natural Gas Consumption for Industrial Development at Buildout
(Lbs. per 10^6 Cu. Ft.)

Estimated Total Monthly Natural Gas Usage: 179,359,867 cf/mo*

Pollutant	Carbon Monoxide	Nitrogen Oxides	Sulfur Oxides	Particulates	Reactive Organic Gases
	179.3	179.3	179.3	179.3	179.3
Factor	x 20.0	x 120.0	negligible	x 0.20	x 5.3
Lbs./Month	3,586	21,516	negligible	35.9	950.3

* Usage factor based on the following breakdown of commercial square footage, cf/sq. ft./month and emission factors: Industrial - 37,366,639 sq. ft. @ 4.8 cf/sq. ft./month (highest commercial usage factor), as provided in Appendix A9-12-A and A9-12-B of the CEQA Air Quality Handbook, 1993.
Source: CEQA Air Quality Handbook, prepared by South Coast Air Quality Management District, April 1993.

Calculation of Moving Emissions

A comprehensive traffic impact analysis was prepared to evaluate the potential traffic and circulation impacts associated with buildout of the proposed General Plan. According to the traffic study, buildout of the planning area is expected to result in approximately 1,488,770 vehicle trips per day.

Moving emissions associated with project buildout are shown in Table III-25. In accordance with SCAQMD guidelines, total vehicle emissions are computed based upon trip emissions and distance related running emissions, multiplied by the number of vehicle miles traveled. Emissions are calculated using the California State Composite Moving Exhaust Emission Rates for calendar year 2009, the latest year for which emission rates are provided by the SCAQMD. Actual per mile emissions over subsequent years can be expected to be reduced as combustion technology improves and reduces vehicle emissions.

Table III-25
Moving Exhaust Emission Projections at Buildout
Calendar Year 2009
(pounds/day)

Estimated Miles Traveled in One Day: 4,466,310*

SPEED (mph)	POLLUTANTS CO	ROC	NO	PARTICULATES TIRE WEAR	EXHAUST
30	18,338	985	2,366	985	49
35	15,676	788	2,267	985	49
40	13,704	591	2,169	985	49
45	12,225	492	2,070	985	49
50	**11,042**	**394**	**2,267**	**985**	**49**
55	9,957	394	2,957	985	49
60	19,521	492	3,746	985	49
Cold Start** (lbs./day)	99,333	2,662	2,496	N/A	N/A
Hot Start** (lbs./day)	4,692	313	337	N/A	N/A
Hot Soak** (lbs./day)	N/A	953	N/A	N/A	N/A
Diurnal*** (lbs./day)	N/A	126	N/A	N/A	N/A

* Calculations based upon 1,488,770 trips per day, as provided in "Desert Hot Springs General Plan Update, Circulation Background Study," prepared by Endo Engineering, March 2000. Based upon average trip length of approximately 3.0 miles.
** Vehicle trips per day (1,488,770 trips/day, including 942,371 cold start trips and 546,399 hot start trips)
*** Vehicles per day (approximately 105,678 vehicles/day; assumes an average of 1.5 vehicles per residence)
Source: Tables A9-5, A9-5-J-10, A9-5-M, Appendix to Chapter 9, "CEQA Air Quality Handbook," prepared by South Coast Air Quality Management District, April 1993.

Summary of Impacts

The following table summarizes the potential generation and emission of pollutants associated with buildout of the planning area, including power plant emissions, emissions associated with the consumption of natural gas and vehicular emissions. The impacts anticipated from buildout of the proposed General Plan will constitute an incremental increase in the air pollutants affecting the Coachella Valley and the City of Desert Hot Springs. As the majority of the area's electrical power is generated in air basins outside the Coachella Valley, projects within the City will also contribute to the cumulative impacts on air quality elsewhere.

Table III-26
Anticipated Cumulative Daily Project-Related Emissions
Associated with Buildout of the Proposed General Plan
(lbs./day)

	Stationary Source Emissions		Moving Source Emissions		Threshold Criteria*
	Power Plants	Natural Gas Consumption	Vehicles at 50mph**	Total Pounds Per day	Total Pounds Per Day
Carbon Monoxide	503.8	416.8	115,067	115,987.6	550.00
Nitrogen Oxides	2,897.0	1,943.3	5,100	9,940.3	100.00
Sulfur Oxide	302.3	n/a	n/a	302.3	150.00
Particulates	100.7	4.1	1,034	1,138.8	150.00
ROCs	25.1	110.4	4,448	4,583.5	75.00

* Threshold criteria offered by the South Coast Air Quality Management District for assistance in determining the significance of air quality impacts.
** Includes Hot and Cold Start, Hot Soak and Diurnal.
Source: "CEQA Air Quality Handbook," prepared by South Coast Air Quality Management District, April 1993.

Table III-26 summarizes the worst case, projected peak emissions in pounds per day from buildout of the General Plan planning area. As shown in the table, threshold criteria for all pollutants are expected to be exceeded. However, these emissions are expected to be adequately mitigated through the implementation measures defined below.

It is important to note that the emissions described in the table above will be spread over the long-term life of General Plan buildout, and will not be emitted during a single quarter or in any short-term or concentrated manner. It should be kept in mind that the emission generation factors used in the above moving emission calculations are based on projected rates of emission extended into the year 2009. It is expected that, in the future, emitters will become more efficient as new combustion technologies are introduced. The impact of new technologies is difficult to anticipate, and even projected future rates of emissions for vehicular traffic cannot be considered definitive.

3. Mitigation Measures

A variety of mitigation measures can be employed throughout the life of the Draft General Plan to reduce project-related pollutant emissions. The implementation and updating of California Title 24 Building Codes, and the more efficient use of energy in general, can be expected to reduce the impacts of pollutant emissions from heating and cooling, power plants and the consumption of natural gas. Alternative methods of electrical power generation have and will continue to replace the need for additional fossil fuel-based generating capacity.

It is safe to assume that improved efficiency in combustion technology and overall reductions in air pollutants can be expected in the future. The State of California has implemented mandatory smog checks for automobiles, which are intended to help assure compliance with existing emissions standards. Cleaner fuels and more efficient automobiles are expected to continue to evolve.

Nonetheless, a number of actions can be taken to further reduce the various long-term operational impacts on air quality. The mitigation measures listed below will most likely be required for all future development projects in the planning area.

A. The City shall participate, through CVAG and SCAQMD, in the monitoring of all pollutants of regional concern, and shall maintain records of regional air quality trends.

B. Implementation of the Land Use Element of the General Plan shall be monitored and routinely updated to locate air pollution point sources, such as industrial facilities, away from residential areas and other sensitive receptors.

C. Development and grading permits shall be reviewed and conditioned to require the provision of all available methods of assuring minimal pollutant emissions from the proposed project. The Community Development Department shall review grading plan applications to assure compliance with mitigation measures set forth in this EIR, as well as those otherwise imposed by the City.

D. Wherever practical, particularly in major project planning, buffer zones shall be provided between sensitive receptors and point source emitters such as highways, hazardous material locations and industrial sources.

E. The City shall encourage the phasing and staging of development projects to assure the lowest construction-related pollutant emission levels practical, and shall require the use of water trucks, temporary irrigation systems and other measures which will limit fugitive dust emissions during site disturbance and construction.

F. The City shall initiate and encourage the use of alternative, clean energy sources for transportation, heating and cooling. Pilot studies and/or demonstration programs shall be encouraged in order to promote these uses.

G. The City shall promote the development of pedestrian-oriented retail centers, community-wide trails and dedicated bike paths/lanes to encourage alternatives to motor vehicle travel. These components shall be integrated and periodically updated in the General Plan Circulation Element.

H. The City shall pursue programs that reduce construction and operations-related emissions by regulating development and creating a diversified transportation system which minimizes vehicle miles traveled and reduces the impact of motor vehicles on local air quality.

I. Noise

1. Existing Conditions

Noise has long been accepted as part of the urban condition, being associated with high traffic volumes, dense development patterns and noise generating mechanical and industrial processes. However, not until recently has it become an important consideration in the community planning process. The evaluation of noise levels and associated impacts is important to protecting the health and welfare of the general public, and preserving an adequate quality of life in urban areas.

The Desert Hot Springs noise environment can be characterized as relatively quiet, with the primary sources of noise being motor vehicle traffic on highways and major arterials. To a lesser degree, aircraft traffic associated with Palm Springs International Airport and rail traffic along the Southern Pacific rail corridor also constitute an intrusive element to the noise environment in the southern portion of the planning area. Other sources of community noise include construction and development noise, wind farms, and mechanical equipment serving commercial, industrial and resort land uses.

The following discussion is largely based upon the noise baseline study prepared by Endo Engineering for the Desert Hot Springs General Plan Update.[73] The study is included in its entirety in Appendix F.

Noise Rating Scales

The most common unit for measuring noise levels is the A-weighted decibel (dBA), which is defined as a measurement of the noise energy received while monitoring a noise source. The A-weighted frequency scale is typically used to correlate or correct noise or sound to the hearing range of the human ear and is denoted as dBA. A number of noise rating scales are used in California to evaluate land use compatibility. The Leq scale represents the average noise level over a given period of time. The Community Noise Equivalent Level (CNEL) represents a 24-hour average noise level which includes a 5 dBA penalty for noises occurring during the evening time period (from 7 p.m. to 10 p.m.) and a 10 dBA penalty for noises occurring during the nighttime period (from 10 p.m. to 7 a.m.).

Applicable Noise Standards

The Federal Highway Program Manual Vol. 7, Ch. 7, Section 3, 1982 provides a land use compatibility chart for community noise. "Normally acceptable" noise limits are 50 to 60 db for residential land uses (single and multi family dwellings, group quarters, and mobile homes), and 50 to 65 db for commercial lands uses. Noise levels up to 70 db are considered "conditionally acceptable" for residential, transient lodging, schools, libraries and commercial uses. However, noise exposure up to only 65 db is considered "conditionally acceptable" for recreational land uses.

73 "Desert Hot Springs General Plan Update Noise Background Study," prepared by Endo Engineering, March 2000.

The California Department of Health Services also provides guidelines for establishing compatible land uses and limiting human exposure to noise.[74] The recommended "normally acceptable" noise limit is 60 dB for residential land uses (including single family dwellings, duplexes, and mobile homes) and 65 dB for multi-family residential dwellings and transient lodging. Noise levels up to 70 dB are "normally acceptable" for commercial land uses. Noise levels up to 70 dB are considered "conditionally acceptable" for residential, lodging, schools, libraries, churches, and hospitals.

Other agencies, including the U.S. Department of Housing and Urban Development and U.S. Environmental Protection Agency have also developed maximum noise level standards and recommendations. The California Administrative Code includes noise insulation standards for new multi-family structures within the 60 CNEL contour adjacent to roads, railroads, airports, industrial areas, and rapid transit lines. Acoustic analysis is required to demonstrate that these multi-family units are designed to limit interior noise levels, with doors and windows closed, to 45 CNEL in any habitable room.

The City of Desert Hot Springs adopted a local Noise Control Ordinance in 1978, which specifies acceptable exterior noise levels for various land uses, as shown in the table below. The ordinance also establishes acceptable interior noise standards for multi-family residential dwellings, which are limited to 35 dB(A) from 10 p.m. to 7 a.m., and 45 dB(A) from 7 a.m. to 10 p.m.[75] More recently developed standards allow for higher interior and exterior noise levels, making the City's current standards somewhat conservative.

74 California Department of Health Services, "Guidelines for the Preparation and Content of the Noise Element in the General Plan," 1990.

75 Section 21-26, City of Desert Hot Springs Zoning Ordinance. 1978.

Table III-27
City of Desert Hot Springs Noise Ordinance
Exterior Noise Limits

Residential Land Use	Time Period	Noise Level dB(A) Noise Zone Classification* Rural	Suburban	Urban
One & Two Family Residential	10 p.m. to 7 a.m.	40	45	50
	7 a.m. to 10 p.m.	50	55	60
Multi-Family Residential/Public Space	10 p.m. to 7 a.m.	45	50	55
	7 a.m. to 10 p.m.	50	55	60

Other Land Use	Time Period	Noise Level dB(A)
Limited Commercial/Some Multi Resid.	10 p.m. to 7 a.m.	55
	7 a.m. to 10 p.m.	60
Commercial	10 p.m. to 7 a.m.	60
	7 a.m. to 10 p.m.	65
Light Industrial	any time	70
Heavy Industrial	any time	75

Levels not to be exceeded more than thirty minutes in any hour.
* The classification of different areas of the community in terms of environmental noise zones shall be determined by the noise control officer, based upon assessment of community noise survey data. Additional area classifications should be used as appropriate to reflect both lower and higher existing ambient levels than those shown. Industrial noise limits are intended primarily for use at the boundary of industrial zones rather than for noise reduction within zone.
Source: Section 21-26, City of Desert Hot Springs Zoning Ordinance.

Motor Vehicle Noise

The primary source of continuous noise within the planning area is vehicular noise, particularly that associated with Interstate-10, State Highway 62, Indian Avenue, Pierson Boulevard and Palm Drive. High noise levels are typically associated with large traffic volumes, high vehicle speeds and high percentages of trucks.

Noise levels currently generated by motor vehicles in the planning area were determined using the Highway Traffic Noise Prediction Model (RD-77-108) developed by the Federal Highway Administration. This model is used nationwide and has been verified with extensive field measurements. It considers a variety of parameters, including traffic volume, roadway geometry, vehicle mix and speed, and the presence of trucks and other oversized vehicles. Results are expressed as Community Noise Equivalent Level (CNEL) values.

Values were calculated for 43 roadway links in the planning area. For each link, distances to the 60, 65, and 70 CNEL noise contours were determined. The resulting CNEL values are provided in Table III-28. Of the 43 roadway links modeled, seven were found to generate a 70 CNEL contour that falls within the street right-of-way. The roadways where current traffic volumes generate noise above acceptable levels for sensitive receptors at 100 feet from the centerline include the following:

- State Highway 62 (on both sides of Pierson Boulevard)
- Pierson Boulevard (on both sides of Little Morongo Road)
- Indian Avenue (on both sides of Pierson Boulevard)
- Palm Drive (south of Eighth Street to the southern city limit)

Table III-28
Existing Noise Exposures Adjacent to
Planning Area Roadways

Roadway Segment	CNEL @ 100 Feet	Distance to Contours (ft.) 70 dBA	65 dBA	60 dBA
Mission Lakes Boulevard				
e/o Indian Avenue	60.5	R/W	R/W	112
w/o West Drive	58.6	R/W	R/W	73
Pierson Boulevard				
w/o State Highway 62	50.1	R/W	R/W	R/W
e/o State Highway 62	57.5	R/W	R/W	56
w/o Indian Avenue	60.3	R/W	R/W	107
e/o Indian Avenue	63.2	R/W	66	209
w/o Little Morongo Road	65.1	R/W	102	315
e/o Little Morongo Road	66.2	R/W	130	405
w/o West Drive	64.8	R/W	96	294
w/o Cactus Drive	63.2	R/W	68	204
w/o Palm Drive	63.6	R/W	74	224
e/o Palm Drive	62.3	R/W	57	167
Hacienda Avenue				
w/o Palm Drive	61.5	R/W	50	139
e/o Palm Drive	63.9	R/W	79	240
e/o Ocotillo Road	63.0	R/W	63	199
e/o Mesquite Avenue	63.0	R/W	63	199
w/o Miracle Hill Road	62.4	R/W	55	174
w/o Mountain View Road	62.9	R/W	62	195
e/o Mountain View Road	61.7	R/W	R/W	148
w/o City Limits	54.9	R/W	R/W	R/W

Table III-28 (continued)
Existing Noise Exposures Adjacent to Planning Area Roadways

Roadway Segment	CNEL @ 100 Feet	Distance to Contours (ft.) 70 dBA	65 dBA	60 dBA
Two Bunch Palms Trail				
w/o Palm Drive	63.4	R/W	71	214
e/o Palm Drive	59.9	R/W	R/W	98
State Route 62				
n/o Pierson Boulevard	71.7	144	446	1407
s/o Pierson Boulevard	70.6	113	247	1092
Indian Avenue				
n/o Mission Lakes Boulevard	64.8	R/W	96	302
n/o Pierson Boulevard	65.5	R/W	112	354
s/o Pierson Boulevard	66.2	R/W	132	416
Little Morongo Road				
n/o Pierson Boulevard	60.3	R/W	R/W	107
s/o Pierson Boulevard	59.8	R/W	R/W	96
s/o Two Bunch Palms Trail	61.8	R/W	R/W	151
West Drive				
n/o Pierson Boulevard	57.8	R/W	R/W	60
s/o Pierson Boulevard	57.4	R/W	R/W	55
Palm Drive				
n/o Eighth Street	64.1	R/W	82	253
n/o Pierson Boulevard	66.3	R/W	133	415
s/o Pierson Boulevard	66.8	52	149	465
n/o Hacienda Avenue	67.9	64	191	599
s/o Hacienda Avenue	69.8	96	294	927
s/o Two Bunch Palms Trail	70.2	104	322	1017
n/o City Limits	70.6	115	362	1146
Miracle Hill Road				
n/o Hacienda Avenue	52.1	R/W	R/W	R/W
s/o Hacienda Avenue	48.1	R/W	R/W	R/W
Mountain View Road				
n/o Hacienda Avenue	53.5	R/W	R/W	R/W
s/o Hacienda Avenue	58.5	R/W	R/W	71

Notes: CNEL values are given at 100 feet from all roadway centerlines. All distances are measured from the centerline. R/W means the contour falls within the right-of-way.
Source:"Desert Hot Springs General Plan Update Noise Background Study," prepared by Endo Engineering, March 2000.

Noise Monitoring Locations

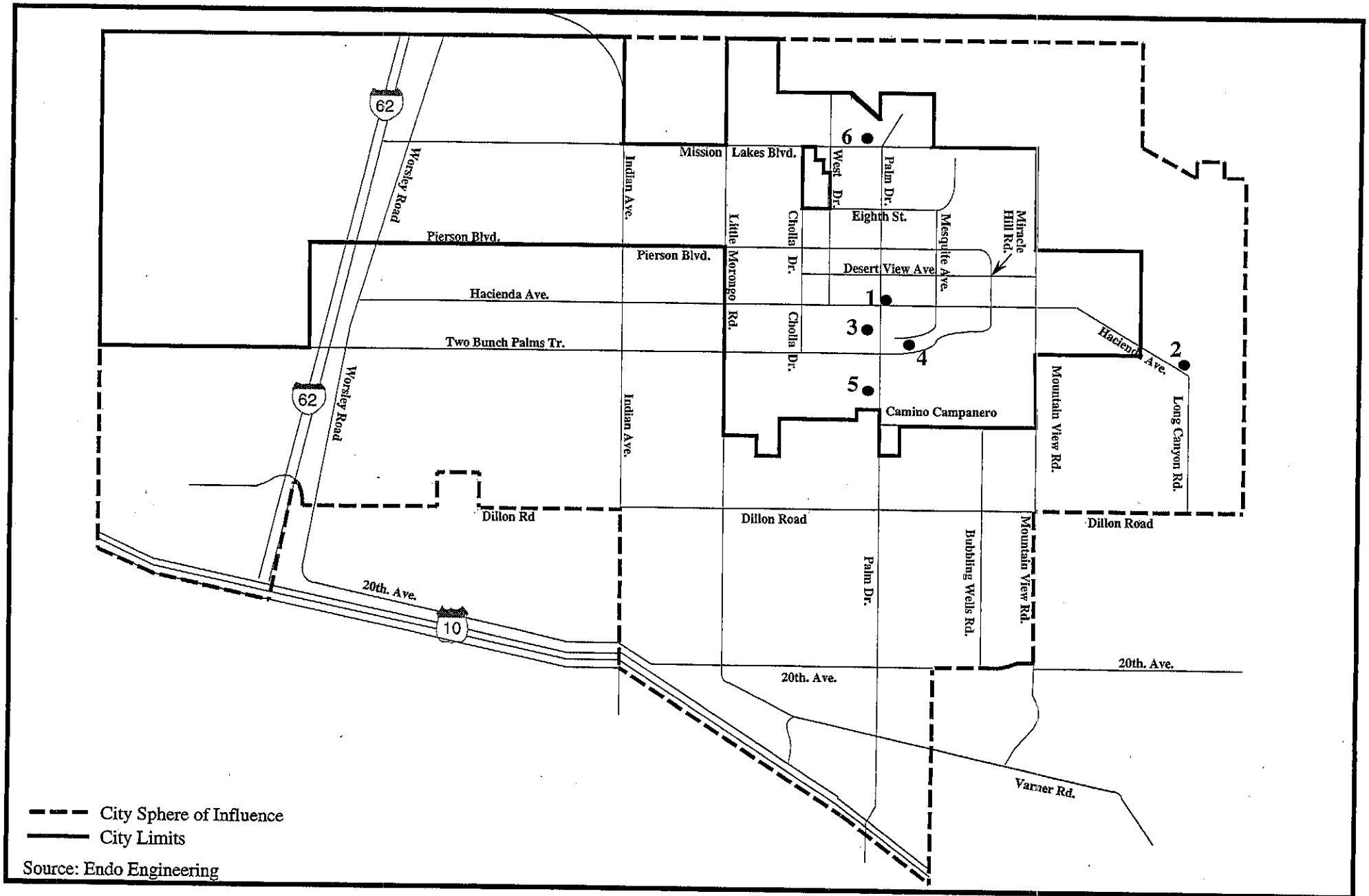
To validate computer modeling and to further evaluate existing noise levels in the planning area, noise measurements were taken adjacent sensitive receptors at six locations. The sensitive receptors included single family residences, a mobile home park, a motel, an elementary school, and a middle school. Measurement locations are shown in Exhibit III-15.

Noise monitoring results reflect the rural character of the planning area, and show that the area enjoys relatively low traffic volumes and a fairly quiet environment. Measurement results are described in Table III-29.

Table III-29
Noise Monitoring at Selected Locations

Location Number	Distance to Centerline (ft.)	Receptor Type	Leq (dBA)
1	61	Single Family Residence	61.6
2	85	Elementary School	54.1
3	63	Motel	66.4
4	54	Middle School/Single Family Residence	60.4
5	38	In front of Mobile Home Park	72.4
6	69	Single Family Residence	58.1

Noise measurements were taken on November 4, 1994 between noon and 3 p.m. Source: "Desert Hot Springs General Plan Update Noise Background Study," prepared by Endo Engineering, March 2000.



Source: Endo Engineering

TERRA NOVA®
Planning & Research, Inc.

City of Desert Hot Springs
Noise Monitoring Sites

Exhibit
III-15

Interstate-10 and Southern Pacific Railroad Lines

In addition to traffic along State Highway 62 and other major arterial roadways impacting the City, the southernmost portions of the planning area are also impacted by vehicular traffic on U.S. Interstate-10. At 100 feet from the centerline of I-10, east of Indian Avenue, the existing noise level is measured at 82.3 CNEL.[76] The 70 CNEL noise contour occurs at 512 feet, the 65 CNEL contour occurs at 1,096 feet, and the 60 CNEL contour occurs at 2,357 feet from the I-10 centerline. The influence of traffic noise on Interstate-10 is more pronounced at night, when the typical acoustic attenuation of distance over open terrain is reduced due to persistent truck volumes and nighttime air temperature inversions.

The southern portion of the planning area is also impacted, to a lesser extent, by rail traffic associated with the Southern Pacific Railroad line located south of Interstate-10. While the passage of trains is an intrusive event, it occurs only periodically, is limited in duration, and does not have a significant impact on development in the planning area.

Aircraft Noise

The planning area may also be impacted, to a limited extent, by aircraft overflights originating from the Palm Springs International Airport. The airport is located approximately one and one-half miles south of the planning area. The Airport Master Plan and Part 150 Noise Compatibility Study evaluated airport operations and projected future noise impacts from planned extensions and increased operations. The projected 1999 peak season aircraft noise exposures associated with the airport, as well as those projected for years 2005 and 2015, place the 60 CNEL noise contour about one mile south of the planning area.[77]

Even with the 1,000 foot northwesterly runway extension, which is currently underway, the 60 CNEL contour is projected to remain well south of the planning area.[78] Although flight paths and overflight patterns are limited in the Desert Hot Springs General Plan planning area, aircraft noise can reach moderate to high levels for relatively short periods of time, and may be occasionally intrusive to development in the southern portion of the planning area.

Mechanical and Industrial Noise

In addition to vehicle, rail and aircraft noise, other activities in the City have the potential to generate noise-related conflicts. Mechanical and industrial noise sources, in particular, can result in potentially intrusive impacts. Such noise sources may include air conditioning and refrigeration units, heating and ventilation units, whistles and bells, power tools, and electrical appliances. Many of these sources are associated with industrial development. Although the City currently has a limited amount of industrial development, future industrial activity has the potential to generate objectionable noise levels, the impacts of which are discussed in the following "Project Impacts" section.

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76 Greg Endo, Endo Engineering, personal communication, May 25, 2000.

77 Exhibits 2M, 2N, 2P, "Palm Springs Regional Airport Master Plan and F.A.R. Part 150 Noise Compatibility Study Update," prepared by Coffman Associates, 1994.

78 Exhibit 5L, "Palm Springs Regional Airport Master Plan and F.A.R. Part 150 Noise Compatibility Study Update," prepared by Coffman Associates, 1994.

Wind Turbines

The planning area includes lands designated for existing and planned energy-related industrial development. Wind Energy Conversion Systems (WECS) fields generally occur at two locations within the planning area: 1) in the southwest portion of the planning area, west of State Highway 62 and north of Interstate-10, and 2) north of Dillon Road, west of Indian Avenue.

Conventional noise survey sound measurements taken at a wind turbine near Sandusky, Ohio indicate that acoustic emissions associated with operation of turbines are indistinguishable from background noise at distances greater than 200 meters.[79] However, other studies have shown that sound from wind turbines can produce noise impacts and structural vibrations in nearby homes and other structures. Noise data collected for wind turbines in the Palm Springs North Sphere annexation area, located south of and partially within the Desert Hot Springs General Plan planning area, indicate that different types of turbines produce different noise levels, and these noise levels decrease at different rates over distance. Micon turbines can generate a noise level of approximately 50 dBA at a distance of more than 3,500 feet, while Carter turbines can produce a noise level equivalent to about 50 dBA at 750 feet.[80]

Wind turbines have the potential to constitute a significant noise impact, particularly on nearby residences and other sensitive land uses. The City has drafted a WECS zoning ordinance, which is intended to regulate and facilitate the installation of commercial WECS in a manner which is safe for both WECS lands and adjacent properties. The ordinance establishes height restrictions, setback requirements and location restrictions for WECS, and requires that WECS related noise be compliant with the City's noise ordinance. Adoption of this ordinance will help assure that residential and other sensitive land uses are not exposed to WECS generated noise levels which exceed City noise standards.

2. Project Impacts

A variety of data has been collected, sites have been monitored, and existing and future impacts have been modeled in order to understand and evaluate the impacts of land use patterns, traffic and individual developments on and impacts from the future noise environment.

Traffic Noise Impacts

Future noise impacts are expected to be primarily associated with increasing traffic volumes. Noise levels adjacent to roadways are dependent upon a number of factors, including traffic volumes, vehicular speeds, the mix of trucks on the road, and the roadway cross-section.

The future noise levels adjacent to the master planned street network were modeled to determine the location and extent of future noise contours. The model was based upon the Preferred Alternative circulation element traffic model (described in Section III-B), traffic volumes, master planned lane geometrics, and posted or estimated speed limits. The model assumes a sound drop-off rate of 4.5 dBA with each doubling of distance.

79 "Acoustical Measurements of DOE/NASA MOD-O Wind Turbine at Plum Brook Station, Ohio," prepared by Solar Energy Research Institute, June 1983.

80 "Final Environmental Impact Report for the Palm Springs Annexation Study," prepared by Smith, Peroni & Fox, April 1993.

It is important to note that these noise contour estimates are conservative and unmitigated. Special attention to project-specific site design may substantially reduce potential noise impacts. A wide range of design criteria affecting roadway engineering and traffic noise abatement include differences in final grade between the roadbed and the top of walls, spacing of intersections, parkway widths and other considerations.

Table III-30 provides the projected CNEL values at a distance of 100 feet from the centerline of each master planned roadway link, which are expected to occur at buildout of the Preferred General Plan. It also shows the anticipated traffic volume on each link and the distances to the future 70 CNEL, 65 CNEL, and 60 CNEL noise contours.

Table III-30
Preferred Alternative
Projected Noise Contours on Major Roadways

Roadway Link	ADT[1] (veh/day)	CNEL[2] @ 100 Ft.	Distance to Contours (feet)[3] 70 CNEL	65 CNEL	60 CNEL
Mission Lakes Blvd.					
e/o State Route 62	11,900	69.5	93	194	416
e/o Indian Avenue	15,500	70.6	109	230	492
w/o West Drive	13,100	68.5	81	167	357
w/o Palm Drive	13,100	68.5	81	167	357
Eighth Street					
e/o Palm Drive	8,400	65.0	49	100	213
Pierson Boulevard					
e/o State Route 62	25,600	73.1	154	324	695
w/o Indian Avenue	46,000	75.6	223	474	1,019
e/o Indian Avenue	28,200	73.3	161	343	738
e/o Little Morongo Rd.	20,200	71.8	129	273	586
e/o Palm Drive	24,700	69.8	97	203	435
w/o Miracle Hill Rd.	18,700	70.1	101	213	456
Desert View Avenue					
w/o Mountain View Rd.	11,300	66.2	58	120	255
Hacienda Boulevard					
e/o Indian Avenue	12,900	69.8	97	203	435
w/o Palm Drive	17,000	68.9	86	178	379
e/o Palm Drive	8,200	66.4	59	123	263
w/o Mountain View Rd.	16,700	69.5	93	197	423
e/o Mountain View Rd.	27,800	70.2	103	219	471
w/o City Limits	19,500	68.6	81	172	369

Table III-30 (continued)
Preferred Alternative
Projected Noise Contours on Major Roadways

Roadway Link	ADT[1] (veh/day)	CNEL[2] @ 100 Ft.	Distance to Contours (feet)[3] 70 CNEL	65 CNEL	60 CNEL
Two Bunch Palms Trl.					
w/o Indian Avenue	17,600	69.7	96	203	436
w/o Palm Drive	11,900	66.5	60	125	267
e/o Palm Drive	6,800	65.6	53	109	233
Dillon Road					
e/o State Route 62	33,300	74.2	181	383	823
w/o Indian Avenue	33,400	74.2	181	383	823
w/o Palm Drive	27,200	71.8	129	273	586
w/o Mountain View Rd.	42,800	73.9	173	366	786
e/o Mountain View Rd.	49,700	74.6	192	407	874
e/o Long Canyon Rd.	43,200	75.3	213	453	974
20th Avenue					
w/o Little Morongo Rd.	30,300	71.5	124	261	560
w/o Palm Drive	21,000	70.6	109	228	488
e/o Palm Drive	37,000	73.3	159	334	717
w/o Mountain View Rd.	17,200	69.0	87	179	382
Varner Road					
w/o Palm Drive	13,400	68.7	84	171	365
e/o Palm Drive	14,300	69.0	87	179	382
e/o Mountain View Rd.	49,500	74.6	192	407	874
Interstate 10					
e/o State Route 62	98,800	85.5	832	1,789	3,852
e/o Indian Avenue	117,900	86.1	912	1,961	4,223
w/o Palm Drive	156,600	87.1	1,063	2,286	4,924
e/o Palm Drive	171,900	87.5	1,130	2,431	5,235
State Route 62					
n/o Pierson Blvd.	25,000	74.5	192	410	881
n/o Two Bunch Palms Trl.	40,900	76.6	264	565	1,216
n/o Dillon Road	43,300	76.9	276	592	1,273
Worsley Road					
n/o Pierson Blvd.	11,000	67.0	66	134	284
n/o Dillon Road	25,800	70.7	111	233	500
Indian Avenue					
n/o Mission Lakes Blvd.	10,600	69.0	87	179	382
n/o Pierson Blvd.	12,000	69.6	95	196	419
n/o Dillon Road	38,300	73.4	161	339	728
n/o 20th Avenue	53,900	75.3	203	427	914

Table III-30 (continued)
Preferred Alternative
Projected Noise Contours on Major Roadways

Roadway Link	ADT[1] (veh/day)	CNEL[2] @ 100 Ft.	Distance to Contours (feet)[3] 70 CNEL	65 CNEL	60 CNEL
Little Morongo Road					
n/o Pierson Blvd.	16,700	70.9	114	240	515
n/o Hacienda Avenue	29,600	73.4	165	352	756
s/o Two Bunch Palms Trl.	39,800	73.6	166	350	750
n/o Dillon Road	43,500	74.0	176	372	798
s/o 20th Avenue	49,800	74.6	192	407	874
West Drive					
s/o Pierson Blvd.	7,500	64.5	46	93	197
Palm Drive					
n/o Hacienda Avenue	32,100	71.2	118	243	520
n/o Two Bunch Palms Trl.	31,800	72.6	143	301	644
s/o Two Bunch Palms Trl.	50,500	74.6	192	407	874
s/o Dillon Road	50,000	75.0	194	408	873
s/o 20th Avenue	68,700	76.4	238	504	1,082
s/o Varner Road	72,600	76.6	245	520	1,115
Verbena Drive					
n/o Hacienda Avenue	9,500	65.5	52	108	230
Miracle Hill Road					
s/o Pierson Blvd.	12,200	66.6	61	127	272
Bubbling Wells Road					
s/o Dillon Road	21,200	69.0	86	183	392
Mountain View Road					
n/o Hacienda Avenue	13,800	67.1	66	137	293
n/o Dillon Road	27,000	70.2	103	215	459
s/o Dillon Road	37,500	73.4	161	339	728
n/o Varner Road	41,500	73.8	171	361	774
Long Canyon Road					
s/o Hacienda Avenue	16,900	69.6	94	197	422
n/o Dillon Road	32,300	72.5	144	306	658

[1] ADT means the average daily two-way traffic volume upon buildout of the Preferred General Plan.

[2] CNEL values are at 100 feet from all roadway centerlines.

3 All distances are measured from the centerline. R/W means that the CNEL contour falls within the right-of-way.

Source:Table 5-1, "Desert Hot Springs General Plan Update Noise Background Study," prepared by Endo Engineering, March 2000.

Appendix F provides a complete listing of all 110 roadway links modeled in the acoustical analysis report, prepared by Endo Engineering. Upon buildout of the Preferred General Plan, 15 of the 110 links modeled (about 14%) are projected to generate noise levels that exceed 75 CNEL at a distance of 100 feet. Forty-two of the links (about 38%) evaluated will generate noise levels between 70 and 75 CNEL at 100 feet from the centerline. Forty links (36% of all modeled links) are projected to generate noise levels between 65 and 70 CNEL at 100 feet. Thirteen links (12%) are expected to generate noise levels below 65 CNEL at 100 feet from the centerline. Noise levels for nine of those links will range between 60 and 65 CNEL. Noise levels will be below 60 CNEL on four links.

Buildout noise levels associated with the Preferred Alternative are not expected to vary significantly from those associated with the current General Plan. Ten links will have the same CNEL under both the Preferred Alternative and the current General Plan. Under the Preferred Alternative, twenty-seven links are expected to experience lower CNEL levels, and 71 links are expected to experience higher CNEL levels than those expected at buildout of the current General Plan.

Of the 71 links which may experience higher CNEL levels, noise increases for 60 links (less than 1.0 dBA increase) are expected to be inaudible. Future noise increases for 10 links (between 1.0 and 3.0 dBA) could be potentially audible. The only link where noise increases are expected to be clearly audible is on Mission Lakes Boulevard, east of Palm Drive.

Construction Noise

Although construction noise is usually short-lived, it can result in periods of high noise levels associated with the operation of heavy equipment. Grading activities typically represent one of the most significant sources of short-term construction noise. Noise and vibration caused by blasting and/or pile driving, if necessary during site preparation, could be a source of considerable noise disturbance to nearby portions of the community.

Typical A-weighted noise levels for various kinds of heavy construction equipment range from approximately 70 to 95 dBA at a distance of 50 feet. The maximum noise generated by construction activity could be a source of short-term annoyance to adjacent low-density neighborhoods. Every reasonable effort should be made to locate construction activities away from sensitive noise receptors and to minimize exposure to high noise levels.

Stationary Noise Sources

Mechanical noise from air conditioning and refrigeration systems for residential, commercial and hotel facilities could be a source of adverse noise impacts on surrounding lands. Rooftop chillers and air handling equipment can generate tonal noise components that can be particularly audible and annoying. Parapets and the edges of rooftops can provide dampening effects at close range, but these benefits are often lost when moving away from the building.

Industrial operations involving such activities as rock crushing, construction and automotive repair can create substantial noise impacts. Loading and material transfer areas, outdoor warehousing operations and other acoustically unscreened operations may also be considered incompatible with certain adjacent land uses.

Residential dwellings, schools, libraries, hospitals and other "sensitive receptors" may be particularly affected by high exterior noise levels. Windows serve as noise portals and, unless thoughtfully designed, can contribute to the deterioration of interior noise levels.

3. Mitigation Measures

Noise Attenuation Principles

A number of methods can be employed to minimize and control environmental noise. The California Vehicle Code is directed at reducing motor vehicle noise and includes regulations pertaining to the operation of vehicles on public roads. Other methods for reducing vehicle noise include enforcing truck routes, reducing motor vehicle speeds and regulating traffic flow. For example, noise levels adjacent to roadways increase by 3.0 dBA with each doubling of the traffic volume, provided that the speed and truck mix do not change.[81] This reinforces the need for controlling traffic flow and volumes, and providing adequate right-of-way to accommodate existing and future traffic volumes.

Additional noise attenuation can be achieved by increasing building setbacks along major roadways, depression of the roadway, and the use of noise walls, earthen berms, landscaping and other barriers. Noise levels from "line sources," such as highways typically decrease by 4.5 decibels per doubling of distance, which reinforces the need for adequate setbacks for sensitive receptors and other structures. Depressing the roadway below the level of sideline terrain by 20 feet may provide up to an 11 dB reduction in adjacent noise levels over an equivalent roadway at grade, but only beyond about 100 feet from the roadway.[82]

The effectiveness of a noise barrier is largely influenced by its mass and design. For a noise barrier to be effective, it must be quite massive and impervious to air flow. Earthen berms and block walls can provide a noise reduction of up to 15 dB, provided they are high enough to block line-of-sight between source and receiver.[83] Dense concentrations of trees and shrubs can also function as effective noise barriers, and can provide between a 3 and 5 dB noise reduction if they are at least 100 feet in depth. Shallow landscaping can act to defract or bend noise levels downward and behind otherwise effective noise barriers, hence the need for wide landscape areas if they are to be effective noise barriers.

The noise attenuation methods described above shall be employed, as appropriate, on a project-specific basis to reduce potentially significant noise impacts. Controlling noise from a commercial or industrial site is best accomplished at the time the facility is constructed. Design considerations should include building orientation, the location of loading areas, parking lots, outdoor machinery and solid waste collection areas, and the restricted use of loudspeaker systems.

Desert Hot Springs Noise Ordinance

The City's Noise Control Ordinance specifies acceptable exterior noise levels for various land uses. The appropriate amendment and continued implementation of the ordinance is intended to regulate excessive noise, and all existing and proposed development shall be in compliance with the ordinance, as amended.

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81 "Desert Hot Springs General Plan Update Noise Background Study," prepared by Endo Engineering, March 2000.

82 Ibid.

83 Ibid.

General Mitigation Measures

The following discussion describes specific mitigation measures, which are presented on a categorical basis.

Construction Noise

A. All construction equipment operating in the planning area shall be fitted with well maintained mufflers to limit noise emissions.

B. Construction activity shall be restricted to Monday through Friday, between 7:00 a.m. and 7:00 p.m., excluding federal holidays. Only emergency work should be allowed to occur outside these hours.

C. Earth moving and hauling routes shall be located away from nearby residences, to the greatest extent practical.

D. Any development involving blasting or pile driving operations shall first have a focused acoustical study conducted to establish the level and duration of off-site noise and vibration impacts, and to set forth appropriate mitigation measures.

Stationary Noise Sources

A. The design, selection and placement of mechanical equipment for various buildings within the planning area shall include consideration of the potential noise impacts on nearby residences, both within any development and in the surrounding community.

B. Appropriate sound attenuation measures, including silencers and/or barriers, shall be provided where necessary on outdoor equipment such as cooling towers, air cooled condensers and refrigeration units, and at the air intake and discharge openings for building ventilation systems.

C. Appropriate sound barriers shall be provided surrounding any and all public facilities capable of generating disturbing levels of noise, such as water pumping stations.

Interior Noise

A. Potential noise impacts shall be considered in the final site plan for all proposed projects within the planning area. Factors to be considered include the strategic arrangement of housing to provide necessary shielding of outdoor living areas, the incorporation of additional setbacks from roadways, and/or the construction of additional noise barriers.

B. During the preparation of construction drawings for project-specific development, the exact acoustical specifications for window glass in buildings with unshielded first floor windows and second floor windows shall be determined. This is in response to the potential for windows with noise exposures of CNEL 65 or above. Acoustically upgraded glazing, such as heavy monolithic or laminated acoustical glass, may be required in these locations.

C. Design of specific projects of all development types shall include and meet State Code requirements for unit-to-unit airborne sound isolation, both laterally and vertically, and for vertical impact sound isolation in multi-family residential and hotel construction.

D. Dense landscaping in wide buffer areas, man-made noise barriers, and natural noise barriers (including hills, berms, boulders and dense vegetation) shall be encouraged and utilized to the greatest extent practical to mitigate any potential noise impacts.

E. Project designs shall be required to include measures which assure that interior noise levels for residential development do not exceed 45 CNEL, as required by Title 25, California Noise Insulation Standards.

Aircraft Noise

A. The City should take a pro-active role in encouraging the adherence to professed and assumed flight patterns at the Palm Springs International Airport to minimize existing and potential noise impacts to the City.

Wind Energy Conversion Systems Noise

A. Applications for Wind Energy Conversion Systems development shall include technical data on noise generation and projected noise contours. Following installation, noise monitoring shall be performed to assure that noise impacts are in conformance with City requirements.

B. Noise generated by existing and future windfarm development shall be kept at a level compatible with residential and other sensitive land uses.

Vehicular Noise

A. Land uses that are compatible with higher noise levels shall be located adjacent to the City's major arterial roads and highways, including the Interstate 10 corridor, to maximize noise related land use compatibility.

B. Encourage a City-wide circulation pattern which places primary traffic loads on major arterials and preserves local neighborhood noise environments by limiting roadways to local traffic, to the greatest extent practical.

C. The City shall designate and clearly mark primary truck routes to minimize truck traffic on community streets.

Mitigation Monitoring/Reporting Program

- Establish and periodically update an inventory of existing significant noise sources and incompatible areas, and develop procedures to reduce the noise effects on these areas, where economically and aesthetically feasible.
  Responsible Parties: Community Development Department

- Periodically review land use patterns and the community noise environment, and amend the land use map as appropriate to assure reasonable land use/noise compatibility.
  Responsible Parties: Community Development Department, Planning Commission, City Council

- Designate acceptable truck/construction equipment routes, as appropriate.
  Responsible Parties: Community Development Department, Public Works Department

- Where significant noise impacts may occur, the City shall require that new development monitor and document compliance with all applicable noise standards.
  Responsible Parties: Community Development Department

Pre-Construction

- During project-specific site planning and building design, ensure acoustical analysis takes the following into consideration:
  - selection and placement of mechanical equipment for all buildings
  - shielding and buffering of mechanical equipment for all buildings
  - strategic location of attached residences to provide for shielding of outdoor living spaces
  - theme wall is constructed to noise barrier specifications
  - designate acceptable truck/construction equipment route(s), as appropriate
  - construction drawings include exact acoustical specifications for window glass in buildings with unshielded first and second floor windows which experience noise exposures above CNEL 65
  - design plans comply with State Code requirements of unit-to-unit airborne sound isolation

  Responsible Parties: Developer, Noise Consultant, City Community Development Department

During Construction

- Ensure that functional mufflers are installed on all construction equipment.
  Responsible Parties: Developer, General Contractor, Community Development Department

- Ensure that designated truck routes are being utilized.
  Responsible Parties: General Contractor, Community Development Department, Public Works Department

- Ensure construction equipment operates within specific time limits.
  Responsible Parties: General Contractor, Community Development Department

J. Visual Impacts

1. Existing Conditions

One of the Coachella Valley's most important assets is its exceptional mountain and open space views. The Coachella Valley and the City of Desert Hot Springs are located within a low desert trough or basin, created by tectonic forces. Seismic activity continues to spread the valley floor, while raising the surrounding terrain to form the San Jacinto, Santa Rosa, San Bernardino and Little San Bernardino mountain ranges.

Mount San Jacinto which rises to 10,804 feet, and Mount San Gorgonio at an elevation of 11,502 feet, are the area's two highest peaks and dominate the north end of the Valley. The desert environment is comprised of large and smaller scale alluvial fans, rocky/sandy washes which drain the surrounding mountains, and the valley floor which contains sand dunes and fields. The valley floor is the central extension of the Salton Trough, with its lowest point occurring at the Salton Sea at an elevation of about 228± feet below mean sea level.

The San Jacinto Mountains trend roughly north-south, and the northeastern toe of slope lies about two miles southwest of the General Plan planning area. Numerous peaks rise to about 9,000 feet and are frequently snow-covered during winter months. This fault-controlled mountain range rises abruptly from the valley floor, creating the steepest gradient in North America and offering dramatic scenery from the valley below.

The San Bernardino Mountains are located partially within and immediately west of the General Plan planning area. This range trends roughly east-west and is often snow-covered in winter months. The Little San Bernardino Range lies immediately north and northeast of the planning area, and some foothills are contained within the City's planning area. Although this range reaches lower elevations, it provides a sense of scale to the Valley and displays rich earthtone colors in late afternoon.

The rugged Santa Rosa Mountains are located more than ten miles south of the planning area and form the southern boundary of the Coachella Valley. The highest peaks include Toro Peak which rises to 8,717 feet, and the Santa Rosa peak at 8,000 feet. The Santa Rosas provide a striking backdrop to the built environment on the valley floor. Other highly visible peaks include Haystack Mountain at 3,808 feet, Asbestos Mountain at 5,265 feet, and Martinez Mountain at 6,548 feet.

The Indio Hills are located about two miles southeast of the General Plan planning area. Edom Hill peak rises to an elevation of 1,614 feet. The slopes of the Indio Hills are visible throughout the City and provide additional visual interest to the area.

Within the General Plan study area, elevations range from about 580 feet above sea level at the southernmost point, near the Interstate-10/Palm Drive interchange, to about 2,800 feet in the extreme northeast in the Little San Bernardino Mountains. Steep slopes are typically defined as those over 25%, with a minimum elevation differential of 50 feet. The northern and western fringes of the planning area are characterized by steep slopes and ridges of the San Bernardino and Little San Bernardino Mountains.

The eastern portion of the City consists largely of developed lands on terrain which slopes gently to the southeast. The western portion of the City and sphere-of-influence, as well as lands at the fringes of the planning area, are comprised of largely undeveloped desert lands on gently sloping terrain, with intermittent stream and wash channels which drain the foothills of the San Bernardino and Little San Bernardino Mountains. The largest of these drainages include, from west to east, Morongo Wash, Little Morongo Wash, Blind Canyon and Long Canyon. Smaller drainages in the western portion of the planning area include Mission Creek, Super Creek and Garnet Wash. Several canyons and washes emanate from the Little San Bernardino Mountains and drain into the planning area. In undeveloped areas, vegetation is dominated by Sonoran Creosote Bush Scrub.

Portions of the planning area which occur in elevated foothill areas, including the Cornerstone and Rancho Royale Specific Plan sites, offer excellent views in all directions. Given their elevated terrain, however, these areas are also visible from the Interstate-10 corridor in the San Gorgonio Pass area, as well as from parts of the Palm Springs and Desert Hot Springs.

2. Project Impacts

Implementation of the proposed General Plan will have generally limited impacts on the visual resources within the City and its sphere-of-influence. Development facilitated by the Plan will be largely limited to low and medium density, low profile structures. Much of this development will occur in and immediately surrounding existing development in the City and will be consistent with the existing urban character of the community. A number of low-density residential sites will be located within master planned communities and will benefit from consolidated open space lands, prescribed architectural themes, and consistent and limited building heights. Regardless of the type of development, new structures, signage and parking lots will contribute to visual impacts to motorists and surrounding properties. The General Plan addresses these potential impacts through a series of policies and programs that either directly regulate development or mandate the development of zoning and other regulating codes that assure detailed staff review and analysis and discretionary approval of building heights and other design features.

Under the proposed General Plan, the foothills of the San Bernardino and Little San Bernardino Mountains are designated as Open Space-Mountain Reserve. No or very limited development will be permitted in these areas, and the natural character and rich visual quality of the mountains will be preserved. Lands adjacent to the foothills will be largely limited to residential estate development, which will provide for rural residential development and limit aesthetic and environmental impacts.

The proposed General Plan will facilitate residential, and visitor-serving and commercial development in several locations which are currently undeveloped and highly visible from the Interstate-10 and State Highway 62 corridors, as well as parts of Palm Springs and Desert Hot Springs. These include, but are not limited to the Rancho Royale, Olympus and Cornerstone Specific Plan sites. The view of these sites from surrounding areas will change from that of undeveloped alluvial fans and foothills with natural desert vegetation to mixed-use resort communities. Given their location in the northwestern portion of the planning area, which remains largely undeveloped, buildout of the Rancho Royale and Olympus Specific Plan sites may result in more intense development than much of the surrounding area. Special attention must be taken to minimize potential visual impacts. Much of these lands will be developed as master planned communities, and will benefit from consolidated open spaces and increased building setbacks. Buildout of the Cornerstone Specific Plan is not expected to result in significant visual impacts, given its proximity to existing residences. Instead, this project and other development in the vicinity will appear as a continuation of existing urban development.

Adoption and implementation of the proposed General Plan will also facilitate the development of Wind Energy Conversion Systems (WECS) fields in the southwestern portion of the planning area. Wind turbines in the San Gorgonio Pass area typically consist of three blade, horizontal axis machines with a galvanized steel tower, and may be up to 290 feet in overall height.

The majority of energy-related development will occur at elevations between about 900 feet (north of Dillon Road and east of Highway 62) and 1500 feet (at Whitewater Hill, north if I-10, west of Highway 62) above sea level. Because of recent technologies, fewer turbines are now required than were several years ago, to produce the same amount of energy. Therefore, the visual clutter associated with numerous turbines will be diminished.

Visual resources in this area have already been impacted by existing turbines both within and south of the General Plan planning area, but may be further impacted by future turbines, access roads, turbine pads, substations and staging areas. Views of principal concern are those of the west-bound traveler on Interstate-10 and, to a lesser extent, travelers on Highway 62, Dillon Road and Indian Avenue. Views from residences in this vicinity will also be impacted, the extent to which will depend on proximity to turbines, and the elevation differential between residences and turbines. While the visual impacts of WECS projects have the potential to be significant when viewed at a short distance, at a distance their impacts take a subordinate position in relation to the surrounding landscape. Views of the expansive San Jacinto and San Bernardino Mountain ranges dominate views for the westbound traveler on I-10, and the southbound traveler on Highway 62, and the visual impacts of WECS projects are largely diminished by the dominance of these landforms.

Light and Glare

Development associated with the proposed General Plan will result in increased activity in the planning area, particularly in the vicinity of Highway 62. New structures in this and other areas will create increased light and glare resulting from residential, commercial and industrial activities. Increased traffic will generate additional headlights and lighting levels on local roadways. All of these potential impacts can be effectively mitigated through thoughtful project design.

3. Mitigation Measures

The Draft General Plan enhances the City's ability to regulate and prevent significant viewshed impacts from occurring as a result of future development, while also mandating continued protection of the City's visual resources. It establishes mechanisms that are intended to reduce the impacts of signs, utility lines and other infrastructure. It also provides for community-wide aesthetic improvements designed to create unique, identifiable street corridors and residential neighborhoods. The following mitigation measures further assure the General Plan's efficacy in preventing significant impacts to the City's visual resources.

A. The City shall assure that private and public sector development projects comply with community design standards, which enhance the community's distinctive character by protecting scenic viewsheds and providing community cohesion.

B. Incorporate landscape designs and materials that complement the native desert environment, and require site-sensitive designs in all building projects to enhance the community's visual cohesion between the built and natural environments.

C. Overhead utility lines shall be undergrounded to the greatest extent possible through the establishment of an undergrounding program and guidelines.

D. Utility infrastructure, including water wells, substations, and switching and control facilities shall be screened to preserve scenic viewsheds and limit visual clutter.

E. Outdoor lighting shall be limited to the minimum height, number of fixtures, and intensity needed to provide sufficient security and identification in each development, making every reasonable effort to protect the community's night skies.

F. Signage shall be limited to the locations, sizes, and maintenance requirements necessary to provide functional identification.

G. Commercial and mixed use development projects shall incorporate safe, convenient vehicular and pedestrian circulation, screened outdoor storage/loading and other unsightly areas, protected and enhanced outdoor seating areas, appropriate lighting levels, limited signage, and landscaping designs that preserve and enhance visual resources.

H. Planning and design of residential neighborhoods and street corridors shall provide distinctive and characteristic design elements, such as entry monumentation and landscaping, which preserve and enhance the viewsheds enjoyed from these areas.

I. Commercial and mixed use development shall be designed with particular attention to limiting the lighting impacts on adjacent residential neighborhoods.

J. Development proposed along designated scenic highways, roadways and corridors shall be reviewed for compatibility with the natural and built environments to assure maximum viewshed protection and pedestrian and vehicular activity.

K. All grading and development proposed within scenic viewsheds, including hillsides, shall be regulated to minimize adverse impacts to these viewsheds.

L. No advertising sign or logo shall be placed or painted on any commercial WECS.

M. All commercial WECS shall be either light environmental colors (such as off-white, gray, beige or tan) or darker fully-saturated colors (such as dark blue or green, maroon or rust red) or galvanized. All commercial WECS shall have a matte or galvanized finish unless good cause is shown to permit any other finish.

Mitigation Monitoring/Reporting Programs

- The City shall maintain and amend a comprehensive Zoning Ordinance and other regulatory documents which define the design parameters to which public and private development projects must conform. Comprehensive application packages shall be prepared and maintained to guide the preparation of Specific Plans, Conditional Use and other permits, and to assure a thorough review of all community design issues.
  Responsible Parties: Planning Department, Planning Commission, City Council.

- The Zoning Ordinance shall include design standards for multi-family developments, including Planned Residential Developments (PRDs), that assure a variety of design possibilities, the provision of safe and secure common open space, adequate parking and appropriate automobile storage, a comprehensive landscape program, perimeter walls and fencing where appropriate, and neighborhood-enhancing design.
  Responsible Parties: Planning Department, Planning Commission, City Council.

- Develop a lighting standards ordinance as part of the Zoning Ordinance, which sets specific standards for lighting levels, acceptable types of lighting and fixtures, and location of lighting control in relation to adjoining and nearby properties and public rights-of-way. The ordinance shall include a lighting retirement program, which establishes finite periods by which non-conforming lighting and fixtures shall be replaced.
  Responsible Parties: Planning Department, Planning Commission, City Council.

- The City shall develop and implement signage regulations in the Zoning Ordinance, which address all aspects of sign review and establish finite periods by which existing non-conforming signage shall be replaced.
  Responsible Parties: Planning Department, Planning Commission, City Council.

- The City shall develop and implement a Commercial Wind Energy Conversion Systems (WECS) ordinance, which establishes development criteria for and regulates the installation of commercial WECS, provides for a safe environment, and minimizes impacts to the environment and visual resources.
  Responsible Parties: Planning Department, Planning Commission, City Council.

K. Public Services and Facilities

Introduction

The planning area occurs within the boundaries of the following service providers:

- Palm Springs Unified School District (public education)
- Desert Hot Springs Library (library services)
- Southern California Edison (electricity)
- The Gas Company (natural gas)
- Desert Hospital, Eisenhower Medical Center, John F. Kennedy Memorial Hospital (health care services)
- Desert Valley Disposal (solid waste management)
- General Telephone Company (telephone)
- Desert Hot Springs Police Department (law enforcement)
- Riverside County Fire Department (fire protection services)
- Mission Springs Water District (domestic water and wastewater treatment)
- Coachella Valley Water District (domestic water and wastewater treatment)

The following discussion describes the facilities, infrastructure and capacity of each to provide services to the General Plan planning area.

Schools

1. Existing Conditions

Public education is provided to residents of the General Plan planning area by the Palm Springs Unified School District (PSUSD). The planning area currently contains four elementary schools, one middle school, one high school, and one continuation high school. Student enrollment figures for year 1999-2000 are identified in the following table. At this time, there are no plans to construct additional schools in the planning area.[84]

Table III-31
Public School Enrollment in the Planning Area
School Year 1999-2000

School Name	Grade Level	Current Enrollment	Max. Capacity*
Bubbling Wells Elementary	K-5	620	661
Edward Wenzloff Elementary	K-5	637	716
Julius Corsini Elementary	K-5	732	756
Two Bunch Palms Elementary	K-5	663	716
Desert Springs Middle	6-8	1,101	1,191
Desert Hot Springs High	9-12	679	1,161
Las Brisas Continuation High	9-12	18	20
TOTAL:		**4,450**	**5,221**

* Includes capacity of portable classrooms, where applicable. Source: Palm Springs Unified School District Facilities Planning & Development Department, correspondence dated March 13, 2000.

Many school facilities in the District are currently overcrowded and use temporary, relocatable trailers to provide additional classroom space. Efforts are continuing to fund and build additional schools throughout the Coachella Valley. However, as shown in the table above, schools in the General Plan planning area can accommodate a total of approximately 771 additional students.

In 1986, the State Legislature approved AB 2926, which authorizes school districts to charge development fees for the construction and reconstruction of public schools. Statutory developer fees are currently $1.93 per square foot of residential development and $0.31 per square foot of commercial development. The City of Desert Hot Springs supports the collection of statutory school impact fees to fund the construction of local public schools. Operating costs for public schools are primarily covered by State Average Daily Attendance (ADA) payments.

84 Facilities and Planning Department, Palm Springs Unified School District, correspondence dated March 13, 2000.

The City of Desert Hot Springs also includes three private schools, including Storyland Preschool, Community Childrens Center, and Palm Springs Christian School. Storyland Preschool is located on West Drive and offers preschool and day care services for children ages 2 to 6, as well as before-and-after school care for children ages 6 to 11. The school can accommodate a total of 67 students, and 1999-2000 enrollment was 58 students.[85] Community Childrens Center is located at Acoma and Mesquite Avenue and provides preschool education and day care for children ages 3.5 to 6. The school also provides elementary education for kindergarten through Grade 6, and operates a before-and-after school program for children ages 6 to 11. Student enrollment for the 1999-2000 school year was 85. Total capacity is currently 95 students; however, the school will expand to accommodate 125 students by year 2001.[86] Palm Springs Christian School is located on Little Morongo Road and includes kindergarten through Grade 12. During the 1999-2000 school year, 35 students were enrolled in the school, although it can accommodate a total of 50 students.[87]

2. Project Impacts

The planning area lies within the boundaries of the Palm Springs Unified School District. Buildout of the proposed General Plan is expected to result in the construction of approximately 70,452 dwelling units, of which 51,183 will be single-family units, and 19,269 will be multi-family units. The table below provides an estimate of future school enrollment associated with buildout of the General Plan planning area. These estimates are based on research conducted for the Palm Springs Unified School District.

Table III-32
Potential School Enrollment
at General Plan Buildout

Grade Level	Potential Buildout Units	Student Generation Rate	Buildout Enrollment
K-5			
Single- Family	51,183	0.2167	11,091
Multi-Family	19,269	0.1321	2,545
6-8			
Single-Family	51,183	0.1012	5,179
Multi-Family	19,269	0.0474	913
9-12			
Single-Family	51,183	0.1176	6,019
Multi-Family	19,269	0.0318	612
		TOTAL :	**26,359**

Based on Student Generation Rates, "Residential Development School Fee Justification Study for Palm Springs Unified School District," June 26, 1998.

85 Storyland Preschool, personal communication, March 14, 2000.

86 Community Childrens Center, personal communication, March 14, 2000.

87 Palm Springs Christian School, personal communication, March 14, 2000.

The table above includes both existing and potential new dwelling units, and assumes that development will occur at moderate densities. Actual student enrollment could be less or greater, depending on actual levels of development during the life of the General Plan. Nonetheless, the number of students generated by General Plan buildout is expected to have a significant cumulative impact on public schools in the area. The increase in student enrollment will occur gradually, as new development occurs. The school district currently has no plans to construct new schools in the planning area. However, a funding mechanism is in place to provide developer fees for school construction, as needed.

3. Mitigation Measures

A. Developers shall continue to be assessed the statutory school mitigation fees for residential and commercial development.

B. In the event that developers in the planning area attempt to utilize Mello-Roos or other types of public facilities financing districts, the Palm Springs Unified School District shall be included in discussions to see if and how the developer may cooperate with the district and participate in its funding streams. The District has the following alternatives available to mitigate significant impacts to area schools:

C. Leroy F. Greene State School Building Lease-Purchase Law - This act provides for the construction, reconstruction, or replacement of school facilities by the State Allocation Board under an agreement between the school district and the state. First priority for future state funding will go to districts with 1) a substantial enrollment in year-round schools, 2) the ability to raise 50 percent of project costs, and 3) the opening of a new facility as a year-round school.

D. Lease-Purchase Arrangements - Many districts may enter into lease-purchase arrangements with private builders of portable classrooms (Section 39240 and 39290 of the State Education Code). This method can also be used to finance capital outlay. An additional advantage of lease-purchase agreements is that they offer the benefits of long-term debt financing without obtaining voter approval of special taxes or benefit assessments.

E. Developer Fees - In 1986 the State Legislature approved AB 2926 (Chapter 887), which authorizes school districts to charge development fees to fund construction or reconstruction of schools. School fees currently stand at $1.93 per square foot of residential development and $0.31 per square foot of commercial development. Limits on the maximum fee that can be collected are set by Government Code Section 65995. Also applicable is Government Code Section 53080, constraining the issuance of development permits until proof of compliance with the School District's resolution has been provided.

F. Mello-Roos Community Facilities Act - Provisions for this funding option are located in Government Code Section 55311 et. seq. A school district must initiate proceedings to declare itself a community facilities district to benefit from this Act. A community facilities district is defined as a governmental entity established to carry out specific activities within specifically defined boundaries. Such a district may engage in the purchase, construction, or rehabilitation of any real or tangible property with an estimated useful life of five years or longer.

Mitigation Monitoring/Reporting Program

- In conjunction and cooperation with the Palm Springs Unified School District, the City of Desert Hot Springs shall continue to monitor public schools in the planning area to determine the extent of overcrowding, security issues, low performance on standardized tests, and other adverse impacts on area schools.
  Responsible Parties: Community Development Department, City Council, Palm Springs Unified School District

- The Palm Springs Unified School District shall use its discretion in mitigating negative impacts to District schools.
  Responsible Parties: Palm Springs Unified School District, Community Development Department

Libraries

1. Existing Conditions[88]

The Desert Hot Springs Public Library is located at 11691 West Drive and is a branch of the Riverside County Library System. The library is housed in a 3,500± square foot building and contained 29,278 volumes in December 1999. Library resources include a children's section, reference resources and a computer lab with internet access, as well as computer network access to all 25 County libraries. Library services include a delivery system, which provides for the exchange of books and other resources between County libraries on a daily basis. A bookmobile, which is operated in conjunction with Sunline Transit Agency and contains approximately 10,000 volumes, provides mobile library services to residents within the unincorporated areas of the planning area and the Coachella Valley.

The County strives to maintain an unadopted standard of 2 volumes and 0.5 square feet of library space per capita. Based on these criteria, the existing Desert Hot Springs population is underserved by about 1,500 volumes and 4,200 square feet of library space.[89] As part of its mitigation fee review process, County staff will soon present to its Board of Supervisors a plan to provide a library facility of at least 10,000 square feet in the City of Desert Hot Springs. The proposal could result in construction of a new library or expansion of the existing facility, but is not expected to be implemented for another five to ten years.

2. Project Impacts

Based on a projected General Plan buildout population of 193,456 residents and the County's unadopted level of service standards described above, the planning area will require approximately 96,728 square feet of library space and an estimated 386,912 volumes at project buildout. The increase in population will impact library services as well, requiring such support items as additional staff, computers, and furniture. These estimates assume General Plan buildout at moderate densities. City buildout population could be less or greater, depending on actual levels of development.

88 Gary Christmas, Riverside County Librarian, personal communication March 20, 2000.

89 Based on 15,398 residents, as provided by California Department of Finance, January 1999.

It is difficult to predict future library needs, particularly as technological advances, such as internet access, continue to evolve. In order to provide adequate services to its residents in the future, the City and County Library System will need to monitor library use and the provision of services as the City grows.

3. Mitigation Measures

The City and County shall continue to monitor and assess the existing usage rate and level of services provided at the Desert Hot Springs library to determine the need for additional services and facilities. The City shall consult and coordinate with Riverside County to establish appropriate mitigation fees necessary to provide adequate library services.

Mitigation Monitoring/Reporting Program

- The City and County shall monitor library needs and utilization on an ongoing basis. **Responsible Parties:** City Manager, County Librarian

Electricity

1. Existing Conditions

The cost of electricity can have a substantial impact on development, and its affordability is essential to continued growth in Desert Hot Springs. It is important to provide cost-effective electrical service to the community to attract new businesses and residents. With recent deregulation of the electrical industry, the market has opened to a variety of service providers, and increased competition is likely to keep costs at reasonable levels at least in the near-term. As a result of deregulation, Desert Hot Springs residents will continue to have greater flexibility in choosing electrical service providers in the future.

The majority of electrical services are provided to the Desert Hot Springs area by Southern California Edison (SCE). SCE obtains electricity from a variety of generating sources, including wind and solar, coal, nuclear and hydroelectric. Electricity is transferred to the planning area through high-voltage lines and stepdown transformers at two substations within the planning area. The substations include the Devers Substation, located north of Dillon Road in the southwestern portion of the SOI, and the Coffee Substation on Camino Aventura, west of Palm Drive and south of the city limits. SCE offers reduced rates to low income residents and other rate reduction incentives to make electric rates more affordable.

SCE estimates that residential customers in the Coachella Valley region use an average of about 6,000 kilowatt-hours per year. It is more difficult to estimate the average electricity usage for commercial and industrial users, since commercial and industrial usage is largely based upon facility size and type of use. Electrical consumption rates provided by the South Coast Air Quality Management District, in conjunction with SCE, are shown in the following table.

Table III-33
Estimated Electricity Usage Rates

Land Use	Annual Usage Rate
Residential	5,626.50 kilowatt-hour/unit/year
Retail Commercial	13.55 kilowatt-hour/sq.ft./year
Restaurant	47.45 kilowatt-hour/sq.ft./year
Hotel/Motel	9.95 kilowatt-hour/sq.ft./year
Office	12.95 kilowatt-hour/sq.ft./year
Food Store	53.30 kilowatt-hour/sq.ft./year

Source: SCAQMD Air Quality Handbook, Appendix to Chapter 9, April 1993.

2. Project Impacts

Buildout of the General Plan could result in the consumption of approximately 919,501,985 kilowatt-hours per year.[90] This estimate accounts for existing and future development in the planning area, and assumes buildout of the proposed General Plan at moderate densities. Actual consumption will depend upon future levels of development, individual project design, the incorporation of energy-efficient measures into new buildings, and local, state and federal energy conservation measures in effect at the time of development. While the project itself is not expected to significantly impact the availability of electricity or the ability of utility companies to provide it, it will contribute cumulatively to the need for additional generating capacity in the future.

Electric power is currently provided to the City by SCE, which uses a broad mix of power sources, including solar, wind, nuclear, hydroelectric and gas turbines. It is the objective of SCE to plan for development in order to avoid potential service deficiencies. Current and planned facilities are expected to adequately serve future growth in the project area, and future development in the General Plan project area is not expected to outstrip SCE's service capabilities. Any extensions of overhead or underground electric lines, or undergrounding of existing overhead lines, will be provided at the expense of individual project proponents.

3. Mitigation Measures

A. Developers shall coordinate and cooperate with Southern California Edison in implementing load management programs which level the demand load on generating capacities. Every effort shall be made to assure the highest level of energy conservation available.

B. Any proposed development in the General Plan planning area shall be subject to the requirements of the Uniform Building Code and Title 24 of the California Administrative Code.

90 Based on CEQA Air Quality Handbook, Appendix to Chapter 9. Prepared by South Coast Air Quality Management District, April 1993. Calculations provided in Section III, Air Quality Analysis of this document.

C. Project developers shall be required to utilize energy efficient design to minimize summer-time solar gains and reduce air conditioning loads. The use of energy efficient lighting fixtures in developments within the planning area shall be required.

Mitigation Monitoring/Reporting Program

- The City Planning Department, Public Works Department, and Building Department shall inspect all detailed project plans for conformance with Title 24 energy conservation code requirements. Southern California Edison and the City Planning Department shall provide developers with references for energy efficient design.
  Responsible Parties: City Planning, Public Works, and Building Departments, Southern California Edison.

- Prior to the undergrounding of utility lines, all impacted utility companies shall be contacted for detailed information about system restrictions, district boundaries, and scheduling.
  Responsible Parties: Mission Springs Water District, The Gas Company, Southern California Edison, GTE California.

Natural Gas

1. Existing Conditions

Natural gas is acquired in association with the extraction of petroleum crude oil deposits, and is generally considered a clean and efficient fuel. Natural gas is typically used for space heating, cooking, hot water for homes and businesses, and in industrial process heating. It is also gaining popularity as an alternative motor vehicle fuel. The Sunline Transit Agency operates its entire mass transit fleet on compressed natural gas (CNG).

The Gas Company, formerly Southern California Gas Company, provides natural gas to the General Plan planning area. Gas is delivered to the planning area via high pressure transmission lines and lower pressure supply and distribution lines. This energy source is fully accessible to the Coachella Valley, as interstate supply lines pass through the region.

The average household in The Gas Company's service area consumes approximately 6,600 cubic feet of natural gas per month. The following table identifies natural gas consumption factors, as estimated by the South Coast Air Quality Management District (SCAQMD).

Table III-34
Natural Gas Consumption Factors

Land Use	Monthly Use Rate
Single Family Residential	6,665.0 cf/unit/month
Multiple Family Residential	4,011.5 cf/unit/month
Retail/Shopping Center	2.9 cf/sq. ft./month
Industrial	4.8 cf/sq. ft./month

Note: Industrial usage factor used is equivalent to the highest commercial usage factor provided by SCAQMD. Source: SCAQMD Air Quality Handbook, Appendix to Chapter 9, April 1993.

The Gas Company plans their facilities in a manner which accommodates future expansion, and works closely with developers and municipalities to provide service and infrastructure extensions.

2. Project Impacts

Buildout of the proposed General Plan will result in increased demand for natural gas. Project buildout could result in natural gas consumption of up to approximately 625 million cubic feet per month.[91] This analysis accounts for both existing and future development in the planning area, and assumes buildout at moderate densities. Actual consumption of natural gas will be dependent upon future levels of development, individual project design, and the efficacy of energy-conserving measures. Additional development associated with the General Plan will increase the rate of consumption of this non-renewable source and will contribute to cumulative impacts on the long-term availability of natural gas. However, General Plan buildout, in and of itself, is not expected to significantly impact natural gas supplies or the provider's ability to deliver it.

3. Mitigation Measures

A. Developers shall install the most efficient furnaces, water heaters, pool heaters and other equipment that use natural gas. Developers shall also encourage the use of kitchen appliances that utilize natural gas and shall investigate the possibility of using alternative energy sources, including solar and co-generation technologies.

B. The City shall strictly enforce Title 24 of the California Administrative Code, which addresses energy conservation in new developments.

91 Ibid.

Mitigation Monitoring/Reporting Program

- The City Planning and Public Works Departments shall inspect all detailed project plans to assure conformance with Title 24 energy conservation code requirements. The Planning Department shall coordinate with The Gas Company to provide developers with references for energy efficient design.
  Responsible Parties: City Planning Department, City Public Works Department, The Gas Company

Health Care Facilities and Services

1. Existing Conditions

In addition to a number of local physicians' offices and urgent care facilities, several large health care facilities are located in the vicinity of the General Plan planning area.

Desert Regional Medical center aka Desert Hospital) in Palm Springs is a private, non-profit hospital that is licensed for 305 acute-care beds.[92], and is managed by Tenet Health Care. Hospital facilities include a 24-hour emergency room, trauma center, and outpatient services. The hospital operates a Home Health Care department that provides in-home nursing care and household maintenance services to those in need. It also includes Hospice of the Desert, which offers services to the terminally ill.

The Eisenhower Medical Center in Rancho Mirage encompasses 98 acres and consists of four facilities: the Eisenhower Medical Center, the Betty Ford Center for Chemical Dependency, the Barbara Sinatra Children's Center, and the Annenberg Center for World Health Sciences. The medical center is licensed for 261 patient beds and includes an emergency room, intensive care unit, cardiac care unit and other specialized units. The Andrew Allen Surgical Pavilion is currently under construction and will consist of a 40,000 square foot state-of-the-art medical surgical facility with ten operating rooms The facility is expected to open in Fall of 2000.[93] The Betty Ford Center is also undergoing an expansion, which will include a new 20-bed residential facility and a structure that will house the Children's Program, Training Services and Alumni Programs.[94]

The John F. Kennedy Memorial Hospital in Indio has 130 patient beds and approximately 85 active physicians.[95] Hospital facilities include a 24-hour emergency room, an intensive care unit (ICU), cardiac care unit, physical therapy unit and other specialized care facilities. Expansions of the ICU and surgery department are currently underway.

92 Business Development Department, Desert Hospital, May 25, 1999.

93 Public Relations Department, Eisenhower Medical Center, May 19, 1999.

94 Community Relations Department, Betty Ford Center, February 15, 2000.

95 Business Development Office, John F. Kennedy Memorial Hospital, May 19, 1999.

2. Project Impacts

Continued urbanization of the planning area will impact all health care facilities, both within and outside the City limits. As independent facilities, hospitals in the Coachella Valley will continue to plan for regional growth. It can be expected that all three Valley hospitals will expand as needs are identified.

3. Mitigation Measures

Local and regional medical care facilities will continue to plan for growth, and therefore, no mitigation measures are necessary.

Solid Waste Management

1. Existing Conditions

The City of Desert Hot Springs contracts with Desert Valley Disposal for the collection and disposal of solid waste. Desert Valley Disposal also provides services to residents in unincorporated Riverside County on an individual basis. Both residential and commercial services are offered, with residential pickup occurring once per week, and commercial pickup available up to 6 days per week.[96]

Solid waste generated in the planning area is currently disposed of at the Edom Hill Landfill, located east of Varner Road on Edom Hill Road. The landfill is operated by Riverside County and receives waste from communities in the Coachella Valley. A 1997 revision to the operating permit allows the landfill to receive an average of 1,153 tons per day and a maximum of 2,651 tons per day.[97] From August 31, 1998 to August 31, 1999, the Edom Hill Landfill received an average of 1,167 tons per day. The remaining capacity of the site is estimated at 1,900,097 tons, and the projected closure date for the landfill is 2004.

Potential Disposal Sites

With the impending closure of the Edom Hill Landfill, the City and other Coachella Valley communities are evaluating disposal site alternatives. Alternatives currently being considered include the future development of a solid waste transfer facility in the vicinity of Interstate-10 between the cities of Desert Hot Springs and Palm Springs.[98] The facility would operate as a 24-hour holding site for solid waste. All waste would be hauled by truck from this site to either the Badlands Landfill in western Riverside County or the proposed Eagle Mountain Landfill, approximately 70 miles east of the Coachella Valley. Other potential disposal sites include the El Sobrante and Lamb Canyon Landfills in western Riverside County.[99]

96 Rick Wade, General Manager, Desert Valley Disposal, personal communication March 6, 2000.

97 Kathy Gifford, Planner III, Riverside County Waste Management Department, letter correspondence dated March 6, 2000.

98 Rick Wade, General Manager, Desert Valley Disposal, personal communication March 6, 2000.

99 Kathy Gifford, Planner III, Riverside County Waste Management Department, letter correspondence dated

The Eagle Mountain Landfill and Recycling Center was approved by the Riverside County Board of Supervisors in September 1997. The site will be operated as a private enterprise and has received all 20 of its required operating permits. The proposed landfill footprint encompasses 2,164 acres, and the total volume of the project at buildout is estimated at 708 million tons.[100] The landfill is projected to have a life expectancy of about 100 years. At this time, no opening date for the facility has been scheduled and may be delayed by on-going litigation.

The Badlands Landfill, which is owned and operated by Riverside County, is located northeast of the City of Moreno Valley and is accessed by State Highway 60. The facility is currently permitted to receive 4,000 tons per day and has a total capacity of approximately 12 million tons.[101] From August 31, 1998 to August 31, 1999, the landfill received an average of 1,461 tons per day.[102]

The El Sobrante Landfill is located south of the City of Corona, and east of Interstate-15 and Temescal Valley Road. The landfill is privately owned and operated, has an overall capacity of approximately 90 million tons, and a daily disposal capacity of 4,000 tons per day.[103] From August 31, 1998 to August 31, 1999, the landfill received an average of 2,500 tons per day. In September 1998, the Riverside County Board of Supervisors approved a proposal to expand the landfill by 100 million tons and to increase the daily disposal capacity to 10,000 tons per day. As part of this approval, the landfill footprint will increase from 90 acres to 495 acres. With this expansion, the landfill will serve as a long-term disposal site.

The Lamb Canyon Landfill is located between the Cities of Beaumont and San Jacinto and is owned and operated by Riverside County. The landfill has an overall capacity of 5.9 million tons and is currently permitted to receive 1,900 tons per day.[104] From August 31, 1998 to August 31, 1999, it received an average tonnage of 491 tons per day. Based upon current usage and waste flow projections, the landfill has a disposal capacity to the year 2011.

Source Reduction and Recycling

The State of California passed the Integrated Waste Management Act (AB 939) in 1989. This legislation requires that every city and county in California implement programs designed to recycle, reduce at the source, and compost 25% of their solid waste by 1995 and 50% by the year 2000. In compliance with AB 939, the California Integrated Waste Management Board approved the Riverside County Integrated Waste Management Plan (CIWMP) in September 1998. This document defines programs and policies intended to reduce waste disposal by the amounts described above, and addresses the County's and cities' landfill capacity needs for a minimum 15-year period.

March 6, 2000.

100 Ibid.

101 Ibid.

102 Ibid.

103 Ibid.

104 Ibid.

Desert Valley Disposal operates a curb-side recycling program, which has diverted recyclables from the waste stream. An estimated 1.5 to 2.5 tons of recyclable materials are collected per month in the Desert Hot Springs area by Desert Valley Disposal.[105] Recyclable materials including glass, aluminum, newspaper, plastics and cardboard are collected and provided to Palm Springs Recycling, where they are sorted and brokered to market. Several other recycling centers are also located throughout the Coachella Valley and are available to the public.

Hazardous Waste Disposal

Hazardous wastes may be generated by small-source household generators in the planning area. The Riverside County Environmental Health Department operates a hazardous waste disposal facility in the City of Palm Springs. The ABOP facility accepts household wastes, including anti-freeze, batteries, waste oil and water-based paint. These materials are disposed of in the Los Angeles area.[106] The County also operates the Household Hazardous Waste program, which provides a mobile hazardous waste collection unit to communities throughout Riverside County, including those in the Coachella Valley. This facility moves to various locations throughout the year and accepts all types of household hazardous wastes, except for explosives, bio-hazards, and radioactive materials.[107] Numerous private vendors provide hazardous waste collection and disposal services for large-scale industrial operations. The Environmental Health Department maintains a comprehensive list of local and regional contractors offering such services.[108]

2. Project Impacts

Growth in the City will increase the generation of solid waste and the need for landfill facilities. Desert Valley Disposal has indicated that it will be capable of serving future development associated with buildout of the proposed General Plan.[109] Continued and increased recycling within the City will help lessen impacts to local landfills and assist with the City's compliance with AB 939.

Buildout of the General Plan is expected to generate approximately 70,452 dwelling units, including existing and potential residences. Of these, it is estimated that 51,183 will be single-family dwelling units and 19,269 will be multi-family units. The project is also expected to result in a total of approximately 9,985,695 square feet of commercial development and 37,366,639 square feet of industrial development. These land uses could generate approximately 191,840 tons of solid waste per year.[110] This estimate assumes buildout at moderate densities Actual waste generation will be dependent upon future levels of development at buildout.

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105 Rick Wade, General Manager, Desert Valley Disposal, personal communication March 6, 2000.

106 Hazardous Materials Section, Riverside County Environmental Health Dept., February 4, 1999.

107 Ibid.

108 Ibid.

109 Rick Wade, General Manager, Desert Valley Disposal, personal communication March 6, 2000.

110 California Integrated Waste Management Board compilation of waste generation rates. Rates used are from the Ventura County Solid Waste Management Department, "Guidelines for Preparation of Environmental Assessments for Solid Waste Impacts," September 1992; and "DEIR for North Hills Development in Santa Clarita," December 1991.

None of the land uses proposed within the Plan area are expected to create unusually high quantities of solid waste or unusual hazardous waste conditions. Nonetheless, the project will result in a substantial increase in the volume of solid waste generated over time, and waste management will need to be monitored to assure the safe and cost-effective disposal of the City's solid waste. Buildout of the planning area will occur gradually and will allow time to assess these impacts as they occur.

3. Mitigation Measures

Reducing the amount of waste produced at the source is the most effective way of lessening the impacts to landfills. Residents and businesses can help mitigate these impacts themselves when offered convenient recycling programs. The following measures will help mitigate solid waste impacts to landfills and assist in City compliance with AB 939.

A. All new development shall establish recycling programs as part of the planning process. The program shall include recycling provisions for residences as well as commercial establishments.

B. Recycling provisions for multi-family dwellings units should consist of dedicated source separation containers (i.e. glass-only, paper-only, plastic-only dumpsters).

C. Recycling provisions for commercial establishments should include separate recycling bins. Items to be recycled at commercial establishments may include white paper, computer ledger paper, cardboard, glass and aluminum cans.

D. As landscaping debris comprises a large percentage of residential solid waste, developers/operators shall contract for professional landscaping services from a company which composts its green waste. Several landscaping companies in the Coachella Valley currently use composting as a means of disposing of solid waste. On-site composting and grass recycling (whereby lawn clippings are left on the lawn) is also encouraged, wherever possible.

E. Recycling of construction waste through on-site grinders and the use of wood waste recycling facilities is encouraged, wherever possible.

F. Recycling provisions for single-family and multi-family residential dwelling units shall continue to be included in the City's solid waste disposal contracts.

G. The City shall ensure that all hazardous materials, whether from construction or operation of land uses within the planning area, are handled, stored and/or disposed of according to all standards and laws in place at the time such activity occurs.

Mitigation Monitoring/Reporting Program

- The City Planning Department shall maintain close contact with project developers to assure the provision and maintenance of recycling containers that correspond with current City programs and those planned in the future.
  Responsible Parties: City Planning Department, Desert Valley Disposal

Telephone Service

1. Existing Conditions

GTE California provides a variety of basic and state-of-the-art telephone services to the planning area. GTE is headquartered in Thousand Oaks, but local service facilities are located in Palm Springs and Indio. GTE plans its facilities to accommodate future growth and often oversizes its infrastructure to allow for increased capacity.[111] The company assesses the need for additional facilities as development occurs.

2. Project Impacts

No significant impacts are anticipated which will affect GTE's ability to provide telephone services to the project area. Buildout of the General Plan area will generate additional demands on existing infrastructure and will also require the extension of telephone services to areas not currently served. However, GTE has indicated its ability to serve future development.

3. Mitigation Measures

A. Developers shall provide required rights-of-way for new GTE conduit systems to provide telephone services to their sites.

Law Enforcement

1. Existing Conditions[112]

The City of Desert Hot Springs operates its own full-service police department, which is based out of the City Hall Building on Pierson Street. The City is budgeted for a total of 22 sworn officers, but currently has 16 on staff. The department strives to maintain a ratio of 1.2 officers for every 1,000 residents. Based on this ratio, and the City's current population of 15,398 residents[113], the department is currently understaffed by two to three officers.

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111 Bob Marra, Public Affairs Representative, GTE California, personal communication May 1999.

112 Chief Paul Stotesbury, City of Desert Hot Springs Police Department, personal communication, March 8, 2000.

113 California Department of Finance, January 1, 1999.

Given the seasonal fluctuations in the City's population, the department is typically "understaffed" in the winter, when the population is at its highest, and "overstaffed" in the summer, when the number of seasonal residents and visitors is at its lowest. The Police Department's vehicle fleet include a total of 22 patrol vehicles, including unmarked cars. Average response times are well within acceptable limits. Response times to emergency calls within the City limits are 2.5 minutes, while non-emergency calls average 8 minutes. The department maintains mutual aid agreements with the Riverside County Sheriff's Department, California Highway Patrol, and police departments of all Coachella Valley cities.

The Police Department sponsors a number of special community programs, including Neighborhood Watch and a Christmas Program for disadvantaged families. The month of May is Green Ribbon Month, during which the department gives presentations on child safety to local elementary and middle school students. The Police Activities League organizes and sponsors youth programs. The Citizens on Patrol (COP) program is comprised of about 25 civilian volunteers who support the department by performing vacation home checks, traffic control assistance and related activities.

2. Project Impacts

For its current population, the City Police Department is currently understaffed by two to three officers. Implementation of the proposed General Plan could result in a total population of approximately 193,456 residents[114]. To maintain a target ratio of 1.2 officers per 1,000 residents at General Plan buildout, the police department will need a total of 232 officers, an increase of 216 officers than currently provided by the City.

The demand for additional law enforcement services will increase gradually, as development occurs. Nonetheless, this constitutes a significant increase over the number of officers and the level of police protection currently provided. An increase in the number of officers and associated support staff, equipment and patrol vehicles could result in substantial costs to the City. However,an increase in City revenues to fund law enforcement can also be expected with General Plan buildout.

The above projections assume buildout of the General Plan area at moderate densities. Given that existing development in the City is not generally constructed at the maximum permissible densities, it is unlikely that vacant lands in the planning area will be built out at higher levels. However, actual demand for police protection will be dependent upon future levels of development.

3. Mitigation Measures

A. The Police Department shall review new development proposals and evaluate project plans based on the Department's ability to provide adequate police protection. The review shall include, but is not limited to internal circulation patterns, and street names and numbering systems. New developments shall comply with recommended Police Department standards.

114 Based on 63,889 potential new dwelling units associated with General Plan buildout, and 2.787 persons per household, added to the existing City population of 15,398.

B. Promote the utilization of crime prevention measures in project planning which results in "defensible space" as a means of providing security in residential, commercial and industrial developments.

C. Encourage the continuation of the Neighborhood Watch, COP, and other community based police programs.

D. Monitor City population and police department staffing levels to assure that adequate levels of law enforcement are provided.

Mitigation Monitoring/Reporting Program

- The Police Department shall monitor calls in the planning area. The City shall annually review response times and Police Department activity to assure adequate levels of protection.
  Responsible Parties: Desert Hot Springs Police Department, City Manager

Fire Protection

1. Existing Conditions[115]

Fire protection is provided to the City of Desert Hot Springs by the Riverside County Fire Department under contract with the California Department of Forestry. The Riverside County Fire Department is rated as Class 4 by the Insurance Service Office (ISO), a private company which rates fire departments throughout the country. Ratings are based on a scale of 1 to 10, with Class 1 being the highest possible score.

At this time, one fire station is located within the City limits. Station No. 37 is located at 65958 Pierson Boulevard, next to the City Hall building. The station is equipped with one squad, one rescue vehicle, and two Type-1 fire engines, each of which has a capacity of 1,500 gallons per minute. A minimum of one company officer and one fire fighter are on duty at any given time. The station currently has seven volunteers, with two in training.

Two other stations are well situated to provide fire protection services to the City and its sphere-of-influence. Station No. 36 is located near the intersection of Dillon Road and Indian Avenue in North Palm Springs, immediately south of the planning area. The station is staffed by a minimum of one company officer and one fire fighter, and currently has twenty volunteers. Equipment includes two Type-1 fire engines and one squad.

Station No. 56 is located on Dillon Road near Sky Valley, approximately three miles east of the planning area. The station includes one Type-1 fire engine, and a minimum of one company officer and one fire fighter are on duty at any time. There are currently no volunteers at this station.

115 Clyde Chittenden, Fire Chief, Riverside County Fire Department, personal communication March 13, 2000.

National Fire Insurance Organizations and the National Fire Protection Association formally recommend, respectively, a minimum three mile and five minute response parameter for the siting of fire stations. Average emergency response times within the City currently range from zero to nine minutes.

The highest response times occur in the eastern portion of the City, in the vicinity of Hacienda Avenue and Mountain View Road, and the Fire Department has identified the need for an additional fire station in this area. The station will be funded through Fire Development Mitigation Fees, which are already programmed for a new station. It is anticipated that the station will be constructed in several years.

The adopted Rancho Royale Specific Plan, located in the northwestern portion of the City, also includes a proposed fire station. The project has been conditioned to construct a new station during the first phase of development, which is expected to result in the development of approximately 2,500 new residences. The station will be located west of Highway 62, north of Pierson Boulevard.

The Fire Department maintains mutual aid agreements with the Palm Springs, Cathedral City and Morongo Valley fire departments. Paramedic services are provided by American Medical Response (AMR), however the Fire Department does provide first responder services, as necessary.

2. Project Impacts

Growth facilitated by implementation of the proposed General Plan is expected to increase the demand for fire protection services. The City has identified a need for an additional fire station in the eastern portion of the City, and has programmed its Fire Development Mitigation Fees for this purpose. The new station will reduce emergency response times and increase the overall level of service provided to existing and future development in this area.

Buildout of the planning area is expected to significantly increase the demand for fire protection services in the western portion of the City, in the vicinity of the Rancho Royale and Olympus Specific Plans. The Rancho Royale Specific Plan is conditioned to include a new fire station during its first phase of development, which will improve the level of service provided to these developments.

As the planning area builds out, it will be necessary to determine the need for additional services, including additional fire trucks, rescue vehicles, personnel and fire stations. Large scale development outside the City limits will require the expansion of water mains and the provision of new fire hydrants to assure sufficient fire protection. Expansion of fire services could result in significant costs to the City. It will be necessary to thoroughly evaluate the need for additional stations and equipment as the planned urban area builds out.

3. Mitigation Measures

To assure the highest level of fire protection to community residents and businesses, the following mitigation measures are necessary:

A. The City shall continue to promote close coordination with the Fire Department with regard to the timely expansion of services and facilities.

B. An adequate portion of Fire Development Mitigation Fees collected by the City shall be programmed for the construction of a new fire station in the eastern portion of the City.

C. The Fire Department shall continue to maintain mutual aid agreements with Morongo Valley and the cities of Palm Springs, Cathedral City for additional fire support.

D. The Fire Department shall continue to review new development proposals and evaluate the Department's ability to provide adequate fire protection services. This shall include, but is not limited to review of internal circulation patterns, and street names and numbering systems. Continue to enforce fire codes and other applicable standards and regulations in the course of reviewing building plans and conducting building inspections.

E. The siting of industrial facilities which involve the storage of hazardous, flammable or explosive materials shall be conducted in such a manner as to assure the highest level of safety in strict conformance with the Uniform Fire Code and other applicable regulations.

F. Coordinate with Mission Springs Water District and Coachella Valley Water District to assure adequate water supplies and pressure for existing and proposed development.

Mitigation Monitoring/Reporting Program

- The Riverside County Fire Department shall inspect all detailed project plans for conformance with all applicable fire protection requirements.
  Responsible Parties: Riverside County Fire Department

Wastewater Collection and Treatment

1. Existing Conditions[116]

Sewage collection and treatment services are provided to the majority of the planning area by the Mission Springs Water District (MSWD). The Coachella Valley Water District (CVWD) is the service provider for a limited portion of the planning area, generally located south of Dillon Road and east of Little Morongo Road, but currently has no facilities for waste water collection.

Mission Springs Water District operates two wastewater treatment facilities. The Horton Wastewater Treatment Plant is located at 14601 Verbena Road. The plant has a capacity of one million gallons per day (mgd), and is currently handling approximately 90 percent of its design flow. The plant will soon be expanded to accommodate two million gallons per day. Expansion is expected to begin in October 2000 and should be completed within two years.

116 Wayne Robertson, Supervisor, Horton Wastewater Treatment Plant, personal communication, March 14, 2000.

The Desert Crest Wastewater Treatment Plant is located at 17400 Sunrise Road. The plant has a capacity of 180,000 gallons per day, and is currently treating only about one-third of its total capacity. Although there are no plans for immediate expansion, long-term expansion of the plant is being considered and will be implemented as demand warrants.

Most of MSWD's sewer mains are 8 inches in diameter, but the main interceptors which occur in Palm Drive and Ocotillo Drive range from 15 to 21 inches in diameter. All wastewater is percolated into the ground, and none leaves the treatment plant sites. Both plants currently provide secondary treatment of wastewater only. Waste water is typically treated to secondary levels and reintroduced into the groundwater table through percolation ponds. Tertiary treated water undergoes an additional stage of treatment, which makes it suitable for irrigation purposes and decreases the demand for groundwater resources. Although tertiary treated water is used elsewhere in the Coachella Valley for landscape and golf course irrigation, the demand for tertiary treated water in the planning area is not sufficient to warrant that these services be provided by MSWD at this time.

While much of the development in the planning area is sewered, many homes and businesses continue to operate on individual septic systems. Approximately 5,000 homes within the MSWD service area are using septic systems.[117] Mission Springs Water District plans to provide sewer service to the entire planning area in the future, and is taking steps to limit the installation of new septic systems. MSWD requires that all development occurring within 200 feet of an existing sewer main be connected to the larger sewer system.[118] In accordance with SB 1852, which addresses the development of residential subdivisions, all parcels less than one-half acre in size are required to be connected to the sewer system. Parcels which are one-half acre or larger can be serviced by individual septic systems.[119]

A small portion of the planning area, generally located south of Dillon Road and east of Little Morongo Road, is located within the Coachella Valley Water District's Improvement District #58. Development in this area is sparse and largely limited to scattered residences. At this time, there are no CVWD wastewater facilities in the area, and all wastewater disposal is accommodated by individual septic systems.

CVWD has indicated that it will be able to install sewer mains and lift stations, as necessary, in this area as additional development occurs and demand for these facilities increases.[120] Wastewater will be conveyed through force mains to the east, and discharged into existing sewer mains in Thousand Palms. From Thousand Palms, the sewage will be gravity fed to the Improvement District #58 Water Reclamation Plant (WRP-7) in Indio. This wastewater treatment plant has a capacity of 2.5 million gallons per day (mgd), and currently treats approximately 2 mgd.[121] Expansion of the plant to 5 mgd is currently underway, and is expected to be completed within one year.

117 Mark Derhock, Mission Springs Water District, personal communication, March 15, 2000.

118 George Thacker, Mission Springs Water District, personal communication, March 29, 2000.

119 Ibid.

120 Bruce Clark, Principal Sanitation Engineer, Coachella Valley Water District, March 17, 2000.

121 Ibid.

2. Project Impacts

General Plan buildout will place additional demand on existing wastewater collection and treatment facilities. Wastewater generation rates are estimated at approximately 100 gallons per day per capita.[122] With an estimated buildout population of 193,456 residents, the total amount of wastewater generated within the planning area could reach approximately 19,345,600 gallons per day. This assumes buildout of the planning area at current densities. Analysis of existing development patterns in the planning area indicates that development has not typically occurred at the maximum densities permitted, and buildout at consistently maximum permissible densities is not anticipated. Actual wastewater generation rates will depend upon future levels of development.

The demand for wastewater collection and treatment services at General Plan buildout could constitute a potentially significant increase over the level of service currently provided in the planning area. However, buildout of the planning area, and the associated increase in demand for wastewater collection and treatment services, will occur gradually over the life of the General Plan, and will allow the City and wastewater treatment purveyors to evaluate service capabilities as demand increases.

The General Plan calls for the City, Mission Springs Water District, and Coachella Valley Water District to evaluate and develop a city-wide sewage collection and treatment system, and to support the formation of assessment districts for the purpose of sewer installation. Additional infrastructure and treatment capacity will be required for new development, particularly that occurring in the western and southern portions of the planning area. General Plan policies and programs are also directed at limiting the number of active septic systems within the planning area. The elimination of individual septic systems is expected to reduce the potential for groundwater contamination associated with the use of septic systems, and result in beneficial environmental effects on groundwater quality and human health.

3. Mitigation Measures

A. All development shall be connected to the a city-wide sewer system, to the greatest extent practical. Septic systems shall be prohibited where soil conditions do not permit percolation.

B. Mission Springs Water District shall continue to require that all new development within 200 feet of an existing sewer main be connected to the sewer system.

C. The City shall investigate and evaluate alternative methods of financing a city-wide sewer system and converting existing septic systems to sewer, including redevelopment funds, assessments and other funding mechanisms.

D. The City shall cooperate and coordinate with Mission Springs Water District and Coachella Valley Water District to assure that adequate wastewater collection and treatment facilities are provided to serve development in the planning area.

122 .Wayne Robertson, Supervisor, Horton Wastewater Treatment Plant, personal communication, March 14, 2000.

E. The City shall coordinate with Mission Springs Water District and Coachella Valley Water District to monitor the demand for tertiary treated water within the planning area, and shall investigate the feasibility of providing tertiary treated water as demand warrants.

Mitigation Monitoring/Reporting Program

- The City Planning and Public Works Departments shall confer and coordinate with the Mission Springs Water District and Coachella Valley Water District to develop plans for implementing city-wide sewer service.
  Responsible Parties: City Planning Department, City Public Works Department, MSWD, CVWD

Domestic Water Service

1. Existing Conditions

Mission Springs Water District[123]
The Mission Springs Water District (MSWD) provides domestic water to the majority of the planning area. MSWD operates seven active wells within the planning area. Wells have been drilled to depths generally ranging between 400 and 1,085 feet below the surface. MSWD also has 20 above-ground water reservoirs in the planning area, with storage capacities ranging from 50,000 to 2.5 million gallons.

Domestic water is conveyed through water mains generally ranging in diameter from 2 to 16 inches. Water mains are heavily concentrated in the most developed portions of the City, and extend as far west as Painted Hills, and as far south as the Indian Avenue/Interstate-10 interchange.

Coachella Valley Water District[124]
A small portion of the planning area is located within the service area of the Coachella Valley Water District (CVWD), and generally includes lands south of Dillon Road and east of Little Morongo Road. CVWD currently provides domestic water to development on Bubbling Wells Road between Dillon Road and 20th Avenue, and limited portions of Mountain View Road, Palm Drive and Dillon Road. Water mains in this area range from 8 to 12 inches in diameter. CVWD will be able to expand services in this vicinity as future development occurs and demand increases.

2. Project Impacts

Consumptive demand for the local population is estimated at 297 gallons per day per capita.[125] Buildout of the General Plan is expected to result in approximately 193,456 residents. Based on the MSWD water consumption factor of 297 gpd, General Plan buildout could raise the city-wide total domestic water demand to approximately 57 million gallons, or about 176 acre-feet per day. This estimate includes water consumed by existing and future residents and all types of land use.

123 George Thacker, Mission Springs Water District, personal communication, March 29, 2000.

124 Mike Tanner, Coachella Valley Water District, personal communication, March 16, 2000.

125 George Thacker, Mission Springs Water District, personal communication, March 29, 2000.

Increases in water consumption will occur gradually, over the life of the General Plan. Both the Mission Springs Water District and Coachella Valley Water District have indicated that they will be capable of serving additional development as demand warrants. New and upgraded wells, reservoirs, water mains and other infrastructure will be required to adequately serve the buildout population and could result in substantial costs to developers and residents.

The Mission Creek subbasin, from which groundwater is extracted, is currently in an overdraft condition of approximately 2 feet per year.[126] The Mission Springs Water District is in the process of negotiating with Desert Water Agency to acquire imported Colorado River Water to artificially recharge the subbasin. In late 2001, MSWD expects to have completed the construction of recharge basins located east of Worsley Road and north of Mission lakes Boulevard (extended), within the Mission Creek wash. Colorado River water will be percolated through these basins into the Mission Creek subbasin at a rate of between 5,000 and 15,000 acre-feet per year.[127] A replenishment fee will be assessed on MSWD customers to help cover the costs of the replenishment program.

For a more thorough discussion regarding impacts to water resources and quality, please refer to Section III-E.

3. Mitigation Measures

A. All future development projects shall be reviewed by the City, Mission Springs Water District and/or Coachella Valley Water District to determine potential impacts of development activities on local groundwater resources.

B. Where feasible, the City shall require the development of on-site stormwater retention or detention basins to enhance infiltration of runoff and the replenishment of groundwater subbasins.

C. The City, Mission Springs Water District and Coachella Valley Water District shall encourage the use of drought tolerant landscaping in public and private development as a means of reducing water consumption. All development plans shall be required to adhere to the City's landscape ordinance.

D. The City shall encourage and/or require the installation of low-flush toilets, and low-flow showerheads and faucets in all new construction, in conformance with Section 17921.3 of the Health and Safety Code, Title 20, California Administrative Code Section 1601(b), and applicable sections of Title 24 of the State Code.

126 Don Coleman, Mission Springs Water District, personal communication, March 29, 2000.

127 George Thacker, Mission Springs Water District, personal communication, March 29, 2000

Mitigation Monitoring/Reporting Program

- All development proposals shall be reviewed by the Community Development Department to assess the potential for adverse effects on water quality and quantity. All development proposals shall be required to mitigate any significant impacts.
  Responsible Parties: Community Development Department, City Engineer, developers, Mission Springs Water District, Coachella Valley Water District

- The Mission Springs Water District and Coachella Valley Water District shall coordinate and cooperate with local, state and federal agencies to assure the protection of groundwater aquifer from excessive extraction and potential contamination.
  Responsible Party: Mission Springs Water District, Coachella Valley Water District

L. Socio-Economic Resources

1. Existing Conditions

The City of Desert Hot Springs and the larger Coachella Valley are directly impacted by the economic conditions of the Southern California region. The region, as defined by the Southern California Association of Governments (SCAG), includes all of the southern California counties, excluding San Diego County. The SCAG region includes Los Angeles, Ventura, San Bernardino, Riverside and Imperial Counties. Since 1920, growth in the SCAG region has been rapid, with a population increase of 171% between 1920 and 1940. World War II initiated explosive growth which increased the regional population to more than 10 million by 1970. By the late 1990s, the Southern California population had reached about 18 million.

Over the past three decades, the Coachella Valley has expanded to become one of the premier destination resort areas in the country. Economic activity in the City of Desert Hot Springs, too, has been largely based upon the promotion of a resort lifestyle and the healthful and life-enhancing effects of the City's hot mineral water and desert environment.

The City, however, is unique in the Coachella Valley in that it lacks adjoining urban development and the economic benefits that such connectivity can provide. While a broad-based agricultural industry enhances the economic activities of the cities of Indio and Coachella, and Palm Springs and the "cove communities" have attracted a substantial amount of resort development and developed a competitive regional retail market, the City of Desert Hot Springs has had to cultivate its own assets and opportunities. The City has become an established resort-residential community, which provides affordable housing and quality of life amenities, but has continued to lack employment opportunities and a tax base of adequate size or diversity.

The following discussion includes economic development trends for the City of Desert Hot Springs, including population, income and housing trends which define the demographic characteristics of the area and provide a basis for growth trends and analysis.

Demographics

From 1990 to 1999, the City's population increased from 11,668 to 15,398 residents, for a total increase of 3,730 residents, or about 32%.[128] The population is expected to reach an estimated 18,100 by the year 2010, and 20,600 by year 2020.[129]

Household size defines the average number of people living in a dwelling. It does not include those living in group housing, however, their effect on the City average is very limited. The average household size in the City has increased steadily over the past few decades, from approximately 1.9 in 1970, to 2.25 in 1980, and 2.47 in 1990. By 1999, the average household size had increased even further to 2.78.[130]

Desert Hot Springs initially attracted an older, retired population and modest second home owners due to its superior environmental qualities, including hot mineral waters, clean and dry air, spectacular scenery and rural lifestyle. However, the median age has declined steadily since the City's incorporation in 1963. The median age was 59.5 in 1970, 45.3 in 1980, and 31.0 in 1990. This figure was expected to have dropped to 29.0 by 2000.[131] The following table illustrates the 1990 age distribution in Desert Hot Springs.

Table III-35
Desert Hot Springs
Age Distribution -1990

Age Range	% of Population
Less than 6 years	12.5%
6-24 years	26.7%
25-34 years	20.0%
35-44 years	12.5%
45-54 years	6.9%
55-64 years	7.0%
65+ years	14.5%
TOTAL:	**100%**

Source: 1990 U.S. Census of Population and Housing.

128 1990 U.S. Census, and California Department of Finance, January 1, 1999.

129 "1998 Regional Transportation Plan Population, Household and Employment Forecasts," Southern California Association of Governments, as provided in letter correspondence dated March 1, 2000.

130 California Department of Finance, January 1, 1999.

131 Ibid.

The City of Desert Hot Springs is primarily a caucasian community, with approximately 20% percent of the population being of Hispanic origin. The following table illustrates the 1990 and projected year 2000 number and percentage of each ethnic group in the City.

Table III-36
City of Desert Hot Springs
Ethnic Characteristics - 1990

Race	1990 Census		2000 Projection	
White	9,722	83.3%	14,605	81.6%
Black	443	3.8%	880	4.9%
Asian/Pacific Islander	228	2.0%	461	2.6%
American Indian	172	1.5%	253	1.4%
Other	1,104	9.5%	1,703	9.5%
Hispanic Origin	2,308	19.8%	4,368	24.4%

Source: "Demographic Trends for the City of Desert Hot Springs," Urban Decision Systems, based on the 1990 Census of Population and Housing.

Employment and Income Characteristics

In 1990, the City of Desert Hot Springs had a total of 4,678 employed persons, of which approximately 2,302 (49.2%) residents were considered to be white collar workers, and 2,376 (50.8%) residents were classified as blue collar workers.[132] It is estimated that this distribution will remain largely unchanged, and that in 2000, 3,528 (49.1%) residents will be white collar workers, and 3,661 (50.9%) residents will be blue collar workers.[133] As indicated in the following table, clerical and service-oriented industries accounted for the largest percentages of the City's occupations in 1990, with production and repair services representing the third highest industry.

The employment participation rate for the City in 1990 was 54.2% of all persons 16 years or older,with an unemployment rate of 6.9%. The employment rate for 1995 in the City was estimated at 6.5%, with projected rates for 2000 remaining largely unchanged at 6.6%.[134]

132 "Labor Force Trends: 1990-1995-2000 for City of Desert Hot Springs," Urban Decision Systems, February 1996.

133 Ibid.

134 Ibid.

Table III-37
Occupations of Residents in the
City of Desert Hot Springs - 1990

Occupation	Number of Residents	% of Working Population
Executive and Managerial	347	7.4%
Professional	359	7.7%
Technicians	140	3.0%
Sales	627	13.4%
Admin. Support/Clerical	829	17.7%
Private Household	27	0.6%
Protective Service	76	1.6%
Other Service Occupations	818	17.5%
Farming/Forestry/Fishing	188	4.0%
Production/Craft/Repair	776	16.6%
Operatives	96	2.1%
Transportation/Material Moving	187	4.0%
Handlers and Laborers	208	4.4%
Total:	**4,678**	**100%**

Source: "Labor Force Trends: 1990-1995-2000 for City of Desert Hot Springs," Urban Decision Systems.

The City's employers represent a varied mix of employment opportunities, with the greatest number of people being employed by the Palm Springs Unified School District, as shown in the table below. A number of hotels and health spas also generate a high seasonal demand for services workers and physiotherapists, particularly during winter months.

Table III-38
Major Employers in the
City of Desert Hot Springs - 1998

Business	No. of Employees
Palm Springs Unified School District	1,400
Angel View Crippled Children's Foundation	230
Miracle Springs Hotel & Spa	95
Desert Springs Spa Hotel	80
K-Mart	80
Stater Brothers Supermarket	75
Vons Supermarket	75
Agua Caliente Spa Hotel	47
City of Desert Hot Springs	41

Source: "Community Economic Profile for Desert Hot Springs, Riverside County, California," Riverside County Economic Development Agency, 1998.

The median household income in Desert Hot Springs was $5,895 in 1970 and $12,312 in 1980. By 1990, this figure had increased to $20,687.[135] Although the City's median household income has increased steadily over the past three decades, it remains considerably lower than the regional, county and state equivalents. In 1990, median household incomes for the Coachella Valley, Riverside County and the state of California were $29,500, $33,100 and $35,800, respectively.[136] These figures were approximately 42%, 60% and 73% higher, respectively, than the City's 1990 median household income. However, the City's household income potential has continued to increase in recent years, and by 1998, the City's median household income had reached $29,555.[137]

Sales Potential

The 1995 aggregate and per capita retail sales potential for the City of Desert Hot Springs, and year 2000 projections, are provided in the table below. The table illustrates that the largest expenditure categories are for food, groceries and restaurants. In 1995, the average City resident spent approximately $1,523 on food and groceries and $745 at restaurants. These expenditures are expected to rise to about $1,622 and $859, respectively, in 2000.

135 1990 U.S. Census of Population and Housing.

136 Table III-6, "Profile of Development Prospects for the Cathedral City General Plan," Economics Research Associates, February 15, 1996.

137 Inland Empire Economic Databank and Forecasting Center, University of California, Riverside, 1998.

Table III-39
Potential Annual Expenditure Estimates for
City of Desert Hot Springs Residents

Merchandise Type	1995 Estimates Aggregate (mil)	1995 Estimates Per Capita	2000 Projections Aggregate (mil)	2000 Projections Per Capita
Apparel & Related	$7.99	$539.54	$11.70	$653.18
Food & Grocery	$22.52	$1,523.50	$29.03	$1,621.93
Food & Alcohol Away from Home	$11.02	$745.17	$15.39	$859.49
Health & Personal Care	$4.61	$311.54	$5.85	$326.51
Home Furnishings/Appliances	$5.72	$386.43	$8.13	$454.10
Electronics	$2.25	$152.49	$3.35	$187.05
Automotive	$8.57	$579.32	$10.26	$573.28
Miscellaneous*	$10.06	$679.51	$14.37	$802.79
Total:	**$72.74**	**$4,917.50**	**$98.08**	**$5,478.33**

* Includes reading materials, recreational equipment, day care, toys, hobbies and other related merchandise. Source: "Merchandise Potential Summary: Summary (Annual) for City of Desert Hot Springs," Urban Decision Systems, February 1996.

The taxable sales figures provided in Table III-40 below indicate that a downward trend in taxable sales occurred from 1995 to 1996. Taxable sales, however, recovered during 1997 and 1998, and 1998 sales ($52,998,000) represented the highest figure in five years.

Table III-40
1994-1998 Taxable Sales Trends
City of Desert Hot Springs
(thousands of dollars)

Year	Total Retail Stores	Total All Outlets
1994	43,840	48,924
1995	44,964	50,033
1996	43,295	47,935
1997	43,851	49,665
1998	46,872	52,998

Source: "Taxable Sales in California (Sales & Use Tax)," California State Board of Equalization.

A comparison of the data provided in the two tables above indicates that the City is experiencing a leakage of approximately 32% of its taxable sales to other communities. Based upon data presented in Table III-39, it is estimated that the City's 1995 population had the potential to spend $72.74 million on a variety of consumer goods, most of which are taxable items. However, data presented in Table III-40, actual 1995 taxable sales in the City totaled only about $50.03 million. The difference of $22.71 million represents the approximate retail sales potential of City residents that is not being spent within the City limits.

It is likely that much or most of these expenditures have occurred in other communities in the Coachella Valley, or other regional markets, which have attracted larger retailers offering a wide range of consumer products. This is attributable to several factors, including the City's relatively small population and market size. The City lacks critical size that would support a full range of retail outlets and larger retailers, many of which are currently located in Cathedral City, Palm Desert and Rancho Mirage. Desert Hot Springs is also physically isolated from neighboring communities, and is not centrally located within the demographic center of the valley. This makes it difficult for the City to attract and capture potential retail sales from residents of neighboring communities.

Housing Market Trends

It is estimated that there were approximately 1,431 housing units in the City in 1970, and 3,123 in 1980, for an increase of 118% during this ten-year period. By 1990, the housing stock had grown to 5,494, increasing the number of dwelling units by 76%.[138] By 1999, the number of dwelling units in the City had increased by only 19% to 6,563,[139] indicating a substantial slowdown in the community's residential growth.

The following table illustrates the types of housing units in the City of Desert Hot Springs in 1999. It is evident that the majority of structures in the community are single family detached dwellings, reflecting the relatively rural character of the community and the number of low density subdivisions in the City.

138 California Department of Finance, January 1, 1999.

139 Ibid.

Table III-41
Housing Characteristics in the
City of Desert Hot Springs - 1999

Unit Type	No. of Units	% of Total
Single Family Detached	3,719	56.7%
Single Family Attached	202	3.0%
Multiple Family Units (2-4)	1,085	16.5%
Multiple Family Units (5+)	1,224	18.7%
Mobile Homes	333	5.1%
Total:	**6,563**	**100%**

Source: California Department of Finance, January 1999.

Desert Hot Springs offers exceptional opportunities for the development of a full range of residential products, from affordable housing to master planned resort developments. Home prices are substantially lower in the City than in other Coachella Valley communities. Many residential areas are located on elevated alluvial fans which provide spectacular and highly marketable views. In 1990, the median housing value in Desert Hot Springs was $74,100.[140] In 1998, the median value of a single family dwelling was $86,500.[141]

Growth Forecasting

The Southern California Association of Governments (SCAG) has developed demographic forecasts designed to assist cities, counties and other agencies in projecting future population and economic trends. SCAG forecasts for the City of Desert Hot Springs are illustrated in the following table, and indicate that the City is expected to experience a relatively steady population increase of about 28% between years 2000 and 2020, and a rather substantial increase in employment of about 85%.

140 1990 U.S. Census of Population and Housing.

141 City of Desert Hot Springs building permit data, as provided in "Community Economic Profile for Desert Hot Springs, Riverside County, California," Riverside County Economic Development Agency, 1998.

Table III-42
Growth Forecasts for the City of Desert Hot Springs
Years 2000-2020

Projection	2000	2005	2010	2015	2020
Population	16,100	17,100	18,100	19,200	20,600
Households	5,700	6,000	6,500	6,900	7,300
Employment	4,700	5,600	6,600	7,800	8,700

Source: Southern California Association of Governments, letter correspondence dated March 1, 2000.

2. Project Impacts

The socio-economic impacts associated with the proposed General Plan are expected to be positive. To help diversify the economy, the City has evaluated a broad range of residential, commercial and industrial development scenarios. Issues examined also include visitor-serving development, including spas, hotels, resort residential development, and other revenue-generating land uses that can benefit from existing and planned infrastructure.

The proposed project has the potential to generate revenues for state, county and local government from a number of sources, most notably property, transient occupancy and sales taxes. The project will also, however, generate additional costs for the provision of general government services. The following discussion addresses the potential fiscal impacts associated with General Plan buildout.

General Plan buildout could potentially result in approximately 63,889 new dwelling units. At the current rate of 2.787 persons per household[142], General Plan buildout could generate an additional 178,058 residents. When combined with the current City population of 15,398 persons[143], the City's population at General Plan buildout could reach about 193,456 persons.

Residential Property Tax Revenues

Buildout of the proposed General Plan is expected to result in the development of approximately of 70,452 dwelling units, 6,563 of which are existing units.[144] The current median housing value in Desert Hot Springs is $86,500.[145] Applying this to the number of existing dwelling units (6,563 units) yields a total residential property value of approximately $567,699,500.

142 California Department of Finance, January 1, 1999.

143 Ibid.

144 Ibid..

145 City of Desert Hot Springs building permit data, as provided in "Community Economic Profile for Desert Hot Springs, Riverside County, California," Riverside County Economic Development Agency, 1998.

Assuming that buildout of future dwelling units will occur over the life of the General Plan, and that the value of the housing stock will rise over time, the median value of future residences is projected to be about $135,000. With 63,889 potential new units to be constructed over the life of the General Plan, the total property value of future dwelling units in the planning area is expected to be approximately $8,625,015,000.

The combined property value of existing and future dwelling units is expected to be about $9,192,714,500. Property taxes are collected annually at a rate of 1% of the property's value, and the City retains 25% of the total property tax. Property taxes collected for all units at General Plan buildout will total about $91,927,145 annually. Of this, the City will retain an estimated $22,981,786 annually.

Commercial Property Tax Revenues

A comparison of typical Coachella Valley commercial construction indicates that community retail structures are valued at approximately $95 per square foot. Buildout of the planning area is expected to result in a total of approximately 9,985,695 square feet of commercial space. This would yield a total land value of about $948,641,025. Total property taxes collected annually on all commercial sites are estimated at $9,486,410. Of this, the City would retain an estimated $2,371,602 annually. It should be noted that these tax revenues will vary based upon the actual value of land, structures and improvements.

Hotel Property Tax Revenues

As described in detail in Section III-A, it is assumed that half (417 acres) of the Visitor-Serving Residential (R-VS) lands designated by the proposed General Plan will be developed as residential uses, and half will be developed as hotel/motel uses. Buildout of the hotel/motel lands at a density of 25 rooms per acre could yield approximately 10,425 rooms. The assessed value for hotel and motel properties, including guest room buildings and all ancillary facilities such as restaurants, swimming pools, spas, and common open space, is conservatively estimated at $60,000 per room. At this rate, hotels and motels in the planning area could result in a total land value of about $625,500,000. Total property taxes collected annually on hotel/motel lands would be approximately $6,255,000. Of this, the City would retain about $1,563,750 annually. Actual revenues will depend future levels of development, and the value of land, structures and improvements at buildout.

Industrial Property Tax Revenues

The proposed General Plan land use plan provides the potential for approximately 37,366,639 square feet of light and medium industrial development. The value of these lands is estimated at about $65 per square foot, including all structural and non-structural site improvements. Buildout of these lands would yield a total value of about $2,428,831,535. Annual property tax revenues from these lands would be approximately $24,288,315, and the City would retain an estimated $6,072,078 annually. Revenues will vary based upon the actual value of land, structures and other improvements, and the level of development which occurs. This estimate does not include property tax revenues derived from lands designated for Energy-Related Industrial development, as the assessed value of wind turbines and associated structures are not generally calculated on a per square foot basis (see discussion below).

Energy-Related Industrial Property Tax Revenues

The proposed Plan provides approximately 1,875 acres for Energy-Related Industrial development, which allows the development of energy-producing industries, including windfarms and photovoltaic arrays. Given the existing patterns of development on these lands, most development is expected to be in the form of Wind Energy Conversion Systems (WECS). For the purposes of this analysis, it is assumed that all Energy-Related Industrial lands will be developed as windfarms.

An analysis of existing windfarm development in Desert Hot Springs indicates that land values are approximately $4,024 per acre. Therefore, the 1,875 acres of Energy-Related Industrial lands designated by the proposed General Plan are expected to have a land value of about $7,545,000.

Wind turbines and other site improvements which are constructed on these lands in the future will contribute further to land values. In general, at least one acre of land is required for each wind turbine.[146] Turbines currently being installed in the Desert Hot Springs area are typically rated between 750-kilowatts and 1.25-megawatts, and initial construction costs are approximately $1 per installed watt.[147]

If a single megawatt turbine is installed on each acre of Energy-Related Industrial designated land, total values for all Energy-Related lands would be about $1,875,000,000. Therefore, the total value of Energy-Related Industrial lands under the proposed General Plan, including both land and structures, would be approximately $1,882,545,000. Of this, the City would retain approximately $4,706,362 annually. This is a conservative estimate that assumes all wind turbines will be installed at 1 megawatt. Turbines installed with greater generating capacity will generate additional revenues.

Sales Tax Revenues

Under the proposed Plan, a total of 128 acres are designated for "Community Commercial" development, which permits larger, community scale shopping centers and malls that may be anchored by several department stores or other large-scale anchors. Assuming 22% lot coverage, buildout of these lands could result in approximately 1,226,650 square feet of commercial space. According to the Urban Land Institute, the average sales volume of tenants in commercial centers of this type is about $224.99 per square foot of gross leasable area.[148] Applying this figure to existing and future community commercial development in the planning area yields an estimated annual sales volume of $275,983,984. Of the 7.75% sales tax levied on taxable goods, one cent of each taxable dollar expenditure is contributed to the City of Desert Hot Springs General Fund. This equates to approximately $2,759,840 in annual sales tax revenues to the City.

The remaining 914 acres of commercial lands are designated for "Neighborhood Commercial" and "General Commercial" development. These lands include neighborhood scale shopping centers conveniently located near residential areas, and a variety of smaller commercial centers, specialty retail shops and personal service businesses.

146 Chris Copeland, Wintec Energy, personal communication, April 10, 2000.

147 Ibid.

148 Table 5-5, "Dollars and Cents of Shopping Centers," Urban Land Institute, 1997.

Assuming 22% lot coverage, buildout of these lands could yield an estimated 8,759,045 square feet of commercial space. The average sales volume of tenants in these commercial centers is $220.69 per square foot of gross leasable area.[149] At this rate, existing and future development on these lands could generate approximately $1,933,033,641 in annual sales. Of this, the City would retain an estimated $19,330,336 annually.

Therefore, buildout of all commercial lands in the planning area could potentially generate annual sales tax revenues of about $22,090,176. This figure is expressed in year 2000 dollars and represents the minimum net revenue gain to the City, assuming that annual incremental increases will be realized from inflation. It also assumes full occupancy of all commercial centers. It is important to note that most, but not all items sold in the planning area will be taxable. Therefore, the above estimate most likely overstates potential revenues. Nonetheless, it provides a useful benchmark by which potential sales tax revenues can be measured.

Transient Occupancy Tax

A substantial portion of City revenues are generated by Transient Occupancy Taxes (TOT), which are derived from hotel and motel room taxes. The City currently has 970 hotel/motel rooms, which are generating annual TOT revenues of approximately $597,620.[150]

As discussed in Section III-A, it is assumed that half of all R-VS lands will be developed as hotel/motel uses. As shown in Table III-2, the Preferred Alternative Land Use Buildout Statistical Summary, there are approximately 307 vacant acres available for future hotel/motel development. At an estimated density of 25 units per acre, buildout of these lands could result in a maximum of 7,675 hotel rooms.

Assuming a room rate of $100 per night, and 65% occupancy, future hotels could generate revenues of approximately $23,725 per room annually. The City retains a 9% TOT tax, which would result in annual revenues of $2,135 per room. TOT revenues generated by 7,675 future hotel rooms could total approximately $16,386,125 annually. When combined with revenues from existing hotel rooms, annual City TOT revenues could reach an estimated $16,983,745.

Motor Vehicle Fees

A sizeable portion of the City's annual revenues come from the State of California in the form of in-lieu motor vehicle license fees. In 1999, these revenues were based on a per capita factor of approximately $34.56 per year.[151] Applying this rate to the anticipated General Plan buildout population of 193,456 residents, the City could potentially generate $6,685,839 annually in revenues associated with motor vehicle fees. This estimate is based on the 1999 per capita factor, and does not account for increases which may occur in the future.

149 Table 6-5, "Dollars and Cents of Shopping Centers," Urban Land Institute, 1997.

150 City of Desert Hot Springs 1999-2000 Annual Budget.

151 Monthly Apportionment of Motor Vehicle License Fees, provided by State of California Controller's Office, Division of Accounting, December 10, 1999.

Business Licenses

The average business license generates about $248 in City revenues.[152] An analysis of existing commercial development in the City indicates that one business license is issued for every 7,057 square feet of commercial development, assuming 22% lot coverage. At this rate, buildout of the proposed General Plan will generate approximately 1,415 business licenses, and annual revenues of about $350,920. This does not include business license revenues from hotels and motels in the planning area or business licenses for those companies conducting business in the City but located elsewhere.

Project-Generated Costs

The City currently budgets $3,989,125 annually for government expenditures, including general administration, parks and recreation, community safety, debt service and other expenses.[153] However, at this level, the City is not able to provide a full level of services to assure a healthy, self-sustaining economy. An increase of about two-thirds of the annual budget is needed to provide an adequate level of public services. An annual budget of approximately $6,620,000 is more representative of the costs necessary to adequately serve the City's current population. On a per capita basis, such a budget would equate to expenditures of about $430 per resident.[154] Buildout of the planning area at moderate densities is expected to generate a total population of approximately 193,456 residents, which could potentially result in expenditures of up to $83,186,080 for public services.

152 Based on FY1997/98 City business license revenues of $105,539 and 425 non-home based commercial business licenses, provided by City on April 12, 2000.

153 p.4, City of Desert Hot Springs 1999-2000 Annual Budget.

154 Based on the City's 1999 population, as provided by California Department of Finance.

Table III-43
Buildout Cost/Revenue Analysis

Item	Annual City Cost ($)	Annual City Revenue ($)
General Administration & Services	$83,186,080	
Residential Property Tax Revenues		$22,981,786
Commercial Property Tax Revenues		$2,371,602
Hotel/Motel Property Tax Revenues		$1,563,750
Industrial Property Tax Revenues		$6,072,078
Energy-Related Industrial Property Tax Revenues		$4,706,362
Sales Tax Revenues		$22,090,176
Transient Occupancy Tax Revenues		$16,983,745
Motor Vehicle Fees		$6,685,839
Business Licenses		$350,920
Subtotal:		$83,806,258
Resulting Annual Positive Cash Flow:	**$620,178**	

Cost/Benefit Analysis
As demonstrated in the table above, the socio-economic impacts associated with the proposed General Plan are expected to be positive. The above analysis is intended to provide a broad overview of projected costs and revenues, and does not include additional revenues which will be derived from other sources, such as development review fees, fines, franchise agreements, and building permits. It is important to note that the City realizes economies of scale with new development and the provision of services, especially in "in-fill" projects surrounded by existing development. The contract for fire protection, for example, will not change based on the addition of one structure per se. The base costs associated with the provision of services remains constant, and the only increase in cost is associated with the added time required to answer calls at new projects, once constructed.

3. Mitigation Measures

The proposed General Plan has been developed to allow the City to maximize its economic development potential, while establishing a balanced economic future. To help diversify the local economy, the City has examined a broad range of commercial, resort-oriented and industrial development scenarios which are intended to optimize existing and planned facilities, services and infrastructure.

A wide range of opportunities should be pursued to develop an independent and solid economic foundation for the City. While the City has been an important provider of affordable housing, a second and retirement home market is emerging and should be further encouraged to broaden the City's revenue base and market appeal.

A wide range of employment and retail opportunities must also be developed to keep residents and their expendable incomes in the community. The City should continue to exploit its hot mineral water resources, and enhance its marketability as a resort-oriented spa hotel community. Other mitigation measures include the following:

A. As a means of enhancing the City's economy, every effort shall be made to broaden the City's tax base by actively soliciting revenue and employment generating development that is compatible and consistent with the City's General Plan.

B. In addition to traditional general commercial development, the City shall pursue economic expansion in the visitor-serving resort sectors, including hotels, spa and golf course resort development, as well as specialty retail and restaurant development.

C. The City shall attempt to limit leakage of taxable sales by attracting appropriate commercial service providers and large retail chains with corresponding market criteria, to the greatest extent practical.

D. The City shall develop and implement an Economic Development Strategy based upon and exploiting the City's comparative economic advantages.

E. The City's Redevelopment Agency shall continue to identify and develop strategies to revitalize blighted areas, and allocate redevelopment funds in an manner which further enhances the City's economic development goals.

F. Coordinating with the Mission Springs Water District and Coachella Valley Water District, the City shall work to maximize the availability of safe and plentiful drinking water, and expanded sewer infrastructure to allow for continued economic development and the protection of the City's precious water resources.

G. Establish and implement strategies that gain and/or expand City access to the Interstate-10 and Highway 62 corridors, and actively promote development of commercial service facilities to capture a share of this drive-by market.

Mitigation Monitoring/Reporting Program

- The City shall develop and implement an Economic Development Strategy that includes enhances and maintains the City's roles as an important commercial center serving the upper Coachella Valley.
  Responsible Parties: Community Development Department, City Council

- The City shall coordinate with the Mission Springs Water District and Coachella Valley Water District to assure sufficient water and sewer infrastructure to enhance economic development opportunities in the community.
  Responsible Parties: Community Development Department, Public Works Department, Mission Springs Water District, Coachella Valley Water District

CITY OF DESERT HOT SPRINGS

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE COMPREHENSIVE GENERAL PLAN

IV. UNAVOIDABLE SIGNIFICANT IMPACTS

Introduction

Unavoidable significant impacts are those which cannot be reduced to acceptable or insignificant levels by the implementation of realistic and feasible mitigation measures (CEQA Guidelines Section 15126.2). The proposed General Plan represents a 2.7% reduction in the number of dwelling units which could conceivably be developed in Desert Hot Springs, when compared to the current General Plan Plan.

Impacts associated with future development are addressed in detail in Section III of this EIR. Comprehensive mitigation and monitoring and reporting programs have been developed to address potential impacts. When considered in concert with the policies, programs and implementation measures set forth in the City Draft General Plan, the mitigation measures set forth herein can demonstrably and effectively reduce potentially significant impacts to levels of insignificance.

A few areas of special concern and sensitivity have been given focused consideration in the development of the General Plan and in the development of mitigation measures. These include impacts on biological resources, water resources, geotechnical hazards and traffic impacts. While the General Plan represents a substantial overall limitation in potential impacts, these sensitive issues are not taken for granted, and each is discussed briefly below.

Biological Resources

Impacts to various species of plants and animals, and their habitats, are addressed throughout the proposed Draft General Plan. In addition to restrictions on mountain and hillside development, as well as other sensitive location of the City, policies and programs throughout the Plan provide a coherent and concerted effort which maximizes the integration of habitat enhancement in private open space areas, floodways, parks and other public lands, and in all aspects of community development.

As a member of the CVAG-coordinated effort to develop the Coachella Valley Multiple Species Habitat Conservation Plan, the City is continuing and extending its role as a responsible steward of biological resources. Through the development and implementation of the subject General Plan and associated EIR, the City continues to demonstrate its ability and willingness to implement federal and other guidelines in the protection of threatened and endangered species.

Water Resources

While the proposed Draft General Plan results in only modest changes in projected impacts to regional groundwater, these limited resources will continue to be placed in an overdraft condition unless additional resources are secured for groundwater recharge (also see Sections III and VIII of this EIR). The continuing efforts of the City, Mission Springs Water District, Coachella Valley Water District and Desert Water Agency to limit the overall and per capita consumption of domestic water is an inherent part of the goals, policies and programs of the Draft General Plan. Plans have been developed to construct a recharge basin at the upper end of the Mission Creek Subbasin serving most of the planning area. Also, the City and Mission Springs Water District have developed and are promoting water-conserving practices, including drought-tolerant landscaping and low water demanding appliances. While the continued draw on these limited resources does not, in the overall, pose a significant impact, the continued overdraft does appear to be unavoidable, at least in the near-term.

Geotechnical Hazards

The City and planning area are subject to a variety of geotechnical forces which may constitute hazards to property and lives. These potential hazards include ground rupture, ground acceleration or shaking, rock falls and landslides, seismic-induces settlement, and wind erosion. Section III-C of this EIR and the geotechnical report prepared for the General Plan[1] address the various potential geotechnical hazards of the planning area. A variety of mitigation measures are set forth in these documents and incorporated into the general Plan to limit the adverse effects associated with identified potential geotechnical hazards. The General Plan and EIR go beyond the delineation of fault hazard areas to include faults that, in the opinion of the consulting geologist, have the potential to serve as the source of an earthquake or to move in sympathy with an earthquake on a nearby fault. In addition to requirements for the preparation of fault hazard and other special studies, the General Plan land use plan acts to limit the exposure of people and property to potential damage due to substantial seismic events. In conjunction with the implementation of the latest versions of the Uniform Building Code, the policies and programs of the general Plan and the mitigation measures set forth in the General Plan are expected to keep potential geotechnical impacts below levels of significance.

1 "Technical Background Report, General Plan Update, City of Desert Hot Springs, Riverside County, California," Earth Consultants International, May 28, 1997.

Traffic and Circulation

The City has prepared the Draft General Plan with a clear goal toward the preservation of roadway capacity and the assurance of a safe and efficient transportation system. The Plan reduces the number of dwelling units which may be built but has increased the amount of commercial lands by approximately 160 acres. These additional commercial lands are located primarily at U.S. Interstate-10 interchanges, at and in the immediate vicinity of the Pierson Boulevard/Highway 62 intersection, and at key nodes along other arterial roadways. The core "village" area located primarily along Palm Drive and portions of Pierson Boulevard are preserved and slightly expanded. It should be further noted that a substantial portion of the traffic expected to be associated with these future commercial centers is either comprised of traffic already on the roadway or provides access along major roadways with substantial design capacity.

The Preferred Alternative land use plan is expected to reduce the total number of trip ends by 322,770 trip-ends per day, or a 21.7%, when compared to buildout of the current General Plan. The General Plan and EIR also set forth a wide range of policies, programs and mitigation measures which are designed to guide future development in a manner that preserves and optimizes roadway capacity. Close consultation with CalTrans and Riverside County will also serve to assure compatible interconnections between jurisdictional systems.

CITY OF DESERT HOT SPRINGS

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE COMPREHENSIVE GENERAL PLAN

V. PROJECT ALTERNATIVES

Introduction

This section of the EIR examines impacts associated with the development of various alternative land use scenarios. Section III of this document contained detailed analysis of the impacts associated with the development of the proposed Preferred Alternative land use scenario. Section III addressed a full range of environmental issues, including traffic and circulation, hydrology, water resources, biological and cultural resources, air quality, noise and public facilities and services. This section addresses the same range of issues as they relate to three project alternatives.

The three alternative land use scenarios addressed in this section include: 1) the No Project Alternative, which represents conditions under the current General Plan, 2) the More Intense Alternative, and 3) the Less Intense Alternative. The potential environmental impacts of each alternative are addressed, and in order to provide a clear comparison of the alternatives, all impacts are analyzed under buildout conditions. The attributes of each alternative are discussed below, and subsequent discussion focuses on the relative impacts of each.

A. No Project Alternative: The Existing Desert Hot Springs General Plan

The No Project Alternative represents the continued implementation of the existing General Plan currently in effect. It also reflects the current Riverside County land use designations on those portions of the planning area not having land use designations assigned by the City. The Plan is best characterized as a being designed to create a low density resort residential community, with the most intense land uses occurring along Palm Drive and Pierson Boulevard. The existing General Plan served as the foundation upon which the Preferred Alternative and two other alternative land use plans were based.

The existing General Plan establishes a residential development pattern that consists of predominantly low density attached and detached single family units within standard subdivisions and planned residential developments. As shown in Table V-1, buildout of the residential component of the Plan is expected to result in approximately 72,422 dwelling units, including those which could be constructed on "Mountainous Area" and "Desert Area" Open Space lands. This analysis is based upon the assumption that existing development within the planning area has not typically occurred at the maximum densities permitted, and that future residential development will continue to occur at low to moderate densities. Specifically, the statistical analysis assumes the following:

- Development on Riverside County 3B Residential lands will typically occur at densities of 0.3 du/ac
- Development on County 3A Residential lands is expected to generate an average of 2 du/ac
- Development on County 2B Residential lands will typically yield 3.5 du/ac
- Low Density Residential (R-L) lands are expected to result in an average of 3.5 du/ac
- Medium Density Residential (R-M) development will typically yield 6 du/ac
- High Density Residential (R-H) development is expected to result in 12 du/ac
- Residential development on Visitor Serving lands (V-S) is expected to occur at an average of 8 du/ac

Of all residential development, approximately 71% is expected to be in the 0 to 5 units per acre range, and the remaining 29% is expected to be in the 6 to 14 units per acre range. The total number of dwelling units that can be accommodated by the existing General Plan represents about 1,970 (or about 2.7%) more units than can be accommodated by buildout of the Preferred Alternative. The current General Plan does not include a land use category dedicated solely to the development of mobile homes, as does the Preferred Alternative.

Like the Preferred Alternative, the current General Plan includes a Visitor-Serving (V-S) land use designation. This designation is divided into four subcategories; one subcategory permits spa/hotel/motel development only, while the other three permit a combination of hotel/motel uses and residential development. The current General Plan can accommodate approximately 7,595 hotel/motel rooms at buildout. This represents 1,050 (or about 12%) fewer rooms than can be accommodated by buildout of the Preferred Alternative.

The current General Plan includes one commercial land use designation. Buildout of the current General Plan would result in the development of approximately 882 acres, or about 8,452,382 square feet, of commercial development (assuming 22% lot coverage). This represents 160 (15%) fewer acres, and 1,533,313 (15%) fewer square feet than can be accommodated by buildout of the Preferred Alternative.

Under the current General Plan, industrial lands comprise 2,554 acres, or about 42% fewer acres than provided under the Preferred Alternative. The current General Plan includes only one industrial land use designation for City lands, and unincorporated lands in the planning area are covered under the County's Industrial/Manufacturing designation. This category has been expanded under the Preferred Alternative to include Light and Medium Industrial development, and a category specifically dedicated to Energy-Related Industrial development.

Under the current General Plan, public and quasi-public lands comprise approximately 3,576 acres of schools, post offices, City Hall, libraries and other institutional lands. These lands continue to be designated as public and quasi-public lands under the Preferred Alternative. The Preferred Alternative also assigns this land use designation to new schools, parks and other public facility sites which have been developed since implementation of the existing General Plan. The public and quasi-public land use designation, and the uses permitted therein, are largely the same under both the existing and Preferred General Plans, with one exception. Under the existing General Plan, lands owned by the Bureau of Land Management (BLM) in the extreme western portion of the planning area are designated as Public/Quasi-Public lands. In the Preferred Alternative, however, these lands are included in the Open Space/Mountain Reserve category to more accurately reflect their importance as a natural resource. For this reason, the existing General Plan appears to provide substantially more public/quasi-public space than the Preferred Alternative.

Open Space categories comprise the largest land use designation under all of the General Plan alternatives. The current General Plan includes approximately 8,869 acres of open space, including mountainous and desert areas, water resources, parks and forests, and recreational open space. This represents about 6% more acres of open space than provided under the Preferred Alternative. While the current General Plan assigns Open Space/Desert Area designations to lands in the southwestern portion of the planning area, the Preferred Alternative assigns Energy-Related Industrial designations to these lands to reflect existing windfarm development. Exhibit V-1 illustrates the land use configuration provided under the current General Plan, and Table V-1 quantifies its development potential.

Table V-1
Current General Plan
Land Use Buildout Statistical Summary

Land Use	Total Acres	Dev. Acres	Exist. Units	Vacant Acres	Potential Units	Bldout Units
3B Residential (0.2-0.4 du/ac)	1,394	106		1,288	515	
3A Residential (0.4-2 du/ac)	1,097	104		993	1,986	
2B Residential (2-5 du/ac)	3,757	435	4,254*	3,322	11,627	50,683
R-L Low Density Resid. (0-5 du/ac)	12,161	2,932		9,229	32,301	
R-M Medium Density Resid. (6-8 du/ac)	672	272		400	2,400	
R-H High Density Resid. (9-14 du/ac)	1,330	113	2,309**	1,217	14,604	19,313
V-S Visitor Serving	669	172				
• Residential (0-14 du/ac)				232	1,856	1,856
• Spas/Hotels/Motels (25 rooms/ac)			[970]	265	[6,625]	[7,595]
Residential Subtotal	21,080	4,134	6,563[1]	16,946	65,289[1]	71,852[1]

	Total Acres	Dev. Acres	Vacant Acres	Existing Sq.Ft.	Future Sq.Ft.	Total Sq.Ft.
C Commercial	882	217	665	2,079,554	6,372,828	8,452,382
I Industrial	990	39	951	577,606	14,084,690	14,662,296
M Industrial/Manufacturing	1,564	110	1,454	1,629,144	21,534,322	23,163,466
Industrial Subtotal	2,554	149	2,405	2,206,750	35,619,012	37,825,762
P Public/Quasi-Public	3,576	575	3,001	—	—	—

	Total Acres	Dev. Acres	Vacant Acres			Bldout Units
MR Mountainous Area (1 du/10 ac)	3,330	318	3,012	—	301	301
DA Desert Area (1 du/10 ac)	3,734	1,043	2,691	—	269	269
W Water Resources	54	1	53	—	—	—
Parks/Forests	184	0	184	—	—	—
OS/R Open Space and Recreation	957	21	936	—	—	—
OS/PV Private Open Space	487	0	487	—	—	—
OS/PP Parks Open Space	123	0	123	—	—	—
Open Space Subtotal	8,869	1,383	7,486	—	570	570
Total	**36,961**	**6,458**	**30,503**	**—**	**65,859[1]**	**72,422[1]**

* Includes attached and detached single family housing units and mobilehomes, as categorized by CA Dept. of Finance, 1999.
** Includes multi-family housing units from two to five-plus, as categorized by CA Dept. of Finance, 1999.

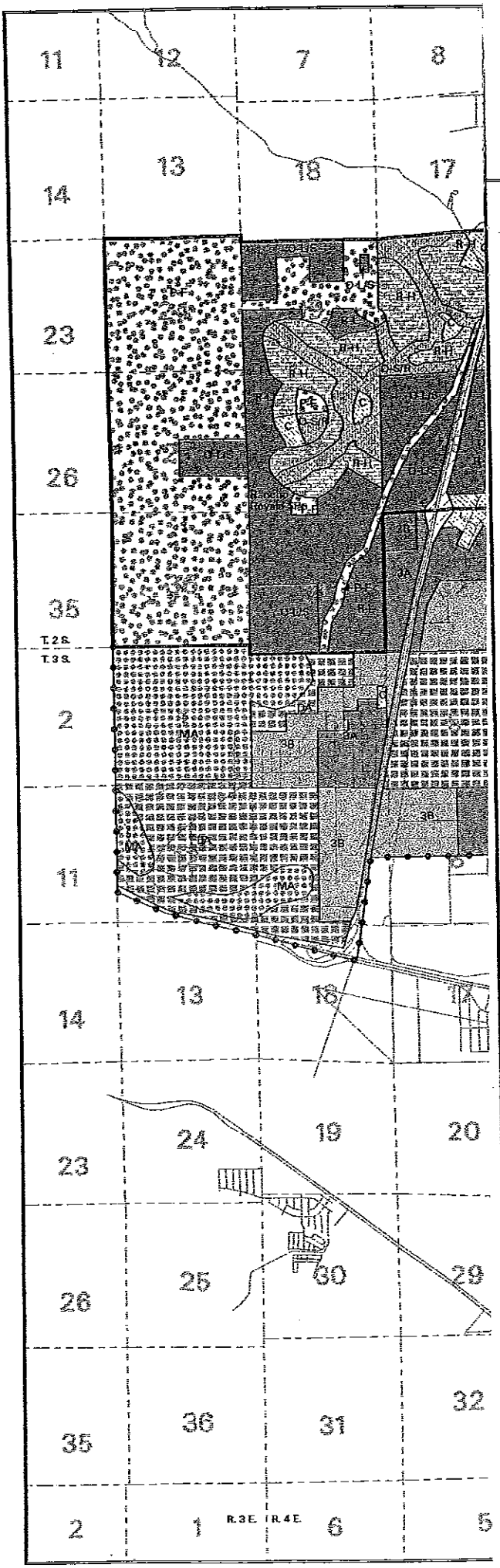
[1] Includes residential dwelling units only; does not include spa/hotel/motel rooms.

B. Alternative I: More Intense Development Scenario

Alternative I represents a more intense development scenario than the Preferred Alternative. The land use configuration for this alternative is illustrated on Exhibit V-2. The land use summary table is provided in Table V-2.

The overall land use pattern established in the More Intense Alternative is similar to those established by the current General Plan and the Preferred Alternative. Compared to the Preferred Alternative, Alternative I results in a reduction of 329 acres available for residential development. However, it provides for an increase in medium and high density residential development, and at buildout, could result in the development of approximately 2,406 more multi-family dwelling units than the Preferred Alternative. Overall, buildout of Alternative I could result in approximately 2,199 dwelling units, or 3.1% more units than the Preferred Alternative.

Alternative I also provides for an increase in the amount of commercial lands of about 465 acres. The majority of additional General Commercial lands are located at the Palm Drive/Interstate-10 interchange, and at the intersection of Pierson Boulevard and State Highway 62. Alternative I also provides for a limited reduction (127 acres) in industrial designated lands, which are replaced with commercial lands at the intersection of Dillon Road and Indian Avenue and at the Palm Drive/Interstate-10 interchange. Public, quasi-public and open space lands remain largely the same as those designated under the Preferred Alternative.



Desert Hot Springs General Plan
(Existing)

LEGEND

- General Plan Designation Boundaries
- Roads
- Township/Range Sections
- Railroads
- City Limits
- City Sphere of Influence
- 3B - 0.2-0.4 du/ac (5-2.5 ac. min.)
- 3A - 0.4-2 du/ac (2.5-.5 ac. min.)
- 2B - 2-5 du/ac
  O-L/S - Low Density Residential Specific Plan Required
  R-L - Low Density residential (0-5 du/ac)
  R-L (1/2.5)
  R-L/S
  R-L/SP
- R-M - Medium Density Redsidential (6-8 du/ac)
- R-H - High Density Residential (9-14 du/ac)
- V-S - Spa/Visitor Serving Commercial
  R-S - Resort Spa
  S - Spa
  H-S - Hotel/Spa
- C - Commercial
- I - Industrial
- M - Industrial/Manufacturing
- P-F - Public Facilities
  CC-PF - Civic Center/Public Facilities
  P/PO - Post Office
- O-S/R - Open Space and Recreation
  OS/PP - Parks Open Space
  PARKS/FORESTS
- OS/PV - Private Open Space
- DA - Desert Area
- MA - Mountainous Areas
- D-R/S - Designation Resort/Spa Specific Plan Req'd.
- W - Water
- T - Transportation

Scale
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0 4,000 8,000 12,000
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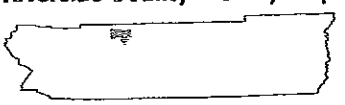
Riverside County Vicinity Map



Map Prepared on: March 30, 2000
Map Prepared by: Aerial Information Systems
Map Version No.: 2

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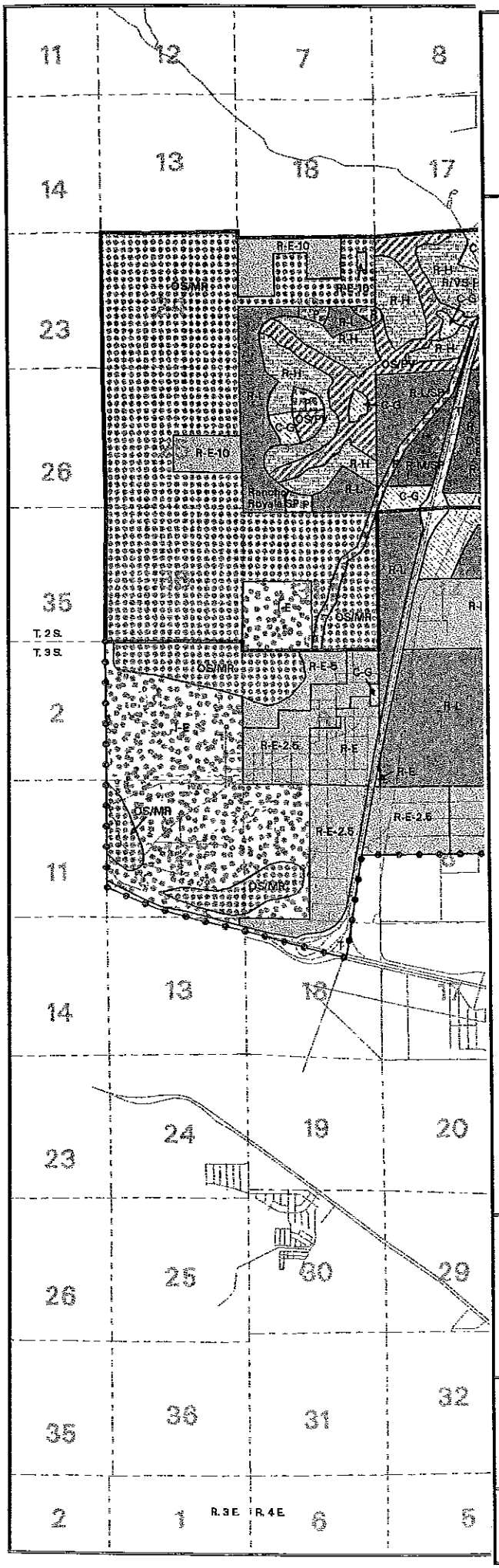

Desert Hot Springs General Plan
(More Intense Alternative)

LEGEND

- General Plan Designation Boundaries
- Roads
- Township/Range Sections
- Railroads
- City Limits
- City Sphere of Influence
- R-E Residential Estates (0-1 du/Varies ac)
  - R-E-10
  - R-E-5
  - R-E-2.5
  - R-E/SP
- R-L Residential Low Density (0-5 du/ac)
  - R-L/SP
- R-M Residential Medium Density (0-8 du/ac)
  - R-M/SP
- R-MH Residential Mobile Home (0-10 du/ac)
- R-H Residential High Density (0-14 du/ac)
- R/VS-L Residential Visitor Serving (Low Density)
- R/VS-M Residential Visitor Serving (Medium Density)
  - V-S-M
- R/VS-H Residential Visitor Serving (High Density)
- C-N Neighborhood Commercial
- C-C Community Commercial
- C-G General Commercial
- I-L Light Industrial
- I-M Medium Industrial
- I-E Industrial Energy-Related
- P Public Uses (Institutional)
  - P/F (Fire Station)
  - P/S (School)
  - P/PO (Post Office)
  - P/U (Utility)
- OS/MR Mountain Reserve
- OS/PP Parks Open Space
- OS/PV Private Open Space
- OS/FW Flood Ways
- T Transportation

Scale
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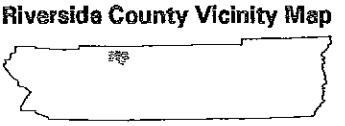
Feet

NORTH

Riverside County Vicinity Map



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Map Prepared by: Aerial Information Systems
Map Version No.: 2

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Table V-2
More Intense Alternative - Land Use Buildout Statistical Summary

Land Use	Total Acres	Dev. Acres	Exist. Units	Vacant Acres	Potential Units	Bldout Units
R-E Residential Estates (0-1 du/ac)	1,121	97		1,024	1,024	
R-E Residential Estates (0-1 du/2.5 ac)	1,122	148		974	389	
R-E Residential Estates (0-1 du/5 ac)	102	0		102	20	
R-E Residential Estates (0-1 du/10ac)	719	3	3,921*	716	71	48,223
R-L Low Density (0-5 du/ac)	15,209	3,185		12,024	42,084	
R-VSL Vis. Serv. Low (0-5 du/ac)	261	57		204	714	
R-M Medium Density (0-8 du/ac)	868	213		655	3,602	
R-VSM Vis. Serv. Med. (0-8 du/ac)	74	31	2,309**	43	236	21,675
R-H High Density (0-14 du/ac)	1,329	114		1,215	14,580	
R-VSH Vis. Serv. High (0-14 du/ac)	82	3		79	948	
R-MH Mobilehome (0-10 du/ac)	517	275	333	242	2,420	2,753
R-VS Hotel/Motel Rooms (25 rooms/ac)	417	91	[970]	326	[8,150]	[9,120]
Residential Subtotal	21,821	4,217	6,563[1]	17,604	66,088[1]	72,651[1]

	Total Acres	Dev. Acres	Vacant Acres	Existing Sq.Ft.	Future Sq.Ft.	Total Sq.Ft.
C-N Neighborhood Commercial	72	29	43	277,913	412,078	689,991
C-C Community Commercial	159	14	145	134,165	1,389,564	1,523,729
C-G General Commercial	1,276	194	1,082	1,859,141	10,369,022	12,228,163
Commercial Subtotal	1,507	237	1,270	2,271,219	12,170,664	14,441,883
I-L Light Industrial	838	22	816	325,829	12,085,286	12,411,115
I-M Medium Industrial	1,558	112	1,446	1,658,765	21,415,838	23,074,603
I-E Energy-Related Industrial	1,875	906	969	—	—	—
Industrial Subtotal	4,271	1,040	3,231	1,984,594	33,501,124	35,485,718
P Public/Quasi-Public	1,008	581	427	–	–	–
OS-MR Mountain Reserve	5,316	67	5,249	–	–	–
OS-PP Public Parks	223	22	201	–	–	–
OS-PV Private Open Space	1,204	42	1,162	–	–	–
OS-FW Floodways	1,608	214	1,394	–	–	–
Open Space Subtotal	8,351	345	8,006	–	–	–
Total	**36,959**	**6,713**	**30,246**			

* Includes attached and detached single family housing units, as categorized by the CA Dept. of Finance, 1999.

** Includes multi-family housing units from two to five-plus, as categorized by CA Dept. of Finance, 1999.

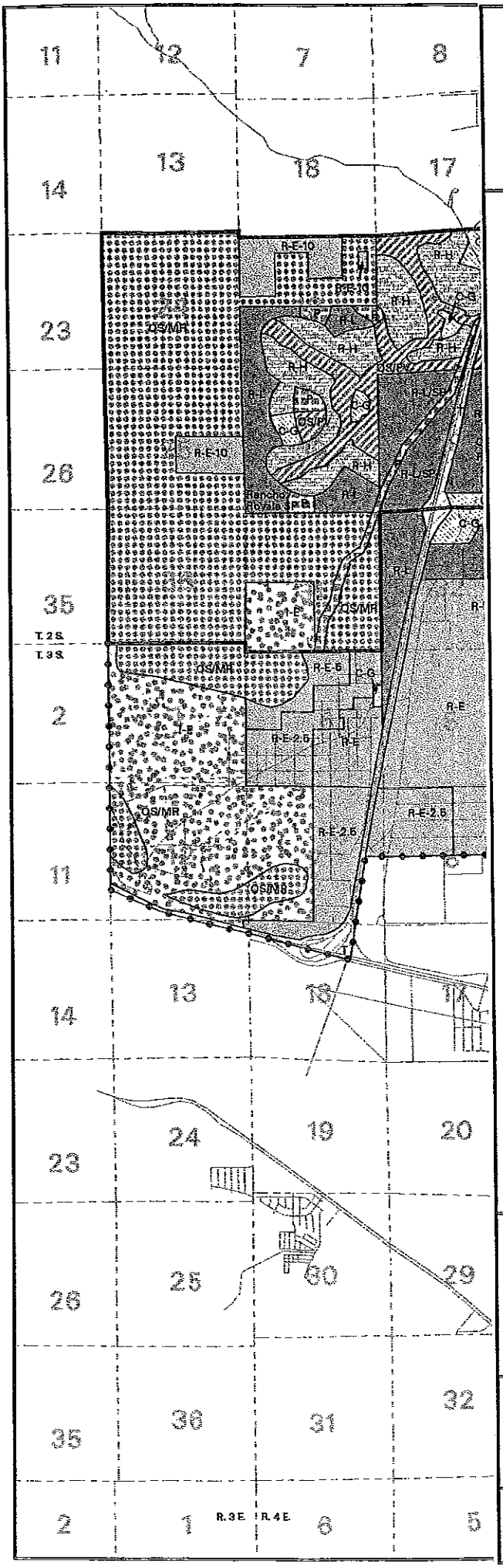
[1] Includes residential dwelling units only; does not include hotel/motel rooms.

C. Alternative II: Less Intense Development Scenario

Alternative II describes a land use configuration that results in increases in residential acreage, but an overall reduction in the potential number of dwelling units. This alternative provides for approximately 175 more residential acres than the Preferred Alternative. However, these lands are generally designated for lower density development, and therefore, can accommodate approximately 6,630 fewer units (9.4% less) than the Preferred Alternative.

Buildout of Alternative II also results in a reduction of 175 acres of commercial development, with most of these reductions occurring in the Community Commercial and General Commercial classifications at the following locations: Palm Drive/Interstate-10 interchange, the intersection of Indian Avenue and Pierson Boulevard, and the intersection of State Highway 62 and Pierson Boulevard. Industrial, Public/Quasi-Public, and Open Space lands remain unchanged under Alternative II.

The land use pattern associated with Alternative II is illustrated on Exhibit V-3, and a buildout land use summary is provided in Table V-3.



Desert Hot Springs General Plan
(Less Intense Alternative)

LEGEND

- General Plan Designation Boundaries
- Roads
- Township/Range Sections
- Railroads
- City Limits
- City Sphere of Influence
- R-E Residential Estates (0-1 du/Varies ac)
  R-E-10
  R-E-5
  R-E-2.5
  R-E/SP
- R-L Residential Low Density (0-3 du/ac)
  R-L/SP
- R-M Residential Medium Density (0-6 du/ac)
  R-M/SP
- R-MH Residential Mobile Home (0-10 du/ac)
- R-H Residential High Density (0-10 du/ac)
- R/VS-L Residential Visitor Serving (Low Density)
- R/VS-M Residential Visitor Serving (Medium Density)
  V-S-M
- R/VS-H Residential Visitor Serving (High Density)
- C-N Neighborhood Commercial
- C-C Community Commercial
- C-G General Commercial
- I-L Light Industrial
- I-M Medium Industrial
- I-E Industrial Energy-Related
- P Public Uses (Institutional)
  P/F (Fire Station)
  P/S (School)
  P/PO (Post Office)
  P/U (Utility)
- OS/MR Mountain Reserve
- OS/PP Parks Open Space
- OS/PV Private Open Space
- OS/FW Flood Ways
- T Transportation

Scale
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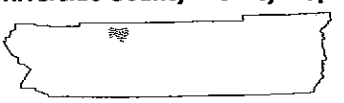
Feet

NORTH

Riverside County Vicinity Map



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Map Version No.: 2

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Table V-3
Less Intense Alternative - Land Use Buildout Statistical Summary

Land Use	Total Acres	Dev. Acres	Exist. Units	Vacant Acres	Potential Units	Bldout Units
R-E Residential Estates (0-1 du/ac)	4,504	442		4,062	4,062	
R-E Residential Estates (0-1 du/2.5 ac)	1,920	216		1,704	681	
R-E Residential Estates (0-1 du/5 ac)	102	0		102	20	
R-E Residential Estates (0-1 du/10ac)	719	3	3,921*	716	71	41,308
R-L Low Density (0-5 du/ac)	11,871	2,774		9,097	31,839	
R-VSL Vis. Serv. Low (0-5 du/ac)	261	57		204	714	
R-M Medium Density (0-8 du/ac)	528	221		307	1,688	
R-VSM Vis. Serv. Med. (0-8 du/ac)	74	31	2,309**	43	236	19,761
R-H High Density (0-14 du/ac)	1,329	114		1,215	14,580	
R-VSH Vis. Serv. High (0-14 du/ac)	82	3		79	948	
R-MH Mobilehome (0-10 du/ac)	517	275	333	242	2,420	2,753
R-VS Hotel/Motel Rooms (25 rooms/ac)	417	91	[970]	326	[8,150]	[9,120]
Residential Subtotal	22,325	4,226	6,563[1]	18,099	57,259[1]	63,822[1]

	Total Acres	Dev. Acres	Vacant Acres	Existing Sq.Ft.	Future Sq.Ft.	Total Sq.Ft.
C-N Neighborhood Commercial	72	29	43	277,913	412,078	689,991
C-C Community Commercial	76	14	62	134,165	594,158	728,323
C-G General Commercial	719	170	549	1,629,144	5,261,177	6,890,321
Commercial Subtotal	867	213	654	2,041,222	6,267,413	8,308,635
I-L Light Industrial	900	31	869	459,122	12,870,238	13,329,360
I-M Medium Industrial	1,623	116	1,507	1,718,006	22,319,273	24,037,279
I-E Energy-Related Industrial	1,875	906	969	—	—	—
Industrial Subtotal	4,398	1,053	3,345	2,177,128	35,189,511	37,366,639
P Public/Quasi-Public	1,008	581	427	–	–	–
OS-MR Mountain Reserve	5,316	67	5,249	–	–	–
OS-PP Public Parks	223	22	201	–	–	–
OS-PV Private Open Space	1,204	42	1,162	–	–	–
OS-FW Floodways	1,617	214	1,403	–	–	–
Open Space Subtotal	8,360	345	8,015	–	–	–
Total	**36,958**	**6,418**	**30,540**			

* Includes attached and detached single family housing units, as categorized by the CA Dept. of Finance, 1999.

** Includes multi-family housing units from two to five-plus, as categorized by CA Dept. of Finance, 1999.

[1] Includes residential dwelling units only; does not include hotel/motel rooms.

D. Land Use, Environmental and Service Impacts

The environmental and service issues discussed below are the same as those discussed in association with the Preferred Alternative in Section III. The following discussions address the potentially significant impacts associated with each of the three project alternatives. By comparing the land use allocations of each of the land use scenarios, a logical prediction of the impacts associated with alternative can be made. Each alternative is compared to and measured against the project impacts that would result from buildout of the Preferred Alternative.

Land Use

No Project Alternative
Buildout of the current General Plan (No Project Alternative) is expected to result in the development of 1,970 dwelling units (2.7%) more than buildout of the Preferred Alternative. As shown in Table V-I, buildout of the current General Plan will provide for about 160 fewer acres (15% reduction) of commercial development than the Preferred Alternative.

Potential industrial development under the current General Plan is substantially less than the Preferred Alternative, and accounts for approximately 1,844 fewer acres (or 42%) than the Preferred Alternative. The current General Plan provides more Public/Quasi-Public lands than the Preferred Alternative. However, a substantial portion of these lands which occur within the foothills of the San Bernardino Mountains have been proposed as Mountainous Open Space in the Preferred Alternative, to more appropriately reflect their value as an important scenic and environmental resource.

In summary, the Preferred Alternative, when compared to the current General Plan, represents a low to moderate decrease in residential development, a moderate increase in commercial development, and a significant increase in industrial development.

Alternative I
Buildout of the somewhat more intensive Alternative I development scenario is expected to result in the development of about 2,199 dwelling units more than the Preferred Alternative, or a 3.1% increase in the number of units. It is expected to result in a slight decrease in single-family dwelling units, but a moderate increase in the number of multi-family units.

Buildout of Alternative I is also expected to result in a rather substantial increase in commercial acreage of about 465 acres, or 45% more than is expected under the Preferred Alternative. Potential industrial development represents a minor decrease of about 127 acres, or 3%, than that associated with buildout of the Preferred Alternative. Public, quasi-public and open space land use categories are essentially unchanged between the two alternatives.

In summary, the Preferred Alternative represents a minor decrease in residential development, a moderate to substantial decrease in commercial development, and a minor increase in industrial development potential, when compared to Alternative I.

Alternative II

Although the Less Intense Alternative II development scenario results in an overall increase in residential acreage (approximately 175 more acres or 0.8% more than the Preferred Alternative), it results in a substantial decrease in the anticipated number of dwelling units. Buildout of Alternative II results in the development of about 6,630 fewer dwelling units than the maximum projected for the Preferred Alternative, or a 9.4% decrease in the number of units. Its buildout also results in a substantial reduction in the level of potential commercial development by about 175 acres, or 17%. Potential industrial development and other land use categories remain unchanged between the two project alternatives.

In summary, when compared to Alternative II, the Preferred Alternative represents a slight decrease in residential acreage, but a substantial increase in the potential number of dwelling units as well as potential commercial development.

Traffic/Circulation

No Project Alternative

As described in the technical circulation report included in the appendices of this document[1], the No Project Alternative is projected to generate approximately 1,811,540 trip-ends per day. When compared to the Preferred Alternative, this equates to 322,770 more trip-ends per day, or a 21.7% increase over the number of trips generated by the Preferred Alternative. This constitutes a substantial increase in overall traffic impacts, and is largely attributed to increases in commercial development along major arterial roadways. This alternative represents the most significant impact to the circulation system with regard to trip generation.

Despite the fact that buildout of the current General Plan will result in the highest trip generation of all the project alternatives, it is projected to result in slightly better Levels-of-Service along modeled roadways. This is primarily because computerized traffic modeling generates traffic volumes by matching origins and destinations by trip type, and productions (residential trips) are matched to attractions (commercial uses). If there are a greater number of attractions than productions, the extra attractions are ignored by the traffic model and do not generate any traffic. Of all the project alternatives, the current General Plan has the fewest residential units and the second lowest residential trip generation, but has the highest commercial trip generation. Therefore, even though this alternative results in the highest trip generation rates, its distribution of land uses causes it to result in comparatively low traffic volumes and improved Levels-of-Service.

1 "Desert Hot Springs General Plan Update Circulation Background Study," prepared by Endo Engineering, March 2000.

The No Project alternative is expected to result in three links functioning at LOS E, rather than nine links as would occur at buildout of the Preferred Alternative. All other links are expected to function at LOS D or better under both project alternatives. The mitigation measures recommended in Section III are appropriate for the No Project alternative. To further mitigate potential traffic impacts on roadway links functioning at LOS E, adequate right-of-way should be maintained to allow for additional turning lanes and approach lanes at major intersections with roadway links projected to operate at LOS E.

Alternative I

This alternative is expected to generate approximately 1,754,460 trip-ends per day.[2] This represents an increase of 265,690 trip-ends per day, or about 17.8% over the Preferred Alternative. This substantial increase is primarily the result of an increase in potential commercial development, and to a lesser extent, an increase in single-family residential development.

This alternative represents the most significant impact on the circulation system with regard to daily Levels-of-Service on local and regional roadways. It is projected to result in ten links operating at LOS E, which are similar to the nine links projected to operate at LOS E under the Preferred Alternative. Alternative I is the only alternative under which 20th Avenue, west of Little Morongo Road, is projected to operate at LOS E on a daily basis. The mitigation measures recommended in Section III, as well as that described above for the No Project Alternative, are expected to be appropriate for this alternative.

Alternative II

Alternative II appears to be the superior project alternative with regard to traffic and circulation impacts. It is expected to generate approximately 1,271,210 trip-ends per day[3], which represents a decrease of 217,560 trip-ends per day, or about 14.6%, over the Preferred Alternative. This substantial decrease can be attributed to a decrease in the potential number of single-family dwelling units and potential commercial development. Under this land use scenario, only two roadway links are projected to operate at LOS E, including Interstate-10 east of Palm Drive, and Palm Drive south of Varner Road. All other links are expected to function at LOS D or better. It is assumed that the same roadway improvements and classifications proposed under the Preferred Alternative in Section III will also occur under this alternative.

Projected impacts associated with buildout of each of the alternatives are illustrated in Table V-4 below.

2 Ibid.

3 ibid.

Table V-4
Comparison of Traffic Impacts
for Each Project Alternative

Roadway Link	Preferred V/C	Preferred LOS	No Project V/C	No Project LOS	Alt. I V/C	Alt. I LOS	Alt. II V/C	Alt. II LOS
Mission Lakes Blvd.								
e/o State Route 62	0.38	B	0.43	B	0.39	B	0.38	B
e/o Indian Avenue	0.50	B	0.43	B	0.46	B	0.43	B
w/o West Drive	0.42	B	0.41	B	0.42	B	0.39	B
w/o Palm Drive	0.42	B	0.44	B	0.45	B	0.42	B
Eighth Street								
e/o Palm Drive	0.34	A	0.35	A	0.42	A	0.34	A
Pierson Boulevard								
e/o State Route 62	0.53	B	0.51	B	0.54	B	0.51	B
w/o Indian Avenue	0.95	D	0.91	D	0.92	D	0.84	D
e/o Indian Avenue	0.91	D	0.89	D	0.88	D	0.83	D
e/o Little Morongo Rd.	0.65	C	0.66	C	0.65	C	0.62	C
e/o Palm Drive	0.80	D	0.85	D	0.81	D	0.75	C
w/o Miracle Hill Rd.	0.75	C	0.77	C	0.78	C	0.68	C
Desert View Avenue								
w/o Mountain View Rd.	0.45	B	0.44	B	0.48	B	0.44	B
Hacienda Boulevard								
e/o Indian Avenue	0.42	B	0.45	B	0.48	B	0.46	B
w/o Palm Drive	0.55	B	0.54	B	0.52	B	0.44	B
e/o Palm Drive	0.33	A	0.36	A	0.38	A	0.28	A
w/o Mountain View Rd.	0.67	C	0.72	C	0.69	C	0.57	B
e/o Mountain View Rd.	1.11	E	1.15	E	1.12	E	0.97	D
w/o City Limits	0.78	C	.0.76	C	0.79	C	0.62	C
Two Bunch Palms Trl.								
w/o Indian Avenue	0.70	C	0.51	B	0.94	D	0.57	B
w/o Palm Drive	0.48	B	0.48	B	0.45	B	0.46	B
e/o Palm Drive	0.27	A	0.36	A	0.27	A	0.24	A
Dillon Road								
e/o State Route 62	0.69	C	0.64	C	0.69	C	0.60	C
w/o Indian Avenue	0.69	C	0.66	C	0.79	D	0.73	C
w/o Palm Drive	0.88	D	0.85	D	0.93	D	0.77	C
w/o Mountain View Rd.	0.88	D	0.75	C	0.81	D	0.69	C
e/o Mountain View Rd.	1.02	E	0.95	D	1.02	E	0.94	D
e/o Long Canyon Rd.	0.89	D	0.91	D	0.89	D	0.89	D
20th Avenue								
w/o Little Morongo Rd.	0.98	D	0.99	D	1.04	E	0.93	D

Roadway Link	Preferred V/C	LOS	No Project V/C	LOS	Alt. I V/C	LOS	Alt. II V/C	LOS
20th Avenue								
w/o Palm Drive	0.68	C	0.80	D	0.73	C	0.66	C
e/o Palm Drive	0.76	C	0.71	C	0.76	C	0.71	C
w/o Mountain View Rd.	0.55	C	0.77	C	0.70	C	0.68	C
Varner Road								
w/o Palm Drive	0.43	B	0.59	C	0.50	B	0.47	B
e/o Palm Drive	0.46	B	0.36	B	0.51	B	0.39	B
e/o Mountain View Rd.	1.02	E	0.90	D	1.00	E	0.96	D
Interstate 10								
e/o State Route 62	0.61	B	0.62	B	0.62	B	0.61	B
e/o Indian Avenue	0.73	C	0.70	C	0.74	C	0.73	C
w/o Palm Drive	0.97	D	0.90	D	0.98	D	0.94	D
e/o Palm Drive	1.07	E	0.96	D	1.06	E	1.03	E
State Route 62								
n/o Pierson Blvd.	0.38	A	0.36	A	0.39	A	0.38	A
n/o Two Bunch Palms Trl.	0.63	B	0.62	B	0.63	B	0.64	B
n/o Dillon Road	0.67	B	0.63	B	0.67	B	0.65	B
Worsley Road								
n/o Pierson Blvd.	0.35	B	0.35	B	0.34	B	0.34	B
n/o Dillon Road	0.83	D	0.75	C	0.87	D	0.76	C
Indian Avenue								
n/o Mission Lakes Blvd.	0.34	B	0.34	B	0.33	B	0.35	B
n/o Pierson Blvd.	0.39	B	0.38	B	0.37	B	0.39	B
n/o Dillon Road	0.79	D	0.73	C	0.76	C	0.73	C
n/o 20th Avenue	0.82	D	0.73	C	0.85	D	0.80	D
Little Morongo Road								
n/o Pierson Blvd.	0.54	B	0.51	B	0.50	B	0.50	B
n/o Hacienda Avenue	0.95	D	0.94	D	0.94	D	0.93	D
s/o Two Bunch Palms Trl.	0.82	D	0.78	C	0.81	D	0.78	C
n/o Dillon Road	0.90	D	0.81	D	0.85	D	0.78	C
s/o 20th Avenue	1.03	E	1.01	E	1.01	E	0.98	D
West Drive								
s/o Pierson Blvd.	0.30	A	0.19	A	0.23	A	0.20	A
Palm Drive								
n/o Hacienda Avenue	0.66	C	0.62	C	0.66	C	0.65	C
n/o Two Bunch Palms Trl.	0.66	C	0.54	B	0.62	C	0.59	C
s/o Two Bunch Palms Trl.	1.04	E	0.91	D	0.99	D	0.94	D
s/o Dillon Road	0.76	C	0.71	C	0.81	D	0.76	C
s/o 20th Avenue	1.04	E	0.83	D	1.01	E	0.95	D

Roadway Link	Preferred V/C	LOS	No Project V/C	LOS	Alt. I V/C	LOS	Alt. II V/C	LOS
Palm Drive								
s/o Varner Road	1.10	E	0.99	D	1.10	E	1.05	E
Verbena Drive								
n/o Hacienda Avenue	0.38	A	0.44	B	0.35	A	0.35	A
Miracle Hill Road								
s/o Pierson Blvd.	0.49	B	0.56	B	0.52	B	0.46	B
Bubbling Wells Road								
s/o Dillon Road	0.85	D	0.45	B	0.60	C	0.57	B
Mountain View Road								
n/o Hacienda Avenue	0.55	B	0.52	B	0.57	B	0.49	B
n/o Dillon Road	0.87	D	0.85	D	0.90	D	0.68	C
s/o Dillon Road	0.77	C	0.74	C	0.81	D	0.72	C
n/o Varner Road	0.86	D	0.75	C	0.86	D	0.81	D
Long Canyon Road								
s/o Hacienda Avenue	0.55	B	0.45	B	0.49	B	0.44	B
n/o Dillon Road	1.04	E	0.85	D	1.04	E	0.82	D

Source: "Desert Hot Springs General Plan Update Circulation Background Study," prepared by Endo Engineering, March 2000.

Soils and Geology

The City of Desert Hot Springs is located within a seismically active region that is expected to be exposed to significant groundshaking and other geotechnical forces. Portions of the planning area may also be susceptible to wind hazards, seismically induced settlement, rockfall and landslides. While the four land use scenarios differ in varying degrees in the intensity of development, none proposes development in areas which increase exposure to an unmitigatable geologic threat beyond that already identified in Section III. The risk to life and property can be expected to be proportional to the intensity of development occurring within geotechnically unstable areas. In all alternatives, lands immediately adjacent to rocky slopes of the San Bernardino and Little San Bernardino Mountains are largely reserved as open space to limit potential hazards associated with rockfall and landslides.

Although each of the project alternatives facilitates potential development in the vicinity of the Banning and Mission Creek Faults, development proposals in these areas will be required to conduct fault investigations that follow Alquist-Priolo Fault Zoning Act guidelines, and shall be designed in accordance with the most recently adopted editions of the Uniform Building Code and seismic design parameters of the Structural Engineers' Association of California. Regardless the alternative implemented, these and other mitigation measures set forth in

Section III of this document are expected to mitigate potential geotechnical impacts associated with construction of all structures. Detailed geotechnical and engineering analysis would be performed prior to development under all alternatives.

Alternative II, the Less Intense Alternative, facilitates the least amount of development, and therefore is expected to expose the fewest number of people and structures to potential seismic and geologic hazards. However, potential impacts from geologic and seismic hazards appear to comparable for each project alternative, since the same construction techniques and building code requirements would be imposed on all proposed developments.

Hydrology

Given the extreme aridity of the Coachella Valley and its relative isolation from moist coastal air masses, the region experiences extremely low mean annual rainfall, which ranges from about 3 to 6 inches on the valley floor. However, sufficient amounts and intensities of rainfall can quickly saturate sandy surfaces, thereby eliminating percolation and increasing runoff. A substantial portion of the planning area is located within the 100-year and 500-year floodplains, as indicated on FEMA Flood Insurance Rate Maps. Capital improvements have been made to manage local runoff in the most developed areas of the City, including debris basins and a network of underground storm drains and open channels.

Development associated with each of the project alternatives will also increase runoff by creating large areas of impervious surfaces. In particular, Alternative I, the More Intense Alternative, will result in more development at higher densities and, therefore, is expected to generate the greatest amount of runoff. The Preferred Alternative, Alternative I and Alternative II each establish a new land use category ("Open Space-Floodway") which is specifically directed at preserving floodways as open space, and these alternatives assign this designation to larger areas than the current General Plan. While the current General Plan does designate some channel and wash areas as "Public Facilities," it fails to assign this designation in several important hazard areas, including the Long Canyon Wash and the Desert Hot Springs Creek, immediately south of the City limits. In this regard, the No Project Alternative (implementation of the current General Plan) appears to be the least favorable alternative.

Regardless of the level of development, the City requires that 100-year stormwater flows be retained on-site. The regional backbone drainage system has been constructed, is being upgraded, or has already been designed. It is assumed that additional flood control improvements will be constructed, as necessary, regardless of which development scenario is selected. None of the four project alternatives is expected to have any significant effect or advantage with regard to the efficacy of these facilities.

Water Quality/Resources

The majority of the planning area is located within the service area of the Mission Springs Water District, which utilizes wells to extract water from a subsurface groundwater subbasin. A limited portion of the planning area, generally located south of Dillon Road and east of Little Morongo Road, is located within the Coachella Valley Water District service area. However, CVWD does not currently provide domestic water services to this area.

Domestic water is extracted from the Mission Springs Subbasin, a subsurface aquifer which underlies much of the planning area. As discussed in Section III, the subbasin is currently in an overdraft condition of about 2 feet per year in existing production wells. Mission Springs Water District is in the process of negotiating with the Desert Water Agency to acquire imported Colorado River water to supplement natural recharge sources. Nonetheless, continued development in the Desert Hot Springs area is expected to contribute to the on-going overdraft condition.

MSWD has derived an aggregate use (residential, commercial, industrial, public) and reduced this to a population-based per capita consumptive figure of 297 gallons per day (gpd), This figure is useful in estimating existing and future demand for domestic water and is applied to the projected buildout population of each project alternative to estimate potential water consumption.

No Project Alternative
Projected Water Demand: 198,947 residents x 297 gpd = 59,087,259 gpd

Alternative I
Potential Water Demand = 199,585 residents x 297 gpd = 59,276,745 gpd

Alternative II
Potential Water Demand = 174,978 residents x 297 gpd = 51,968,466 gpd

As discussed in Section III, the potential water demand associated with buildout of the Preferred Alternative is estimated at 57,456,432 gpd. From a water resources perspective, it is clear that Alternative II, the Less Intense Alternative, is the superior development scenario, as its buildout will result in the least demand for water resources. Alternative I and the No Project Alternative are comparable in their demand for domestic water, and are slightly more water intensive than the other scenarios.

Regardless of which project alternative is implemented, the City, Mission Springs Water District and the Coachella Valley Water District will continue to encourage and influence water conservation efforts. The use of drought-tolerant landscaping, efficient irrigation systems, and water-conserving appliances will continue to reduce the direct demand for groundwater. The groundwater replenishment program will contribute to recharge of the Mission Creek subbasin and an reduction in overdraft.

Biological Resources

For each of the project alternatives, those lands subject to urbanization are essentially the same. Each of the alternatives reserves between 8,300 and 8,800 acres for open space, and none of the alternatives entertains future development within the foothills of the San Bernardino or Little San Bernardino Mountains, or within floodways and drainage channels, where many sensitive biological resources are located. Certain floodplains are expected to be removed from the 100-year flood threat and development has occurred and is expected to occur in these areas in the future.

While the intensity of land uses and development varies to some degree between the alternatives considered, in most instances, development removes the native vegetation and wildlife from the site. While native wildlife may recolonize some of these disturbed areas, invasive and non-native plants and wildlife often make the remaining environment uninhabitable for native species. Alternative II, the Less Intense Alternative, will likely have a greater potential for the re-establishment of landscaped open space areas, which may attract native plant and animal species lost to development. This alternative facilitates development at generally lower densities and intensities, thereby allowing more area for landscaping and residential yards. Alternative I, the More Intense Alternative, which will result in the highest densities and intensities, is expected to result in more disturbed area and fewer landscaped and open space areas that could be used for nesting and foraging.

The policies and programs set forth in the current General Plan and proposed Plan address these issues. However, the degree to which they can reduce the level of impact to biological resources is limited. The City will continue its joint effort with surrounding jurisdictions to put into place a multiple species habitat conservation plan, which will apply an ecosystem approach to habitat and species preservation. Regardless of which land use alternative is implemented, this joint effort and on-going state and federal regulation will affect the pattern of urbanization in the City and vicinity.

Cultural Resources

The community's cultural resources appear to be equally impacted by each of the four land use alternatives considered. While the density of residential development, and the intensity of commercial and industrial development may vary with each alternative, the patterns of urban development and the lands to be impacted remain essentially the same. State and federal regulations regarding the identification and protection of cultural resources will also remain the same, regardless of which land use alternative is implemented. The Preferred Alternative appears to be somewhat superior to the current General Plan in that it calls for better documentation of archaeological and historic resources, and establishes policies and programs for their preservation. The potential impacts associated with Alternatives I and II are expected to be comparable to those associated with the Preferred Alternative.

Air Quality

As illustrated in the tables below, emissions for all project alternatives will exceed the SCAQMD threshold criteria. However, it is important to note that some of these emissions will be spread over the life of General Plan buildout, and will not be emitted in any short-term, concentrated manner. Also, future technologies are expected to contribute to substantial reductions in pollution emissions.

As can be seen by comparing the cumulative air pollutant emissions totals for each of the alternatives, emissions associated with the No Project Alternative and the More Intense Alternative are expected to be comparable to one another, and are expected to result in the greatest emissions of all the project alternatives. Compared to these two alternatives, buildout of the Preferred Alternative is expected to result in a moderate reduction in overall emissions. However, the Less Intense Alternative appears to be the superior alternative with regard to air quality, as it produces the least emissions.

No Project Alternative

Table V-5
No Project Alternative: Current General Plan
Anticipated Cumulative Daily Project-Related Emissions
(lbs./day)

	Stationary Source Emissions		Moving Source Emissions		Threshold Criteria*
	Power Plants	Natural Gas Consumption	Vehicles at 50mph**	Total Pounds Per day	Total Pounds Per Day
Carbon Monoxide	496.3	420.9	126,246	127,163.2	550.00
Nitrogen Oxides	2,853.9	1,956.9	5,919	10,729.8	100.00
Sulfur Oxide	297.8	n/a	n/a	297.8	150.00
Particulates	99.3	4.2	1,260	1,363.5	150.00
ROCs	24.8	111.6	5,067	5,203.4	75.00

* Threshold criteria offered by the South Coast Air Quality Management District for assistance in determining the significance of air quality impacts.
** Includes Hot and Cold Start, Hot Soak and Diurnal.
Source: "CEQA Air Quality Handbook," South Coast Air Quality Management District, April 1993.

Alternative I

Table V-6
Alternative I: More Intense Alternative
Anticipated Cumulative Daily Project-Related Emissions
(lbs./day)

	Stationary Source Emissions		Moving Source Emissions		Threshold Criteria*
	Power Plants	Natural Gas Consumption	Vehicles at 50mph**	Total Pounds Per day	Total Pounds Per Day
Carbon Monoxide	547.4	424.6	126,075	127,047.0	550.00
Nitrogen Oxides	3,147.5	1,978.7	5,811	10,937.2	100.00
Sulfur Oxide	328.4	n/a	n/a	328.4	150.00
Particulates	109.5	4.2	1,219	1,332.7	150.00
ROCs	27.4	112.5	5,002	5,141.9	75.00

* Threshold criteria offered by the South Coast Air Quality Management District for assistance in determining the significance of air quality impacts.
** Includes Hot and Cold Start, Hot Soak and Diurnal.
Source: "CEQA Air Quality Handbook," South Coast Air Quality Management District, April 1993.

Alternative II

Table V-7
Alternative II: Less Intense Alternative
Anticipated Cumulative Daily Project-Related Emissions
(lbs./day)

	Stationary Source Emissions		Moving Source Emissions		Threshold Criteria*
	Power Plants	Natural Gas Consumption	Vehicles at 50mph**	Total Pounds Per day	Total Pounds Per Day
Carbon Monoxide	466.1	383.4	100,409	101,258.5	550.00
Nitrogen Oxides	2,679.9	1803.2	4,400	8,883.1	100.00
Sulfur Oxide	279.6	n/a	n/a	279.6	150.00
Particulates	93.2	3.8	883	980	150.00
ROCs	23.3	101.6	3,853	3,977.9	75.00

* Threshold criteria offered by the South Coast Air Quality Management District for assistance in determining the significance of air quality impacts.
** Includes Hot and Cold Start, Hot Soak and Diurnal.
Source: "CEQA Air Quality Handbook," South Coast Air Quality Management District, April 1993.

Noise

A detailed noise impact study was prepared for the Preferred Alternative, as well as the three other alternatives considered in the EIR. The findings are shown in Table V-8 and described below.

Table V-8
Comparison of Anticipated Noise Levels
Generated by Each Project Alternative

Noise Level at 100 Feet	**Preferred Alt Links**	**No Project Alt. Links**	**Alt. I Links**	**Alt. II Links**
< 60 CNEL	4 (4%)	5 (5%)	6 (5%)	6 (5%)
60 -65 CNEL	9 (8%)	8 (7%)	6 (5%)	8 (7%)
65 - 70 CNEL	40 (36%)	37 (34%	36 (33%)	42 (38%)
70 - 75 CNEL	42 (38%)	47 (43%)	46 (42%)	40 (36%)
> 75 CNEL	15 (14%)	13 (12%)	16 (15%)	14 (13%)

Source: "Desert Hot Springs General Plan Update Noise Background Study," Endo Engineering, March 2000.

No Project Alternative
Compared to the Preferred Alternative, buildout of the current General Plan is projected to generate clearly audible noise increases (greater than 3.0 dBA) on only one of the roadway links modeled, and potentially audible noise increases (between 1.0 and 3.0 dBA) along four of the links (4%) modeled. The current General Plan would cause clearly audible noise decreases along one of the roadway links, and potentially audible noise decreases along ten of the links evaluated. Along the remaining 94 links (85%), the differences in projected buildout noise levels are expected to be within 1.0 dBA and inaudible.

Alternative I
Buildout of the More Intense Alternative will result in the highest number of roadway links (62 links) generating noise levels above 70 CNEL, and will have the smallest number of links (12 links) generating noise levels below 65 CNEL. However, no clearly audible adverse noise impacts are expected from this alternative, when compared to the No Project Alternative described above. Along 97 roadways links, buildout noise levels will be essentially the same as the No Project Alternative (within 1.0 dBA). A potentially audible noise increase is expected to occur along eight links, and a potentially audible noise decrease is projected to occur along four links, when compared to the No Project Alternative.

Alternative II
Buildout of the Less Intense Alternative is expected to result in the lowest number of roadway links (54 links) generating noise levels above 70 CNEL, and the greatest number of links (14) with noise levels below 65 CNEL. Noise levels from buildout of the Less Intense Alternative are expected to be essentially the same as the No Project Alternative along 99 of the roadway links modeled (90%). When compared to the No Project Alternative, a potentially audible noise increase could occur along three roadway links from the Less Intense Alternative. A potentially audible noise decrease could occur along six links.

As can be seen in the above analysis and in Section III-I, Alternative II is slightly superior to the other three project alternatives, with regard to potential noise impacts. However, the noise impacts associated with each alternative deviate only slightly from one another, and there is no significantly superior alternative. Neither are any of the alternatives substantially impacted by noise generated by regional rail or air traffic. Opportunities for mitigating noise impacts are essentially the same for each of the alternatives considered. Traffic noise is still the most significant noise source, and the relatively limited intensity of land uses in each scenario assures rather limited impacts to the noise environment.

Visual Impacts

Visual impacts associated with each of the project alternatives are expected to be essentially the same. The Less Intense Alternative will decrease the overall amount and intensity of development, while the other three alternatives provide for increased potential development. The current General Plan does not include specific goals, policies and programs regarding aesthetics or community design, and therefore, implementation of the No Project Alternative appears to be the least desirable of the project alternatives.

Development guidelines set forth in the Community Design Element of the proposed General Plan, as well as existing standards and regulations set forth in the City Zoning Ordinance and other regulatory documents, assure that potential impacts to the City's visual resources will be protected. In this regard, the Preferred Alternative, Alternative I and Alternative II appear to be superior to the No Project Alternative. Regardless of which alternative is implemented, development in the planning area will continue to occur at low densities and low profiles.

Public Services and Facilities

Schools

Projections of student enrollment for each alternative are provided in the tables below.

Table V-9
No Project Alternative - Current General Plan
Potential School Enrollment

Grade Level	Potential Buildout Units	Student Generation Rate	Buildout Enrollment
K-5			
Single- Family	51,253	0.2167	11,106
Multi-Family	21,169	0.1321	2,796
6-8			
Single-Family	51,253	0.1012	5,186
Multi-Family	21,169	0.0474	1,003
9-12			
Single-Family	51,253	0.1176	6,027
Multi-Family	21,169	0.0318	673
		TOTAL :	**26,791**

Based on Student Generation Rates, "Residential Development School Fee Justification Study for Palm Springs Unified School District," June 26, 1998.

Table V-10
Alternative I - More Intense Alternative
Potential School Enrollment

Grade Level	Potential Buildout Units	Student Generation Rate	Buildout Enrollment
K-5			
Single- Family	50,976	0.2167	11,046
Multi-Family	21,675	0.1321	2,863
6-8			
Single-Family	50,976	0.1012	5,158
Multi-Family	21,675	0.0474	1,027
9-12			
Single-Family	50,976	0.1176	5,994
Multi-Family	21,675	0.0318	689
		TOTAL :	**26,777**

Based on Student Generation Rates, "Residential Development School Fee Justification Study for Palm Springs Unified School District," June 26, 1998.

Table V-11
Alternative II - Less Intense Alternative
Potential School Enrollment

Grade Level	Potential Buildout Units	Student Generation Rate	Buildout Enrollment
K-5			
Single- Family	44,061	0.2167	9,548
Multi-Family	19,761	0.1321	2,610
6-8			
Single-Family	44,061	0.1012	4,458
Multi-Family	19,761	0.0474	936
9-12			
Single-Family	44,061	0.1176	5,181
Multi-Family	19,761	0.0318	628
		TOTAL :	**23,361**

Based on Student Generation Rates, "Residential Development School Fee Justification Study for Palm Springs Unified School District," June 26, 1998.

As illustrated in the tables above, Alternative II is expected to generate the smallest student enrollment of the four project alternatives and appears to be the superior alternative in this regard. Compared to the Preferred Alternative, Alternative II represents a decrease of approximately 2,998 students (11% decrease), Alternative I represents an increase of 418 students (2% increase), and the No Project Alternative represents an increase of 432 students (2% increase). The continued payment of statutory mitigation fees is expected to reduce project-related impacts to acceptable levels under all development alternatives.

Libraries

No Project Alternative
Continued implementation of the current General Plan is expected to generate a total buildout population of about 198,947 residents. To adequately serve this population, the City will need to provide a library with approximately 99,474 square feet of building space and 397,894 volumes.

Alternative I
Buildout of the More Intense Alternative is expected to generate a population of 199,585 residents, which would require approximately 99,792 square feet and 399,170 volumes.

Alternative II
Alternative II is expected to result in a buildout population of about 174,978 residents. This population will require approximately 87,489 square feet of building space and 349,956 volumes.

While buildout of Alternative II will require the smallest library facility and fewest volumes, there is limited difference in the potential impacts of all four alternatives. Each alternative will require an expansion of library services and facilities, and the City will need to continually monitor the demand for these services. The proposed General Plan sets forth specific goals, policies and programs in this regard.

Electricity

As discussed in Section III, the South Coast Air Quality Management District provides electricity usage factors for residential, commercial and industrial development. Based on these usage rates, the project alternatives are expected to demand the following:

No Project Alternative: 905,802,037 kwh/year

Alternative I: 999,004,949 kwh/year

Alternative II: 850,589,901 kwh/year

It is important to note that Energy-Related Industrial lands are not figured into the consumption projections for the Preferred Alternative, Alternative I and Alternative II. Development on these lands is expected to consist solely of windfarm and other energy-related facilities, which are energy producers, not consumers. The current General Plan does not have a related land use category for energy-producing facilities, and therefore, all industrial lands are included in its energy consumption figure above.

As discussed in Section III, the demand for electricity under the Preferred Alternative is expected to be approximately 919,501,985 kwh/year. Based on these projections, the No Project Alternative is expected to demand about 1.5% less than the Preferred Alternative, and Alternative I is expected to require approximately 9% more than the Preferred Alternative. Alternative II is expected to demand about 7% less than the Preferred Alternative, and appears to be the superior alternative with regard to the consumption of electricity.

Natural Gas

As discussed in Section III, the South Coast Air Quality Management District provides estimates of natural gas usage for residential, commercial and industrial development. These factors can be used to project the monthly demand for natural gas for each of the project alternatives.

No Project Alternative: 631,455,183 cf/month

Alternative I: 636,967,552 cf/month

Alternative II: 575,271,056 cf/month

The consumption projections for the Preferred Alternative, Alternative I and Alternative II do not take into account potential energy consumed by Energy-Related Industrial lands. Development on these lands is expected to consist of windfarm and other energy-generating facilities, which produce energy and are not expected to consume it. It is conceivable that gas-fired co-generation and similar natural gas consuming systems may be developed on these lands, thereby increasing overall gas consumption. The current General Plan does not have a land use category for energy-producing facilities, and therefore, all industrial lands are included in its energy consumption figure above.

As determined in Section III, the Preferred Alternative is expected to demand approximately 625,411,596 cubic feet per month. The No Project Alternative will demand about 1% more than the Preferred Alternative, and Alternative I is expected to demand about 2% more. It is anticipated, however, that Alternative II will demand approximately 8% less natural gas than the Preferred Alternative. In this regard, Alternative II is the superior alternative, as it will place less demand on this non-renewable energy resource.

Solid Waste Disposal

The following projections are based on solid waste generation rates compiled by the California Integrated Waste Management Board.

No Project Alternative: 191,029 tons/year

Alternative I: 202,868 tons/year

Alternative II: 173,862 tons/year

As discussed in Section III, the Preferred Alternative is expected to generate approximately 191,840 tons of solid waste per year. A comparison of these figures indicates that the amount of solid waste generated at buildout of the current General Plan is expected to be comparable to that generated at buildout of the Preferred Alternative. Alternative I is expected to generate the greatest amount of solid waste (6% more than the Preferred Alternative). The Less Intense Alternative provides for substantially fewer residential units than the Preferred Alternative, and therefore is expected to result in about a 9% reduction in solid waste generation.

Law Enforcement

No Project Alternative
Buildout of the No Project Alternative is expected to generate a City population of 198,947 residents. To maintain a target ratio of 1.2 officers per 1,000 residents, the police department will need a total of 238 officers.

Alternative I:
Alternative I is expected to result in a buildout population of about 199,585 residents, which will require about 239 police officers.

Alternative II:
Buildout of Alternative II is expected to generate a population of 174,978 persons. At a rate of 1.2 officers per 1,000 residents, Alternative II will require about 209 police officers.

As discussed in Section III, buildout of the Preferred Alternative will require approximately 232 police officers, if a target ratio of 1.2 officers per 1,000 residents is to be maintained. Buildout of the current General Plan will require about 6 more police officers, and the More Intense Alternative (Alternative I) will require about 7 more. The Less Intense Alternative (Alternative II) is expected to require about 23 fewer officers than the Preferred Alternative, and appears to be the superior alternative. However, buildout of any of the project alternatives will represent a substantial increase in the number of officers currently serving the City. The mitigation measures set forth in Section III are expected to adequately reduce project-related impacts, regardless of which alternative is implemented.

Fire Protection

Implementation of either project alternative will increase the demand for additional fire personnel and fire protection services. Each of the alternatives provides for increased development in the northwesterly portion of the planning area, in the Rancho Royale Specific Plan area, which will require a new fire station to adequately serve the buildout population. Each alternative also provides for continued development in the easterly portion of the planning area, where the need for a new fire station has already been identified. The impacts associated with buildout of each project alternative are expected to be comparable, and the goals, policies and programs set forth in the proposed General Plan are expected to adequately address the need for additional fire protection.

Wastewater Generation

As discussed in Section III, the Mission Springs Water District estimates that wastewater generation rates in its service area are about 100 gallons per day per capita. This factor can be used to estimate wastewater generation for each project alternative.

No Project Alternative: 19,894,700 gallons/day

Alternative I: 19,958,500 gallons/day

Alternative II: 17,497,800 gallons/day

As described in Section III, buildout of the Preferred Alternative is expected to generate approximately 19,345,600 gallons of wastewater per day. The No Project Alternative represents a wastewater generation rate that is expected to result in an increase of almost 3% over the Preferred Alternative. Alternative I will also result in an increase of about 3% over the Preferred Alternative, and Alternative II will result in a decrease of about 10%. Regardless of which alternative is selected, the demand for wastewater collection and treatment services will increase substantially over the level of service currently provided in the planning area. The mitigation measures set forth in Section III are expected to adequately mitigate the potential impacts of either project alternative.

Domestic Water Demand

Aggregate consumptive demand in the Mission Springs Water District service area is estimated to equate to 297 gallons per day per capita. This rate can be applied to each of the project alternatives to project total domestic water demand at buildout.

No Project Alternative: 59,087,259 gallons/day

Alternative I: 59,276,745 gallons/day

Alternative II: 51,968,466 gallons/day

As described in Section III, buildout of the Preferred Alternative could demand approximately 57,456,432 gallons of water per day. Water consumption associated with the No Project Alternative is expected to constitute about a 3% increase over the Preferred Alternative, which is largely comparable to the projected impacts of the More Intense Alternative (Alternative I). The Less Intense Alternative (Alternative II) is expected to result in a 10% decrease over the Preferred Alternative, and appears to be the superior alternative in this regard.

Socio-Economic Resources

No Project Alternative

Buildout of the No Project Alternative will add approximately 65,859 new dwelling units to the City's housing stock. Based on the City's average household population of 2.787 persons per household, the City's population will increase by about 183,549 additional persons. Combined with the existing City population of 15,398 people, the total buildout population could reach an estimated 198,947 residents. This represents in increase of 5,491 residents over the Preferred Alternative. The following table provides a cost/revenue analysis for buildout of the No Project Alternative. Estimates were derived in the same manner as those for the Preferred Alternative in Table III-43.

Table V-12
No Project Alternative
Buildout Cost/Revenue Analysis

Item	Annual City Cost ($)	Annual City Revenue ($)
General Administration & Services	$85,547,210	
Residential Property Tax Revenues		$22,227,413
Commercial Property Tax Revenues		$2,007,441
Hotel Property Tax Revenues		$1,139,250
Industrial Property Tax Revenues		$6,146,686
Sales Tax Revenues		$18,653,562
Transient Occupancy Tax Revenues (from existing hotels/motels)		$14,743,651
Motor Vehicle Fees		$6,875,608
Business Licenses		$297,104
Subtotal:		$72,090,715
Resulting Annual Cash Flow:	**- $13,456,495**	

Table V-12 indicates that buildout of the current General Plan could result in overall negative fiscal impacts to the City. This is largely due to the relatively low amount of commercial acreage assigned to City lands under the current General Plan, which substantially limits potential revenues from commercial property taxes, sales taxes and business licenses.

Alternative I

Buildout of the More Intense Alternative is expected to result in a total population of about 199,585 residents, which represents a 3% increase over the population expected at buildout of the Preferred Alternative. This alternative will also facilitate the development of 66,088 new dwelling units, for a total housing stock of 72,651 units. A cost/revenue analysis for buildout of Alternative I is provided in the table below.

Table V-13
Alternative I: More Intense Alternative
Buildout Cost/Revenue Analysis

Item	Annual City Cost ($)	Annual City Revenue ($)
General Administration & Services	$85,821,550	
Residential Property Tax Revenues		$23,723,948
Commercial Property Tax Revenues		$3,429,947
Hotel/Motel Property Tax Revenues		$1,563,750
Industrial Property Tax Revenues		$5,766,429
Energy-Related Industrial Property Tax Revenues		$4,706,362
Sales Tax Revenues		$31,937,311
Transient Occupancy Tax Revenues		$17,999,907
Motor Vehicle Fees		$6,897,657
Business Licenses		$507,408
Subtotal:		$96,532,719
Resulting Annual Cash Flow:	**$10,711,169**	

As shown in the table above, buildout of Alternative I is expected to result in net positive fiscal impacts to the City. Potential revenues are expected to exceed those associated with the Preferred Alternative by about $10 million. This is primarily due to a substantial increase in commercial lands, which could generate significantly higher sales tax revenues than under the Preferred Alternative.

Alternative II

Buildout of Alternative II, the Less Intense Alternative, is expected to result in the development of 57,259 potential new dwelling units. When combined to the existing housing stock, this alternative could result in a total of about 63,822 residential units, with a buildout population is expected to be approximately 174,978 residents. Potential costs and revenues associated with buildout of Alternative II are provided in Table V-14.

Table V-14
Alternative II: Less Intense Alternative
Buildout Cost/Revenue Analysis

Item	Annual City Cost ($)	Annual City Revenue ($)
General Administration & Services	$75,240,540	
Residential Property Tax Revenues		$20,744,161
Commercial Property Tax Revenues		$1,973,300
Hotel/Motel Property Tax Revenues		$1,563,750
Industrial Property Tax Revenues		$6,072,078
Energy-Related Industrial Property Tax Revenues		$4,706,362
Sales Tax Revenues		$18,367,643
Transient Occupancy Tax Revenues		$17,999,907
Motor Vehicle Fees		$6,047,239
Building Licenses		$291,896
Subtotal:		$77,766,336
Resulting Annual Cash Flow:	**$2,525,796**	

As shown in the above analysis, buildout of the Less Intense Alternative is expected to result in positive fiscal impacts to the City. Although total revenues are approximately $6 million less than revenues generated by buildout of the Preferred Alternative, the projected population is also substantially lower which results in a significant reduction in potential costs.

The current General Plan does not thoroughly evaluate the City's fiscal position or establish policies and programs which advocate aggressive economic development. The draft General Plan, however, recognizes the economic forces driving development in the City. Continued growth will come from commercial development, resort hotel visitors and limited industrial development. Implementation of the policies and programs set forth in the proposed General Plan are designed to balance the ratio of housing to jobs, promote economic activities in both commercial and industrial sectors, and encourage the balanced and managed growth of the community.

CITY OF DESERT HOT SPRINGS

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE COMPREHENSIVE GENERAL PLAN

VI. SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

This section of the EIR reviews the relationship between the local short-term uses of the environment and the maintenance and enhancement of long-term productivity. Cumulative impacts are discussed in Section VIII of this document, while this section addresses the long-term effects of the proposed General Plan on the environment. Special attention has been given to those areas of impact which narrow the range of beneficial uses of the environment or pose long-term risks to health or safety, including geophysical conditions, biological resources, scenic/visual resources, air resources, noise environment, and water resources. Why the proposed General Plan is believed to be justified for adoption and implementation at this time, rather than delaying its adoption to consider additional alternatives not addressed in this EIR, is also discussed.

Geophysical Conditions

As discussed in Section III-C of this EIR, the City of Desert Hot Springs is subject to significant geotechnical forces associated with several active earthquake faults and areas of steep terrain. The continued urbanization of the City, even at relatively low densities and intensities, can be expected to result in the exposure of greater numbers of residents, workers and shoppers to geotechnical hazards of potential significance. Much has been learned from recent seismic activity in the region, which has actually served to reduce the potential for new development to be exposed to or be engineered to withstand significant geotechnical forces. Through the enforcement of provisions and requirements of the Alquist-Priolo Earthquake Fault Zoning Act, Title 24 of the California Administrative Code and enforcement of the Uniform Building Code for Seismic Zone 4, as amended, risks to public health and safety are expected to be reduced. Nonetheless, impacts from major seismic events cannot be completely removed and the threat to life and property will remain in the long-term.

Biological Resources

As the City continues to develop, the clearing and grading of land and the construction of improvements will result in the continued loss of wildlife habitat on the valley floor and in those foothill and upper alluvial fan areas where development is still permitted. The proposed General Plan does exclude development in many sensitive areas, and substantially limits the density and intensity of development permitted overall. However, buildout of the City will degrade or remove significant areas of stabilized sand field habitat and other habitat types located within the City and planning area boundaries.

Continued development of the City will also impact habitat of Coachella Valley Fringe-toed, flat-tailed horned lizard, Little San Bernardino Mountains. gilia, burrowing owl, Palm Springs pocket mouse, the Palm Springs. round-tailed ground squirrel, as well as sensitive species, and may result in the legal taking of individual animals. Federal and state agencies are currently working with the Coachella Valley Association of Governments, the County and Coachella Valley cities, as well as the Santa Rosa Mountain Conservancy, on a broadly based Multiple Species Habitat Conservation Plan to protect a broad range of species and their habitat.

In the meantime, the City shall adhere to applicable management protocol for investigating impact potential and mitigation. Where state and/or federal listed species are identified, appropriate incidental take permits and associated mitigation measures will be required before development will be permitted. Overall, the loss and degradation of foraging habitat and the continued pressure of human activity on local biological resources will all contribute to the long-term reduction of plant and animal species, habitat and biological diversity.

Scenic/Visual Resources

Scenic and visual resources of the City are one of its most important assets. The combination of unique mountain formations and low desert environments combine to create a setting that attracts visitors and new residents from all over the country. These resources will be affected by continued development within the City's boundaries but only to a limited extent. The General Plan policies and programs provide for appropriate development criteria and assure the review of development proposals with the potential to have adverse impacts on scenic resources. The General Plan also provides for the preservation and integration of elements of the desert landscape into urban design, and the provision on native and other drought-tolerant vegetation within new development. Nonetheless, the clearing and grading of lands and the construction of roads and structures will all contribute to the long-term impacts to visual resources.

Air Resources

The increased traffic, and residential, commercial and industrial power and energy consumption expected to accompany continued development within the planning area will add to pollutants currently emitted locally and in air basins outside the Coachella Valley. Locally increased emissions will result in higher concentrations of reactive organic gases and particulates. Local production of ozone is expected to be possible in the future since conditions required for its generation occur in the Coachella Valley.

The continued use of gasoline and diesel fuels in vehicles, and the burning of natural gas, contribute to the generation of oxides of nitrogen and reactive hydrocarbons that degrade local air quality to a greater or lesser extent, depending on rates of dispersion. While continued urban development will increase the emissions of fugitive dust, these increases are expected to be temporary and disturbed sites will be permanently stabilized with structures, pavement and landscaping. While the General Plan policies and programs direct the regulation of emissions, especially those in close proximity to sensitive receptors, these impacts cannot be completed removed. Further, without a radical change in methods of transportation and combustion technology, reductions in emissions on a unit of energy basis will not be seen in the near-term.

Noise Environment

The continued development of the community under the direction of the proposed Desert Hot Springs General Plan will result in unavoidable increases in the level of noise impacting the community. Specifically, traffic related noise can be expected to increase proportionate to the increase in vehicular traffic to a maximum level with the buildout of the community. Levels and frequency of impacts from two other noise sources, operations at the Palm Springs Regional Airport and rail traffic associated with operation on Union Pacific Railroad lines, can be expected to increase over time. Although generating intrusive types of noise rather than continuous levels, they will nonetheless add to the degradation of the noise environment in the southern portion of the planning area. The General Plan provides policies and programs which address and establish procedures to help reduce the impacts of noise on the living environment.

Water Resources

As discussed in Sections II and III of this document, the City of Desert Hot Springs, and the Mission Creek Subbasin specifically, is in a groundwater overdraft condition, which has lowered the depth to groundwater in the primary aquifer serving the City. While plans have been developed to deliver Colorado River water to recharge basins in the upper Mission Creek Subbasin to recharge the aquifer, the allotment to be provided may not be insufficient to off-set future overdraft. However, this recharge is expected to limit the impacts of current demand. At this time, the rate of recharge to the Mission Creek Subbasin is projected to be between 5,000 and 15,000 acre feet per year. At 15,000 acre feet, this recharge constitutes more than twice the level of groundwater extraction going on today (1999).

As residential, commercial and recreational development continues the aquifer may experience an increased rate of overdraft unless more stringent conservation methods are implemented and additional sources of recharge are secured. The Draft General Plan includes policies and programs to encourage the conservative use of water resources for domestic and landscape uses and encourages the use of native, drought resistent planting materials. Nonetheless, with California periodically in a drought condition, expected reductions in available Colorado River water and the sources of recharge water being directly affected, the availability of domestic water resources will continue to be a constraint, albeit a limited one, on future development.

CITY OF DESERT HOT SPRINGS

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE COMPREHENSIVE GENERAL PLAN

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF ENVIRONMENTAL RESOURCES

In accordance with CEQA, it is required that the EIR address the utilization of non-renewable resources in the course of development, and the continued use of these limited resources once development has been completed. While non-renewable resources usually imply energy resources, they can also refer to biological resources, and the permanent loss of visual resources.

Future development of the City of Desert Hot Springs planning area under the proposed General Plan will result in the irreversible and irretrievable commitment of the following renewable and non-renewable natural resources: open land, energy resources (natural gas, oil and other fossil fuels), water, construction materials (lumber, gravel, sand, asphalt, and metals), minerals, and biological resources.

The proposed General Plan will not have a significant, unmitigatable direct impact on sensitive and/or non-renewable environmental resources. The continued consumption of natural gas and electrical energy will contribute to the on-going depletion of fossil fuel resources. The cumulative use of fossil fuels may result in the ultimate loss of an important source of chemical and material feed stocks, which will not be retrievable once consumed. Buildout of the General Plan area will include grading and the removal of native vegetation and wildlife in all or portions of development sites. The irretrievable loss of habitat and other biological resources will result from this future development. Further development of the planning area will irreversibly change the viewsheds of the community and may reduce the quality of the open space environment as development continues. Nonetheless, the relatively low densities and land use intensities, and the regulatory framework created by the General Plan to conserve and protect valued resources will significantly reduce long-term impacts to these resources.

It is expected that, over time, urban development will have less of an impact on finite environmental resources than is expected today. This is likely to be true for such resources as fossil fuels and other finite mineral resources. The impacts of development on other natural resource, including open space lands and biological resources, are expected to be limited by the urban limits established by the General Plan. The Plan describes the long-term limits of urban development in this portion of the Coachella Valley.

CITY OF DESERT HOT SPRINGS

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE COMPREHENSIVE GENERAL PLAN

VIII. GROWTH INDUCING AND CUMULATIVE IMPACTS

A. Growth Inducement

The proposed land use scenario for the City of Desert Hot Springs will not overtly or significantly induce growth or change the physical conditions of the area, but will incrementally increase growth-inducing impacts associated with long-term future development implemented under the various cities' and County General Plans. The proposed Desert Hot Springs General Plan is expected to maintain and enhance the low density resort residential character of the City, while still providing opportunities for continued growth in all sectors of the economy. The proposed land use scenario constitutes a reduction in overall residential land use intensities and an increase in industrial and commercial land uses.

Urbanizing patterns are dependent upon stimulation of growth and development which is directly proportional with the intensity of a land use plan. The reduction in the residential dwelling unit intensity resulting from the proposed Desert Hot Springs General Plan reduces growth inducing tendencies, provides a balance between infrastructure, the environment and the pressures of human development. The reduced overall densities also help preserve the resort residential character of the City. Growth inducing and cumulative impacts are further controlled by orienting and sizing the City roadway network so as to optimize infrastructure, including existing highways, arterials, collectors and other important local roads.

Finally, the growth inducing and cumulative impacts associated with the proposed General Plan are further limited by climatologic, topographic and hydrologic constraints, as well as those associated with sensitive biological resources and the need for their protection and preservation. Numerous General Plan goals, policies and programs set preservation of the City's low density resort residential character and its natural resources as a high priority, which will further limit development intensities and, therefore, associated growth inducement.

B. Cumulative Impacts

The implementation of the Desert Hot Springs General Plan will result in impacts which, in and of themselves, have not been determined significant. However, these impacts must be considered in conjunction with the effects of other development which may take place outside the planning area and the City's jurisdiction; under CEQA, these are called cumulative impacts (Section 21083 (b), CEQA Statutes, and Section 15355 of the CEQA Guidelines).

While adoption and implementation of the General Plan will control and regulate development within the existing and future incorporated boundaries of the City, the General Plan will have only an indirect moderating effect on development outside the City. The Riverside County General Plan/Western Coachella Valley Community Plan, adopted in 1984 promotes development densities and intensity in some areas which appear to be compatible and consistent with resource and infrastructure constraints predominant in the area. A wide range of physical constraints identified throughout this EIR also serve to constrain and moderate the possible intensities of development. These physical and regulatory constraints can generally be expected to be a moderating influence on maximizing potential land use intensities permitted under the County General Plan.

Most lands within the planning area and current City boundaries are privately owned. However, substantial public lands within and adjacent to the planning area further constrain development and limit cumulative impacts. These include the San Bernardino and Little San Bernardino Mountains, which include most of the City's northwestern and northern boundary, these include lands in the western portion of the planning area under the jurisdiction of the U.S. Bureau of Land Management. Clearly, these lands will not be developed to more intensive levels than would be the case within the City and are likely to remain undeveloped.

Land Use Compatibility

Cumulative land use impacts associated with the development of the City are primarily the continued conversion of desert open space to urban uses and the continued growth seen in the surround area. Increasing the population adjacent to vacant lands may encourage illegal dumping, the use of off-road vehicles and other conflicting land uses. Avoiding these problems will require attentive code enforcement and other land use regulation by the City, County and BLM. No significant cumulative impacts or land uses incompatibilities are expected to result from adoption and implementation of the Desert Hot Springs General Plan.

Landform Alteration/Aesthetics

As discussed in Sections II and III of this document, visual resources, including mountains and associated vegetation, are important and valuable resources of the City and surrounding communities. The City General Plan includes measures that require the thoughtful review and analysis of impacts of development on mountain viewsheds and other scenic resources. The combination of unique mountain formations and low desert environments creates a setting that is the essence of the character of the community. These resources will be affected by continued development within the City's boundaries but only to a limited extent. The General Plan policies and programs provide for applicable development criteria and assure the review of development proposals with the potential to have adverse impacts on scenic resources. The General Plan also provides for the preservation and integration of elements of the desert landscape into urban design, and the provision of native and other drought-tolerant vegetation within new development. Nonetheless, the clearing and grading of lands and the construction of roads and structures will all contribute to the long-term impacts to visual resources.

Hydrology

While future construction of residential, commercial and other types of developments can be expected to contribute to runoff generated in the area, and may require construction of additional drainage facilities, impacts are expected to be significantly limited by the low land use intensities and the instituting of General Plan policies and programs, which reduce runoff and enhance percolation. Furthermore, the Riverside County Flood Control District is actively planning the construction of additional regional stormwater facilities that will convey runoff and enhance groundwater recharge in the northern and central portions of the City. Requirements for the construction of on-site stormwater retention facilities will further reduce runoff volumes and the contribution to cumulative effects from continued buildout of the City. Both District and City efforts and regulations are expected to reduce rather than increase potential cumulative impacts of stormwater runoff.

Geology/Seismicity

Development of the planning area will result in continued urbanization in a seismically active region. The active San Andreas Fault Zone (Banning and Mission Creek Branches), and the potentially co-seismically active Blind Canyon Fault, will constrain development in the City and its SOI. Development in the incorporated city limits has already resulted in the placement of buildings and people in close proximity to an active fault. Continued urban development will result in the location of more people into an area with a potential for strong ground acceleration. Potential ground motions in the planning area resulting from earthquakes on these and other faults have been known to cause severe damage.

The Desert Hot Springs General Plan results in reductions in the potential number of dwelling units, but the plan increases the amount of commercial and industrial land and potentially the number of people exposed to seismic hazards. Development within the planning area shall be required to be designed in accordance with the policies and programs of the General Plan, recommendations of the geotechnical consultant, and seismic requirements presented in the Uniform Building Code. No significant cumulative impacts associated with geotechnical hazards are expected to result from adoption and implementation of the Desert Hot Springs General Plan if the appropriate design and engineering precautions are implemented in future development.

Biological Resources

The Desert Hot Springs General Plan constitutes a reduction in the intensity of residential development in the planning area and a 60 percent increase in acreage assigned a "Mountain Reserve" designation. It also incorporates policies and programs which encourage the preservation of major washes and drainages as natural wildlife corridors and enhanced habitat, consistent with their function as drainage facilities. Nonetheless, on a regional scale, the loss of vegetation from future development must be viewed as an incremental contribution to the loss of habitat and associated wildlife. The encroachment of man into undeveloped desert reduces open space, the availability of foraging habitat for ranging species and the availability of large "home ranges" for predators.

Continued disruptions of this sort within the City and surrounding areas could result in cumulative negative impacts with regard to: (i) reduction of foraging territory, (ii) dislocating species' migration patterns, (iii) creating isolated sub-populations, (iv) restricting mate-finding behavior, and (v) reducing "gene flow" between existing sub-populations. But preserving washes, canyons and steep terrain within the City for use as potential movement and migration corridors will limit cumulative regional disruption of wildlife movement. General Plan policies and programs include the integration of open space areas and wildlife corridors into major development design and future area-wide planning.

Potential cumulative impacts to biological resources are also expected to be further reduced by the completion and implementation of the Coachella Valley Multiple Species Habitat Conservation Plan, which is expected to address a large portion of the planning area. Inasmuch as sensitive species currently occur within the planning area, development proposals will be required to adequately mitigate impacts to wildlife and habitat before development is permitted. Within the physical and regulatory context of the Plan, no significant cumulative impacts associated with biological resources are expected to result from adoption and implementation of the Desert Hot Springs General Plan.

Cultural Resource

Due to the predominant location of prehistoric resources in the canyons and mountains, and along the mesquite hummocks along earthquake faults, Native American cultural resource sites are limited to highly specific use areas, which are generally not expected to be impacted by development facilitated by the proposed General Plan. These are located primarily in areas where water was available and where food or materials gathering, or lithic workshops were prevalent. Some areas around mesquite hummocks located along faults have already been developed for golf and resort uses. Many of these areas have already been surveyed and the likely location of additional prehistoric resources is generally known. The proposed Desert Hot Springs General Plan limits development to locations away from sensitive resource areas and, therefore, reduces potential impacts to these areas.

The City also has an interesting historic and cultural tradition that has become better known and appreciated in recent years. Important structures and locations have been identified and are progressively being documented. The General Plan encourages the development of programs to be pursued by the City and private organizations to identify, designate and preserve important historical sites and resources. General Plan policies and programs include measures to record, preserve and protect these resources. No significant cumulative impacts associated with archaeological or historic resources are expected to result from adoption and implementation of the Desert Hot Springs General Plan.

Traffic

Continued development of the community will incrementally add to impacts along major roadways, including Highways 62, Interstate-10, Palm Drive, Indian Avenue, Dillon Road, Pierson Boulevard and other major arteries, which also serve regional traffic. The proposed General Plan will result in traffic levels that can be cost-effectively accommodated through design geometries and programmed improvements set forth in the EIR and associated traffic study. Nonetheless, levels of services on existing roadways will decrease as development within the City and Coachella Valley continues.

The development and implementation of transportation demand management (TDM) techniques, the increased use of alternative modes of travel and the use of traffic congestion management strategies should adequately address the cumulative traffic impacts expected for the buildout of the planning area. General Plan policies and programs include the integration of the above mentioned transportation demand management programs and roadway and intersection improvements. With the inclusion of growth in background traffic consistent with regional traffic projections developed in the CVAG CVATS traffic model, no significant cumulative impacts associated with traffic and the circulation system are expected to result from adoption and implementation of the Desert Hot Springs General Plan.

Noise

Based upon the projected buildout of the proposed land use plan, the additional population and traffic that will occur will incrementally contribute to a cumulative rise in noise levels in the area. Although increases in noise levels will occur with future development, the overall quiet/suburban noise environment is not expected to appreciably deteriorate if policies and programs of the General Plan and proper mitigation measures are adhered to. The most significant impacts will occur as a result of increased traffic volumes. Naturally, the most impacted areas will be along roadways that are projected to carry the highest traffic volumes. The construction of commercial structures and the need for large mechanical systems will also introduce another potentially significant source of noise.

Potential noise impacts shall be considered in the application review process for all proposed projects within the City. Factors to be considered shall include the strategic placement of acoustical barriers such as masonry walls, the arrangement of attached housing to provide necessary shielding of outdoor living areas and the incorporation of additional setbacks from roadways. Where determined necessary, future developments within the City will be required to conduct acoustical analyses to properly identify those noises associated with project and other noise sources. Specific mitigation measures to reduce identified impacts will be required. General Plan policies and programs include community noise standards, monitoring of the noise environment, compliance monitoring, land use reassessments, and other actions which control and minimize impacts to the community noise environment. No significant cumulative impacts associated with noise generation are expected to result from adoption and implementation of the Desert Hot Springs General Plan.

Air Quality

Although largely originating from outside the community, increased generation of electricity from fossil fuels may have increased effects on the Southeast Desert Air Basin and the Coachella Valley. Levels in carbon monoxide, exhaust hydrocarbons, and oxides of nitrogen and sulphur will contribute to the degradation of regional air quality. Fugitive dust (PM_{10}) generation is largely a local condition and will require the continued application of development controls and soils stabilization to effectively reduce these impacts. Emissions related to traffic generated by local and regional development will further contribute to the degradation of local air quality. While regional and local strategies are currently being developed and implemented to reduce these impacts, local policies and programs set forth in the Desert Hot Springs General Plan, including the implementation of transportation demand management and congestion management strategies, will further control local contributions to air quality degradation. No significant cumulative impacts associated with air quality are expected to result from adoption and implementation of the proposed General Plan.

Water Resources

The demand for water in the Coachella Valley is as high and probably higher than in other areas of Southern California, given the high average temperatures and low humidity. The City is completely reliant upon groundwater to serve the community's needs. With the significant growth that has taken place in the area over the past twenty years the City-serving aquifer is now in an overdraft condition. Imported Colorado River water will soon be diverted into large spreading ponds in the upper end of the Mission Creek aquifer and will help to reduce and may in the near to mid-term eliminate the level of overdraft.

Through the continued implementation of Title 24 conservation measures, the widespread use of native and other drought-resistant planting materials and other water conservation methods, cumulative impacts can be reduced. General Plan policies and programs will also enhance the water conservation efforts of the City and the Mission Springs Water District, and will further reduce per capita and overall water demand generated by the community. No significant cumulative impacts associated with water resources are expected to result from adoption and implementation of the Desert Hot Springs General Plan.

While the proposed General Plan does facilitate conservation of water resources, the City must work cooperatively with the Mission Springs Water District and the Coachella Valley Water District to address the problems of potential groundwater contamination associated with the continued reliance of large areas of the community on on-lot septic tanks. The General Plan sets forth policies and programs to encourage the study of this issue and to require interconnection to sewage collection systems whenever possible. With the relatively low residential densities and still limited commercial and industrial development potential established by the proposed General Plan, no significant cumulative impacts associated with water quality are expected to result from adoption and implementation of the proposed Plan.

Public Services and Facilities:
Increasing development in the planning area cumulatively contributes to increased demands upon all of the community's public facilities and services.

The demand for electrical energy in the Coachella Valley is probably higher than in other areas of Southern California, given the high summer temperatures. Energy requirements are associated with air conditioning loads which can put a strain on utility capacity. The construction of energy efficient buildings and the expanded use of non-polluting energy systems can significantly reduce the cumulative demand for energy.

Increased population cumulatively impacts landfill capacities; aggressive waste minimization and recycling programs can greatly reduce this cumulative impact. Regionally coordinated recycling programs will also help preserve resources and energy, and reduce the amount of material going to landfills.

Governmental services in the City will experience the cumulative impacts of increased population and possible disproportionate revenue generation. At city, county and state levels, public services are experiencing considerable cumulative impacts as population in the State continues to increase at a faster pace than the generation of revenues for operations, new facilities and other capital improvements. Developer fees and assessment districts help to reduce direct and cumulative impacts on public services. Development in the planning area is expected to provide adequate revenues to support the provision of needed public services and facilities.

Socio-Economics and Housing:
The proposed Desert Hot Springs General Plan has been developed to allow the City to maximize its economic development potential, while establishing a balanced and secure economic future. It provides mechanisms to help diversify the local economy and examines a broad range of commercial, energy and industrial development opportunities, which look at tourism, spa and hotel visitations, restaurants, general commercial activities, energy production, warehousing/distribution, and clean industry or other types of development that optimize existing and planned facilities, services and transportation infrastructure.

Through the coordinated promotion of the City as a diversified urban economy, the groundwork may be laid for making the local economy less susceptible to economic downturns, and assuring a successful and prosperous future. As a means of establishing and maintaining the City's financial soundness, the General Plan facilitates the broadening of the City's tax base by actively soliciting revenue and employment generating development compatible and consistent with the General Plan.

General Plan policies and programs require that individual project applications shall be reviewed and analyzed to ensure a long-term balance between employment and housing within the City. Necessary analysis may include, but not be limited to, fiscal impact analysis, economic feasibility studies, and similar documentation. In addition to traditional general and resort commercial development, the Plan encourages pursuing economic expansion in the institutional/medical and light industrial sectors to further diversify its economic base.

The Desert Hot Springs General Plan also provides a comprehensive Housing Element, which takes advantage of and maximizes the impact of the City's housing set aside monies generated by the City's Redevelopment project areas. Objectives have been quantified and programs developed that will assure that the City provides its fair share of affordable housing. Redevelopment Agency funds are expected to be available to assist in construction of all required low and very low income housing units. The City Housing Authority will continue to protect the rights of renters and mobilehome residents.

CITY OF DESERT HOT SPRINGS

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE COMPREHENSIVE GENERAL PLAN

IX. ORGANIZATIONS, PERSONS AND DOCUMENTS CONSULTED

A. Project Proponent

City of Desert Hot Springs
65950 Pierson Blvd.
Desert Hot Springs, CA 92240

B. Planning/Environmental Consultant

John D. Criste, AICP
Terra Nova Planning & Research, Inc.
400 South Farrell Dr., Suite B-205
Palm Springs, CA 92262

C. Transportation Consultant

Gregory Endo
Endo Engineering
28811 Woodcock Drive
Laguna Niguel, CA 92677-1330

D. Biological Consultant

Dr. Thomas A. Leslie, Cal EPA REA
John Minch and Associates, Inc.
26461 Crown Valley Parkway, Suite 200
Mission Viejo, CA 92691

E. Geotechnical Consultant

Tania Gonzalez, CEG
Earth Consultants International, Inc.
2522 North Santiago Blvd., Suite B
Orange, CA 92867

F. Noise Consultant

Gregory Endo
Endo Engineering
28811 Woodcock Drive
Laguna Niguel, CA 92677-1330

G. Archaeology Consultant

Dr. Thomas A. Leslie, Cal EPA REA
John Minch and Associates, Inc.
26461 Crown Valley Parkway, Suite 200
Mission Viejo, CA 92691

H. City of Desert Hot Springs

Nicole Sauviat Criste, Planning Consultant
Paul Stotesbury, Police Chief
Clyde Chittenden, Fire Chief

I. Mission Springs Water District

George Thacker
Don Coleman
Wayne Robertson
Mark Derhock

J. Coachella Valley Water District

Bruce Clark
Joe Cook
Mike Tanner

K. Utilities

Mission Springs Water District
Coachella Valley Water District
Southern California Edison
GTE California
The Gas Company
Desert Valley Disposal

L. Public Agencies

Riverside County Planning Department
Riverside County Fire Department
Riverside County Department of Environmental Health
Riverside County Transportation and Land Management Agency
Riverside County Waste Management Department
Riverside County Flood Control and Water Conservation District
City of Palm Springs Planning Department
Coachella Valley Association of Governments
Palm Springs Unified School District
Southern California Association of Governments
California Department of Transportation
California Office of Planning and Research
California Department of Finance
California Department of Fish and Game
California Department of Housing and Community Development
California Integrated Waste Management Board
South Coast Air Quality Management District
U.S. Bureau of Land Management
U.S. Fish and Wildlife Service

M. Quasi-Public and Other Agencies

Coachella Valley Mountains Conservancy
Sunline Transit Agency

N. Medical Facilities

Desert Hospital
Eisenhower Medical Center
John F. Kennedy Memorial Hospital

O. Documents

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- City of Palm Springs General Plan Land Use Map, City of Palm Springs Planning Department, April 22, 1997.
- Desert Hot Springs General Plan Update Circulation Background Study, Endo Engineering, March 2000.
- Coachella Valley Multimodal Transportation Planning Study, DKS Associates, Gensler and Associates and NBS Lowry, October 1995.
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- Preliminary Draft, Biological Analysis of Three Conservation Alternatives for the Coachella Valley Multiple Species HCP/NCCP, Coachella Valley Mountains Conservancy, December 1999.
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- Cultural Resources Assessment for the Cornerstone Project, City of Desert Hot Springs, Riverside County, Bruce Love, Archaeological Research Unit, University of California-Riverside, December 17, 1990.

- The Cahuilla, Lowell John Bean and Lisa Bourgeault, Chelsea House Publishers, 1989.
- Mukat's People: The Cahuilla Indians of Southern California, Lowell John Bean, University of California Press, 1972.
- Cultural Resources Assessment of 2,267 Acres of Land Located Near Mission Creek in Riverside County, California, Brooke S. Arkush, Archaeological Research Unit, University of California - Riverside, June 1989.
- An Archaeological Assessment of Desert Dunes Resort (Seven Palms Ranch), Desert Hot Springs, Riverside County, California, Christopher Drover, Ph.D., June 10, 1989.
- Archaeological Test Phase of Riv-1825 and 1827, Seven Palms Ranch, Desert Hot Springs, California, Christopher Drover, Ph.D., October 1982.
- Cultural Resources Report for the Rancho Mirage General Plan, Bruce Love and Bai Tom Tang, CRM Tech, January 5, 1996.
- Archaeological Site Survey Records for the Desert Hot Springs Area, compiled by Eastern Information Center, University of California - Riverside, October 24, 1994.
- 1997 Air Quality Management Plan, South Coast Air Quality Management District.
- Coachella Valley PM10 Attainment Redesignation Request and Maintenance Plan, South Coast Air Quality Management District, September 1996.
- CEQA Air Quality Handbook, South Coast Air Quality Management District, April 1993.
- Developer's Manual for the Preparation of Project-Specific Local Air Quality Management Plans to Control PM10 and Other Harmful Emissions, Terra Nova Planning & Research, Inc., 1992.
- State Implementation Plan for PM10 in the Coachella Valley, South Coast Air Quality Management District, November 1990.
- San Gorgonio Wind Resource Study, Environmental Impact Report/Statement #158, Wagstaff and Brady with Robert Odland Associates, Riverside County and U.S. Bureau of Land Management, March 1982.
- Desert Hot Springs General Plan Update Noise Background Study, Endo Engineering, March 2000.
- Guidelines for the Preparation and Content of the Noise Element in the General Plan, California Department of Health Services, 1990.

- Acoustical Analysis Report for the Rancho Mirage General Plan Update, Hersh Acoustical Engineering, Inc., July 1996.
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- 1990 U.S. Census of Population and Housing.
- Profile of Development Prospects for the Cathedral City General Plan, Economics Research Associates, February 15, 1996.
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- Dollars and Cents of Shopping Centers, Urban Land Institute, 1997.
- City of Desert Hot Springs 1999-2000 Annual Budget.

APPENDIX A

INITIAL STUDY,
NOTICE OF PREPARATION (NOP)

AND

RESPONSES TO NOP

PREPARED BY:

THE CITY OF DESERT HOT SPRINGS

AND

TERRA NOVA PLANNING & RESEARCH, INC.

FEBRUARY, 2000

NOTICE ON APPENDIX REDUCTION

This technical appendix has been reduced by 50% and printed double-sided to conserve paper and to allow the technical appendices to be incorporated in the EIR. If you wish to have a full-sized copy of this appendix, please contact the City of Desert Hot Springs at (760)329-6411.

Notice of Completion

See NOTE below

SCH # _____

Mail to: State Clearinghouse, 1400 Tenth Street, Sacramento, CA 95814 916/445-0613

Project Title: City of Desert Hot Springs Comprehensive General Plan EIR

Lead Agency: Desert Hot Springs Planning Dept. Contact Person: John D. Criste, AICP

Street Address: 65950 Pierson Blvd. Phone: (760)320-9040

City: Desert Hot Springs Zip: 92240 County: Riverside

Project Location

County: Riverside City/Nearest Community: Desert Hot Springs

Cross Streets: See Attached NOP Zip Code: ~~92282~~ 92240, 92241 Total Acres: 36,962

Assessor's Parcel No. N/A Section: See NOP Twp. 2,3 S. Range: 3,4,5E. Base: SBB&M

Within 2 Miles: State Hwy #: SR62& I-10 Waterways: Mission Creek, Blind Cyn., Morongo Wash, Cyn. Long

Airports: Palm Springs Railways: Southern Pac. Schools: Seven (7)

Document Type

CEQA: [X] NOP [ ] Supplement/Subsequent [ ] NOI [ ] Other: [ ] Joint Document

[ ] Early Cons [ ] EIR (Prior SCH No.)_____ [ ] EA [ ] Final Document

[ ] Neg Dec [ ] Other_____ [ ] Draft EIS [ ] Other_____

[ ] Draft EIR [ ] FONSI

Local Action Type

[X] General Plan Update [ ] Specific Plan [ ] Rezone [ ] Annexation

[ ] General Plan Amendment [ ] Master Plan [ ] Prezone [ ] Redevelopment

[ ] General Plan Element [ ] Planned Unit Development [ ] Use Permit [ ] Coastal Permit

[ ] Community Plan [ ] Site Plan [ ] Land Division (Subdivision, Parcel Map, Tract Map, etc.) [ ] Other_____

Development Type

[X] Residential: Units_____ Acres 22,153

[X] Office: Sq.ft._____ Acres_____ Employees_____

[X] Commercial: Sq.ft._____ Acres 1,042 Employees_____

[X] Industrial: Sq.ft._____ Acres 4,398 Employees_____

[X] Educational _____

[X] Recreational _____

[ ] Water Facilities: Type_____ MGD_____

[ ] Transportation: Type_____

[ ] Mining: Mineral_____

[ ] Power: Type_____ Watts_____

[ ] Waste Treatment: Type_____

[ ] Hazardous Waste: Type_____

[ ] Other:_____

Project Issues Discussed in Document

[X] Aesthetic/Visual [X] Flood Plain/Flooding [X] Schools/Universities [X] Water Quality

[ ] Agricultural Land [X] Forest Land/Fire Hazard [X] Septic Systems [X] Water Supply/Groundwater

[X] Air Quality [X] Geologic/Seismic [X] Sewer Capacity [X] Wetland/Riparian

[X] Archeological/Historical [X] Minerals [X] Soil Erosion/Compaction/Grading [X] Wildlife

[ ] Coastal Zone [X] Noise [X] Solid Waste [X] Growth Inducing

[X] Drainage/Absorption [X] Population/Housing Balance [X] Toxic/Hazardous [X] Landuse

[X] Economic/Jobs [X] Public Services/Facilities [X] Traffic/Circulation [X] Cumulative Effects

[X] Fiscal [X] Recreation/Parks [X] Vegetation [ ] Other_____

Present Land Use/Zoning/General Plan Use

See attached NOP

Project Description

EIR for the City of Desert Hot Springs Comprehensive General Plan Update. Planning area includes 14,782± acres of incorporated lands and 22,180± acres of Sphere-of-Influence lands.

NOTE: Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. from a Notice of Preparation or previous draft document) please fill it in.

Reviewing Agencies Checklist

KEY
S = Document sent by lead agency
X = Document sent by SCH
✓ = Suggested distribution

___Resources Agency
___Boating & Waterways
___Coastal Commission
___Coastal Conservancy
___Colorado River Board
___Conservation
✓ Fish & Game
___Forestry
✓ Office of Historic Preservation
✓ Parks & Recreation
___Reclamation
___S.F. Bay Conservation & Development Commission
✓ Water Resources (DWR)

Business, Transportation & Housing
___Aeronautics
___California Highway Patrol
✓ CALTRANS District # 8
___Department of Transportation Planning (headquarters)
✓ Housing & Community Development

___Food & Agriculture

Health & Welfare
___Health Services

State & Consumer Services
___General Services
___OLA (Schools)

Cal-EPA
___Air Resources Board
✓ APCD/AQMD (South Coast)
___California Waste Management Board
___SWRCB: Clean Water Grants
___SWRCB: Delta Unit
___SWRCB: Water Quality
___SWRCB: Water Rights
✓ Regional WQCB # _____ (Colorado River)

Youth & Adult Corrections
___Corrections

Independent Commissions & Offices
___Energy Commission
___Native American Heritage Commission
___Public Utilities Commission
___Santa Monica Mountains Conservancy
___State Lands Commission
___Tahoe Regional Planning Agency

___Other _____

Public Review Period (to be filled in by lead agency)

Starting Date February 2, 2000 Ending Date March 4, 2000

Signature John D. Criste Date 2.03.2000

Lead Agency (Complete if applicable):

Consulting Firm: Terra Nova Planning & Research, Inc.

Address: 400 S. Farrell, Ste B-205

City/State/Zip: Palm Springs, CA 92262

Contact: John D. Criste, AICP

Phone: (760) 320-9040

Applicant: City of Desert Hot Springs

Address: 65-950 Pierson Blvd.

City/State/Zip: Desert Hot Springs, CA 92240

Phone: (760) 329-6411

For SCH Use Only:

Date Received at SCH _____

Date Review Starts _____

Date to Agencies _____

Date to SCH _____

Clearance Date _____

Notes:

NOTICE OF PREPARATION

OF AN

ENVIRONMENTAL IMPACT REPORT

FOR THE

DESERT HOT SPRINGS
COMPREHENSIVE GENERAL PLAN UPDATE

DESERT HOT SPRINGS
RIVERSIDE COUNTY, CALIFORNIA

PREPARED FOR

CITY OF DESERT HOT SPRINGS
65-950 PIERSON BOULEVARD
DESERT HOT SPRINGS, CA 92240

PREPARED BY

TERRA NOVA PLANNING & RESEARCH, INC®
400 SOUTH FARRELL DRIVE, SUITE B-205
PALM SPRINGS, CA 92262

NOTICE OF PREPARATION

OF AN

ENVIRONMENTAL IMPACT REPORT

FOR THE

CITY OF DESERT HOT SPRINGS COMPREHENSIVE GENERAL PLAN

Introduction

The City of Desert Hot Springs, Riverside County, California is in the process of drafting an update to its Comprehensive General Plan. A broad range of data and information have been assembled by the City and its consultant regarding the existing physical and environmental conditions within the City and the Coachella Valley region in which the City is located. To further assess the characteristics of the General Plan study area, a series of special studies have been prepared, including those which address traffic and circulation, geotechnical conditions, noise, and biological and cultural resources.

Given the nature and broad scope of the General Plan, and the need for subsequent environmental analysis for specific projects occurring within the study area, a Program EIR is currently envisioned. A description of the planning area and particular areas of environmental concern which will be addressed in the EIR is provided below.

Project Description

The General Plan study area encompasses a total of approximately 36,961 acres, including 14,781 acres of incorporated City lands, and 22,180 acres of Sphere-of-Influence lands. During 1997, the City staff and the General Plan Advisory Committee (GPAC), appointed by the City Council, held extensive meetings to discuss overall and specific goals for the community, as well as specific policy issues for inclusion in the Comprehensive General Plan document. A detailed assessment of existing land use designations was conducted, and a new set of land use designations were considered in various portions of the study area. Modifications to the circulation system were also considered to address current and projected traffic volumes on major roadways. The land use designations have been revisited and refined in recent months, based upon input from City staff and members of the Planning Commission, City Council and the GPAC. A description of the proposed land use designations is provided in Table I.

The General Plan update is conceived as a series of discussion topics encompassed in major chapters. Each element includes a purpose and intent statement, extensive background and technical information, and goals, policies and programs. The General Plan document also includes a land use map.

Table I
City of Desert Hot Springs Draft General Plan
Proposed Land Use Designations

Land Use Designation (Density)	Purpose of Land Use
Residential	
(R-E) Residential Estates (0-1 du/Varies ac)	This designation provides for single-family residential development on lots varying from one to 10 acre minimum in size. This land use provides intermediate steps in development density between more typical open space lands and low residential densities, providing lots sufficient for rural and estate lifestyle yet with room to limit site and environmental impacts.
(R-L) Low Density Residential (0-5 du/ac)	This low density designation provides for single-family residential development on individual lots of not less than 9,000 sq. ft. These lands serve to buffer more dense residential development from estate residential uses, and may be appropriate in areas with some site constraints. This designation typically provides for moderately low density single family subdivisions and Planned Residential Developments (PRDs). It serves to transition between lower and more moderate (medium) residential densities. **Planned Residential Developments (PRDs)** are master planned communities which consolidate areas for structures, common open space and recreation areas, and integrate access and private internal roadways. PRDs permit the transfer of densities from open space/recreation areas, thus preserving open space and possibly permitting the development to maximize allowable densities. The purpose of PRDs is to promote planned residential development and amenities beyond those expected under conventional development. They are also meant to provide greater flexibility in design, varying ranges in densities, and to encourage well planned neighborhoods through creative and

imaginative planning. PRDs also provide for an appropriate mix of housing types, which are unique in their physical characteristics to warrant special methods of residential development. A full range of residential development is permitted in PRDs.

(R-M) Medium Density Residential (0-8 du/ ac)

Appropriate residential development under this designation includes single family and PRDs with shared open space, recreation and other amenities. Condominiums, garden apartments and affordable housing may also be appropriate for these lands. The intent of this designation is to encourage development of a wide variety of dwelling unit types.

(R-MH) Residential Mobilehome (0-10 du/ac)

This land use designation is assigned to existing mobilehome parks and subdivisions, and also provides for new mobilehome developments on thoughtfully considered lands. Projects developed under this designations should be integrated, planned developments within a minimum planning area of 2.5 acres, although larger sites are preferred.

(R-H) High Density Residential (0-14 du/ac)

This designation allows for the greatest diversity of residential development, including attached single and multi-family dwellings. This designation is most suitable for planned communities and affordable and senior housing, where smaller units and higher densities may be appropriate. Duplex and multiplex development is most common and provides for PRD's comprised of a varying range of residential types, including apartments and condominiums. Mobile home parks or subdivisions with PRD type development may also allowed with the approval of a Conditional Use Permit.

(R-VS) Residential-Visitor Serving (Varies du/ac)

This land use designation recognizes the predominant residential character of lands which also include numerous spa-type hotels. It is meant to foster compatible development to serve permanent and seasonal residents, as well as the vacationing public visiting resorts, hotels and motels. To this end, this designation is followed by a suffix (L, M & H) designating permitted residential densities.

Commercial

(C-N) Neighborhood Commercial

This designation provides for neighborhood scale shopping centers conveniently located near residential areas. These developments are typically anchored by supermarkets and super drugstores. A wide range of other uses, including banking, barbers/beauty salons, dry cleaners, restaurants, service businesses, offices and other related activities are typically found in these planned centers. Typical sizes are 8 to 10 acres providing approximately 80,000 to 100,000 square feet of gross leasable floor area.

(C-G) General Commercial

These lands includes a wide variety of smaller commercial centers, specialty retail shops, a broad range of clothing and apparel, jewelry stores and a variety of personal service businesses. Smaller, moderately priced department stores may also be appropriate under this designation. Development may range from free-standing retail buildings, offices and restaurants, to planned commercial centers. Typical sizes range between 2 to 8 acres with gross leasable square footage varying with uses. Hotels and motels may also be appropriate on these lands.

(C-C) Community Commercial

This designation provides for larger, community scale shopping centers and malls, which may be anchored by several department stores or other large-scale anchors. A variety of retail outlets, and restaurant and entertainment uses are also typical. Hotels and motels may also be appropriate on these lands. Office development may also be an integral part of these developments. Typical sizes range between 100-300,000 square feet or more of gross leasable floor area. This type of development requires approval of a Specific Plan. While smaller than regional facilities, the community commercial center will serve the entire community, as well as the surrounding market area.

(---/SP) Specific Plan Overlay	This designation is used in conjunction with other underlying designations. It requires the development of a Specific Plan of Land Use on parcels or groups of parcels of 40 acres or more. The designation is applied as an overlay on the General Plan Land Use Map and can be added to any land use designation. It is also appropriate as a means of processing community-scale commercial and mixed use development proposals. Specific Plans provide detailed design and analysis of large scale and/or complex projects, describing the distribution, location, and intensity of proposed land uses. They also examine the required level of public facilities and services and their availability, and they should help establish economic viability of proposed developments. Several Specific Plan have been adopted and are shown on the Land Use Map.

Industrial

(I-L) Light Industrial	This designation provides for business parks and the development of any and all industrial uses operating entirely in enclosed buildings, and those requiring limited and screenable outdoor storage. Examples include clean manufacturing operations, warehousing and distribution facilities, mini-warehouse storage, and a variety of light manufacturing businesses. Siting industrial lands in close proximity to major regional highways is also desirable. Preferred development includes master planned business and industrial parks with integrated access and internal circulation.
(I-M) Medium Industrial	This designation may allows development of more intense industrial uses with the potential to generate substantial levels of noise, smoke, dust, glare, traffic, vibration or other nuisance. Examples include the manufacturing of durable goods such as appliances, furniture, fabricated metal products, and light electrical and transportation equipment. These uses may also have greater dependence on outdoor storage. Proponents will be required to mitigate any adverse impacts to acceptable or insignificant levels, demonstrate

	conformance with all community environmental standards, and be compatible with existing and planned land uses.
(I-E) Energy-Related Industrial	This land use designation provides for the development of energy producing industries, including windfarms and solar photovoltaic or thermal arrays on an industrial scale. Proposed development must demonstrate compatibility with surrounding uses, and must be especially sensitive to nearby residential development. Other appropriate uses may include those incidental to energy production or transmission, as well as those which do not impair development of energy resources, including landscape nurseries and non-structural recreation such as golf courses.

Institutional Services and Facilities

(P) Public/Quasi-Public	As noted herein and on the Land Use Map, this designation provides for City Hall, other City and governmental offices, libraries, schools, hospitals, floodways, police and fire stations, utility substations, as well as other public/quasi-public administrative offices.

Institutional Symbols

(P/CH)	City Hall
(P/F) Fire Station	Fire Station
(P/PS) Police Station	Police Station
(P/H) Hospital	Hospitals and similar in/out patient medical services. Also may be assigned to convalescent and skilled nursing facilities.
(P/S)	Provides for educational facilities such as day care, elementary, intermediate, high schools, special schools and technical schools.
(P/L)	Libraries
(P/PO)	Post Offices
(P/U)	Utility Substation- designates electric, gas, telephone, water and other similar facilities.
(T)	Designated major transportation corridors.

(OS) Open Space	This designation is assigned to those lands which constitute a special, important or valuable natural resource, which warrants protection. The designation is assigned to such lands as parks, which carry a designation of (OS/PP); golf courses/pool areas/landscaped lands are defined as private open space with a designation of OS/PV. Mountainous areas under public or quasi-public ownership are assigned the designation of Mountain Reserve (OS/MR). The designation allows the discretionary approval of trails, trailheads and associated facilities, but does not allow vehicular access. The Open Space designation may also be used to define special resource areas or those that may pose threats or hazards to development. Lands important for their recreational, biological, or regional economic value may also be assigned an open space designation. Examples of resource lands and hazards include ground rupture or liquefaction hazard areas, detention and retention basins, trails, estuaries and large habitat areas for biological resources.
(OS/PP)	Public Parks
(OS/MR)	Mountain Reserve
(OS/PV)	Private Open Space
(OS/FW)	Floodways

Table 2
City of Desert Hot Springs & SOI
Statistical Summary of Land Uses
Current Comprehensive General Plan (City & County)

Land Use Category	Density	Acres in City	% Acres in City	Acres in SOI	% Acres in SOI
3B County Residential	0.2-0.4 du/ac	0	0.0%	1,394	6.3%
3A County Residential	0.4-2 du/ac	0	0.0%	1,097	5.0%
2B County Residential	2-5 du/ac	0	0.0%	3,757	16.9%
R-L Low Density Residential	0-5 du/ac	7,216	48.8%	4,945	22.3%
R-M Medium Density Residential	6-8 du/ac	437	3.0%	235	1.1%
R-H High Density Residential	9-14 du/ac	1,330	9.0%	0	0.0%
Residential Subtotal		**8,983**	**60.8%**	**11,428**	**51.6%**
V-S Spa/Visitor Serving Commercial		582	4.0%	0	0.0%
H-S Hotel/Spa		13	0.09%	0	0.0%
R-S Resort/Spa		43	0.3%	0	0.0%
C Commercial		545	3.7%	337	1.5%
D-R/S Destination Resort Spa		31	0.2%	0	0.0%
Commercial Subtotal		**1,214**	**8.3%**	**337**	**1.5%**
I Industrial		362	2.4%	628	2.8%
M Industrial/Manufacturing (County)		0	0.0%	1,564	7.1%
Industrial Subtotal		**362**	**2.4%**	**2,192**	**9.9%**
P-F Public Facilities		2,566	17.4%	669	3.0%
T Transportation		90	0.6%	252	1.1%
Institutional Subtotal		**2,656**	**18.0%**	**921**	**4.1%**
OS/R Open Space & Recreation		957	6.4%	0	0.0%
OS/PP Parks Open Space		123	0.8%	0	0.0%
OS/PV Private Open Space		487	3.2%	0	0.0%
P Parks/Forests (County)		0	0.0%	184	0.8%
DA Desert Areas (County)		0	0.0%	3,734	16.8%
MA Mountainous Areas (County)		0	0.0%	3,330	15.0%
W Water Resources (County)		0	0.0%	54	0.2%
Open Space Subtotal		**1,567**	**10.4%**	**7,302**	**32.8%**
Total		**14,782**	**100%**	**22,180**	**100%**

Table 3
City of Desert Hot Springs & SOI
Statistical Summary of Land Uses
GPAC Preferred Alternative

Land Use Category	Density	Acres in City	% Acres in City	Acres in SOI	% Acres in SOI
R-E Residential Estates	0-1 du/varies ac	486	3.3%	3,734	16.8%
R-L Low Density Residential	0-5 du/ac	6,149	41.6%	8,630	39.0%
R-M Medium Density Residential	0-8 du/ac	384	2.6%	88	0.4%
R-MH Residential Mobilehome	0-10 du/ac	48	0.3%	469	2.1%
R-H High Density Residential	0-14 du/ac	1,329	9.0%	0	0.0%
R-VS Residential/Visitor-Serving	Varies du/ac	797	5.4%	39	0.2%
Residential Subtotal		**9,193**	**62.2%**	**12,960**	**58.4%**
C-N Neighborhood Commercial		73	0.5%	0	0.0%
C-C Community Commercial		40	0.3%	88	0.4%
C-G General Commercial		440	3.0%	401	1.8%
Commercial Subtotal		**553**	**3.8%**	**489**	**2.2%**
I-L Light Industrial		362	2.4%	538	2.4%
I-M Medium Industrial		0	0.0%	1,623	7.3%
I-E Energy-Related Industrial		165	1.1%	1,710	7.7%
Industrial Subtotal		**527**	**3.5%**	**3,871**	**17.5%**
P Public Uses		367	2.5%	286	1.3%
T Transportation		90	0.6%	266	1.2%
Institutional Subtotal		**457**	**3.1%**	**552**	**2.5%**
OS/MR Mountain Reserve		2,432	16.5%	2,884	13.0%
OS/PP Public Parks		223	1.5%	0	0.0%
OS/PV Private Open Space		1,162	7.9%	42	0.2%
OS/FW Floodways		235	1.6%	1,382	6.2%
Open Space Subtotal		**4,052**	**27.4%**	**4,308**	**19.4%**
Total		**14,782**	**100%**	**22,180**	**100%**

Current Land Use

The current land use pattern in the City of Desert Hot Springs can be best characterized as a low density residential and spa resort community with a well developed urban core and progressively expanding development pattern. The City's corporate limits are generally bisected east to west by Two Bunch Palms Trail on the south and Mission Lakes Boulevard on the north. Major north-south streets include Palm Drive, Indian Avenue and State Highway 62. The General Plan study area, including corporate limits and Sphere-of-Influence, includes expanses of sparsely developed developed desert lands and extensive windfarm development which extend west, past State Highway 62 to the foothills of the San Bernardino Mountains.

Current residential development consists primarily of low density attached and detached single family units within standard subdivisions, with limited residential development occurring within planned residential developments. A mix of multi-family units, older homes and mobile home parks also comprise part of the existing housing stock. A substantial portion of the City's existing housing stock is affordable both on a market rate basis and due to subsidies.

Both developed and vacant residential lands comprise approximately 60.8% of all incorporated lands, while residential lands comprise approximately 51.6% in the unincorporated portions of the planning area. Low density residential designations, with densities ranging from 0 to 5 dwelling units per acre, encompass about 7,216 acres or about 49% of incorporated lands, and approximately 4,945 acres or 22.3% of the unincorporated planning area. Medium and high residential designations range in density from 6 to 14 units per acre and encompass approximately 1,767 acres or about 12% of incorporated lands. In the unincorporated portions of the planning area lands designated for residential densities in excess of 5 units per acre total about 235 acres or about 1.1% of the unincorporated planning area.

Within the city limits, commercial lands provide a wide range of retail commercial services, including neighborhood and community-scale retail, general commercial, hotel, spa and resort facilities. SIn the City, spa and Visitor Serving (V-S) commercial lands comprise the largest block of lands in this category, totaling about 582 acres or about 4% of incorporated lands. The next largest category is Commercial, which includes general and neighborhood commercial facilities and currently encompasses about 545 acres or 3.7% of incorporated lands. All totalled, commercial and resort-related facilities account for about 8.3% of all City lands. Within the unincorporated portions of the planning area, 337 acres or about 1.5% of these lands are designated for commercial use.

Industrial lands in the planning area are predominantly those found in the unincorporated areas, which total 2,192 acres or about 9.9% of the unincorporated planning area. Industrial designations within the city limits accommodate a variety of light industrial activities, including warehousing and distribution operations, light manufacturing, and research and development. The current General Plan provides about 362 acres of industrial designated lands, most of which are currently undeveloped and are located adjacent to Little Morongo Boulevard, primarily south of Two Bunch Palms Trail. Industrial designations comprise the smallest land use category in the City and encompass about 2.4% of incorporated lands.

Public, quasi-public, and institutional facilities, including the civic center, schools, fire stations, utilities, and active and passive recreation areas are currently provided for through the Public Facilities land use designation. Combined, these facilities encompass about 2,566 acres or about 17.4% of incorporated lands. Major transportation corridors (US Interstate-10 and State Highway 62) occurring within the city limits encompass about 90 acres, while in the unincorporated portions of the study area these facilities occupy about 252 acres.

Open space in Desert Hot Springs city limits takes several forms, including parks, private open space, floodways, steep hillsides, and drainage areas. This designation is assigned to lands that are subject to severe development constraints or are used for public and private recreational purposes. The current General Plan provides for approximately 1,567 acres of open space or about 10.4% of incorporated lands, including approximately 150 acres to be used primarily as a groundwater recharge basin. Open Space designations in the unincorporated portions of the planning area total 7,302 acres or about 32.8% of these lands.

Preferred Alternative Land Use Plan
The Preferred Alternative Land Use Plan prepared by the General Plan Advisory Committee (GPAC). The land use allocations are set forth in Table 3, above. The plan continues the predominant low density residential character of the City but still provides essentially current General Plan acreage for high density residential (1,329 acres). The Preferred Alternative incorporates the "Visitor-Serving" designation into the residential categories and has been increased this redefined R-VS designation by almost 44% to 836 acres. A major enhancement to the City's residential mix is incorporated into the Residential Estate (R-E) designation, which provides for development of rural and estate lot residential development and lot sizes ranging from 1 to 10 acres. The Preferred Alternative provides 4,220 acres of this designation, of which about 486 acres occur within the existing city limits.

Commercial lands in the planning area total approximately 1,042 acres, of which 553 acres occur within the existing city limits and represent a modest increase over current commercial lands in the City. The three commercial categories in the plan include General, Neighborhood and Community. The commercial development potential in the existing city limits is approximately 5.3 million square feet, while the combined commercial acreage in the planning area could provide approximately 9.98 million square feet.

Industrial lands within the existing city limits have been expanded to include about 165 acres of windfarm development (I-E). The I-E designation also provides for development of a variety of energy-related industrial activity and totals 1,875 acres in the planning area. Two other industrial designations are provided, including I-L (Light Industrial) and I-M (Medium Industrial). Major transportation corridors (T, Interstate-10 and Highway 62) comprise 90 acres within the City and an additional 266 acres in the unincorporated portions of the planning area.

Open Space lands have been broken down into four sub-categories to better define their use, including Mountain Reserve (OS/MR), Public Parks (OS/PP), Private open Space and Floodways. Within the city limits, OS/MR comprise the largest acreage (2,432 acres) and reflects the areas of steep terrain located primarily on the west end of the City on lands owned and managed by the Bureau of Land Management. Private open space is the next largest category, comprising about 1,162 acres.

Surrounding Land Uses
Surrounding land uses are under the jurisdiction of Riverside County, with a limited area in the southwest portion of the planning area being under the jurisdiction of the City of Palm Springs. Riverside County lands west of the City are designated as Mountainous Areas within the foothills of the San Bernardino Mountains, and Desert Areas in low-lying areas at the base of the mountains. Current land uses in this area are consistent with these designations and include the rugged, undeveloped mountain foothills and desert open spaces. Lands north of the planning area consist of similar undeveloped mountainous terrain. Riverside County designations in this vicinity include Mountainous Areas within the Little San Bernardino Mountains, Desert Areas at the base of the mountains, and areas designated as Water Resources along Mission Creek and Morongo Wash.

Riverside County lands to the east and southeast of the study area are designated for low density residential and small pockets of commercial development. These lands are largely undeveloped, with scattered single family density development occurring in a rural environment. South of Interstate-10, County lands are designated for a variety of lands uses, including Desert and Water Resources associated with the watershed of the Whitewater River.

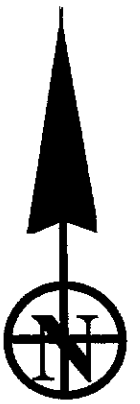
Lands south of Dillon Road and west of Indian Avenue are either incorporated lands of Palm Springs or occur within that City's Sphere-of-Influence. A quarter-section north of Dillon Road is also located within the Palm Springs city limits. Most of these lands are designated for windfarm and related development, with the exception of land designated for commercial use at the northwest corner of Interstate-10 and Indian Avenue.

Project Location
The incorporated boundaries of the City of Desert Hot Springs can generally be described as follows: on the west by the foothills of the San Bernardino Mountains, on the north by the foothills of the Little San Bernardino Mountains, on the east by Long Canyon Road, and on the south by Dillon Road, extending south to Interstate-10 in the central portion of the study area.

The incorporated limits of the City of Desert Hot Springs can be specifically described as including: Sections 24, 25,and 36, Township 2 South, Range 3 East; all of Sections 19, 20, 21, 22, 26, 27, 28, 29, 30, 31, 36, and portions of Sections 24 and 25, Township 2 South, Range 4 East; all of Sections 29, 30, 31, 32, 33, and portions of Sections 19, Township 2 South, Range 5 East; portions of Section 1, Township 3 South, Range 4 East; and portions of Sections 5 and 6, Township 3 South, Range 5 East of the San Bernardino Baseline and Meridian.

Sphere-of-Influence (SOI and other unincorporated planning area) lands include: all of Section 1 and portions of Sections 12 and 13, Township 3 South, Range 3 East; Sections 32, 33, 34, 35, Township 2 South, Range 4 East; all of Sections 2, 3, 4, 5, 6, 11, 12, 13, and portions of Sections 1, 7, 8, 9, 10, 14, 18, 23, 24, 25, Township 3 South, Range 4 East; all of Section 23 and portions of Sections 24 and 25, Township 2 South, Range 4 East; all of Sections 20, 21, 28, 34, and portions of Sections 19 and 27, Township 2 South, Range 5 East; all of Sections 3, 4, 7, 8, 17, 18, 19, and portions of Sections 5, 6, 9, 10, 30, Township 3 South, Range 5 East of the San Bernardino Baseline and Meridian. Also see attached the following exhibit.

CALIFORNIA



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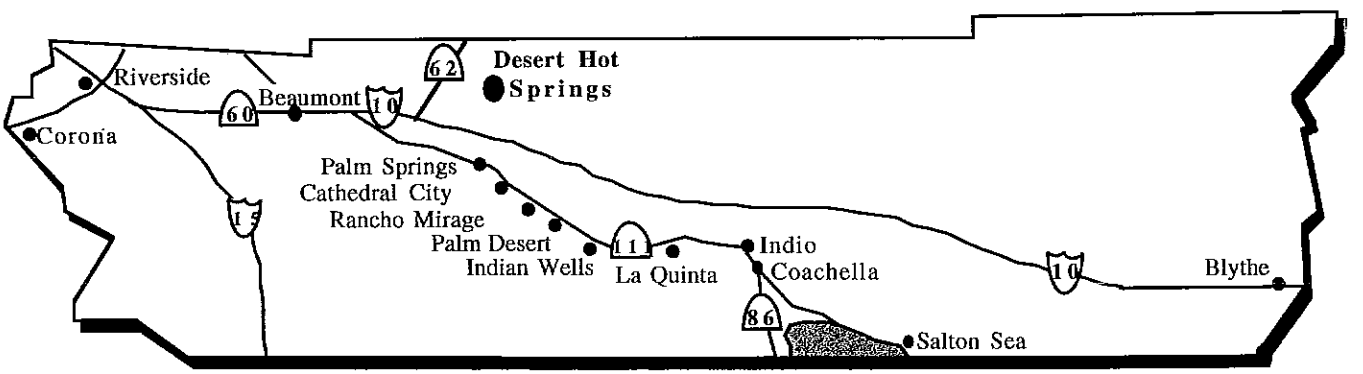
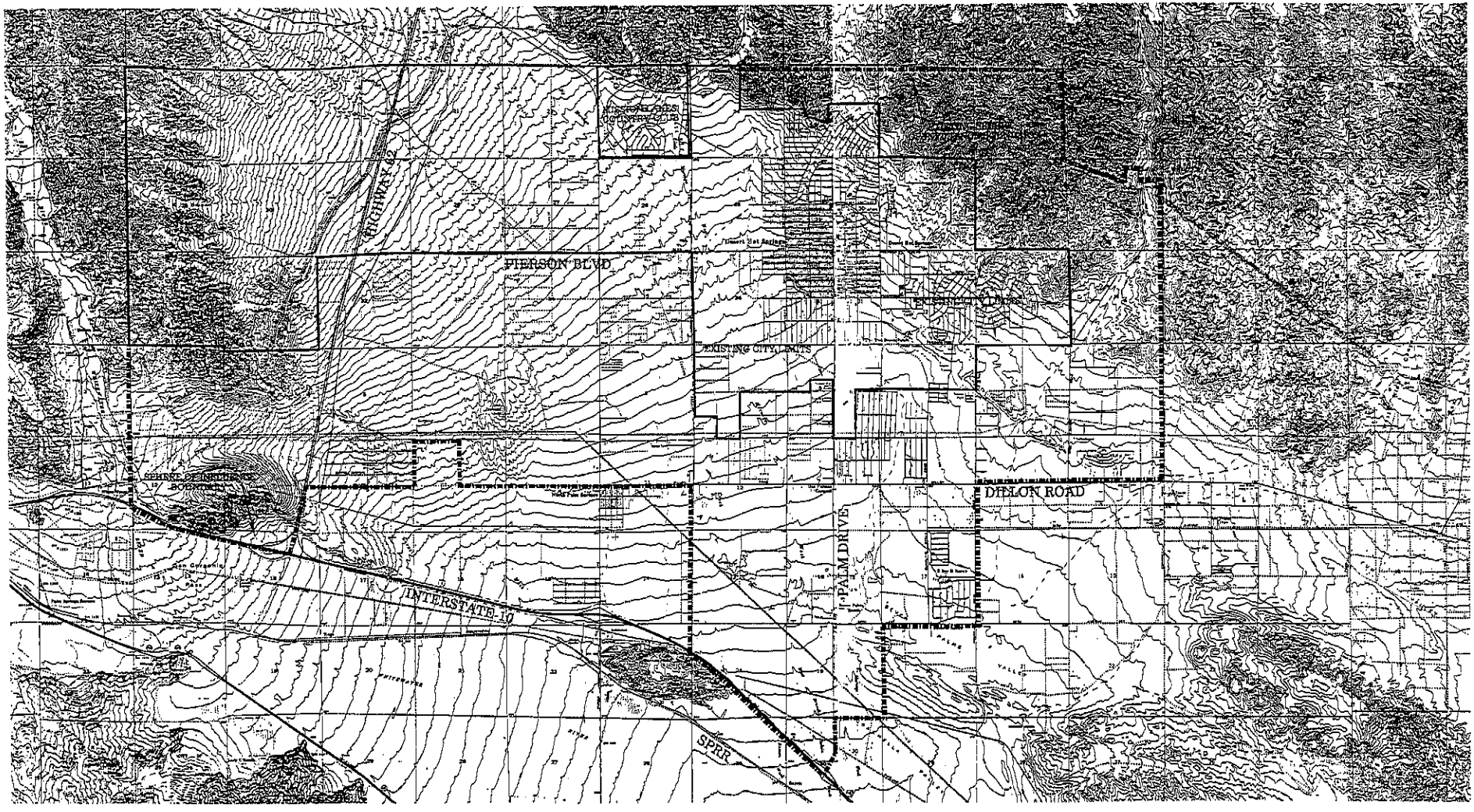


RIVERSIDE COUNTY

TERRA NOVA®
Planning & Research, Inc.

Desert Hot Springs General Plan
Regional Location Map

Exhibit



TERRA NOVA®
Planning & Research, Inc.

Desert Hot Springs
General Plan Study Area

Exhibit

ENVIRONMENTAL SETTING

Following is a brief description of the City of Desert Hot Springs and the Coachella Valley in which the City is located. Environmental resources which may be adversely impacted by the proposed changes to the General Plan, and environmental hazards which currently affect the community or may do so in the future, are also described.

The City of Desert Hot Springs is located in the northwestern portion of the Coachella Valley, which is in turn located in the central portion of Riverside County, in Southern California. The Desert Hot Springs city limits and General Plan study area encompass lands located near the western end of the Salton Trough, a fault-controlled valley basin with expansive and varying geography and habitats, and the complexity of various transition zones, which make the region a rich resource area. This desert environment is comprised of large and smaller scale alluvial fans, rocky/sandy washes draining the mountains that surround the valley, and the valley floor which contains sand dunes and fields. A wide range of biological resources and habitats are located within and in the vicinity of the study area.

The physical character of the City and the Coachella Valley is significantly affected by seismic activity occurring on the San Andreas Fault Zone and other faults, which pass through the City and SOI. Regional topography is characterized by extreme variations in elevation and terrain, ranging from a sub-sea level geologic sink to mountain peaks that rise two miles above sea level. The Salton Sea is located at the southern end of the valley and occurs at an elevation of about 228 feet below sea level. At the northwestern end of the valley are the San Jacinto and San Bernardino Mountains, with peaks ranging from 9,600 to more than 11,500 feet above sea level. Within the General Plan study area, elevations range from about 580 feet above sea level at the southernmost point, near the Interstate-10/Palm Drive interchange, to about 2,800 feet in the extreme northeast in the Little San Bernardino Mountains.

The Coachella Valley region is known for prime agricultural lands in the eastern valley. In the western portion of the valley, agriculture which developed early this century near the Santa Rosa Mountains has given way to residential, commercial and exclusive resort development. Urbanization in the valley initially occurred along the slopes of the Santa Rosa and San Jacinto Mountains, but has spread primarily to the southeast. The Desert Hot Springs planning area is not contiguous with this pattern of urbanization and has developed as a separate urban center. The region is served by several major transportation arteries, including US Interstate-10, numerous state highways and the Southern Pacific Railroad. Palm Springs International Airport functions as the region's major airport, but secondary general aviation facilities also serve the eastern portion of the valley.

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

Introduction

In accordance with the California Environmental Quality Act (CEQA), an Initial Study has been prepared for the proposed Comprehensive General Plan Update. The proposed changes to the General Plan do not constitute a radical departure from the current General Plan. However, several areas of concern have been identified where the potential for impacts to important environmental resources exists, and where impacts from environmental hazards may affect the community. Each of these areas of concern is briefly described below, and each will be addressed in greater detail in the Program EIR being prepared for this project.

Land Use Compatibility

Land use compatibility is a critical component in developing an effective and responsive General Plan update. The Land Use Element of the General Plan clarifies and addresses most of the concerns of the community's development and plays an essential role in synthesizing land use issues. The proposed land use plan is meant to establish basic goals and policies relevant to a low to medium density and spa resort community, with a balanced mix of locally and regionally serving land uses. Patterns of land use and open space preservation have been assigned to preserve existing neighborhoods and sensitive open space lands. The Land Use Element continues to support the logical and staged extension of public infrastructure systems and the land uses they support. The proposed land use pattern is designed to complement existing patterns, while also enhancing the functional and aesthetic qualities of future land uses.

Transportation/Circulation

Unlike other communities in the Coachella Valley, the City of Desert Hot Springs is somewhat isolated from other urban development patterns. While intra-community traffic is provided by arterial and collector-sized roadways, Desert Hot Springs is connected to the rest of the Valley and region by state and interstate highways, including US Interstate-10 and State Route 62. Regional arterials, including Palm Drive/Gene Autry Trail, Indian Avenue, Dillon Road, Date Palm Drive and Mountain View Road, connect City traffic to other Coachella Valley communities.

Major roadway segments and intersections are likely to be substantially impacted by future traffic. It is essential that impacts to the roadway system be thoroughly analyzed to assure that they can continue to operate at acceptable levels of service as the planning area builds out. The need for and appropriateness of future design modifications and mitigation measures will be assessed in the EIR.

Hydrology

The flood hazard in City of Desert Hot Springs and its SOI is related primarily to storm flooding on the alluvial fans that drain the San Bernardino and Little San Bernardino Mountains. Substantial portions of the General Plan study area are located within or between the 100-year and 500-year flood zones. These areas are generally located in the eastern and central portions of the study area, where some urbanization has already occurred, and are associated with the channels of Morongo Wash, Mission Creek, Little Morongo Creek, Blind Canyon, and Long Canyon.

The City of Desert Hot Springs, Riverside County Flood Control and Water Conservation District, and Federal Emergency Management Agency (FEMA), have participated in the construction of stormwater drainage improvements in the study area, including a partially constructed earthen channel within the Mission Creek Wash at approximately Mission Lakes Boulevard (extended), and portions of a levee system which conveys Blind Creek and local drainage southwest to join the unimproved Morongo Creek Channel north of Pierson Boulevard. While an all-weather crossing of Mission Creek at Pierson Boulevard has been constructed in recent years, potential flooding on Morongo Wash and elsewhere in the city continue to threaten to isolate the City during major storm events. Drainage from the Long Canyon Wash and the Desert Hot Springs Wash impact roadways and development in the south-central portion of the planning area, and have occasionally closed streets. Additional flood control facilities are planned for long-term construction.

Future development in the City and its SOI may contribute to an incremental increase in runoff and flooding potential, and may be subject to storm hazards as well as seismically induced inundation from twenty above-ground water storage tanks in the study area. The General Plan Program EIR will assess existing flood hazards, the implications of continued urbanization and anticipated flooding hazards associated with buildout of the proposed General Plan.

Geology/Seismicity
The City and Coachella Valley are affected by the active geologic conditions which center around the San Andreas Fault Zone and other nearby faults. Major earthquakes have occurred in the region in the past decade, and the region is considered a prime candidate for major seismic activity in the next 20 to 30 years. Issues associated with these geotechnical conditions include ground rupture, strong ground shaking, liquefaction, subsidence, and slope instability. The rocky hillsides and unstable slopes of the Little San Bernardino Mountains, and seismically induced inundation associated with the collapse of above-ground water storage tanks may also pose a threat to development in the City. Portions of the study area, particularly in the vicinity of 20th Avenue, are also subject to strong, sustained winds and are susceptible to the effects of wind erosion and blowsand. These and associated issues shall be addressed in detail in the Program EIR.

Air Quality
Compared to other communities in Southern California, the City of Desert Hot Springs has generally good air quality. However, in the past few decades, a noticeable deterioration in air quality has occurred due to increased development, population growth, traffic, construction activity and various other site disturbances. These impacts have been somewhat lessened in the City due to its relatively high elevation compared to that of the desert floor.

The City of Desert Hot Springs and the Coachella Valley are located within the Salton Sea Air Basin (SSAB). The South Coast Air Quality Management District (SCAQMD) is responsible for establishing air quality management criteria and relevant management policies for the SSAB and neighboring air basins. The SCQAMD also routinely monitors daily pollutant levels and meteorological factors throughout the District.

Of all pollutants, ozone and PM_{10} (suspended particulate matter) are the most prevalent in the Coachella Valley. The valley is currently classified as a "severe-17" non-attainment area for ozone under the federal Clean Air Act. Although these pollutants are produced from various sources within the Coachella Valley, the most evident degradation of air quality but ozone may be attributed mainly to sources outside the area, including the Los Angeles County and San Bernardino/Riverside air basins. The region is also classified as a "serious" non-attainment area for PM_{10} by the U.S. EPA. However, recent monitoring data indicate that PM_{10} emissions in the region have been reduced considerably, and the Coachella Valley may soon be eligible for reconsideration by the EPA as having attained the federal PM_{10} standard.

Buildout associated with implementation of the General Plan update may result in occasional and temporary exceedances of both state and federal standards for various air pollutants. These issues will be more fully assessed in the Program EIR.

Water Resources
Domestic water resources for the City of Desert Hot Springs are provided by the Mission Springs Water District (MSWD), which utilizes wells to extract groundwater primarily from the Mission Creek Subbasin. The groundwater subbasin is currently being recharged by natural sources, including precipitation and runoff from the San Bernardino and Little San Bernardino Mountains. The MSWD, in cooperation with the Desert Water Agency, is actively developing facilities to provide for additional groundwater recharge with imported Colorado River water. The water is currently transported via the Metropolitan Water District aqueduct, which passes through the west end of the City and its SOI, and is used to recharge other groundwater subbasins in the project vicinity.

It is unclear whether and to what extent groundwater extraction in the Mission Creek Subbasin is resulting in an overdraft condition, which results in a net reduction of water in storage. However, continued growth in the City and other parts of the subbasin service area will have a cumulative effect on the long-term viability of this water source. The Program EIR will quantify General Plan buildout demand for water resources and provide mitigation measures to address projected impacts.

Biological Resources
The City of Desert Hot Springs and the Coachella Valley are located within one of the most biologically unique and diverse regions in the country. The valley supports a wide variety of common and sensitive plants and animals that are well adapted to the desert floor, alluvial fan and rocky hillside environments that comprise the study area. These varying habitats support a variety of common species, including the chuckwalla, desert iguana, Golden eagle, western burrowing owl, Palm Springs ground squirrel, Prairie falcons and several species of bats. The study area also supports a number of sensitive species, which are listed as endangered or threatened, or considered to be a species of concern by state and/or federal governments. Sensitive animal species include the Coachella Valley fringe-toed lizard, Desert slender salamander, Desert tortoise, and the Least Bell's Vireo. Sensitive plant species include the California ditaxis, Coachella Valley milkvetch, Little San Bernardino Mountains gilia, flat-seeded spurge and Payson's jewelflower.

One of the most important biological resources in the community is the Coachella Valley fringe-toes lizard (CVFTL), which is dependent upon the natural blowsand processes of the upper Coachella Valley. The CVFTL was listed as a federally threatened and state endangered species in 1980. The Coachella Valley fringe-toed lizard Habitat Conservation Plan was developed in 1985 as a cooperative federal and local program of conservation for the species. Portions of the General Plan study area lie within the boundaries of occupiable CVFTL habitat, and development within the City is subject to the provisions of the CVFTL Habitat Conservation Plan.

The General Plan planning area occurs within the planning area boundaries of the Coachella Valley Multiple Species Habitat Conservation Plan being prepared under the direction of the Coachella Valley Association of Governments (CVAG). The City is a signatory to the Memorandum of Understanding supporting development of the Plan. The potential impacts on biological resources from buildout of the General Plan will be evaluated in the Program EIR.

Noise

The predominant noise source in the City of Desert Hot Springs and its SOI is vehicular traffic. In general, the existing noise environment in the City is relatively quiet, with significant noise associated with Interstate-10, State Highway 62, Palm Drive and other major arterial roadways. Other substantial noise generators include the operations of the Southern Pacific Railroad, construction vehicles and equipment, and mechanical equipment including fans and compressors. Wind turbine operations can also be expected to be potentially significant noise generators. Noise monitoring has been conducted along major roadways, and future traffic shall be modeled to determine associated impacts and establish parameters for mitigation.

Cultural Resources

The most recent identifiable native culture to evolve in the Coachella Valley region are the Desert Cahuilla, whose territory extended from the Salton Sea (Ancient Lake Cahuilla) to the San Gorgonio Pass. A number of habitation and village sites were developed by the Cahuilla in the Coachella Valley, including villages, milling sites, trail segments, lithic workshops and quarries used for making stone tools and weapons, and rock sites that were used for artistic and/or religious purposes. Most Cahuilla sites are associated with canyons, especially those with permanent or seasonal surface water, including sites located along tectonic faults that interrupt the movement of ground water and direct it to the surface. Historic resources have been identified within the General Plan study area, and potential impacts to these resources will be addressed in the Program EIR.

Scenic Resources

One of the Coachella Valley's most important assets is its exceptional mountain and open space views. The Valley is bordered on the north, west and south by the Little San Bernardino, San Bernardino, San Jacinto and Santa Rosa Mountains. The contrasting mountain scenery and vast expanses of desert on the valley floor contribute to the valley's scenic beauty and help define its character. Views of the San Jacinto and Santa Rosa Mountains, in particular, are highly prized, and continued development in the General Plan study area can constitute a significant impact to these and other valuable scenic resources. The Program EIR will assess the potential for adverse impacts to these resources.

Socio-Economic Resources

The City of Desert Hot Springs is unique in the Coachella Valley in that it lacks adjoining urban development and the economic stimulation that such development can provide. While development in much of the valley has generally followed a growth pattern that began in Palm Springs and expanded to the southeast, and while the economy in the eastern valley has been founded on and strengthened by agriculture , the City of Desert Hot Springs has had to cultivate its own economic opportunities. The City's hot mineral waters provided the initial impetus for hotel and resort development and have become an identifying characteristic of the community. Today, the City is home to more than 40 hotels, which contribute substantial revenues to the City's economy The City also serves as an important provider of housing for all socio-economic sectors in a rural setting.

The City's population has generally doubled each decade since 1970; however, this growth has slowed somewhat in recent years. By 1999, the population had reached about 15,400. Although the City's per capita income ($12,406 in 1997) and median income ($26,264 in 1995) have been consistently lower than the Riverside County and state averages, the City has experienced rather constant increases in both per capita and median incomes, which reinforce the economic development potential of the community.

Most residential growth activity continues to be single family home development, and the City is generally considered to be an exceptional opportunity for the development of a full range of residential products, from affordable housing to planned resort residential development. Non-residential development, however, has been generally slow over the past decade. Major employers include Palm Springs Unified School District, Two Bunch Palms Resort, Desert Hot Springs Spa, and Hotel, Mirage Springs Hotel, K-Mart and others. These trends in employment appear to provide good direction to the City on how to further develop its job base.

The proposed General Plan update encourages the redevelopment of the downtown area and the development of the tourist/traveler commercial potential of the U.S. Interstate-10 and State Highway 62 corridors, and provides other economic opportunities for the community. The potential socio-economic impacts associated with buildout of the General Plan will be assessed in the Program EIR.

Public Services and Facilities

Fire protection services are provided to the City of Desert Hot Springs by the Riverside County Fire Department through a contract with the California Department of Forestry. One fire station is located within the incorporated City limits, and two others are well situated to provide additional fire support and excellent response times to the community.

Police protection in the City is provided by the City's Police Department, which operates out of the City Hall building. Although police response times can vary depending on the location of patrols and level of activity, current response times are within acceptable time frames.

Seven public schools currently serve the City, which lies within the boundaries of the Palm Springs Unified School District. The City operates a public library with a wide range of library and media services. In addition, the City owns and maintains 1 community park, 2 neighborhood parks and 2 mini-parks. The City is fortunate to be located in close proximity to several regional recreational facilities, including Joshua Tree National Park and Big Morongo Canyon Preserve/Covington Park. The Program EIR will assess the potential impacts of General Plan buildout on public services and facilities.

APPENDIX G

Environmental Checklist Form

1. Project title: Desert Hot Springs Comprehensive General Plan Update

2. Lead agency name and address:
City of Desert Hot Springs
65-950 Pierson Blvd.
Desert Hot Springs, Ca 92240

3. Contact person and phone number: John D. Criste, AICP/(760) 320-9040

4. Project location: City of Desert Hot Springs, Riverside County, CA

5. Project sponsor's name and address:
City of Desert Hot Springs
65-950 Pierson Blvd.
Desert Hot Springs, CA 92240

6. General plan designation: Varies/All 7. Zoning: Varies/All

8. Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)
New Comprehensive General Plan addressing 14,782± acres within the corporate limits,and 22,180± acres in the unincorporated planning area. Includes changes to land use designations, circulation system, and new goals, policies and programs for all General Plan Elements.

9. Surrounding land uses and setting: Briefly describe the project's surroundings:
Surrounding lands are under the jurisdiction of Riverside County with limited acreage also within the corporate and Sphere-of-influence limits of the City of Palm Springs. Surrounding land use designation include low density residential, a variety of open space industrial and wind energy.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)
Housing Element to be reviewed by the CA. Department of Housing and Community Development. Safety/Geotechnical Element to be reviewed by the Ca. Division of Mines and Geology.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

[X] Aesthetics	[ ] Agriculture Resources	[X] Air Quality
[X] Biological Resources	[X] Cultural Resources	[X] Geology /Soils
[X] Hazards & Hazardous Materials	[X] Hydrology / Water Quality	[X] Land Use / Planning

[X] Mineral Resources	[X] Noise	[X] Population / Housing
[X] Public Services	[X] Recreation	[X] Transportation/Traffic
[X] Utilities / Service Systems	[X] Mandatory Findings of Significance	

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

[ ] I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

[ ] I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

[X] I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

[ ] I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

[ ] I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature 2.3.00
Date

John D. Criste, AICP
Printed name

City of Desert Hot Springs
For

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose

sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used. Identify and state where they are available for review.

   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:
   a) the significance criteria or threshold, if any, used to evaluate each question; and
   b) the mitigation measure identified, if any, to reduce the impact to less than significance

SAMPLE QUESTION

Issues:

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
I. AESTHETICS – Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	X	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	X	☐	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	X	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	X	☐	☐	☐
II. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	X
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	X
III. AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				

a) Conflict with or obstruct implementation of the applicable air quality plan?		X		
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X		
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	X			
d) Expose sensitive receptors to substantial pollutant concentrations?		X		
e) Create objectionable odors affecting a substantial number of people?			X	

IV. BIOLOGICAL RESOURCES -- Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	X			
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	X			
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				X
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	X			

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?			X	

V. CULTURAL RESOURCES -- Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?		X		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			X	
d) Disturb any human remains, including those interred outside of formal cemeteries?			X	

VI. GEOLOGY AND SOILS -- Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:		X		
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.		X		
ii) Strong seismic ground shaking?		X		
iii) Seismic-related ground failure, including liquefaction?		X		
iv) Landslides?		X		
b) Result in substantial soil erosion or the loss of topsoil?		X		
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		X		
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?		X		

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?			X	

VII. HAZARDS AND HAZARDOUS MATERIALS – Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X	
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			X	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X	
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			X	

VIII. HYDROLOGY AND WATER QUALITY – Would the project:

a) Violate any water quality standards or waste discharge requirements?			X	

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?		X		
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?		X		
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?		X		
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X	
f) Otherwise substantially degrade water quality?		X		
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	X			
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	X			
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			X	
j) Inundation by seiche, tsunami, or mudflow?		X		

IX. LAND USE AND PLANNING - Would the project:

a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			X	
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?			X	

X. MINERAL RESOURCES – Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☒	☐
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☒	☐

XI. NOISE –

Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

XII. POPULATION AND HOUSING – Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☒	☐	☐	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

XIII. PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☒	☐	☐
Fire protection?	☐	☒	☐	☐
Police protection?	☐	☒	☐	☐
Schools?	☐	☒	☐	☐
Parks?	☐	☒	☐	☐
Other public facilities?	☐	☒	☐	☐

XIV. RECREATION –

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☒	☐	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☒	☐	☐

XV. TRANSPORTATION/TRAFFIC – Would the project:

a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☒	☐	☐	☐
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☒	☐	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Result in inadequate parking capacity?	☐	☒	☐	☐

g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☒	☐

XVI. UTILITIES AND SERVICE SYSTEMS –

Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☒	☐	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☒	☐	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☒	☐	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☒	☐	☐

	Potentially Significant Impact	Less than Significant With Mitigation	Less Than Significant Impact	No Impact
XVII. MANDATORY FINDINGS OF SIGNIFICANCE –				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

CITY OF DESERT HOT SPRINGS
COMPREHENSIVE GENERAL PLAN UPDATE

ADDENDUM
TO
ENVIRONMENTAL CHECKLIST

I.a. Future development facilitated by the proposed Plan has the potential to create aesthetic impacts to scenic vistas viewed from public lands and/or rights-of-way. In particular, large commercial and light industrial developments have the potential to generate adverse impacts. While policies and programs in the proposed Plan such as comprehensive landscaping programs, site-sensitive planning and architectural plan review will limit these impacts, a more thorough assessment should be made.

I.b. Grading and construction activities associated with implementation of the proposed General Plan could cause damage to scenic resources, including vegetation and rock outcroppings. A series of mitigation measures, including architectural review and the regulation of grading and development occurring within scenic highway viewsheds, are expected to reduce these potential impacts. However, these issues need to be further examined.

I.c. Continued urbanization made possible by the updated Plan has the potential to degrade the existing visual character of the City and its surroundings. In particular, land clearing, grading and construction activity have the potential to alter existing scenic resources. These issues should be further assessed.

I.d. Desert Hot Springs enjoys dark night skies with excellent visibility. Future development associated with the Plan update is likely to result in increased light and possibly glare. The potential for these impacts to occur should be further assessed.

II.a. There is no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance located within the boundaries of the study area, and implementation of the proposed Plan will not result in the conversion of such lands to non-agricultural uses. (Source: "Soil Survey of Riverside County, California, Coachella Valley Area," U.S. Dept. of Agriculture, Soil Conservation Service, September 1980)

II.b. Implementation of the General Plan is not expected to conflict with a Williamson Act contract or existing zoning for agricultural uses. (Source: "Soil Survey of Riverside County, California, Coachella Valley Area," U.S. Dept. of Agriculture, Soil Conservation Service, September 1980)

II.c. Development facilitated by the proposed Plan is not expected to result in any environmental changes which could result in the conversion of farmland to non-agricultural uses. (Source: "Soil Survey of Riverside County, California, Coachella Valley Area," U.S. Dept. of Agriculture, Soil Conservation Service, September 1980)

III.a. Plan-facilitated future development has the potential to emit air pollutants which are subject to the provisions of local and regional air quality plans. While these impacts are expected to be mitigated through General Plan policies and programs, including pollutant monitoring, the use of alternative energy sources, and the use of water trucks and other measures intended to reduce fugitive dust emissions, the potential for these types of impacts should be further analyzed. (Source: "Desert Hot Springs General Plan Update, Air Quality Background Study Baseline," Endo Engineering, November 16, 1994)

III.b. Future development associated with buildout of the proposed Plan could exceed air quality standards and could contribute to existing exceedances in air quality pollutants. These impacts are expected to be mitigated through the use of alternative modes of transportation, the use of water trucks and other measures which reduce the emission of fugitive dust, and the preparation of site-specific air quality analyses. However, these issues should be examined further.

III.c. Buildout of the proposed General Plan has the potential to contribute to local and regional exceedances in particulate matter, ozone and other air pollutants. These issues need to be further assessed, and mitigation measures should be proposed.

III.d. Development facilitated by the proposed General Plan could potentially expose sensitive receptors, such as schools and residences, to pollutant concentrations. General Plan policies and programs, including thoughtful land use planning, the phasing of development projects, and the use of water trucks and other measures designed to reduce fugitive dust emissions, are expected to reduce these potential impacts to insignificant levels. However, these issues should be further addressed.

III.e. Implementation of the proposed Plan, particularly the development of restaurants, certain industrial and similar facilities, has a limited potential to create objectionable odors which would affect a substantial number of people. These potential impacts should be further evaluated.

IV.a. Development facilitated by approval and implementation of the Plan has the potential to degrade wildlife resources, including habitat, and have other potentially adverse impacts on sensitive, threatened or endangered biological species, including the Coachella Valley fringe-toed lizard and the Little San Bernardino Mountains gilia. While impacts are addressed through Plan policies and programs, these issues should be further examined. (Source: p. 42, "Biological Resources Assessment of the City of Desert Hot Springs and Sphere-of-Influence," John Minch and Associates, Inc., Jan. 18, 1995.)

IV.b. As with native animals, sensitive plant species and natural communities may also be affected by development facilitated by the Plan. Both numbers and their habitat may be affected, and these potential impacts should be further assessed. (Source: p. 43, "Biological Resources Assessment of the City of Desert Hot Springs and Sphere-of-Influence," John Minch and Associates, Inc., Jan. 18, 1995.)

IV.c. Federally protected wetlands are not known to occur within the boundaries of the General Plan study area, and therefore will not be adversely impacted by implementation of the Plan. (Source: "Biological Resources Assessment of the City of Desert Hot Springs and Sphere-of-Influence," John Minch and Associates, Inc., Jan. 18, 1995.)

IV.d. Development facilitated by the proposed plan may result in the establishment of insurmountable barriers which isolate native species, interfere with their migration corridors and/or impede the use of their nursery sites. These issues should be further examined. (Source: p. 16, "Biological Resources Assessment of the City of Desert Hot Springs and Sphere-of-Influence," John Minch and Associates, Inc., Jan. 18, 1995.)

IV.e. The proposed project is expected to be fully compliant with local policies and ordinances which protect biological resources.

IV.f. Development facilitated with the proposed Plan will be compliant with the provisions of the Coachella Valley fringe-toed lizard Habitat Conservation Plans and other approved habitat conservation plans.

V.a & b. Future development facilitated by implementation of the Plan could conceivably lead to the alteration or destruction of historical and/or archaeological resources. A series of General Plan policies and programs, including the thorough review of development proposals for potential impacts to cultural resources and continued efforts at historical preservation, are expected to reduce potential impacts to acceptable levels. However, these issues should be further assessed.

V.c. Implementation of the Plan could potentially result in the disturbance or destruction of paleontological resources or unique geologic features. While this potential impact is not considered substantial, a more thorough assessment of potential impacts should be made.

V.d. While the possibility of disturbing human remains during implementation of the General Plan is not considered significant, the potential for doing so exists and should be further addressed.

VI.a.i. Active and potentially active segments of the San Andreas Fault Zone, including the Banning and Mission Creek Branches, are located within the boundaries of the General Plan study area, and portions of the study area are contained within Alquist-Priolo Special Study Zones, as delineated by the State Geologist. Implementation of the proposed Plan has the potential to expose people and structures to the adverse effects of surface rupture. The regulation of development within Alquist-Priolo Special Study Zones, and the preparation of thorough geotechnical and fault zone investigations, are expected to mitigate the impacts associated with fault rupture. However, these impacts should be further evaluated. (Source: p. 12, "Seismic, Geologic and Flooding Hazards Sections of the Technical Background Report, General Plan Update, City of Desert Hot Springs, California," Earth Consultants International, May 28, 1997)

VI.a.ii. The General Plan study area contains active and potentially active faults, and implementation of the proposed Plan could potentially expose people and structures to strong seismic groundshaking. General Plan policies and programs, including strict adherence to the Uniform Building Code and other applicable building standards, and the rehabilitation of unreinforced structures, appear to adequately address these potential impacts. However, these issues should be further addressed. (Source: p. 5, "Seismic, Geologic and Flooding Hazards Sections of the Technical Background Report, General Plan Update, City of Desert Hot Springs, California," Earth Consultants International, May 28, 1997)

VI.a.iii. Portions of the General Plan study area may be susceptible to seismically induced ground failure, including liquefaction, and development facilitated by the proposed Plan may expose people and structures to such hazards. While these potential impacts are expected to be minimized through the application of mitigation measures, these issues need to be further assessed. (Source: p. 15, "Seismic, Geologic and Flooding Hazards Sections of the Technical Background Report, General Plan Update, City of Desert Hot Springs, California," Earth Consultants International, May 28, 1997)

VI.a.iv. Plan-facilitated development, particularly that occurring adjacent to the foothills of the San Bernardino and Little San Bernardino Mountains, may be exposed to seismically induced landslides and/or rockfalls. The identification of rockfall and landslide hazard areas, and the restriction of development in these areas, is expected to minimize these potential hazards. However, these issues should be further evaluated. (Source: Figure 1-5, "Seismic, Geologic and Flooding Hazards Sections of the Technical Background Report, General Plan Update, City of Desert Hot Springs, California," Earth Consultants International, May 28, 1997)

VI.b. While the General Plan will not directly increase soil erosion, development facilitated by the Plan may have the potential of inducing erosion through mass grading, removing topsoil and otherwise affecting surface relief and soil consolidation. These impacts are expected to be mitigated through the implementation of site-specific grading and drainage controls, and improvements that enhance local drainage conditions. These issues should be further addressed.

VI.c. Development facilitated by the proposed Plan may be constructed on unstable geologic units or soils, which could potentially result in landslides, lateral spreading, liquefaction or collapse. Although these potential impacts are expected to be minimized through the implementation of mitigation measures, such as locating drainage facilities and heavily irrigated areas away from foundations and other structural supports, they should be further examined. (Source: p. 15, "Seismic, Geologic and Flooding Hazards Sections of the Technical Background Report, General Plan Update, City of Desert Hot Springs, California," Earth Consultants International, May 28, 1997)

XII.b & c. Adoption and implementation of the proposed Plan will facilitate new development on largely vacant lands, and is not expected to displace substantial numbers of existing housing or residents.

XIII.a Increased or expanded urbanization which may result from adoption of the proposed General Plan may increase the demand for fire protection services. Possible increases in traffic may also extend response times for fire equipment and personnel. On-going consultation and coordination with the Riverside County Fire Department and the California Department of Forestry, in addition to the careful siting of potential hazardous structures and the enforcement of applicable fire codes, are expected to mitigated these potential impacts. However, these issues should be further assessed.

Increased urbanization and associated increases in population and commercial activity, which may result from adoption of the proposed General Plan, may increase the demand for police protection services. Possible increases in traffic may also lengthen response times for police patrols. General Plan policies and programs, which include the integration of defensible space in development projects and the implementation of the Neighborhood Watch and Citizens on Patrol programs, appear to adequately address these issues. However, these potential impacts need to be further evaluated.

The proposed changes to the General Plan are expected to result in new and/or expanded households, including households with school-age children. These potential impacts are expected to be minimized through the payment of statutory schools mitigation fees, and on-going consultation with the Palm Springs Unified School District for the construction and maintenance of area schools. Associated impacts need to be further assessed.

Further development facilitated by the Plan may impact existing neighborhood parks and/or generate an increased demand for additional parks and recreation facilities. These impacts need to be further addressed.

Buildout of the General Plan may increase impacts to public roads and other public facilities and services. These potential impacts should be further analyzed.

XIV.a. The proposed Plan has the potential to increase the demand for existing park and recreation facilities such that the quality and quantity of existing facilities may be affected. General Plan policies and programs call for the updating of the City's Master Parks Plan and the implementation of a Parks Improvement Program to assure adequate parklands are provided to meet the needs of the community. However, potential impacts to existing parks and recreation facilities should be further assessed.

XIV.b. The proposed Plan provides for new parks and recreation facilities, the construction of which could result in limited adverse environmental impacts. The General Plan proposes a variety of mitigation measures which are intended to minimize these

potential impacts, including the installation of adequate landscaping and irrigation systems, the preservation of open space and passive recreation areas, and the implementation of water and other conservation measures. However, these potential impacts need to be addressed further.

XV.a. Implementation and buildout of the General Plan have the potential to generate substantial increases in the number of vehicular trips and traffic movements. These impacts need to be further analyzed.

XV.b. It is unclear whether and to what extent buildout of the General Plan could exceed established levels of service for designated roads. Alterations to existing traffic loads and circulation patterns and capacities could affect these levels. General Plan policies and programs appear to adequately mitigate these potential impacts, and include the development of a comprehensive master plan of roads, the promotion of alternative modes of transportation, on-going consultation and coordination with Caltrans and appropriate agencies, thorough review of development proposals, and other mitigation measures. However, these potential impacts and related issues need to be further assessed.

XV.c. While implementation of the proposed Plan could result in a limited increase in regional airport use, it is not expected to result in significant changes to air traffic patterns or airport safety risks.

XV.d. With increased traffic anticipated from the implementation and buildout of the General Plan, there is the increased potential for traffic hazards to be created. However, the Plan does not appear to propose dangerous design features or incompatible traffic uses which would significantly increase traffic hazards.

XV.e. Development facilitated by the proposed Plan may increase the demand for emergency response personnel and equipment, and may extend emergency response times. General Plan policies and programs appear to provide for adequate emergency access; however, these issues should be further evaluated.

XV.f. General Plan buildout will result in the demand for additional parking. The General Plan offers a number of mitigation measures which appear to minimize these potential impacts, including development plan review, and the promotion of public transit, bicycle use, and tele-commuting to reduce the demand for parking facilities. These impacts and the ability of the Plan to adequately address them should be further assessed.

XV.g. The policies and programs of the proposed General Plan appear to be consistent with applicable transportation policies and plans, including those which support alternative modes of transportation. However, these issues should be addressed further.

XVI.a. Development facilitated by the Plan will increase the amount of wastewater generated and will require the construction and/or extension of wastewater treatment facilities. While these impacts are not expected to exceed the requirements of Regional Water Quality Control Board, they need to be further quantified and evaluated.

XVI.b. Major water and wastewater system components are already in place throughout the planning area. However, continued urbanization facilitated by the proposed Plan may require new or altered systems and should be further evaluated.

XVI.c. Continued urbanization facilitated by the proposed General Plan may require new storm drainage facilities or alterations to existing facilities. General Plan policies and programs appear to minimize the potential environmental impacts associated with construction of these facilities and maximize their wildlife habitat value. However, these issues should be further assessed.

XVI.d. Future development facilitated by the proposed Plan will increase the demand for domestic water and may result in a reduction in groundwater available for use. The General Plan proposes a number of mitigation measures designed to minimize potential impacts to the water supply, including the use of drought tolerant landscaping, the installation of low-flush toilets and low-flow showerheads, and coordination with Mission Springs Water District and other appropriate agencies to enhance groundwater recharge. However, these impacts need to be quantified and further evaluated.

XVI.e. The Mission Springs Water District (MSWD) provides wastewater treatment services to much of the General Plan study area. Development facilitated by the proposed Plan may require expansions to MSWD's existing treatment facilities, and these potential impacts should be further assessed.

XVI.f. The management and disposal of solid waste is an on-going issue of concern in the Coachella Valley. Continued urbanization will result in the generation of additional volumes of solid waste. General Plan policies and programs include the installation of recycling bins in new developments, the recycling of green waste, and other mitigation measures intended to minimize the potential impacts to landfills. However, these issues should be assessed further.

XVI.g. Development facilitated by the proposed General Plan will result in increased volumes of solid waste. General Plan policies and programs appear to be consistent with federal, state and local laws regarding the recycling of solid waste materials. However, these issues should be evaluated further.

XVII.a. Development facilitated by approval and implementation of the Plan has the potential to substantially degrade wildlife resources and have other potentially adverse impacts on sensitive, threatened or endangered biological species and their habitats. Similar impacts to historic and prehistoric resources also appear possible. This potential needs to be more fully assessed.

XVII.b. Implementation of the proposed General Plan may result in potentially considerable cumulative impacts to various environmental resources, however, it is unclear to what extent this may occur. This potential needs to be more fully assessed in the Program EIR.

XVII.c. It is unclear whether and to what extent the Plan will contribute to environmental effects that could cause substantial adverse effects on humans, and this potential should be more fully assessed in the Program EIR.

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse

Gray Davis
GOVERNOR

Loretta Lynch
DIRECTOR

Notice of Preparation

February 4, 2000

To: Reviewing Agencies

Re: City of Desert Hot Springs Comprehensive General Plan EIR
SCH# 2000021006

Attached for your review and comment is the Notice of Preparation (NOP) for the City of Desert Hot Springs Comprehensive General Plan EIR draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

John D. Criste
Desert Hot Springs Planning Department
65950 Pierson Blvd
Desert Hot Springs, CA 92240

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Project Analyst, State Clearinghouse

Attachments
cc: Lead Agency

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
916-445-0613 FAX 916-323-3018 WWW.OPR.CA.GOV/CLEARINGHOUSE.HTML

Document Details Report
State Clearinghouse Data Base

SCH# 2000021006
Project Title City of Desert Hot Springs Comprehensive General Plan EIR
Lead Agency Desert Hot Springs, City of

Type nop Notice of Preparation
Description EIR for the City of Desert Hot Springs Comprehensive General Plan Update. Planning area includes 14,782+- acres of incorporated lands and 22,180+- acres of Sphere-of-Influence lands.

Lead Agency Contact

Name John D. Criste
Agency Desert Hot Springs Planning Department
Phone 760-320-9040 **Fax**
email
Address 65950 Pierson Blvd
City Desert Hot Springs **State** CA **Zip** 92240

Project Location

County Riverside
City Desert Hot Springs
Region
Cross Streets
Parcel No.
Township 2,3S **Range** 3-5E **Section** **Base** SBB&M

Proximity to:

Highways SR62 & I-10
Airports Palm Springs
Railways Southern Pacific
Waterways Mission Creek, Blind Cyn., Morongo Wash, Long Cyn.
Schools Seven (7)
Land Use

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Drainage/Absorption; Economics/Jobs; Fiscal Impacts; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Growth Inducing; Landuse; Cumulative Effects

Reviewing Agencies Resources Agency; Department of Conservation; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Game, Region 6; Native American Heritage Commission; State Lands Commission; Caltrans, District 8; Department of Housing and Community Development; Caltrans, Division of Aeronautics; California Highway Patrol; Air Resources Board, Major Industrial Projects; Integrated Waste Management Board; Department of Toxic Substances Control; Regional Water Quality Control Board, Region 7

Date Received 02/04/2000 **Start of Review** 02/04/2000 **End of Review** 03/03/2000

Note: Blanks in data fields result from insufficient information provided by lead agency.

RIVERSIDE COUNTY
Regional Park And Open-Space District
4600 Crestmore Road • Riverside, CA 92509-6858 • (909) 955-4310
Fax (909) 955-4505
PAUL FRANDSEN
General Manager

February 7, 2000

John D. Criste
Terra Nova Planning and Research Inc.
400 South Farrell, Suite B-205
Palm Springs, CA 92262

NOP for Desert Hot Springs General Plan Update

Dear Mr. Criste:

Thank you for the opportunity to comment on the Notice of Preparation for the Desert Hot Springs Comprehensive General Plan Update Environmental Impact Report. The Riverside County Park and Open-Space District would like to offer the following comments:

Parks
The nearest County regional park to Desert Hot Springs is Lake Cahuilla Recreation Area, located in the City of La Quinta. The District is currently exploring the need for another regional park in the desert area. Areas currently being studied for this park are located north of the I-10 freeway.

Trails
We request that the placement of your multipurpose recreational trails be coordinated with the trails shown on the Western Coachella Valley Plan to allow connections between the County's trails and those within your City.

If you have any questions please call me at (909) 955-6515.

Sincerely,

Kim Jarrell Johnson

Kim Jarrell Johnson
Assistant Park Planner

ar\desert hot springs.doc

"To acquire, protect, develop, manage and interpret for the inspiration, use and enjoyment of all people, a well-balanced system of areas of outstanding scenic, recreation, and historic importance."

NOP Distribution List

SCH# 2000021006

Resources Agency

- [X] Nadell Gayou, *Resources Agency*, 1020 Ninth Street, Third Floor, Sacramento, CA 95814, 916/327-1722 Fax 916/327-1648
- [ ] Bill Curry, *Dept. of Boating & Waterways*, 2000 Evergreen Street, Sacramento, CA 95815-3896, 916/263-4326 Fax 916/263-0648
- [ ] Elizabeth A. Fuchs, *California Coastal Commission*, 45 Fremont Street, Suite 2000, San Francisco, CA 94105-2219, 415/904-5200 Fax 415/904-5400
- [X] Ken Trott, *Dept. of Conservation*, 801 K Street, MS-24-02, Sacramento, CA 95814, 916/445-8733 Fax 916/324-0948
- [ ] Allen Robertson, *Dept. of Forestry & Fire Protection*, 1416 Ninth Street, Room 1516-24, Sacramento, CA 95814, 916/657-0300 Fax 916/653-8957
- [X] Hans Kreutzberg, *Office of Historic Preservation*, P.O. Box 942896, Sacramento, CA 94296-0001, 916/653-6624 Fax 916/653-9824
- [X] Beth Walls, *Resource Management Division Dept. of Parks and Recreation*, P.O. Box 942896, Sacramento, CA 94296-0001, 916/653-6725 Fax 916/657-3355
- [ ] Pam Bruner, *Reclamation Board*, 1416 Ninth Street, Room 1601, Sacramento, CA 95814, 916/653-5434 Fax 916/653-5805
- [ ] Steve McAdam, *S.F. Bay Conservation & Dev't. Comm.*, 30 Van Ness Avenue, Room 2011, San Francisco, CA 94102, 415/557-3686 Fax 415/557-3767
- [X] Nadell Gayou, *Department of Water Resources*, 1020 Ninth Street, Third Floor, Sacramento, CA 95814, 916/327-1722 Fax 916/327-1648

Health & Welfare

- [ ] Wayne Hubbard, *Dept. of Health/Drinking Water*, 601 N. 7th Street, PO Box 942732, Sacramento, CA 94234-7320, 916/445-2519 Fax 916/327-6092

Food & Agriculture

- [ ] Ted Bell, *Dept. of Food and Agriculture*, 1220 N Street, Room 409, Sacramento, CA 95814, 916/653-7663 Fax 916/653-4723

Fish and Game & River State

- [ ] Joe Vincenty, Department of Fish and Game, Environmental Services Division, 1416 Ninth Street, 13th Floor, Sacramento, CA 95814, 916/653-1070 Fax 916/653-2588
- [ ] Donald Koch (Region 1), Department of Fish and Game, 601 Locust Street, Redding, CA 96001, 530/225-2363 Fax 530/225-2381
- [ ] Banky Curtis (Region 2), Department of Fish & Game, 1701 Nimbus Road, Suite A, Rancho Cordova, CA 95670, 916/358-2898 Fax 916/358-2912
- [ ] Brian Hunter (Region 3), Department of Fish and Game, P.O. Box 47, Yountville, CA 94599, 707/944-5518 Fax 707/944-5563
- [ ] William Laudermilk (Region 4), Department of Fish and Game, 1234 East Shaw Avenue, Fresno, CA 93710, 559/243-4005 Fax 559/243-4022
- [ ] Sandy Peterson (Region 5), Department of Fish and Game, Habitat Conservation Program, 4949 Viewridge Avenue, San Diego, CA 92123, 858/467-4234 Fax 858/467-4299
- [X] Cheryl Ayers (Region 6), Department of Fish and Game, Habitat Conservation Program, 330 Golden Shore, Suite 50, Long Beach, CA 90802, 562/590-5159 Fax 562/590-5192
- [ ] Alan Pickard (Region 6, Inyo/Mono), Department of Fish and Game, Habitat Conservation Program, 407 West Line Street, Room 8, Bishop, CA 93514, 760/872-1129
- [ ] DeWayne Johnston (Marine Region), Department of Fish and Game, 20 Lower Ragsdale Drive, Suite 100, Monterey, CA 93940, 831/649-2870 Fax 831/649-2894

Independent Commissions/Agencies

- [ ] Greg Newhouse, *California Energy Commission*, 1516 Ninth Street, MS-15, Sacramento, CA 95814, 916/654-5000 Fax 916/654-3882
- [X] Debbie Treadway, *Native American Heritage Comm.*, 915 Capitol Mall, Room 364, Sacramento, CA 95814, 916/653-4082 Fax 916/657-5390
- [ ] Andrew Barnsdale, *Public Utilities Commission*, 505 Van Ness Avenue, San Francisco, CA 94102, 415/703-3231 Fax 415/703-1184
- [X] Betty Silva, *State Lands Commission*, 100 Howe Avenue, Suite 100-S, Sacramento, CA 95825, 916/574-1872 Fax 916/574-1885

- [ ] Gerald R. Zimmerman, *Colorado River Board*, 770 Fairmont Avenue, Suite 100, Glendale, CA 91203-1035, 818/543-4676 Fax 818/543-4685
- [ ] Lyn Barnett, *Tahoe Regional Planning Agency*, P.O. Box 1038, Zephyr Cove, NV 89448, 775/588-4547 Fax 775/588-4527
- [ ] John Bowden, Manager, *Office of Emergency Services*, 11030 White Rock Road, Ste.110, Rancho Cordova, CA 95670, 916/464-1014 Fax 916/464-1019
- [ ] Debby Eddy, *Delta Protection Commission*, P.O. Box 530, Walnut Grove, CA 95690, 916/776-2290 Fax 916/776-2293
- [ ] Paul Edelman, *Santa Monica Mountains Conservancy*, 5750 Ramirez Canyon Road, Malibu, CA 90265, 310/589-3200 Fax 310/589-3207

Department of Transportation District Contacts

- [ ] IGR/Planning, *Caltrans, District 1*, 1656 Union Street, P.O. Box 3700, Eureka, CA 95502-3700, 707/441-5812 Fax 707/441-5869
- [ ] Vicki Roe, Local Development Review, *Caltrans, District 2*, P.O. Box 496073, Redding, CA 96049-6073, 530/225-3089 Fax 530/225-3271
- [ ] Jeff Pulverman, *Caltrans, District 3*, P.O. Box 942874, MS-41, Sacramento, CA 94274-0001, 916/327-3859 Fax 916/323-7669
- [ ] Jean Finney, *Caltrans, District 4*, P.O. Box 23660, Oakland, CA 94623-0660, 510/286-5572 Fax 510/286-5513
- [ ] Lawrence Newland, *Caltrans, District 5*, 50 Higuera Street, San Luis Obispo, CA 93401-5415, 805/549-3683 Fax 805/549-3077
- [ ] Marc Birnbaum, *Caltrans, District 6*, P.O. Box 12616, Fresno, CA 93778-2616, 559/488-4260 Fax 559/488-4088
- [ ] Stephen J. Buswell, *Caltrans, District 7*, 120 South Spring Street, 1-10C, Los Angeles, CA 90012, 213/897-4429 Fax 213/897-9210
- [X] Mike Sim, *Caltrans, District 8*, 464W. 4th Street, 7th Floor, San Bernardino, CA 92401-1400, 909/383-4808 Fax 909/383-5936
- [ ] Robert Ruhnke, *Caltrans, District 9*, 500 South Main Street, Bishop, CA 93514, 760/872-0689 Fax 760/872-0678

- [ ] Chris Sayre, *Caltrans, District 10*, P.O. Box 2048, Stockton, CA 95201, 209/948-7142 Fax 209/948-7906
- [ ] Lou Salazar, *Caltrans, District 11*, P.O. Box 85406, MS 6-5, 2829 Juan Street, San Diego, CA 92186-5406, 619/688-3140 Fax 619/688-4299
- [ ] Aileen Kennedy, *Caltrans, District 12*, 3347 Michelson Drive, Suite 100, Irvine, CA 92612-0661, 949/724-2239 Fax 949/724-2592

Business, Transportation, & Housing

- [X] Cathy Creswell, *Housing & Community Development*, Housing Policy Division, 1800 Third Street, Room 430, Sacramento, CA 95814, 916/323-3176 Fax 916/327-2643
- [X] Sandy Hesnard, *Caltrans - Division of Aeronautics*, P.O. Box 942874, MS-40, Sacramento, CA 94274-0001, 916/654-5314 Fax 916/653-9531
- [X] Lt. Dennis Brunette, *California Highway Patrol*, Office of Special Projects, 2555 1st Ave., Sacramento, CA 95818, 916/657-7222 Fax 916/452-3151
- [ ] Ron Helgeson, *Caltrans - Planning*, P.O. Box 942874, Sacramento, CA 94274-0001, 916/653-9966 Fax 916/653-0001

State and Consumer Services

- [ ] Robert Sleppy, *Dept. of General Services Environmental Services Section*, 1102 Q Street, #5100, Sacramento, CA 95814-6311, 916/324-0214 Fax 916/445-3556

California Environmental Protection Agency

- [X] *Air Resources Board*, 2020 L Street (PO Box 2815), Sacramento, CA 95814 (95814-2815), 916/327-5783 Fax 916/322-3646
  - ( ) Rob Regen (airport projects)
  - ( ) Ann Geraghty (transportation projects)
  - (X) Mike Tollstrup (industrial projects)
- [X] Sue O'Leary, *Integrated Waste Management Board*, 8800 Cal Center Drive MS 24, Sacramento, CA 95826, 916/255-0663 Fax 916/255-4216
- [ ] Diane Edwards, *State Water Resources Control Board Division of Clean Water Programs*, P.O. Box 944212, Sacramento, CA 94244-2120, 916/227-4572 Fax 916/227-4349

- [ ] Phil Zentner, *State Water Resources Control Board Division of Water Quality*, P.O. Box 944213, Sacramento, CA 94244-2130, 916/657-0912 Fax 916/657-2388
- [ ] Mike Falkenstein, *State Water Resources Control Board Division of Water Rights*, 901 P Street, 3rd Floor, Sacramento, CA 95814, 916/657-1377 Fax 916/657-1485
- [X] Dept. of Toxic Substances Control, *CEQA Tracking Center*, 400 P Street, Fourth Floor, P.O. Box 806, Sacramento, CA 95812-0806, 916/324-3119 Fax 916/324-1788

Regional Water Quality Control Board

- [ ] North Coast Region (1), Cathy Goodwin, 5550 Skylane Blvd., Suite A, Santa Rosa, CA 95403, 707/576-2220 Fax 707/523-0135
- [ ] San Francisco Bay Region (2), Environmental Document Coordinator, 1515 Clay Street, Suite 1400, Oakland, CA 94612, 510/622-2300 Fax 510/622-2460
- [ ] Central Coast Region (3), 81 Higuera Street, Suite 200, San Luis Obispo, CA 93401-5427, 805/549-3147 Fax 805/543-0397
- [ ] Los Angeles Region (4), Jonathan Bishop, 320 West 4th Street, Suite 200, Los Angeles, CA 90013, 213/576-6600 Fax 213/576-6640
- [ ] Central Valley Region (5), 3443 Routier Road, Suite A, Sacramento, CA 95827-3003, 916/255-3000 Fax 916/255-3015
  - ( ) Fresno Branch Office, 3614 East Ashlan Avenue, Fresno, CA 93726, 559/445-5116 Fax 559/445-5910
  - ( ) Redding Branch Office, 415 Knollcrest Drive, Redding, CA 96002, 530/224-4845 Fax 530/224-4857
- [ ] Lahontan Region (6), 2501 Lake Tahoe Boulevard, South Lake Tahoe, CA 96150, 530/542-5400 Fax 530/544-2271
  - ( ) Victorville Branch Office, 15428 Civic Drive, Suite 100, Victorville, CA 92392-2359, 760/241-6583 Fax 760/241-7308
- [X] Colorado River Basin Region (7), 73720 Fred Waring Drive, #100, Palm Desert, CA 92260-2564, 760/346-7491 Fax 760/341-6820
- [ ] Santa Ana Region (8), 3737 Main Street, Suite 500, Riverside, CA 92501-3339, 909/782-4130 Fax 909/781-6288
- [ ] San Diego Region (9), 9771 Clairemont Mesa Blvd., Suite A, San Diego, CA 92124-1331, 858/467-2952 Fax 858/571-6972

Coachella Valley
Recreation & Park District
45-871 Clinton Street, Indio, California 92201
(760) 347-3484 FAX (760) 347-4660 www.cvrpd.org

RECEIVED FEB - 8 2000

General Manager
Don Martin

Superintendent
Laura McGalliard

February 7, 2000

John Criste, Planning Consultant
TERRA NOVA PLANNING & RESEARCH, INC.
400 South Farrell, Suite B-205
Palm Springs, CA 92262

Dear Mr. Criste:

Thank you for the opportunity to comment on the City of Desert Hot Springs Environmental Impact Report.

Desert Hot Springs, like most cities in the valley, is experiencing growth. One of the areas that sometimes goes unnoticed is parks. I would highly recommend that if the City of Desert Hot Springs has not yet adopted the Quimby Act, they should do so now. The funds would help mitigate the over use of existing parks by having funds available for building new parks or expanding existing ones.

Sincerely,

Don Martin

DON MARTIN, General Manager
Coachella Valley Recreation & Park District
DM/dg

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South Coast
Air Quality Management District
21865 E. Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 · http://www.aqmd.gov

February 15, 2000

Mr. John D. Criste
Planning Consultant
City of Desert Hot Springs
400 South Farrell, Suite B-205
Palm Springs, CA 92262

Dear Mr. Criste:

Notice of Preparation of an Environmental Impact Report
Desert Hot Springs Comprehensive General Plan Update

The South Coast Air Quality Management District (AQMD) appreciates the opportunity to comment on the above-mentioned document. The AQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the Draft Environmental Impact Report (EIR).

Air Quality Analysis

The AQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The AQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the AQMD's Subscription Services Department by calling (909) 396-3720.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction and operations should be considered. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips

should be included in the evaluation. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the AQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additionally, AQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Pursuant to state CEQA Guidelines Section 15126 (c), any impacts resulting from mitigation measures must also be discussed.

Data Sources

AQMD rules and relevant air quality reports and data are available by calling the AQMD's Public Information Center at (909) 396-3600. Much of the information available through the Public Information Center is also available via the AQMD's World Wide Web Homepage (http://www.aqmd.gov).

The AQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. Please call Dr. Charles Blankson, Transportation Specialist, CEQA Section, at (909) 396-3304 if you have any questions regarding this letter.

Sincerely,

Steve Smith

Steve Smith, Ph.D.
Program Supervisor, CEQA Section
Planning, Rule Development and Area Sources

SS:CB:li

RVC000204-01LI
Control Number

DEPARTMENT OF TRANSPORTATION
DISTRICT 8
464 W Fourth Street, 6th Floor MS 726
San Bernardino, CA 92401-1400
PHONE (909) 383-6327
FAX (909) 383-6890

February 16, 2000

08-Riv-62-R3.344/R6.015
NOP - EIR

Mr. John Criste, AICP
Planning Consultant
City of Desert Hot Springs
400 South Farrell Suite B-205
Palm Springs, CA 92262

Dear Mr. Criste:

Desert Hot Springs Comprehensive General Plan Update

The California Department of Transportation (Caltrans) Development Review Unit has reviewed the above document with respect to CEQA. The following comments are offered for your consideration.

The local agency should comply with the current Congestion Management Program in place as defined by the Riverside County Transportation Commission (1997).

Since traffic demand mitigation programs are a necessary part of the solution to future traffic congestion and all future development in the Desert Hot Springs area, early and continuous liaison with Caltrans on all new development is urged as they affect the State highway system.

If you have any questions, please contact Jim Belty at (909) 383-4473 or FAX (909) 383-6890.

Sincerely,

for: LINDA GRIMES, Chief
Office of Forecasting
IGR/CEQA Review

COUNTY OF RIVERSIDE

TRANSPORTATION AND LAND MANAGEMENT AGENCY

Transportation Department

David E. Barnhart
Director of Transportation

February 23, 2000

Terra Nova Planning & Research Inc.
400 South Farrell, Suite B-205
Palm Springs, Ca 92262
Attention: John D. Criste, AICP, Planning Consultant, City of Desert Hot Springs

RE: Draft EIR preparation notice and request for comments for the Comprehensive General Plan Update for the City of Desert Hot Springs.

Dear Mr. Criste:

Thank you for including the County of Riverside Transportation Department in your Notice of Preparation for the above referenced EIR. At this time we have no comments on the Notice except to commend you on your efforts.

The County of Riverside is presently involved in a similar study known as the Riverside County Integrated Plan (RCIP). It includes completing the following three major regional planning elements simultaneously:

1. Updating of the Riverside County General Plan (as required by law).
2. Identification of new multi-modal transportation corridors through *the Community and Environmental Transportation Acceptability Process* (CETAP)
3. Creation of a *Multiple Species Habitat Conservation Plan* (MSHCP) to identify habitat and preserve open space, which will allow for the preservation of Riverside County's diverse natural resources.

This is a Countywide endeavor involving daily involvement and cooperation with, RCTC, CVAG, WRCOG, US Fish and Wildlife, Caltrans, Sierra Club, RTA, BIA, all municipal jurisdictions, and all other public and private Stakeholders.

4080 Lemon Street, 8th Floor • Riverside, California 92501 • (909) 955-6740
P.O. Box 1090 • Riverside, California 92502-1090 • FAX (909) 955-6721

We would like to offer our cooperation with regards to your General Plan update along with coordinating it with the County's Integrated Plan. You may also wish to visit our Web Site for related information at www.rcip.org/. It explains in detail our three year mission of the Integrated Plan, our vision statement, and valuable data and exhibits that are being updated monthly by our consulting team.

If you have any questions, please feel free to call me at (909) 955-6800.

Respectfully,

Edwin D. Studor
Administrative Manager

CC: Jerry Jolliffe
Kristi Lovelady
Dick Ramella-Planning Center

EDS:LS:jas

SunLine TRANSIT AGENCY

MEMBERS:
Desert Hot Springs, Palm Springs, Cathedral City, Rancho Mirage, Palm Desert, Indian Wells, La Quinta, Indio, Coachella, Riverside County
A Public Agency

February 28, 2000

Mr. John D. Criste
Terra Nova Planning & Researching
400 South Farrell Suite B-205
Palm Springs, CA. 92262

RE: Desert Hot Springs Comprehensive General Plan Update Environmental Impact Report.

Dear Mr. Criste:

I am writing in response to your request for comments regarding the above referenced General Plan.

SunLine Transit Agency would like to have included in the General Plan information pertaining to Public Transportation. Most other jurisdictions include information in their General Plan under the "Transportation/Circulation" area.

The following is an example that may be helpful for you:

Public Transportation

The SunLine Transit Agency is the provider of public transit services within the City of Desert Hot Springs and the Coachella Valley. The SunLine fleet consists of buses powered by compressed natural gas. Buses are also equipped with wheelchair lifts and bike racks. There is one route, Line 14 that provides service within the City limits of Desert Hot Springs. Line 14 provides service along Palm Drive, Hacienda Drive, Mission Lakes Drive, West Street and Pierson Blvd., operating on 50 minute headways. SunLine is required to have bus stops that comply with the federal Americans Disability Act (ADA) for access by 1997. Along portions of the roadways within Desert Hot Springs access does not currently meet these requirements. SunLine Transit Agency works closely with City staff for recommended improvements as part of development projects and street/road improvements.

SunLine also provides the "SunDial" service, consisting of a fleet of small buses providing curb-to-curb service from home to destination. The service is wheelchair accessible. The service is designated for persons with Disabilities and reservations are required. Reservations are accepted up to 14 days in advance and on a same-day available basis.

John, if you should require any further information, please feel free to contact me at (760) 343-3456 ext. 119. I hope you will be able to include the information I have included into the General Plan.

Sincerely,

Leslie Grosjean
Sr. Transportation Analyst

32-505 Harry Oliver Trail, Thousand Palms, California 92276 Phone 760-343-3456 Fax 760-343-3845

SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS

Main Office
818 West Seventh Street
12th Floor
Los Angeles, California
90017-3435

t (213) 236-1800
f (213) 236-1825

www.scag.ca.gov

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Riverside County: James Venable, Riverside County • Charles White, Moreno Valley • Ron Loveridge, Riverside • Andrea Puga, Corona • Ron Roberts, Temecula

San Bernardino County: Kathy Davis, San Bernardino County • Bill Alexander, Rancho Cucamonga • Jim Bagley, Twentynine Palms • David Eshleman, Fontana • Lee Ann Garcia, Grand Terrace • Gwenn Norton-Perry, Chino Hills • Ray Rucker, Highland

Ventura County: Judy Mikels, Ventura County • Donna De Paola, San Buenaventura • Andrew Fox, Thousand Oaks • Toni Young, Port Hueneme

Riverside County Transportation Commission: Robin Lowe, Hemet

Ventura County Transportation Commission: Bill Davis, Simi Valley

Printed on Recycled Paper 559-01/08/00

March 1, 2000

Mr. John D. Criste, AICP
Planning Consultant
City of Desert Hot Springs
65-950 Pierson Boulevard
Desert Hot Springs, CA 92240

RE: **Comments on the Notice of Preparation for the Draft Environmental Impact Report for Desert Hot Springs Comprehensive General Plan Update – SCAG No. I20000044**

Dear Mr. Criste:

Thank you for submitting the **Notice of Preparation for the Draft Environmental Impact Report for the Desert Hot Springs Comprehensive General Plan Update** to SCAG for review and comment. As areawide clearinghouse for regionally significant projects, SCAG assists cities, counties and other agencies in reviewing projects and plans for consistency with regional plans.

In addition, The California Environmental Quality Act requires that EIRs discuss any inconsistencies between the proposed project and the applicable general plans and **regional plans (Section 15125 [d]).** If there are inconsistencies, an explanation and rationalization for such inconsistencies should be provided.

Policies of SCAG's Regional Comprehensive Plan and Guide and Regional Transportation Plan which may be applicable to your project are outlined in the attachment. **We expect the DEIR to specifically cite the appropriate SCAG policies and address the manner in which the Project is consistent with applicable core policies or supportive of applicable ancillary policies. Please use our policy numbers to refer to them in your DEIR. Also, we would encourage you to use a side-by-side comparison of SCAG policies with a discussion of the consistency or support of the policy with the Proposed Project.**

Please provide a minimum of 45 days for SCAG to review the DEIR when this document is available. If you have any questions regarding the attached comments, please contact Jeffrey Smith, Senior Planner at (213) 236-1867. Thank you.

Sincerely,

J. DAVID STEIN
Manager, Performance Assessment and Implementation

COMMENTS ON THE PROPOSAL TO DEVELOP THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE DESERT HOT SPRINGS COMPREHENSIVE GENERAL PLAN UPDATE

PROJECT DESCRIPTION

The proposed Project involves the Comprehensive General Plan update for the City of Desert Hot Springs, which will address 14,782 acres within the corporate limits, and 22,180 acres in the unincorporated planning area. The Update will consist of changes to land use designations, circulation system, and new goals, policies and programs for all General Plan Elements.

CONSISTENCY WITH REGIONAL COMPREHENSIVE PLAN AND GUIDE POLICIES

The Growth Management Chapter (GMC) of the Regional Comprehensive Plan and Guide (RCPG) contains the following policies that are particularly applicable and should be addressed in the Draft EIR for the Project.

3.01 *The population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies, shall be used by SCAG in all phases of implementation and review.*

REGIONAL GROWTH FORECASTS

The Draft EIR should reflect the most current SCAG forecasts which are the 1998 RTP (April 1998) Population, Household and Employment forecasts for the CVAG subregion and the City of Desert Hot Springs. These forecasts follow:

CVAG Forecasts	2000	2005	2010	2015	2020
Population	372,300	412,100	450,000	497,600	551,800
Households	122,500	135,500	151,900	168,600	187,200
Employment	149,200	164,900	183,800	203,900	220,400

City of Desert Hot Springs Forecasts	2000	2005	2010	2015	2020
Population	16,100	17,100	18,100	19,200	20,600
Households	5,700	6,000	6,500	6,900	7,300
Employment	4,700	5,600	6,600	7,800	8,700

3.03 The timing, financing, and location of public facilities, utility systems, and transportation systems shall be used by SCAG to implement the region's growth policies.

REGIONAL TRANSPORTATION PLAN

The Regional Transportation Plan (RTP) also has goals, objectives, policies and actions pertinent to this proposed project. This RTP links the goal of sustaining mobility with the goals of fostering economic development, enhancing the environment, reducing energy consumption, promoting transportation-friendly development patterns, and encouraging fair and equitable access to residents affected by socio-economic, geographic and commercial limitations. Among the relevant goals, objectives, policies and actions of the RTP are the following:

Core Regional Transportation Plan Policies

4.01 Transportation investments shall be based on SCAG's adopted Regional Performance Indicators.

Mobility – Transportation Systems should meet the public need for improved access, and for safe, comfortable, convenient and economical movements of people and goods.
- *Average Work Trip Travel Time in Minutes – 22 minutes*
- *PM Peak Highway Speed – 33 mph*
- *Percent of PM Peak Travel in Delay (All Trips) – 33%*

Accessibility - Transportation Systems should ensure the ease with which opportunities are reached. Transportation and land use measures should be employed to ensure minimal time and cost.
- *Work Opportunities within 25 Minutes – 88%*

Environment - Transportation Systems should sustain development and preservation of the existing system and the environment. (All Trips)
- *Meeting Federal and State Standards – Meet Air Plan Emission Budgets*

Reliability - Reasonable and dependable levels of service by mode. (All Trips)
- *Transit – 63%*
- *Highway – 76%*

Safety - Transportation Systems should provide minimal, risk, accident, death and injury. (All Trips)
- *Fatalities Per Million Passenger Miles – 0.008*
- *Injury Accidents – 0.929*

Livable Communities - Transportation Systems should facilitate Livable Communities in which all residents have access to all opportunities with minimal travel time. (All Trips)
- *Vehicle Trip Reduction – 1.5%*
- *Vehicle Miles Traveled Reduction – 10.0%*

Equity - The benefits of transportation investments should be equitably distributed among all ethnic, age and income groups. (All trips)
- *Low-Income (Household Income $12,000)) Share of Net Benefits – Equitable Distribution of Benefits*

Cost-Effectiveness - Maximize return on transportation investment. (All Trips)
- *Net Present Value – Maximum Return on Transportation Investment*
- *Value of a Dollar Invested – Maximum Return on Transportation Investment*

The numeric Regional Plan Objectives are not applicable on a project level, since the objectives are based upon performance of the regional system as a whole. Furthermore, several important policy issues are not accommodated in the Regional Plan Objectives, such as environmental impacts other than air quality. Individual projects must be evaluated by the local implementing agency and the goals and policies (i.e. mobility, accessibility, environment, reliability, safety, equity, Livable Communities, and cost-effectiveness) evaluated and weighed during the final project development. Such evaluation could occur via the MIS and/other environmental review processes. Projects are then proposed for funding through the RTIP which must be consistent with the RTP.

4.02 Transportation investments shall mitigate environmental impacts to an acceptable level.

4.04 Transportation Control Measures shall be a priority.

4.06 Implementing transit restructuring, including Smart Shuttles, freight improvements, advanced transportation technologies, airport ground access and traveler information services are RTP priorities.

4.08 All existing and new public transit services, facilities and/or systems shall be fully accessible to persons with disabilities as required by applicable sections of the 1990 Americans with Disabilities Act.

4.10 All existing and new public transit services shall be provided in a manner consistent with Title VI of the 1964 Civil Rights Act, prohibiting intentional discrimination and adverse disparate impact with regard to race, ethnicity, or national origin.

4.11 All existing and new public transit services, facilities and/or systems shall evaluate the potential for private sector participation through the use of competitive procurement.

4.15 Arterial HOV facilities to support transit and rideshare will be supported and encouraged.

4.16 Maintaining and operating the existing transportation system will be a priority over expanding capacity.

4.17 Alternatives to highway expansion must be evaluated before giving regional approval to expand single occupancy lanes.

GMC POLICIES RELATED TO THE RCPG GOAL TO IMPROVE THE REGIONAL STANDARD OF LIVING

The Growth Management goals to develop urban forms that enable individuals to spend less income on housing cost, that minimize public and private development costs, and that enable firms to be more competitive, strengthen the regional strategic goal to stimulate the regional economy. The evaluation of the proposed project in relation to the following policies would be intended to guide efforts toward achievement of such goals and does not infer regional interference with local land use powers.

3.04 Encourage local jurisdictions' efforts to achieve a balance between the types of jobs they seek to attract and housing prices.

3.05 Encourage patterns of urban development and land use which reduce costs on infrastructure construction and make better use of existing facilities.

3.08 Encourage subregions to define an economic strategy to maintain the economic vitality of the subregion, including the development and use of marketing programs, and other economic incentives, which support attainment of subregional goals and policies.

3.09 Support local jurisdictions' efforts to minimize the cost of infrastructure and public service delivery, and efforts to seek new sources of funding for development and the provision of services.

3.10 Support local jurisdictions' actions to minimize red tape and expedite the permitting process to maintain economic vitality and competitiveness.

GMC POLICIES RELATED TO THE RCPG GOAL TO IMPROVE THE REGIONAL QUALITY OF LIFE

The Growth Management goals to attain mobility and clean air goals and to develop urban forms that enhance quality of life, that accommodate a diversity of life styles, that preserve open space and natural resources, and that are aesthetically pleasing and preserve the character of communities, enhance the regional strategic goal of maintaining the regional quality of life. The evaluation of the proposed project in relation to the following policies would be intended to provide direction for plan implementation, and does not allude to regional mandates.

3.11 Support provisions and incentives created by local jurisdictions to attract housing growth in job rich subregions and job growth in housing rich subregions.

3.12 Encourage existing or proposed local jurisdictions' programs aimed at designing land uses which encourage the use of transit and thus reduce the need for roadway expansion, reduce the number of auto trips and vehicle miles traveled, and create opportunities for residents to walk and bike.

3.13 Encourage local jurisdictions' plans that maximize the use of existing urbanized areas accessible to transit through infill and redevelopment.

3.14 Support local plans to increase density of future development located at strategic points along the regional commuter rail, transit systems, and activity centers.

3.15 Support local jurisdictions strategies to establish mixed-use clusters and other transit-oriented developments around transit stations and along transit corridors.

3.16 Encourage developments in and around activity centers, transportation corridors, underutilized infrastructure systems, and areas needing recycling and redevelopment.

3.17 Support and encourage settlement patterns which contain a range of urban densities.

3.18 Encourage planned development in locations least likely to cause environmental impact.

3.19 SCAG shall support policies and actions that preserve open space areas identified in local, state, and federal plans.

3.20 Support the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals.

3.21 Encourage the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites.

3.22 Discourage development, or encourage the use of special design requirements, in areas with steep slopes, high fire, flood, and seismic hazards.

3.23 Encourage mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources ,measures that would reduce exposure to seismic hazards, minimize earthquake damage, and to develop emergency response and recovery plans.

GMC POLICIES RELATED TO THE RCPG GOAL TO PROVIDE SOCIAL, POLITICAL, AND CULTURAL EQUITY

The Growth Management Goal to develop urban forms that avoid economic and social polarization promotes the regional strategic goal of minimizing social and geographic disparities and of reaching equity among all segments of society. The evaluation of the proposed project in relation to the policy stated below is intended guide direction for the accomplishment of this goal, and does not infer regional mandates and interference with local land use powers.

3.24 Encourage efforts of local jurisdictions in the implementation of programs that increase the supply and quality of housing and provide affordable housing as evaluated in the Regional Housing Needs Assessment.

3.25 Encourage the efforts of local jurisdictions, employers and service agencies to provide adequate training and retraining of workers, and prepare the labor force to meet the challenges of the regional economy.

3.26 Encourage employment development in job-poor localities through support of labor force retraining programs and other economic development measures.

3.27 Support local jurisdictions and other service providers in their efforts to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection.

AIR QUALITY CHAPTER CORE ACTIONS

The Air Quality Chapter core actions related to the proposed project include:

5.07 Determine specific programs and associated actions needed (e.g., indirect source rules, enhanced use of telecommunications, provision of community based shuttle services, provision of demand management based programs, or vehicle-miles-traveled/emission fees) so that options to command and control regulations can be assessed.

5.11 Through the environmental document review process, ensure that plans at all levels of government (regional, air basin, county, subregional and local) consider air quality, land use, transportation and economic relationships to ensure consistency and minimize conflicts.

WATER QUALITY CHAPTER RECOMMENDATIONS AND POLICY OPTIONS

The Water Quality Chapter core recommendations and policy options relate to the two water quality goals: to restore and maintain the chemical, physical and biological integrity of the nation's water; and, to achieve and maintain water quality objectives that are necessary to protect all beneficial uses of all waters.

11.02 Encourage "watershed management" programs and strategies, recognizing the primary role of local governments in such efforts.

11.03 Coordinate watershed management planning at the subregional level by (1) providing consistent regional data; (2) serving as a liaison between affected local, state, and federal watershed management agencies; and (3) ensuring that watershed planning is consistent with other planning objectives (e.g., transportation, air quality, water supply).

11.05 Support regional efforts to identify and cooperatively plan for wetlands to facilitate both sustaining the amount and quality of wetlands in the region and expediting the process for obtaining wetlands permits.

11.06 Clean up the contamination in the region's major groundwater aquifers since its water supply is critical to the long-term economic and environmental health of the region. The financing of such clean-ups should leverage state and federal resources and minimize significant impacts on the local economy.

11.07 Encourage water reclamation throughout the region where it is cost-effective, feasible, and appropriate to reduce reliance on imported water and wastewater discharges. Current administrative impediments to increased use of wastewater should be addressed.

11.08 Ensure wastewater treatment agency facility planning and facility development be consistent with population projection contained in the RCPG, while taking into account the need to build wastewater treatment facilities in cost-effective increments of capacity, the need to build well enough in advance to reliably meet unanticipated service and storm water demands, and the need to provide standby capacity for public safety and environmental protection objectives.

OPEN SPACE CHAPTER ANCILLARY GOALS

Outdoor Recreation

9.01 Provide adequate land resources to meet the outdoor recreation needs of the present and future residents in the region and to promote tourism in the region.

9.02 Increase the accessibility to open space lands for outdoor recreation.

9.03 Promote self-sustaining regional recreation resources and facilities.

Public Health and Safety

9.04 Maintain open space for adequate protection of lives and properties against natural and man-made hazards.

9.05 Minimize potentially hazardous developments in hillsides, canyons, areas susceptible to flooding, earthquakes, wildfire and other known hazards, and areas with limited access for emergency equipment.

9.06 Minimize public expenditure for infrastructure and facilities to support urban type uses in areas where public health and safety could not be guaranteed.

Resource Production

9.07 Maintain adequate viable resource production lands, particularly lands devoted

to commercial agriculture and mining operations.

Resource Protection

9.08 Develop well-managed viable ecosystems or known habitats of rare, threatened and endangered species, including wetlands.

CONCLUSIONS

All feasible measures needed to mitigate any potentially negative regional impacts associated with the proposed project should be implemented and monitored, as required by CEQA.

ENDNOTE

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

Roles and Authorities

SCAG is a ***Joint Powers Agency*** established under California Government Code Section 6502 et seq. Under federal and state law, SCAG is designated as a Council of Governments (COG), a Regional Transportation Planning Agency (RTPA), and a Metropolitan Planning Organization (MPO). SCAG's mandated roles and responsibilities include the following:

SCAG is designated by the federal government as the Region's ***Metropolitan Planning Organization*** and mandated to maintain a continuing, cooperative, and comprehensive transportation planning process resulting in a Regional Transportation Plan and a Regional Transportation Improvement Program pursuant to 23 U.S.C. • 134(g)-(h), 49 U.S.C. • 1607(f)-(g) et seq., 23 C.F.R. • 450, and 49 C.F.R. • 613. SCAG is also the designated ***Regional Transportation Planning Agency***, and as such is responsible for both preparation of the Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP) under California Government Code Section 65080.

SCAG is responsible for developing the demographic projections and the integrated land use, housing, employment, and transportation programs, measures, and strategies portions of the ***South Coast Air Quality Management Plan***, pursuant to California Health and Safety Code Section 40460(b)-(c). SCAG is also designated under 42 U.S.C. • 7504(a) as a ***Co-Lead Agency*** for air quality planning for the Central Coast and Southeast Desert Air Basin District.

SCAG is responsible under the Federal Clean Air Act for determining ***Conformity*** of Projects, Plans and Programs to the Air Plan, pursuant to 42 U.S.C. • 7506.

Pursuant to California Government Code Section 65089.2, SCAG is responsible for ***reviewing all Congestion Management Plans (CMPs) for consistency with regional transportation plans*** required by Section 65080 of the Government Code. SCAG must also evaluate the consistency and compatibility of such programs within the region.

SCAG is the authorized regional agency for ***Inter-Governmental Review*** of Programs proposed for federal financial assistance and direct development activities, pursuant to Presidential Executive Order 12,372 (replacing A-95 Review).

SCAG reviews, pursuant to Public Resources Code Sections 21083 and 21087, ***Environmental Impact Reports*** of projects of regional significance for consistency with regional plans [California Environmental Quality Act Guidelines Sections 15206 and 15125(b)].

Pursuant to 33 U.S.C. • 1288(a)(2) (Section 208 of the Federal Water Pollution Control Act), SCAG is the authorized ***Areawide Waste Treatment Management Planning Agency.***

SCAG is responsible for preparation of the ***Regional Housing Needs Assessment***, pursuant to California Government Code Section 65584(a).

SCAG is responsible (with the San Diego Association of Governments and the Santa Barbara County/Cities Area Planning Council) for preparing the ***Southern California Hazardous Waste Management Plan*** pursuant to California Health and Safety Code Section 25135.3.

ESTABLISHED IN 1918 AS A PUBLIC AGENCY

COACHELLA VALLEY WATER DISTRICT

POST OFFICE BOX 1058 • COACHELLA, CALIFORNIA 92236 • TELEPHONE (619) 398-2651

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OWEN McCOOK, ASSISTANT GENERAL MANAGER
REDWINE AND SHERRILL, ATTORNEYS

March 2, 2000

File: 1150.12

COPY

City of Desert Hot Springs
65-950 Pierson Boulevard
Desert Hot Springs, California 92240

Gentlemen:

Subject: Desert Hot Springs Comprehensive
General Plan Update Environmental Impact Report

We have reviewed the General Plan Update for the city of Desert Hot Springs and appreciate the opportunity to comment on this report. Our comments can be found in attachment A.

If you have any questions please call Joe Cook, planning engineer, extension 292.

Yours very truly,

Tom Levy
General Manager-Chief Engineer

Enclosures/3/as

cc: John Criste (with enclosures)
Terra Nova Planning and Research, Inc.
400 South Farrell Drive, Suite B-205
Palm Springs, California 92262

JEC:md\eng\sw\feb\criste

ATTACHMENT A

1. Page 18, Water Resources, first paragraph to be revised to reflect the following:

The report overlooks the fact that a portion of the subject area is within the jurisdiction of the Coachella Valley Water District (CVWD) for domestic water and sanitation service. We are enclosing a copy of our service area boundary for your use.

2. Addendum A-6, item VIII.C. to be revised to address the following:

A small portion of the General Plan study area is within the jurisdiction of the Coachella Valley Water District (CVWD) stormwater unit. The area of concern is within section 30 of township 3 south, range 5 east. We have enclosed a copy of our stormwater unit map for your use.

JEC:md\eng\sw\feb\criste

SOUTHERN CALIFORNIA EDISON
An *EDISON INTERNATIONAL*℠ Company

March 3, 2000 Faxed & Mailed

Mr. John Criste
Terra Nova Planning & Research, Inc.
400 South Farrell Drive, Suite B-205
Palm Springs, CA 92262

Re: Notice of Preparation of an Environmental Impact Report
Desert Hot Springs Comprehensive General Plan Update

Dear Mr. Criste:

Thank you for including Southern California Edison Company (SCE) in the review process of the subject document. We have no comments or suggestions for issues that should be addressed in the DRAFT EIR; however, we would like to review the DRAFT EIR when it is completed. Please send that document to me at 36100 Cathedral Canyon Drive, Cathedral City, CA 92234.

If you have any questions or need additional information, please call me at (760) 202-4251.

Very truly yours,

Mary Drury
Region Manager
Public Affairs

36-100 Cathedral Canyon Dr.
Cathedral City, CA 92234

DAVID P. ZAPPE
General Manager-Chief Engineer

1995 MARKET STREET
RIVERSIDE, CA 92501
909.955.1200
909.788.9965 FAX

61169.1

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

March 6, 2000

Mr. John D. Criste
AICP, Planning Consultant
City of Desert Hot Springs
400 South Farrell, Suite B-205
Desert Hot Springs, CA 92262-2743

Dear Mr. Criste:

Re: Notice of Preparation of an Environmental Impact Report for the Desert Hot Springs Comprehensive General Plan Update

This letter is written in response to the Notice of Preparation of an Environmental Impact Report (EIR) for the Desert Hot Springs Comprehensive General Plan Update. The project involves the assignment of new land use designations on 14,781 acres of incorporated city lands and 22,180 acres of city sphere-of-influence lands for a total of 36,961 acres.

The following issues should be addressed in the EIR:

1. The proposed project area is located within the District's Desert Hot Springs and Garnet Wash Master Drainage Plans (MDP). Based on the review of the MDP's (copies enclosed), there are proposed facilities within the project site. When fully implemented, the MDP facilities will provide flood protection to relieve those areas within the plans of the most serious flooding problems and will provide adequate drainage outlets. The EIR should address potential impacts to the proposed MDP facilities, including increased runoff or changes in the existing drainage patterns within the project area. The EIR should discuss which MDP facilities might be needed to provide flood protection for the proposed project site. To obtain further information on existing or proposed District facilities, contact Bob Cullen of the District's Planning Section at 909.955.1345.

2. The District has existing flood control facilities within the proposed project area that may be impacted by proposed changes to the General Plan, particularly from increased runoff due to development. The EIR should address potential impacts to existing District facilities. Any work involving District rights of way, easements or facilities will require an encroachment permit from the District. The construction of facilities within road right of way that may impact existing District storm drains should also be coordinated with us. To obtain further information on encroachment permits or existing facilities, contact Ed Lotz of the District's Permit Section at 909.955.1266.

3. The proposed project area is currently shown on the Federal Flood Insurance Rate Map (FIRM) for the unincorporated Riverside County area (Community Panel Number 060245 0900D and 060245 0925B) and for the city of Desert Hot Springs (Community Panel Number 060251 005 C) issued in conjunction with the National Flood Insurance Program (NFIP). For additional information or how to obtain copies of the FIRM, please contact the City of Desert Hot Springs for the portion within the city, or Don Dellgadillo of the District's Floodplain Management Section at 909/955.1265 for the portion located within the unincorporated area of the County.

4. The implementation of the proposed project also has the potential to significantly increase stormwater runoff and erosion downstream of the project area. The EIR should address these issues and any impacts that may result. In addition, the EIR should address potential impacts to groundwater recharge that may be caused by increases in impervious areas within the proposed project site. A detailed hydrology study should be prepared for the proposed project addressing the above comments. The findings should be included in the EIR.

Thank you for the opportunity to review the Notice of Preparation of the EIR. Please forward the copy of the final EIR to the Environmental Regulatory Section of this office when it becomes available. Any further questions concerning this letter may be referred to me at 909.955.1233 or Shaheen Mooman at 909.955.1318.

Very truly yours,

ZULLY SMITH
Senior Civil Engineer

Enclosure

c: Bob Cullen
Ed Lotz
Don Dellgadillo

SKM:slj

Riverside County
Waste Management Department
Robert A. Nelson, General Manager-Chief Engineer

March 6, 1999

John Christe, AICP, Planning Consultant
Terra Nova Planning & Research Inc.
400 South Farrell, Suite B-205
Palm Springs, CA 92262

RE: Notice of Preparation (NOP), CEQA Initial Study and Additional Information for the Desert Hot Springs Comprehensive General Plan Update Environmental Impact Report

Dear Mr. Christe:

The Riverside County Waste Management Department (Department) has reviewed the Notice of Preparation (NOP) for the Desert Hot Springs Comprehensive General Plan update. The following information is provided to assist in the preparation of the DEIR:

Current Solid Waste Information:

1. On September 23, 1998, the California Integrated Waste Management Board approved the Riverside Countywide Integrated Waste Management Plan (CIWMP). This document (composed of the Countywide Summary Plan, the Countywide Siting Element, and the County's and each of its cities' Source Reduction and Recycling Elements, Household Hazardous Waste Elements, and Nondisposal Facility Elements) was prepared in compliance with the Integrated Waste Management Act of 1989 (AB 939, et seq.) for the purpose of defining programs and policies to reduce waste disposal by 25 percent in 1995 and 50 percent by the year 2000. This document also addresses the County's and its cities' landfill capacity needs and identifies how these disposal needs will be met over a minimum of a 15-year period. These needs are based on the amount of waste disposed at the County's landfills over the past seven years and a projection of future waste disposal. In order for the County and its cities to meet the State's mandatory goal of 50 percent reduction in waste disposal, it is important that this project participate in these efforts to reduce waste.

2. The Edom Hill Landfill is the nearest landfill to the project. The Edom Hill Landfill is located in the Coachella Valley, east of Varner Road on Edom Hill Road. The existing landfill property encompasses 655 acres, of which 148 acres are permitted for landfilling. The landfill is operated by Riverside County and receives waste from the Coachella Valley. In 1997, a revision to the operating permit was approved, allowing a 40-foot vertical expansion of the landfill footprint. The permit revision allows the Edom Hill Landfill to receive an average of 1,153 tons per day and a maximum of 2,651 tons per day. During the period from August 31, 1998 to August 31, 1999, the Edom Hill Landfill received 1,167 tons per day. The site has a remaining capacity of 1,900,097 tons. The estimated closure date for the landfill is 2004 based on updated information and new waste flow projections.

   The Coachella Valley will lack local waste disposal capacity with the closure of the Edom Hill Landfill. Potential disposal sites in Riverside County include the proposed Eagle Mountain Landfill, located approximately 70 miles east of the Coachella Valley, or the El Sobrante, Lamb Canyon or Badlands Landfills, located in western Riverside County. Transfer stations can be used to reduce the high cost of direct hauling waste to landfills outside the Coachella Valley. On October 1, 1996, the Riverside County Board of Supervisors approved the Coachella Transfer Station. The Coachella

1995 Market Street • Riverside, CA 92501-1719 • (909) 955-1370 • Fax (909) 955-1374 • Fax (909) 955-1334

Transfer Station will be built at the closed Coachella Landfill (87-011 44th Street, Coachella), north of the landfill footprint. The Transfer Station is projected to open in the summer of the year 2000 and will be operated by the Coachella/Indio Waste Transfer Station Authority.

The following is a general description of alternative landfill disposal sites in Riverside County:

Eagle Mountain Landfill and Recycling Center: The Eagle Mountain Landfill and Recycling Center, which is a private enterprise, was approved by the Riverside County Board of Supervisors on September 9, 1997. The proposed project is located in an abandoned iron ore mine at Eagle Mountain in the unincorporated area of eastern Riverside County, 10 miles northwest of the community of Desert Center. The total site acreage is approximately 4,654 acres. The total acreage of the Eagle Mountain Landfill footprint, as proposed, is 2,164 acres. The total volume of the project at ultimate build-out is 708 million tons. The landfill is expected to have a life expectancy of approximately 100 years. The proposed landfill has a reserve capacity of 2000 tons per day for County waste. The project has received 19 of its 20 permits to operate and is completing a land exchange with the Bureau of Land Management. No opening date for the facility has been set.

El Sobrante Landfill: The El Sobrante Landfill is located east of Interstate 15 and Temescal Valley Road to the south of the City of Corona and Cajalco Road at 10910 Dawson Canyon Road. The landfill is owned and operated by Waste Management, Inc. The existing landfill encompasses 178 acres, of which 90 acres are permitted for landfilling. The landfill has an overall capacity of approximately 9 million tons and a daily disposal capacity of 4,000 tons per day. During the August 31, 1998 to August 31, 1999 period, the landfill received an average of 2,500 tons per day of waste (1,504 tons per day/in-County; 996 tons/out-of-County).

A proposal to expand the landfill by 100 million tons (40 million tons reserved for in-County waste, and 60 million reserved for out-of-County waste) and to increase the daily disposal capacity to 10,000 tons per day was approved by the Riverside County Board of Supervisors on September 1, 1998. Under this proposal, the landfill boundary will also be expanded to encompass an additional 1,144 acres, increasing the landfill footprint area to a total of 495 acres. Upon permitting, this landfill will have sufficient disposal capacity to provide long-term disposal capacity.

Lamb Canyon Landfill: The Lamb Canyon Landfill is located between the City of Beaumont and City of San Jacinto at 16411 Lamb Canyon Road (State Route 79), with Interstate 10 to the north and Highway 74 to the south. The landfill is owned and operated by Riverside County. The landfill encompasses approximately 1,088 acres, of which 178 acres are permitted landfill acreage. The landfill is currently permitted to receive 1,900 tons per day of trash for disposal and has an overall disposal capacity of approximately 5.9 million tons. During the August 31, 1998 to August 31, 1999 period, the landfill received an average of 491 tons per day. Based on current usage, the landfill has disposal capacity to the year 2011.

Badlands Landfill: The Badlands Landfill is located northeast of the City of Moreno Valley at 31125 Ironwood Avenue and accessed from State Highway 60 at Theodore Avenue. The landfill is owned and operated by Riverside County. The existing landfill encompasses 1,093 acres, of which 150 acres are permitted for landfilling and another 70 acres are permitted for excavation of cover material and stockpiling. The landfill is currently permitted to receive 4,000 tons per day and has an overall disposal capacity of approximately 12 million tons. During the August 31, 1998 to August 31, 1999 period, the landfill received an average of 1,461 tons per day. The landfill provides long-term disposal capacity.

Topics to be addressed by the DEIR:

1. The DEIR needs to address how the project will comply with the City of Desert Hot Springs Source Reduction and Recycling Element and Household Hazardous Waste Element.

2. The DEIR should identify the estimated waste generated by the project, including construction and green waste. To reduce the amount of waste generated, the Department recommends that the DEIR incorporate the following mitigation measures:

   - The California Solid Waste Reuse and Recycling Act of 1991 requires that adequate areas for collecting and loading recyclable materials be provided in public facilities, commercial projects, business areas, multi-family residential projects with five or more units and detached, single family residential projects where solid waste is collected and loaded in a location which serves five or more units.

   - The project proponent is encouraged to add a mitigation measure for recycling construction waste through available methods, such as onsite grinders and use of wood waste recycling facilities.

   - Green waste generated from the project should be reduced through such measures as grass recycling (where lawn clippings from a mulching type mower are left on the lawn), onsite composting, or green waste separation from other waste types to send to a composting facility in the area for recycling.

3. County landfills do not accept hazardous materials. The DEIR should assess how much household hazardous waste will be generated by the project and how it will be disposed.

4. The DEIR needs to address the potential cumulative impacts associated with the collection and transportation of the solid waste from the project, i.e., disposal truck traffic; as well as, cumulative air quality impacts. Any circulation and/or local air quality impacts resulting from this activity should be identified.

Thank you for the opportunity to review the screencheck document. When the DEIR becomes available, we would appreciate the opportunity to review that document. If you have any questions, please contact me at (909) 955-4387.

Sincerely,

Katherine M. Gifford
Planner III

cc: File
KG/kg f:\data\plng\landuse\eir\2000\99-04

United States Department of the Interior

NATIONAL PARK SERVICE
Joshua Tree National Park
74485 National Park Drive
Twentynine Palms, California 92277-3597

IN REPLY REFER TO:

L7621 (JOTR-S)

March 6, 2000

Mr. John D. Criste
Terra Nova Planning and Research, Inc.
400 South Farrell, Suite B-205
Palm Springs, California 92262

Dear Mr. Criste:

Thank you for the opportunity to review the Notice of Preparation, CEQA Initial Study and Additional Information for the Desert Hot Springs Comprehensive General Plan Update Environmental Impact Report. We understand that this project involves the assignment of new land use designations on incorporated city lands and the city's sphere of influence.

Although we found the document to be well prepared and organized, we do have some general comments about it.

1. The planning area appears to incorporate about 5 square miles of the Bureau of Land Management's (BLM) Big Morongo Canyon Preserve into its northeast section. This action may conflict with BLM land use classification.

2. By incorporating the above-mentioned section of the BLM preserve into the plan, two to five miles of the new planning area is now adjacent to Joshua Tree National Park. This should be mentioned in the plan and the impacts anticipated by the plan on the park need to be specifically addressed.

3. It is difficult to understand the intent of the plan and anticipated impacts to park lands without an adequate map delineating the land use zones.

In addition, we suggest the following:

1. Add reference to Big Morongo Canyon Preserve and Joshua Tree National Park in the Surrounding Land Uses and Environmental Setting sections of the document along with appropriate description of these areas (pages 12 and 15).

2. Add the boundaries of Big Morongo Canyon Preserve and Joshua Tree National Park on the Desert Hot Springs General Plan Study Area map on page 14.

3. Add some discussion about the undeveloped network of dirt roads that radiate from the city under the Transportation/Circulation section on page 16. These roads are experiencing increased unmanaged, off-road vehicle use.

4. Add reference to Big Morongo Canyon Preserve and Joshua Tree National Park to number 9 on Appendix G, Environmental Checklist Form.

In the Addendum to the Environmental Checklist, we request that as you examine I.b., I.c., and I.d., you be sensitive to the Big Morongo Canyon Preserve and Joshua Tree National Park, which are both within the sphere of influence.

Again, we appreciate this opportunity to review this information. If you have any questions, please feel free to contact Assistant Superintendent Mary Risser or me on (760) 367-5502.

Sincerely,

Mary Risser

for Ernest Quintana
Superintendent

US Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
2730 Loker Avenue, West
Carlsbad, CA 92008
(760) 431-9440
FAX (760) 431-5902 + 9618

CA Dept. of Fish & Game
1416 Ninth Street
PO Box 944209
Sacramento, CA 94244-2090
(916) 653-2458
FAX (916) 653-2588

MAR 0 8 2000

Nicole Criste
Planning Department
City of Desert Hot Springs
65-950 Pierson Boulevard
Desert Hot Springs, CA 92240

Re: Notice of Preparation Of An Environmental Impact Report For The Desert Hot Springs Comprehensive General Plan Update

Dear Ms. Criste:

The U.S. Fish and Wildlife Service (Service) and the California Department of Fish and Game (Department) have reviewed the Notice of Preparation (NOP) for the Desert Hot Springs Comprehensive General Plan Update Environmental Impact Report. We provide these comments based on our knowledge of habitat types and species' status within the Coachella Valley.

Section 7 of the Endangered Species Act of 1973, as amended, (Act) requires Federal agencies to consult with the Service should it be determined that their actions may affect federally listed threatened or endangered species. Section 9 of the Act prohibits the "take" (e.g., harm, harassment, pursuit, injury, kill) of federally listed wildlife. "Harm" is further defined to include habitat modification or degradation where it kills or injures wildlife by impairing essential behavioral patterns including breeding, feeding, or sheltering. Take incidental to otherwise lawful activities can be permitted under the provisions of sections 7 (Federal consultation) and 10 of the Act.

The Project proponent is also required to obtain an incidental take permit under section 2080.1 or 2081 of the California Fish and Game Code. Although a Habitat Conservation Plan has been established under section 10(a) of the Federal Endangered Species Act and permits take of the Coachella Valley fringe-toed lizard incidental to otherwise lawful activities without any Federal involvement, the Department was not a signatory to that plan and therefore the permit does not cover take under the California Endangered Species Act. Revisions to the Fish and Game Code, effective January 1998, require that the Department issue a separate CEQA document for the issuance of a CESA permit unless the project CEQA document addresses all project impacts to

listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of a CESA permit. For these reasons, the following information is requested:

a. Biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA Permit.

b. A Department-approved Mitigation Agreement and Mitigation Plan are required for plants listed as rare under the Native Plant Protection Act.

General Comments

The Desert Hot Springs General Plan area contains a unique assemblage of wildlife, including many endemic and endangered species. We want to emphasize the opportunity for effective planning that includes the concerns for wildlife from information already gathered in the developing Coachella Valley Multi-Species Plan (Multi-Species Plan) and the existing Fringe-toed Lizard Habitat Conservation Plan (HCP). Now is the time to prevent forseable future trainwrecks between zoning and ordinances that may be incompatible with wildlife and endangered species issues.

Specific Comments

Hydrology, p.16: The Willow Hole Preserve (Preserve), created through the HCP, is located just east of Mountain View and Varner, about one mile east of the southern sphere of influence area. The Preserve contains wind-blown sand accumulations that provide habitat for the federally threatened and State endangered fringe-toed lizard (*Uma inornata*), the federally endangered Coachella Valley milk vetch (*Astragalus lentiginosus* var. *coachellae*), and several species proposed for conservation coverage in the Multi-Species Plan: the Palm Springs pocket mouse (*Perognathus longimembris bangsi*), Palm Springs ground squirrel (*Spermophilus teritaudus chlorus*), giant sand treader cricket (*Macrobaenetes valgum*), Le Contes thrasher (*Toxostoma lecontei*), and others. The wind-blown sand originates from the Little San Bernardino and San Bernardino Mountains and the alluvial fans in Desert Hot Springs as sediment carried downstream in big storm events. Once the sediment is fluvially deposited into a wind corridor that blows from west to east along the San Andreas Fault and Varner Avenue, it is sorted by the wind. The finer sands are carried eastward from Mission and Morongo Creeks and immediately deposited in the mesquite hummocks along the San Andreas Fault, behind individual creosote bushes and other shrubs, and in the Willow Hole Preserve area. Most of the fine sand is carried in the wind just inches above the ground.

The sediment-producing system discussed above continues to function naturally in its current state, but future development and flood control facilities on the alluvial fans and drainages upstream of the wind corridor in the City's General Plan area may deplete the amount of sediment that reaches the wind corridor, thereby contributing to a decrease in the amount of sand (or habitat) on the Preserve over time.

To address the sand source issue, we recommend that areas roughly corresponding to the 500-year flood plain be zoned as natural open space or equivalent densities and land uses that would not require flood control infrastructure that impedes sediment delivery processes. This may alleviate the need for building some of the anticipated flood control facilities.

Geology and Seismicity p.17: Reference to strong, sustained winds along 20th Avenue is the wind corridor we identified above. The EIR should analyze how the wind corridor would function with various levels of development. We need information that will indicate if, for example, random low density residential development will disrupt the wind corridor and block sand from reaching the Preserve. If placed in the wrong location, minimal development can completely disrupt a wind corridor. We recommend that IV.f IX.c in Appendix G be changed to "Potentially Significant Impact" because of the potential effect of the General Plan update on the sand transportation system to the Preserve and the developing Multi-Species Plan.

Biological Resources p.18: The desert slender salamander is not known from the Desert Hot Springs area and should be removed from the study area species list. Conversely, the Palm Springs pocket mouse and the endangered triple-ribbed milk vetch are known to occur in the study area and should be added to the species list. The endangered southwestern willow flycatcher should be considered as a migrant through the study area.

Addendum to the Environmental Checklist, p. A-3, IV.c: As mentioned above, many major desert dry washes occur in the study area, some of which were mentioned in the NOP as potential candidates for bridge construction to maintain access to Desert Hot Springs during flooding events. These types of projects are subject to obtaining a section 404 permit of the Clean Water Act from the Army Corps of Engineers for fill of Federal jurisdictional waters. This Federal action of issuing a Clean Water Act 404 permit may require consultation between the Army Corps of Engineers and the Service if the proposed project may affect a listed species. We recommend that IV.c and VIII.b, d, and e in Appendix G be changed to "Potentially Significant Impact".

The Department opposes the elimination of watercourses and/or their channelization or conversion to subsurface drains. All wetlands and watercourses, whether intermittent or perennial, must be retained and provided with substantial setbacks which preserve the riparian and aquatic values and maintain their value to on-site and off-site wildlife populations.

c. The Department has direct authority under Fish and Game Code § 1600 et seq. in regard to any proposed activity which would divert, obstruct, or affect the natural flow or change the bed, channel, or bank of any river, stream, or lake.

d. A discussion of potential adverse impacts from any increased runoff, sedimentation, soil erosion, and/or pollutants on streams and watercourses on or near the project site, with mitigation measures proposed to alleviate such impacts, must be included.

e. The Department is in the process of complying with a writ of mandate issued by the Superior Court of California (Mendocino Environmental Center vs California Department of Fish and Game, Respondents, Bruce Choder, River Rat Salvage, et. al. Real Parties). The writ of mandate states:

> "A writ of mandate shall issue ordering the California Department of Fish and Game on or before May 1, 1999, to prepare and implement a program or process that will incorporate a CEQA review into the Fish and Game Section 1603 process. The writ of mandate shall further order the California Department of Fish and Game to cease and desist entering into Section 1603 agreements after May 1, 1999, unless such agreements have been subject to a CEQA review."

The writ of mandate clearly spells out what the Department's responsibilities are under CEQA with respect to all SAA's (1601 and 1603). In this regard, the Department is emphasizing in comment letters on projects that impacts to lakes or streambeds, alternatives, and mitigation measures must be addressed in CEQA-certified documents prior to submittal of an application of a SAA. Any information which is supplied to the Department after the CEQA process is complete will not have been subject to the public review requirements of CEQA. In this instance, the Department has three choices: 1) refuse to issue the SAA; 2) not file the Notification because CEQA has not been complied with and return the package to the lead agency for further CEQA action; or 3) become the lead agency.

In order for the Department to process a SAA agreement, the CEQA-certified documents must include an analysis of the impacts of the proposed project on the lake or streambed, an analysis of the biological resources present on the site, copies of biological studies conducted on the site, biological survey methodology, and a discussion of any alternative measures, avoidance measures, or mitigation measures which will reduce the impacts of the proposed development to a level of insignificance.

Addendum VIII.d: Reduced runoff absorption areas and increased runoff due to more development may have an impact on reducing the amount of sediment that is deposited in the wind corridor and ultimately the amount of blow sand that is transported to the Willow Hole Preserve area. This hydrologic/sedimentation effect should be addressed in the draft EIR.

Addendum VIII.h: We believe that allowance for building structures within the 100-500 year floodplain would have an impact on the sand transport process because of the future need for flood control facilities. The 500-year flood plain should be studied for maintaining or downzoning to a density that would not require flood control improvements.

Addendum XVI.d: If the proposed project results in a lowering of the water table from groundwater pumping, the mesquite hummocks that hold much of the wind blown sand in the Willow Hole area may die off. However, the mesquite hummocks along the San Andreas fault, may have an independent source of upwelling water. More information should be provided that indicates how natural vegetation along and away from the San Andreas fault would be effected by a lower water table.

Lastly, we recommend that the XVII.a be changed to "Potentially Significant Impact".

Please do not hesitate to contact Kim Nicol at (760) 251-4827 or Ken Corey at (760) 431-9440 if you have questions regarding this letter.

Sincerely,

Glenn Black
Habitat Conservation South Supervisor
California Department of Fish and Game

for Nancy Gilbert
Assistant Field Supervisor
U.S. Fish and Wildlife Service

cc: John Criste

PALM SPRINGS UNIFIED SCHOOL DISTRICT

980 EAST TAHQUITZ CANYON WAY
PALM SPRINGS, CALIFORNIA 92262-0119
(760) 416-6000
FAX (760) 416-6015

WILLIAM E. DIEDRICH, Ph.D., Superintendent of Schools

BOARD OF EDUCATION: MEREDY SHOENBERGER, *President* — ANDREW GREEN, *Clerk*
LESLIE DeMERSSEMAN, *Member* — DONALD T. AIKENS, *Member* — MICHAEL McCABE, *Member*

March 13, 2000

Terra Nova Planning & Research, Inc.
Andrea Randall
400 S. Farrell, Suite B-205
Palm Springs, CA 92262

RE: Desert Hot Springs General Plan

Dear Ms. Randall:

I have reviewed the update of the general plan for the City of Desert Hot Springs. I find the plan lacking in fully mitigating the impact on PSUSD. Statutory school fees as stated in the plan would not mitigate growth of the magnitude indicated. The fees do not cover 50% of the construction of new schools. Additionally the fees are also used for interim housing of new students until new schools can be funded.

Currently, the list of schools serving the Desert Hot Springs area is:

	Enrollment	Capacity
Bubbling Wells Elementary	620	661
Julius Corsini Elementary	732	756
Two bunch Palms Elementary	663	716
Edward Wenzloff Elementary	637	716
Desert Springs Middle	1101	1191
Desert Hot Springs High	679	1161
Las Brisas Continuation High	18	20

The district has no plans to add any new schools to the Desert Hot Springs area. Planning a new school facility requires state eligibility, state funding and local district funding. Currently, there is not sufficient eligibility, as determined by the state, to plan a new elementary, middle or high school. Sufficient eligibility would not be available for several years. State funds are currently available for new school construction projects but it is expected that the funds will be depleted within two years. Local funds from Measure P have been expended.

If you have any questions or comments, please contact me at (760) 416-6116.

Sincerely,

William J. Schmidt
Facilities Planning & Development

/rl

cc: John Criste
David Costner

APPENDIX B

DESERT HOT SPRINGS
CIRCULATION ELEMENT UPDATE
BACKGROUND STUDY

FOR

THE CITY OF DESERT HOT SPRINGS

PREPARED BY:

ENDO ENGINEERING
GREGORY ENDO

MARCH, 2000

NOTICE ON APPENDIX REDUCTION

This technical appendix has been reduced by 50% and printed double-sided to conserve paper and to allow the technical appendices to be incorporated in the EIR. If you wish to have a full-sized copy of this appendix, please contact the City of Desert Hot Springs at (760)329-6411.

Desert Hot Springs

Circulation Element Update
Background Study

March 21, 2000

Prepared For:

The City of Desert Hot Springs
65950 Pierson Boulevard
Desert Hot Springs, California 92240
(760) 329-6411

Prepared By:

Endo Engineering
28811 Woodcock Drive
Laguna Niguel, CA 92677-1330
(949) 362-0020

Desert Hot Springs General Plan Update Circulation Background Study

Prepared by: Endo Engineering

March 2000

Endo Engineering *Traffic Engineering* *Air Quality Studies* *Noise Assessments*

March 21, 2000

Mr. John Criste
Terra Nova Planning and Research, Inc.
400 South Farrell, Suite B-205
Palm Springs, CA 92262

SUBJECT: ***Desert Hot Springs General Plan Circulation Element Update Background Study***

Dear Mr. Criste;

Endo Engineering is pleased to submit this Circulation Background Study summarizing our findings regarding the current and future transportation environment throughout the City of Desert Hot Springs for your use in updating the Circulation Element of the Desert Hot Springs General Plan. The data provided herein establishes a foundation for and assessment of future transportation impacts on the community and the evolution of planning and development strategies to minimize the potential for adverse transportation impacts within the planning area. The pages which follow document: (1) the location, extent, and traffic flow characteristics of the existing transportation system; (2) regional transportation plans and programs; (3) alternative transportation modes; (4) designated scenic corridors and truck routes; (5) future traffic projections and levels of service upon buildout of the General Plan alternatives; and (6) recommendations related to the various components of the transportation system within the planning area. Specific circulation issues of concern to the community are also discussed.

City assistance in the development of this study and planning support services provided by Terra Nova Planning and Research, Inc. have been greatly appreciated. A well coordinated effort was essential to the execution of the work program, and your cooperation in providing necessary information and data contributed in no small measure to the completion of this study.

Cordially,

ENDO ENGINEERING

Vicki Lee Endo

Vicki Lee Endo
Registered Professional
Traffic Engineer TR 1161

REGISTERED PROFESSIONAL ENGINEER
VICKI LEE ENDO
TR 1161
12/31/2002
TRAFFIC
STATE OF CALIFORNIA

28811 Woodcock Drive, Laguna Niguel, CA 92677-1330
(949) 362-0020 FAX: (949) 362-0015

Table of Contents

Section	Title	Page
1.0	INTRODUCTION	1-1
1.1	**Project Location**	1-1
1.2	**Purpose and Scope**	1-1
2.0	GOALS AND OBJECTIVES	2-1
3.0	EXISTING CIRCULATION CONDITIONS	3-1
3.1	**Streets and Highways** - Existing Roadways - Existing Traffic Controls - Current Traffic Volumes - Adopted Circulation Element - Roadway Capacity Considerations - Daily Volume-To-Capacity Analysis - Peak Hour Intersection Analysis	3-1
3.2	**Public Transportation**	3-8
3.3	**Bicycle Facilities**	3-8
3.4	**Truck Routes**	3-8
4.0	FUTURE CIRCULATION CONDITIONS	4-1
4.1	**1995 CVAG Origin Destination Survey** - Travel Patterns and Socioeconomic Characteristics - Modal Split - Pass-Through Trops	4-1
4.2	**Desert Hot Springs General Plan Transportation Model** - Consistency With Sub-Regional Modeling	4-3
4.3	**Future Traffic Volume Forecast**	4-4
4.4	**Preferred Circulation Plan**	4-5
4.5	**General Plan Buildout Volume-To-Capacity Analysis** - Preferred General Plan - Adopted General Plan - General Plan Alternative 3 - General Plan Alternative 4 - Change in Daily V/C Ratio and LOS	4-11
4.6	**Trip Generation By General Plan Alternative**	4-18

Table of Contents

Section	Title	Page
4.7	**Circulation Issue Assessment** - North/South Travel Corridors - East/West Travel Corridors - Undeveloped Areas - Interstate 10 Interchanges	4-20
4.8	**Scenic Corridors**	4-22
4.9	**Phasing of Master Planned Transportation Improvements**	4-24
4.10	**Alternate Transportation Modes** - Southern Pacific Railroad - Palm Springs International Airport - Public Transportation - Non-Motorized Transportation Facilities	4-24
4.11	**Future Truck Routes**	4-29
4.12	**Congestion Management Program** - Designated CMP System - Multimodal System Performance Standards - LOS Deficiency Plans - TDM/Air Quality Provisions - Capital Improvement Program	4-29
5.0	PRINCIPAL FINDINGS AND RECOMMENDATIONS	5-1
5.1	**Interstate 10 Interchanges**	5-1
5.2	**State Route 62**	5-1
5.3	**Little Morongo Road Interchange**	5-2
5.4	**Palm Drive**	5-2
5.5	**Dillon Road**	5-2
	APPENDICES A. Traffic Signal Warrant Analysis B. Current Traffic Count Data C. HCM Methodology and Worksheets D. TAZ Map and Modifications to the CVATS Model Data Files E. Trip Generation Forecast By Land Use Category and Alternative	

List of Figures

Number	Title	Following Page
1-1	Regional Location	1-1
1-2	Existing Planning Area	1-1
1-3	Future Planning Area	1-1
3-1	Existing Streets and Highways	3-1
3-2	Existing Traffic Controls	3-1
3-3	Posted Speed Limits	3-1
3-4	Existing Daily Traffic Volumes	3-2
3-5	Existing Peak Hour Turning Movements	3-2
3-6	Current Circulation Plan	3-2
3-7	Typical Street Cross-Sections	3-2
3-8	Existing Lane Geometrics at Key Intersections	3-7
3-9	Existing Public Transportation	3-8
3-10	Existing Bikeways and Regional Bikeway System	3-8
3-11	Existing Truck Routes	3-9
4-1	Buildout Daily Traffic Projections - Preferred General Plan	4-5
4-2	Buildout Daily Traffic Projections - Adopted General Plan	4-5
4-3	Buildout Daily Traffic Projections - Alternative 3	4-5
4-4	Buildout Daily Traffic Projections - Alternative 4	4-5
4-5	Proposed Desert Hot Springs Circulation Plan	4-5
4-6	Proposed Desert Hot Springs Typical Street Sections	4-8
4-7	Scenic Highways	4-22
4-8	CVAG Proposed System of Non-Motorized Facilities	4-26
4-9	Proposed Truck Routes	4-29

List of Tables

Number	Title	Page
3-1	Current Level of Service Criteria	3-3
3-2	Current Daily Roadway Capacity Estimates	3-4
3-3	Current Daily V/C Ratio and LOS Summary	3-5
3-4	Existing Levels of Service at Unsignalized Intersections	3-7
3-5	Existing Levels of Service at 4-Way Stop Controlled Intersections	3-7
3-6	Existing Levels of Service at Signalized Intersections	3-8
4-1	Origin-Destination Study Findings Comparison	4-3
4-2	General Plan Buildout Daily Traffic Volumes By Alternative	4-6
4-3	Recommended Daily Roadway Volume Estimates For Each Level Of Service	4-9
4-4	General Plan Buildout Daily V/C Ratios and Levels Of Service By Roadway Link and Alternative	4-12
4-5	Portion of Network Providing Each Level Of Service By Alternative	4-17
4-6	Number of Roadway Links Changing Level Of Service By Alternative	4-18
4-7	Trip Generation Forecast By General Plan Alternative	4-19

1.0 INTRODUCTION

On October 15, 1987, the City of Desert Hot Springs adopted the *Circulation Element of the General Plan.* Changes have occurred in the City and surrounding communities since that time which necessitate a re-evaluation of the existing Circulation Element. Future land use expectations and the concerns of residents regarding future growth have evolved. Current community goals and standards for their implementation must be clearly defined to insure consistency as future growth occurs.

1.1 PURPOSE AND SCOPE

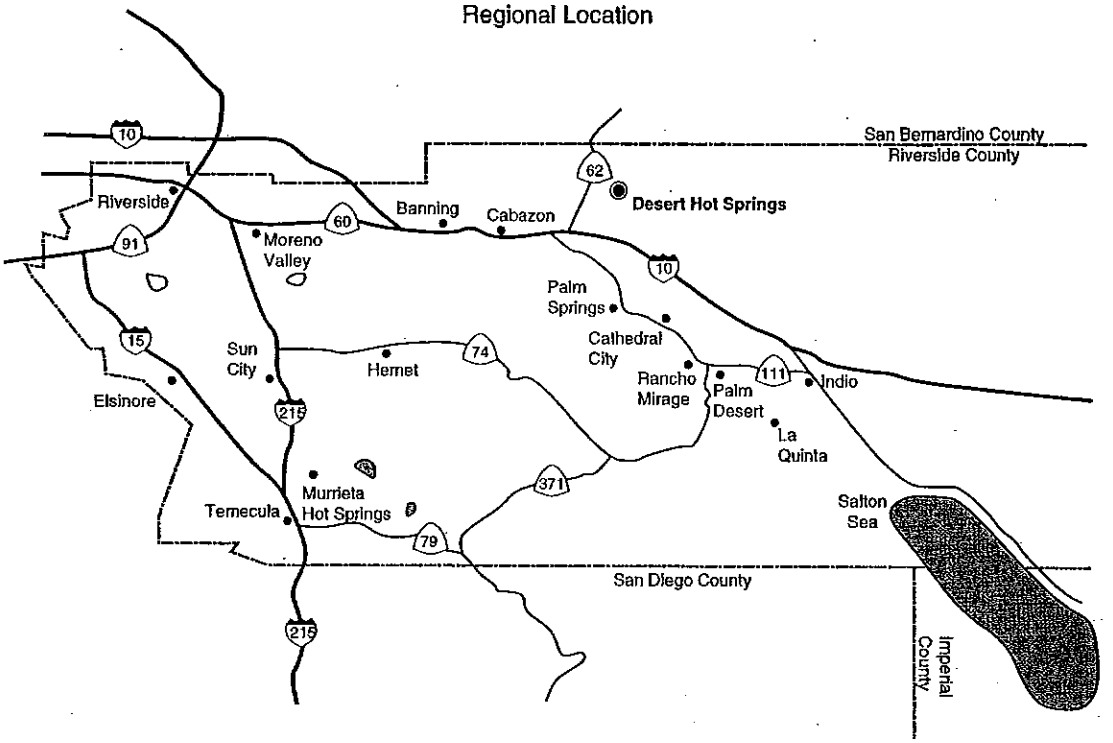
The purpose of this report is to describe the existing condition of the various components of the City of Desert Hot Springs circulation system. These components include: streets, highways, public transportation, bicycle facilities and truck routes. There are no airports or railroads within the City of Desert Hot Springs. The nearest railroad is located south of and adjacent to Interstate 10 and the nearest airport is Palm Springs International Airport.

1.2 PROJECT LOCATION

In 1994, the City of Desert Hot Springs had a population of 14,150 and an area of 10.0 square miles. It is located in the Coachella Valley, north of Interstate 10 and 53 miles east of the Riverside Downtown Civic Center. Figure 1-1 is a Regional Location Map that illustrates the City of Desert Hot Springs in its regional context. Figure 1-2 depicts the planning area that was used in the development of the traffic baseline conditions in November, 1994. The planning area was defined by the streets and highways that served the travel demands of residents and visitors within the City limits. Based upon 1999 daily traffic counts from CVAG, the traffic volumes on the streets shown in the baseline (counted in 1994) have generally decreased in the past few years by 8 to 10 percent.

The planning area used for future post 2020 traffic conditions includes the City of Desert Hot Springs and its Sphere of Influence, as shown in Figure 1-3. Most of the unincorporated land between the City of Desert Hot Springs and the City of Palm Springs has been addressed in the Desert Hot Springs General Plan buildout analysis.

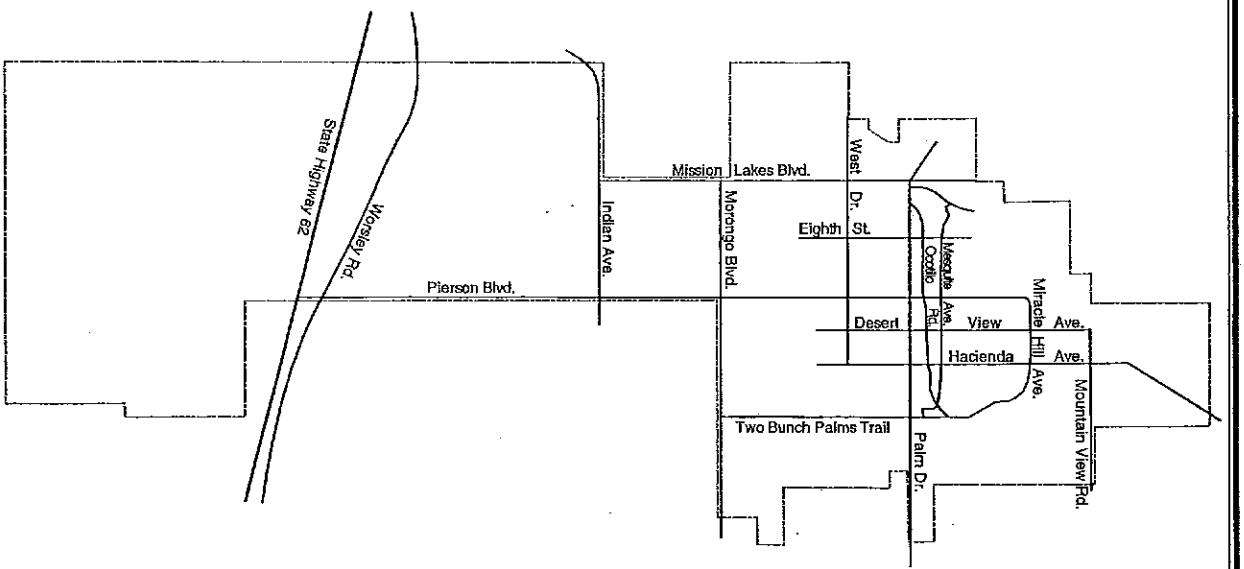
Figure 1-1
Regional Location



Endo Engineering

Scale: 1" = 13.3 Miles

Figure 1-2
Existing Planning Area



Endo Engineering

Scale: 1" = 1 Mile

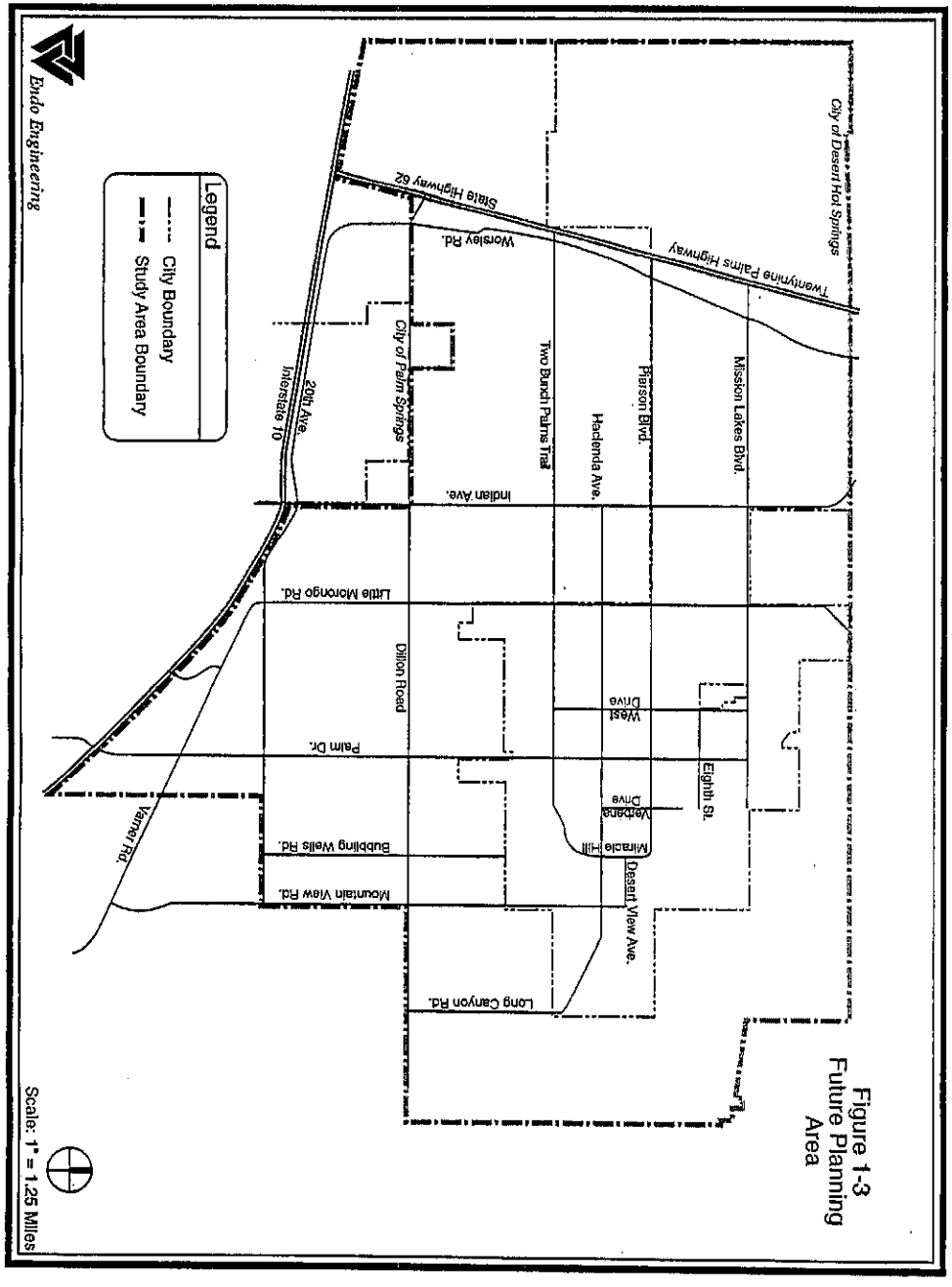


Figure 1-3
Future Planning Area

2.0 GOALS AND OBJECTIVES

It is the goal of transportation planners and engineers to develop an integrated transportation system consisting of a blend of transportation modes capable of meeting the continuing need to move people and goods by private and public means with maximum efficiency, convenience, economy, safety and comfort. An integrated transportation system should also be consistent with other community and regional goals and values.

In the process of developing a balanced and coordinated circulation system, data about the City of Desert Hot Springs is compiled, evaluated and analyzed to establish the community's social, economic and environmental goals as well as its circulation needs, deficiencies, opportunities and constraints. Transportation planners then evaluate both transportation systems and plans to determine their feasibility in meeting the current and future needs of the community.

Maintaining consistency between land uses and roadways requires continual coordination between responsible agencies and interested parties. Roadways play such a significant role in determining urban form that the planning, design and construction processes can generate many issues of concern. Public participation through the public hearing process is one way that interested parties can provide input and receive responses to specific issues of concern. This process provides increased public awareness and understanding of the City's transportation future as well as a platform for residents to express their views and thereby provide decision makers with necessary public guidance. Public input is an essential element in the resolution of transportation issues and should begin early in the planning process.

Although an efficient circulation system, is desirable on a community-wide basis, some sectors may view specific roads as unnecessary, unsightly, too costly or unrealistic. Therefore, the planning process must balance land development needs, related circulation system needs, and the needs of the environment and the community in a creative and sensitive way.

When through traffic is allowed to encroach into residential areas, it has a disruptive effect. It increases public safety hazards on streets and results in mid-block friction with parked cars, driveways and pedestrians. Through traffic on residential streets affects the safety of children, bicyclists and pedestrians by increasing average speeds and the potential for accidents. Consequently, transportation planning must protect the integrity of residential neighborhoods by discouraging unnecessary through traffic.

Community-wide implications of local circulation system decisions must also be evaluated. Failure to treat circulation comprehensively threatens both the efficiency and the effectiveness of the system. It is therefore incumbent on all involved to continually strive to improve the assessment of the full range of circulation impacts (whether beneficial or adverse) so that decision makers can make informed decisions.

The orderly phasing of development is essential to the provision of an effective and efficient street system. Careful phasing of circulation improvements is necessary to maximize the efficiency and the effectiveness of the existing network. Phasing considerations should include: (1) anticipated traffic demands (including through traffic); (2) traffic network continuity; (3) the benefits of additional access that could reduce

circuitous travel or the need for alternate access routes; (4) fiscal feasibility; (5) compatibility with community needs; and (6) environmental protection.

The circulation goal of the 1987 General Plan was to "develop a unified circulation system with Palm Drive, Hacienda Avenue and Pierson Boulevard as four-lane major arterials; including consideration of bicycle lanes, walkways from residential and spa areas to commercial and recreational facilities and public transit." Ten policy statements designed to achieve this goal were included in the 1987 Circulation Element.

To achieve the City's goals and objectives, a street and highway system is needed which improves access and provides better options for through vehicle trips within the City. A public transportation system and a pedestrian and bicycle circulation system connecting employment, shopping, residential, recreation and transit destinations are also needed.

To adequately serve projected traffic volumes upon General Plan buildout, the Desert Hot Springs roadway network will require improvement. A roadway plan that meets the desires of the community for mobility and accessibility while supporting the development intensity anticipated in the Land Use Element has been developed by the City. It includes a new I-10 interchange at Little Morongo, high volume corridors and the widening of State Route 62 to adequately accommodate projected traffic demand. The new high-volume corridors will also provide access across the freeway into the City of Palm Springs.

3.0 EXISTING CIRCULATION CONDITIONS

Regional access for the City of Desert Hot Springs is currently available from Interstate 10 and State Highway 62. Interstate 10 is a 6-lane freeway in the vicinity that provides access to the Cities of Banning, Riverside and San Bernardino to the west and the Cities of Thousand Palms, Indio and Coachella to the east. The Interstate 10 interchanges at Twentynine Palms Highway, Indian Avenue and Palm Drive provide the most direct access.

Access to Desert Hot Springs from other cities in the Coachella Valley typically occurs via Interstate 10 or Palm Drive, which extends south to Palm Springs and Cathedral City as Gene Autry Trail. Palm Drive extends 6 miles north of Interstate 10 to become the main north-south street within the City of Desert Hot Springs.

Pierson Boulevard is the main east-west street within the City limits. It extends westerly to the Twentynine Palms Highway (State Highway 62) which provides access to Morongo Valley, Yucca Valley and Twentynine Palms to the north. Highway 62 can also be reached via Indian Avenue.

3.1 STREETS AND HIGHWAYS

3.1.1 Existing Roadways

Figure 3-1 depicts the existing roadways within the City of Desert Hot Springs. The number of mid-block through lanes are shown as well as whether or not each roadway is a divided or undivided facility.

Basically, State Highway 62, Pierson Boulevard and Palm Drive are the four-lane divided roadways (with the exception of short segments of Hacienda Avenue and Two Bunch Palms Trail). Palm Drive, between Mission Lakes Boulevard and Eighth Street, is the only four-lane undivided roadway within the City Limits. Most of the roadways within the City of Desert Hot Springs are two-lane undivided facilities.

3.1.2 Existing Traffic Controls

Figure 3-2 documents the existing traffic controls within the City of Desert Hot Springs. As shown therein, traffic signals control three intersections along Palm Drive including those at: Pierson Boulevard, Hacienda Avenue and Two Bunch Palms Trail. Four-way stops control twelve intersections and three-way stops control the intersections of Hacienda Avenue with West Drive and Cactus Drive.

Daily planning level traffic signal warrants were checked at each unsignalized key intersection (refer to the signal warrant worksheets in Appendix A). The results indicate that signalization is currently warranted at the intersection of Pierson Boulevard and Indian Avenue. In addition, the intersection of Hacienda Avenue and Mountain View Road may warrant signalization, based upon peak season daily traffic volumes.

Posted speed limits within the City of Desert Hot Springs are shown in Figure 3-3. They range from 25 miles per hour along Ocotillo Road to 55 miles per hour along Pierson Boulevard. Although two links along Hacienda Avenue and two links along Palm Drive have 40 mile per hour speed limits, most of the remaining roadways within the City Limits are posted for 35 or 45 miles per hour.

3.1.3 Current Traffic Volumes

Daily traffic volumes were determined with 24-hour machine counters placed at ten locations throughout the City if Desert Hot Springs in October of 1994. In addition, evening peak hour turning movement counts were made manually at nine key intersections. The count locations are shown in Appendix B. The peak hour and daily count data is also provided in Appendix B.

The count data obtained in October was seasonally adjusted to reflect traffic flow variations that typically occur in the Coachella Valley. As shown in the seasonal adjustment table in Appendix B (developed by the City of Indio Traffic Engineering from the Caltrans SR 111 corridor analysis), the peak travel season is in the spring. Traffic counts taken in the fall were increased by 21 percent, and winter counts were increased by 27 percent, to adjust the counts to peak season volumes. The seasonal adjustments are included in a spreadsheet in Appendix B and were consistent with the Caltrans count data along State Highway 62.

Current peak season traffic volumes are depicted in Figure 3-4 (Existing Daily Traffic Volumes) and Figure 3-5 (Existing Peak Hour Turning Movements). Two 24-hour counts were available from Caltrans along State Highway 62 that represent peak month conditions in 1993. In addition, the Riverside County Transportation Department provided 24-hour counts from January of 1993 for two roadway links (Indian Avenue north of Mission Lakes and Pierson Boulevard east of Indian Avenue). The Riverside County count data shown in Figure 3-4 was seasonally adjusted.

3.1.4 Current Roadway Designations

The currently adopted Circulation Element of the Desert Hot Springs General Plan details the general location and extent of the circulation system required to serve future traffic demands associated with build-out per the Land Use Element of the General Plan adopted in 1987. Figure 3-6 illustrates the currently master planned roadway designations within the City of Desert Hot Springs. Figure 3-7 provides typical cross-sections associated with each roadway classification.

As shown therein, master planned 4-lane arterial roads require a 100-foot right-of-way and 76 feet of pavement. Master planned 4-lane major roads require an 80-foot right-of-way and 76 feet of pavement. Major and arterial roads include geometric design and traffic control measures that expedite the movement of through traffic. Roadways in this category generally carry daily volumes in excess of 20,000 vehicles.

Four-lane secondary highways require an 80-foot right-of-way and 64 feet curb-to-curb. Secondary roadways typically do not carry the amount of through traffic that arterial and major roads can. Daily volumes on secondary roads generally range between 10,000 and 20,000 vehicles.

Collector streets include 40 feet of pavement within a 60-foot right-of-way. They carry traffic from residential streets to secondary higher classification facilities. They provide full access to abutting properties instead of serving the needs of through traffic and typically carry fewer than 10,000 vehicles per day.

Minor roads are local 2-lane streets that provide direct access to individual parcels. Minor roads typically permit on-street parking on both sides of the street and have a minimum right-of-way width of 50 feet.

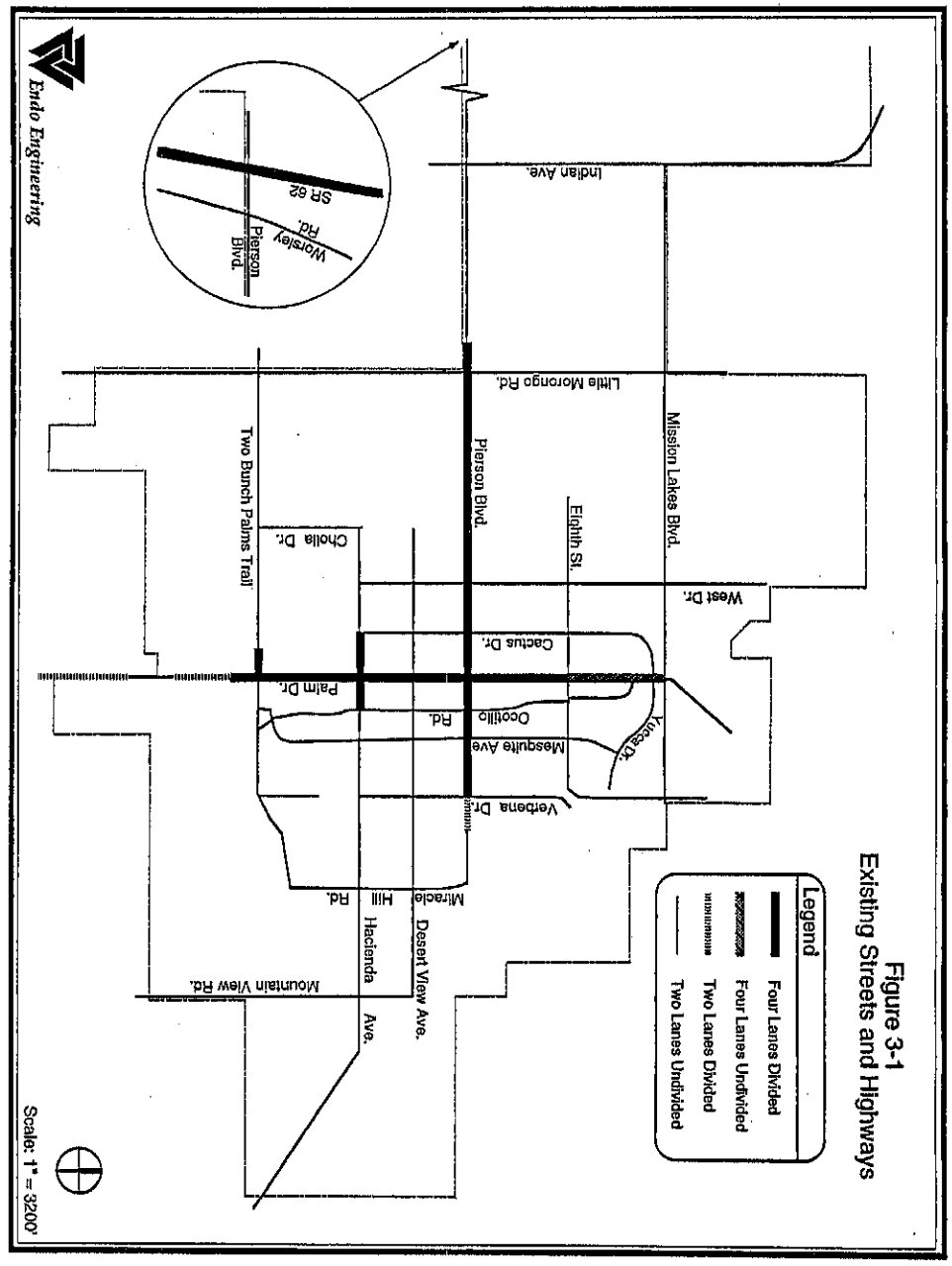


Figure 3-1
Existing Streets and Highways

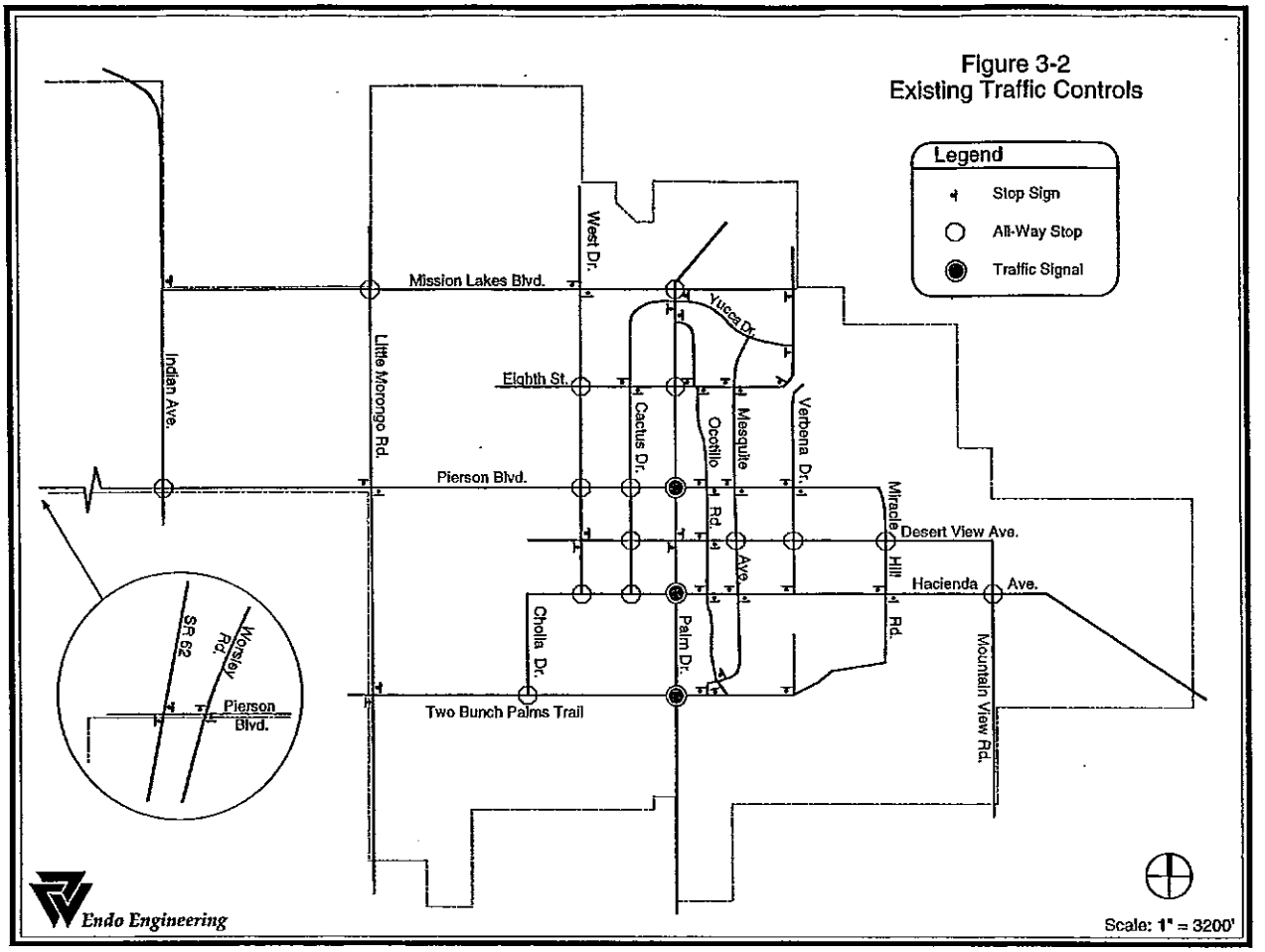


Figure 3-2
Existing Traffic Controls
Legend
Stop Sign
All-Way Stop
Traffic Signal
West Dr.
Mission Lakes Blvd.
Yucca Dr.
Indian Ave.
Little Morongo Rd.
Eighth St.
Cactus Dr.
Ocotillo Rd.
Mesquite Ave.
Verbena Dr.
Pierson Blvd.
Miracle Hill Rd.
Desert View Ave.
Hacienda Ave.
Cholla Dr.
Palm Dr.
Two Bunch Palms Trail
Mountain View Rd.
SR 62
Worsley Rd.
Pierson Blvd.
Endo Engineering
Scale: 1" = 3200'

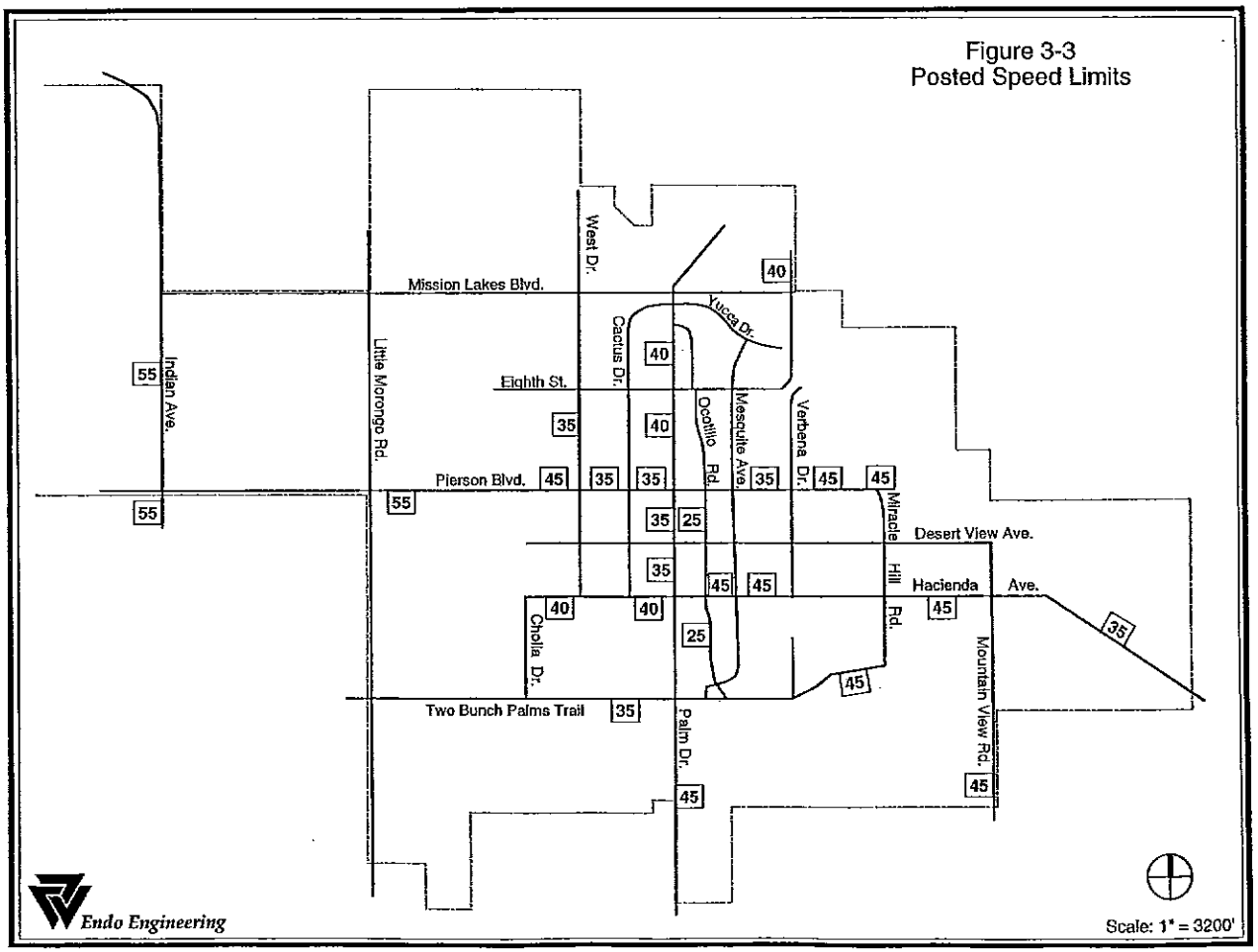


Figure 3-3
Posted Speed Limits
West Dr.
Mission Lakes Blvd.
Yucca Dr.
Indian Ave.
Little Morongo Rd.
Cactus Dr.
Eighth St.
Ocotillo Rd.
Mesquite Ave.
Verbena Dr.
Pierson Blvd.
Miracle Hill Rd.
Desert View Ave.
Hacienda Ave.
Cholla Dr.
Palm Dr.
Two Bunch Palms Trail
Mountain View Rd.
Endo Engineering
Scale: 1" = 3200'

Figure 3-4
Existing Daily Traffic Volumes
(Peak Season)

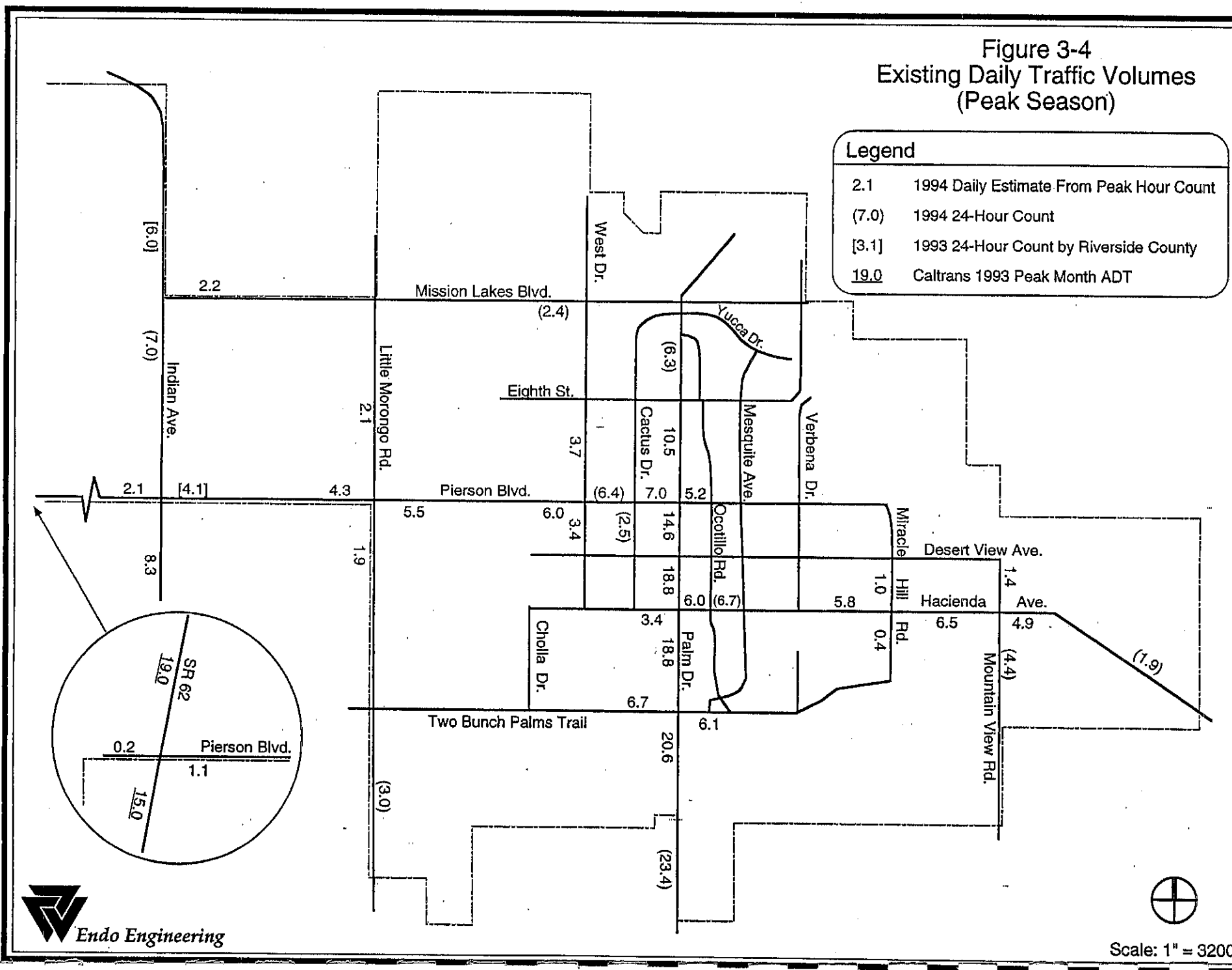


Figure 3-5
Existing Peak Hour Turning Movements
(Peak Season)

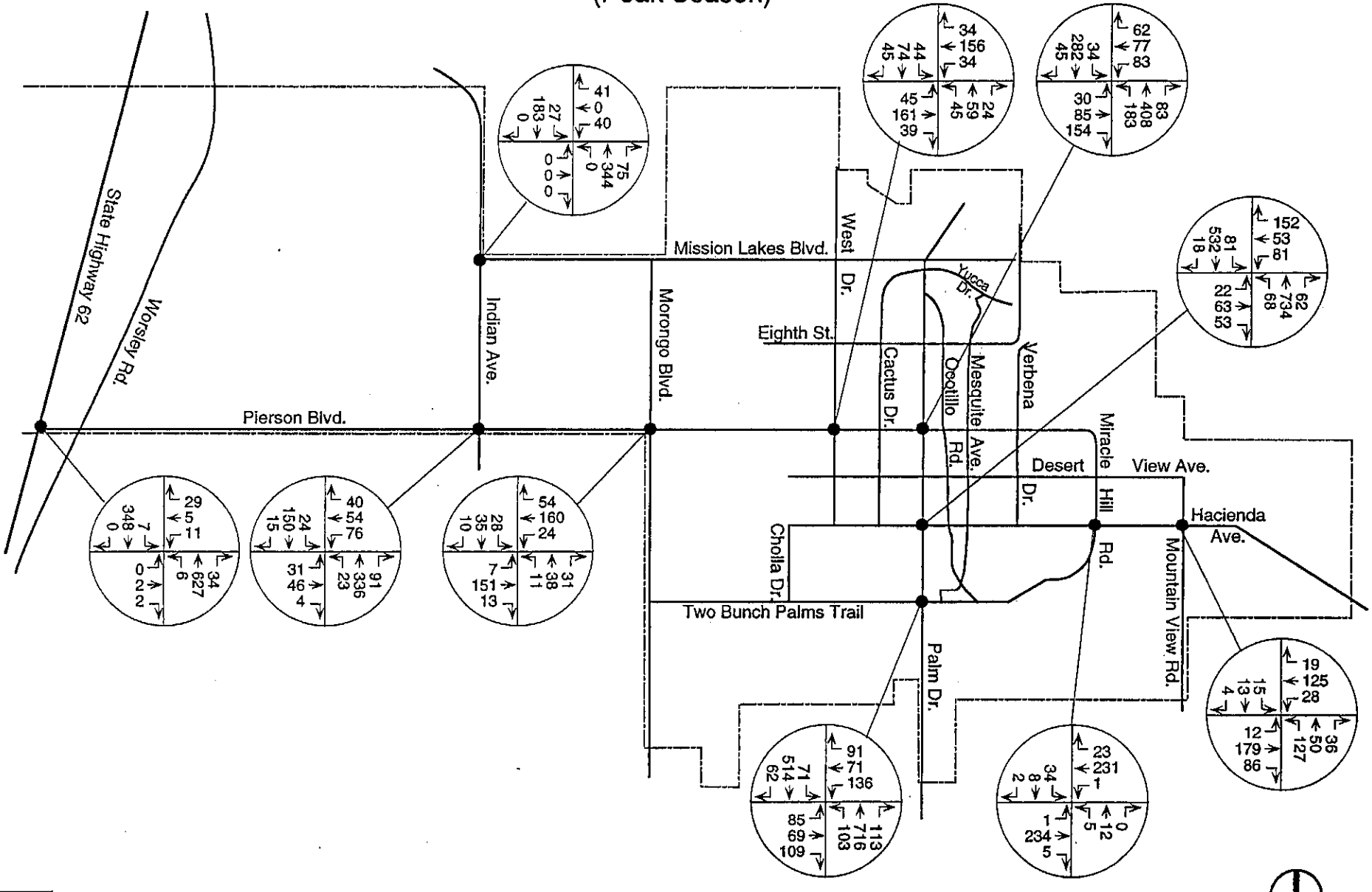
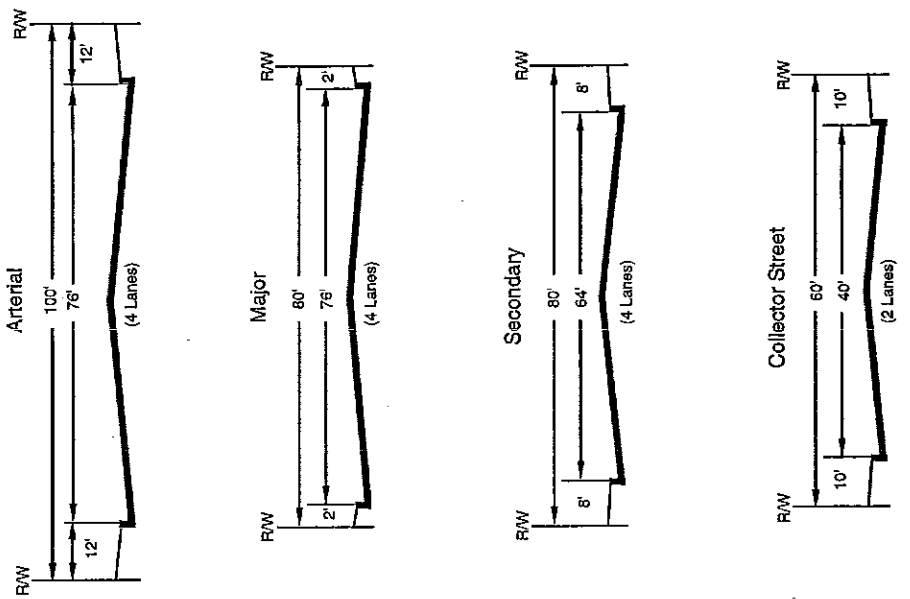


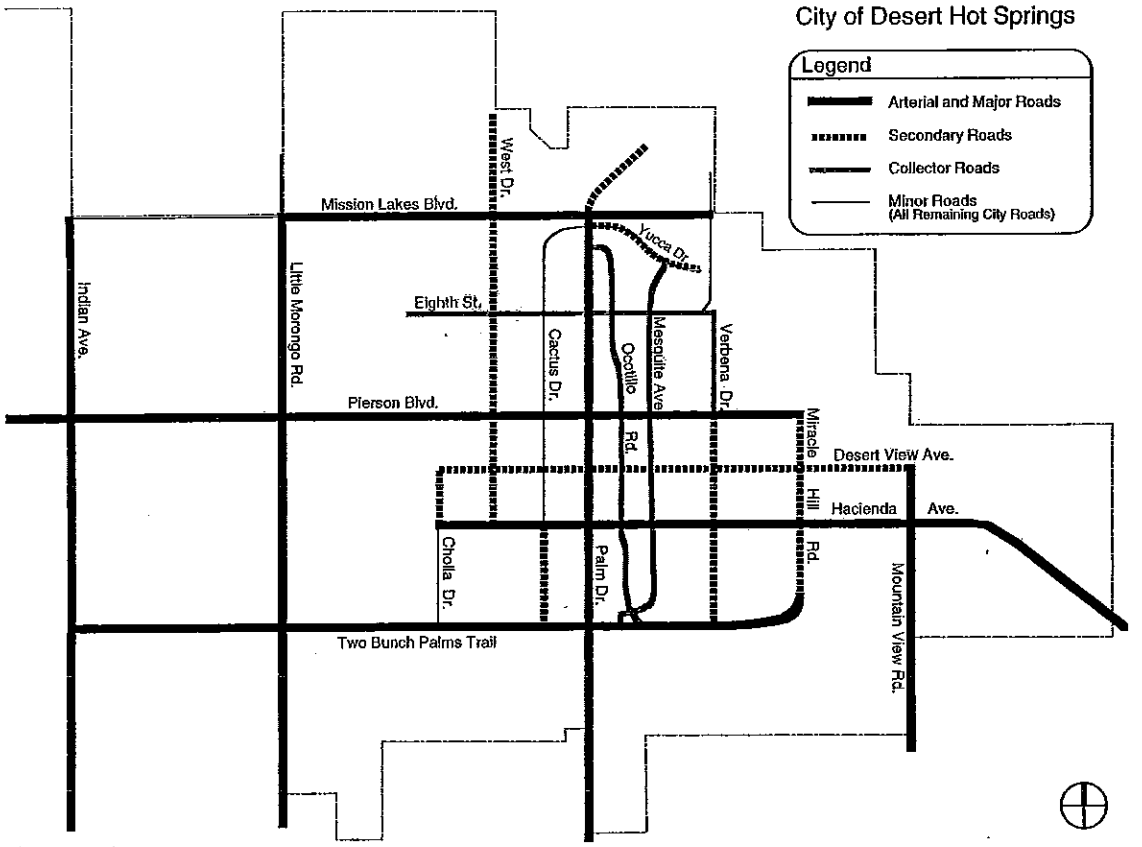
Figure 3-7
Typical Street Cross-Sections
(City of Desert Hot Springs)



Not to Scale

Endo Engineering

Figure 3-6
Current Circulation Plan
City of Desert Hot Springs



Endo Engineering

Source: Desert Hot Springs General Plan Adopted 10/15/87

Scale: 1" = 3200'

3.1.5 Roadway Capacity Considerations

Roadway capacity has been defined as the maximum number of vehicles that can pass over a given roadway during a given time period under prevailing roadway and traffic conditions. By comparison, levels of service are a relative measure of driver satisfaction, with values ranging from A (free flow) to F (forced flow) as described in Table 3-1. Levels of service (LOS) reflect a number of factors such as speed and travel time, traffic interruptions, vehicle delay, freedom to maneuver, driver comfort and convenience, safety and vehicle operating costs.

Table 3-1
Current Level of Service Criteria[a]

Level of Service	Traffic Flow Characteristics	V/C Ratio[b] Range	Stopped Delay Per Vehicle (Sec.)
A	Extremely favorable progression with very low delay. Most vehicles do not stop at all.	.00-.66	≤ 5.0
B	Good progression and stable flow with an occasional approach phase fully utilized.	.67-.77	5.1-15.0
C	Satisfactory operation with fair progression and longer cycle lengths. Individual cycle failures may begin to appear.	.78-.88	15.1-25.0
D	Tolerable delay where congestion becomes noticeable and many vehicles stop.	.89-1.00	25.1-40.0
E	Unstable flow with poor progression and frequent cycle failures. This is considered the limit of acceptable delay.	1.01-1.11	40.1-60.0
F	Over saturation with arrival flow rates exceeding the capacity of the intersection Considered unacceptable to most drivers.	1.12+	> 60.0

a. Source: "Highway Capacity Manual", Special Report 209, Transportation Research Board, 1985; pp. 9-4 and 9-5.
b. For roadway link mid-block applications only. Refer to the HCM Methodology discussion in Appendix C for LOS ranges related to peak hour intersection analyses.

An important distinction exists between the concepts of capacity and levels of service. A given lane or roadway may provide a wide range of service levels depending upon traffic volumes and speeds, but it has only one maximum capacity. The maximum capacity is determined from roadway factors (such as lane widths, lateral clearance, shoulders, surface conditions, alignment and grades) as well as traffic factors (such as vehicle composition (truck and bus mix, distribution by lane, peaking characteristics, traffic control devices, intersections, etc.). It is usually given as the hourly service volume at the upper limit of LOS E.

Table 3-2 presents daily vehicle volumes at the upper limit of LOS C (the desirable or design capacity) and at the upper limit of LOS E (the maximum capacity) on typical master planned roadways throughout Riverside County. These capacity values have been applied at the General Plan level by the County as guidelines relating the daily traffic volume to the number of lanes needed mid-block to serve that volume. They were approved by the City for use with the understanding that although level of service C is desirable, in most urbanized areas like Desert Hot Springs, LOS D is generally considered to be acceptable.

Table 3-2
Daily Roadway Capacity Estimates

Facility Type	Number of Lanes	Maximum Daily Vehicle Volume For Each Level Of Service				
		LOS A[b]	LOS B[b]	LOS C[a]	LOS D[b]	LOS E[a]
Arterial	4	10,000	17,000	24,000	31,000	38,000
Major	4	10,000	17,000	24,000	31,000	38,000
Secondary	4	10,000	15,000	20,000	25,000	30,000
Collector[3]	2	6,000	9,000	12,000	15,000	18,000

a. Source: Riverside County Road Department "Information Pamphlet", 1987.
b. Source: Estimates developed by Endo Engineering based upon LOS C and LOS E values provided by the Riverside County Road Department.
c. Capacities for two-lane arterials, majors and secondaries will be similar.

It should be kept in mind that the roadway capacity estimates in Table 3-2 are "rule-of-thumb" estimates. They are affected by site specific factors such as the number and configuration of intersections, the degree of access control, roadway grades, substandard design geometrics (horizontal and vertical alignment), sight distance, the level of truck and bus traffic, the percentage of turning movements, and the level of pedestrian and bicycle traffic.

The City of Desert Hot Springs Circulation Element standards state that although the use of LOS C for link and intersection analysis and evaluation purposes is desirable, in most urbanized areas like Desert Hot Springs, LOS D is generally considered to be acceptable. LOS C is a stable flow condition where traffic volume and vehicle density restrict motorist's freedom to select speed, change lanes, or pass. For LOS C, peak hour capacities are assumed to be 10 percent of the average daily traffic volumes in Table 3-2.

LOS D approaches unstable flow, with tolerable operating speeds being maintained albeit significantly affected by changes in operating conditions. With LOS D, fluctuations in volume and temporary restrictions to flow may cause substantial drops in operating speeds.

The LOS E maximum capacity values shown in Table 3-2 reflect the absolute maximum volume under ideal conditions (assuming improvement to full standards under optimum operating conditions). This level of service is characterized by unstable flows, extremely high volumes, limited operating speeds, and intermittent vehicle queuing. Peak hour capacities for LOS E are assumed to be 8 percent of the average daily traffic volumes shown in Table 3-2 (based on higher volumes spread over a longer time period).

3.1.6 Daily Volume-To-Capacity Analysis

A comparison of daily traffic volumes to the daily capacity gives the proportion of the roadway capacity being utilized by the traffic volumes present. Therefore, a volume-to-capacity (V/C) ratio of 1.0 indicates that the facility is handling the maximum traffic volume that it can accommodate while maintaining the level of service deemed appropriate for design purposes (LOS D). Smaller volume-to-capacity ratios imply better operational characteristics and levels of service. Ratios which exceed 1.0 imply less favorable operating conditions and lower levels of service.

Table 3-3 shows the current daily volume-to-capacity ratios and corresponding levels of service on roadways within the City. Current daily volume-to-capacity ratios in the City of Desert Hot Springs range from 0.01 to 1.56 on the roadway links analyzed. All of the links analyzed currently provide LOS C or better operation on a daily basis except one.

Table 3-3
Current Daily Volume-To-Capacity Ratio
and Level of Service Summary

Roadway Link	Current ADT	Daily Capacity[a] (Veh./Day)	V/C[b] Ratio	Level of Service
Mission Lakes Boulevard				
- East of Indian Avenue	2,200	15,000	0.15	A
- West of West Drive	2,400	15,000	0.16	A
Pierson Boulevard				
- West of State Route 62	200	15,000	0.01	A
- East of State Route 62	1,100	15,000	0.07	A
- West of Indian Avenue	2,100	15,000	0.14	A
- East of Indian Avenue	4,100	15,000	0.27	A
- West of Little Morongo Road	4,300	15,000	0.29	A
- East of Little Morongo Road	5,500	15,000	0.37	A
- West of West Drive	6,000	15,000	0.40	A
- West of Cactus Drive	6,400	15,000	0.43	B
- West of Palm Drive	7,000	15,000	0.47	B
- East of Palm Drive	5,200	15,000	0.35	A
Hacienda Boulevard				
- West of Palm Drive	3,400	31,000	0.11	A
- East of Palm Drive	6,000	31,000	0.19	A
- East of Ocotillo Road	6,700	15,000	0.45	B
- East of Mesquite Avenue	6,700	15,000	0.45	B
- West of Miracle Hill Road	5,800	15,000	0.39	A
- West of Mountain View Road	6,500	15,000	0.43	B
- East of Mountain View Road	4,900	15,000	0.33	A
- West of City Limits	1,900	15,000	0.13	A
Two Bunch Palms Trail				
- West of Palm Drive	6,700	15,000	0.45	B
- East of Palm Drive	6,100	15,000	0.41	B

a. These values represent the current capacity (upper limit of LOS D) in Table 3-2.
b. These values were calculated using the capacity at the upper limit of LOS D.

Table 3-3
Current Daily Volume-To-Capacity Ratio
and Level of Service Summary

Roadway Link	Current ADT	Daily Capacity[a] (Veh./Day)	V/C[b] Ratio	Level of Service
Two Bunch Palms Trail				
- West of Palm Drive	6,700	15,000	0.45	B
- East of Palm Drive	6,100	15,000	0.41	B
State Route 62				
- North of Pierson Boulevard	19,000	65,000	0.29	A
- South of Pierson Boulevard	15,000	65,000	0.23	A
Indian Avenue				
- North of Mission Lakes Blvd.	6,000	15,000	0.40	A
- North of Pierson Boulevard	7,000	15,000	0.47	B
- South of Pierson Boulevard	8,300	15,000	0.55	B
Little Morongo Road				
- North of Pierson Boulevard	2,100	15,000	0.14	A
- South of Pierson Boulevard	1,900	15,000	0.13	A
- South of Two Bunch Palms Trail	3,000	15,000	0.20	A
West Drive				
- North of Pierson Boulevard	3,700	15,000	0.25	A
- South of Pierson Boulevard	3,400	15,000	0.23	A
Palm Drive				
- North of Eighth Street	6,300	25,000	0.25	A
- North of Pierson Boulevard	10,500	31,000	0.34	B
- South of Pierson Boulevard	14,600	31,000	0.47	B
- North of Hacienda Avenue	18,800	31,000	0.61	C
- South of Hacienda Avenue	18,800	31,000	0.61	C
- South of Two Bunch Palms Trail	20,600	31,000	0.66	C
- North of South City Limits	23,400	15,000	1.56	F
Miracle Hill Road				
- North of Hacienda Avenue	1,000	15,000	0.07	A
- South of Hacienda Avenue	400	15,000	0.03	A
Mountain View Road				
- North of Hacienda Avenue	1,400	15,000	0.09	A
- South of Hacienda Avenue	4,400	15,000	0.29	A

a. These values represent the current capacity (upper limit of LOS D) in Table 3-2.
b. These values were calculated using the capacity at the upper limit of LOS D.

Palm Drive, just within the southern City Limit is currently operating at LOS F on a daily basis during the peak season. The daily volume-to-capacity ratio at this location is 1.56, which implies that the peak season demand exceeds the LOS D daily capacity by 56 percent. This two-lane facility appears to be carrying as many as 8,400 vehicles per day more than it was designed to handle. This indicates that there is a demand for north-south travel parallel to this roadway that should be met by widening the road to provide a consistent cross-section with four travel lanes as soon as it is feasible.

3.1.7 Peak Hour Intersection Analysis

Since peak hour traffic creates the heaviest demand upon the circulation system and since the lane configuration at intersections is the limiting factor in roadway capacity, peak hour intersection capacity analyses are useful indicators of "worst-case" conditions. The 1985 *Highway Capacity Manual* (HCM) methodology was utilized for evening peak hour analysis at key intersections in the project vicinity. Refer to Appendix C for a general discussion of this methodology.

Existing HCM and level of service values at unsignalized key intersections are provided in Table 3-4, based upon the current intersection approach lane geometrics shown in Figure 3-8. The four-way stop analysis is provided in Table 3-5 and Table 3-6 provides the signalized intersection analysis for existing conditions.

Table 3-4
Existing Levels of Service at
Unsignalized Intersections[a]

Intersection	Critical Move[b]	Reserve Capacity (pcph)[c]	Level of Service[d]
Mission Lakes Blvd. @			
- Indian Avenue	WBL	248	C
Pierson Boulevard @			
- State Highway 62	WBL	98	E
- Little Morongo Blvd.	SBL	315	B
Hacienda Avenue @			
- Miracle Hill Road	SBL	312	B

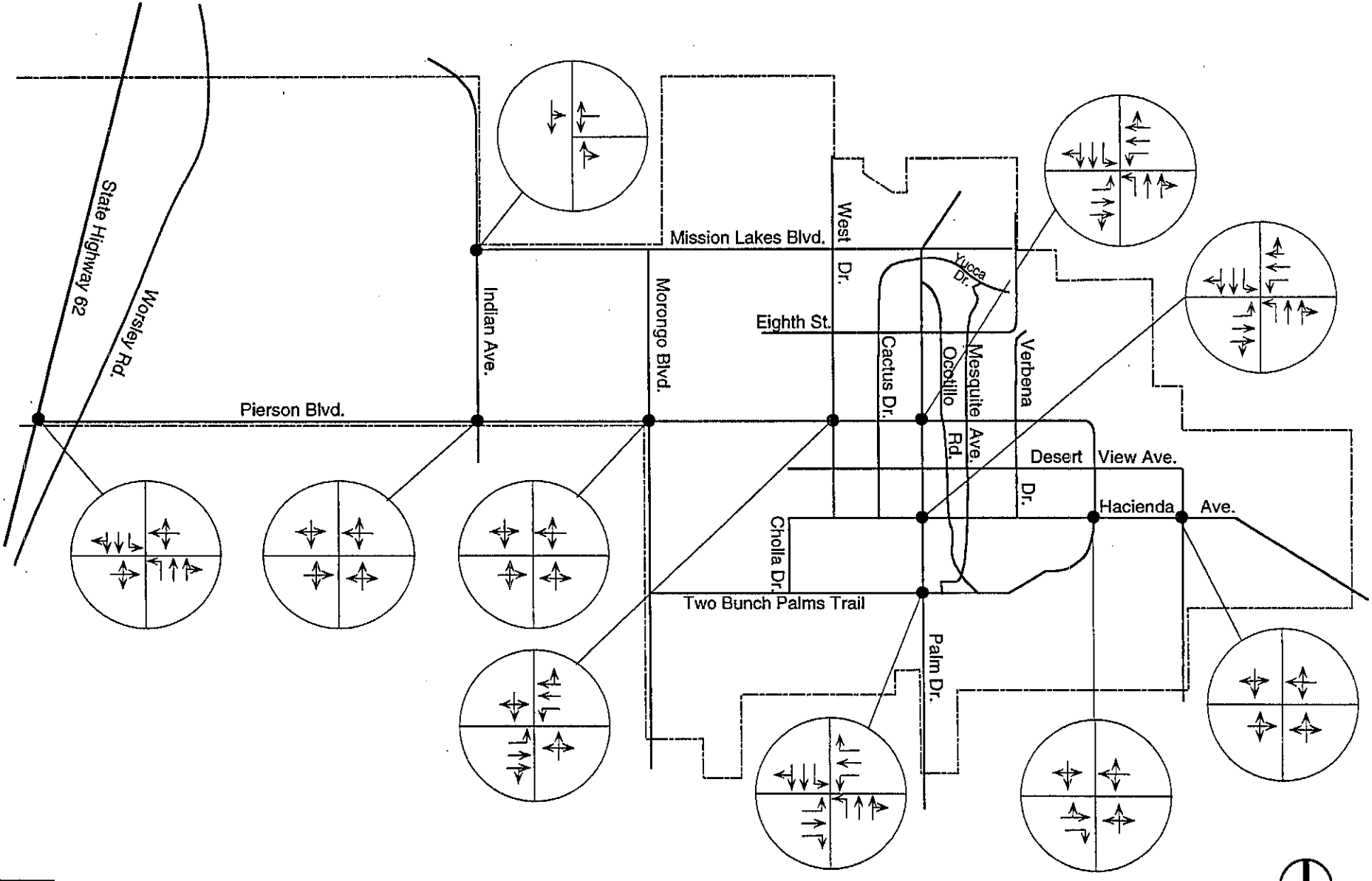
a. Refer to Appendix C for the HCM worksheets for unsignalized intersections.
b. Critical move is the movement with the smallest reserve capacity (e.g. WBL is the westbound left-turn).
c. pcph=passenger car equivalents per hour (an adjusted volume that takes the truck mix into account).
d. The level of service was determined from the reserve capacity shown in Appendix C.

Table 3-5
Existing Levels of Service at
Four-Way Stop Intersections[a]

Intersection	Average Delay (sec)	Level of Service
Pierson Boulevard @		
- Indian Avenue	9	B
- West Drive	4	A
Hacienda Avenue @		
- Mountain View Road	6	B

a. Analysis based upon "Interim Materials on Unsignalized Intersection Capacity", Transportation Research Board Circular #373, July 1991 (see Appendix C for worksheets).

Figure 3-8
Existing Lane Geometrics At Key Intersections



Endo Engineering

Scale: 1" = 4400'

Table 3-6
Existing Levels of Service at
Signalized Intersections[a]

Intersection	Avg. Stopped Delay (Sec./Veh.)	V/C Ratio	Level of Service
Palm Drive @			
- Pierson Blvd.	14.0	0.32	B
- Hacienda Avenue	8.1	0.32	B
- Two Bunch Palms Trail	7.5	0.40	B

a. Based upon 1985 *Highway Capacity Manual* Signalized Operation Methodology. See Appendix C for the HCM signalized intersection worksheets.

At present, eight of the nine key intersections analyzed in the City of Desert Hot Springs provide acceptable levels of service (LOS D or better) during the peak hour of the peak season. One of the intersections provides LOS E operation on only the minor leg (westbound left-turn movement) during the evening peak hour. Each of the signalized intersections currently operate at LOS B.

3.2 Public Transportation

Public transportation is provided between Desert Hot Springs and other desert cities by Sun Bus Lines between 8:00 AM and 4:15 PM. Route 14 serves the City of Desert Hot Springs and is shown in Figure 3-9.

A Teleride service is also available within the City of Desert Hot Springs by scheduling 24 hours in advance. All residents within the City limits can take advantage of the Teleride service.

3.3 Bicycle Facilities

The use of bicycles instead of automobiles as a means of transportation improves health and fitness, provides enjoyment, reduces air pollution, traffic congestion, energy consumption and transportation costs. These benefits justify local and regional government recognition of bicycles as a viable transportation mode for local trips as well as the development and improvement of facilities to accommodate safe and efficient bicycle use.

Figure 3-10 depicts the existing bikeways and the regional bikeway system within the City of Desert Hot Springs. As shown therein, Class II bikeways exist throughout the City. Class II Bikeways provide a striped lane (with a minimum width of 5 feet) for one-way bike travel within the paved area of a street or highway. Class II bike lanes are within an exclusive right-of-way designated for use by bicycles only, except that cross traffic is permitted for driveway access. They include a 6-inch solid white stripe separating the bike lane from the traffic lane.

3.4 Truck Routes

Truck routes are designed to provide access to areas of the City that utilize truck service (principally commercial and industrial areas) and to provide through-truck traffic with efficient routes which avoid residential areas and congested streets as much as possible.

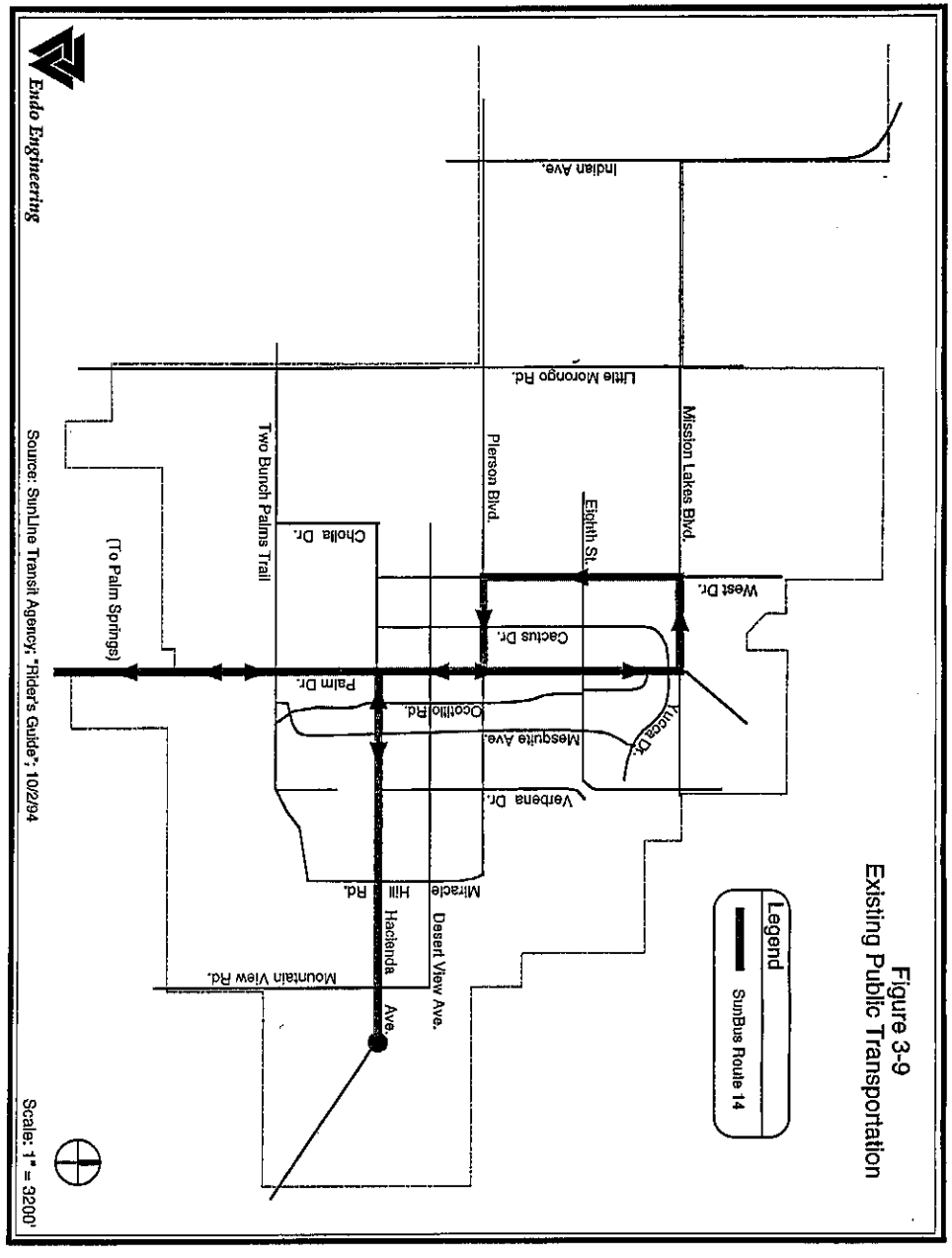
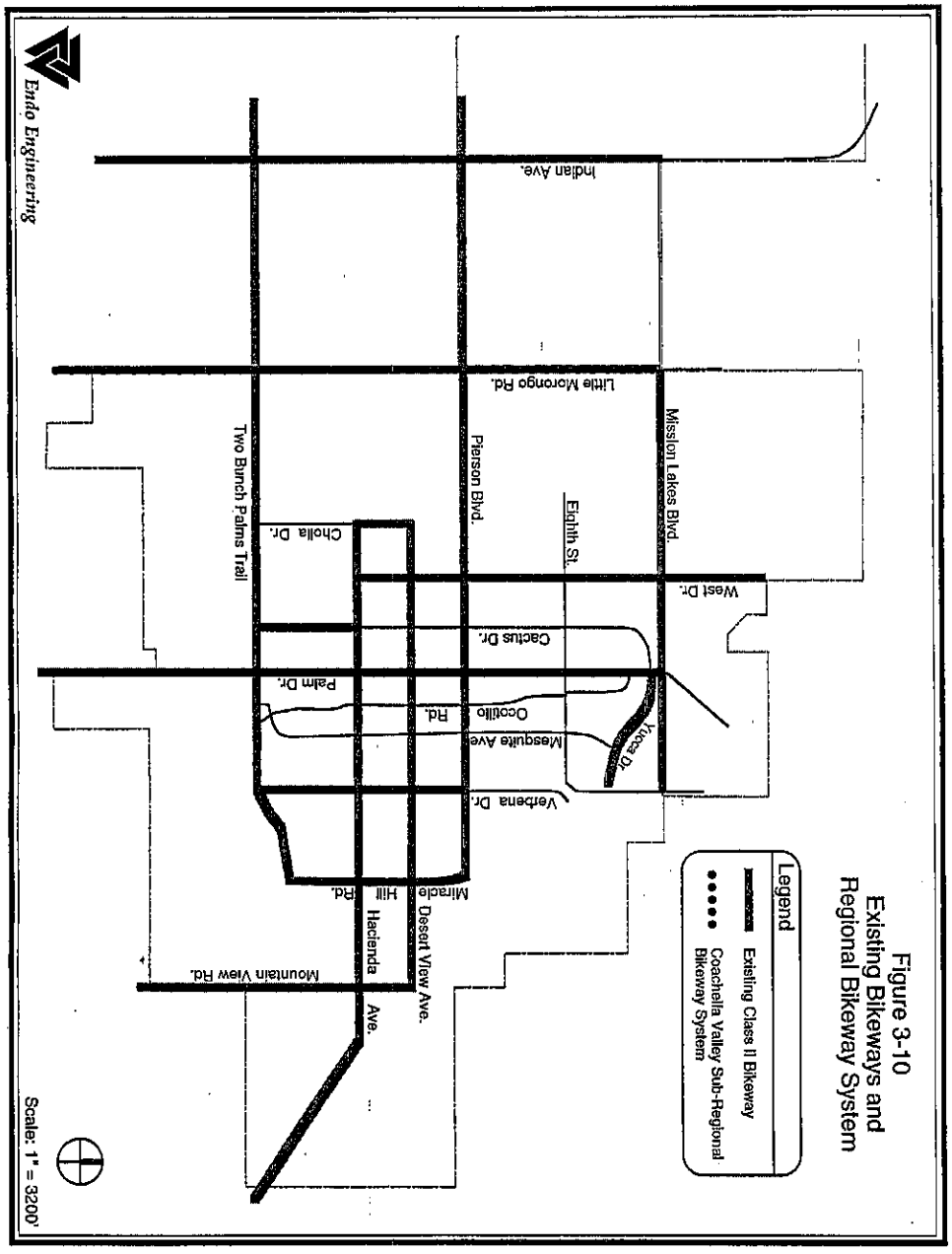


Figure 3-9
Existing Public Transportation

Trucks making local deliveries are allowed to divert from these routes to businesses. Streets used for truck routes are designed to support the weight of the heavier vehicles and have intersections with sufficient room for turning movements. Figure 3-11 depicts the existing truck routes within the City of Desert Hot Springs.



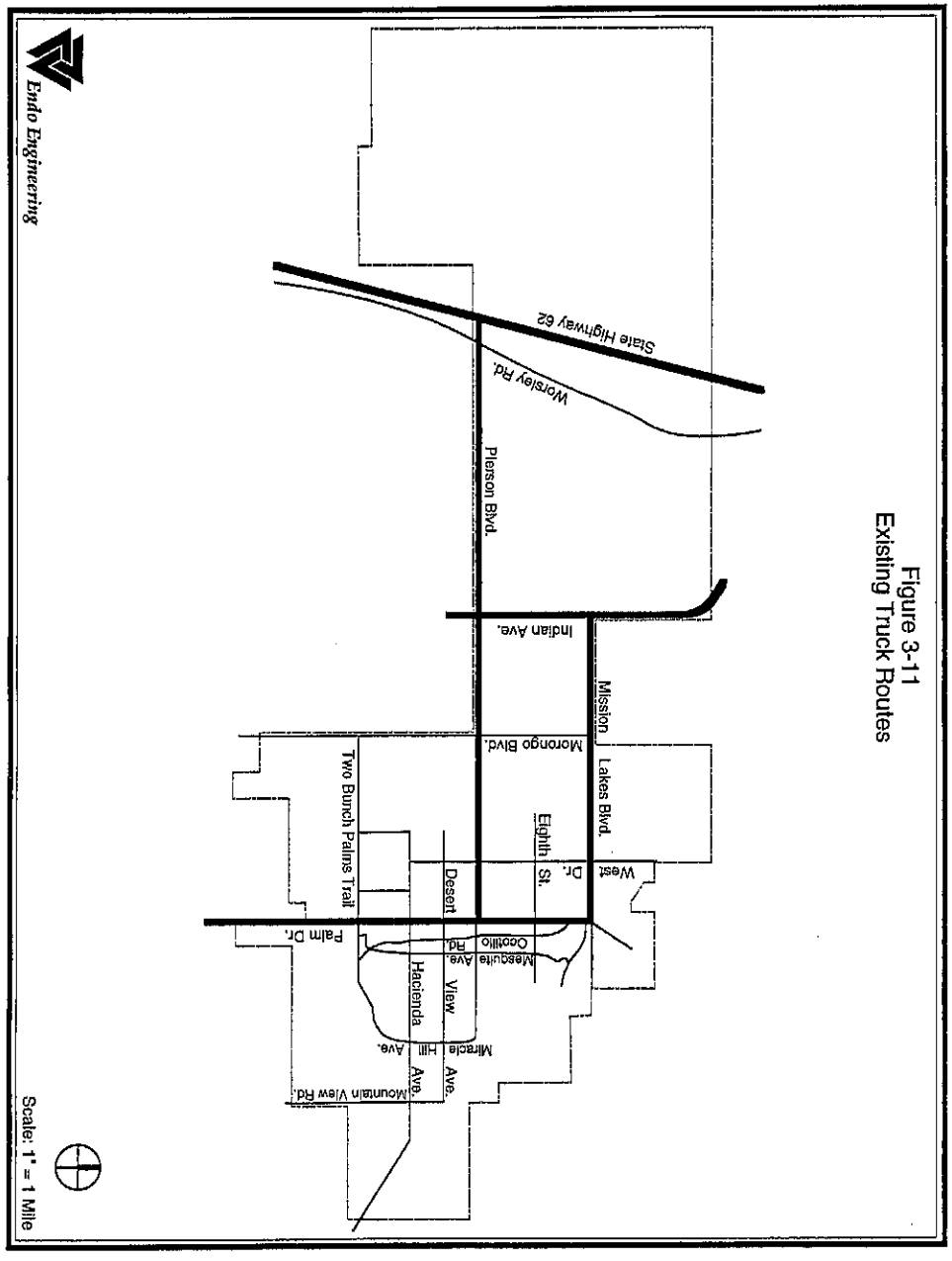


Figure 3-11
Existing Truck Routes

4.0 FUTURE CIRCULATION CONDITIONS

There are sizable areas within Desert Hot Springs and its Sphere of Influence that have yet to be developed. The rapid growth in population and tourism expected over the next 20 years will lead to increasingly severe traffic congestion without new and improved circulation facilities to accommodate the projected growth. Consequently, the planning of an adequate circulation system to support future development and tourism is vital. The proposed Desert Hot Springs Circulation Plan must anticipate travel demands within the study area upon buildout of the Desert Hot Springs Land Use Plan and provide a map of desired alignments and classifications of master planned roadways.

The Desert Hot Springs General Plan Transportation Model (DHSGPT Model), a city-wide transportation planning model, was developed by Endo Engineering to assist in the evaluation and refinement of local growth policies as part of the Desert Hot Springs General Plan Update process. To minimize model development costs and maintain consistency with sub-regional transportation modeling, the DHSGPT Model was based on the Coachella Valley Area Transportation Study 2020 Model (the CVATS Model).

The CVATS Model incorporates the 1995 Coachella Valley Origin-Destination Survey findings and forecasts peak season (winter months) average weekday travel demands for the year 2020, and. However, the model is limited in its ability to forecast turning movement volumes at intersections. Intersection level forecasting is difficult and requires more detailed models. Therefore, although daily traffic volume projections were made, peak hour forecasts for intersections were not. The roadway network modeled excluded local streets as it is impractical to model the regional circulation system to that level of detail.

Three General Plan Alternatives were evaluated in addition to the Preferred General Plan. Alternative 1 was the No Project Alternative which was represented by the currently adopted Desert Hot Springs General Plan and the County of Riverside General Plan for unincorporated portions of the planning area. Alternative 2 was the preferred General Plan. Alternatives 3, and 4 were different intensity alternatives.

4.1 THE 1995 CVAG ORIGIN-DESTINATION SURVEY

The 1995 Coachella Valley Origin-Destination Survey incorporated over 100,000 pieces of travel data provided by 724 households, 313 visitors, and 205 transit riders regarding their typical travel patterns. The survey was designed to identify modal split information and other travel characteristics for use in updating and refining the CVATS model.

4.1.1 Travel Patterns and Socioeconomic Characteristics

Communities within the western portion of the Coachella Valley were found to have similar socioeconomic characteristics and travel patterns. Desert Hot Springs is in the western zone, which also includes: Cathedral City, White Water, North Palm Springs, Palm Springs, Rancho Mirage, Palm Desert, Indian Wells, and La Quinta.

The trip making data indicated that travel behavior of people within Desert Hot Springs, White Water and North Palm Springs had the following characteristics:

- **internal trips:** 57.9% of the household trips associated with people within the Desert Hot Springs Analysis Zone remained within the Desert Hot Springs Analysis Zone 1 (AZ 1);
- **external trips:** 42.1% of the household trips of residents within AZ 1 were destined for other surrounding areas. Of those trips, 14.6 percent were destined to Palm Springs, 8.3 percent to Cathedral City; 6.3 percent to Palm Desert, 5.8 percent to Rancho Mirage, 2.9 percent to unincorporated areas; 1.7 percent to Indio; and 0.8 percent to La Quinta; and 0.4 percent to Coachella.
- **internal transit trips:** 45.2% of the transit trips associated with people within the Desert Hot Springs Analysis Zone remained within AZ 1;
- **external transit trips:** the remaining 54.8% of the transit trips associated with people within the Desert Hot Springs Analysis Zone were destined for other surrounding areas as follows: 51.6 percent to Palm Springs, 3.2 percent to Palm Desert.
- **internal visitor trips:** 9.1% of the visitor trips associated with people within the Desert Hot Springs Analysis Zone remained within AZ 1;
- **external visitor trips:** 90.9% of the visitor trips associated with people within the Desert Hot Springs Analysis Zone were destined for Palm Springs.

Table 4-1 summarizes the 1995 Coachella Valley Origin-Destination Survey findings and compares them to the findings from the 1991 SCAG Origin-Destination Survey of Riverside County as well as the 1985 CVAG Origin-Destination Survey. It can be seen from Table 4-1 that between 1985 and 1995, the number of persons per household has increased slightly from 2.2 to 2.4 and the total number of trips per household has also increased from 4.6 to 5.2. Although home-to-work travel times have remained essentially constant, the average travel times appear to have decreased significantly from 21.5 to 18.5 minutes. Average vehicle occupancy has increased slightly, and was found to be consistent with that throughout Riverside County in 1991.

4.1.2 Modal Split

The modal split found within the Coachella Valley included 94 percent private automobile trips, 2 percent bus trips and 4 percent other trips (rail, bicycle, pedestrian etc.). The analysis zone that included Desert Hot Springs (AZ 1) was responsible for 10.3 percent of the travel identified by the 1995 CVAG Origin Destination Survey including 9.4 percent of the automobile travel, 0.3 percent of the bus travel and 0.6 percent of the travel by other modes.[1] Visitors to Desert Hot Springs are responsible for 1 percent of the visitor trips made in the Coachella Valley.

4.1.3 Pass-Through Trips

Based upon Caltrans traffic count data, CVAG quantified external pass-through trips on State Highways in the Coachella Valley. Of the vehicles on Interstate 10 (west of SR-111) ten percent (or 6,400 vehicles per day of the 64,000 AADT) were identified as pass-through trips. Similarly, ten percent of the vehicles on State Highway 62 (north of Indian Avenue) (or 2,500 vehicles per day of the 25,000 AADT) were identified as pass-through trips.

1. DKS Associates, Gensler and Associates and NBS Lowry; *Coachella Valley Multimodal Transportation Planning Study;* October 1995; page 2-8.

Table 4-1
Origin-Destination Study Findings Comparison[a]

Characteristic	1991 SCAG[b] Riverside Co.	1985 CVAG[c] O-D Study	1995 CVAG[d] O-D Study
Persons per Household	3.1	2.2	2.4
Vehicles per Household	1.9	1.81	1.8
Total Trips per Household	8.4	4.6	5.2
Average Vehicle Occupancy[e]	1.51	1.48	1.52
Average Travel Times (Minutes)[f]	22.5	21.5	18.5
Home-Work Travel Time (Minutes)[g]	32.0	20.3	20.4

a. Source: *1995 Coachella Valley Origin Destination Survey;* Valley Research and Planning Associates and DKS Associates; October 1995; Table 7-1.
b. County totals from *1991 Southern California Origin Destination Survey: Summary Findings;* February 1993.
c. *Coachella Valley Area Transportation Study;* December 1985, based on 1980 census.
d. *1995 Coachella Valley Origin Destination Survey;* October 1995.
e. Vehicle occupancy averaged for all trip purposes.
f. Average travel times for all trip purposes by all trip modes.
g. Average travel times for home-work trips by all trip modes.

4.2 Desert Hot Springs General Plan Transportation Model

Proposed land use information, socioeconomic and highway network assumptions were utilized to project future traffic demands upon buildout of the Desert Hot Springs General Plan by refining the latest release of the CVATS Model. This model was developed by the Southern California Association of Governments (SCAG) in association with the Coachella Valley Association of Governments (CVAG) and the Riverside County Transportation Commission. It is currently used by CVAG to analyze and forecast future transportation deficiencies in the Coachella Valley.

The latest version of the CVATS Model data was requested by the City of Desert Hot Springs. Terra Nova Planning & Research, Inc. provided future local land use data, that was utilized by Endo Engineering to modify the CVATS Model. The goal of the circulation modeling was to satisfy local transportation model development needs by refining the CVATS Model attributes and characteristics to better replicate local land use conditions and travel characteristics and produce accurate and reasonable traffic forecasts for local conditions upon buildout of the Desert Hot Springs General Plan. The future volume projections were necessary to develop a long range plan of circulation improvements to accommodate projected growth.

CVAG's *Consistency Guidelines For Transportation Modeling and Traffic Forecasting Within Riverside County/Coachella Valley* (November 1994) were followed to maintain consistency with the CVATS Sub-Regional Model and CVAG's officially adopted socioeconomic data base. However, the use of the CVATS Model as a city-wide buildout model created inherent inconsistencies in that the CVATS model used had a horizon year of 2020, rather than the Desert Hot Springs General Plan buildout year (post 2020).

Additional network and zone detail were added to the Desert Hot Springs General Plan Transportation (DHSGPT) Model to allow it to provide better resolution on streets within the planning area and address local transportation issues. Twelve Traffic Analysis Zones (TAZs) were added by splitting existing TAZs along the boundaries of the study area and along roadways to more accurately reflect the loading of the zones. Refer to Appendix D for the location of the TAZs in the planning area.

The DHSGPT Model included the Desert Hot Springs General Plan buildout land use data as well as proposed highway network changes to better reflect General Plan buildout conditions within the planning area. Modifications to the land use data and socio-economic data were developed through coordination with Terra Nova Planning & Research, Inc., the City of Desert Hot Springs, CVAG and SCAG. These modifications are included in Appendix D. The DHSGPT Model included highway network changes to reflect a new Little Morongo Road Interchange at Interstate 10.

4.2.1 Consistency With Sub-Regional Circulation Modeling

Future traffic forecasts generated by circulation models are the basis of Congestion Management Plans, Capital Improvement Plans, highway project design decisions, transportation planning and land use decisions. It is desirable, therefore, for regional, sub-regional and local jurisdictions to have a consistent basis for evaluating transportation projects and programs.

However, buildout of the land use and transportation facilities within the Desert Hot Springs General Plan Update planning area must be evaluated to demonstrate consistency between the proposed Land Use Element and Circulation Element of the Desert Hot Springs General Plan. The DHSGPT Model future city-level socioeconomic data (SED) assumptions by traffic analysis zone for General Plan buildout (post 2020) conditions with each alternative are provided in Appendix D.

Since the CVATS Model has a year 2020 horizon year, the DHSGPT model incorporates the best available land use and transportation facility database for areas outside the planning area (which are represented by year 2020 CVATS horizon year conditions). However, within the planning area, the DHSGPT model addresses buildout (post 2020) of the Desert Hot Springs General Plan Update land uses and transportation facilities.

Although the CVATS Model horizon year 2020 highway network was constrained to funded highway projects, the Desert Hot Springs General Plan Transportation Model buildout highway network was not constrained to funded highway projects. Consequently, it was not possible to satisfy local transportation model development needs while maintaining consistency with the CVATS Model.

Highway network changes incorporated to reflect post 2020 conditions are outlined in Section 4.4 below, and included the addition of a Little Morongo Road Interchange at Interstate 10. To permit comparisons between the impacts of the General Plan land use alternatives, all of the future traffic projections assumed the same circulation network.

4.3 Future Traffic Volume Forecast

Since the study area is located in the northwest corner of the Coachella Valley, the greatest traffic demand is for travel south and east of the City of Desert Hot Springs. Palm Drive and Interstate 10 are the primary facilities providing regional access down valley. Therefore, the primary circulation constraints in the future are expected to occur along the

north-south roadways that provide access to Interstate 10, Palm Springs, Cathedral City, Rancho Mirage and Palm Desert.

Figure 4-1 displays the peak season average weekday traffic volume projections from the DHSGPT Model for conditions upon buildout of the proposed Desert Hot Springs General Plan. Interstate 10 has the highest traffic volumes in the study, ranging from 98,800 to 171,900 vehicles per day. The highest surface street traffic volumes occur north of Interstate 10 along State Route 62 (75,900 vehicles per day), Palm Drive (72,600 vehicles per day), and Indian Avenue (53,900 vehicles per day). These areas may require special studies and upgrades to provide acceptable levels of service at intersections.

Figure 4-2 illustrates the peak season average weekday DHSGPT Model projections upon buildout of the currently adopted Desert Hot Springs General Plan. Figure 4-3 displays the peak season average weekday traffic volume projections from the DHSGPT Model for conditions upon buildout of Desert Hot Springs General Plan Alternative 3. Figure 4-4 illustrates the peak season average weekday traffic volume projections upon buildout of the less intense Desert Hot Springs General Plan Alternative 4.

Table 4-2 provides a summary of the daily traffic volume projections expected upon Desert Hot Springs General Plan buildout by alternative for comparison purposes. As shown therein, Alternative 3 generally has the highest traffic volumes and Alternative 4 generally has the lowest traffic volumes of the four General Plan land use alternatives. Traffic volumes from the Adopted General Plan are generally lower than the Preferred General Plan Alternative.

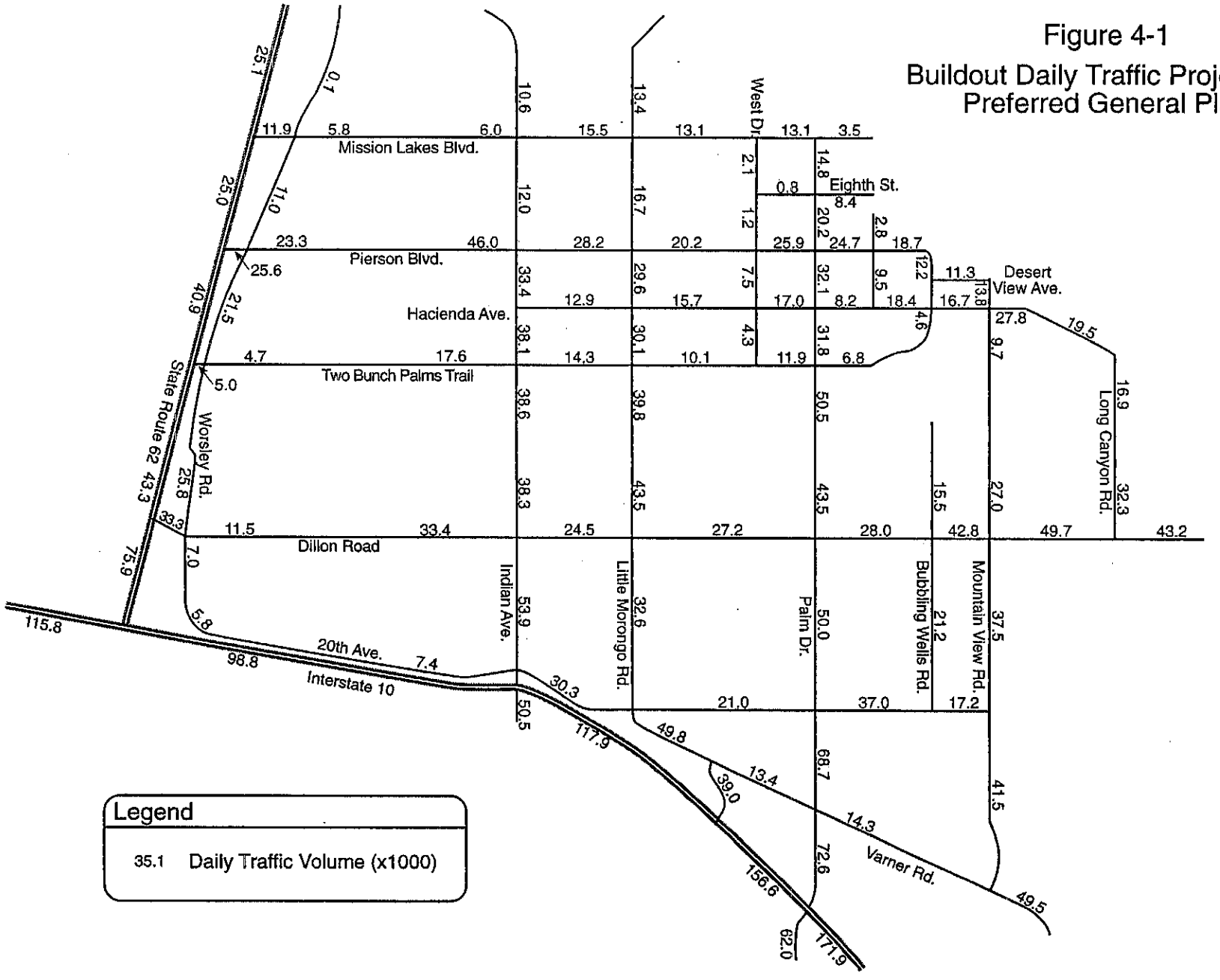
4.4 Preferred Circulation Plan

To achieve the City's goals and objectives, a street and highway system is needed which improves access and provides better options for through vehicle trips within the City. A public transportation system and a pedestrian and bicycle circulation system connecting employment, shopping, residential, recreation and transit destinations are also needed.

To adequately serve projected traffic volumes upon General Plan buildout, the Desert Hot Springs roadway network will require improvement. A roadway plan that meets the desires of the community for mobility and accessibility while supporting the development intensity anticipated in the Land Use Element has been developed by the City. It includes a new Interstate 10 interchange at Little Morongo Road to better accommodate some of the north/south travel demand and facilitate the movement of cars from the City street system onto the freeway. In addition, the approach to Interstate 10 along Indian Avenue and Palm Drive has been upgraded to insure adequate capacity for future development. These new higher-volume corridors will link the Interstate 10 freeway with the future growth centers in the planning area.

The transportation network included in the DHSGPT model for the Preferred Desert Hot Springs Circulation Plan is depicted in Figure 4-5. It reflects the circulation system required to satisfy General Plan buildout travel demands and it builds upon the current and future strengths of the area. It includes a classification system that applies to all roadways that serve Desert Hot Springs and identifies specific improvements that will be required. Designated streets are shown within the city limits as well as the surrounding Sphere of Influence that has been defined for the General Plan Update process. Any permanent closure to through traffic or relocation of the designated streets would require a General Plan Amendment.

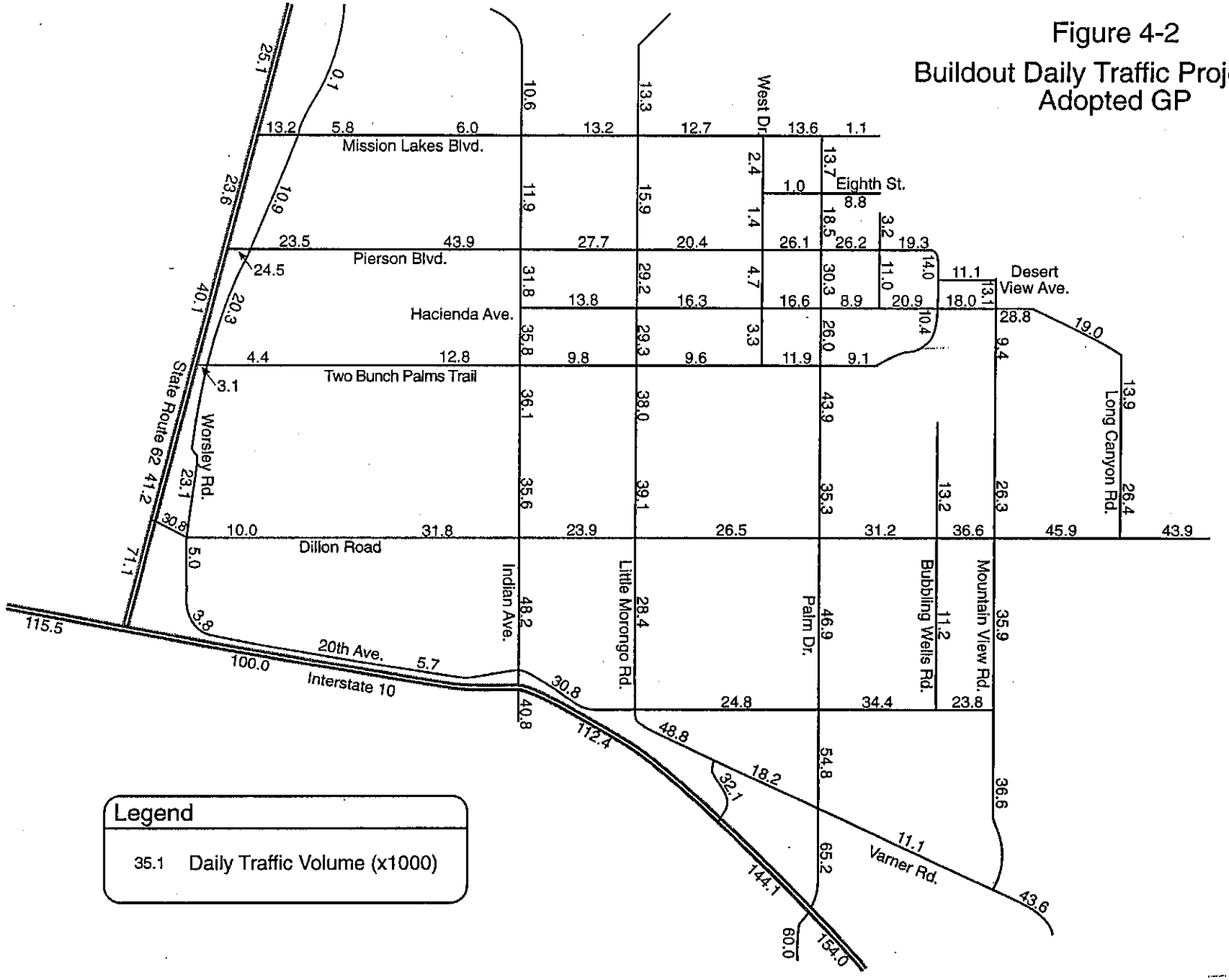
Figure 4-1
Buildout Daily Traffic Projections
Preferred General Plan



Endo Engineering

Scale: 1" = 1.25 Miles

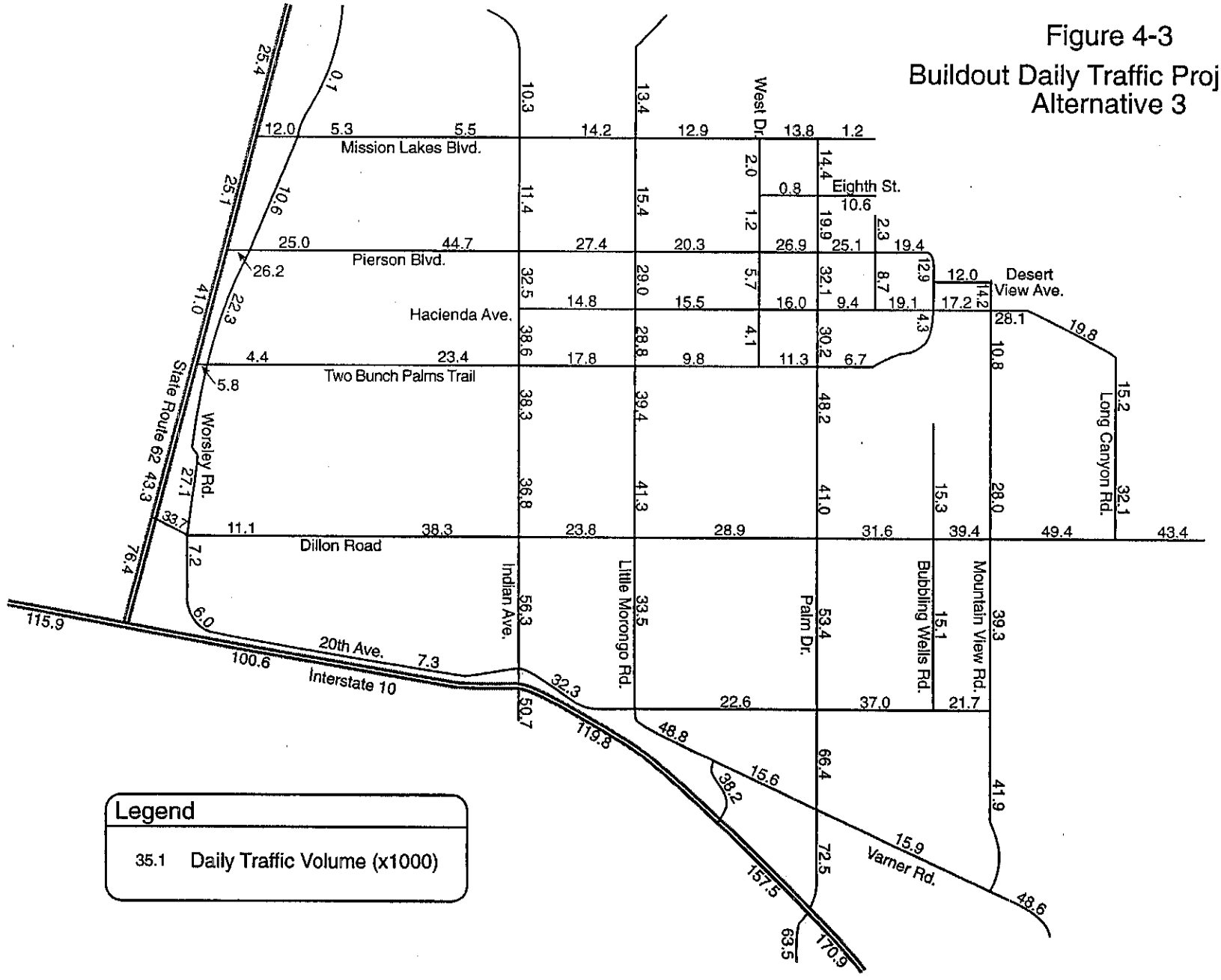
Figure 4-2
Buildout Daily Traffic Projections
Adopted GP



Endo Engineering

Scale: 1" = 1.25 Miles

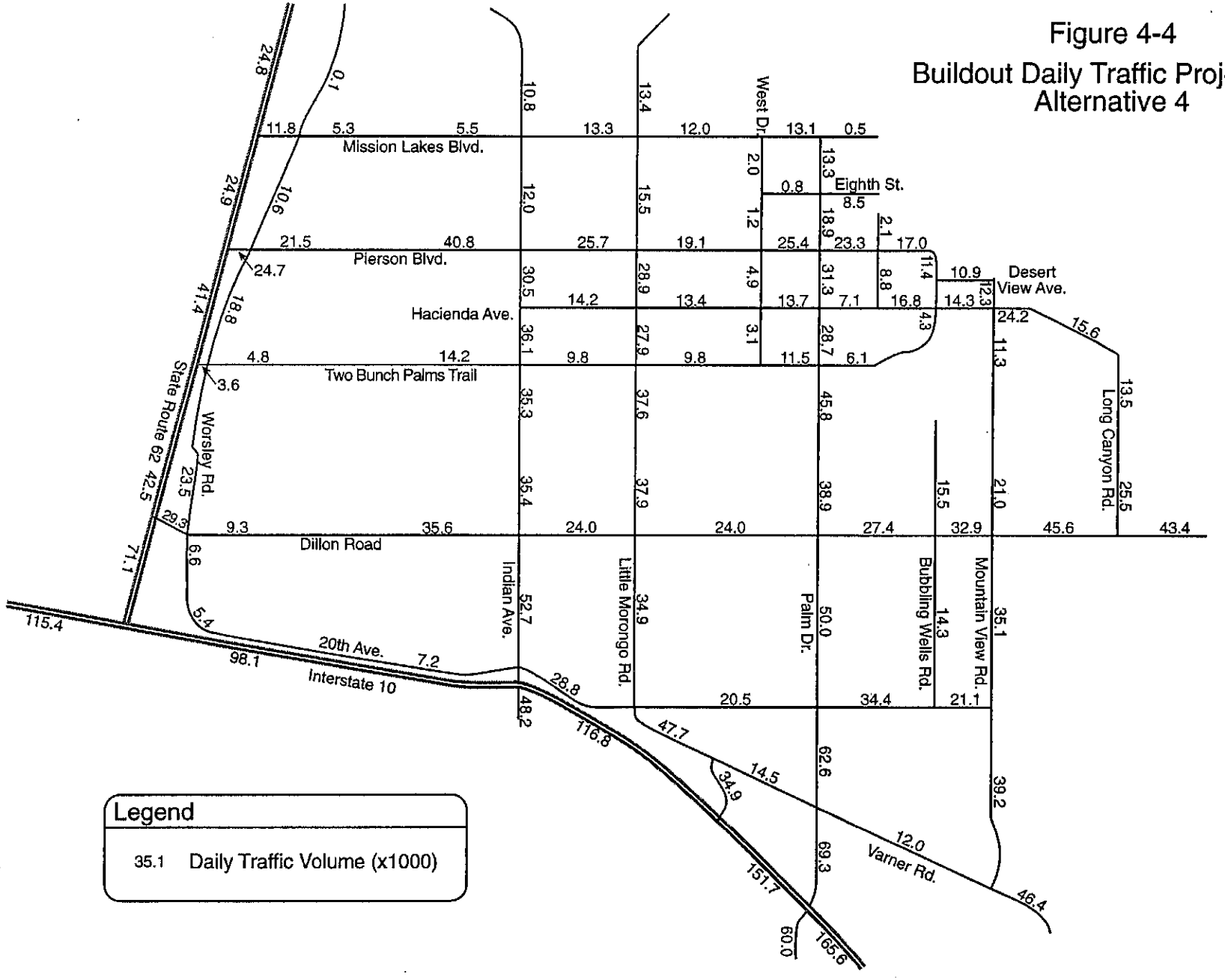
Figure 4-3
Buildout Daily Traffic Projections
Alternative 3



Endo Engineering

Scale: 1" = 1.25 Miles

Figure 4-4
Buildout Daily Traffic Projections
Alternative 4



Endo Engineering

Scale: 1" = 1.25 Miles

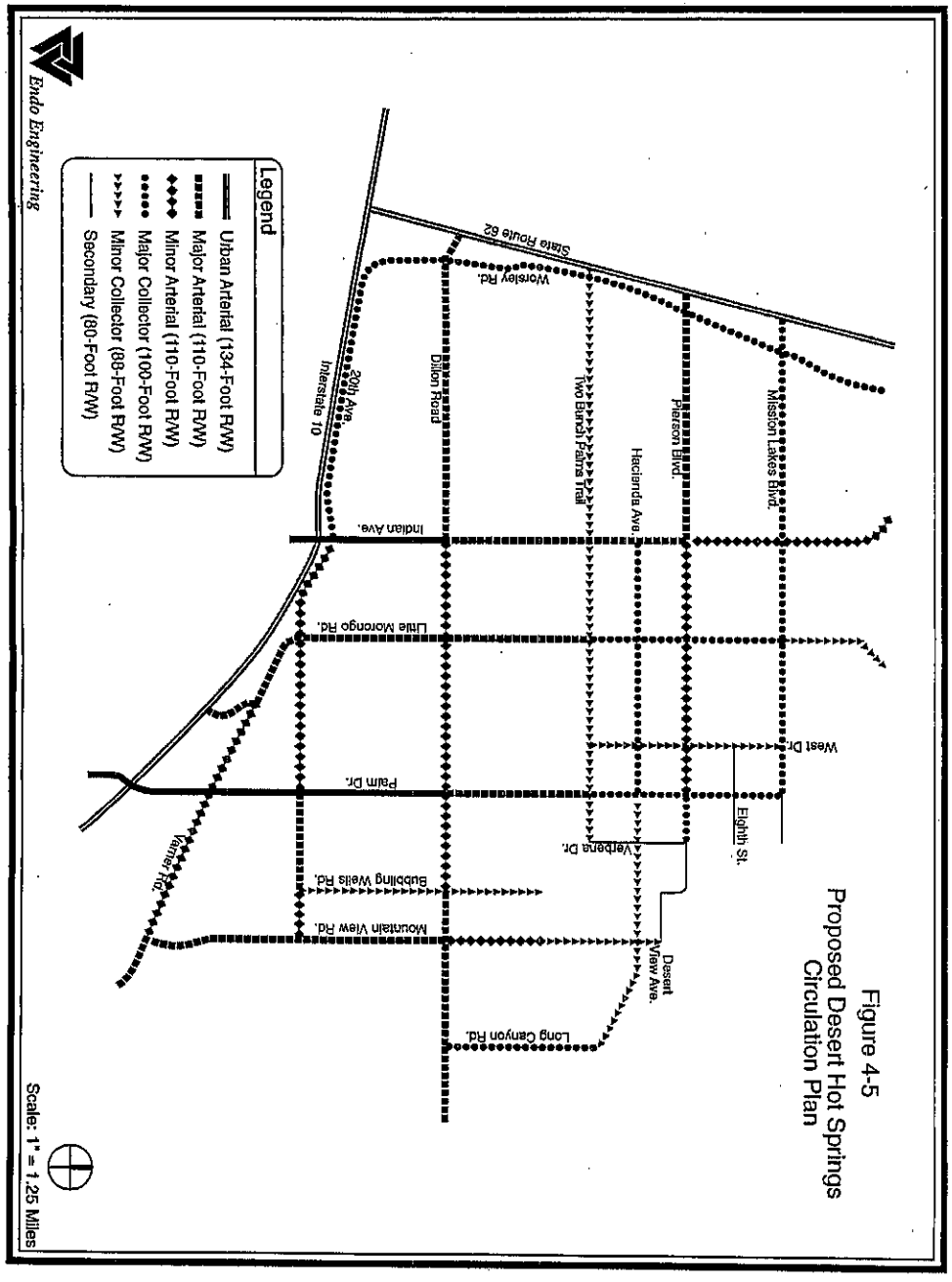


Figure 4-5
Proposed Desert Hot Springs
Circulation Plan

Table 4-2
General Plan Buildout
Daily Traffic Volumes By Alternative[a]

Roadway Link	Preferred GP	Adopted GP	Alternative 3	Alternative 4
Mission Lakes Boulevard				
- East of State Route 62	11,900	13,200	12,000	11,800
- East of Worsley Road	5,800	5,800	5,300	5,300
- West of Indian Avenue	6,000	6,000	5,500	5,500
- East of Indian Avenue	15,500	13,200	14,200	13,300
- West of West Drive	13,100	12,700	12,900	12,000
- West of Palm Drive	13,100	13,600	13,800	13,100
- East of Palm Drive	3,500	1,100	1,200	500
Eighth Street				
- West of Palm Drive	800	1,000	800	800
- East of Palm Drive	8,400	8,800	10,600	8,500
Pierson Boulevard				
- East of Route 62	25,600	24,500	26,200	24,700
- East of Worsley Road	23,300	23,500	25,000	21,500
- West of Indian Avenue	46,000	43,900	44,700	40,800
- East of Indian Avenue	28,200	27,700	27,400	25,700
- East of Little Morongo Road	20,200	20,400	20,300	19,100
- East of West Drive	25,900	26,100	26,900	25,400
- East of Palm Drive	24,700	26,200	25,100	23,300
- West of Miracle Hill Road	18,700	19,300	19,400	17,000
Desert View Avenue				
- West of Mountain View Road	11,300	11,100	12,000	10,900
Hacienda Boulevard				
- East of Indian Avenue	12,900	13,800	14,800	14,200
- East of Little Morongo Road	15,700	16,300	15,500	13,400
- West of Palm Drive	17,000	16,600	16,000	13,700
- East of Palm Drive	8,200	8,900	9,400	7,100
- West of Miracle Hill Road	18,400	20,900	19,100	16,800
- West of Mountain View Road	16,700	18,000	17,200	14,300
- East of Mountain View Road	27,800	28,800	28,100	24,200
- West of City Limits	19,500	19,000	19,800	15,600
Two Bunch Palms Trail				
- East of State Route 62	5,000	3,100	5,800	3,600
- East of Worsley Road	4,700	4,400	4,400	4,800
- West of Indian Avenue	17,600	12,800	23,400	14,200
- East of Indian Avenue	14,300	9,800	17,800	9,800
- West of West Drive	10,100	9,600	9,800	9,800
- West of Palm Drive	11,900	11,900	11,300	11,500
- East of Palm Drive	6,800	9,100	6,700	6,100
Dillon Road				
- East of Route 62	33,300	30,800	33,700	29,300
- East of Worsley Road	11,500	10,000	11,100	9,300
- West of Indian Avenue	33,400	31,800	38,300	35,600
- West of Little Morongo Road	24,500	23,900	23,800	24,000
- West of Palm Drive	27,200	26,500	28,900	24,000
- East of Palm Drive	28,000	31,200	31,600	27,400
- West of Mountain View Road	42,800	36,600	39,400	32,900
- East of Mountain View Road	49,700	45,900	49,400	45,600
- East of Long Canyon Road	43,200	43,900	43,400	43,400

Table 4-2 (Continued)
General Plan Buildout
Daily Traffic Volumes By Alternative

Roadway Link	Preferred GP	Adopted GP	Alternative 3	Alternative 4
20th Avenue				
- West of Indian Avenue	7,400	5,700	7,300	7,200
- West of Little Morongo Road	30,300	30,800	32,300	28,800
- West of Palm Drive	21,000	24,800	22,600	20,500
- East of Palm Drive	37,000	34,400	37,000	34,400
- West of Mountain View Road	17,200	23,800	21,700	21,100
Varner Road				
- West of Palm Drive	13,400	18,200	15,600	14,500
- East of Palm Drive	14,300	11,100	15,900	12,000
- East of Mountain View Road	49,500	43,600	48,600	46,400
Interstate 10				
- West of Route 62	115,800	115,500	115,900	115,400
- East of Route 62	98,800	100,000	100,600	98,100
- East of Indian Avenue	117,900	112,400	119,800	116,800
- West of Palm Drive	156,600	144,100	157,500	151,700
- East of Palm Drive	171,900	154,000	170,900	165,600
State Route 62				
- North of Mission Lakes Blvd.	25,100	25,100	25,400	24,800
- North of Pierson Boulevard	25,000	23,600	25,100	24,900
- N/O Two Bunch Palms Trail	40,900	40,100	41,000	41,400
- North of Dillon Road	43,300	41,200	43,300	42,500
- North of Interstate 10	75,900	71,100	76,400	71,100
Worsley Road				
- North of Mission Lakes Blvd.	100	100	100	100
- North of Pierson Boulevard	11,000	10,900	10,600	10,600
- N/O Two Bunch Palms Trail	21,500	20,300	22,300	18,800
- North of Dillon Road	25,800	23,100	27,100	23,500
- South of Dillon Road	7,000	5,000	7,200	6,600
- North of 20th Avenue	5,800	3,800	6,000	5,400
Indian Avenue				
- North of Mission Lakes Blvd.	10,600	10,600	10,300	10,800
- North of Pierson Boulevard	12,000	11,900	11,400	12,000
- North of Hacienda Avenue	33,400	31,800	32,500	30,500
- N/O Two Bunch Palms Trail	38,100	35,800	38,600	36,100
- S/O Two Bunch Palms Trail	38,600	36,100	38,300	35,300
- North of Dillon Road	38,300	35,600	36,800	35,400
- North of 20th Avenue	53,900	48,200	56,300	52,700
- South of Interstate 10	50,500	40,800	50,700	48,200
Little Morongo Road				
- North of Mission Lakes Blvd.	13,400	13,300	13,400	13,400
- North of Pierson Boulevard	16,700	15,900	15,400	15,500
- North of Hacienda Avenue	29,600	29,200	29,000	28,900
- N/O Two Bunch Palms Trail	30,100	29,300	28,800	27,900
- S/O Two Bunch Palms Trail	39,800	38,000	39,400	37,600
- North of Dillon Road	43,500	39,100	41,300	37,900
- North of 20th Avenue	32,600	28,400	33,500	34,900
- South of 20th Avenue	49,800	48,800	48,800	47,700
- South of Varner Road	39,000	32,100	38,200	34,900

Table 4-2 (Continued)
General Plan Buildout
Daily Traffic Volumes By Alternative

Roadway Link	Preferred GP	Adopted GP	Alternative 3	Alternative 4
West Drive				
- South of Mission Lakes Blvd.	2,100	2,400	2,000	2,000
- North of Pierson Boulevard	1,200	1,400	1,200	1,200
- South of Pierson Boulevard	7,500	4,700	5,700	4,900
- South of Hacienda Avenue	4,300	3,300	4,100	3,100
Palm Drive				
- South of Mission Lakes Blvd.	14,800	13,700	14,400	13,300
- North of Pierson Boulevard	20,200	18,500	19,900	18,900
- North of Hacienda Avenue	32,100	30,300	32,100	31,300
- N/O Two Bunch Palms Trail	31,800	26,000	30,200	28,700
- S/O Two Bunch Palms Trail	50,500	43,900	48,200	45,800
- North of Dillon Road	43,500	35,300	41,000	38,900
- South of Dillon Road	50,000	46,900	53,400	50,000
- South of 20th Avenue	68,700	54,800	66,400	62,600
- South of Varner Road	72,600	65,200	72,500	69,300
- South of Interstate 10	62,000	60,000	63,500	60,000
Verbena Drive				
- North of Pierson Boulevard	2,800	3,200	2,300	2,100
- North of Hacienda Avenue	9,500	11,000	8,700	8,800
Miracle Hill Road				
- South of Pierson Boulevard	12,200	14,000	12,900	11,400
- South of Hacienda Avenue	4,600	10,400	4,300	4,300
Bubbling Wells Road				
- North of Dillon Road	15,500	13,200	15,300	15,500
- South of Dillon Road	21,200	11,200	15,100	14,300
Mountain View Road				
- North of Hacienda Avenue	13,800	13,100	14,200	12,300
- South of Hacienda Avenue	9,700	9,400	10,800	11,300
- North of Dillon Road	27,000	26,300	28,000	21,000
- South of Dillon Road	37,500	35,900	39,300	35,100
- North of Varner Road	41,500	36,600	41,900	39,200
Long Canyon Road				
- South of Hacienda Avenue	16,900	13,900	15,200	13,500
- North of Dillon Road	32,300	26,400	32,100	25,500

Proposed typical street cross-sections that will be used to implement the Desert Hot Springs Circulation Plan are provided for each roadway classification in Figure 4-6. Recommended daily volume estimates at each level of service by roadway classification are provided in Table 4-3 that were assumed to develop volume-to-capacity ratios and determine future levels of service.

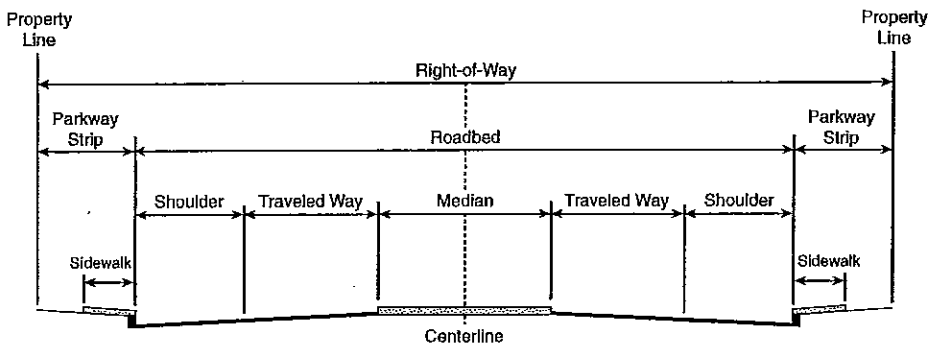
Local Collector: An undivided street with two lanes designed to provide access from residential and local streets in the community to secondary and higher classification streets. Local collector streets provide a means for movement from within a living, working or shopping area to the periphery of that area.

Table 4-3
Recommended Daily Roadway Volume Estimates For Each Level of Service

Classification (Right-of-Way)	Typical Lane Configuration	Average Daily Volume At The Upper Limit Of Each LOS (Vehicles/Day)[a] LOS A[c]	LOS B[c]	LOS C[b]	LOS D[c]	LOS E[b]
Freeway (Varies)	10-Lane Divided	96,000	132,000	168,000	204,000	240,000
Freeway (Varies)	8-Lane Divided	74,000	103,000	132,000	161,000	190,000
Expressway (Varies)	6-Lane Divided	36,000	57,000	78,000	99,000	120,000
Expressway (Varies)	4-Lane Divided	20,000	35,000	50,000	65,000	80,000
Urban Arterial (134')	8-Lane Divided	24,000	38,000	52,000	66,000	80,000
Major Arterial (110')	6-Lane Divided	17,000	27,500	38,000	48,500	59,000
Minor Arterial (110')	4-Lane Divided	10,000	17,000	24,000	31,000	38,000
Major Collector (100')	4-Lane Divided	10,000	17,000	24,000	31,000	38,000
Minor Collector (88')	4-Lane Undivided	10,000	15,000	20,000	25,000	30,000
Secondary (80')	4-Lane Undivided	10,000	15,000	20,000	25,000	30,000
Local Collector (60')	2-Lane Undivided	6,000	9,000	12,000	15,000	18,000

a. The upper limit of LOS D was assumed as the "design" capacity in the City of Desert Hot Springs. All capacities are based upon improvement to full City standards under optimum operating conditions. Capacity can be significantly reduced by a high incidence of pedestrian traffic and turning movements. Substandard vertical and horizontal alignment, or any combination which might restrict sight distance will also reduce capacity.
b. Source: Riverside County Road Department, *Information Pamphlet for Riverside County Traffic Circulation and Roadway Improvement Requirements*, Revised 11/24/87.
c. Source: Endo Engineering, based upon LOS C and LOS E values provided by Riverside County.

Figure 4-6
Proposed Desert Hot Springs Typical Street Sections



Corridor Classification	Lanes	Median (Feet)	Traveled Way (Ft.)	Shoulder (Feet)	Parkway Strip (Ft.)	Sidewalk (Feet)	Roadbed (Feet)	Right-of-Way (Ft.)
Urban Arterial	8	14	48	4	8	5	118	134
Major Arterial	6	14	36	4	8	5	94	110
Minor Arterial	4	22	24	8	12	5	86	110
Major Collector	4	16	24	8	10	5	76	100
Minor Collector	4	—	24	8	12	5	64	88
Secondary	4	—	24	12	8	7	68	80
Industrial Collector	2	—	16	10	11	5	56	78
Local Collector	2	—	12	8	10	5	40	60

Endo Engineering

Not to Scale

Minor Collector/Secondary Highway: A four-lane undivided street that collects and distributes traffic from major collector and arterial highways to local collector streets, local streets, or traffic destinations. Minor collectors and secondary highways can serve traffic generators like small business centers, schools, and major parks or recreational attractions.

Major Collector: A four-lane divided street with a higher capacity than minor collectors and secondary highways, a limited number of cross-streets, stacking and turning lanes and parking. Major collectors are intended to move people through and within the community.

Arterial Highway: A four-lane or six-lane divided street designed to efficiently move people and goods several miles from one part of the community to another with few cross-streets. Arterials are the principal thoroughfares through the city and also provide a link to adjacent cities. They have high design standards including quarter-mile intersection spacing and controlled access to provide for the efficient flow of high volumes.

Urban Arterial: An eight-lane divided street designed to efficiently move a large volume of people and goods relatively short distances from one part of the community to the freeway with few cross-streets. Urban arterials have very high design standards including quarter-mile intersection spacing and controlled access to provide for the efficient flow of high volumes.

Special Study Zones have been identified along the two arterial highways: Palm Drive and Indian Avenue in the vicinity of Interstate 10. Within these Special Study Zones a high capacity arterial highway will ultimately be needed to more efficiently move vehicles and provide high capacity connections to I-10. The urban arterial highways in these corridors should, where feasible, incorporate higher design standards, synchronized traffic signals, raised medians, controlled access and no parking lanes. These urban arterial highways may be required to provide additional turning capacity via auxiliary turn lanes at major intersections where high demand for turning moves occurs during peak hours. Right-of-way requirements along these arterials should be determined through detailed peak hour corridor studies.

Within Special Study Zones, capacity augmentation features will need to be identified and applied to intersections with restricted rights-of-way that experience high demand during peak hours. In instances where a roadway is found to be operating at acceptable levels of service except along one link, capacity enhancements at intersections can be identified and implemented to maintain network continuity. In most cases, this type of localized improvement will be more effective than upgrading a single roadway segment with additional through lanes.

The Preferred Circulation Plan includes a number of upgrades with regard to the adopted General Plan roadway network within the planning area. The following are the more important changes that will need to be implemented:

- the addition of a future Little Morongo Road Interchange at Interstate 10;
- the improvement of Little Morongo Road (between Two Bunch Palms Trail and Interstate 10) as a major arterial highway to better serve future development and reduce future volumes at the Palm Drive interchange;
- the improvement of Palm Drive to urban arterial standards (south of Dillon Road) and major arterial standards (between Two Bunch Palms Trail and Dillon Road);

- the improvement of Indian Avenue to urban arterial standards (south of Dillon Road);
- the designation of Special Study Zones along two urban arterial highways (Palm Drive and Indian Avenue, in the vicinity of Interstate 10) where capacity augmentation may ultimately be required;
- the widening of State Highway 62 from four to six lanes, between Interstate 10 and Dillon Road.

4.5 General Plan Buildout Volume-To-Capacity Analysis

A comparison of future daily traffic volumes to the master planned daily LOS D capacity gives the portion of the roadway capacity that will be utilized by future traffic volumes upon General Plan buildout. A volume-to-capacity (V/C) ratio of 1.0 indicates that the facility is handling the maximum traffic volume that it can accommodate at the upper limit of LOS D (the design capacity of the roadway). Volume-to-capacity ratios smaller than 1.0 imply better operational characteristics and levels of service. V/C ratios which exceed 1.0 imply worse operating conditions and level of service E or F operation, where peak travel demands can exceed the roadway carrying capacity and the arrival rate of vehicles can exceed the departure rate.

Daily LOS F designations indicate that daily travel demand in excess of the physical capacity is expected along a master planned route. When alternate parallel routes have available capacity, traffic will divert to these routes as delay increases, particularly during peak hours. Since the capacity of a roadway link is limited by the amount of traffic that can flow through the intersections, favorable intersection conditions can provide better levels of service on a roadway link than indicated by the daily volume and LOS. In particular, low cross traffic volumes or tee-intersections can result in a higher percentage of the traffic signal cycle being allocated to the primary traffic flow, and allow acceptable levels of service with higher daily volumes. A daily volume-to-capacity and LOS analysis is, therefore, an indicator of high traffic demand rather than an absolute indication of an unavoidable significant impact.

Table 4-4 provides the future daily volume-to-capacity ratios (based upon full roadway improvements per the master planned classification cross-section) and levels of service within the planning area upon buildout of the preferred General Plan and each alternative. Although the proposed circulation network was designed to provide acceptable levels of service (LOS D or better) where feasible, in a few instances, right-of-way acquisition constraints make upgrading a roadway not feasible. In other cases, projected volumes may exceed the capacity of the roadway on only one relatively short link.

Network continuity and maintaining a consistent cross-section will better serve the public than mitigating a slight exceedance of the daily design capacity. For example, the projected traffic volumes on Palm Drive (between Pierson Boulevard and Two Bunch Palms Trail) slightly exceed the design capacity of a major collector. Since this roadway is fully improved, Palm Drive cannot be upgraded to a 6-lane major arterial facility. Localized capacity enhancements are available and can be employed to accommodate the future demand, if it materializes as projected, without widening the roadbed.

Near Interstate 10, the projected traffic volumes on Palm Drive are expected to exceed the design capacity of an eight-lane roadway by 4 to 10 percent. Since a ten-lane roadway is not considered feasible, Palm Drive is proposed with eight lanes and projected to provide LOS E on a daily basis from 20th Avenue to Interstate 10.

Table 4-4
General Plan Buildout
Daily V/C Ratio and LOS By Alternative[a]

Roadway Link	Preferred GP V/C	LOS	Adopted GP V/C	LOS	Alternative 3 V/C	LOS	Alternative 4 V/C	LOS
Mission Lakes Boulevard								
- East of State Route 62	0.38	B	0.43	B	0.39	B	0.38	B
- East of Worsley Road	0.19	A	0.19	A	0.17	A	0.17	A
- West of Indian Avenue	0.19	A	0.19	A	0.18	A	0.18	A
- East of Indian Avenue	0.50	B	0.43	B	0.46	B	0.43	B
- West of West Drive	0.42	B	0.41	B	0.42	B	0.39	B
- West of Palm Drive	0.42	B	0.44	B	0.45	B	0.42	B
- East of Palm Drive	0.14	A	0.04	A	0.05	A	0.02	A
Eighth Street								
- West of Palm Drive	0.03	A	0.04	A	0.03	A	0.03	A
- East of Palm Drive	0.34	A	0.35	A	0.42	B	0.34	A
Pierson Boulevard								
- East of Route 62	0.53	B	0.51	B	0.54	B	0.51	B
- East of Worsley Road	0.48	B	0.48	B	0.52	B	0.44	B
- West of Indian Avenue	0.95	D	0.91	D	0.92	D	0.84	D
- East of Indian Avenue	0.91	D	0.89	D	0.88	D	0.83	D
- East of Little Morongo Road	0.65	C	0.66	C	0.65	C	0.62	C
- East of West Drive	0.84	D	0.84	D	0.87	D	0.82	D
- East of Palm Drive	0.80	D	0.85	D	0.81	D	0.75	C
- West of Miracle Hill Road	0.75	C	0.77	C	0.78	C	0.68	C
Desert View Avenue								
- West of Mountain View Road	0.45	B	0.44	B	0.48	B	0.44	B
Hacienda Boulevard								
- East of Indian Avenue	0.42	B	0.45	B	0.48	B	0.46	B
- East of Little Morongo Road	0.51	B	0.53	B	0.50	B	0.43	B
- West of Palm Drive	0.55	B	0.54	B	0.52	B	0.44	B
- East of Palm Drive	0.33	A	0.36	A	0.38	A	0.28	A
- West of Miracle Hill Road	0.74	C	0.84	D	0.76	C	0.67	C
- West of Mountain View Road	0.67	C	0.72	C	0.69	C	0.57	B
- East of Mountain View Road	1.11	E	1.15	E	1.12	E	0.97	D
- West of City Limits	0.78	C	0.76	C	0.79	C	0.62	C
Two Bunch Palms Trail								
- East of State Route 62	0.20	A	0.12	A	0.23	A	0.14	A
- East of Worsley Road	0.19	A	0.18	A	0.18	A	0.19	A
- West of Indian Avenue	0.70	C	0.51	B	0.94	D	0.57	B
- East of Indian Avenue	0.57	B	0.39	A	0.71	C	0.39	A
- West of West Drive	0.40	B	0.38	A	0.39	A	0.39	A
- West of Palm Drive	0.48	B	0.48	B	0.45	B	0.46	B
- East of Palm Drive	0.27	A	0.36	A	0.27	A	0.24	A
Dillon Road								
- East of Route 62	0.69	C	0.64	C	0.69	C	0.60	C
- East of Worsley Road	0.24	A	0.21	A	0.23	A	0.19	A
- West of Indian Avenue	0.69	C	0.66	C	0.79	D	0.73	C
- West of Little Morongo Road	0.79	D	0.77	C	0.77	C	0.77	C

a. These V/C ratio values assumed the master planned capacity (upper limit of LOS D) in Table 4-3.

Table 4-4 (Continued)
General Plan Buildout
Daily V/C Ratio and LOS By Alternative[a]

Roadway Link	Preferred GP V/C	LOS	Adopted GP V/C	LOS	Alternative 3 V/C	LOS	Alternative 4 V/C	LOS
Dillon Road								
- West of Palm Drive	0.88	D	0.85	D	0.93	D	0.77	C
- East of Palm Drive	0.90	D	1.01	E	1.02	E	0.88	D
- West of Mountain View Road	0.88	D	0.75	C	0.81	D	0.68	C
- East of Mountain View Road	1.02	E	0.95	D	1.02	E	0.94	D
- East of Long Canyon Road	0.89	D	0.91	D	0.89	D	0.89	D
20th Avenue								
- West of Indian Avenue	0.24	A	0.18	A	0.24	A	0.23	A
- West of Little Morongo Road	0.98	D	0.99	D	1.04	E	0.93	D
- West of Palm Drive	0.68	C	0.80	D	0.73	C	0.66	C
- East of Palm Drive	0.76	C	0.71	C	0.76	C	0.71	C
- West of Mountain View Road	0.55	C	0.77	C	0.70	C	0.68	C
Varner Road								
- West of Palm Drive	0.43	B	0.59	C	0.50	B	0.47	B
- East of Palm Drive	0.46	B	0.36	B	0.51	B	0.39	B
- East of Mountain View Road	1.02	E	0.90	D	1.00	E	0.96	D
Interstate 10								
- West of Route 62	0.72	C	0.72	C	0.72	C	0.72	C
- East of Route 62	0.61	B	0.62	B	0.62	B	0.61	B
- East of Indian Avenue	0.73	C	0.70	C	0.74	C	0.73	C
- West of Palm Drive	0.97	D	0.90	D	0.98	D	0.94	D
- East of Palm Drive	1.07	E	0.96	D	1.06	E	1.03	E
State Route 62								
- North of Mission Lakes Blvd.	0.39	A	0.39	A	0.39	A	0.38	A
- North of Pierson Boulevard	0.38	A	0.36	A	0.39	A	0.38	A
- N/O Two Bunch Palms Trail	0.63	B	0.62	B	0.63	B	0.64	B
- North of Dillon Road	0.67	B	0.63	B	0.67	B	0.65	B
- North of Interstate 10	0.77	C	0.72	B	0.77	C	0.72	B
Worsley Road								
- North of Mission Lakes Blvd.	0.00	A	0.00	A	0.00	A	0.00	A
- North of Pierson Boulevard	0.35	B	0.35	B	0.34	B	0.34	B
- N/O Two Bunch Palms Trail	0.69	C	0.65	C	0.72	C	0.61	C
- North of Dillon Road	0.83	D	0.75	C	0.87	D	0.76	C
- South of Dillon Road	0.23	A	0.16	A	0.23	A	0.21	A
- North of 20th Avenue	0.19	A	0.12	A	0.19	A	0.17	A
Indian Avenue								
- North of Mission Lakes Blvd.	0.34	B	0.34	B	0.33	B	0.35	B
- North of Pierson Boulevard	0.39	B	0.38	B	0.37	B	0.39	B
- North of Hacienda Avenue	0.69	C	0.66	C	0.67	C	0.63	C
- N/O Two Bunch Palms Trail	0.79	D	0.74	C	0.80	D	0.74	C
- S/O Two Bunch Palms Trail	0.80	D	0.74	C	0.79	D	0.73	C
- North of Dillon Road	0.79	D	0.73	C	0.76	C	0.73	C
- North of 20th Avenue	0.82	D	0.73	C	0.85	D	0.80	D
- South of Interstate 10	0.77	C	0.62	C	0.77	C	0.73	C

a. These V/C ratio values assumed the master planned capacity (upper limit of LOS D) in Table 4-3.

Table 4-4 (Continued)
General Plan Buildout
Daily V/C Ratio and LOS By Alternative[a]

Roadway Link	Preferred GP V/C	LOS	Adopted GP V/C	LOS	Alternative 3 V/C	LOS	Alternative 4 V/C	LOS
Little Morongo Road								
- North of Mission Lakes Blvd.	0.54	B	0.53	B	0.54	B	0.54	B
- North of Pierson Boulevard	0.54	B	0.51	B	0.50	B	0.50	B
- North of Hacienda Avenue	0.95	D	0.94	D	0.94	D	0.93	D
- N/O Two Bunch Palms Trail	0.97	D	0.95	D	0.93	D	0.90	D
- S/O Two Bunch Palms Trail	0.82	D	0.78	C	0.81	D	0.78	C
- North of Dillon Road	0.90	D	0.81	D	0.85	D	0.78	C
- North of 20th Avenue	0.67	C	0.59	C	0.69	C	0.72	C
- South of 20th Avenue	1.03	E	1.01	E	1.01	E	0.98	D
- South of Varner Road	0.80	D	0.66	C	0.79	D	0.72	C
West Drive								
- South of Mission Lakes Blvd.	0.08	A	0.10	A	0.08	A	0.08	A
- North of Pierson Boulevard	0.05	A	0.06	A	0.05	A	0.05	A
- South of Pierson Boulevard	0.30	A	0.19	A	0.23	A	0.20	A
- South of Hacienda Avenue	0.17	A	0.13	A	0.16	A	0.12	A
Palm Drive								
- South of Mission Lakes Blvd.	0.48	B	0.44	B	0.46	B	0.43	B
- North of Pierson Boulevard	0.65	C	0.60	C	0.64	C	0.61	C
- North of Hacienda Avenue	0.66	C	0.62	C	0.66	C	0.65	C
- N/O Two Bunch Palms Trail	0.66	C	0.54	B	0.62	C	0.59	C
- S/O Two Bunch Palms Trail	1.04	E	0.91	D	0.99	D	0.94	D
- North of Dillon Road	0.90	D	0.73	C	0.85	D	0.80	D
- South of Dillon Road	0.76	C	0.71	C	0.81	D	0.76	C
- South of 20th Avenue	1.04	E	0.83	D	1.01	E	0.95	D
- South of Varner Road	1.10	E	0.99	D	1.10	E	1.05	E
- South of Interstate 10	0.94	D	0.91	D	0.96	D	0.91	D
Verbena Drive								
- North of Pierson Boulevard	0.11	A	0.13	A	0.09	A	0.08	A
- North of Hacienda Avenue	0.38	A	0.44	B	0.35	A	0.35	A
Miracle Hill Road								
- South of Pierson Boulevard	0.49	B	0.56	B	0.52	B	0.46	B
- South of Hacienda Avenue	0.31	A	0.69	C	0.29	A	0.29	A
Bubbling Wells Road								
- North of Dillon Road	0.62	C	0.53	B	0.61	C	0.62	C
- South of Dillon Road	0.85	D	0.45	B	0.60	C	0.57	B
Mountain View Road								
- North of Hacienda Avenue	0.55	B	0.52	B	0.57	B	0.49	B
- South of Hacienda Avenue	0.39	A	0.38	A	0.43	B	0.45	B
- North of Dillon Road	0.87	D	0.85	D	0.90	D	0.68	C
- South of Dillon Road	0.77	C	0.74	C	0.81	D	0.72	C
- North of Varner Road	0.86	D	0.75	C	0.86	D	0.81	D
Long Canyon Road								
- South of Hacienda Avenue	0.55	B	0.45	B	0.49	B	0.44	B
- North of Dillon Road	1.04	E	0.85	D	1.04	E	0.82	D

a. These V/C ratio values assumed the master planned capacity (upper limit of LOS D) in Table 4-3.

A new parallel route connection to the proposed Little Morongo Road interchange at I-10 would provide additional north/south capacity during periods of peak demand and thereby divert some of the traffic from Palm Drive. By designating this portion of Palm Drive as a Special Study Zone, access restrictions, exclusive turn lanes, and other localized capacity enhancements can be implemented that will accommodate the travel demand as well as or better than ten through lanes could. By the same token, the design of the Little Morongo Road interchange at I-10 and its connection to Little Morongo Road can encourage motorists to utilize this route rather than Palm Drive.

Hacienda Avenue, east of Mountain View Road, is also projected to operate at LOS E for a short distance, with volumes that exceed the design capacity by 11 to 15 percent. It should be noted that the limitations associated with the model concentrate traffic from the adjacent zones by loading it at only a few access locations. When development occurs along Hacienda Avenue, access will be taken at many more locations than modeled. As future projects are planned, they can be designed to avoid access at constrained locations and encourage access in other directions. Since adjacent roadway links have adequate capacity, the potential for impact on this link is related to the access assumed for adjacent development. Impacts should be mitigated by carefully reviewing access proposals when specific projects are proposed, and providing left-turn pockets at intersections, rather than upgrading the master planned classification of a short segment of Hacienda Avenue.

All of the remaining surface street links that are projected to operate at LOS E on a daily basis in Table 4-4 are expected to carry daily traffic demands that exceed their design capacities by five percent or less. There is inherently some uncertainty in the projected volumes and the roadway capacity estimates. There are also parallel routes with available capacity that can accommodate additional traffic if these links become congested. Therefore, it is not recommended that the master planned classifications of these links be upgraded from their designations in the Preferred Circulation Plan.

4.5.1 Preferred General Plan

As shown in Table 4-4, the Preferred Circulation Plan will provide LOS D or better operation on a daily basis upon General Plan buildout along most of the roadway links in the planning area. One hundred one of the 110 roadway links evaluated (92%) are projected to operate at LOS D or better upon General Plan buildout. The remaining nine roadway links (8%) are projected to provide LOS E operation on a daily basis. None of the roadways are projected to operate at LOS F upon buildout of the preferred General Plan.

Level of Service E Roadway Segments

- Hacienda Boulevard, east of Mountain View Road, (V/C Ratio = 1.11);
- Dillon Road, east of Mountain View Road, (V/C Ratio = 1.02);
- Varner Road, east of Mountain View Road, (V/C Ratio = 1.02);
- Interstate 10, east of Palm Drive, (V/C Ratio = 1.07);
- Little Morongo Road, south of 20th Avenue, (V/C=1.03);
- Palm Drive, south of Two Bunch Palms Trail, (V/C Ratio = 1.04);
- Palm Drive, south of 20th Avenue, (V/C Ratio = 1.04);
- Palm Drive, south of Varner Road, (V/C Ratio = 1.10); and
- Long Canyon Road, north of Dillon Road, (V/C Ratio = 1.04).

4.5.2 Adopted General Plan

Table 4-4 provides the daily volume-to-capacity ratio and level of service for each of the roadways analyzed by General Plan alternative. As shown therein, the adopted General Plan, is projected to have 3 roadway links (3%) operating at LOS E on a daily basis with the remaining 107 links (97%) providing LOS D or better operation. None of the roadway links are projected to operate at LOS F on a daily basis.

Level of Service E Roadway Segments

- Hacienda Boulevard, east of Mountain View Road, (V/C Ratio = 1.15);
- Dillon Road, east of Palm Drive, (V/C Ratio = 1.01); and
- Little Morongo Road, south of 20th Avenue, (V/C=1.01).

4.5.3 General Plan Alternative 3

Table 4-4 provides the daily volume-to-capacity ratio and level of service for each of the roadways analyzed with General Plan Alternative 3. As shown therein, 100 links are projected to provide LOS D or better operation upon buildout of Alternative 3. Ten roadway links would operate at LOS E and none of the roadway links would operate at LOS F. The links projected to operate at LOS E would be similar to those with the Preferred General Plan Alternative with three exceptions. Alternative 3 is the only alternative where 20th Avenue, west of Little Morongo Road, is projected to operate at LOS D on a daily basis.

Alternative 3, like the adopted General Plan, is projected to have LOS E on a daily basis along Dillon Road, east of Palm Drive. With Alternative 3, unlike the proposed General Plan, Palm Drive (south of Two Bunch Palms Trail) will operate at LOS D (V/C ratio of 0.99).

4.5.4 General Plan Alternative 4

Table 4-4 provides the daily volume-to-capacity ratio and level of service for each of the roadways analyzed with General Plan Alternative 4. As shown therein, 108 links (98%) are projected to provide LOS D or better operation upon buildout of Alternative 4. Two roadway links (2%) would operate at LOS E and none of the roadway links would operate at LOS F. The two LOS E links would be the same as the preferred General Plan and Alternative 3: I-10 (east of Palm Drive) and Palm Drive (south of Varner Road).

4.5.5 Change in Daily V/C Ratio and LOS

Table 4-5 provides the number of master planned roadway links within each daily level of service category by alternative for comparison to the existing daily levels of service in the planning area. A review of Table 4-5 indicates that there is currently one roadway link in the planning area that is operating at LOS F. None of the General Plan alternatives is projected to have roadway links operating at LOS F upon buildout.

Each of the General Plan buildout scenarios will increase the number of roadway links providing LOS E on a daily basis, compared to existing conditions (by having from two to ten links at LOS E, depending upon the General Plan alternative). It can be seen from Table 4-5, that 2 percent of the existing roadway links analyzed are operating below LOS D (at LOS E or F) on a daily basis.

Table 4-5
Portion of Network Providing Each LOS By Alternative[a]

Level of Service	Existing Links (%)	Preferred GP Links (%)	Adopted GP Links (%)	Alternative 3 Links (%)	Alternative 4 Links (%)
LOS A	28 (65%)	24 (22%)	24 (22%)	23 (21%)	25 (23%)
LOS B	11 (26%)	27 (24%)	30 (27%)	27 (24%)	30 (27%)
LOS C	3 (7%)	24 (22%)	31 (28%)	24 (22%)	33 (30%)
LOS D	0 (0%)	26 (24%)	22 (20%)	26 (24%)	20 (18%)
LOS E	0 (0%)	9 (8%)	3 (3%)	10 (9%)	2 (2%)
LOS F	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

a. Format is: number of roadway links at each LOS (percentage of all links analyzed in the roadway network at each LOS). Forty-three links were evaluated in the existing roadway network and 110 links were analyzed for the adopted General Plan and the other alternatives.

With Alternative 4, the number of links in this category will increase upon General Plan buildout to 2, but the percentage of the roadway network in this category will remain approximately the same. The adopted General Plan is projected to include 3 percent of the links in this category. The Preferred General Plan Alternative is projected to have 8 percent of the links operating below LOS D on a daily basis. Alternative 3 would increase the percentage of links operating below LOS D to 9 percent.

Another way to view the impact of the project alternatives on levels of service is to quantify the portion of the street system that will operate upon General Plan buildout at better levels of service, the same LOS or worse levels of service than currently exist on those same roadway links. For example, one alternative may improve the daily service levels from LOS B to LOS A on many links but also cause the service levels to drop from LOS B to LOS E on an equal number of links. This evaluation can only be undertaken for those links where current traffic volumes are known so that an existing LOS can be determined. Table 4-6 summarizes the findings of this analysis.

Buildout per the adopted General Plan would result in daily levels of service on eight of the links analyzed remaining unchanged from the current LOS. The preferred General Plan would result in ten links operating at the same LOS upon General Plan buildout as today. The adopted General Plan would improve daily levels of service on three roadway links, when compared to existing levels of service. The preferred General Plan would improve the daily LOS on two links compared to current levels of service.

The adopted General Plan alternative would result in buildout daily levels of service on 24 roadway links that are below current levels of service. The preferred General Plan alternative would result in buildout daily levels of service on 23 roadway links that are worse than current levels of service. This is as expected, since the development that will occur upon buildout of the General Plan will generate many more trips in the planning area than occur at present and these new trips will be served by both existing and new master planned roadways.

Table 4-6
Number of Roadway Links Changing LOS By Alternative[a]

Change in Daily Level of Service	Preferred GP Links	Adopted GP Links	Alternative 3 Links	Alternative 4 Links
LOS Improves By				
3 LOS	0	1	0	0
2 LOS	1	0	1	1
1 LOS	1	2	1	1
LOS Unchanged	10	8	9	10
LOS Degrades By				
1 LOS	12	13	14	13
2 LOS	4	4	3	6
3 LOS	6	6	3	4
4 LOS	1	1	1	0

a. Change in LOS represents future LOS upon buildout relative to current LOS per Table 3-3.

A comparison of Table 3-3 to Table 4-4 allows the change in daily V/C and LOS associated with the preferred General Plan update compared to existing conditions to be identified. This comparison indicates that along ten links in the planning area, there will be no change in the daily levels of service between current conditions and preferred General Plan buildout conditions. The daily LOS will drop by one level of service along twelve links. Along four links, the daily LOS will drop by two levels (e.g. LOS A to LOS C or LOS B to LOS D). Along six links, the daily LOS will drop by three levels (e.g. from LOS A to LOS D). Two of the roadway links evaluated will experience an improvement in the daily LOS upon buildout of the Preferred General Plan. One link will improve by one LOS and one link will improve by two levels of service on a daily basis.

4.6 Trip Generation By General Plan Alternative

To assist in the determination of the relative traffic impacts of the alternatives to the preferred General Plan, the trip generation potential of each alternative was assessed. This cannot be done directly from the circulation model; therefore, trip generation rates from the Institute of Transportation Engineers *Trip Generation* manual (6th Edition) were employed to estimate the trip generation of each alternative for comparison, as shown in Table 4-7. Although ITE rates are not used by the computer model (which balances trip attractions with trip productions) they allow the relative difference in trip generation between the alternatives to be gauged. Appendix E includes a more detailed trip generation forecast by land use category and land use alternative.

Based upon the ITE trip generation rates, the adopted General Plan would have the highest trip generation potential and the preferred General Plan would exhibit the lowest trip generation potential of the alternatives evaluated. The preferred General Plan has a daily trip generation total that is 17.8 percent less than the adopted General Plan, 15.1 percent less than Alternative 3, and 17.1 percent greater than Alternative 4.

Table 4-7
Trip Generation Forecast
By General Plan Alternative[a]

Development Scenario	AM Peak Hour Inbound	AM Peak Hour Outbound	AM Peak Hour Total	PM Peak Hour Inbound	PM Peak Hour Outbound	PM Peak Hour Total	Daily 2-Way
Preferred General Plan	51,338	49,749	101,087	77,025	82,130	159,154	1,488,770
Adopted General Plan	68,145	50,340	118,485	88,011	107,166	195,177	1,811,540
General Plan Alternative 3	54,446	53,238	107,684	89,573	94,349	183,921	1,754,460
General Plan Alternative 4	41,915	44,296	86,210	67,014	68,103	135,118	1,271,210

a. Note: Refer to Appendix E for additional details regarding the trip generation forecast by land use category.

Although the trip generation of the Adopted General Plan (shown in Table 4-7) was the highest of the four alternatives, the traffic volumes associated with this alternative (shown in Figure 4-2) are the second lowest. Since the computerized circulation modeling generates traffic volumes by matching origins and destinations by trip type, productions (residential trips) are matched to attractions (commercial uses). If the trip generation for an area has a greater number of attractions than productions, the extra attractions are ignored by the model and do not generate traffic.

The Adopted General Plan has the fewest number of residential units and the second lowest residential trip generation of the four alternatives, but the highest commercial trip generation. Therefore, even though the trip generation of this alternative is the highest (based upon ITE rates) this alternative results in the second lowest traffic volume projections from the computer modeling.

4.7 Circulation Issue Assessment

The analysis of daily volumes is a planning tool to identify areas which need further analysis and special consideration. The amount of delay experienced by a motorist is primarily determined by the turning movements at intersections. Therefore, any mitigation should be based on a detailed analysis of the operation at intersections.

Typically, roadway links which are projected to operate at LOS E (which exceeds the design volume) on a daily basis can be adequately mitigated by providing additional turning lanes at the intersections. Additional approach lanes on the cross-streets mean that a greater portion of the signal cycle can be dedicated to provide additional capacity to the impacted link. It is vitally important to reserve adequate right-of-way at the major intersections to mitigate LOS E conditions. Although the delays associated with LOS E exceed desirable levels for design purposes, the roadways projected to operate at LOS E are still operating within their physical capacity.

When roadway links are projected to operate at LOS F, it is typically necessary to provide additional lanes for the through movements to adequately reduce the delay or provide alternative parallel routes. Additional approach lanes at cross-streets can provide additional capacity, but may not be sufficient to mitigate LOS F conditions. Right-of-way should be preserved at the major intersections as well as along the length of any roadways projected to operate at LOS F. As intersections approach LOS F, excessive delays will cause a diversion of traffic to alternative routes and will minimize the increase in traffic along the impacted roadway. If all alternative routes are similarly impacted (e.g. the interchanges at Palm Drive and Indian Avenue) delays will increase sharply until additional capacity is provided.

4.7.1 North/South Travel Corridors

Palm Drive currently has the highest traffic volumes of any surface street in the study area, and will continue to carry the highest volumes in the future. As development occurs to the west, State Route 62 and Indian Avenue will serve as the primary north-south commuter routes for these areas, with traffic volumes increasing near Interstate 10. Traffic volumes on Varner Road southeast of the study area also increase in the direction of the Date Palm Drive interchange with Interstate 10.

Access to Interstate 10 or across Interstate 10 from the planning area is limited to four locations: State Highway 62, Indian Avenue, Palm Drive, and Date Palm Drive separated by 3-mile intervals. This wide separation concentrates traffic onto a few streets near Interstate 10.

To ensure that the north-south facilities continue to provide acceptable levels of service upon General Plan buildout, it is critical that adequate right-of-way be reserved near Interstate 10 to accommodate ultimate roadway widths. Even with the improvement of Palm Drive and Indian Drive to eight-lane roadways north of Interstate 10, portions of these facilities could operate at unacceptable levels of service. Therefore, a new I-10 interchange is being proposed between the freeway interchanges at Indian Drive and Palm Drive to distribute the traffic loading to Interstate 10.

The proposed roadway connection to the new interchange should be designed to encourage the use of Little Morongo Road for access to and from this interchange. Without this interchange, the traffic on Little Morongo Road destined for Interstate 10 would divert to the Indian Avenue Interchange or the Palm Drive Interchange.

4.7.2 East/West Travel Corridors

The east/west travel corridors shown in Figure 4-5 will have the capacity to provide adequate levels of service (LOS D or better) within the planning area, except for a few instances along Dillon Road and Varner Road (as shown in Table 4-4). Future traffic volumes tend to be higher on these roadways near Palm Drive because the interchange on Palm Drive must service the eastern portion of the planning area. General Plan Buildout traffic volumes on are projected to exceed the design capacity of these roadway links by two percent or less (LOS E) on a daily basis with some alternatives.

Although there is the potential to extend Hacienda Avenue from the City of Desert Hot Springs to State Route 62, the additional roadway capacity is not required to support the projected traffic volumes. Two Bunch Palms Trail is designated as a minor collector and has a relatively low projected traffic volume when compared to the adjacent parallel major arterials, Dillon Road and Pierson Blvd. If development intensity is increased in the future, Two Bunch Palms Trail could be upgraded west of Indian Avenue to increase the capacity to the west.

4.7.3 Undeveloped Areas

North of Mission Lakes Boulevard

Projected daily traffic volumes north of Mission Lakes Boulevard are generally well below the master planned capacity of the roadways serving this area. Since development north of Mission Lakes Boulevard is severely restricted by the steep terrain, and traffic demand in the study area is generally to the south, Mission Lakes Boulevard and other roadways to the north should have adequate capacity to serve future traffic demands upon General Plan buildout.

West of State Route 62

The Rancho Royale Specific Plan is located between Pierson Boulevard and Mission Lakes Boulevard, primarily west of State Route 62. The Rancho Royale Specific Plan represents the majority of the potential development west of State Route 62. In addition, there is another potential development area located west of State Route 62 and north of Dillon Road. Because of topographic constraints and the Whitewater River, these two development areas will need to take access to/from the east. The development west of State Route 62 and the through traffic to Twentynine Palms will utilize a large portion of the capacity of State Route 62. Consequently, a larger portion of the traffic from development east of State Route 62 will utilize the Indian Avenue I-10 interchange. Although the future

development west of State Route 62 will not generally utilize the Indian Avenue I-10 interchange or the Palm Drive interchange, it may indirectly increase the traffic at the other Interstate 10 interchanges.

4.7.4 Interstate 10 Interchanges

The Interstate 10 interchanges in the study area are generally spaced approximately 3 miles apart. In more heavily developed areas, freeway interchanges are typically spaced 1 to 1.5 miles apart. With the current interchange locations, the traffic volumes associated with citywide buildout of the proposed General Plan would exceed the capacity of an eight-lane roadway along Palm Drive and Indian Avenue. The proposed Little Morongo Interchange would divert some of the traffic from the Indian Avenue and Palm Drive interchanges to allow the future traffic demand at the two interchanges to be accommodated with localized turn lanes and fewer through lanes. It will be important to secure adequate right-of-way at the Palm Drive, Indian Avenue, and Little Morongo interchanges as future development occurs to prevent the need to take property in the future.

The Palm Drive Interstate 10 interchange is currently being studied by Caltrans in order to design a facility which will address future traffic volumes. The two design alternatives include an improved diamond interchange, and a half cloverleaf. Either alternative will improve the capacity of the interchange significantly.

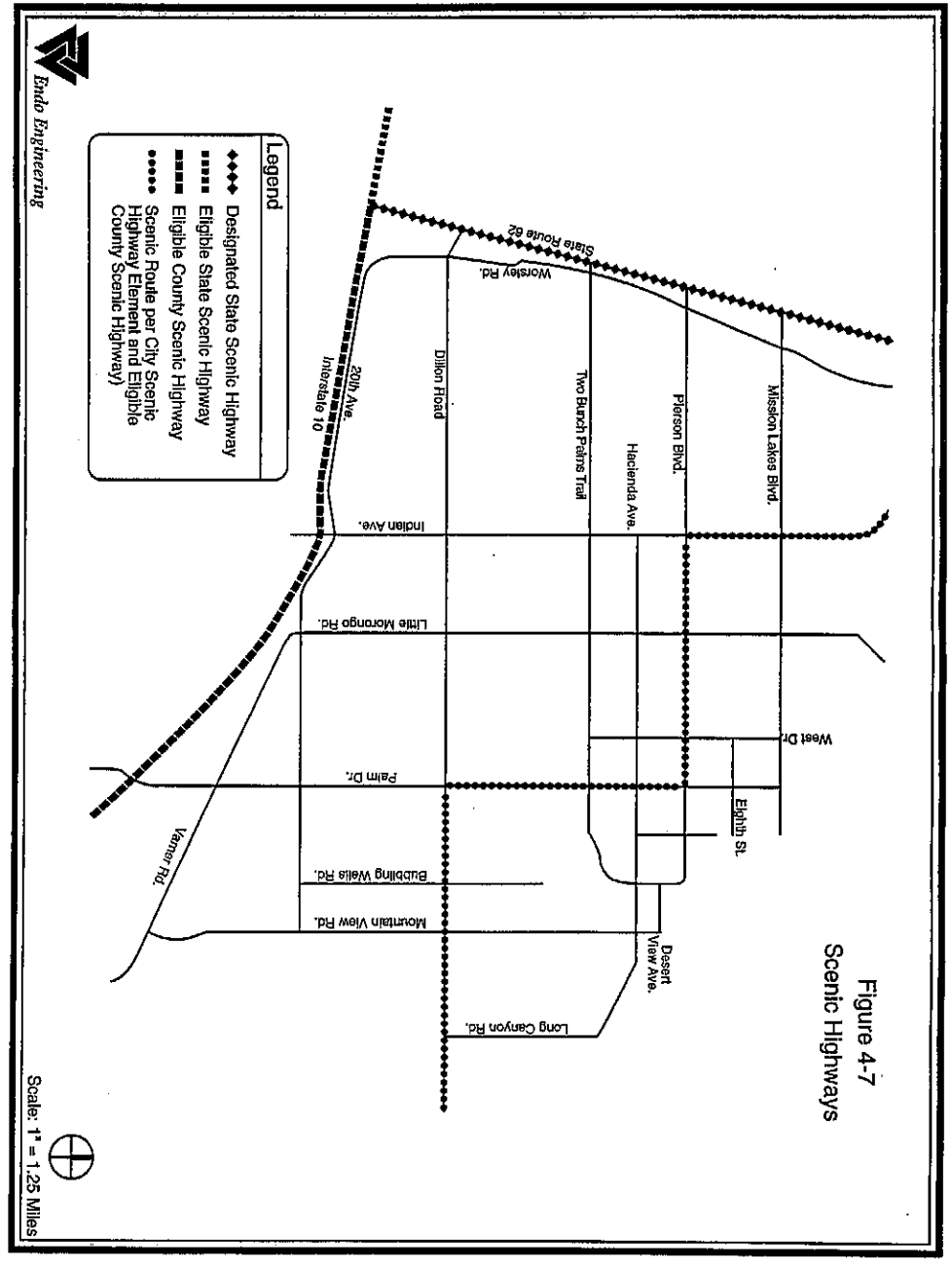
Although the traffic volumes at the Indian Avenue interchange do not currently warrant interchange improvements, the projected traffic volumes from buildout of the study area will require substantial improvements to this interchange. Since 20th Avenue is aligned just north of the Indian Avenue interchange, this site may not be a good candidate for a cloverleaf or even a partial cloverleaf design. In those cases where a frontage road is located close to the interchange, a single point urban interchange (SPUI) has been utilized with great success. Although the construction costs associated with a SPUI are typically four to six percent higher than a diamond interchange, the lower right-of-way requirements may make this design appropriate for this location. Furthermore, an SPUI generally provides one classification higher LOS operation than a diamond interchange.

4.8 Scenic Corridors

Scenic corridors are linear features of the City through which people and vehicles move. They include streets, highways, pedestrian ways and bicycle trails. To highlight and improve the environmental and scenic amenities of the planning area, the City periodically identifies scenic traffic corridors and gateways to preserve, enhance and protect, and designates them for special treatment and improvement. A series of development standards expressing a common vision should be adopted to improve the quality of development and the visual environment in Desert Hot Springs. These standards should be used in the design review process to ensure that the needs of the people are not overwhelmed by the needs of the cars.

The adopted Desert Hot Springs Scenic Highways Element includes four Scenic Routes, as shown in Figure 4-7. These include:

- **Indian Avenue**, north of Pierson Boulevard;
- **Pierson Boulevard**, from Indian Avenue to Palm Drive;
- **Palm Drive**, from Pierson Boulevard to Dillon Road; and
- **Dillon Road**, east of Palm Drive.



Palm Drive is the primary entrance to Desert Hot Springs from Interstate 10, serving both commuter and local traffic. As future development occurs along Palm Drive, it should provide a people-oriented commercial area with street trees and increased setbacks that are attractive to tourists. The main entries to commercial centers should be landscaped as gateways and the parked cars should be screened from view with landscaping, masonry walls and berms. Pedestrian access to commercial centers along Palm Drive should be emphasized.

Several gateways should be identified at major intersections entering Desert Hot Springs. These crossroads would benefit from unique designs, special landscaping (and in some cases monument signs and enhanced pedestrian facilities) that accent the entry. The gateways could include:

- Palm Drive at Varner Road,
- Little Morongo Road at Varner Road,
- Indian Avenue at 20th Avenue,
- Dillon Road at Worsely Road,
- Two Bunch Palms Trail Road at Worsely Road,
- Pierson Boulevard at Worsely Road, and
- Mission Lakes Boulevard at Worsely Road.

State Highway 62, from its junction with Interstate 10 8.8 miles north to the San Bernardino County line, is a Designated State Scenic Highway. To protect the scenic resources of this route, guidelines established by the Scenic Highways Program should be applied to all future development within the Designated State Scenic Corridor boundaries. The State Scenic Corridor boundaries extend westerly to the limits of the planning area (refer to Figure 1-3) and easterly approximately one-third of the distance to Indian Avenue.

Interstate 10 is an Eligible State Scenic Highway, north of State Highway 62, and an Eligible County Scenic Highway south of SR 62 to the Colorado River.[2] To preserve the visual resources of the I-10 scenic corridor, the City of Desert Hot Springs should apply the State Scenic Highways Land Use Standards to all projects within the I-10 scenic highway corridor. These standards include a 50-foot setback from the edge of the right-of-way for all new development, where feasible.

Interstate 10 and the Twentynine Palms Highway are important visual corridors that should receive special landscape treatments because so many motorists and tourists will form their image of Desert Hot Springs from their travels along I-10 and SR-62. Two types of high speed corridor treatment are possible along these routes to influence the city's image: buffer edges to screen unsightly views from the freeway and landscaped edges designed to promote selected views into the City. The view corridor due north from the I-10 overpasses at Palm Drive and Indian Avenue could also be enhanced with a street tree program in which every adjacent development would participate.

2. CALTRANS; *California Master Plan of State Highways as Eligible For Official Scenic Highway Designation;* Revised March 31, 1993. Verified by telephone with Mr. Alan Nakano, CALTRANS District 8 Scenic Highway Coordinator; October 18, 1996.

4.9 Phasing of Master Planned Transportation Improvements

The ultimate circulation system is not in place at this time and will not be fully completed until local and regional growth warrant it. In general, the road network will be constructed in phases consistent with the needs of the community. The General Plan Circulation Element will incorporate policies and implementation programs which will encourage the orderly development and funding of the street system with priority given to funding and implementing projects which either complete links in the circulation system or relieve existing deficiencies. In addition, Desert Hot Springs shall require dedication and improvement of necessary rights-of-way along master planned streets as conditions of approval on new development and redevelopment projects.

4.10 Alternate Transportation Modes

4.10.1 Southern Pacific Railroad

An integral part of the multi-modal transportation system is the provision for adequate rail service for freight hauling and, when feasible, passenger service. Although any unused capacity on the Southern Pacific railroad line between Los Angeles and Yuma, Arizona is currently being reserved for future growth in freight traffic, the potential for NAFTA funding for a second rail line could allow increased passenger rail service on the Southern Pacific mainline. The City should work with appropriate agencies to plan and implement rail service between the international border crossings in Calexico and the Coachella Valley.

4.10.2 Palm Springs International Airport

Endo Engineering evaluated the traffic impacts associated with the Palm Springs Regional Airport Master Plan Update in September of 1994. With the increased demand projected by the year 2015, the Palm Springs International Airport was projected to generate approximately 44,650 daily trips upon build-out of the Airport Master Plan. A total of 3,283 trips (865 inbound and 2,418 outbound) were projected to be on the surrounding street system during the evening peak hour as a result of airport and airport-related uses. During the morning peak hour, 3,250 trips were projected to occur (2,435 inbound and 815 outbound) on the surrounding street system as a result of airport and airport-related uses.

Heavy congestion was projected for the year 2010 at the Date Palm Drive interchange with Interstate 10 which will require substantial improvements to provide adequate levels of service under future year 2010 conditions. The majority of increased traffic demand for the year 2010 on Date Palm Drive and Gene Autry Trail at Interstate 10 is from development in Desert Hot Springs. A southbound loop will be required at the eastbound ramps for southbound traffic traveling east on Interstate 10. At the westbound ramps, Gene Autry Trail will require four southbound through lanes to accommodate projected Desert Hot Springs traffic in the year 2010.

4.10.3 Public Transportation

Some households within the planning area have no motorized form of private transportation. This portion of the population relies most heavily upon public transportation and includes: students, the elderly, the poor, and those who are disabled or ill and unable to drive.

Desert Hot Springs is currently in the process of designing a future circulation system that will accommodate alternatives to private transportation that meet the needs of all City

residents. To accomplish this goal, the City will make public transit an integral part of Desert Hot Springs's multi-modal circulation system by making it convenient and accessible to users. The City will identify centralized locations for public transportation and ride sharing services as the demand increases enough to warrant it.

Desert Hot Springs will coordinate with SunLine Transit to attain a balance of transportation opportunities including the development of short and long range service plans and the implementation of transit improvements. The City shall also coordinate with SunLine Transit to establish transit stops adjacent to medical facilities, senior citizen facilities, major employment areas, shopping centers and parks.

Desert Hot Springs will require dedication and or construction of appropriate facilities in support of the public transportation system in conjunction with new development and redevelopment activities. The City shall also require developers to construct, where appropriate, transit facilities such as bus pull-outs on arterials and bus stop amenities (including lighted and covered shelters, benches and route information signs). Through the design review process, the City shall encourage developers to include breaks in noise barriers and other community perimeter walls to allow pedestrian access to bus stops.

4.10.4 Non-Motorized Transportation Facilities

Bicycling, walking and equestrian transportation modes represent non-motorized alternatives to the automobile. The CVAG *Non-Motorized Transportation Element* documents on a sub-regional level existing and proposed bicycle, equestrian, pedestrian and other trail facilities, policies and programs that will be necessary to meet the needs of the Coachella Valley in the future.[3]

The Coachella Valley currently has 8.5 miles of bike paths, 62 miles of bike lanes (or paved and striped shoulders), 23 miles of signed bike routes, and 26 miles of sidewalk bikeways, but a contiguous network of bicycle lanes is not currently apparent in the Coachella Valley.

Non-motorized travel can play a part in long-range trips if these facilities provide safe and convenient access to inter-modal facilities. The potential number of daily non-motorized trips in the Coachella Valley has been estimated at 120,370 trips, (based upon survey results from around California and the formula: 4 percent of all employed adults, plus 20 percent of all persons aged 5-14 years).[4]

Figure 3-10 depicts the existing non-motorized facilities within the study area. At present, there are only 0.6 miles of bike lanes (signed or striped bike lane adjacent to the street curb or striped paved shoulder) and no bike paths (separated from the road rught-of-way and designated for exclusive non-motorized use) located within Desert Hot Springs. For nearly half of each year, the weather does not permit the use of non-motorized modes for any trips other than very short ones.

The flat terrain and large areas of undeveloped land in the study area present few physical constraints to non-motorized infrastructure. However, the pavement width on the overpasses of Interstate 10 are currently constrained for bicyclists and pedestrians. In addition, older roadways (like Pierson Boulevard on either side of Palm Drive) do not have enough right-of-way to accommodate bike lanes without eliminating travel lanes.

3. CVAG; *Non-Motorized Transportation Element Draft Master Plan;* May 16, 1995.
4. CVAG; *Non-Motorized Transportation Element Draft Master Plan;* May 16, 1995.

The use of bicycles instead of automobiles as a means of transportation improves health and fitness, provides enjoyment, reduces air pollution, traffic congestion, energy consumption and transportation costs. These benefits justify local and regional government recognition of bicycles as a viable transportation mode for local trips as well as the development and improvement of facilities to accommodate safe and efficient bicycle use.

Alternative modes of transportation are an important component of the circulation system and the physical facilities necessary to make them safe and comfortable are essential. A master plan and renewed commitment toward capital improvement projects and regulations for new development are necessary in order to begin to correct existing deficiencies in providing for pedestrians and bicyclists.

CALTRANS standards are used to design bikeways by most jurisdictions throughout California, including the City of Desert Hot Springs. These standards apply to three different classifications of bicycle facilities: Class I, Class II, and Class III bikeways, as described below.

Class I Bikeway A bike path that provides for bicycle travel on a right-of-way completely separated from any street or highway. The paths may be located along alignments parallel to streets or unrelated alignments as long as there is no encroachment from motor vehicle or pedestrian traffic except at grade intersections.

Class II Bikeway A bike lane that provides a striped lane for one-way bike travel within the paved area of a street or highway. These bike lanes are within an exclusive right-of-way designated for use by bicyclists. However, cross traffic is permitted for driveway access.

Class III Bikeway A bike route in which both bicycle and motor vehicle traffic share the same roadway surface area. The route is marked with signs or stenciled lettering on the pavement identifying the roadway as part of a bikeway system.

The *Coachella Valley Multimodal Transportation Planning Study* includes 4.0 miles of proposed primary bikeways and 5.03 miles of proposed secondary bikeways for a total of 9.03 new bikeway and trail miles within Desert Hot Springs.[5] Figure 4-8 illustrates the non-motorized facilities within the study area currently proposed by CVAG.

Bicycle Facilities

The non-motorized transportation system should be designed to serve a variety of users and trip types, from school children to commuters to casual recreation users. The underlying objective is to enhance safety and enjoyment for residents and encourage the use of non-motorized transport as a viable and preferred alternative form of transportation. Research conducted around the United States by the U.S. Department of Transportation shows a definitive link between bicycle use and (1) average age, and (2) the number of miles of bicycle facilities provided.

5. DKS Associates, Gensler and Associates and NBS Lowry; *Coachella Valley Multimodal Transportation Planning Study;* October 1995; page 2-62.

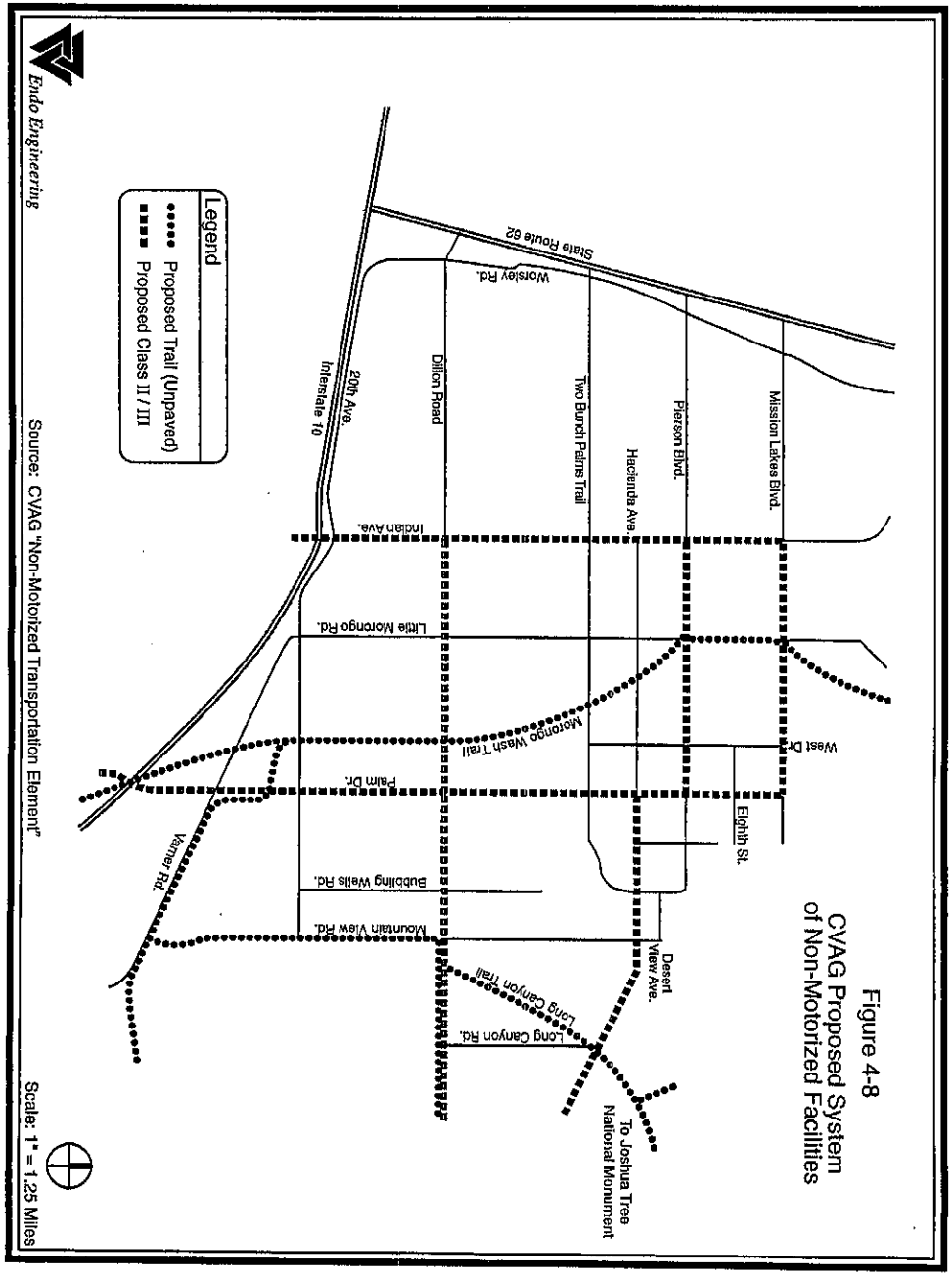


Figure 4-8
CVAG Proposed System of Non-Motorized Facilities

In the future, a Bikeway Plan will be developed to serve as a general guide to the location of bikeways until a Comprehensive Trails System Master Plan can be prepared. It will include an extensive network of bikeways that connect with proposed bikeways in surrounding areas. The proposed Circulation Element includes additional information regarding objectives and policies that Desert Hot Springs will adopt to encourage the use of bicycles as an alternate transportation mode.

The CALTRANS document *Bikeway Planning and Design* (July 1993) is based largely on American Association of State Highway and Transportation Officials (AASHTO) and Federal Highway Administration (FHWA) documents and is the standard by which bikeways are designed and implemented in California. It provides specific design standards for various conditions and details the relationship between bikeways and roadways.

CALTRANS standards provide for three distinct types of bicycle facilities. These include: Class I Bikeways (bike paths), Class II Bikeways (bike lanes), and Class III Bikeways (bike routes without striped lanes). Historically, the emphasis has been on Class I paths, but this has been changing to a preference for Class II and III systems due to budget and environmental constraints which often make construction and maintenance of Class I paths difficult. In addition, rider preference studies have shown that more experienced riders would rather ride in a bike lane than in a separate path because of safety and convenience concerns regarding driveways and crossing at intersections.

The non-motorized sub-regional system in Desert Hot Springs should have good connections to existing and proposed regional bikeway routes, and other routes into adjacent areas. Primary routes should be designed to serve as major non-motorized transportation facilities providing direct connections between major areas. Secondary routes should be designed to serve as collectors from local neighborhoods, schools, parks, employment centers and other major non-motorized traffic generation points which are not served by the primary system.

Each link should serve a definitive purpose whether it is recreation (such as exercise, racing or touring), utility trips (for shopping and errands), or commuting (to work or school). This is important because while recreational riders may be interested in routes leading to parks, through areas of interest or racing circuits, commuters are interested in the shortest, fastest, and safest route between two points. Regardless of which trip purpose is being served, each link should be continuous and minimize the number of arterial crossings and uncontrolled intersections. Links should not duplicate other links that are within one-quarter mile unless they serve two distinct user groups.

The system should provide equitable, reasonable access from all residential neighborhoods to both commuting and recreation routes. The major employment centers should be accessible from all neighborhoods by a reasonably direct system of commuter routes.

All schools and parks should be connected to surrounding residential neighborhoods by bikeways and trails. While not serving every residential street, the system should act as a "feeder" route, where special safety features can be located at busy intersections.

Mixed-use developments should be encouraged that allow walking and bicycling to work places, shopping and recreation opportunities to reduce reliance on low occupancy private vehicles. Major new residential areas should be provided with reasonable access to a recreation loop so that users can ride and exercise without crossing major arterials or having to backtrack.

Multi-use trails and bike paths should be planned along rights-of-way separate from a street or highway along existing washes, rail, water or utility corridors wherever possible. The use of narrow high traffic arterials should be avoided. Whenever possible, Class II bikeways should be located on collector streets, provided there is adequate width.

Bike lanes (a striped lane for one-way bike travel on a street or highway) should be provided rather than bike routes, wherever feasible. While providing bicyclists with signage, bike routes (travel ways through a community denoted by signs only) do not provide any additional margin of safety or comfort for bicyclists. Where bike lanes are not practical due to restricted street widths (or not needed due to wide residential streets or collector streets with low traffic volumes) bike route improvements are a viable alternative.

The average walk trip is 0.25 miles but the average bicycle trip is 2 miles. Most commute bicycle trips are under 5 miles and therefore are not regional trips (except for those commuters linking to another mode at bus stops or Park & Ride lots). Allowing bicycles on other modes at rail or bus, or providing bicycle lockers at multi-modal stations will help extend the range of the bicycle commuter.

Pedestrian Facilities

Pedestrian facilities are typically constructed as part of roadway construction or reconstruction activities. However, pedestrian activity zones or improvement locations may be identified at the discretion of the City. These zones or locations are areas like the Downtown area where a package of planning, design, and operational measures may be made to make the area more pedestrian friendly. As an alternative, traffic calming techniques can be employed to reduce vehicular speeds and encourage pedestrian and other non-motorized activities.

Existing gaps and deficiencies in the sidewalk network should be identified and programmed for future improvement. Sidewalks measuring a minimum of 4 feet wide should be provided on both sides of urban area streets, (but not in low density residential areas). Ramps meeting "Americans with Disabilities Act Accessibility Guidelines" should be provided at all intersections and driveways.

All signalized intersections with approach volumes over 5,000 vehicles per day should provide crosswalks. Separate pedestrian signals and signal activation buttons should be provided where the daily number of pedestrians exceeds 100 persons. A minimum green time of 10 seconds should be provided at all signalized crosswalks, with the minimum green time adjusted to reflect at least 1 second of green time per 3.5 feet of street width. Crosswalks should be provided on major access routes to all schools, with crossing guards provided in the morning and afternoon, where warranted.

Most pedestrian improvements will be localized closures of existing gaps, installation of crosswalks and signals, and other features such as benches. The goal is to improve pedestrian circulation and safety. The bikeway system can also accommodate pedestrian circulation on the Class I bike paths, providing a quiet corridor to run, walk, or commute.

Wide walkways should be constructed in high pedestrian activity generator areas, such as retail centers, government buildings, other employment centers, school campuses and transit stops and stations. Pedestrian activity centers are recommended for all commercial centers. Commercial areas should have pedestrian access ways into adjacent neighborhoods.

To provide clear visibility of pedestrians approaching intersection crosswalks at night, the approaches to and all street corners should be well illuminated, including the crossing and waiting areas. Similarly, all commercial, entertainment, school and other pedestrian generating corridors and spaces should be well illuminated. Left turns should be minimized and in some instances eliminated in downtown areas and in other places of high volume pedestrian use.

4.11 Future Truck Routes

The economy of the planning area relies on the transportation system to move freight efficiently. Truck travel should be encouraged on direct routes to Interstate 10 and State Highway 62 by designating truck routes, as shown in Figure 4-9.

4.12 Riverside County Congestion Management Program

The Riverside County Transportation Commission (RCTC) is the Congestion Management Agency (CMA) responsible for preparing Riverside County's Congestion Management Program (CMP). The CMP is an effort to more directly link land use, transportation and air quality, thereby prompting reasonable growth management programs that will more effectively utilize new and existing transportation funds, alleviate traffic congestion and related impacts and improve air quality.

Any jurisdiction that adopts a Transportation Uniform Mitigation Fee (TUMF) or a subregional deficiency plan that compliments the objectives of the CMP will be found in compliance with the Land Use Coordination requirements of the CMP. Those jurisdictions that do not participate in a TUMF program or adopt a subregional deficiency plan, must follow the Land Use Coordination process described in the CMP. All local jurisdictions must comply with requirements described in the TDM/Air Quality and Conformance Monitoring Elements. A "Local Agency CMP Handbook" is incorporated as an Appendix to the CMP which provides a detailed explanation of each CMP requirement that must be implemented by Riverside County and each of the cities.

4.12.1 Designated CMP System of Highways and Roadways

All State Highways within Riverside County have been designated as part of the CMP System of Highways and Roadways. Within the planning area, the following facilities are designated as part of the CMP System of Highways and Roadways:

- **Interstate 10** (San Bernardino County line to State line);
- **State Route 62** (I-10 to San Bernardino County line).

Additional facilities may be designated as principal arterials during the CMP update process.

4.12.2 Multimodal System Performance Standards

The minimum LOS standard for intersections and segments along the CMP System of Highways and Roadways is LOS "E" unless the intersection or segment had a lower LOS or LOS "F" in 1991. Such facilities are exempt from CMP deficiency plan requirements. However, if the LOS is improved to "E" or better since 1991, the LOS must then be maintained. Intersections or street segments that have dropped to LOS "F" since 1991 will be subject to the development of a deficiency plan prepared by the affected local agencies.

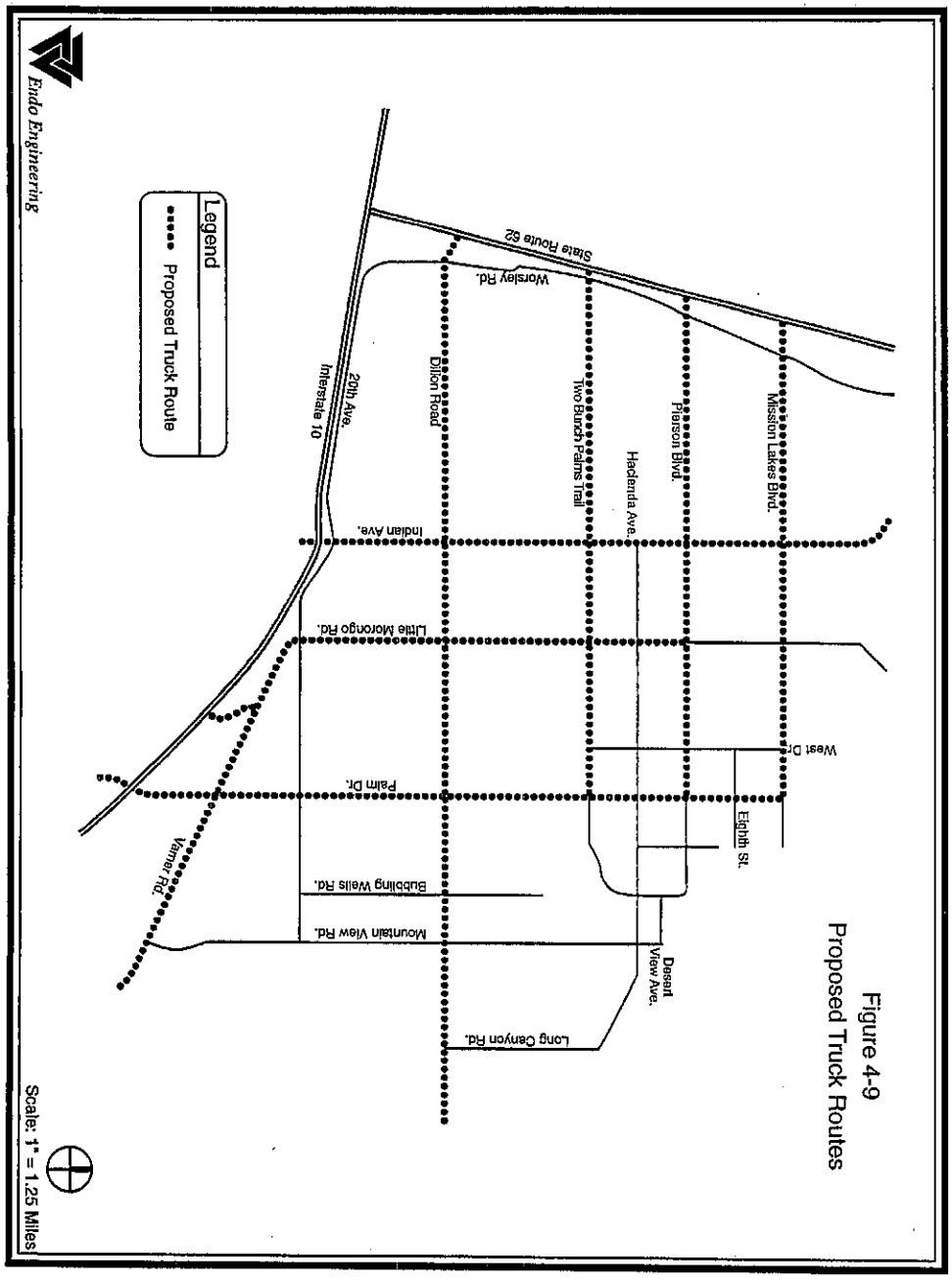


Figure 4-9
Proposed Truck Routes

Minimum public transit frequency, routing and coordination standards are identified in the CMP which are consistent with those described in the Short Range Transit Plan (SRTP) a seven year document consistent with the CMP Capital Improvement Program (CIP) and the Transportation Improvement Program (TIP). SunLine Transit has established public transit routing and service frequency standards for inclusion in the CMP that include the following:

- **Local Urban Service**

  Proposed Route Spacing Standard: 60% of the population should be within 0.25 mile of a bus route or General Public Demand Response Service.

  Proposed Service Frequency Standard: 60 minute headways.

- **Regional Service**

  Proposed Routing and Frequency Standards: Coordinated With Local Transit Services.

- **Demand Responsive Service**

  Existing Service Frequency Standard: Maximum 15 Minutes From Scheduled Pick-Up Time.

  Proposed Frequency Standards: Maximum 15 Minutes From Scheduled Pick-Up Time. Maximum 60-Minute Ride For Any One-Way Trip. Maximum 90-Minute Ride for a Subscription Trip.

- **Express Service**

  Proposed Route Spacing Standard: As appropriate for Demand to Intermodal Centers and/or Major Employment Centers.

  Proposed Frequency Standard: As necessary to Meet Identified Demand.

4.12.3 LOS Deficiency Plans

A city or county may designate individual deficient segments or intersections which do not meet the established LOS standards, if prior to the designation at a noticed public hearing, the city or county has adopted a deficiency plan. The RCTC will prepare deficiency plans on the State Highway System when deficiencies are identified by local jurisdictions.

If transit or Alternative Mass Transit Systems are included as mitigation measures to offset impacts on the CMP System, the minimum Transit/Alternative Mass Transit System Standards must be maintained. Local agencies will be required to identify mitigation measures or improvements to these systems necessary to maintain those minimum standards.

4.12.4 Transportation Demand Management/Air Quality Provisions

The CMP includes alternatives to single occupant auto use, such as transit, and van and carpooling; and must promote strategies to manage overall travel demand such as jobs/housing balance, flextime, telecommuting and parking strategies. Local agencies must adopt a trip reduction and travel demand ordinance and comply with annual CMP monitoring requirements to comply with CMP statutes. The CMP includes model ordinances as an Appendix.

4.12.5 Capital Improvement Program (CIP)

The CIP is a 7-year program that includes all projects which maintain or improve the minimum traffic LOS or transit performance standards as well as conform to transportation-

related emission air quality mitigation measures. Projects in the CIP may be incorporated into the Regional Transportation Improvement Program (RTIP) for the programming of Flexible Congestion Relief (FCR) and Urban and Commuter Rail funds. CIP projects also receive priority for state Traffic Systems Management (TSM) funds.

5.0 PRINCIPAL FINDINGS AND RECOMMENDATIONS

To develop a comprehensive circulation plan that will serve the current and future population in the planning area, it is imperative that circulation opportunities be identified to ensure that they are not overlooked in the planning process. A thorough understanding of circulation needs and deficiencies is also critical so that the future circulation system satisfies both current and future demands for the movement of people and goods.

The local agency should comply with the current Congestion Management Program in place as defined by the Riverside County Transportation Commission (1997). Since traffic demand mitigation programs are a necessary part of the solution to future traffic congestion and all future development in the Desert Hot Springs area, early and continuous liaison with Caltrans on all new development as they affect the State highway system should be maintained.

5.1 INTERSTATE 10 INTERCHANGES

Traffic generated within the planning area will increase dramatically by the time the General Plan is implemented and a significant portion of that traffic will utilize Interstate 10. The current Interstate 10 interchanges at Palm Drive, Indian Avenue, and State Route 62 are spaced approximately 3 miles apart. To accommodate the projected growth, a new Interstate 10 interchange is needed along the extension of Little Morongo Road, between the Indian Avenue interchange and the Palm Drive interchange. Although a new interchange will effectively reduce the future traffic volume on Indian Avenue and Palm Drive, it will not be sufficient in and of itself to ensure acceptable levels of service upon General Plan buildout. Additional capacity enhancing treatments will be required along Indian Avenue, Palm Drive and Little Morongo Road, in the vicinity of Interstate 10, to ensure acceptable levels of service at these gateways to Desert Hot Springs.

Although an improvement alternative has not been selected, a Project Study Report (PSR) has been completed for the Palm Drive interchange at Interstate 10. The PSR addresses two alternatives to upgrade the existing interchange as either an improved diamond interchange or as a partial cloverleaf. To accommodate future traffic volumes, the Indian Avenue interchange should be designated as "Special Study Zone" to insure that the freeway interchange will be designed and improved to provide the additional capacity that Desert Hot Springs will require in the future. The Indian Avenue interchange may be a good candidate for an urban interchange because of the right-of-way constraints associated with the proximity of 20th Avenue.

It is important that the City of Desert Hot Springs preserve access to Interstate 10. Until final plans are completed for each interchange, it is vitally important to preserve sufficient right-of-way along Indian Avenue, Palm Drive and Little Morongo Road, to allow the master planned cross-section to be augmented with exclusive turn lanes at intersections. More detailed analyses of these "Special Study Zones" will be required addressing peak hour traffic demands so that specific cost effective improvements that enhance capacity can be identified.

5.2 State Route 62

State Route 62 is a regional facility that provides a connection between the Twentynine Palms community and Interstate 10. In addition, State Route 62 will provide the primary north/south access for future development located west of State Route 62. With projected through traffic and traffic from adjacent development, State Route 62 is projected to require widening to 6-lanes between Dillon Road and Interstate 10, prior to General Plan buildout.

5.3 Little Morongo Road Interchange at Interstate 10

Based upon projected future traffic volumes at the Indian Avenue and Palm Drive interchanges, it was determined that a new freeway interchange should be proposed between these two interchanges to accommodate a portion of the future traffic. The main north/south corridor that feeds into the new interchange is Little Morongo Road. Although the interchange should be connected to the extension of Little Morongo Road, the interchange was located a short distance east of the Little Morongo Road alignment to avoid Garnet Hill. By locating the interchange east of Garnet Hill, the interchange could provide access to an industrially zoned area in the City of Palm Springs formerly occupied by the Palm Springs Raceway.

5.4 Palm Drive

Palm Drive is currently and will continue to be the primary route to the City of Desert Hot Springs. The General Plan buildout traffic projections exceed the design capacity and generate level of service E along several Palm Drive links between Pierson Boulevard and Interstate 10. These traffic volume projections underscore the need to provide specific capacity enhancing improvements at the key intersections to maintain acceptable levels of service. Adequate right-of-way should be preserved near the major cross-streets (including Dillon Road, Varner Road, and the Interstate 10 ramps) to permit dual left-turn lanes and exclusive right-turn lanes, as needed.

5.5 Dillon Road

Dillon Road parallels Interstate 10 from State Route 62 to the City of Indio. As development extends to the south, Dillon Road will be the primary travel corridor, north of Interstate 10. To ensure adequate capacity for future traffic volumes, access along Dillon Road should be controlled and adequate right-of-way should be preserved at major intersections to permit dual left-turn lanes and exclusive right-turn lanes, as needed.

Appendices

A. Traffic Signal Warrant Analysis
B. Existing Traffic Count Data
C. HCM Methodology and Worksheets
D. Modifications to the CVATS Model Data Files
E. Trip Generation Forecast By Land Use Category

Appendix A

Traffic Signal Warrants
Traffic Signal Warrants Worksheet

Traffic Signal Warrants

(Based on Estimated Average Daily Traffic)

Urban ☐ Rural ☐
Major Street Speed Limit _____

Minimum Requirements Estimated ADT

1. Minimum Vehicular

Satisfied ☐ Not Satisfied ☐

Number of lanes for moving traffic on each approach		Vehicles per day on major street (total of both approaches)		Vehicles per day on higher-volume minor-street approach (one direction only)	
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	1	8,000	5,600	2,400	1,680
2 or more	1	9,600	6,720	2,400	1,680
2 or more	2 or more	9,600	6,720	3,200	2,240
1	2 or more	8,000	5,600	3,200	2,240

2. Interruption of Continuous Traffic

Satisfied ☐ Not Satisfied ☐

Number of lanes for moving traffic on each approach		Vehicles per day on major street (total of both approaches)		Vehicles per day on higher-volume minor-street approach (one direction only)	
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	1	12,000	8,400	1,200	850
2 or more	1	14,400	10,080	1,200	850
2 or more	2 or more	14,400	10,080	1,600	1,120
1	2 or more	12,000	8,400	1,600	1,120

3. Combination of Warrants

Satisfied ☐ Not Satisfied ☐

No one warrant satisfied but following warrants fulfilled 80% or more: ☐ 1 ☐ 2

2 Warrants | 2 Warrants

Notes:

1. Left turn movements from the major street may be included with minor street volumes if a separate signal phase is to be provided for the left-turn movement.
2. To be used only for NEW INTERSECTIONS or other locations where actual traffic volumes cannot be counted.

Endo Engineering

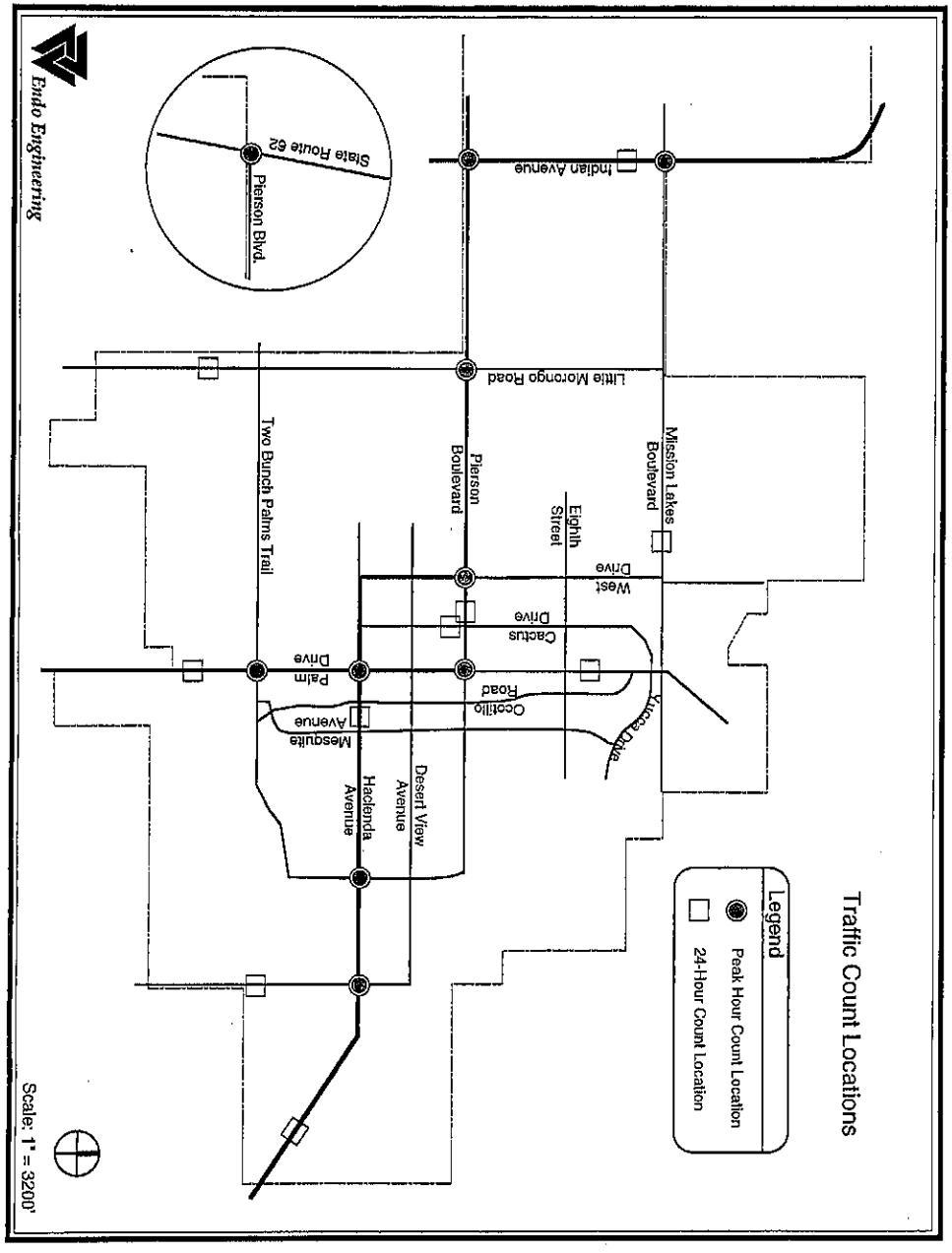
Source: "Traffic Manual" State of California Revised 4/20/77

DHSGP Signal Warrants

Intersection	Major	Approach Lanes		Major Leg Vol		Minor Leg	Warrant 1		Warrant 2		Minor	Major
	Speed	Major	Minor	Leg 1	Leg 2	Volume	Major	Minor	Major	Minor	Approach	Approach
Existing												
Mission Lakes Blvd.	55	1	1	7,245	7,821	2,228	Yes	No	No	Yes	1,114	7,533
Indian Avenue								0.6631	0.8968			
Pierson Blvd.	55	2	1	12,336	12,543	1,077	Yes	No	Yes	No	539	12,440
State Route 62								0.3205		0.6335		
Pierson Blvd.	55	1	1	7,275	8,293	4,043	Yes	Yes	No	Yes	2,022	7,784
Indian Avenue									0.9267			
Pierson Blvd.	55	1	1	5,475	4,294	2,095	No	No	No	Yes	1,048	4,885
Little Morongo							0.8722	0.6235	0.5815			
Pierson Blvd.	45	2	1	5,519	5,976	3,660	No	Yes	No	Yes	1,830	5,748
West Drive							0.8553		0.5702			
Hacienda Avenue	45	1	1	6,375	5,829	989	Yes	No	No	No	495	6,102
Miracle Hill Road								0.2943	0.7264	0.5818		
Hacienda Avenue	45	1	1	4,899	6,493	4,146	Yes	Yes	No	Yes	2,073	5,696
Mountain View Road									0.6781			

Appendix B

Traffic Count Locations
1994 24-Hour Traffic Count Data
1994 Peak Hour Traffic Count Data
Seasonal Traffic Variation Adjustment Factors
Seasonal Adjustment of Peak Hour Intersection Counts
Comparison Between 1999 and 1994 Daily Counts



CITY OF DESERT HOT SPRINGS
INDIAN AVENUE/
SOUTH OF MISSION LAKES BLVD
NOON WED/NOON THUR

COUNTS UNLIMITED
25424 Jaclyn Ave.
Moreno Valley, CA 92557
909.247.8716 FAX 909.924.8804
NORTH/SOUTH

Site Code : 000807
Start Date: 10/26/94
File I.D. : DHINSMNS
Page : 1

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12:15	9		30		5		34		14		64	
12:30	4		32		6		34		10		66	
12:45	5	33	37	142	6	19	35	138	11	52	72	280
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05:30	10		91		24		48		34		139	
05:45	16	42	83	345	25	73	43	188	41	115	126	531
06:00	17		62		49		24		66		86	
06:15	15		59		52		26		67		85	
06:30	19		47		79		26		98		73	
06:45	28	79	52	220	51	241	30	106	85	320	82	326
07:00	14		31		64		27		78		58	
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10:45	36	140	8	51	34	194	8	38	70	334	16	89
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11:15	41		21		55		7		96		28	
11:30	39		9		43		5		82		14	
11:45	50	169	10	57	40	178	8	32	90	347	18	89
Totals	854		2185		1510		1254		2364		3439	
Day Totals		3039				2764				5803		
Split %	36.1%		63.5%		63.8%		36.4%					

Peak Hour	11:00	04:45	07:30	05:00	07:15	05:00
	169	351	308	186	428	531
	.84	.96	.87	.93	.87	.94

CITY OF DESERT HOT SPRINGS
PALM DRIVE/
NORTH OF EIGHTH STREET
12AM-12AM THURSDAY

COUNTS UNLIMITED
25424 Jaclyn Ave.
Moreno Valley, CA 92557
909.247.6716 FAX 909.924.8604
NORTH/SOUTH

Site Code : 09862528
Start Date: 10/27/94
File I.D. : DHPAN8NS
Page : 1

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Day Totals		2787				2408				5195		
Split %	43.4%		59.1%		56.8%		40.8%					
Peak Hour	10:30		05:00		07:00		05:45		09:30		05:30	
	165		247		205		167		322		403	
	.89		.95		.81		.75		.90		.91	

CITY OF DESERT HOT SPRINGS
PALM DRIVE/
SOUTH OF TWO BUNCH PALMS TRAIL
12AM/12AM THURSDAY

COUNTS UNLIMITED
25424 Jaclyn Ave.
Moreno Valley, CA 92557
909.247.6716 FAX 909.924.8604
NORTH/SOUTH

Site Code : 09862417
Start Date: 10/27/94
File I.D. : DHPAS2NS
Page : 1

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05:00	13		208		21		151		34		359	
05:15	19		215		35		136		54		351	
05:30	24		267		75		141		99		348	
05:45	24	80	177	867	72	203	156	584	96	283	333	1391
06:00	29		188		88		184		117		332	
06:15	44		172		99		152		143		324	
06:30	59		154		197		140		256		304	
06:45	64	196	160	664	169	553	128	564	233	749	288	1248
07:00	90		147		174		125		264		272	
07:15	142		117		172		111		314		228	
07:30	115		103		264		98		379		201	
07:45	93	440	99	486	163	773	95	429	256	1213	194	895
08:00	106		93		128		78		234		171	
08:15	111		93		137		81		248		174	
08:30	159		91		172		74		331		165	
08:45	157	533	84	361	137	574	72	305	294	1107	156	666
09:00	114		104		163		82		277		185	
09:15	97		84		136		65		233		149	
09:30	118		75		123		60		241		135	
09:45	145	474	71	334	136	558	55	262	281	1032	125	596
10:00	126		86		152		46		278		136	
10:15	126		54		159		43		285		97	
10:30	163		58		164		40		327		98	
10:45	149	564	47	247	153	626	37	168	302	1192	84	415
11:00	147		45		136		43		283		88	
11:15	136		39		159		29		295		68	
11:30	142		39		153		19		295		58	
11:45	128	553	30	153	175	623	20	111	303	1176	50	264
Totals	3084		6486		4171		5610		7255		12096	
Day Totals		9570				9781				19351		
Split %	42.5%		53.6%		57.4%		46.3%					
Peak Hour	10:30		04:45		06:45		03:00		07:00		03:00	
	595		829		779		706		1213		1509	
	.91		.96		.73		.92		.89		.95	

CITY OF DESERT HOT SPRINGS
HACIENDA AVENUE/
BETWEEN MESQUITE & OCOTILLO
3:30 WED/3:30 THUR

COUNTS UNLIMITED
25424 Jaclyn Ave.
Moreno Valley, CA 92557
909.247.6716 FAX 909.924.8604

Site Code : 098831
Start Date: 10/26/94
File I.D. : DHHAOMEW
Page : 1

EAST/WEST

Begin	EBND				WBND				Combined			
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
12:00 10/26	5		41		3		37		8		78	
12:15	3		44		6		54		9		98	
12:30	4		38		1		51		5		89	
12:45	3	15	39	162	3	13	50	192	6	28	89	354
01:00	4		39		4		46		8		85	
01:15	1		43		1		45		2		88	
01:30	1		47		2		52		3		99	
01:45	1	7	45	174	0	7	41	184	1	14	86	358
02:00	1		53		4		61		5		114	
02:15	1		37		6		36		7		73	
02:30	2		45		3		60		5		105	
02:45	2	6	54	189	2	15	48	205	4	21	102	394
03:00	3		62		1		38		4		100	
03:15	0		42		2		70		2		112	
03:30	0		65		1		63		1		128	
03:45	2	5	55	224	3	7	57	228	5	12	112	452
04:00	4		60		1		56		5		116	
04:15	2		60		6		53		8		113	
04:30	1		43		9		54		10		97	
04:45	1	8	71	234	2	18	66	229	3	26	137	463
05:00	4		53		6		32		10		85	
05:15	3		55		12		60		15		115	
05:30	3		45		8		47		11		92	
05:45	8	18	40	193	15	41	57	196	23	59	97	389
06:00	13		40		18		48		31		88	
06:15	15		53		15		48		30		101	
06:30	16		49		24		47		40		96	
06:45	8	52	41	183	37	94	35	178	45	146	76	361
07:00	15		35		34		51		49		86	
07:15	24		30		20		27		44		57	
07:30	25		32		36		19		61		51	
07:45	24	88	29	126	37	127	40	137	61	215	69	263
08:00	36		30		35		21		71		51	
08:15	26		22		45		27		71		49	
08:30	47		31		60		26		107		57	
08:45	43	152	30	113	76	216	24	98	119	368	54	211
09:00	50		29		46		22		96		51	
09:15	20		20		54		15		74		35	
09:30	40		26		52		18		92		44	
09:45	46	156	25	100	61	213	16	71	107	369	41	171
10:00	34		19		49		9		83		28	
10:15	24		30		46		11		70		41	
10:30	38		11		48		12		86		23	
10:45	35	131	5	65	44	187	8	40	79	318	13	105
11:00	50		3		51		10		101		13	
11:15	37		12		50		9		87		21	
11:30	42		7		50		7		92		14	
11:45	44	173	9	31	38	189	7	33	82	362	16	64
Totals	811		1794		1127		1791		1938		3585	
Day Totals		2605				2918				5523		
Split %	41.8%		50.0%		58.1%		49.9%					

Peak Hour	11:00	03:30	08:30	03:15	08:30	03:30
	173	240	236	246	396	459
	.86	.92	.77	.87	.83	.91

CITY OF DESERT HOT SPRINGS
MOUNTAIN VIEW ROAD/
SOUTH OF HACIENDA AVENUE
12AM/12AM THURSDAY

COUNTS UNLIMITED
25424 Jaclyn Ave.
Moreno Valley, CA 92557
909.247.6716 FAX 909.924.8604

Site Code : 09682927
Start Date: 10/27/94
File I.D. : DHMVSHNS
Page : 1

NORTH/SOUTH

Begin	NBND				SBND				Combined			
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
12:00 10/27	6		27		2		19		8		46	
12:15	9		33		1		22		10		55	
12:30	6		29		3		27		9		56	
12:45	5	26	19	108	2	8	16	94	7	34	35	192
01:00	4		21		0		27		4		48	
01:15	4		20		2		25		6		45	
01:30	2		30		0		20		2		50	
01:45	1	11	34	105	1	3	26	98	2	14	60	203
02:00	2		32		2		24		4		56	
02:15	2		32		0		21		2		53	
02:30	0		50		3		20		3		70	
02:45	2	6	27	141	3	8	26	91	5	14	53	232
03:00	4		45		1		22		5		67	
03:15	3		54		1		27		4		81	
03:30	1		38		0		28		1		66	
03:45	1	9	36	173	0	2	28	105	1	11	64	278
04:00	3		47		1		29		4		76	
04:15	4		46		7		27		11		73	
04:30	5		45		3		26		8		71	
04:45	2	14	55	193	2	13	20	102	4	27	75	295
05:00	7		37		2		25		9		62	
05:15	3		50		6		24		9		84	
05:30	7		58		5		24		12		92	
05:45	5	22	58	223	11	24	35	109	16	46	93	331
06:00	16		45		28		19		43		65	
06:15	10		43		34		23		44		66	
06:30	22		45		25		18		47		62	
06:45	9	56	31	165	22	109	11	89	31	165	42	235
07:00	13		14		39		13		52		27	
07:15	21		27		45		6		66		33	
07:30	37		19		52		5		89		24	
07:45	24	95	17	77	38	174	18	42	62	269	35	119
08:00	20		29		43		14		63		43	
08:15	24		25		33		8		57		33	
08:30	31		25		44		11		75		36	
08:45	29	104	22	101	16	138	10	43	47	242	32	144
09:00	28		21		32		9		60		30	
09:15	29		16		21		5		50		21	
09:30	23		17		31		7		54		24	
09:45	16	96	17	71	25	109	4	25	41	205	21	96
10:00	23		14		21		10		44		24	
10:15	25		11		25		8		51		19	
10:30	30		10		22		9		52		19	
10:45	26	105	12	47	21	89	6	33	47	194	18	80
11:00	25		8		17		3		42		9	
11:15	21		10		23		5		44		15	
11:30	29		12		19		3		48		15	
11:45	20	95	7	35	24	83	1	12	44	178	8	47
Totals	639		1440		760		812		1399		2252	
Day Totals		2079				1572				3851		
Split %	45.6%		63.9%		54.3%		36.0%					

Peak Hour	08:30	05:15	07:15	03:15	07:15	05:15
	117	232	178	112	280	334
	.94	.85	.85	.96	.78	.89

CITY OF DESERT HOT SPRINGS
HACIENDA AVENUE/
AT EAST CITY LIMITS
8:00 AM/8:00 AM

COUNTS UNLIMITED
25424 Jaclyn Ave.
Moreno Valley, CA 92557
909.247.5715 FAX 909.924.8604
EAST/WEST

Site Code : 098811
Start Date: 11/01/94
File I.D. : DHHAECEW
Page : 1

Begin	EBND				WBND				Combined				
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		
12:00 11/01	2		24		0		18		2		42		
12:15	4		22		1		14		5		36		
12:30	2		25		0		22		2		47		
12:45	0	6	9	80	1	2	15	69	1	10	24	149	
01:00	0		18		0		13		0		31		
01:15	0		15		1		9		1		24		
01:30	0		17		1		13		1		30		
01:45	0	*	13	63	0	2	14	49	0	2	27	112	
02:00	0		16		0		16		0		32		
02:15	0		20		1		11		1		31		
02:30	1		19		0		22		1		41		
02:45	0	1	12	67	0	1	17	66	0	2	29	133	
03:00	0		19		0		10		0		29		
03:15	1		24		0		18		1		42		
03:30	0		24		1		17		1		41		
03:45	0	1	23	90	0	1	18	63	0	2	41	153	
04:00	0		25		1		11		1		36		
04:15	0		21		0		12		0		33		
04:30	0		16		2		10		2		26		
04:45	0	*	18	62	3	4	9	42	3	4	27	124	
05:00	0		16		3		9		3		25		
05:15	0		13		0		12		0		25		
05:30	7		9		2		10		9		19		
05:45	3	10	6	46	1	6	1	32	4	16	9	78	
06:00	3		12		0		11		3		23		
06:15	1		13		10		11		11		24		
06:30	3		10		10		7		13		17		
06:45	8	15	8	43	2	22	6	35	10	37	14	78	
07:00	6		5		9		4		15		9		
07:15	6		5		12		8		18		13		
07:30	9		5		7		5		16		10		
07:45	11	32	8	23	16	45	0	17	29	78	8	40	
08:00	5		4		14		1		19		5		
08:15	8		5		10		2		18		7		
08:30	8		2		16		2		26		4		
08:45	11	32	5	16	28	70	2	7	39	102	7	23	
09:00	10		4		20		2		30		6		
09:15	8		7		15		0		23		7		
09:30	13		4		21		1		34		5		
09:45	15	46	6	21	16	72	2	5	31	118	8	26	
10:00	19		5		12		2		31		7		
10:15	16		2		15		5		31		7		
10:30	15		2		20		1		35		3		
10:45	15	65	0	9	16	63	0	8	31	128	0	17	
11:00	13		0		14		1		27		1		
11:15	22		3		14		1		36		4		
11:30	25		1		6		1		33		2		
11:45	12	72	3	7	17	53	2	5	29	125	5	12	
Totals	282		547		342		398		624		945		
Day Totals		829				740				1569			
Split %	45.1%		57.8%		54.8%		42.1%						
Peak Hour	10:45		03:15		09:45		00:00		10:30		03:15		
	75		96		84		69		129		160		
	.75		.96		.75		.78		.89		.95		

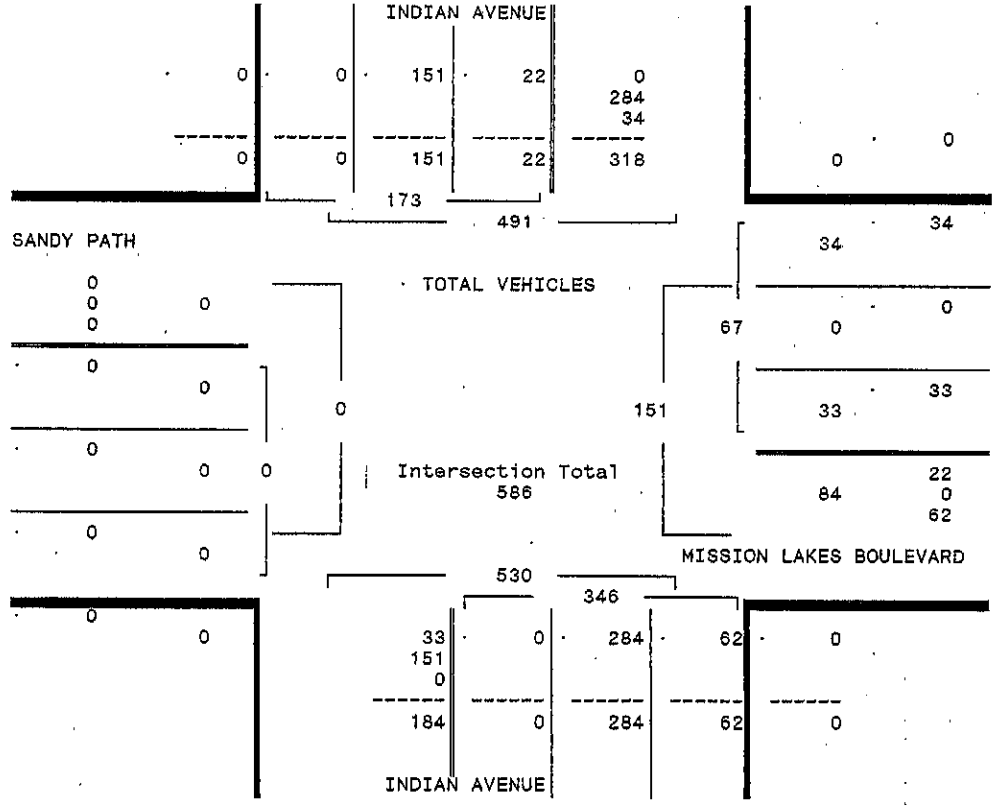
CITY OF DESERT HOT SPRINGS
N/S: INDIAN AVENUE
E/W: MISSION LAKES BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-5716

Site Code : 00098823
Start Date: 10/26/94
File I.D. : DHINWLPM
Page : 1

TOTAL VEHICLES

	INDIAN AVENUE Southbound			MISSION LAKES BOULEVARD Westbound			INDIAN AVENUE Northbound			SANDY PATH Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/26/94													
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/26/94													
Peak start 17:00				17:00			17:00			17:00			
Volume	22	151	0	33	0	34	0	284	62	0	0	0	
Percent	13%	87%	0%	49%	0%	51%	0%	82%	18%	0%	0%	0%	
Pk total	173			67			346			0			
Highest	17:15			17:30			17:15			16:00			
Volume	5	46	0	11	0	10	0	72	19	0	0	0	
Hi total	51			21			91			0			
PHF	.85			.80			.95			.0			



COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

CITY OF DESERT HOT SPRINGS
N/S: INDIAN AVENUE
E/W: MISSION LAKES BOULEVARD
WEATHER: SUNNY

Site Code : 00098823
Start Date: 10/26/94
File I.D. : DHINMLPM
Page : 1

TOTAL VEHICLES

	INDIAN AVENUE Southbound			MISSION LAKES BOULEVARD Westbound			INDIAN AVENUE Northbound			SANDY PATH Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/26/94													
16:00	4	40	0	4	0	8	0	55	15	0	0	0	126
16:15	6	31	0	4	0	12	0	72	18	0	0	0	143
16:30	4	20	0	10	0	9	0	58	16	0	0	0	117
16:45	7	19	0	12	0	6	0	74	17	0	0	0	135
Hr Total	21	110	0	30	0	35	0	259	66	0	0	0	521
17:00	5	35	0	8	0	12	0	65	11	0	0	0	137
17:15	5	46	0	8	0	6	0	72	19	0	0	0	156
17:30	6	32	0	11	0	10	0	71	15	0	0	0	146
17:45	6	38	0	6	0	6	0	75	16	0	0	0	147
Hr Total	22	151	0	33	0	34	0	284	62	0	0	0	586
TOTAL	43	261	0	63	0	69	0	543	128	0	0	0	1107

Peak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 10/26/94

Peak start	17:00			16:15			17:00			17:00		
Volume	22	151	0	34	0	39	0	284	62	0	0	0
Percent	13%	87%	0%	47%	0%	53%	0%	82%	18%	0%	0%	0%
Pk total	173			73			346			0		
Highest	17:15			17:00			17:15			16:00		
Volume	5	46	0	8	0	12	0	72	19	0	0	0
Hi total	51			20			91			0		
PHF	.85			.91			.95			.0		

Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/26/94

Peak start	17:00			17:00			17:00			17:00		
Volume	22	151	0	33	0	34	0	284	62	0	0	0
Percent	13%	87%	0%	49%	0%	51%	0%	82%	18%	0%	0%	0%
Pk total	173			67			346			0		
Highest	17:15			17:30			17:15			16:00		
Volume	5	46	0	11	0	10	0	72	19	0	0	0
Hi total	51			21			91			0		
PHF	.85			.80			.95			.0		

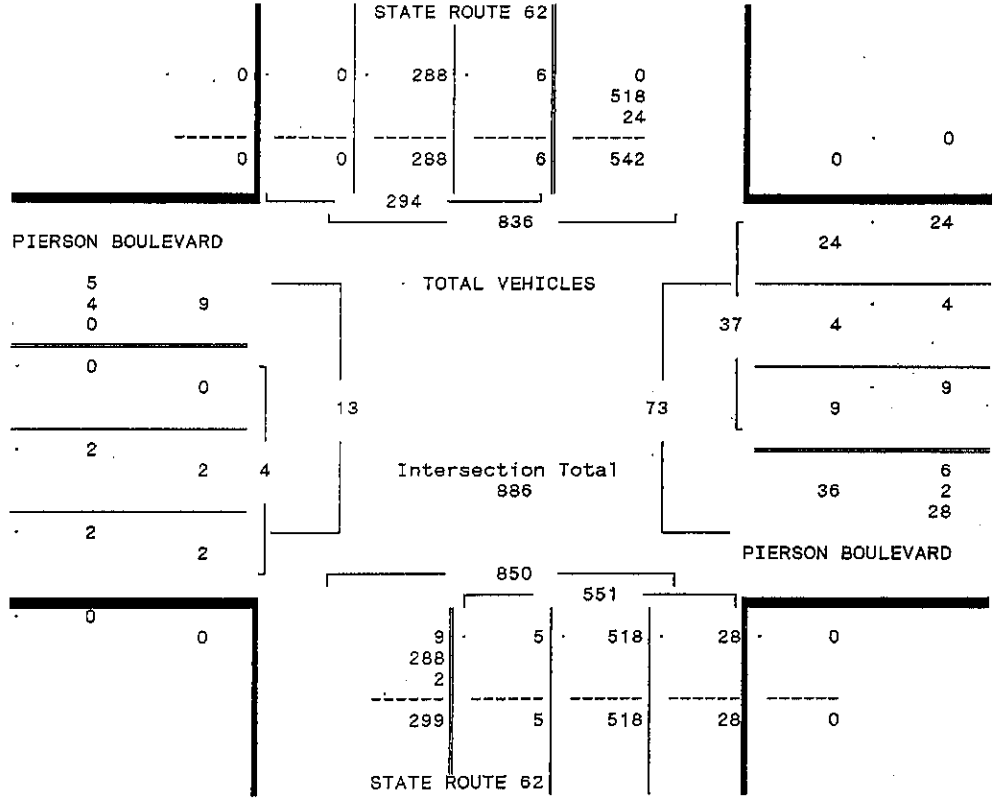
COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

CITY OF DESERT HOT SPRINGS
N/S: STATE ROUTE 62
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

Site Code : 00098811
Start Date: 10/27/94
File I.D. : DH62PIPM
Page : 1

TOTAL VEHICLES

	STATE ROUTE 62 Southbound			PIERSON BOULEVARD Westbound			STATE ROUTE 62 Northbound			PIERSON BOULEVARD Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/27/94													
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/27/94													
Peak start	16:45			16:45			16:45			16:45			
Volume	6	286	0	9	4	24	5	518	28	0	2	2	
Percent	2%	98%	0%	24%	11%	65%	1%	94%	5%	0%	50%	50%	
Pk total	294			37			551			4			
Highest	17:30			17:00			17:15			16:45			
Volume	3	85	0	3	1	7	0	139	8	0	1	1	
Hi total	88			11			147			2			
PHF	.84			.84			.94			.50			



CITY OF DESERT HOT SPRINGS
N/S: STATE ROUTE 62
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098811
Start Date: 10/27/94
File I.D. : DH62PIPM
Page : 1

TOTAL VEHICLES

	STATE ROUTE 62 Southbound			PIERSON BOULEVARD Westbound			STATE ROUTE 62 Northbound			PIERSON BOULEVARD Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/27/94													
16:00	2	66	0	6	2	9	4	93	4	0	0	1	187
16:15	1	62	0	6	0	3	1	128	11	0	0	0	212
16:30	1	99	0	5	0	2	1	117	3	0	0	0	228
16:45	0	77	0	1	0	6	0	126	6	0	1	1	218
Hr Total	4	304	0	18	2	20	6	464	24	0	1	2	845
17:00	2	57	0	3	1	7	2	116	9	0	1	0	198
17:15	1	69	0	2	2	7	0	139	8	0	0	1	229
17:30	3	85	0	3	1	4	3	137	5	0	0	0	241
17:45	3	66	0	7	0	5	2	119	12	0	3	0	217
Hr Total	9	277	0	15	4	23	7	511	34	0	4	1	885
TOTAL	13	581	0	33	6	43	13	975	58	0	5	3	1730

Peak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 10/27/94

Peak start	16:00			17:00			17:00			17:00		
Volume	4	304	0	15	4	23	7	511	34	0	4	1
Percent	1%	99%	0%	36%	10%	55%	1%	93%	6%	0%	80%	20%
Pk total	308			42			552			5		
Highest	16:30			17:45			17:15			17:45		
Volume	1	99	0	7	0	5	0	139	8	0	3	0
Hi total	100			12			147			3		
PHF	.77			.88			.94			.42		

Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/27/94

Peak start	16:45			16:45			16:45			16:45		
Volume	6	288	0	9	4	24	5	518	28	0	2	2
Percent	2%	98%	0%	24%	11%	65%	1%	94%	5%	0%	50%	50%
Pk total	294			37			551			4		
Highest	17:30			17:00			17:15			16:45		
Volume	3	85	0	3	1	7	0	139	8	0	1	1
Hi total	88			11			147			2		
PHF	.84			.84			.94			.50		

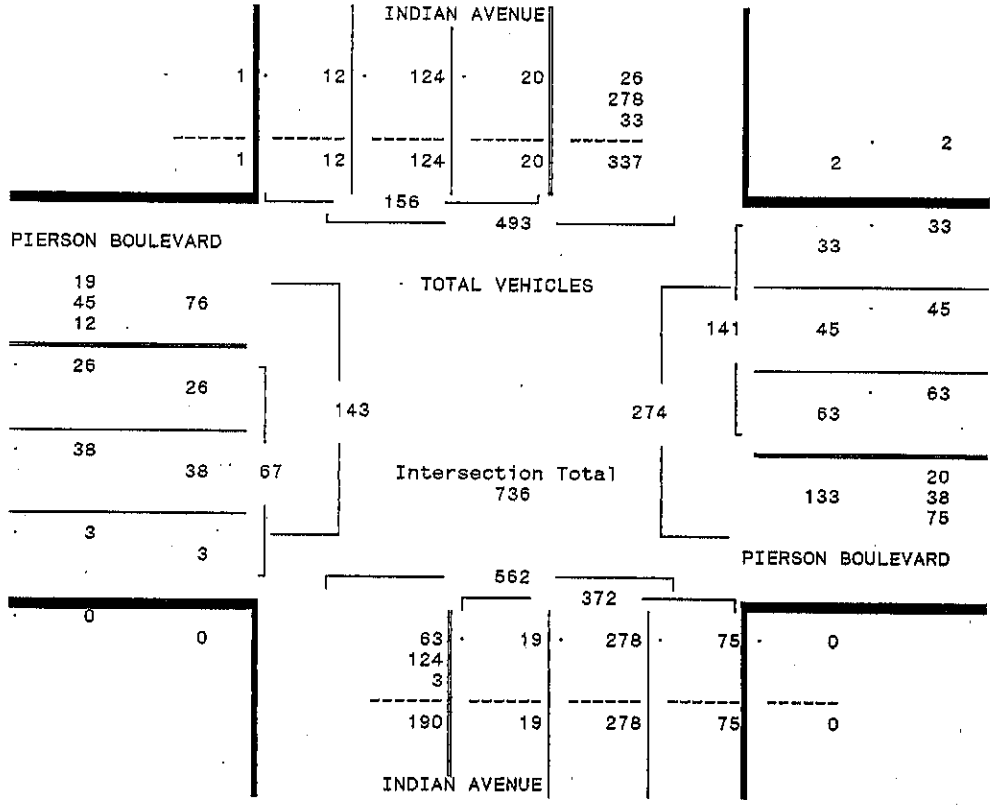
CITY OF DESERT HOT SPRINGS
N/S: INDIAN AVENUE
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098811
Start Date: 10/26/94
File I.D. : DHINPIPM
Page : 1

TOTAL VEHICLES

	INDIAN AVENUE Southbound			PIERSON BOULEVARD Westbound			INDIAN AVENUE Northbound			PIERSON BOULEVARD Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/26/94													
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/26/94													
Peak start	16:45			16:45			16:45			16:45			
Volume	20	124	12	63	45	33	19	278	75	26	38	3	
Percent	13%	79%	8%	45%	32%	23%	5%	75%	20%	39%	57%	4%	
Pk total	156			141			372			67			
Highest	17:15			17:30			17:30			17:15			
Volume	6	33	4	14	14	10	5	73	24	9	12	0	
Hi total	43			38			102			21			
PHF	.91			.93			.91			.80			



CITY OF DESERT HOT SPRINGS
N/S: INDIAN AVENUE
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098811
Start Date: 10/26/94
File I.D. : DHINPIPM
Page : 1

TOTAL VEHICLES

	INDIAN AVENUE Southbound			PIERSON BOULEVARD Westbound			INDIAN AVENUE Northbound			PIERSON BOULEVARD Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/26/94													
16:00	9	32	3	13	17	7	2	63	21	5	12	0	184
16:15	3	26	1	17	7	10	3	67	19	6	11	1	171
16:30	8	21	6	14	14	9	3	64	21	7	11	1	179
16:45	5	22	5	11	15	10	5	73	20	7	5	0	178
Hr Total	25	101	15	55	53	36	13	267	81	25	39	2	712
17:00	5	31	2	20	7	8	6	60	10	4	7	2	162
17:15	6	33	4	18	9	5	3	72	21	9	12	0	192
17:30	4	38	1	14	14	10	5	73	24	6	14	1	204
17:45	5	23	5	11	9	13	1	52	14	10	11	0	154
Hr Total	20	125	12	63	39	36	15	257	69	29	44	3	712
TOTAL	45	226	27	118	92	72	28	524	150	54	83	5	1424

Peak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 10/26/94

Peak start	17:00			16:00			16:45			17:00		
Volume	20	125	12	55	53	36	19	278	75	29	44	3
Percent	13%	80%	8%	38%	37%	25%	5%	75%	20%	38%	58%	4%
Pk total	157			144			372			76		
Highest	17:15			16:00			17:30			17:15		
Volume	6	33	4	13	17	7	5	73	24	9	12	0
Hi total	43			37			102			21		
PHF	.91			.97			.91			.90		

Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/26/94

Peak start	16:45			16:45			16:45			16:45		
Volume	20	124	12	63	45	33	19	278	75	26	38	3
Percent	13%	79%	8%	45%	32%	23%	5%	75%	20%	39%	57%	4%
Pk total	156			141			372			67		
Highest	17:15			17:30			17:30			17:15		
Volume	6	33	4	14	14	10	5	73	24	9	12	0
Hi total	43			38			102			21		
PHF	.91			.93			.91			.80		

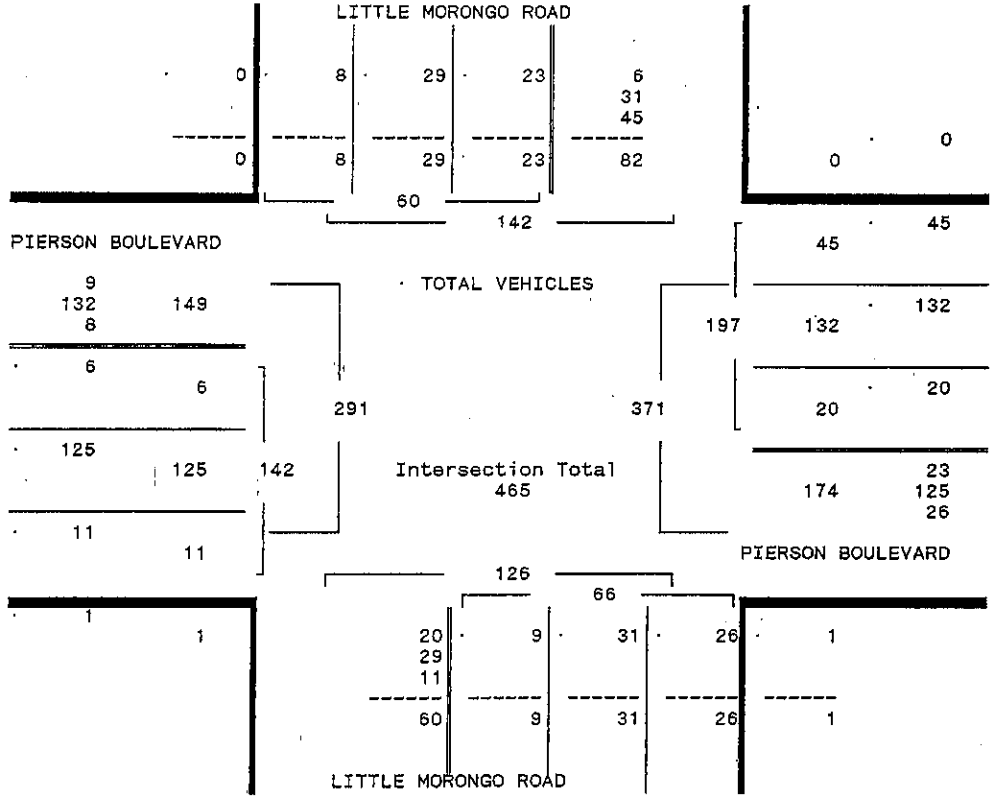
CITY OF DESERT HOT SPRINGS
N/S: LITTLE MORONGO ROAD
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098820
Start Date: 10/27/94
File I.D. : DHLMPIPM
Page : 1

TOTAL VEHICLES

	LITTLE MORONGO ROAD Southbound			PIERSON BOULEVARD Westbound			LITTLE MORONGO ROAD Northbound			PIERSON BOULEVARD Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/27/94													
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/27/94													
Peak start	16:15			16:15			16:15			16:15			
Volume	23	29	8	20	132	45	9	31	26	6	125	11	
Percent	38%	48%	13%	10%	67%	23%	14%	47%	39%	4%	88%	8%	
Pk total	80			197			66			142			
Highest	16:45			16:45			16:15			16:15			
Volume	5	9	5	3	40	14	2	11	9	4	42	3	
Hi total	19			57			22			49			
PHF	.79			.86			.75			.72			



CITY OF DESERT HOT SPRINGS
N/S: LITTLE MORONGO ROAD
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098820
Start Date: 10/27/94
File I.D. : DHLMPIPM
Page : 1

TOTAL VEHICLES

	LITTLE MORONGO ROAD Southbound			PIERSON BOULEVARD Westbound			LITTLE MORONGO ROAD Northbound			PIERSON BOULEVARD Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/27/94													
16:00	2	5	0	2	30	8	4	13	6	0	26	0	96
16:15	4	6	2	8	37	9	2	11	9	4	42	3	137
16:30	8	10	0	3	26	10	5	5	10	1	25	3	105
16:45	5	9	5	3	40	14	0	7	1	1	25	2	112
Hr Total	19	30	7	16	133	41	11	36	26	6	118	8	451
17:00	6	4	1	6	29	12	2	8	6	0	33	3	110
17:15	2	6	1	2	19	9	7	12	6	2	26	1	93
17:30	4	3	0	2	34	5	2	7	4	3	36	2	102
17:45	3	10	0	2	33	4	1	18	1	3	52	3	130
Hr Total	15	23	2	12	115	30	12	45	17	8	147	9	435
TOTAL	34	53	9	28	248	71	23	81	43	14	265	17	886

Peak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 10/27/94

Peak start	16:15			16:15			17:00			17:00		
Volume	23	29	8	20	132	45	12	45	17	8	147	9
Percent	38%	48%	13%	10%	67%	23%	16%	61%	23%	5%	90%	5%
Pk total	60			197			74			164		
Highest	16:45			16:45			17:15			17:45		
Volume	5	9	5	3	40	14	7	12	6	3	52	3
Hi total	19			57			25			58		
PHF	.79			.86			.74			.71		

Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/27/94

Peak start	16:15			16:15			16:15			16:15		
Volume	23	29	8	20	132	45	9	31	26	6	125	11
Percent	38%	48%	13%	10%	67%	23%	14%	47%	39%	4%	88%	8%
Pk total	60			197			66			142		
Highest	16:45			16:45			16:15			16:15		
Volume	5	9	5	3	40	14	2	11	9	4	42	3
Hi total	19			57			22			49		
PHF	.79			.86			.75			.72		

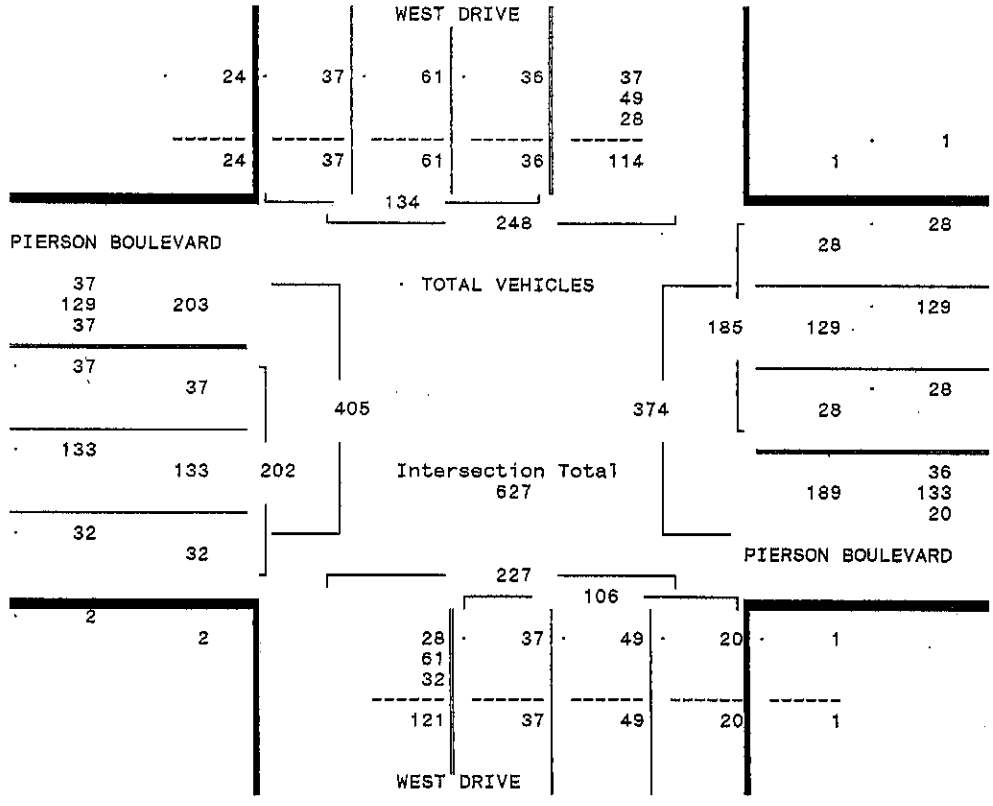
CITY OF DESERT HOT SPRINGS
N/S: WEST DRIVE
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098821
Start Date: 10/27/94
File I.D. : DHWEPIPM
Page : 1

TOTAL VEHICLES

	WEST DRIVE Southbound			PIERSON BOULEVARD Westbound			WEST DRIVE Northbound			PIERSON BOULEVARD Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/27/94													
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/27/94													
Peak start	16:00			16:00			16:00			16:00			
Volume	36	61	37	28	129	28	37	49	20	37	133	32	
Percent	27%	46%	28%	15%	70%	15%	35%	46%	19%	18%	66%	16%	
Pk total	134			185			106			202			
Highest	16:00			16:15			16:00			16:15			
Volume	15	23	9	8	47	8	13	17	8	8	44	8	
Hi total	47			61			38			60			
PHF	.71			.76			.70			.84			



CITY OF DESERT HOT SPRINGS
N/S: WEST DRIVE
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098821
Start Date: 10/27/94
File I.D. : DHWEPIPM
Page : 1

TOTAL VEHICLES

	WEST DRIVE Southbound			PIERSON BOULEVARD Westbound			WEST DRIVE Northbound			PIERSON BOULEVARD Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/27/94													
16:00	15	23	9	7	27	5	13	17	8	9	29	8	170
16:15	13	12	5	6	47	8	8	7	4	8	44	8	170
16:30	4	13	11	4	25	6	6	15	5	13	24	10	136
16:45	4	13	12	11	30	9	10	10	3	7	36	6	151
Hr Total	36	61	37	28	129	28	37	49	20	37	133	32	627
17:00	4	13	7	3	32	8	5	17	6	9	33	6	143
17:15	11	15	4	5	24	8	3	19	5	12	23	4	133
17:30	7	22	4	2	33	10	8	10	4	14	27	7	148
17:45	3	23	5	8	31	8	6	18	2	13	26	15	158
Hr Total	25	73	20	18	120	34	22	64	17	48	109	32	582
TOTAL	61	134	57	46	249	62	59	113	37	85	242	64	1209

Peak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 10/27/94

Peak start	16:00			16:15			16:00			16:15		
Volume	36	61	37	24	134	31	37	49	20	37	137	30
Percent	27%	46%	28%	13%	71%	16%	35%	46%	19%	18%	67%	15%
Pk total	134			189			106			204		
Highest	16:00			16:15			16:00			16:15		
Volume	15	23	9	6	47	8	13	17	8	8	44	8
Hi total	47			61			38			60		
PHF	.71			.77			.70			.85		

Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/27/94

Peak start	16:00			16:00			16:00			16:00		
Volume	36	61	37	28	129	28	37	49	20	37	133	32
Percent	27%	46%	28%	15%	70%	15%	35%	46%	19%	18%	66%	16%
Pk total	134			185			106			202		
Highest	16:00			16:15			16:00			16:15		
Volume	15	23	9	6	47	8	13	17	8	8	44	8
Hi total	47			61			38			60		
PHF	.71			.75			.70			.84		

CITY OF DESERT HOT SPRINGS
N/S: WEST DRIVE
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098821
Start Date: 10/27/94
File I.D. : DHWEPIPM
Page : 1

TOTAL PEDESTRIANS

	WEST DRIVE Southbound	PIERSON BOULEVARD Westbound	WEST DRIVE Northbound	PIERSON BOULEVARD Eastbound	
	Other	Other	Other	Other	Total
Date 10/27/94					
16:00	13	0	0	0	13
16:15	4	0	0	0	4
16:30	7	1	1	1	10
16:45	0	0	0	1	1
Hr Total	24	1	1	2	28
17:00	13	0	2	2	17
17:15	2	1	1	1	5
17:30	8	0	0	0	8
17:45	4	0	0	0	4
Hr Total	27	1	3	3	34
TOTAL	51	2	4	5	62

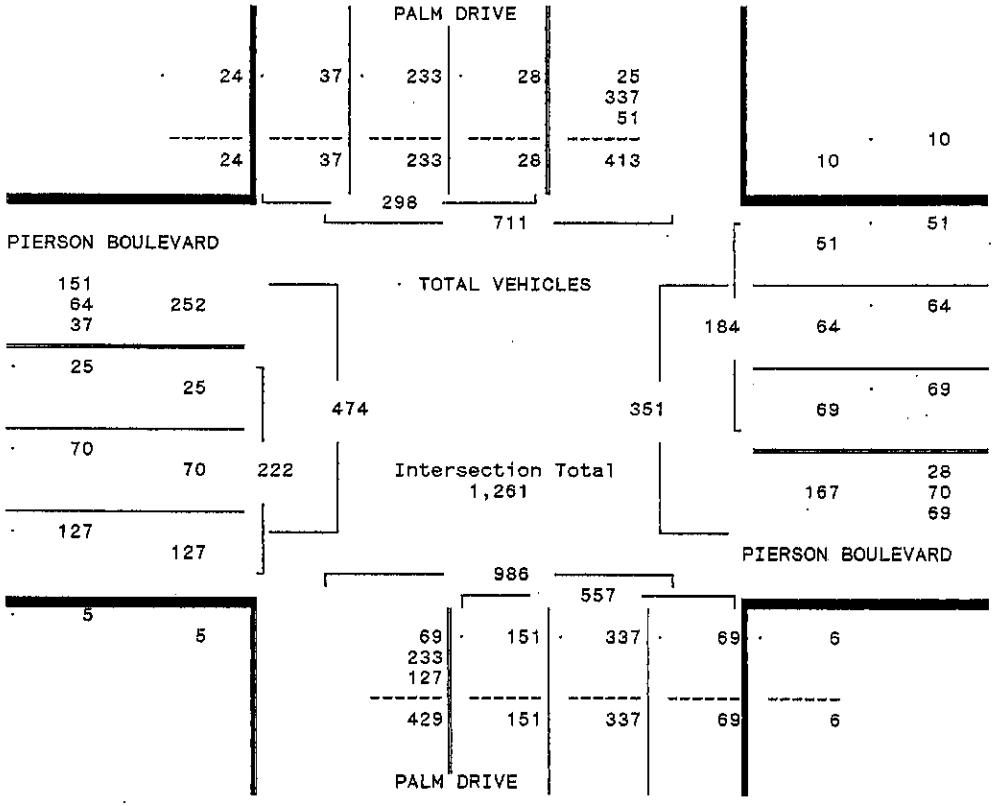
CITY OF DESERT HOT SPRINGS
N/S: PALM DRIVE
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098809
Start Date: 10/27/94
File I.D. : DHPAPIPM
Page : 1

TOTAL VEHICLES

	PALM DRIVE Southbound			PIERSON BOULEVARD Westbound			PALM DRIVE Northbound			PIERSON BOULEVARD Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/27/94													
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/27/94													
Peak start	16:00			16:00			16:00			16:00			
Volume	28	233	37	69	64	51	151	337	69	25	70	127	
Percent	9%	78%	12%	38%	35%	28%	27%	61%	12%	11%	32%	57%	
Pk total	298			184			557			222			
Highest	16:15			16:30			16:00			16:00			
Volume	8	71	12	16	15	21	44	87	22	6	22	31	
Hi total	91			52			153			59			
PHF	.82			.88			.91			.94			



CITY OF DESERT HOT SPRINGS
N/S: PALM DRIVE
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098809
Start Date: 10/27/94
File I.D. : DHPAPIPM
Page : 1

TOTAL VEHICLES

	PALM DRIVE Southbound			PIERSON BOULEVARD Westbound			PALM DRIVE Northbound			PIERSON BOULEVARD Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/27/94													
16:00	12	51	12	21	15	11	44	87	22	6	22	31	334
16:15	8	71	12	15	17	12	40	79	16	5	19	34	328
16:30	3	54	8	16	15	21	29	78	16	5	11	32	288
16:45	5	57	5	17	17	7	38	93	15	9	18	30	311
Hr Total	28	233	37	69	64	51	151	337	69	25	70	127	1261
17:00	9	60	3	16	14	9	37	93	8	4	10	30	293
17:15	5	56	4	8	10	7	33	78	12	3	14	23	253
17:30	10	75	7	15	14	9	30	86	19	11	20	23	319
17:45	4	56	10	14	20	12	28	85	20	6	15	25	295
Hr Total	28	247	24	53	58	37	128	342	59	24	59	101	1160
TOTAL	56	480	61	122	122	88	279	679	128	49	129	228	2421

Peak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 10/27/94

Peak start	17:00			16:00			16:00			16:00			
Volume	28	247	24	69	64	51	151	337	69	25	70	127	
Percent	9%	83%	8%	38%	35%	28%	27%	61%	12%	11%	32%	57%	
Pk total	299			184			557			222			
Highest	17:30			16:30			16:00			16:00			
Volume	10	75	7	16	15	21	44	87	22	6	22	31	
Hi total	92			52			153			59			
PHF	.81			.88			.91			.94			

Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/27/94

Peak start	16:00			16:00			16:00			16:00			
Volume	28	233	37	69	64	51	151	337	69	25	70	127	
Percent	9%	78%	12%	38%	35%	28%	27%	61%	12%	11%	32%	57%	
Pk total	298			184			557			222			
Highest	16:15			16:30			16:00			16:00			
Volume	8	71	12	16	15	21	44	87	22	6	22	31	
Hi total	91			52			153			59			
PHF	.82			.88			.91			.94			

CITY OF DESERT HOT SPRINGS
N/S: PALM DRIVE
E/W: PIERSON BOULEVARD
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098809
Start Date: 10/27/94
File I.D. : DHPAPIPM
Page : 1

TOTAL PEDESTRIANS

	PALM DRIVE Southbound	PIERSON BOULEVARD Westbound	PALM DRIVE Northbound	PIERSON BOULEVARD Eastbound	
	Other	Other	Other	Other	Total
Date 10/27/94					
16:00	6	4	0	1	11
16:15	5	0	2	2	9
16:30	8	3	3	1	15
16:45	5	3	1	1	10
Hr Total	24	10	6	5	45
17:00	2	2	7	3	14
17:15	4	2	6	3	15
17:30	8	3	2	3	16
17:45	13	6	5	3	27
Hr Total	27	13	20	12	72
TOTAL	51	23	26	17	117

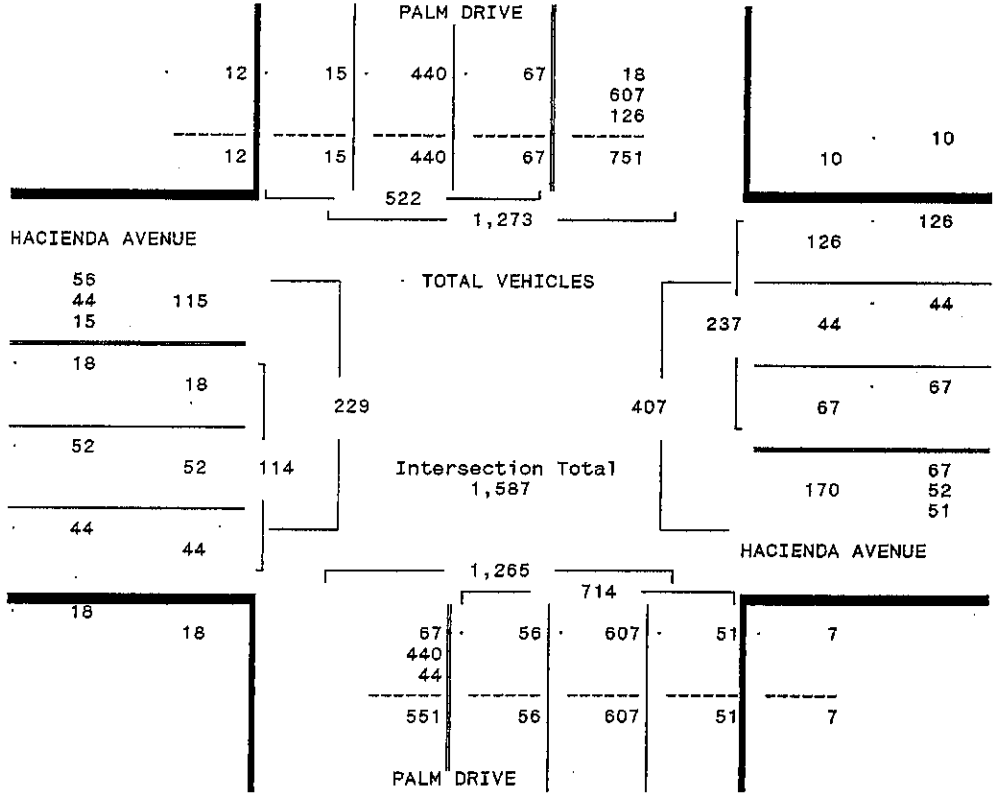
CITY OF DESERT HOT SPRINGS
N/S: PALM DRIVE
E/W: HACIENDA AVENUE
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098808
Start Date: 10/26/94
File I.D. : DHPAHAPM
Page : 1

TOTAL VEHICLES

	PALM DRIVE Southbound			HACIENDA AVENUE Westbound			PALM DRIVE Northbound			HACIENDA AVENUE Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/26/94													
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/26/94													
Peak start	16:45			16:45			16:45			16:45			
Volume	67	440	15	67	44	126	56	607	51	18	52	44	
Percent	13%	84%	3%	28%	19%	53%	8%	85%	7%	15%	46%	39%	
Pk total	522			237			714			114			
Highest	16:45			16:45			17:30			17:15			
Volume	19	114	8	21	18	33	21	173	9	6	14	13	
Hi total	139			70			203			33			
PHF	.94			.85			.88			.86			



CITY OF DESERT HOT SPRINGS
N/S: PALM DRIVE
E/W: HACIENDA AVENUE
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098808
Start Date: 10/26/94
File I.D. : DHPAHAPM
Page : 1

TOTAL VEHICLES

	PALM DRIVE Southbound			HACIENDA AVENUE Westbound			PALM DRIVE Northbound			HACIENDA AVENUE Eastbound			
Date 10/26/94	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
16:00	24	124	4	22	14	26	16	118	20	2	16	10	396
16:15	23	102	3	12	13	17	12	150	7	5	18	12	374
16:30	22	103	4	25	11	39	8	133	13	2	10	14	384
16:45	19	114	6	21	16	33	9	153	14	3	15	6	409
Hr Total	88	443	17	80	54	115	45	554	54	12	59	42	1563
17:00	16	103	3	15	11	40	13	138	18	4	12	13	386
17:15	19	114	5	19	6	27	13	143	10	6	14	13	389
17:30	13	109	1	12	11	26	21	173	9	5	11	12	403
17:45	15	109	2	17	10	19	8	145	10	1	7	12	355
Hr Total	63	435	11	63	38	112	55	599	47	16	44	50	1533
TOTAL	151	878	28	143	92	227	100	1153	101	28	103	92	3096

Peak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 10/26/94

Peak start	16:00			16:30			16:45			16:15		
Volume	88	443	17	80	44	139	56	607	51	14	55	45
Percent	16%	81%	3%	30%	17%	53%	8%	85%	7%	12%	48%	39%
Pk total	548			263			714			114		
Highest	16:00			16:30			17:30			16:15		
Volume	24	124	4	25	11	39	21	173	9	5	18	12
Hi total	152			75			203			35		
PHF	.90			.88			.88			.81		

Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/26/94

Peak start	16:45			16:45			16:45			16:45		
Volume	67	440	15	67	44	126	56	607	51	18	52	44
Percent	13%	84%	3%	28%	19%	53%	8%	85%	7%	16%	46%	39%
Pk total	522			237			714			114		
Highest	16:45			16:45			17:30			17:15		
Volume	19	114	6	21	16	33	21	173	9	6	14	13
Hi total	139			70			203			33		
PHF	.94			.85			.88			.86		

CITY OF DESERT HOT SPRINGS
N/S: PALM DRIVE
E/W: HACIENDA AVENUE
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098808
Start Date: 10/25/94
File I.D. : DHPAHAPM
Page : 1

TOTAL PEDESTRIANS

	PALM DRIVE Southbound	HACIENDA AVENUE Westbound	PALM DRIVE Northbound	HACIENDA AVENUE Eastbound	
Date 10/26/94	Other	Other	Other	Other	Total
16:00	0	0	1	3	4
16:15	1	1	0	0	2
16:30	1	1	4	4	10
16:45	0	3	2	0	5
Hr Total	2	5	7	7	21
17:00	1	1	1	5	8
17:15	9	3	0	6	18
17:30	2	3	4	7	16
17:45	2	0	3	6	11
Hr Total	14	7	8	24	53
TOTAL	16	12	15	31	74

Geotechnical investigations conducted for developments in the valley floor, on stream-deposited sediments, should include an assessment of seismically induced settlement. These studies need to be site-specific because differences in grain size and depth of the recently-deposited soils -- conditions that determine in great measure the amount of settlement that could occur -- vary across the valley floor. The hazard of seismically induced settlement can be mitigated with proper site preparation that involves the densification of the subsurface soils, and with proper foundation design that can accommodate a limited degree of differential settlement resulting from seismic shaking.

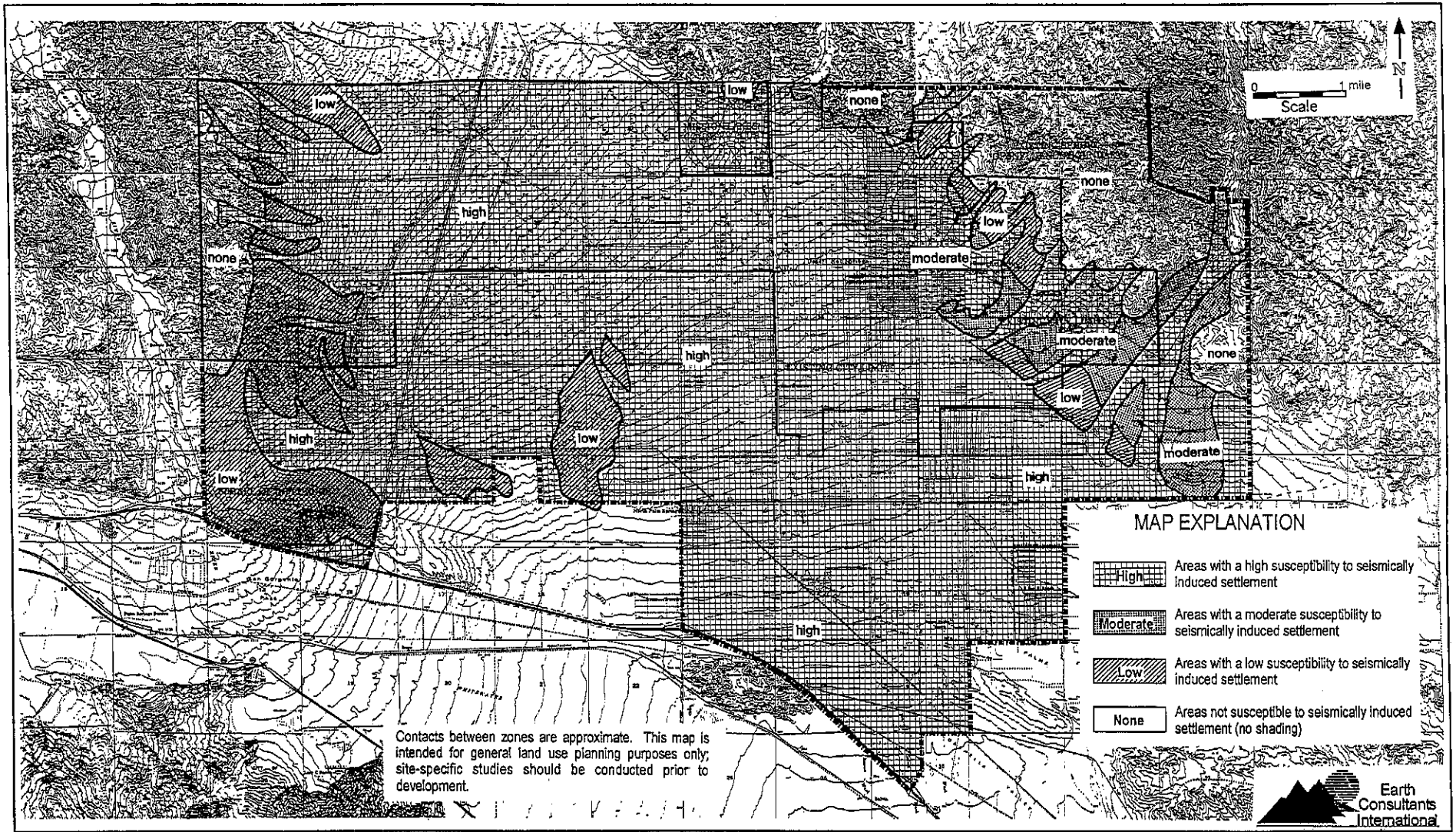
1.4.3 Seismically Induced Slope Instability

Seismically induced landslides, rock slides and rock falls can be expected to occur on both the northern and western portions of the General Plan area (Figure 1-5). Wilson and Keefer (1985) have reported that a ground acceleration of at least 0.10g in steep terrain is necessary to induce earthquake-related rock falls, although this does not guarantee that rock falls will occur if this acceleration value is exceeded. Since there are several faults capable of generating peak ground accelerations of over 0.10g in the study area, there is a high potential for seismically-induced rock falls and landslides to occur in the area.

The North Palm Springs Earthquake of July 8, 1986, triggered several landslides and ground fractures in the Palm Springs area and within the western reaches of the General Plan area (Morton and others, 1989). Most of the landslides and ground fractures were associated with the surface traces of mapped faults, including the Banning, Garnet Hill and Coachella Valley segment of the San Andreas. Landslides were abundant on the sides of steep-walled canyons, while debris slides and rock falls occurred in fractured basement rocks of the San Bernardino and Little San Bernardino mountains. Similar types of landslides and rock falls are anticipated to occur in the General Plan area if an earthquake occurs on either the Banning fault or on the Coachella Valley segment of the San Andreas fault. Intense ground shattering (also called ridge-top shattering) can be expected at the top of Painted Hill as a result of the topography locally focusing the earthquake shaking.

One of the most spectacular landslides in the Coachella Valley area is the Martinez Mountains Landslide, located off Highway 86, south of Indio, in the Santa Rosa Mountains. This landslide, which occurred in pre-historic times, is a rock avalanche consisting of coarse granitoid debris. The debris was transported nearly 6 miles, dropping more than 1 mile in elevation, at velocities estimated to have exceeded 75 miles per hour (Baldwin, 1987). It is unknown what triggered the landslide, although seismic shaking has been suggested (Morton and Sadler, 1989).

With the exception of Miracle Hill and Devers Hill, there are no significant natural slopes in the valley floor. However, some of the planned developments in the area could incorporate engineered cut slopes or fill slopes in the design. If these slopes are of significant height they could be subject to failure during a strong earthquake. Factors controlling the stability of these slopes include: 1) the slope height and inclination, 2) the engineering characteristics of the earth materials comprising the slope, and 3) the intensity of ground shaking.



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CITY OF DESERT HOT SPRINGS GENERAL PLAN

City Limits:
Sphere of Influence:
Date: 2/18/97
Base Map: Desert Hot Springs, and Seven Palms Valley USGS 7.5' Quad Maps

Areas Susceptible to Seismically Induced Settlement

Engineered slopes should be designed to resist seismically induced failure. Slope design should be based on pseudo-static stability analyses using soil engineering parameters established on a site-specific basis from detailed geotechnical investigations that included subsurface soil sampling and laboratory testing. The stability analyses should factor in the intensity of ground shaking expected in the City.

1.5 Seiches and Tsunamis

The potential for seismically induced seiching is considered low because there are no large natural or artificially impounded bodies of water in the area (Refer to Chapter 3 for a discussion on seismically induced flooding as a result of damaged water tanks). Minor localized flooding as a result of water sloshing during an earthquake could occur adjacent to some of the golf course ponds in the General Plan area. The potential for tsunamis (seismically induced large sea waves) in nil owing to the inland location of the City.

1.6 Issues and Opportunities

1. Strong ground shaking can be expected to occur in the future in the City of Desert Hot Springs and its Sphere of Influence. The Coachella Valley segment of the San Andreas (aka Mission Creek fault) and Banning faults are capable of generating ground motions at the City that would be much stronger than anything the area has experienced historically. Furthermore, these faults are considered "ripe" for an earthquake. The Coachella and San Bernardino Mountains segments of the San Andreas, the two closest segments to the City, have a moderate (22 to 28 percent) probability of generating a moderate to large earthquake in the period between 1994 and 2024. An earthquake on either of these two fault segments can generate peak horizontal ground accelerations of between 0.5 and 0.75g in Desert Hot Springs. An earthquake on the Banning fault, which extends across the General Plan area, can generate peak horizontal ground accelerations of up to 0.9g.

2. Several regional faults, including the east-trending Pinto - Morongo and Blue Cut faults, and the north-northwest trending faults of the Mojave Shear Zone, have the potential of generating strong ground motions in the General Plan area. The Pinto Mountain - Morongo fault has the potential of generating peak ground accelerations of about 0.6g.

3. The two segments of the San Jacinto fault closest to the City have a high (37 to 43 percent) probability of rupturing in the period between 1994 and 2024. These faults are estimated capable of generating peak horizontal ground accelerations of between 0.06 and 0.16g in the General Plan area. These levels of ground shaking, although very minor compared to what the San Andreas fault is capable, could be damaging to many of the older, low- to mid-rise buildings in the commercial area of the City, especially to soft-story buildings, pre-cast concrete tilt-ups, and unreinforced masonry buildings. Soft-story buildings have a story, typically the first floor, that lacks adequate strength or toughness due to too few shear walls. Two types of soft-story buildings are common: 1) buildings with large window openings used for display purposes on the first floor, and 2) buildings housing the garage on the first floor. Pre-1973 tilt-up buildings may

have concrete panels that are not adequately anchored to the roof and floor diaphragms. Weak structures should be retrofitted or rehabilitated to current building and fire codes. This can reduce significantly the damage caused by an earthquake.

4. An Alquist-Priolo Earthquake Fault Zone has been designated for the Coachella Valley (aka Mission Creek) segment of the San Andreas fault. This fault extends right through the middle of the City, underlying several structures. This segment of the San Andreas has not ruptured the ground surface in historic times. Paleoseismic studies indicate that the fault has ruptured on average every 220 years, and that the last surface rupturing earthquake on this fault occurred around 1680, almost 320 years ago. Therefore, the fault has a relatively high probability of rupturing during the life time of many of the projects that are currently straddling this fault trace.

5. Alquist-Priolo Zones have also been designated for the section of the Banning fault that extends across the south-central portion of the General Plan area, and for the fault on the west side of Devers Hill. Surface rupture on these faults has the potential of impacting development on or very near the faults. Rupture of the Banning fault would also impact several of the roads in the General Plan area.

6. Several north to north-northeast trending faults have been mapped in the General Plan area, primarily in the Little San Bernardino Mountains. Most have not been evaluated thoroughly as to their activity. These faults are related to the San Andreas fault system, and although they are not likely to generate an earthquake on their own, they certainly could rupture the ground surface as a response to an earthquake on either the Coachella Valley (Mission Creek) segment of the San Andreas fault or the Banning fault.

7. All development planned within the Alquist-Priolo Zones should meet the guidelines of the Alquist-Priolo Act. A geologic investigation, which may include trenching, should be performed if structures designed for human occupancy are proposed within these zones. The studies should evaluate whether an active fault extends across the area proposed for development. Based on the results of these studies, appropriate development setbacks from the fault may be prescribed. Similar investigations are recommended in areas where other faults have been mapped, since this is clearly a very tectonically active area, with the potential for significant surface fault rupture, and other types of ground deformation. Roadways, water lines, pipelines, and other improvements built across these faults would be damaged if ground rupture occurs during an earthquake.

8. The General Plan area generally has a low liquefaction potential. However, most of the valley-floor sediments are susceptible to liquefaction, dependent on the ground-water levels in the area. If the ground-water table rises in the future, the liquefaction potential for the area should be reassessed. Site-specific geotechnical studies should be conducted, especially for critical facilities, or for projects that will result in saturated or semi-saturated conditions near the ground surface, such as debris basin embankments, or ground-water recharge basins.

9. The recently deposited sediments on the valley floor are subject to seismically induced differential settlement. This hazard should be investigated on a site-specific basis, and appropriate mitigation measures should be implemented as part of the design of a development.

10. Landslides and rock falls will occur in both the northern and western portions of the General Plan area during a moderate to strong earthquake. Landslides are also likely to occur in the Painted Hill area, along steep canyons. If the Banning fault breaks, there would be significant downslope failures adjacent to the trace of the fault. Sections of Highway 62, and of Interstate 10 in the San Gorgonio Pass area, could be blocked by fallen rock debris following an earthquake, which could hinder rescue and evacuation operations. Rock falls could also impact developments adjacent to the mountain front, especially those at the mouth of Little Morongo Canyon and Blind Canyon. To reduce this hazard, a geotechnical evaluation of steep slopes prior to development should be conducted. Similarly, a geotechnical evaluation that includes the implementation of appropriate mitigation measures is recommended for existing developments located adjacent to and downslope of fractured rock faces. These geotechnical studies should be conducted in accordance with Chapter 5 of the California Division of Mines and Geology Special Publication 117 (1997, Guidelines for Evaluation and Mitigation of Seismic Hazards in California).

CHAPTER 2: GEOLOGIC HAZARDS

2.1 Physiographic and Geologic Setting

Most of the City of Desert Hot Springs and its Sphere of Influence are located in the Colorado Desert physiographic province of southern California. The Little San Bernardino Mountains, in the northeastern reaches of the General Plan, and the San Bernardino Mountains, to the west, are part of the Transverse Ranges physiographic province.

The relatively flat-lying valley floor is a tectonic depression that began forming about 5 million years ago, when the boundary between the Pacific and North American Plates moved ashore to its present position along the San Andreas fault. This narrow depression is known as the Salton Trough. Although the trough is physically continuous from the San Gorgonio Pass to the Gulf of Mexico, early settlers gave different portions of the valley different names. The portion north of the Salton Sea is known as the Coachella Valley or Indio region; the portion south of the Salton Sea is known as the Imperial Valley. Desert Hot Springs is located at the northwestern end of the Coachella Valley, near the San Gorgonio Pass.

The rocks and sediments infilling the trough detail the recent history of the area. Rocks of the Imperial Formation, which crop out at Painted Hill, but more commonly occur at depth in the Desert Hot Springs area, are of marine origin, indicating that the trough was underwater during the latest Miocene (?) (approximately 10 to 6 million years ago). In the last 6 million years, these marine sediments were in turn overlain by a thick sequence of terrestrial sediments emanating from the adjacent highlands (Matti and others, 1992; Murphy, 1986). Downdropping over time is indicated by the approximately 3,000 feet thick sequence of sediments, originally deposited at or near sea level, that underlie the valley floor in the Desert Hot Springs area (Proctor, 1968). Near the international border, this sequence of sedimentary deposits may be as much as 40,000 feet thick (Fuis and others, 1982; 1984; Fuis and Mooney, 1990). Deposition of sediments on the valley floor is still ongoing.

Elevations across the western reaches of the Coachella Valley floor, within the boundaries of the General Plan area, range between 580 and 2,200 feet above mean sea level. The summit of Whitewater Hill, located near the southwestern corner of the City's Sphere of Influence, rises to an elevation of 1,784 feet. Similarly, Painted Hill, in the western portion of the General Plan area, rises to an elevation of 2,480 feet. Other areas elevated above the valley floor, although less dramatically, include Miracle Hill and Devers Hill. All of these areas have been elevated by faults of the San Andreas fault system. The highest point in the General Plan area has an elevation of 2,800 feet above mean sea level. This point is located at the extreme northeastern corner of the area, within the Little San Bernardino Mountains.

The Whitewater River forms the southern and southwestern margins to the General Plan area. The river emanates from the San Bernardino Mountains, and intermittently drains the surrounding highlands and the northwestern portion of the Coachella Valley. Other smaller drainages flowing out of the San Bernardino Mountains and onto the western portion of the study area include Mission Creek, Super Creek, and Garnet Wash. To the north and northeast, several canyons and washes emanate from the Little San Bernardino Mountains and drain onto the General Plan area. The largest of these

include, from west to east, Morongo Wash, Little Morongo Wash, Blind Canyon, and Long Canyon.

2.2 Geologic Units

2.2.1 Composition and Age

The sediments that cover the valley floor are typically stream-deposited (alluvium). The alluvial materials that occur within the active stream channels are shown on Figure 2-1 with map symbol Qa. These sediments typically consist of sand and silty sand, with layers of gravel, cobbles and boulders. The coarse-grained layers were deposited during high-energy flood events. The active channel deposits are unweathered and have no soil development. In the southern portion of the study area, next to Interstate 10, Matti and others (1992) mapped a blanket of fine-grained sand, silt and clay. These fine-grained sediments are floodplain deposits of the Whitewater River (Map Symbol Qpl).

The coarse, poorly sorted sands and gravels at the base of the mountains and in desert washes are alluvial fan deposits. These sediments are deposited into the canyons by gravity, and transported down the canyons and onto the valley floor during flash floods. During transport, the finer grained particles are carried out farther than the coarser, heavier particles. As a result, alluvial fan sediments typically decrease in grain size with increasing distance from the mouth of the canyons. Based on their degree of dissection and soil development (i.e., age), Matti and others (1992) identified several alluvial fan surfaces in the Desert Hot Springs area. The sediments on the active alluvial fans are unweathered and undissected, and have no soil development. These sediments are shown with the symbol Qf_1. The alluvial fan surfaces that are slightly to moderately dissected, and that have some soil profile development are shown on the map with the symbols Qf_2, Qf_{2a} and Qf_{2b}. The Qf_{2a} surfaces are Holocene in age; the Qf_{2b} surfaces are latest Pleistocene.

Older alluvial fan surfaces, with moderately to well dissected surfaces and moderately well developed soil profiles, have been mapped on Devers and Whitewater hills, and in the northwestern portions of the study area, at the base of the San Bernardino Mountains (Map Symbol Qf_3). Proctor (1968) previously mapped these surfaces as the Cabazon Fanglomerate. The oldest fan surfaces mapped in the area are shown with the symbol Qf_4. These surfaces are moderately to well dissected, and have well-developed soil profiles, with thick argillic horizons. In the Miracle Hill area, Proctor (1968) had previously mapped these sediments as the Ocotillo Conglomerate.

The alluvial sediments are underlain by a thick section of semi-consolidated and consolidated sedimentary rocks of terrestrial and marine origin. These semi-consolidated sedimentary units are exposed primarily in the western portion of the study area, forming the flanks of the Whitewater and Painted hills. The Painted Hill Formation (Map Symbol Ti) is, appropriately enough, exposed on Painted Hill. The Imperial Formation is exposed only in the westernmost reaches of the area, on the eastern flanks of the San Bernardino Mountains, and north of

the Banning fault. The Coachella Fanglomerate (Map Symbol Tc) has also been mapped on the eastern flank of the San Bernardino Mountains.

On the north side of the San Andreas fault zone, the sedimentary units described above are believed to be underlain at great depths by bedrock similar to that exposed in the Little San Bernardino and the San Bernardino Mountains. South of the San Andreas fault zone, the rocks at depth are thought to be similar to the bedrock exposed in the Santa Rosa and San Jacinto Mountains, on the south side of the Coachella Valley. The rocks in the Little San Bernardino Mountains generally consist of granitoid rocks of Triassic through Cretaceous age that intruded through prebatholithic gneiss and metasedimentary rocks (metaquartzite, marble, schist and gneiss). These rocks are shown on Figure 2-1 with map symbol **sbb**. The rocks of the San Jacinto Mountains are primarily metamorphic in origin, and include mica schist, gneiss, and marble that have been intruded by aplite dikes and sills. San Jacinto Mountain-style rocks are not exposed in the study area.

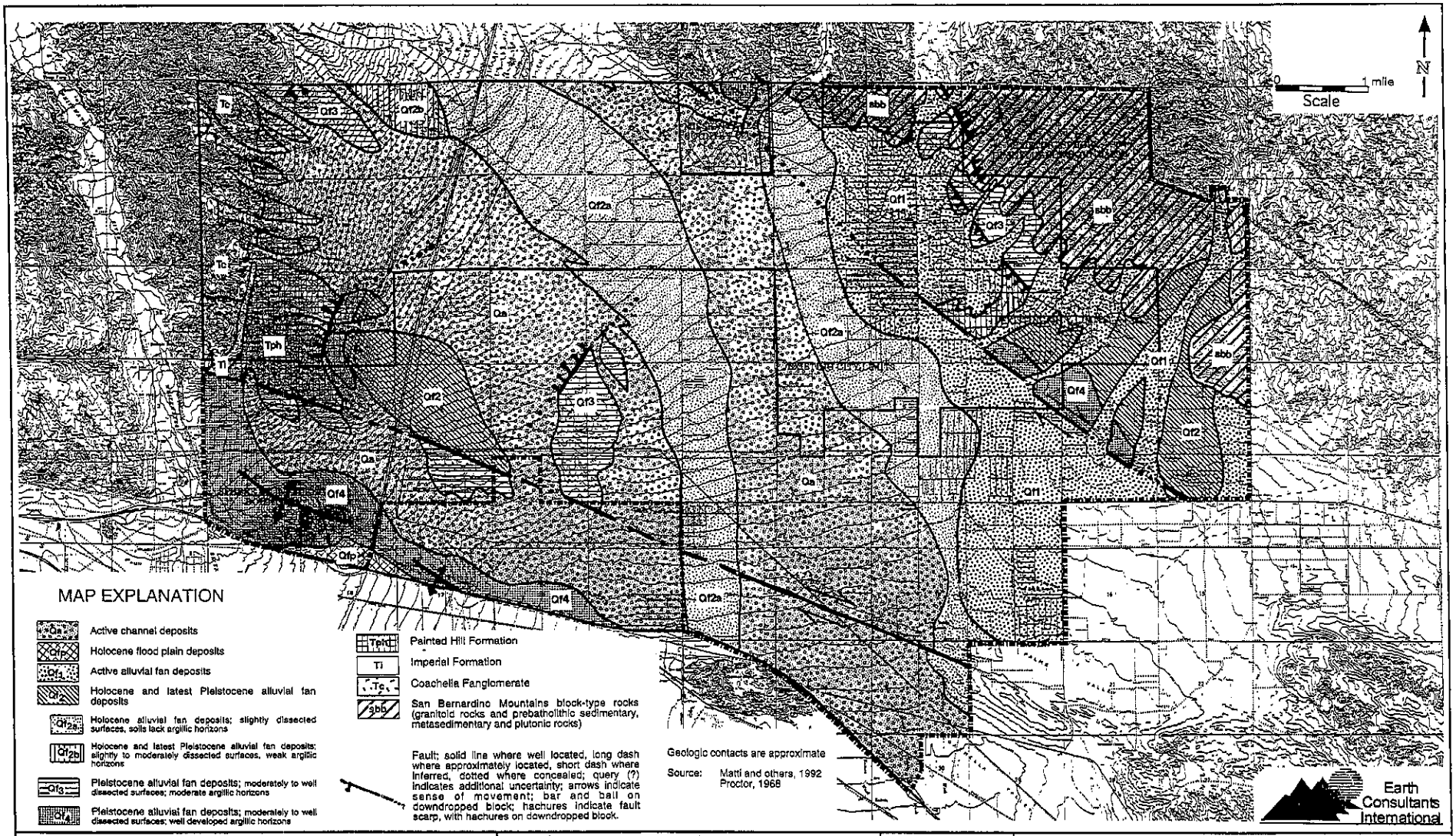
To summarize, the earth materials exposed at the surface in the General Plan area can be classified, based on their age, as follows:

1) Holocene (0-11,000 years old) sediments: including the active channel deposits (Qa), active floodplain deposits (Qfp), active alluvial fan deposits (Qf_1), and some of the young alluvial fan deposits (Qf_{2a});

2) Pleistocene (11,000 to 1.6 million years old) sediments: Qf_{2b} sediments, characterized by a weakly developed argillic horizon in the soil profile; and the Qf_3 and Qf_4 deposits on Painted, Devers, Whitewater, and Miracle hills, and along the southern margin of the Little San Bernardino Mountains;

3) Pliocene and Upper Miocene (1.6 to approximately 12 million years old) sediments: including the Painted Hill Formation (the bottom of this unit has been dated at 6 million years old); the Imperial Formation; and the Coachella Fanglomerate; and

4) Mesozoic and older (66 million years old and older) rocks in the Little San Bernardino and the San Bernardino mountains.



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CITY OF DESERT HOT SPRINGS GENERAL PLAN

City Limits:
Sphere of Influence:
Date: 2/18/97
Base Map: Desert Hot Springs, and Seven Palms Valley USGS 7.5' Quad Maps

Geology Map of the Desert Hot Springs Area

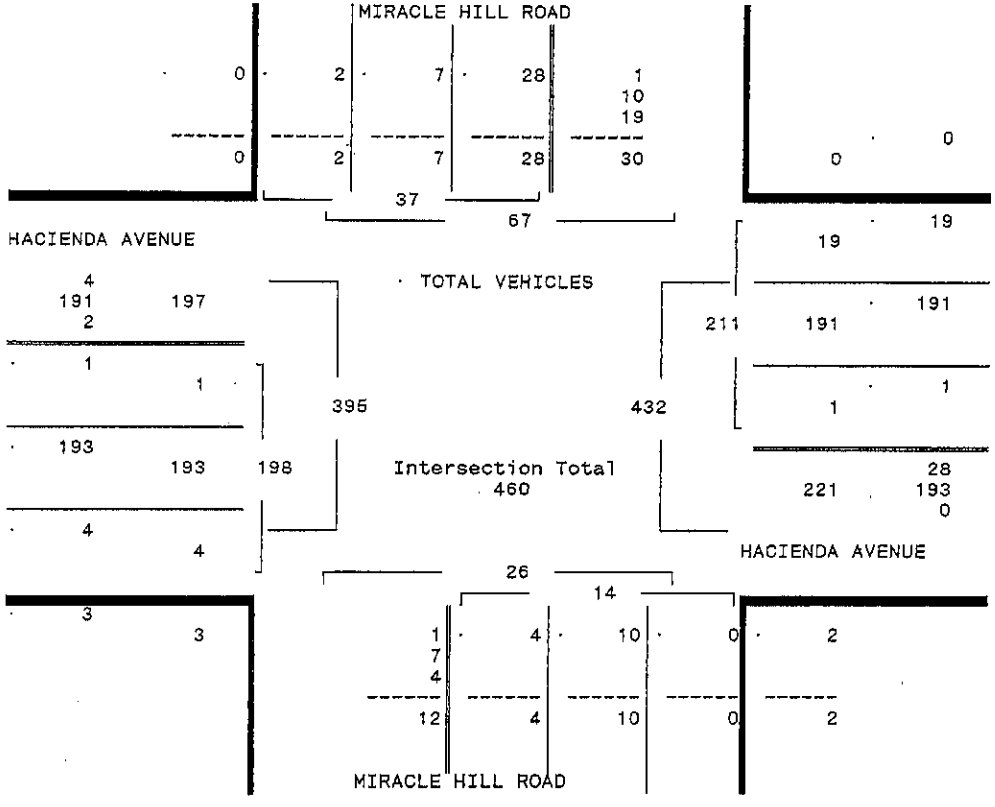
CITY OF DESERT HOT SPRINGS
N/S: MIRACLE HILL ROAD
LOCATION: HACIENDA AVENUE
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098809
Start Date: 10/26/94
File I.D. : DHNHHAPM
Page : 1

TOTAL VEHICLES

	MIRACLE HILL ROAD Southbound			HACIENDA AVENUE Westbound			MIRACLE HILL ROAD Northbound			HACIENDA AVENUE Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/26/94													
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/26/94													
Peak start	16:30			16:30			16:30			16:30			
Volume	28	7	2	1	191	19	4	10	0	1	193	4	
Percent	76%	19%	5%	0%	91%	9%	29%	71%	0%	1%	97%	2%	
Pk total	37			211			14			198			
Highest	16:30			16:30			16:45			17:00			
Volume	7	3	1	0	52	6	1	4	0	0	55	3	
Hi total	11			58			5			58			
PHF	.84			.91			.70			.85			



CITY OF DESERT HOT SPRINGS
N/S: MIRACLE HILL ROAD
LOCATION: HACIENDA AVENUE
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098809
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Page : 1

TOTAL VEHICLES

	MIRACLE HILL ROAD Southbound			HACIENDA AVENUE Westbound			MIRACLE HILL ROAD Northbound			HACIENDA AVENUE Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/26/94													
16:00	6	1	1	0	47	2	0	0	0	1	36	0	94
16:15	2	1	2	0	47	6	3	3	2	1	40	0	107
16:30	7	3	1	0	52	6	1	2	0	0	46	1	119
16:45	9	2	0	1	47	3	1	4	0	0	47	0	114
Hr Total	24	7	4	1	193	17	5	9	2	2	169	1	434
17:00	5	1	1	0	49	4	0	1	0	0	55	3	119
17:15	7	1	0	0	43	6	2	3	0	1	45	0	108
17:30	4	0	1	0	44	6	1	2	0	1	32	1	92
17:45	1	2	3	0	39	5	2	2	0	0	34	1	89
Hr Total	17	4	5	0	175	21	5	8	0	2	166	5	408
TOTAL	41	11	9	1	368	38	10	17	2	4	335	5	842

Peak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 10/26/94

Peak start	16:30			16:15			16:15			16:30		
Volume	28	7	2	1	195	19	5	10	2	1	193	4
Percent	76%	19%	5%	0%	91%	9%	29%	59%	12%	1%	97%	2%
Pk total	37			215			17			198		
Highest	16:30			16:30			16:15			17:00		
Volume	7	3	1	0	52	6	3	3	2	0	55	3
Hi total	11			58			8			58		
PHF	.84			.93			.53			.85		

Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/26/94

Peak start	16:30			16:30			16:30			16:30		
Volume	28	7	2	1	191	19	4	10	0	1	193	4
Percent	76%	19%	5%	0%	91%	9%	29%	71%	0%	1%	97%	2%
Pk total	37			211			14			198		
Highest	16:30			16:30			16:45			17:00		
Volume	7	3	1	0	52	6	1	4	0	0	55	3
Hi total	11			58			5			58		
PHF	.84			.91			.70			.85		

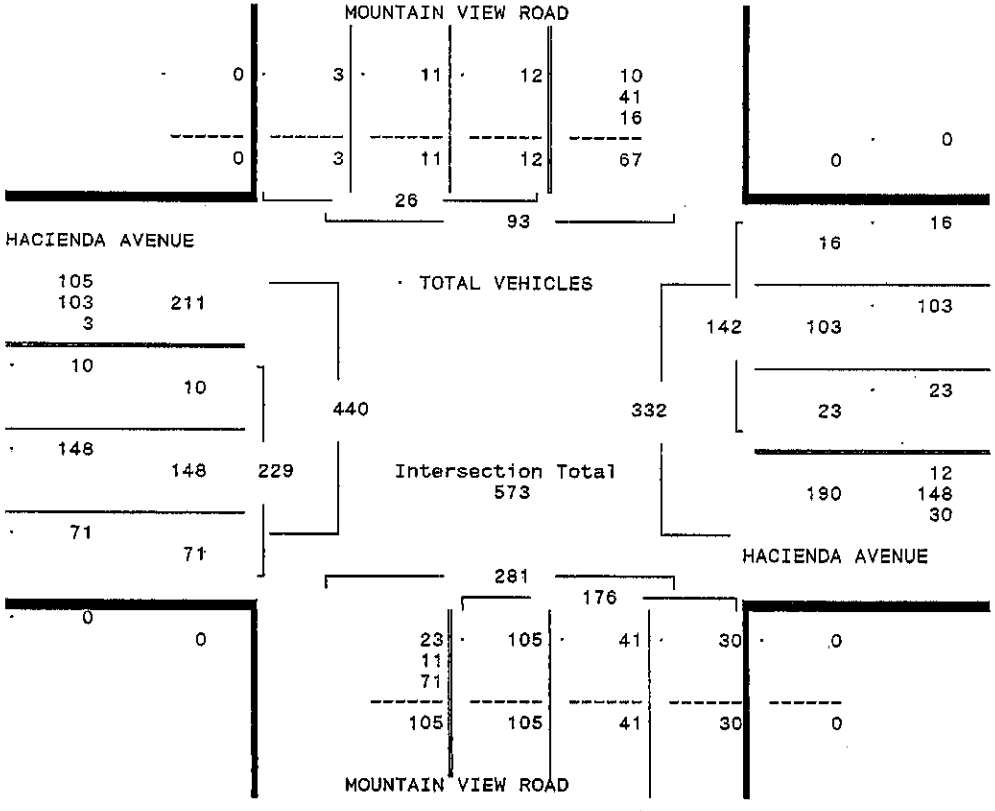
CITY OF DESERT HOT SPRINGS
N/S: MOUNTAIN VIEW ROAD
E/W: HACIENDA AVENUE
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098801
Start Date: 10/27/94
File I.D. : DHMVHAPM
Page : 1

TOTAL VEHICLES

	MOUNTAIN VIEW ROAD Southbound			HACIENDA AVENUE Westbound			MOUNTAIN VIEW ROAD Northbound			HACIENDA AVENUE Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/27/94													
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/27/94													
Peak start	16:00			16:00			16:00			16:00			
Volume	12	11	3	23	103	16	105	41	30	10	148	71	
Percent	46%	42%	12%	16%	73%	11%	60%	23%	17%	4%	65%	31%	
Pk total	26			142			176			229			
Highest	16:45			16:15			16:45			16:00			
Volume	5	2	1	6	29	4	24	18	8	2	43	19	
Hi total	8			39			50			64			
PHF	.81			.91			.88			.89			



CITY OF DESERT HOT SPRINGS
N/S: MOUNTAIN VIEW ROAD
E/W: HACIENDA AVENUE
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
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Site Code : 00098801
Start Date: 10/27/94
File I.D. : DHMVHAPM
Page : 1

TOTAL VEHICLES

	MOUNTAIN VIEW ROAD Southbound			HACIENDA AVENUE Westbound			MOUNTAIN VIEW ROAD Northbound			HACIENDA AVENUE Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Date 10/27/94													
16:00	2	3	2	7	22	3	26	7	8	2	43	19	144
16:15	3	4	0	6	29	4	30	9	5	3	32	18	143
16:30	2	2	0	4	28	6	25	7	9	1	36	16	138
16:45	5	2	1	6	24	3	24	18	8	4	37	16	148
Hr Total	12	11	3	23	103	16	105	41	30	10	148	71	573
17:00	1	2	1	4	25	1	21	8	5	2	31	22	123
17:15	4	1	0	9	25	1	33	12	9	1	27	14	142
17:30	1	2	1	8	24	1	41	13	3	1	34	17	144
17:45	2	6	2	3	19	2	40	13	7	6	28	25	153
Hr Total	8	11	4	22	93	5	141	46	24	10	120	78	562
TOTAL	20	22	7	45	196	21	246	87	54	20	268	149	1135

Peak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 10/27/94

Peak start	16:00			16:00			17:00			16:00			
Volume	12	11	3	23	103	16	141	46	24	10	148	71	
Percent	46%	42%	12%	16%	73%	11%	67%	22%	11%	4%	65%	31%	
Pk total	26			142			211			229			
Highest	16:45			16:15			17:15			16:00			
Volume	5	2	1	6	29	4	39	12	9	2	43	19	
Hi total	8			39			60			64			
PHF	.81			.91			.88			.89			

Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/27/94

Peak start	16:00			16:00			16:00			16:00			
Volume	12	11	3	23	103	16	105	41	30	10	148	71	
Percent	46%	42%	12%	16%	73%	11%	60%	23%	17%	4%	65%	31%	
Pk total	25			142			176			229			
Highest	16:45			16:15			16:45			16:00			
Volume	5	2	1	6	29	4	24	18	8	2	43	19	
Hi total	8			39			50			64			
PHF	.81			.91			.88			.89			

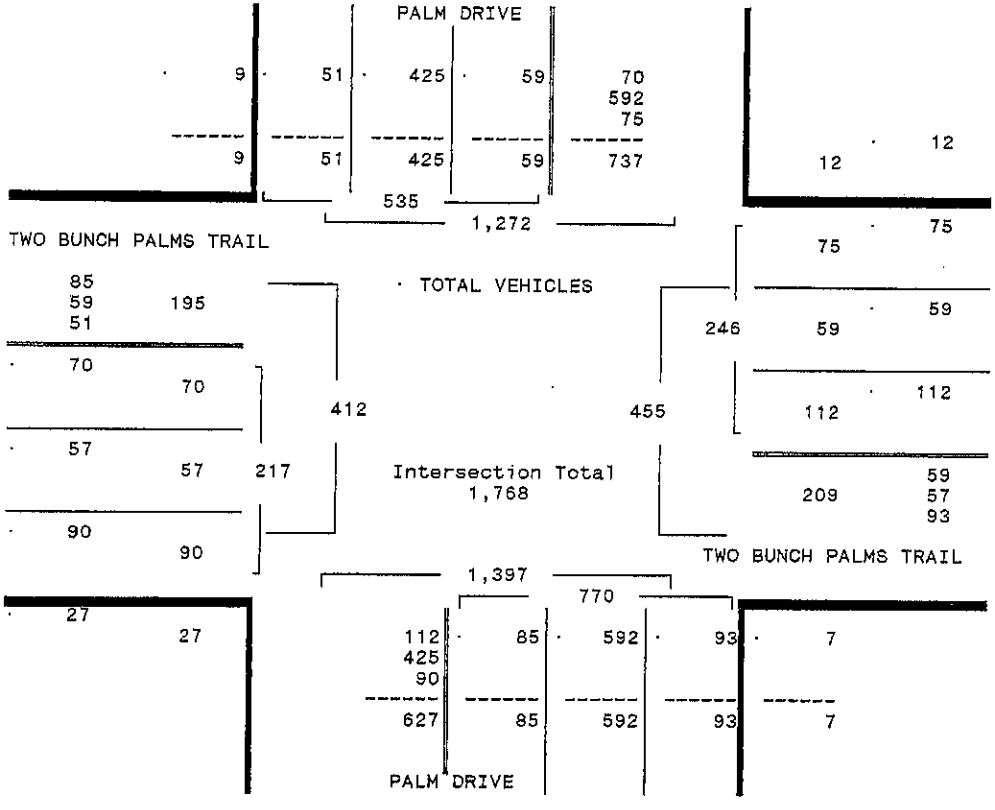
CITY OF DESERT HOT SPRINGS
N/S: PALM DRIVE
E/W: TWO BUNCH PALMS TRAIL
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098819
Start Date: 10/26/94
File I.D. : DHPA2BPM
Page : 1

TOTAL VEHICLES

	PALM DRIVE Southbound			TWO BUNCH PALMS TRAIL Westbound			PALM DRIVE Northbound			TWO BUNCH PALMS TRAIL Eastbound			
Date 10/26/94	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
Peak Hour Analysis By Entire Intersection for the Period: 15:00 to 18:00 on 10/26/94													
Peak start	17:00			17:00			17:00			17:00			
Volume	59	425	51	112	59	75	85	592	93	70	57	90	
Percent	11%	79%	10%	46%	24%	30%	11%	77%	12%	32%	26%	41%	
Pk total	535			246			770			217			
Highest	17:00			17:00			17:30			17:00			
Volume	24	121	13	25	26	15	15	171	27	17	18	25	
Hi total	158			66			213			60			
PHF	.85			.93			.90			.90			



CITY OF DESERT HOT SPRINGS
N/S: PALM DRIVE
E/W: TWO BUNCH PALMS TRAIL
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098819
Start Date: 10/26/94
File I.D. : DHPA2BPM
Page : 1

TOTAL VEHICLES

	PALM DRIVE Southbound			TWO BUNCH PALMS TRAIL Westbound			PALM DRIVE Northbound			TWO BUNCH PALMS TRAIL Eastbound			
Date 10/26/94	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
16:00	10	95	5	26	8	12	14	109	10	9	13	16	327
16:15	5	115	14	32	10	19	18	147	12	16	16	24	422
16:30	15	132	9	25	10	25	11	146	23	11	6	10	423
16:45	19	97	2	27	9	18	28	160	26	11	15	14	427
Hr Total	49	439	30	110	37	74	71	562	71	41	51	64	1599
17:00	24	121	13	25	26	15	18	126	19	17	18	25	447
17:15	9	89	18	27	12	18	29	149	24	15	13	25	426
17:30	11	101	10	30	9	22	15	171	27	23	11	15	445
17:45	15	114	10	30	12	20	23	146	23	15	15	25	448
Hr Total	59	425	51	112	59	75	85	592	93	70	57	90	1768
TOTAL	108	864	81	222	96	149	156	1154	164	111	108	154	3367

Peak Hour Analysis By Individual Approach for the Period: 16:00 to 18:00 on 10/26/94

Peak start	15:15			17:00			16:45			17:00			
Volume	53	465	38	112	59	75	90	605	96	70	57	90	
Percent	11%	82%	7%	46%	24%	30%	11%	77%	12%	32%	26%	41%	
Pk total	556			246			792			217			
Highest	17:00			17:00			16:45			17:00			
Volume	24	121	13	25	26	15	28	160	26	17	18	25	
Hi total	158			66			214			60			
PHF	.90			.93			.93			.90			

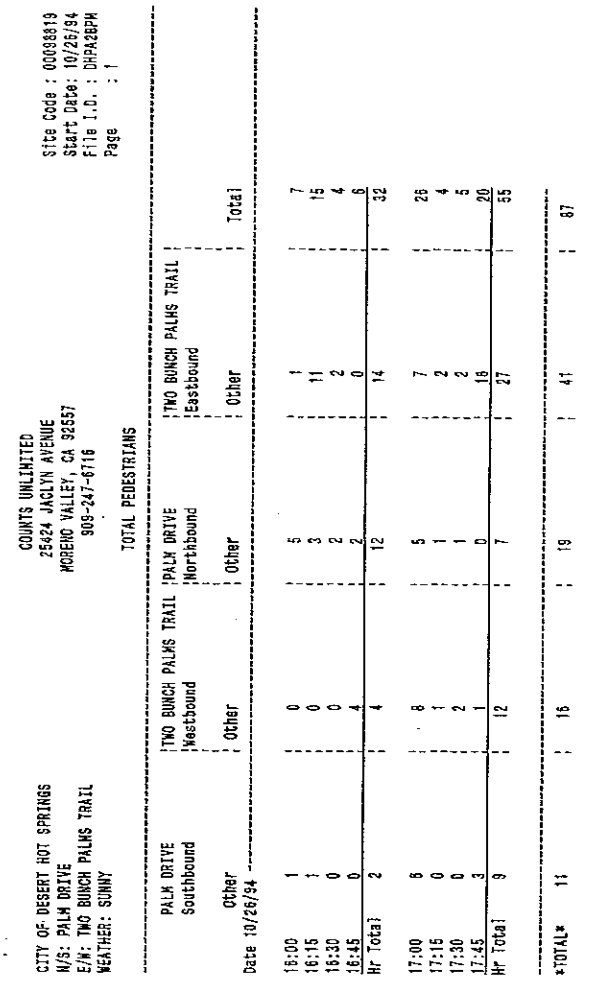
Peak Hour Analysis By Entire Intersection for the Period: 16:00 to 18:00 on 10/26/94

Peak start	17:00			17:00			17:00			17:00			
Volume	59	425	51	112	59	75	85	592	93	70	57	90	
Percent	11%	79%	10%	46%	24%	30%	11%	77%	12%	32%	26%	41%	
Pk total	535			246			770			217			
Highest	17:00			17:00			17:30			17:00			
Volume	24	121	13	25	26	15	15	171	27	17	18	25	
Hi total	158			66			213			60			
PHF	.85			.93			.90			.90			

Annual Daily Traffic Volume Conversion Factors[a]

Month Count Was Made	Day of The Week On Which the Traffic Count Was Made						
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
December January February	1.637	0.984	0.973	0.984	0.987	0.918	1.139
March April May	1.158	0.796	0.733	0.794	0.775	0.736	0.913
June July August	1.799	1.144	1.125	1.152	1.159	1.016	1.327
September October November	1.556	0.921	0.924	0.949	0.941	0.811	1.092

a. Source: City of Indio Traffic Engineer, Mr. Hossein Modarressi. July 19, 1994.



CITY OF: DESERT HOT SPRINGS
N/S: PALM DRIVE
E/W: TWO BUNCH PALMS TRAIL
WEATHER: SUNNY

COUNTS UNLIMITED
25424 JACLYN AVENUE
MORENO VALLEY, CA 92557
909-247-6716

Site Code : 00098819
Start Date: 10/26/94
File I.D. : DHPA26PM
Page : 1

TOTAL PEDESTRIANS

	PALM DRIVE Southbound		TWO BUNCH PALMS TRAIL Westbound		PALM DRIVE Northbound		TWO BUNCH PALMS TRAIL Eastbound		
Date 10/26/94		Other		Other		Other		Other	Total
16:00	1		0		5		1		7
16:15	1		0		3		11		15
16:30	0		0		2		2		4
16:45	0		4		2		0		6
Hr Total	2		4		12		14		32
17:00	8		8		5		7		26
17:15	0		1		1		2		4
17:30	0		2		1		2		5
17:45	3		1		0		16		20
Hr Total	9		12		7		27		55
TOTAL	11		16		19		41		87

Annual Daily Traffic Volume Conversion Factors

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Dec/Jan/Feb	1.637	0.984	0.973	0.984	0.987	0.918	1.139
Mar/Apr/May	1.158	0.796	0.733	0.794	0.775	0.736	0.913
Jun/Jul/Aug	1.799	1.144	1.125	1.152	1.159	1.016	1.327
Sep/Oct/Nov	1.556	0.921	0.924	0.949	0.941	0.811	1.092

1. Provided by the City of Indio Traffic Engineer.

Daily Variance with Seasonal Adjustments

Avg Weighting	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1.02	1.670	1.004	0.992	1.004	1.007	0.936	1.162
1.30	1.505	1.035	0.953	1.032	1.008	0.957	1.187
0.87	1.565	0.995	0.979	1.002	1.008	0.884	1.154
1.07	1.665	0.985	0.989	1.015	1.007	0.868	1.168

1. Adjustments are to normalize Tuesday, Wednesday, and Thursday.

Adjustment to Peak Season

	Avg Weighting	**Adjustment**
Dec/Jan/Feb	1.02	**1.27**
Mar/Apr/May	1.30	**1.00**
Jun/Jul/Aug	0.87	**1.49**
Sep/Oct/Nov	1.07	**1.21**

Seasonal Adjustment of Peak Hour Intersection Count Data

N/S Street	Indian Avenue		
E/W Street	Mission Lakes Blvd.		
Date	10/26/94	Seas	Adj
Start Time	17:00		1.21
SR	0	SR	0
ST	151	ST	183
SL	22	SL	27
WR	34	WR	41
WT	0	WT	0
WL	33	WL	40
NR	62	NR	75
NT	284	NT	344
NL	0	NL	0
ER	0	ER	0
ET	0	ET	0
EL	0	EL	0
North link	7,245	Ea	2,228
South link	7,821	We	0

N/S Street	State Route 62		
E/W Street	Pierson Blvd.		
Date	10/27/94	Seas	Adj
Start Time	16:45		1.21
SR	0	SR	0
ST	288	ST	348
SL	6	SL	7
WR	24	WR	29
WT	4	WT	5
WL	9	WL	11
NR	28	NR	34
NT	518	NT	627
NL	5	NL	6
ER	2	ER	2
ET	2	ET	2
EL	0	EL	0
North link	12,336	Ea	1,077
South link	12,543	We	192

N/S Street	Indian Avenue		
E/W Street	Pierson Blvd.		
Date	10/26/94	Seas	Adj
Start Time	16:45		1.21
SR	12	SR	15
ST	124	ST	150
SL	20	SL	24
WR	33	WR	40
WT	45	WT	54
WL	63	WL	76
NR	75	NR	91
NT	278	NT	336
NL	19	NL	23
ER	3	ER	4
ET	38	ET	46
EL	26	EL	31
North link	7,275	Ea	4,043
South link	8,293	We	2,110

N/S Street	Little Morongo Road		
E/W Street	Pierson Blvd.		
Date	10/27/94	Seas	Adj
Start Time	17:00		1.21
SR	8	SR	10
ST	29	ST	35
SL	23	SL	28
WR	45	WR	54
WT	132	WT	160
WL	20	WL	24
NR	26	NR	31
NT	31	NT	38
NL	9	NL	11
ER	11	ER	13
ET	125	ET	151
EL	6	EL	7
North link	2,095	Ea	5,475
South link	1,859	We	4,294

N/S Street	West Drive		
E/W Street	Pierson Blvd.		
Date	10/27/94	Seas	Adj
Start Time	16:00		1.21
SR	37	SR	45
ST	61	ST	74
SL	36	SL	44
WR	28	WR	34
WT	129	WT	156
WL	28	WL	34
NR	20	NR	24
NT	49	NT	59
NL	37	NL	45
ER	32	ER	39
ET	133	ET	161
EL	37	EL	45
North link	3,660	Ea	5,519
South link	3,350	We	5,976

N/S Street	Palm Drive		
E/W Street	Pierson Blvd.		
Date	10/27/94	Seas	Adj
Start Time	16:00		1.21
SR	37	SR	45
ST	233	ST	282
SL	28	SL	34
WR	51	WR	62
WT	64	WT	77
WL	69	WL	83
NR	69	NR	83
NT	337	NT	408
NL	151	NL	183
ER	127	ER	154
ET	70	ET	85
EL	25	EL	30
North link	10,492	Ea	5,179
South link	14,550	We	6,994

N/S Street	Palm Drive		
E/W Street	Hacienda Avenue		
Date	10/26/94	Seas	Adj
Start Time	16:45		1.21
SR	15	SR	18
ST	440	ST	532
SL	67	SL	81
WR	126	WR	152
WT	44	WT	53
WL	67	WL	81
NR	51	NR	62
NT	607	NT	734
NL	56	NL	68
ER	44	ER	53
ET	52	ET	63
EL	18	EL	22
North link	18,785	Ea	6,006
South link	18,666	We	3,379

N/S Street	Miracle Hill Road		
E/W Street	Hacienda Avenue		
Date	10/26/94	Seas	Adj
Start Time	16:30		1.21
SR	2	SR	2
ST	7	ST	8
SL	28	SL	34
WR	19	WR	23
WT	191	WT	231
WL	1	WL	1
NR	0	NR	0
NT	10	NT	12
NL	4	NL	5
ER	4	ER	5
ET	193	ET	234
EL	1	EL	1
North link	989	Ea	6,375
South link	384	We	5,829

N/S Street	Mountain View Road		
E/W Street	Hacienda Avenue		
Date	10/27/94	Seas	Adj
Start Time	16:00		1.21
SR	3	SR	4
ST	11	ST	13
SL	12	SL	15
WR	16	WR	19
WT	103	WT	125
WL	23	WL	28
NR	30	NR	36
NT	41	NT	50
NL	105	NL	127
ER	71	ER	86
ET	148	ET	179
EL	10	EL	12
North link	1,372	Ea	4,899
South link	4,146	We	6,493

N/S Street	Palm Drive		
E/W Street	Two Bunch Palms Trail		
Date	10/26/94	Seas	Adj
Start Time	17:00		1.21
SR	51	SR	62
ST	425	ST	514
SL	59	SL	71
WR	75	WR	91
WT	59	WT	71
WL	112	WL	136
NR	93	NR	113
NT	592	NT	716
NL	85	NL	103
ER	90	ER	109
ET	57	ET	69
EL	70	EL	85
North link	18,770	Ea	6,714
South link	20,614	We	6,080

Year 1999 Versus 1994 Daily Traffic Volumes

Roadway Links	1994 ADT	1999 ADT	Change In ADT	Percentage Change
Mission Lakes Boulevard				
- East of Indian Avenue	2,200	2,812	612	28%
- West of West Drive	2,400	2,808	408	17%
- East of Palm Drive		1,284		
Pierson Boulevard				
- West of Indian Avenue	2,100	1,615	-485	-23%
- West of Little Morongo Road	4,300	3,491	-809	-19%
- West of Palm Drive	7,000	6,611	-389	-6%
- East of Palm Drive	5,200	3,556	-1,644	-32%
Hacienda Boulevard				
- West of Palm Drive	3,400	2,965	-435	-13%
- East of Palm Drive	6,000	5,431	-569	-9%
- West of Mountain View Road	6,500	6,728	228	4%
- East of Mountain View Road	4,900	4,035	-865	-18%
Two Bunch Palms Trail				
- West of Little Morongo		2,638		
- East of Little Morongo		135		
- West of Palm Drive	6,700	4,335	-2,365	-35%
- East of Palm Drive	6,100	4,994	-1,106	-18%
Dillon Road				
- West of Indian Avenue		1,862		
- West of Palm Drive		6,033		
- West of Mountain View Road		8,944		
- East of Mountain View Road		8,289		
- East of Long Canyon Road		9,835		
State Route 62				
- North of Pierson Boulevard	19,000	15,500	-3,500	-18%
- South of Pierson Boulevard	15,000	12,400	-2,600	-17%
Indian Avenue				
- North of Mission Lakes Blvd.	6,000	6,182	182	3%
- North of Pierson Boulevard	7,000	6,575	-425	-6%
- South of Pierson Boulevard	8,300	7,106	-1,194	-14%
Little Morongo Road				
- North of Pierson Boulevard	2,100	1,610	-490	-23%
- South of Pierson Boulevard	1,900	1,922	22	1%
- South of Two Bunch Palms Trail	3,000	2,843	-157	-5%
- North of Dillon Road		3,210		
Palm Drive				
- North of Pierson Boulevard	10,500	9,298	-1,202	-11%
- South of Hacienda Avenue	18,800	17,879	-921	-5%
- North of City Limits	23,400	22,568	-832	-4%
- South of Dillon Road		16,342		
- North of Interstate 10		17,601		
Mountain View Road				
- North of Dillon Road		4,202		
- North of 20th Avenue		7,261		
- North of Varner Road		7,057		
Varner Road				
- East of Palm Drive		1,112		
- East of Mountain View Road		7,953		
Interstate 10				
- West of SR 62	51,000	60,000		
- West of Indian Avenue	45,500	54,000		
- West of Palm Drive	46,500	50,000		
- East of Palm Drive	46,500	50,000		

The 1994 traffic volume data in the baseline report was not updated with new traffic counts since available 1999 traffic count data for the study area was 8% to 10% lower on an overall basis than previously addressed.

Daily traffic volumes within the planning area decreased, for the most part, between 1994 and 1999. Of the twenty-three roadway links for which volumes were available for both years, eighteen links (78%) exhibited a decrease in daily traffic volumes and five links (22%) exhibited an increase. Based upon all of the surface street links analyzed (excluding I-10 and SR 62) an over all decrease of 8.17% in daily traffic volumes occurred.

Three of the five links where daily traffic volumes increased exhibited increases of 4% or less. The remaining two links are along Mission Lakes Boulevard, where daily traffic increased significantly (17% to 28%).

Daily traffic volumes along State Highway 62 decreased by 17% to 18%. If this decrease is included in the analysis, an over all decrease in daily volumes of 10% occurred within the study area between 1994 and 1999.

Volumes along Interstate 10 were not included in the conclusions above, as Interstate 10 carries regional through traffic. Daily traffic volumes along Interstate 10 increased by approximately 13% between 1994 and 1999.

Appendix C

1985 HCM Methodology
Unsignalized Intersection HCM Worksheets
All Way Stop Intersection Analysis Worksheets
Signalized Intersection HCM Worksheets

1985 *Highway Capacity Manual* Methodology

Unsignalized Intersection Analysis

Some of the key intersections in the project vicinity are currently unsignalized and are controlled by stop signs on one or more of the approaches. To evaluate the ability of these intersections to serve current and future traffic demands during peak hours, the capacity was determined for each minor approach movement and the left turns onto the minor streets, and then compared to the demand for each movement. In this manner, the probable delay and level of service during the peak hour was estimated.

The methodology utilized to determine the maximum capacity of the minor approach movements and the left turn onto the minor street (in passenger car equivalents per hour or PCPH) accounts for approach grade and speed, traffic mix, lane configuration, and type of traffic control. It allows the maximum capacity to be determined from the conflicting volumes and the critical gap associated with each type of vehicle maneuver.

The difference between the capacity value determined and the existing or projected traffic flows is defined as the reserve capacity. Both the traffic delay and the resulting level of service are directly related to the magnitude of the available reserve capacity, as shown in the table below.

Level of Service Criteria[a]

Level of Service	Traffic Flow Characteristics	Stopped Delay Per Vehicle (sec)	Reserve Capacity (PCPH)[b]
A	Extremely favorable progression with very low delay. Most vehicles do not stop at all.	≤ 5.0	≥ 400
B	Good progression and stable flow with an occasional approach phase fully utilized.	5.1 - 15.0	300 - 399
C	Satisfactory operation with fair progression and longer cycle lengths. Individual cycle failures may begin to appear.	15.1 - 25.0	200 - 299
D	Tolerable delay where congestion becomes noticeable and many vehicles stop.	25.1 - 40.0	100 - 199
E	Unstable flow with poor progression and frequent cycle failures. This is considered the limit of acceptable delay.	40.1 - 60.0	0 - 99
F	Oversaturation with arrival flow rates exceeding the capacity of the intersection. Considered unacceptable to most drivers.	> 60.0	< 0

a. *Highway Capacity Manual, Special Report 209*, Transportation Research Board, 1985; pp. 9-4 and 9-5.
b. PCPH = Passenger Cars Per Hour.

It should be noted that the concept of reserve capacity applies only to an individual stream of vehicles (or shared lane stream). The summation of individual reserve capacities for various movements should not be attempted.

Once the capacity of each of the critical movements is calculated and the level of service and expected delay are determined, an overall evaluation of the intersection is made. Typically, the movement with the smallest available reserve capacity (ARC) or worst level or service defines the overall evaluation; however, this may be tempered by engineering judgement, when conditions warrant it.

All-Way Stop Intersection Analysis

Intersections controlled by 4-way or 3-way stop signs can be evaluated for acceptable levels of service (level of service C or better) using the table below. The approximate LOS C volume of these intersections is given in terms of the total number of entering vehicles in the peak hour. The intersection capacity varies with the split in the demand between the two streets and the number of approach lanes. The maximum intersection capacity is achieved when the traffic flow on the two cross streets is approximately equal.

Approximate LOS C Volumes for
Four-Way Stop Controlled Intersections[a]

Traffic Demand Split	Number of Approach Lanes		
	2 by 2	2 by 4	4 by 4
50/50	1,200	1,800	2,200
55/45	1,140	1,720	2,070
60/40	1,080	1,660	1,970
65/35	1,010	1,630	1,880
70/30	960	1,610	1,820

a. *Highway Capacity Manual, Highway Research Board Special Report 87*, 1965 and "A Study of Four-Way Intersection Capacities" by Jacques Hebert, 1963.

Signalized Intersection Analysis

The 1985 *Highway Capacity Manual* (HCM) signalized intersection capacity and level of service methodology addresses the capacity and level of service of intersection approaches as well as the level of service of the intersection as a whole. The analysis is undertaken in terms of the ratio of demand flow rate to capacity (V/C ratio) for individual movements during a peak 15-minute interval and the composite V/C ratio for the sum of critical movements or lane groups within the intersection. The level of service is determined based upon average stopped delay per vehicle.

A critical V/C ratio less than 1.00 indicates that all movements at the intersection can be accommodated within the defined cycle length and phase sequence by proportionally allocating green time. In other words, the total available green time in the phase sequence is adequate to handle all movements, if properly allocated.

It is possible to have unacceptable delays (LOS F) while the V/C ratio is below 1.00 (if the lane group has a long red time because of signal timing and/or the signal progression for the subject movements is poor). Conversely, a saturated approach may have low delays if the cycle length is short and/or the signal progression is favorable. Therefore, an LOS F designation may not necessarily mean that the intersection, approach or lane group is overloaded and LOS A to LOS E does not automatically imply available unused capacity.

Unsignalized Intersection HCM Worksheets

****

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55

PEAK HOUR FACTOR..... 1

AREA POPULATION..... 13400

NAME OF THE EAST/WEST STREET..... Mission Lakes Blvd.

NAME OF THE NORTH/SOUTH STREET..... Indian Avenue

NAME OF THE ANALYST..... Greg

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/14/94

TIME PERIOD ANALYZED..... PM PEAK

OTHER INFORMATION....

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	--	40	6	27
THRU	--	5	344	183
RIGHT	--	41	75	0

NUMBER OF LANES

	EB	WB	NB	SB
LANES	--	1	1	1

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	-----	---	---	-
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	---	---	---
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS	WB	6.50	6.50	0.00	6.50
MAJOR LEFTS	SB	5.50	5.50	0.00	5.50
MINOR LEFTS	WB	8.00	8.00	0.00	8.00

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Mission Lakes Blvd.
NAME OF THE NORTH/SOUTH STREET.... Indian Avenue
DATE AND TIME OF THE ANALYSIS..... 11/14/94 ; PM PEAK
OTHER INFORMATION....

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v(pcph)	POTEN-TIAL CAPACITY c (pcph) P	ACTUAL MOVEMENT CAPACITY c (pcph) M	SHARED CAPACITY c (pcph) SH	RESERVE CAPACITY c = c - v R SH	LOS
MINOR STREET						
WB LEFT	44	300	292	> 292	> 248	> C
				> 389	> 300	>C
RIGHT	45	574	574	> 574	> 529	> A
MAJOR STREET						
SB LEFT	30	686	686	686	657	A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Mission Lakes Blvd.
NAME OF THE NORTH/SOUTH STREET.... Indian Avenue
DATE AND TIME OF THE ANALYSIS..... 11/14/94 ; PM PEAK
OTHER INFORMATION....

1985 HCM: UNSIGNALIZED INTERSECTIONS

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.: 55

PEAK HOUR FACTOR..... 1

AREA POPULATION..... 13400

NAME OF THE EAST/WEST STREET..... Pierson Blvd.

NAME OF THE NORTH/SOUTH STREET..... State Highway 62

NAME OF THE ANALYST..... Greg

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/14/94

TIME PERIOD ANALYZED..... Evening Peak Hour

OTHER INFORMATION....

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

CONTROL TYPE WESTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	0	11	6	7
THRU	2	5	627	348
RIGHT	2	29	34	0

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	1	1	3	3
LANE USAGE	LTR	LTR		

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	BASE VALUES (Table 10-1)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
EB	[illegible]	6.50	0.00	6.50
WB	[illegible]	6.50	0.00	6.50
MAJOR LEFTS				
SB	[illegible]	6.00	0.00	6.00
NB	[illegible]	6.00	0.00	6.00
MINOR THROUGHS				
EB	[illegible]	8.00	0.00	8.00
WB	[illegible]	8.00	0.00	8.00
MINOR LEFTS				
EB	[illegible]	8.50	0.00	8.50
WB	[illegible]	8.50	0.00	8.50

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Pierson Blvd.
NAME OF THE NORTH/SOUTH STREET.... State Highway 62
DATE AND TIME OF THE ANALYSIS..... 11/14/94 ; Evening Peak Hour
OTHER INFORMATION....

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v (pcph)	POTENTIAL CAPACITY c (pcph) P	ACTUAL MOVEMENT CAPACITY c (pcph) M		SHARED CAPACITY c (pcph) SH		RESERVE CAPACITY c = c - v R		SH	LOS
MINOR STREET										
EB LEFT	0	104	97	>		97	>		97	> E
THROUGH	2	130	128	>	221	128	>	216	126	>C D
RIGHT	2	804	804	>		804	>		802	> A
MINOR STREET										
WB LEFT	12	113	110	>		110	>		98	> E
THROUGH	6	134	132	>	251	132	>	201	126	>C D
RIGHT	32	698	698	>		698	>		666	> A
MAJOR STREET										
SB LEFT	8	445	445			445			437	A
NB LEFT	7	667	667			667			660	A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Pierson Blvd.
NAME OF THE NORTH/SOUTH STREET.... State Highway 62
DATE AND TIME OF THE ANALYSIS..... 11/14/94 ; Evening Peak Hour
OTHER INFORMATION....

****

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55

PEAK HOUR FACTOR..... 1

AREA POPULATION..... 13400

NAME OF THE EAST/WEST STREET..... Pierson Blvd.

NAME OF THE NORTH/SOUTH STREET..... Little Morongo Blvd.

NAME OF THE ANALYST..... Greg

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/14/94

TIME PERIOD ANALYZED..... PM PEAK

OTHER INFORMATION....

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG

MAJOR STREET DIRECTION: EAST/WEST

CONTROL TYPE NORTHBOUND: STOP SIGN

CONTROL TYPE SOUTHBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	7	24	11	28
THRU	151	140	38	35
RIGHT	13	54	31	10

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	1	1	1	1
LANE USAGE			LTR	LTR

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
NB	[illegible]	6.50	0.00	6.50
SB	[illegible]	6.50	0.00	6.50
MAJOR LEFTS				
EB	[illegible]	5.50	0.00	5.50
WB	[illegible]	5.50	0.00	5.50
MINOR THROUGHS				
NB	[illegible]	7.50	0.00	7.50
SB	[illegible]	7.50	0.00	7.50
MINOR LEFTS				
NB	[illegible]	8.88	8.88	8.88
SB	[illegible]	8.88	8.88	8.88

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Pierson Blvd.
NAME OF THE NORTH/SOUTH STREET.... Little Morongo Blvd.
DATE AND TIME OF THE ANALYSIS..... 11/14/94 ; PM PEAK
OTHER INFORMATION....

CAPACITY AND LEVEL-OF-SERVICE Page-3

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c (pcph) p	ACTUAL MOVEMENT CAPACITY c (pcph) M		SHARED CAPACITY c (pcph) SH		RESERVE CAPACITY c = c - v R SH		LOS
MINOR STREET									
NB LEFT	12	387	356	>	356	>	344	>	B
THROUGH	42	453	443	> 509	443	> 421	402	>A	A
RIGHT	34	763	763	>	763	>	728	>	A
MINOR STREET									
SB LEFT	31	384	346	>	346	>	315	>	B
THROUGH	39	469	458	> 427	458	> 346	420	>B	A
RIGHT	11	733	733	>	733	>	722	>	A
MAJOR STREET									
EB LEFT	8	876	876		876		868		A
WB LEFT	26	928	928		928		901		A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Pierson Blvd.
NAME OF THE NORTH/SOUTH STREET.... Little Morongo Blvd.
DATE AND TIME OF THE ANALYSIS..... 11/14/94 ; PM PEAK
OTHER INFORMATION....

1985 HCM: UNSIGNALIZED INTERSECTIONS Page-1

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET.. 55

PEAK HOUR FACTOR..... 1

AREA POPULATION..... 13400

NAME OF THE EAST/WEST STREET..... Hacienda Avenue

NAME OF THE NORTH/SOUTH STREET..... Miracle Hill Road

NAME OF THE ANALYST..... Greg

DATE OF THE ANALYSIS (mm/dd/yy)..... 11/14/94

TIME PERIOD ANALYZED..... PM PEAK

OTHER INFORMATION....

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: 4-LEG

MAJOR STREET DIRECTION: EAST/WEST

CONTROL TYPE NORTHBOUND: STOP SIGN

CONTROL TYPE SOUTHBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	1	1	5	34
THRU	234	231	12	8
RIGHT	8	23	0	2

NUMBER OF LANES AND LANE USAGE

	EB	WB	NB	SB
LANES	2	1	1	1
LANE USAGE			LTR	LTR

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	0	0	0
WESTBOUND	0	0	0
NORTHBOUND	0	0	0
SOUTHBOUND	0	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS				
NB	6.50	6.50	0.00	6.50
SB	6.50	6.50	0.00	6.50
MAJOR LEFTS				
EB	6.00	6.00	0.00	6.00
WB	6.00	6.00	0.00	6.00
MINOR THROUGHS				
NB	8.00	8.00	0.00	8.00
SB	7.50	7.50	0.00	7.50
MINOR LEFTS				
NB	8.50	8.50	0.00	8.50
SB	8.00	8.00	0.00	8.00

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Hacienda Avenue
NAME OF THE NORTH/SOUTH STREET.... Miracle Hill Road
DATE AND TIME OF THE ANALYSIS..... 11/14/94 ; PM PEAK
OTHER INFORMATION....

CAPACITY AND LEVEL-OF-SERVICE

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c (pcph) p	ACTUAL MOVEMENT CAPACITY c (pcph) M		SHARED CAPACITY c (pcph) SH		RESERVE CAPACITY c = c - v R SH		LOS
MINOR STREET									
NB LEFT	6	319	313	>	313	>	308	>	B
THROUGH	13	360	359	> 344	359	> 325	346	>B	B
RIGHT	0	801	801	>	801	>	801	>	A
MINOR STREET									
SB LEFT	37	358	349	>	349	>	312	>	B
THROUGH	9	403	402	> 366	402	> 318	393	>B	B
RIGHT	2	684	684	>	684	>	682	>	A
MAJOR STREET									
EB LEFT	1	749	749		749		748		A
WB LEFT	1	762	762		762		761		A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... Hacienda Avenue
NAME OF THE NORTH/SOUTH STREET.... Miracle Hill Road
DATE AND TIME OF THE ANALYSIS..... 11/14/94 ; PM PEAK
OTHER INFORMATION....

Signalized Intersection HCM Worksheets

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..Hacienda Avenue/Palm Drive
AREA TYPE.....OTHER
ANALYST.......Gmes
DATE.....11/14/94
TIME.....PM PEAK
COMMENT.....EXISTING

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB		WB		NB		SB	
LT	22	81	68	81	: L	12.0	L	12.0	L	12.0	L	12.0	
TH	63	53	734	532	: T	12.0	T	12.0	T	12.0	T	12.0	
RT	53	152	62	18	: TR	12.0	TR	12.0	TR	12.0	TR	12.0	
RR	0	0	0	0	:	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	2.00	N	0	0	1.00	10	N	20.5	3
WB	0.00	2.00	N	0	0	1.00	10	N	20.5	3
NB	0.00	2.00	N	0	0	1.00	10	N	20.5	3
SB	0.00	2.00	N	0	0	1.00	10	N	20.5	3

SIGNAL SETTINGS — CYCLE LENGTH = 90.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X				NB	LT	X			
	TH	X					TH	X			
	RT	X					RT	X			
	PD	X					PD	X			
WB	LT	X				SB	LT	X			
	TH	X					TH	X			
	RT	X					RT	X			
	PD	X					PD	X			
GREEN		35.0	0.0	0.0	0.0	GREEN		51.0	0.0	0.0	0.0
YELLOW		2.0	0.0	0.0	0.0	YELLOW		2.0	0.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.047	0.389	13.0	B	11.6	B
	TR	0.100	0.389	11.3	B		
WB	L	0.157	0.389	13.6	B	12.2	B
	TR	0.185	0.389	11.7	B		
NB	L	0.147	0.567	7.0	B	7.2	B
	TR	0.419	0.567	7.2	B		
SB	L	0.249	0.567	7.6	B	6.7	B
	TR	0.287	0.567	6.5	B		

INTERSECTION: Delay = 8.1 (sec/veh) V/C = 0.324 LOS = B

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..Pierson Blvd./Palm Drive
AREA TYPE.....OTHER
ANALYST.......Greg
DATE.....11/14/94
TIME.....PM PEAK
COMMENT.....EXISTING

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB		WB		NB		SB	
LT	30	83	183	34	: L	12.0	L	12.0	L	12.0	L	12.0	
TH	85	77	408	282	: T	12.0	T	12.0	T	12.0	T	12.0	
RT	154	62	83	45	: TR	12.0	TR	12.0	TR	12.0	TR	12.0	
PP	0	0	0	0	:	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR.	TYPE
EB	0.00	2.00	N	0	0	1.00	10	N	23.5		3
WB	0.00	2.00	N	0	0	1.00	10	N	23.5		3
NB	0.00	2.00	N	0	0	1.00	10	N	23.5		3
SB	0.00	2.00	N	0	0	1.00	10	N	23.5		3

SIGNAL SETTINGS — CYCLE LENGTH = 90.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X				NB	LT	X	X		
	TH	X					TH		X	X	
	RT	X					RT		X	X	
	PD	X					PD			X	
WB	LT	X				SB	LT	X			
	TH	X					TH			X	
	RT	X					RT			X	
	PD	X					PD			X	
GREEN		33.0	0.0	0.0	0.0	GREEN		10.0	13.0	26.0	0.0
YELLOW		2.0	0.0	0.0	0.0	YELLOW		2.0	0.0	2.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.267	14.0	B	12.9	B
	TR	0.323	12.7	B		
WB	L	0.194	14.9	B	13.2	B
	TR	0.121	12.2	B		
NB	L	0.448	21.9	C	13.3	B
	TR	0.344	10.3	B		
SB	L	0.191	27.7	D	16.6	C
	TR	0.235	15.5	C		

INTERSECTION: Delay = 0.0 (sec/veh) V/C = 0.323 LOS = B

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..Two Bunch Palms Trail/Palm Drive
AREA TYPE.....OTHER
ANALYST.......Greg
DATE.....11/14/94
TIME.....PM PEAK
COMMENT.....EXISTING

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB		WB		NB		SB	
LT	85	136	103	71	: L	12.0	L	12.0	L	12.0	L	12.0	
TH	69	71	716	514	: T	12.0	T	12.0	T	12.0	T	12.0	
RT	109	91	113	62	: R	12.0	R	12.0	TR	12.0	TR	12.0	
PP	0	0	0	0	:	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR.	TYPE
EB	0.00	2.00	N	0	0	1.00	10	N	20.5		3
WB	0.00	2.00	N	0	0	1.00	10	N	20.5		3
NB	0.00	2.00	N	0	0	1.00	10	N	20.5		3
SB	0.00	2.00	N	0	0	1.00	10	N	20.5		3

SIGNAL SETTINGS — CYCLE LENGTH = 90.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X				NB	LT	X			
	TH	X					TH	X			
	RT	X					RT	X			
	PD	X					PD	X			
WB	LT	X				SB	LT	X			
	TH	X					TH	X			
	RT	X					RT	X			
	PD	X					PD	X			
GREEN		35.0	0.0	0.0	0.0	GREEN		51.0	0.0	0.0	0.0
YELLOW		2.0	0.0	0.0	0.0	YELLOW		2.0	0.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.187	0.389	13.8	B	7.5	B
	T	0.105	0.389	11.3	B		
	R	0.080	0.956	0.1	A		
WB	L	0.307	0.389	14.6	B	9.4	B
	T	0.108	0.389	11.3	B		
	R	0.067	0.956	0.1	A		
NB	L	0.230	0.567	7.4	B	7.5	B
	TR	0.466	0.567	7.5	B		
SB	L	0.230	0.567	7.5	B	6.8	B
	TR	0.322	0.567	6.7	B		

INTERSECTION: Delay = 7.5 (sec/veh) V/C = 0.401 LOS = B

Appendix D

Noise Measurement System and Procedure

Noise Measurement System and Procedure

I. Sound Level Meter

The sound level meter utilized was a Model 800B Precision Sound Level Meter and Analyzer manufactured by Larson & Davis Laboratories. This meter meets ANSI and IEC Standards (ANS S1.4-1971 Type I precision) and was calibrated before field measurements were taken.

II. Procedure

One integrated noise measurement was taken at each location. Ten-minute noise level recordings were used to represent the average noise level at each location.

General Plan Buildout
Input Assumptions for FHWA RD-77-108 Noise Model

Roadway Link	Speed[a] (mph)	Half-Width[b] (feet)	Percent Trucks[c] (% Medium)
Mission Lakes Boulevard			
- East of State Route 62	55	26	8.00 (37.50)
- East of Worsley Road	55	26	8.00 (37.50)
- West of Indian Avenue	55	26	8.00 (37.50)
- East of Indian Avenue	55	26	8.00 (37.50)
- West of West Drive	45	26	8.00 (37.50)
- West of Palm Drive	45	26	8.00 (37.50)
- East of Palm Drive	40	18	8.00 (37.50)
Eighth Street			
- West of Palm Drive	35	18	8.00 (37.50)
- East of Palm Drive	35	18	8.00 (37.50)
Pierson Boulevard			
- East of Route 62	55	37	8.00 (37.50)
- East of Worsley Road	55	37	8.00 (37.50)
- West of Indian Avenue	55	37	8.00 (37.50)
- East of Indian Avenue	55	29	8.00 (37.50)
- East of Little Morongo Road	55	29	8.00 (37.50)
- East of West Drive	35	29	8.00 (37.50)
- East of Palm Drive	35	26	8.00 (37.50)
- West of Miracle Hill Road	45	26	8.00 (37.50)
Desert View Avenue			
- West of Mountain View Road	35	18	8.00 (37.50)
Hacienda Boulevard			
- East of Indian Avenue	55	26	8.00 (37.50)
- East of Little Morongo Road	40	26	8.00 (37.50)
- West of Palm Drive	40	26	8.00 (37.50)
- East of Palm Drive	45	18	8.00 (37.50)
- West of Miracle Hill Road	45	18	8.00 (37.50)
- West of Mountain View Road	45	18	8.00 (37.50)
- East of Mountain View Road	35	18	8.00 (37.50)
- West of City Limits	35	18	8.00 (37.50)
Two Bunch Palms Trail			
- East of State Route 62	45	18	8.00 (37.50)
- East of Worsley Road	45	18	8.00 (37.50)
- West of Indian Avenue	45	18	8.00 (37.50)
- East of Indian Avenue	45	18	8.00 (37.50)
- West of West Drive	35	18	8.00 (37.50)
- West of Palm Drive	35	18	8.00 (37.50)
- East of Palm Drive	45	18	8.00 (37.50)
Dillon Road			
- East of Route 62	55	37	8.00 (37.50)
- East of Worsley Road	55	37	8.00 (37.50)
- West of Indian Avenue	55	37	8.00 (37.50)
- West of Little Morongo Road	45	29	8.00 (37.50)

a. Speed was was based upon posted speed limits, observed speeds or arterial classification.
b. The half-width is the distance from the roadway centerline to the center of the outermost travel lane.
c. Truck mix values for state highways were provided by Caltrans, truck mix values for arterial streets were based upon the Riverside County Department of Health specifications for noise analyses.

General Plan Buildout
Input Assumptions for FHWA RD-77-108 Noise Model

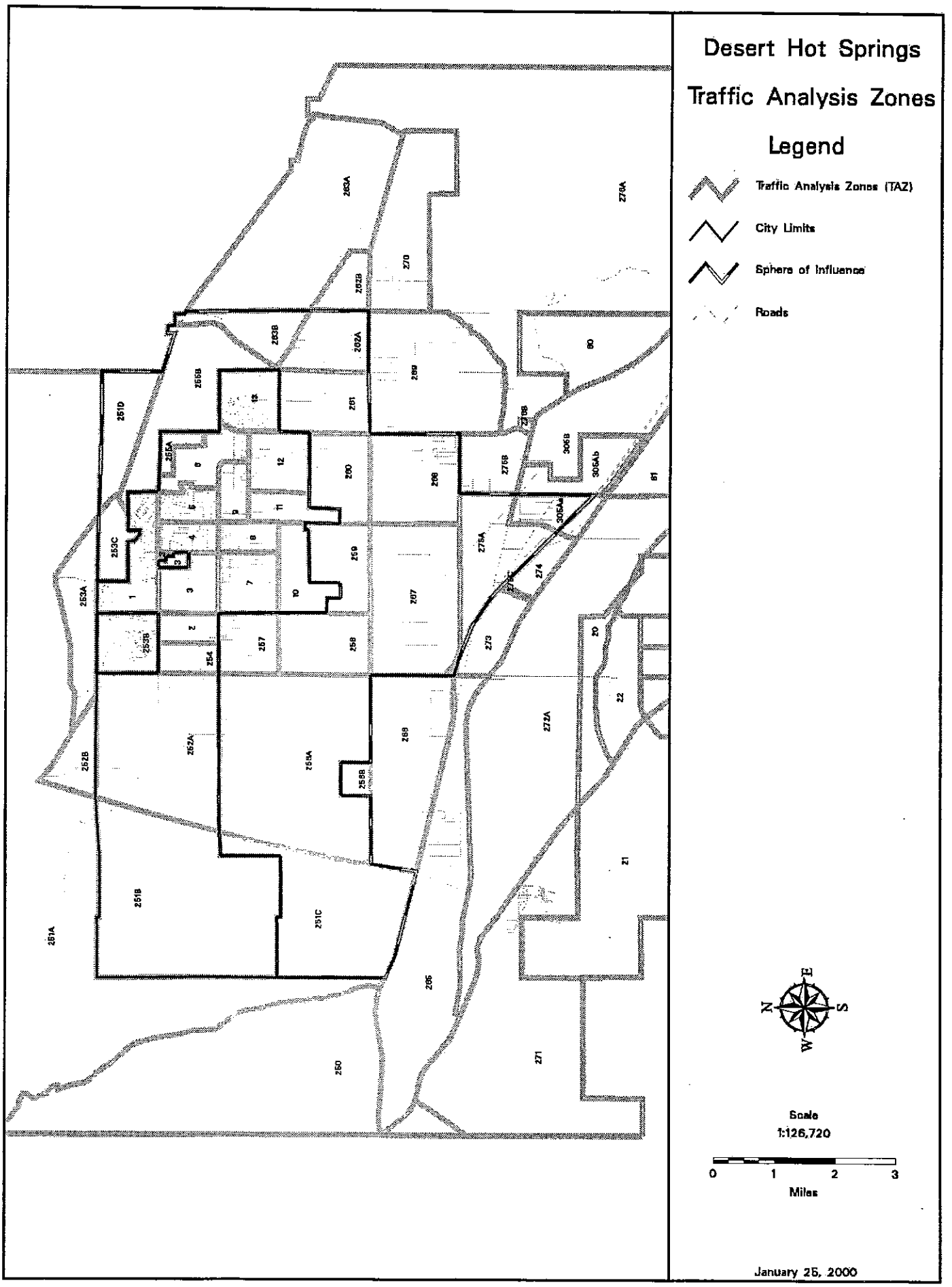
Roadway Link	Speed[a] (mph)	Half-Width[b] (feet)	Percent Trucks[c] (% Medium)
Dillon Road			
- West of Palm Drive	45	29	8.00 (37.50)
- East of Palm Drive	45	29	8.00 (37.50)
- West of Mountain View Road	45	37	8.00 (37.50)
- East of Mountain View Road	45	37	8.00 (37.50)
- East of Long Canyon Road	55	37	8.00 (37.50)
20th Avenue			
- West of Indian Avenue	40	26	8.00 (37.50)
- West of Little Morongo Road	40	29	8.00 (37.50)
- West of Palm Drive	45	29	8.00 (37.50)
- East of Palm Drive	45	37	8.00 (37.50)
- West of Mountain View Road	40	29	8.00 (37.50)
Varner Road			
- West of Palm Drive	45	29	8.00 (37.50)
- East of Palm Drive	45	29	8.00 (37.50)
- East of Mountain View Road	45	37	8.00 (37.50)
Interstate 10			
- West of Route 62	70	64	21.90 (37.50)
- East of Route 62	70	64	26.20 (37.50)
- East of Indian Avenue	70	64	25.00 (37.50)
- West of Palm Drive	70	64	23.60 (37.50)
- East of Palm Drive	70	64	23.60 (37.50)
State Route 62			
- North of Mission Lakes Blvd.	55	31	13.80 (37.50)
- North of Pierson Boulevard	55	31	13.80 (37.50)
- North of Two Bunch Palms Trail	55	31	13.80 (37.50)
- North of Dillon Road	55	31	13.80 (37.50)
- North of Interstate 10	55	43	13.80 (37.50)
Worsley Road			
- North of Mission Lakes Blvd.	40	26	8.00 (37.50)
- North of Pierson Boulevard	40	26	8.00 (37.50)
- North of Two Bunch Palms Trail	40	26	8.00 (37.50)
- North of Dillon Road	40	26	8.00 (37.50)
- South of Dillon Road	40	26	8.00 (37.50)
- North of 20th Avenue	40	26	8.00 (37.50)
Indian Avenue			
- North of Mission Lakes Blvd.	55	29	8.00 (37.50)
- North of Pierson Boulevard	55	29	8.00 (37.50)
- North of Hacienda Avenue	45	37	8.00 (37.50)
- North of Two Bunch Palms Trail	45	37	8.00 (37.50)
- South of Two Bunch Palms Trail	45	37	8.00 (37.50)
- North of Dillon Road	45	37	8.00 (37.50)
- North of 20th Avenue	45	49	8.00 (37.50)
- South of Interstate 10	45	49	8.00 (37.50)

a. Speed was was based upon posted speed limits, observed speeds or arterial classification.
b. The half-width is the distance from the roadway centerline to the center of the outermost travel lane.
c. Truck mix values for state highways were provided by Caltrans, truck mix values for arterial streets were based upon the Riverside County Department of Health specifications for noise analyses.

General Plan Buildout
Input Assumptions for FHWA RD-77-108 Noise Model

Roadway Link	Speed[a] (mph)	Half-Width[b] (feet)	Percent Trucks[c] (% Medium)
Little Morongo Road			
- North of Mission Lakes Blvd.	55	18	8.00 (37.50)
- North of Pierson Boulevard	55	26	8.00 (37.50)
- North of Hacienda Avenue	55	26	8.00 (37.50)
- North of Two Bunch Palms Trail	55	26	8.00 (37.50)
- South of Two Bunch Palms Trail	45	37	8.00 (37.50)
- North of Dillon Road	45	37	8.00 (37.50)
- North of 20th Avenue	45	37	8.00 (37.50)
- South of 20th Avenue	45	37	8.00 (37.50)
- South of Varner Avenue	45	37	8.00 (37.50)
West Drive			
- South of Mission Lakes Blvd.	35	18	8.00 (37.50)
- North of Pierson Boulevard	35	18	8.00 (37.50)
- South of Pierson Boulevard	35	18	8.00 (37.50)
- South of Hacienda Avenue	35	18	8.00 (37.50)
Palm Drive			
- South of Mission Lakes Blvd.	40	26	8.00 (37.50)
- North of Pierson Boulevard	40	26	8.00 (37.50)
- North of Hacienda Avenue	35	37	8.00 (37.50)
- North of Two Bunch Palms Trail	45	37	8.00 (37.50)
- South of Two Bunch Palms Trail	45	37	8.00 (37.50)
- North of Dillon Road	45	37	8.00 (37.50)
- South of Dillon Road	45	49	8.00 (37.50)
- South of 20th Avenue	45	49	8.00 (37.50)
- South of Varner Avenue	45	49	8.00 (37.50)
- South of Interstate 10	45	49	8.00 (37.50)
Verbena Drive			
- North of Pierson Boulevard	35	18	8.00 (37.50)
- North of Hacienda Avenue	35	18	8.00 (37.50)
Miracle Hill Road			
- South of Pierson Boulevard	35	18	8.00 (37.50)
- South of Hacienda Avenue	35	18	8.00 (37.50)
Bubbling Wells Road			
- North of Dillon Road	35	18	8.00 (37.50)
- South of Dillon Road	35	18	8.00 (37.50)
Mountain View Road			
- North of Hacienda Avenue	35	18	8.00 (37.50)
- South of Hacienda Avenue	35	18	8.00 (37.50)
- North of Dillon Road	35	29	8.00 (37.50)
- South of Dillon Road	45	37	8.00 (37.50)
- North of Varner Avenue	45	37	8.00 (37.50)
Long Canyon Road			
- South of Hacienda Avenue	45	26	8.00 (37.50)
- North of Dillon Road	45	26	8.00 (37.50)

a. Speed was was based upon posted speed limits, observed speeds or arterial classification.
b. The half-width is the distance from the roadway centerline to the center of the outermost travel lane.
c. Truck mix values for state highways were provided by Caltrans, truck mix values for arterial streets were based upon the Riverside County Department of Health specifications for noise analyses.


Desert Hot Springs
Traffic Analysis Zones
Legend
Traffic Analysis Zones (TAZ)
City Limits
Sphere of Influence
Roads
N
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Scale
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1
2
3
Miles
January 25, 2000

Appendix E

Trip Generation Forecast By Land Use Category

Year 2020 Land Use Assumptions for new Split TAZs

Riverside County General Plan Acreages for Split TAZs Outside the Study Area										
		SFD	MFA		Res1		Res2		Com		Ind
251A		2726	0		300		824		11.1		0
252B		35	0		0		0		0		0
253A		91.4	0		0		0		0		0
262B		2055	0		0		411		0		0
263A		3005	80		1638		311		10.4		0
275B		667	0		615		84.3		0		0
305Ab		57.3	0		0		0		33.6		92.7

Desert Hot Springs General Plan Trip Generation By Alternative

Land Use	Amount	Units	AM IN	AM OUT	AM TOTAL	PM IN	PM OUT	PM TOTAL	Daily
Preferred GP									
Residential - SFD	57,516	DU	10,784	32,353	43,137	37,178	20,913	58,091	550,430
Residential - MFA	21,476	DU	1,606	7,843	9,449	7,770	3,827	11,597	125,850
Commercial	1,042	Acres	7,659	4,897	12,556	24,800	26,884	51,683	554,340
Light Industrial	2,524	Acres	15,733	3,222	18,955	4,031	14,293	18,324	130,740
Public Facility	653	Acres	15,409	1,340	16,749	2,770	15,697	18,467	127,410
Total			51,338	49,749	101,087	77,025	82,130	159,154	1,488,770
Adopted GP									
Residential - SFD	57,006	DU	10,689	32,066	42,755	36,849	20,727	57,576	545,550
Residential - MFA	14,350	DU	1,073	5,241	6,314	5,192	2,557	7,749	84,090
Commercial	1,520	Acres	11,172	7,144	18,316	36,176	39,216	75,392	808,640
Light Industrial	2,554	Acres	15,920	3,261	19,181	4,079	14,463	18,542	132,300
Public Facility	1,235	Acres	29,144	2,534	31,678	5,239	29,687	34,926	240,960
Total			68,145	50,340	118,485	88,011	107,166	195,177	1,811,540
Alternative 3									
Residential - SFD	60,122	DU	11,273	33,819	45,092	38,863	21,860	60,723	575,370
Residential - MFA	21,476	DU	1,606	7,843	9,449	7,770	3,827	11,597	125,850
Commercial	1,507	Acres	11,076	7,083	18,159	35,867	38,881	74,747	801,720
Light Industrial	2,396	Acres	14,935	3,059	17,994	3,827	13,568	17,395	124,110
Public Facility	653	Acres	15,409	1,340	16,749	2,770	15,697	18,467	127,410
Total			54,446	53,238	107,684	89,573	94,349	183,921	1,754,460
Alternative 4									
Residential - SFD	50,326	DU	9,436	28,308	37,744	32,531	18,299	50,830	481,620
Residential - MFA	21,476	DU	1,606	7,843	9,449	7,770	3,827	11,597	125,850
Commercial	868	Acres	6,380	4,080	10,459	20,658	22,394	43,053	461,780
Light Industrial	2,524	Acres	15,733	3,222	18,955	4,031	14,293	18,324	130,740
Public Facility	365	Acres	8,613	749	9,362	1,548	8,774	10,322	71,220
Total			41,915	44,296	86,210	67,014	68,103	135,118	1,271,210

Date 3/8/00 : Time 9:19 AM

APPENDIX C

SEISMIC, GEOLOGIC AND FLOODING HAZARDS SECTIONS OF THE TECHNICAL BACKGROUND REPORT GENERAL PLAN UPDATE

FOR

THE CITY OF DESERT HOT SPRINGS

PREPARED BY:

EARTH CONSULTANTS INTERNATIONAL, INC.
TANIA GONZALEZ, CEG

MAY, 1997

NOTICE ON APPENDIX REDUCTION

This technical appendix has been reduced by 50% and printed double-sided to conserve paper and to allow the technical appendices to be incorporated in the EIR. If you wish to have a full-sized copy of this appendix, please contact the City of Desert Hot Springs at (760)329-6411.

Table of Contents (Continued)

Section ..... Page No.

CHAPTER 3: FLOODING AND INUNDATION HAZARDS 34

3.1 Introduction 34

3.2 Storm Flooding 34

3.3 Seismically Induced Inundation 37
3.3.1 Water Tanks 38

3.4 Issues and Opportunities 42

Appendices

Appendix A: Bibliography and References Cited
Appendix B: Pertinent Sections of Hart (1994) Regarding Surface Fault Rupture
Appendix C: Seismic Parameters for the Desert Hot Springs Area

List of Illustrations and Tables

Figures

Figure 1-1: Regional Tectonic Setting 2
Figure 1-2: Regional Fault Map 7
Figure 1-3: Faults in the Desert Hot Springs General Plan Area 13
Figure 1-4: Areas Susceptible to Seismically Induced Settlement 17
Figure 1-5: Seismically Induced Rock Falls and Landslides Susceptibility Map 19
Figure 2-1: Geology Map of Desert Hot Springs and its Sphere of Influence 26
Figure 2-2: Wind Hazard Zones in the Desert Hot Springs Area 32
Figure 3-1: Flooding Hazards in Desert Hot Springs and its Sphere of Influence 36
Figure 3-2: Water Tanks in the Desert Hot Springs Area 41
Figure C-1: Deterministic Seismic Analysis Locations C-1

Tables

Table 1-1: Abridged Modified Mercalli Intensity Scale 3
Table 1-2: Estimated Horizontal Peak Ground Accelerations and Seismic Intensities in Desert Hot Springs and Vicinity 6
Table 3-1: Water Storage Tanks in the City of Desert Hot Springs and Vicinity 40

CHAPTER 1: SEISMIC HAZARDS

1.1 Introduction

1.1.1 General Tectonic Setting

The city of Desert Hot Springs is located in the Coachella Valley, the northwestward portion of the Salton Trough. The Salton Trough is the landward extension of the East Pacific Rise spreading ridge and transform-fault system (also referred to as the San Andreas rift zone). The creation of new crust at this spreading ridge is responsible for separating Baja California from mainland Mexico, and creating the Gulf of California. As the new crust forms and spreads laterally, it also forces the Pacific Plate to move northwesterly relative to the North American Plate. The rate at which these plates are sliding past each other has been estimated at about 50 mm/yr (Figure 1-1).

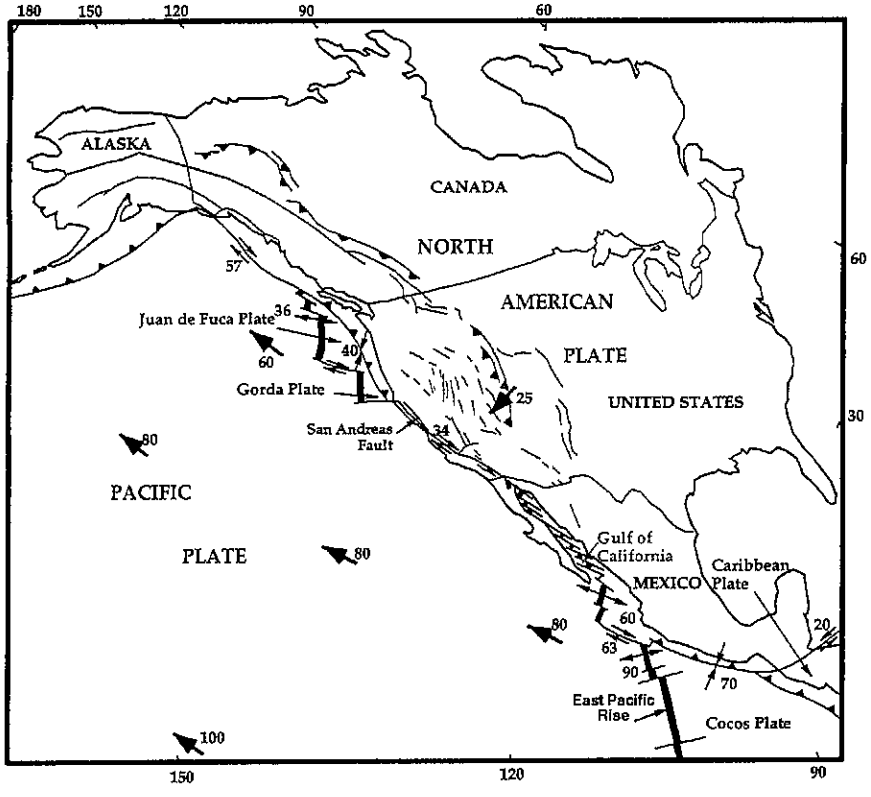
Movement between these two plates is responsible for the earthquakes that occur in the southern California region. Most (about 70 percent) of the movement between the Pacific and North American plates is accommodated by the San Andreas fault. The rest of the motion is distributed between the Eastern Mojave Shear Zone (a series of faults east of the San Andreas, responsible for the 1992 Landers earthquake), and several northwest-trending faults west of the San Andreas, including the San Jacinto, Whittier-Elsinore, Newport-Inglewood, Palos Verdes, and offshore faults (Working Group on California Earthquake Probabilities - WGCEP, 1995).

1.1.2 Definitions

Earthquake Size and Impact: Earthquakes are normally classified as to severity according to their magnitude (a measure of the amount of energy released when a fault ruptures), or their seismic intensity (a qualitative estimate of the damage caused by an earthquake at a given location). Because the amount of destruction generally decreases with increasing distance away from the epicenter (the point at the Earth's surface directly above where the earthquake originated), earthquakes are assigned several intensities. The most commonly used seismic intensity scale, called the Modified Mercalli Intensity (MMI) scale, has 12 levels of damage. The higher the number the greater the damage (Table 1.1). The intensity of seismic ground shaking at any given site is a function of several factors, but primarily the magnitude of the earthquake, the distance from the epicenter to the area of concern, the type of bedrock or soil materials between the epicenter and the site, and the topographic conditions of the site (whether it is located in a valley, or at the top of a hill or mountain). The amount of damage is also controlled to a certain extent by the size, shape, age, and engineering characteristics of the affected structures.

Several factors control how ground motion interacts with structures, making the hazard of ground shaking difficult to predict. In general, however, long-period seismic waves, characteristic of earthquakes that occur about 10 miles (15 kilometers) and farther from the area of concern, interact with and damage preferentially long-period structures such as high-rise buildings and bridges.

Figure 1-1: Regional Tectonic Setting



MAP EXPLANATION

- 60 — Strike-slip fault - showing slip vectors and rate (mm/yr)
- 70 — Subduction zone - showing slip vectors and rate (mm/yr) of convergence; sawteeth on upper plate
- 90 — Spreading center - showing vectors and rate (mm/yr) of spreading
- 100 — Vector and rate (mm/yr) of absolute plate motion
- Fault in North American plate - sawteeth on upper plate of thrust fault

(Modified from Wallace, 1990)

Table 1.1
Abridged Modified Mercalli Intensity Scale*

Intensity Value and Description	Average Peak Velocity (cm/sec)	Average Peak Acceleration (g, gravity = 9.8 m/sec^2)
I. Not felt except by a very few under especially favorable circumstances. (I Rossi-Forel scale)		
II. Felt only by a few persons at rest, especially on upper floors of high-rise buildings. Delicately suspended objects may swing. (I to II Rossi-Forel scale)		
III. Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibration like passing of truck. Duration estimated. (III Rossi-Forel scale)		
IV. During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensation like a heavy truck striking building. Standing automobiles rocked noticeably. (IV to V Rossi-Forel scale)	1-2	0.015g-0.02g
V. Felt by nearly everyone, many awakened. Some dishes, windows, and so on broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop. (V to VI Rossi-Forel scale)	2-5	0.03g-0.04g
VI. Felt by all, many frightened and run outdoors. Some heavy furniture moved, a few instances of fallen plaster and damaged chimneys. Damage slight. (VI to VII Rossi-Forel scale)	5-8	0.06g-0.07g
VII. Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving cars. (VIII Rossi-Forel scale)	8-12	0.10g-0.15g
VIII. Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed. (VIII+ to IX Rossi-Forel scale)	20-30	0.25g-0.30g
IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken. (IX+ Rossi-Forel scale)	45-55	0.50g-0.55g
X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks (X Rossi-Forel scale)	more than 60	more than 0.60g
XI. Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.		
XII. Damage total. Waves seen on ground surface. Lines of sight and level distorted. Objects thrown into air.		

Primary Source: Bolt (1993)

Short-period seismic waves, characteristic of earthquakes that occur less than 10 miles from the area of concern, have the potential for damaging preferentially short-period structures, such as one- and two-story buildings.

Planning and Design Earthquakes: The largest earthquake likely to occur on a fault or fault segment is termed the maximum credible (MCE) or characteristic earthquake. Depending on the planned use, lifetime, or importance of a facility, a maximum probable earthquake (MPE) is the earthquake most likely to occur in a specified period of time, (such as 30 to 500 years). The more critical the project, the longer the time period chosen and the larger the design earthquake. Geologists, seismologists, engineers and urban planners typically use maximum credible and maximum probable earthquakes to evaluate the seismic hazard of a region, the assumption being that if we plan for the worst-case scenario, smaller earthquakes that are more likely to occur can be dealt with more effectively. Seismic design parameter values (including peak ground or bedrock acceleration (PGA), duration of strong ground shaking, and period of ground motion) are derived from maximum credible earthquakes to establish safety margins.

Although earthquakes occur often in Southern California, many of the faults in the area have not moved and caused earthquakes in historic times, and fewer yet have caused a maximum credible earthquake in historic times. Therefore, the magnitude of the maximum credible and maximum probable earthquakes for a given fault are generally estimates calculated by seismologists based on the length of the fault, style of faulting, and other characteristics of the fault or the area. Data obtained from excavations across a fault (paleoseismic studies) provide additional insight as to how often the fault ruptures, and how much the fault moves in a single earthquake.

Fault Activity: The State of California, under the guidelines of the Alquist-Priolo Earthquake Fault Zoning Act (Hart, 1994), classifies faults according to the following criteria:

- **Active**: faults showing proven displacement of the ground surface within about the last 11,000 years (Holocene Epoch); and
- **Potentially Active**: faults showing evidence of movement within the last 1.6 million years (modified to 750,000 years by the U.S. Geological Survey).

A fault that has not moved in the last 11,000 years, as determined from direct geologic evidence, is presumed to be inactive for residential subdivisions. Although simple in theory, the evidence necessary to determine whether a fault has or has not moved during the last 11,000 years is sometimes difficult to obtain. The State definition of an active fault is designed to gauge the surface rupture potential of a fault, and is used to prevent development from being sited directly on the trace of an active fault. The underlying assumption is that if a fault has not moved in the last 11,000 years, it is not likely to move and be the source of a damaging earthquake in the future. Potentially active faults are considered, relative to active faults, less likely to be the origin of an earthquake. In reality, however, most potentially active faults have been insufficiently studied to determine whether they are active or not. In this study, both active and potentially active faults are addressed as potential earthquake sources.

The Alquist-Priolo Special Studies Zones Act was signed into law in 1972 (in 1994 it was renamed Alquist-Priolo Earthquake Fault Zoning Act). The primary purpose of the Act is to mitigate the hazard of fault rupture by prohibiting the location of structures for human occupancy across the trace of an active fault (Hart, 1994). The Act requires the State Geologist (Chief of the Division of Mines and Geology) to delineate "Earthquake Fault Zones" along faults which are "sufficiently active" and "well-defined." These faults show evidence of Holocene surface displacement along one or more or their segments (sufficiently active) and are clearly detectable by a trained geologist as a physical feature at or just below the ground surface (well defined). The boundary of an "Earthquake Fault Zone" is generally about 500 feet from major active faults, and 200 to 300 feet from well-defined minor faults. The Act dictates that cities and counties withhold development permits for sites within an Earthquake Fault Zone within their jurisdiction until geologic investigations demonstrate that the sites are not threatened by surface displacements from future faulting (Hart, 1994 - See Appendix B in this report).

Given its tectonic setting, earthquakes are a fact of life in Southern California. Recent studies indicate that far too few earthquakes have occurred in Southern California in the last 200 years to account for the rate of movement between the Pacific and North American plates. The data suggest that Southern California is due for either numerous, moderate, Northridge-like earthquakes, or a few, larger (Magnitude 7.2 or larger) earthquakes (WGCEP, 1995; Dolan and others, 1994). Since it is not possible to prevent an earthquake from occurring, local governments, emergency relief organizations, and residents are advised to take action and develop and implement policies and programs aimed at reducing the effects of earthquakes.

History shows that earthquakes cause property damage and can cause loss of life. Strong shaking from an earthquake can result in landslides, ground lurching, structural damage, and liquefaction. Strong ground shaking can also set into motion other hazards such as fire, disruption of essential facilities and systems (water, sewer, gas, electricity, transportation, communications, irrigation and drainage systems), releases of hazardous materials, or flood inundation as a result of dam or water tank failure. An effective seismic hazard reduction program should therefore include the identification and mapping of geologic and seismic hazards, the enforcement of building and fire codes, and the expedient retrofitting and rehabilitation of weak structures. Individuals should also exercise prudent planning to provide for themselves and their families in the aftermath of an earthquake.

1.2 Seismic Ground Shaking

The two seismic hazards that have the potential of severely impacting the Desert Hot Springs area are seismic ground shaking, and surface fault rupture (discussed in Section 1.3). Earthquake-induced ground shaking is considered the most significant hazard because it typically affects a much broader area than other seismic hazards. Several local and regional faults have the potential of generating strong ground shaking that will impact all of the General Plan area. Table 1-2 lists those faults that, given their distance to Desert Hot Springs, have the potential for causing strong ground motions in the City. Only those faults that have the potential of generating peak horizontal ground

accelerations of about 0.1g and greater in the City are shown on Table 1-2. Other known active and potentially active faults within 62 miles (100 kilometers) of the City are listed in Appendix C. Refer to Figure 1-2 for a map of the active and potentially active faults in the region.

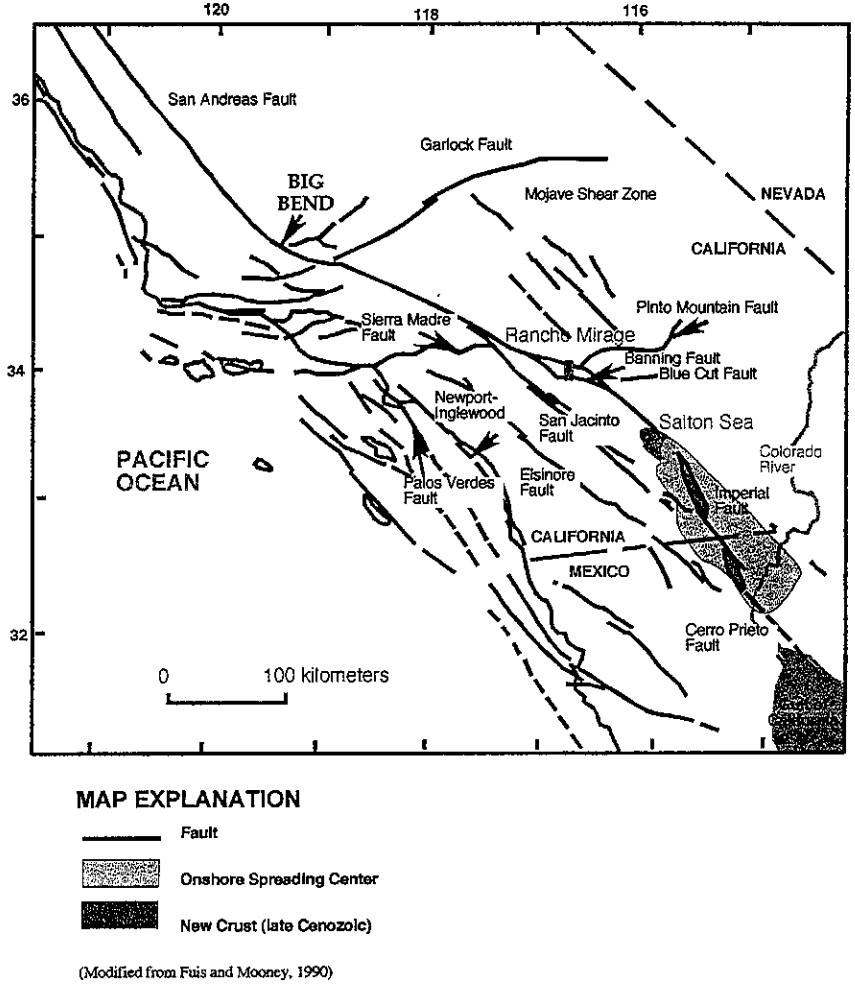
Table 1-2 shows: 1) the distance, in miles, between the fault and various locations in the General Plan (GP) area; 2) the maximum credible earthquake (MCE) each fault is estimated capable of generating; 3) the intensity of ground motion, or peak horizontal ground acceleration (PGA), expressed as a fraction of the acceleration of gravity, that could be experienced in the Desert Hot Springs area if the MCE occurs on one of these faults; and 4) the Modified Mercalli (MM) seismic intensity values that would be felt in the City and vicinity. In general, peak ground accelerations and seismic intensity values decrease with increasing distance away from the causative fault. However, local site conditions, such as the top of ridges, could amplify the seismic waves generated by an earthquake, resulting in higher accelerations than those listed here.

Table 1-2: Estimated Horizontal Peak Ground Accelerations and Seismic Intensities in Desert Hot Springs and Vicinity

Fault Name	Distance to GP Area (miles)	MCE	PGA from MCE	MMI from MCE
San Andreas - Coachella Segment	0 - 5	8.0	0.50 - 0.75	X - XI
Banning (*)	0 - 6	7.5	0.48 - 0.90	X - XI
San Andreas - San Bernardino Mnt.	1 - 10	8.0	0.48 - 0.66	X - XI
Pinto Mountain - Morongo	2 - 13	7.3	0.28 - 0.60	IX - X
Blue Cut	9 - 22	7.0	0.10 - 0.30	VII - IX
Johnson Valley	13 - 19	7.5	0.20 - 0.28	VII-VIII
Homestead Valley	21 - 27	7.5	0.13 - 0.19	VIII
North Frontal Fault	23 - 32	7.7	0.11 - 0.18	VII-VIII
Helendale	19 - 29	7.3	0.10 - 0.17	VII-VIII
Lenwood - Old Woman Springs	22 - 28	7.3	0.10 - 0.15	VII - VIII
San Jacinto (Hot Springs - Buck Ridge)	18 - 25	7.0	0.08 - 0.16	VII - VIII
San Jacinto (Casa Loma - Clark)	21 - 28	7.0	0.06 - 0.13	VI - VII
San Jacinto (Glen Helen - Lytle Creek - Claremont)	22 - 30	7.0	0.06 - 0.12	VI - VII

Analysis conducted using EQFAULT (Version 2.02) by T. Blake.
* The Banning fault is thought to have an oblique-slip (strike slip and thrusting) component of movement. Thrust faults typically generate higher ground accelerations than pure strike-slip faults, which explains why the PGA reported for the Banning is higher than that for the Coachella Valley segment of the San Andreas fault.

Figure 1-2: Regional Fault Map



(Modified from Fuis and Mooney, 1990)

As Table 1.2 shows, there is the potential for very strong ground shaking to occur in the City, with peak horizontal ground accelerations approaching 1g. A review of earthquakes that have occurred within 100 miles of the City between 1800 and 1993 indicates that the highest peak ground acceleration estimated to have impacted the area is 0.35g (caused by the Desert Hot Springs magnitude 6.5 earthquake that occurred December 4, 1948). The M_L 5.9 North Palm Springs earthquake of 1986 generated peak horizontal ground accelerations at the City of about 0.2g. The M_W 7.3 Landers earthquake of 1992 caused ground motions at the City of about 0.3g. Therefore, historically, the City has never experienced the ground motions that a characteristic earthquake on the San Andreas fault would generate.

1.2.1 San Andreas Fault Zone

As discussed above, the San Andreas fault is the principal boundary between the Pacific and North American Plates. In southern California, the San Andreas fault is comprised of three segments: 1) the Mojave Desert segment, 2) the San Bernardino Mountains segment, and 3) the Coachella Valley segment. Nomenclature for the various fault strands that comprise each of these segments has changed significantly over time. In this report, we follow the nomenclature used by Matti, Morton and Cox (1992).

Only the Coachella Valley segment extends across the study area. However, the eastern terminus of the San Bernardino Mountains segment is located where the Morongo Wash intersects the northern boundary of the General Plan area. Therefore, the San Bernardino Mountains segment also poses a significant seismic hazard to the study area.

The **Coachella Valley** segment of the San Andreas fault zone is a simple, relatively straight strand that runs along, and generally forms the eastern edge of the valley floor (this strand is commonly referred to as the Mission Creek fault). This fault strand bisects the eastern, most heavily populated portion of the City of Desert Hot Springs. No ground-rupturing earthquakes have been recorded on this strand in historic times, and paleoseismic studies suggest that the last surface-rupturing earthquake on this strand occurred around 1680 AD (Sieh, 1986; Sieh and Williams, 1990). Studies at Indio indicate that prior to 1680, earthquakes on this fault occurred at an average recurrence interval of 220 years. The data also suggest that the Coachella Valley and San Bernardino Mountain segments ruptured simultaneously in earthquakes that occurred around 1680 and 1450 (Grant and Sieh, 1994; Seitz and Weldon, 1994; WCCEP, 1995). The Coachella Valley segment is creeping at a rate of about 2-4 mm/year, and has a long-term slip rate of about 25 ± 5 mm/yr (WGCEP, 1995). This segment is estimated to have a 22 percent probability of rupturing in the period between 1994 and 2024 (WGCEP, 1995). An earthquake of magnitude 8.0 on this segment is estimated capable of generating peak horizontal ground accelerations of between 0.5 and 0.75g at Desert Hot Springs.

The San Bernardino Mountains segment of the San Andreas fault is a structurally complex zone because in this area the San Andreas fault makes a left-step, and bends to trend in a more westerly direction (see Figure 1-2). Compression associated with this left step is expressed as a zone of lateral (Mill Creek,

deformation (San Gorgonio Pass fault). Several estimates of slip rate obtained independently indicate that the San Bernardino Mountains segment has a slip rate of 24 ± 5 mm/yr, with an average recurrence interval of 146 years (WGCEP, 1995). Paleoseismic studies at Wrightwood indicate that there have been six surface-rupturing earthquakes on this segment since 1192 AD, with the most recent five events occurring, on average, every 106 years. The most recent surface-rupturing earthquake on this segment is thought to have occurred in 1812, 183 years ago. The Working Group on California Earthquake Probabilities (1995) estimates that this segment has a 28 percent probability of rupturing in the time period between 1994 and 2024. An earthquake of magnitude 8.0 on the San Bernardino Mountains segment is estimated capable of generating peak horizontal ground accelerations in the City of between 0.48 and 0.66g.

1.2.2 Banning Fault

The Coachella Valley segment of the San Andreas fault zone is joined near Indio by another more-westerly trending fault, the Banning. The **Banning fault** itself consists of three segments, namely the eastern, central, and western segments. Activity on the Banning fault zone appears to have shifted eastward over time. The eastern segment extends from near Indio to about Cottonwood Canyon (the canyon west of Whitewater River), across Desert Hot Springs' Sphere of Influence. This segment is creeping at a rate of about 2 mm/yr (Allen and Sieh, 1983), and is thought to have caused the 1986 North Palm Springs Earthquake. Several investigators consider this section of the Banning fault the southern strand of the San Andreas fault zone. The central segment extends from near Cottonwood Canyon westward, to near Cherry Valley, northwest of Beaumont. This section of the Banning fault is largely obscured by Quaternary sedimentary deposits and appears to be overprinted by compressional (i.e., thrusting) tectonic features. The western segment, which extends from Cherry Valley to San Bernardino, appears not to have ruptured during the Quaternary period, and has no surface expression. A magnitude 7.5 earthquake on the eastern section of the Banning fault is estimated capable of generating peak horizontal ground accelerations of between 0.5 and 0.9g in the area.

1.2.3 Pinto Mountain - Morongo Fault

The Pinto Mountain - Morongo fault is one of several east-trending, high-angle strike-slip faults exhibiting left-lateral movement that have been associated with the San Andreas fault in southern California. The fault is traceable for approximately 47 miles, from its junction with the San Andreas fault eastward to just east of Twentynine Palms, as a zone of fault traces near the base of the Sawtooth Mountains. Westward of the Town of Yucca Valley, the fault breaks into the Pinto Mountain fault in the north, and the Morongo Valley fault in the south. Holocene movement on some of these fault traces has been documented by Bryant (1986). Sympathetic ground ruptures associated with the Landers earthquake were also reported by Treiman (1993). In addition to left-slip movement, the fault has displayed significant uplift, as evidenced by the presence of the Sawtooth and San Bernardino Mountains to the north.

The Pinto Mountain fault is considered active, although historically it has not produced a well-defined zone of seismicity, but rather a cluster of epicenters at depth (Bryant, 1986). The fault is estimated capable of generating a maximum

credible earthquake of 7.3 to 7.4. Such an event would generate peak horizontal ground accelerations of up to 0.6g in the northern reaches of the Desert Hot Springs area.

1.2.4 Blue Cut Fault

The Blue Cut fault is an east-west trending fault near the southeast corner of the Mojave Desert, along the northern flank of the Eagle Mountains. This fault is one of several east-trending faults east of the San Andreas fault, including the Garlock and Pinto Mountain, that appear to be accommodating some of the north-south compression that results from the "big bend" in the San Andreas fault. The WGCEP (1995) include the Blue Cut as one of the major active surface faults in Southern California.

Recent mapping and geomorphic studies of the Blue Cut fault indicate that this feature consists of three segments that extend easterly from the Dillon fault (Schell and Schell, 1994). Schell and Schell (1994) strongly suggest that the Blue Cut fault has not moved in the last 11,000 years, and that there is a very long recurrence interval between surface ruptures. However, additional studies are necessary to confirm these observations, and to quantify the seismic hazard, if any, posed by this fault. Given that the western end of the Blue Cut fault is relatively close to the Desert Hot Springs' Sphere of Influence, an earthquake on this fault is estimated capable of generating peak horizontal ground accelerations in the General Plan area of between 0.1 and 0.3g.

1.2.5 Johnson Valley Fault

The Johnson Valley fault is one of several northwest-trending faults between the Helendale and Ludlow faults of the Mojave Desert that collectively appear to be accommodating between 9 percent and 23 percent of the motion between the North American and Pacific Plates (Dokka and Travis, 1990; Petersen and Wesnousky, 1994). These faults are referred to as the Eastern California or Mojave shear zone. The epicenter of the 1992 Landers earthquake occurred on the Johnson Valley fault, with surface rupture occurring along several known and previously unknown faults. Trenching studies on the Northern Johnson Valley and Emerson faults indicate that the last surface-rupturing earthquake on these faults, prior to the 1992 Landers event, occurred about 9,000 years ago (Rubin and Sieh, 1993; Herzberg and Rockwell, 1993; T. Rockwell, personal communication, 1997). Although unlikely to occur in the near future, an earthquake of magnitude 7.5 on the Johnson Valley or a similar fault of the Mojave shear zone is estimated capable of generating peak horizontal ground accelerations of about 0.2 to 0.3g in Desert Hot Springs.

1.2.6 Homestead Valley Fault

The Homestead Valley fault is one of the five principal faults that ruptured during the 1992 Landers earthquake. Portions of this fault moved laterally more than 3 meters (10 feet) during the 1992 event. According to T. Rockwell (personal communication, 1997), in addition to 1992, the Homestead Valley fault has ruptured at least two more times during the Holocene: 1) approximately 5,000 to 6,000 years ago, and 2) 8,000 to 12,000 years ago. A magnitude 7.5 earthquake on the Homestead Valley fault would generate peak

horizontal ground accelerations in the Desert Hot Springs area of about 0.13 to 0.19g.

1.2.7 North Frontal Fault

The North Frontal fault is a partially blind, south-dipping thrust structure that underlies the northern and eastern portions of the San Bernardino Mountains. To our knowledge, the North Frontal fault has not been studied in detail. T. Rockwell (personal communication, 1997) estimates that the fault has a slip rate of about 0.5 mm/yr, and is responsible for about 1 mm/yr uplift of the San Bernardino Mountains. The fault zone appears to be offset right-laterally by the Helendale fault, and it forms a complex junction with the Old Woman Springs fault (Jennings, 1994). The North Frontal fault zone is estimated capable of generating a magnitude 7.7 earthquake, which would generate peak horizontal ground accelerations in the General Plan area of about 0.1 to 0.2g.

1.2.8 Helendale Fault

The Helendale fault is one of the several northwest-trending right-lateral strike slip faults that comprise the Mojave Shear Zone (Dokka and Travis, 1990; Petersen and Wesnousky, 1994). According to SCEC (1997), the Helendale fault has a slip rate of about 0.8 mm/yr, and has ruptured during the Holocene. Trenching studies on this fault indicate that the fault has ruptured at least three times during the last 16,000 years, with a recurrence interval of 5,000 to 7,000 years. The last surface rupturing earthquake on this fault occurred less than 2,300 years ago (T. Rockwell, personal communication, 1997). As discussed above, the Helendale fault appears to cut through and offset the North Frontal fault zone. A magnitude 7.3 earthquake on this fault would generate peak horizontal ground accelerations in the General Plan area of about 0.1 to 0.17g.

1.2.9 Lenwood - Old Woman Springs Fault Zone

The Lenwood - Old Woman Springs faults are two north-northwest trending structures that are part of the Mojave shear zone, but west of the faults that ruptured in 1992. The Lenwood segment did experience triggered slip near its southeastern end due to the Landers earthquake (Jennings, 1994). Prior to 1992, creep had been recorded but not verified for this fault (Hart and others, 1988). Trenching studies of this fault indicate that the Lenwood fault has ruptured at least three times during the Holocene: 1) 200 to 400 years ago; 2) 5,000 to 6,000 years ago; and 3) about 8,300 years ago (T. Rockwell, personal communication, 1997). The fault has a slip rate of about 0.8 mm/yr (SCEC, 1997). The Old Woman Springs fault is the main trace in a complex zone of faulting. This fault interacts with both the North Frontal fault zone, and the Lenwood fault (Hart and others, 1988). A magnitude 7.3 earthquake on this fault zone is estimated capable of generating peak horizontal ground accelerations in the Desert Hot Springs area of about 0.1 to 0.15g.

1.2.10 San Jacinto Fault Zone

The San Jacinto Fault Zone consists of a series of closely spaced faults that form the western margin of the San Jacinto Mountains. The fault zone extends from its junction with the San Andreas fault in San Bernardino, southeasterly toward the

Brawley area, where it continues south of the international border as the Imperial fault. The San Jacinto fault zone has a high level of historical seismic activity, with at least ten moderate ($6 < M < 7$) earthquakes having occurred on this fault zone between 1890 and 1986. Offset across this fault is predominantly right-lateral, similar to the San Andreas, although Brown (1990) has suggested that vertical motion contributes up to 10 percent of the net slip.

Fault slip rates on the various segments of the San Jacinto are less well constrained than for the San Andreas fault, but the data available suggest slip rates of 12 ± 6 mm/yr for the northern segments of the fault, and slip rates of 4 ± 2 mm/yr for the southern segments (WGCEP, 1995). Various investigators have suggested a recurrence interval for large ground-rupturing earthquakes on the San Jacinto fault of between 150 and 300 years (Petersen and Wesnousky, 1994). The WGCEP (1995) have estimated that the San Bernardino and San Jacinto Valley segments have a 37 percent and 43 percent probability, respectively, of rupturing in the period between 1994 and 2024.

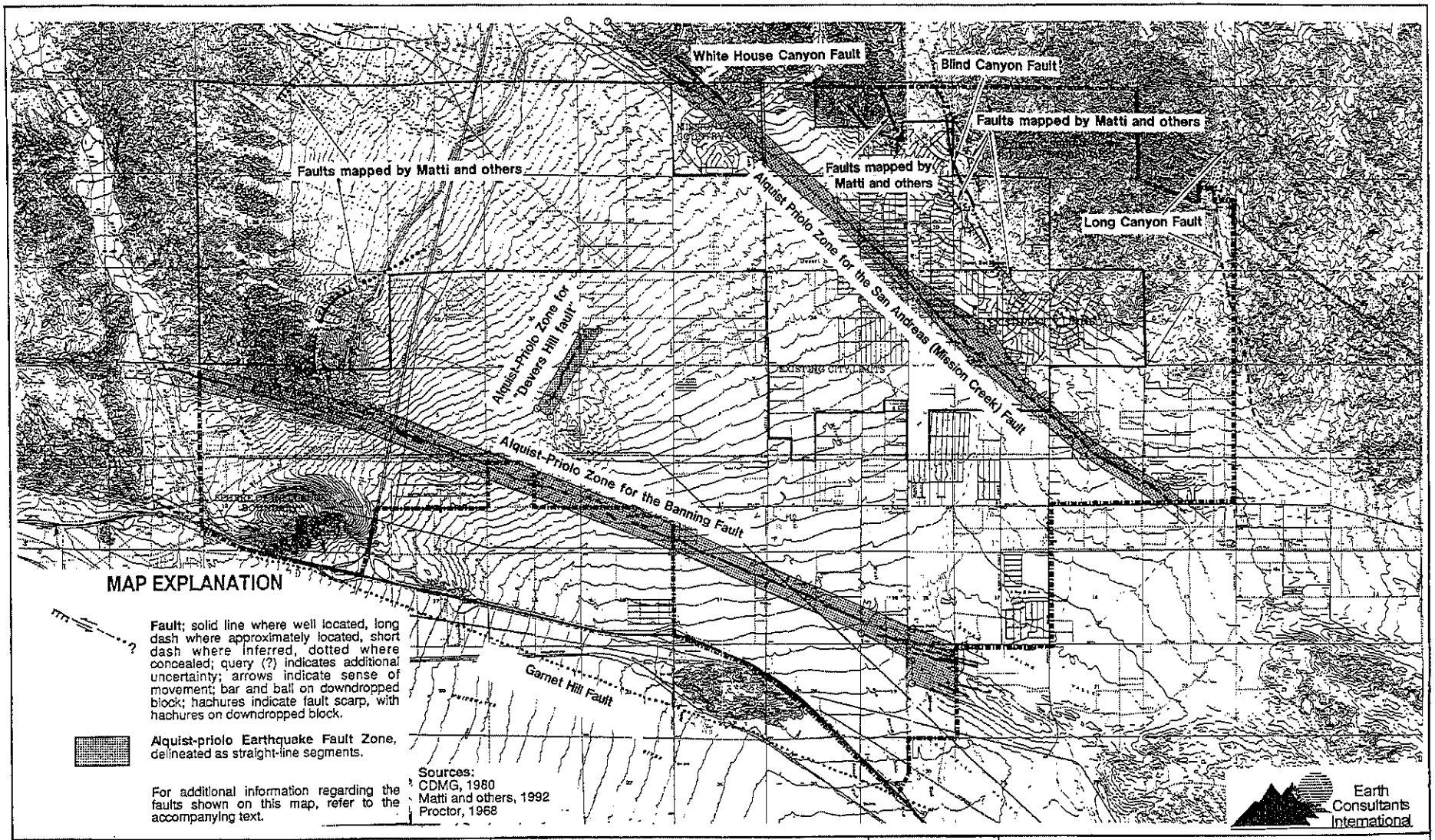
A maximum credible earthquake of magnitude 7.0 on any of the three closest segments of the San Jacinto fault zone to the City of Desert Hot Springs is estimated to generate peak horizontal ground accelerations in the area of about 0.06 to 0.16g.

1.3 Fault Rupture

Alquist-Priolo Earthquake Fault Zones have been designated by the California Division of Mines and Geology (1980) for the strands of the San Andreas and Banning faults that extend through the City and its Sphere of Influence, and for the fault on the west side of Devers Hill. The A-P Zones are shown on Figure 1-3.

The **Coachella Valley segment** (also called the **Mission Creek fault**) of the San Andreas fault extends right through the center of the City. This fault has a strong geomorphic expression, especially in the eastern and central portions of the study area. In addition, the fault is known to form a ground water barrier, with ground water on the north side of the fault zone typically closer to the ground surface than water on the south side of the fault zone. In the northwestern portion of the study area, the San Andreas fault does not have strong geomorphic expression, primarily because it is covered with modern sediments of the Little Morongo Wash. However, trenching studies in the Mission Lakes Country Club area have located the fault within the alluvium (Lohr, 1980; Rasmussen, 1988; Leighton and Associates, 1989). Locally, based on these trenching studies, the fault has been located approximately 50 feet north of where it is shown on the A-P map (Leighton and Associates, 1989). These trenching studies typically exposed a zone of faulting approximately 20 feet wide, with several near-vertical faults that could be traced upwards to within 1 foot of the ground surface.

Also in the Mission Lakes Country Club area, Lohr (1980) mapped a fault almost 300 feet north of the main San Andreas fault that he referred to as the **White House Canyon fault**. Reportedly, Lohr found evidence that the White House Canyon fault extends upwards into the alluvium, prompting him to recommend building setbacks for the fault. Evidence for the recency of activity of the fault is also provided by the topography: The fault extends across canyons, and onto saddles in between ridges. Farther to the east, the fault has not been located, but possibly forms the northeastern



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CITY OF DESERT HOT SPRINGS GENERAL PLAN

City Limits:
Sphere of Influence:
Date: 2/18/97
Base Map: Desert Hot Springs and Seven Palms Valley USGS 7.5' Quad Maps

Faults in the Desert Hot Springs General Plan Area

edge of the valley floor. Where mapped, the White House Canyon fault closely coincides with the northeastern limits of the A-P Earthquake Fault Zone.

The eastern Banning fault is considered to have been the source of the 1986 North Palm Springs earthquake of magnitude 5.9. Although the fault did not rupture the ground surface, secondary ground failures, including ground fractures and landsliding, were reported (Morton and others, 1989). Most of the ground fractures associated with the 1986 earthquake occurred west of, and in the western reaches of the General Plan area, between Whitewater Canyon on the west, and Highway 62 on the east. Fractures varied from single, discontinuous breaks less than 1 mm wide, to extensively fractured zones 30 to 40 m (100 to 120 feet) wide. As a result of the ground fractures caused by this earthquake, new A-P maps have been issued for the Whitewater, Cabazon and El Casco quadrangles (J. Treiman, personal communication, 1997). This segment of the Banning fault appears to have ruptured the surface in the late Pleistocene and Holocene, and therefore, has the potential for rupturing the ground surface in the future.

The fault on the west side of Devers Hill was mapped by Smith (1979) as part of his Fault Evaluation Report for the San Andreas fault in the Desert Hot Springs area. The fault has a scarp that is 3 to 12 feet (1 to 4 meters) high and moderately dissected. The scarp was youthful enough in appearance that Smith zoned the fault. Given its orientation relative to the major faults in the vicinity, the "Devers Hill" fault appears to be a secondary fault that ruptures in response to earthquakes on either the Coachella segment or the Banning fault, and accommodates some of the differences in the lateral slip between these faults.

The Blind Canyon fault was mapped by Proctor (1968) and Hope (1969) as a fault trending slightly west of north through the San Bernardino Mountains. Proctor suggested that the Blind Canyon fault continues southward and merges with the Mission Creek fault. Proctor observed an exposure of the fault in an excavation for the Colorado River Aqueduct where the fault reportedly consisted of a 22-inch wide gouge zone, dipping 70 degrees to the west. The fault disrupted the gneissic bedrock, but the 30 feet of overlying alluvium were not affected. However, Proctor indicated that "the fault is best exposed in the terrace gravels and older alluvial fan remnants suggesting that it was mainly active in early Recent time."

More recently, the Blind Canyon fault was mapped or trenched by Rasmussen (1977), Smith (1979), and Leighton and Associates (1991). These studies were not conclusive as to the activity or inactivity of the Blind Canyon fault. Rasmussen stated that the fault is "possibly an active fault...". Smith (1979) disagreed with Rasmussen, and, based on several exposures of the fault, stated that the fault does not offset surfaces that he believed are pre-Holocene in age. However, Smith did not provide documentation to support his age estimates of the surfaces upon which he based his conclusions. Leighton and Associates (1991) mapped the fault in the Cornerstone area, where the fault was observed to consist of three distinct fault planes that offset older (Quaternary) alluvial deposits. Although Holocene movement on this fault was not demonstrated, Leighton and Associates (1991) recommended building setbacks from the Blind Canyon fault because the fault may be structurally related to the San Andreas fault, with the resultant potential for sympathetic movement on the Blind Canyon fault as a response to an earthquake on the San Andreas fault.

Given these differences in opinion, it is prudent to require site-specific fault investigations if a development is proposed in the area where the Blind Canyon fault

has been mapped. A well-documented study that is designed to obtain conclusive evidence of the activity status of this fault would be ideal. The fault exposures should be reviewed by the County geologist, geologists from the California Division of Mines and Geology, and other interested, local parties, to provide them with the opportunity to assess in the field the evidence provided. This approach typically results in a collective conclusion regarding the activity of the fault that is less likely to be questioned later on. Once the activity status of the fault is established, other detailed studies on this fault would not be necessary. However, if the Blind Canyon fault is determined to be active, and a development is planned in an area intersected by the fault, site-specific studies would be required to locate the fault, and establish building setbacks.

The Garnet Hill fault extends from the vicinity of Whitewater Canyon to possibly as far as Edom Hill. The fault is located just south of the Desert Hot Springs Sphere of Influence, south of Interstate 10. Its orientation and proximity to the San Andreas fault zone suggest that the Garnet Hill fault is associated with the San Andreas fault zone. Proctor (1968) even suggested that the Garnet Hill is an ancestral branch of the San Andreas. Although the Garnet Hill fault is not zoned as an active fault by the California Division of Mines and Geology, ground fractures associated with the 1986 North Palm Springs earthquake were reported along the trace of this fault. These fractures displayed both compressional and extensional features that Morton and others (1989) interpret to be a localized, near-surface response of weak surfaces to the faulting at depth.

The Long Canyon fault is a north-trending, vertical or steeply dipping fault that was mapped by Proctor (1968), and was revisited by Smith (1979). The fault offsets crystalline basement rock at several locations, and locally, according to Smith, if affects an older alluvial surface. However, at other locations reviewed by Smith (1979), the fault does not offset older alluvial terrace surfaces. Smith found no evidence to zone this fault.

Two other unnamed faults have been mapped by Matti and others (1992) trending in a northeasterly direction across the valley floor. The first of these faults, near the northwestern corner of the General Plan area, places an older fan surface against a younger, possibly early Holocene or latest Pleistocene surface (see Figures 1-3 and 2-1). Therefore, this fault could be active. If development is planned in the area of this fault, site-specific studies should be conducted to evaluate when the fault last ruptured the ground surface. The second fault scarp appears to be confined to the Painted Hill Formation, and is thus probably inactive. If this fautl is inactive, building setbacks would not be required.

1.4 Liquefaction and Other Secondary Ground Failure

1.4.1 Liquefaction

Liquefaction typically occurs in loose, saturated sediments of primarily sandy composition, in the presence of ground accelerations over 0.2g (Borcherdt and Kennedy, 1979; Tinsley and Fumal, 1985). When liquefaction occurs, the sediments involved have a total or substantial loss of shear strength, and behave like a liquid or semi-viscous substance. Liquefaction can cause structural distress or failure due to settlement, a loss of bearing capacity in the foundation soils, and the buoyant rise of buried structures. The excess hydrostatic pressure

generated by ground shaking can result in the formation of sand boils, and mud spouts, and/or seepage of water through ground cracks.

As indicated above, there are three general conditions that need to be met for liquefaction to occur. The first of these - strong ground shaking of relatively long duration - can be expected to occur in the General Plan area, the result of an earthquake on any of several active faults in the region. The second condition - loose, or unconsolidated, recently deposited sediments consisting primarily of silty sand and sand - occurs in a large portion of the valley floor, in the central portion of the General Plan area. However, these sediments do not satisfy the third condition of being saturated. Ground water in this area typically occurs 150 to 400 feet below the ground surface. Therefore, the potential for these sediments to liquefy is low to none. The only exception is immediately adjacent to, and north of the San Andreas fault, where locally, water-loving vegetation indicates that the fault forms a barrier to ground water, ponding water behind, and to the north of the fault. Similarly, shallow ground water has been reported locally on the northern side of the Banning fault. If water rises to within 50 feet of the ground surface in these areas, liquefaction could occur. If developments are proposed in areas where shallow ground water conditions are suspected, site specific studies to assess the potential for liquefaction should be conducted.

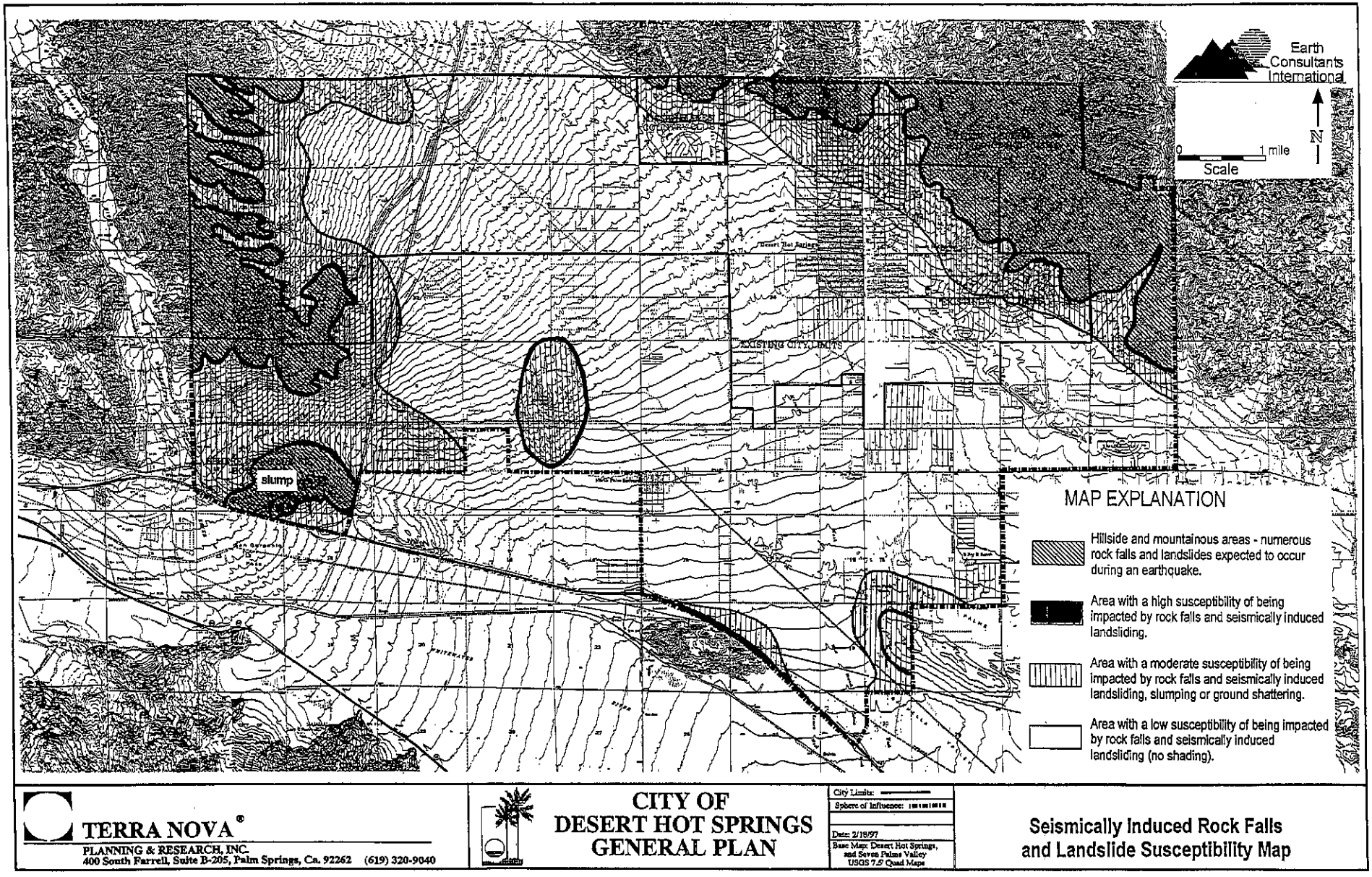
In the northern portions of the City, and in the western portions of the Sphere of Influence, adjacent to the mountains, ground water may occur at the contact between the alluvium and the underlying bedrock. In some areas, this contact may occur within 50 feet of the ground surface. However, the alluvial sediments at the base of the mountains typically consist of coarse-grained sand, gravels, cobbles, and boulders that are not susceptible to liquefaction.

Liquefaction could occur in or adjacent to the major drainages that extend across the General Plan area, if the near-surface alluvial sediments were saturated as a result of precipitation or the recent input of surface water from the adjacent mountains. Saturated, near-surface conditions could also develop within and adjacent to ground-water recharge basins such as the one proposed in the northern reaches of the City, within Section 21. However, water percolates rapidly through these alluvial materials, so it is highly unlikely that the events necessary to produce the required conditions would occur simultaneously.

1.4.2 Seismically Induced Settlement

In some situations, strong ground shaking can cause the densification of soils, with a resultant local or regional settlement of the ground surface. Damage to buildings and other structures occurs as a result of local differential settlements.

The potential for seismically induced settlement to occur is controlled by the intensity and duration of ground shaking, and the relative density (the ratio between the in-place density and the maximum density) of the subsurface soils. Recently deposited alluvial sediments are typically loose, and therefore potentially subject to seismically induced settlement. Areas susceptible to seismically induced settlement are depicted on Figure 1-4.



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Seismically Induced Rock Falls and Landslide Susceptibility Map

2.2.2 General Engineering Features

The geologic units that occur at or near the surface in the General Plan area are described herein in detail because the geologic hazards and geotechnical constraints and opportunities of an area are controlled in large measure by the types of rocks or soils that occur there. For example, the availability of ground water is dependent on whether the underlying earth materials have the capacity to transmit, store and release water. The suitability of a geologic unit as foundation material for a building or structure is dependent, in part, on the strength characteristics of the soil or rock. General engineering and hydrological features of the geologic units that crop out in the Desert Hot Springs area are described below.

Alluvial sediments: The active channel (Qa) deposits typically consist of light gray and light brown, gravelly fine- to coarse-grained sand with variable amounts of cobbles and scattered boulders (Unified Soil Classification: GP, GW, SP, and SW [0 to 15 percent passing No. 200 sieve]; high sand equivalents of 60 to 80+; low expansion potential when wetted). These deposits are typically loose near the ground surface, and become medium dense with depth (limited data indicate natural dry densities ranging from 70 to 105 pounds per cubic foot [pcf], with maximum dry densities ranging from 120 to 130 pcf). These soils are generally suitable for use as compacted fill, and can be readily compacted using a combination of thorough wetting and wheel rolling with rubber-tired construction equipment. Shrinkage of 10 to 20 percent can be expected upon compaction of the near-surface soils.

The flood plain alluvial deposits (Qfp) consist of light gray to brown, layered sand, silty sand and silt (Unified Soil Classification: SP, SW, SM [2 to 35 percent passing No. 200 sieve] and ML [55 to 60 percent passing No. 200 sieve]; relatively high sand equivalents of approximately 25 to 75+, low expansion potential when wetted). Flood plain deposits are also loose near the ground surface, becoming dense with increasing depth (limited data indicate that natural dry densities range from 60 to 105 pcf, with maximum dry densities ranging from 108 to 125 pcf). These soils are generally suitable for use as compacted fill, and can be readily compacted using a combination of thorough wetting and wheel rolling with rubber-tired construction equipment. Shrinkage of 20 to 30 percent can be expected upon compaction of the near-surface soils. These sediments have medium to high permeabilities, except where silt layers may retard the downward percolation of water.

Alluvial fan sediments: The (Qf) deposits typically consist of light brown, gravelly to bouldery, fine- to coarse-grained sand (Unified Soil Classification: GW, SP, SW). These sediments are generally dry and of medium density. Only 1 to 15 percent of the soil fraction typically passes the No. 200 sieve. The Qf_1 and Qf_2 soils typically have low expansion potentials. The older alluvial fan deposits (Qf_3 and Qf_4) may have moderate to locally high expansion potentials near the surface, in areas where strongly developed, clay-rich argillic horizons are present. Limited engineering data on the alluvial fan deposits show in-situ dry densities of about 120 pcf, with optimum moisture contents of about 12-15 percent. The Qf_1 and Qf_2 deposits have high permeabilities. Near-surface permeability of the Qf_3 and Qf_4 surfaces is limited by the clay-rich argillic horizons. These alluvial

fan soils are generally suitable for use as compacted fill, and can be readily compacted using a combination of thorough wetting and wheel rolling with rubber-tired construction equipment. Shrinkage of up to 15 percent can be expected upon compaction of the near-surface Qf_1 and Qf_2 soils. The alluvial fan sediments, where buried under the valley floor, are the principal water-bearing units in this portion of the upper Coachella Valley.

Painted Hill Formation: In the Painted Hill, where it was first described, this unit consist of gray to light brown poorly sorted beds of conglomerate and conglomeratic sandstone (Unified Soil Classification: GW to GM, SW). Natural and maximum dry density data not available. The subrounded clasts typical of this unit are on average about 1 foot in diameter. The sediments are poorly consolidated.

Imperial Formation: This unit is of marine origin, and consists of siltstone, claystone or sandstone in shades of dark yellow, brown, and green. Shells and shell fragments are locally abundant. Gypsum stringers are common. Engineering data for this unit were not available. However, some assumptions can be made. Expansion potential of these soils would vary depending on whether the sediments at the surface consist primarily of sandstone (low expansion), or claystone (moderate to high expansion potential). Where gypsum is prevalent, the soils may be corrosive to metal and/or concrete. These sediments are moderately to well consolidated.

Coachella Fanglomerate: This unit consists of poorly-sorted angular clasts of gneiss, granite and basalt as much as 6 feet in diameter within a well-indurated coarse sandstone matrix (Proctor, 1968). These sediments, which locally are more than 4,500 feet thick, were deposited by gravity. The unit has since been tilted, so that it dips to the east at angles of between 20 and 40 degrees from the horizontal.

Granitic and metasedimentary rocks: Contorted schists and gneisses intruded by granitoid rocks (Unified Soil Classification not applicable except where the rock has been weathered extensively, forming a soil cover). The granitic intrusives are generally fractured and jointed, with joints spaced closely throughout. The fractures typically do not follow preferred orientations. These rocks are typically non-water bearing, and have moderately low to low permeabilities. Unweathered rock cannot be excavated easily; blasting is generally required.

2.3 Geologic Hazards

2.3.1 Landslides, Rockfalls and Slope Instability

Given the steep slopes flanking the northern and western limits of the General Plan area, slope instability is of concern. No large-scale, deep-seated landslides or significant slope failures (like the Martinez Mountain landslide) have been mapped within the City or its Sphere of Influence. However, at least two possible landslides were identified from the available literature: 1) a slump mapped by Proctor (1968) on the south flank of Whitewater Hill, and 2) a landslide mapped by Lohr (1980) in the White House Canyon area. In addition,

as discussed in Chapter 1, earthquake-induced landslides have occurred in the area, most recently during the 1986 North Palm Springs earthquake. Refer to Figure 1-5 for those locations in the General Plan area most susceptible to damage from landslides, rockslides and rock falls.

The rocks that form the San Bernardino and Little San Bernardino mountains are typically not foliated or jointed along preferred orientations, but the joints, fractures and intrusive dikes characteristic of these rocks do provide planes of weakness along which slope failures and rock pop-outs can occur. Designed cut faces may expose unfavorable joint and fracture conditions that could result in slope failures. Therefore, any developments in this area should include an analysis for potential slope instability. Similarly, east-facing cut slopes exposing Coachella fanglomerate may be unstable, since this unit has been tilted so that it dips to the east at between 20 and 40 degrees. Geotechnical investigations that include slope stability analyses should be conducted for projects that expose this formation.

2.3.2 Collapsible Soils

Hydroconsolidation or soil collapse typically occurs in recently deposited, Holocene soils that were deposited in an arid or semi-arid environment. Soils prone to collapse are commonly associated with wind-laid sands and silts, and alluvial fan and mudflow sediments deposited during flash floods. The soils typically contain minute pores and voids. The soil particles may be partially supported by clay, silt, or carbonate bonds. When saturated, collapsible soils undergo a rearrangement of their grains and a loss of cementation, resulting in substantial and rapid settlement under relatively low loads. An increase in surface water infiltration, such as from irrigation, or a rise in the ground water table, combined with the weight of a building or structure, can initiate rapid settlement and cause foundations and walls to crack.

The alluvial sediments in the General Plan area are prone to collapse. Limited geotechnical data indicate these soils have collapse values of 1 to 1.5 percent. The potential for soils to collapse should be evaluated on a site-specific basis as part of the geotechnical studies for development. If the soils are determined to be collapsible, the hazard can be mitigated by a combination of measures, including pre-saturation of the susceptible soils to induce collapse prior to construction. After construction, infiltration of water into the subsurface soils should be minimized by proper project design, including adequate positive drainage away from structures, avoiding the use of open-bottomed planters adjacent to structures, and the use of roof gutters to facilitate drainage away from foundations. In general, very little water should be used for irrigation and landscaping.

2.3.3 Expansive Soils

Expansive soils are soils with a significant amount of clay particles that have the ability to give up water (shrink) or take on water (swell). When these soils swell, the change in volume exerts significant pressures on loads (such as buildings) that are placed on them.

In the Desert Hot Springs area, expansive soils are generally not considered a hazard. Locally, however, the Qf_3 and Qf_4 surfaces (see Figure 2.1) could have moderate to high expansion potentials. The clay in these surfaces is concentrated in the argillic soil horizon, which typically occurs near the ground surface, within the upper 10 feet. Therefore, if site-specific studies indicate that soils with high expansion potentials occur in an area proposed for development, the hazard can generally be mitigated by removing the upper soils, mixing them with coarser-grained sand, and recompacting them. Claystone layers in the Imperial Formation could also have moderate to high expansion potentials. The potential hazard posed by expansive soils to structures and infrastructure built on outcrops of the Imperial Formation should be addressed on a case-by-case basis.

2.3.4 Ground Subsidence

Ground subsidence is the gradual settling or sinking of the ground surface with little or no horizontal movement. In the areas of Southern California where ground subsidence has been reported, this phenomenon is usually associated with the extraction of oil, gas or ground water from below the ground surface. Ground surface effects related to regional subsidence are generally restricted to structures sensitive to slight changes in elevations, such as canals, sewers, and drainages.

Ground subsidence can also occur as a response to natural forces such as earthquake movements, and the folding and subsiding activity of sedimentary basins. Earthquakes have caused abrupt elevation changes in excess of 1 foot across faults. The Imperial Valley earthquake of 1979, for example, resulted in ground subsidence of approximately 15 inches on the east side of the Imperial fault (Sharp and Lienkaemper, 1982).

As discussed previously, the Salton Trough, inclusive of the Desert Hot Springs area, is a depression that has clearly undergone regional subsidence as a response to the active tectonic forces in the area. At this time it is unknown whether subsidence of the trough has, and continues to occur gradually over time, or occurs in discrete, measurable amounts associated with earthquakes on the San Andreas fault. However, landforms in the Desert Hot Springs area indicate that uplift (and subsidence) have occurred locally, in Devers Hill, and in the elevated older fans emanating from the Little San Bernardino Mountains. The 4-meters (12 feet) high scarp on the west side of Devers Hill (Smith, 1979) has probably formed in response to several earthquakes on the San Andreas fault, although how many earthquakes, it is unknown. Other elevated surfaces along the San Andreas fault, such as Miracle Hill, need not be the result of uplift on the San Andreas fault. Rather, lateral movement on the fault can juxtapose elevated areas against low-lying areas, giving the impression of uplift, when in fact there has been none.

2.3.5 Wind Erosion

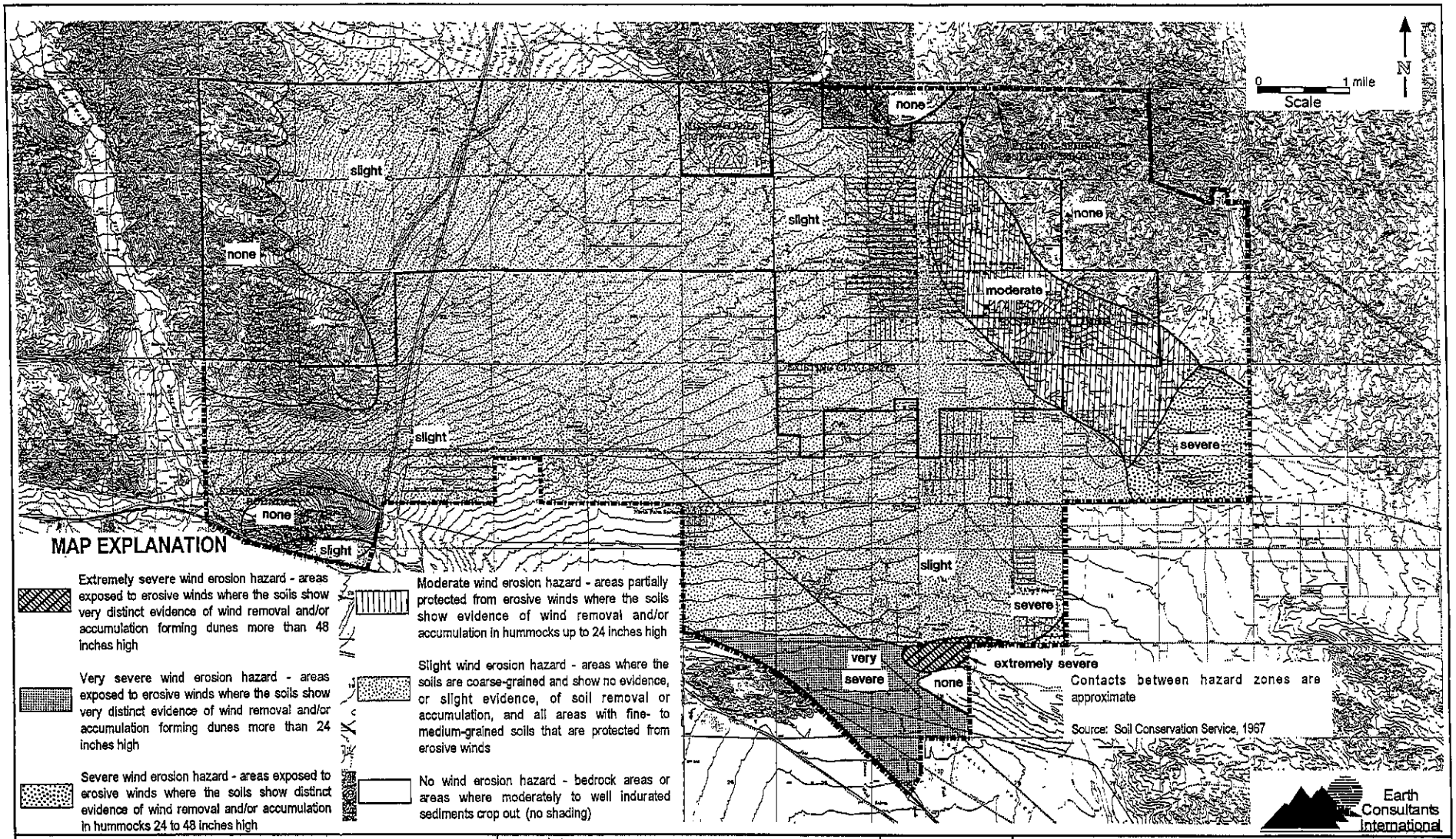
The hazard posed by wind erosion is particularly endemic to the Coachella Valley. Strong winds funneled through the San Gorgonio Pass have been blowing

and redistributing the sand deposits in the area for thousands of years. To local residents and motorists that venture into the area, this natural process poses a hazard because the blowing sand abrades and damages buildings, motor vehicles, and trailers. Shifting sands fill in drainages, driveways, yards, and other enclosed areas, costing thousands of dollars in sand removal operations. Severe wind storms can also limit visibility on the freeways and roads in the area. The winds are strongest during the spring months, when dust storms may last three or more days.

Although most of the soils exposed in the valley floor in Desert Hot Springs and its Sphere of Influence are of the right size to be picked up and transported by wind (U.S. Soil Conservation Service, 1967), a large portion of the study area is protected to some degree from the strong winds that blow southeasterly toward the desert. Figure 2-2 shows the wind erosion hazard zones that have been defined in the General Plan area. As Figure 2-2 shows, wind erosion is most severe in the south and southeasterly portions of the study area. In Garnet Hill, immediately south of the General Plan area, strong winds have, over the years, formed grooves, notches, and pits in the rocks (Sharp, 1949; Proctor, 1968; Saunders, 1976). The wind erosion hazard decreases near the mountain front, where the gravels, cobbles and boulders that dominate the soil fraction are too heavy to be picked up and transported by the wind.

The hazard of wind erosion can be mitigated, although it may require changing considerably the natural environment, often at significant monetary expense. Urbanization can provide long-term wind erosion protection by covering the soils with impervious surfaces, and by landscaping, which stabilizes the shifting sand dunes. In developed areas, the soils can be protected from erosion by maintaining the surface soils moist, planting stabilizing vegetation, and establishing wind breaks. When using plants for erosion control, it is important that the ground cover chosen is suitable for the area.

In the short-term, urban development can result in significant wind erosion. Blowing sand and dust can be expected to worsen when surface soils, such as on graded fill slopes or cut slopes, are disturbed and/or left unprotected. Riverside County's General Plan requires that an erosion control plan be submitted to the County before grading permits can be issued for developments in areas where wind erosion or blow sand may result from or during development. Wind erosion during grading activities can generally be controlled with adequate pre-watering of the exposed soils. Watering of the soils should occur prior to, and during construction. Limiting the area of exposed soils during grading, and landscaping the areas immediately after grading, are widely used mitigation measures. An alternative to grading fill slopes and cut slopes in sands is to use retaining walls. Slope stabilization can also be achieved by using soil cement.



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Sphere of Influence:
Date: 2/18/97
Base Map: Desert Hot Springs, and Seven Palms Valley USGS 7.5 Quad Maps

Wind Hazard Zones in the Desert Hot Springs Area

2.4 Issues and Opportunities

1. The western and northern portions of the General Plan area have a moderate to high susceptibility to rock falls and landsliding as a result of the steep topography and fractured nature of the bedrock exposed in these areas. Rockfalls and landslides triggered by earthquakes are of significant concern. Slumping and downslope creep can occur on the steep flanks of Whitewater, Painted, and Devers hills. East-facing slopes on Painted Hill could expose out-of-slope, unstable bedding conditions within the Coachella Fanglomerate.

2. The alluvial deposits in the valley floor are susceptible to collapse. In areas proposed for development, site-specific studies need to be conducted to evaluate the settlement potential of the underlying soils. These geotechnical studies should evaluate the collapse potential of the entire soil column within the effective depth of infiltration of irrigation water, instead of only the near-surface soils.

3. Some of the older alluvial surfaces may have significant amounts of clay in the near surface, with moderate to high expansion potentials. Excavation, mixing, and recompaction of the clayey horizons in these soils is anticipated to mitigate the hazard, if any, of soil expansion in these areas.

4 Wind erosion is a significant constraint in the southern and eastern portions of the study area. Increased development of the area is expected to provide increased stabilization of the soils susceptible to wind erosion. The vegetation cover selected to stabilize the soils should be able to withstand hot, dry spells, and be resistant to high salt concentrations in the soils. Increased wind erosion can occur during construction activities. Project-specific erosion control measures should be implemented to protect the soils from the erosive winds.

CHAPTER 3: FLOODING AND INUNDATION HAZARDS

3.1 Introduction

Safety Elements of General Plans must assess the impact of flooding from storm activity such as from 100- and 500-year flood events. A 100-year flood event is a flood that has a 1/100 chance of occurring in any one year. Smaller-scale flooding generally associated with overburdened storm drain and canal systems can damage property and hinder emergency activities such as fire department access or evacuation. Consequently, the potential for more frequently occurring, small-scale flooding is also assessed in this report. In addition, Government Code Section 65302(g) requires local governments to assess the potential hazard that failure of dams or other water retention structures may pose to the community.

3.2 Storm Flooding

The northern Coachella Valley, where Desert Hot Springs is located, is flanked by the Little San Bernardino Mountains to the north and northeast, the San Bernardino Mountains to the west and northwest, and the San Jacinto and Santa Rosa Mountains to the southwest and south, respectively. The mountains act as a rain shadow and stop most of the rain-laden clouds moving in from the Pacific Ocean. Most precipitation occurs on the west-facing slopes of the San Bernardino and San Jacinto mountains. These areas receive 35 to 45 inches of rain a year; in some areas up to 50 inches of rain a year have been reported. In contrast, rain in Desert Hot Springs averages about 4 to 6 inches a year, although some years, no rain in measurable quantities has been reported. Precipitation in the mountains surrounding the Coachella Valley typically occurs in the winter months, between December and March. The valley itself gets almost 40 percent of its precipitation during the summer, as storms moving in from the Gulf of California (Department of Water Resources, 1964).

Although precipitation on the desert floor is limited, desert areas are subject to various degrees of storm flooding, typically the result of flash floods of relatively short duration that overwhelm the existing drainages and flood control improvements. Flash flooding in the desert is generally limited to low-lying drainages or washes that extend outward from the flanks of the mountains and into the valleys or flatlands. Storm flooding can also occur in floodways or floodplains adjacent to rivers, in low-lying areas adjacent to water sources (such as irrigation canals) and adjacent to storm drain ditches or other low-lying areas where storm water may collect.

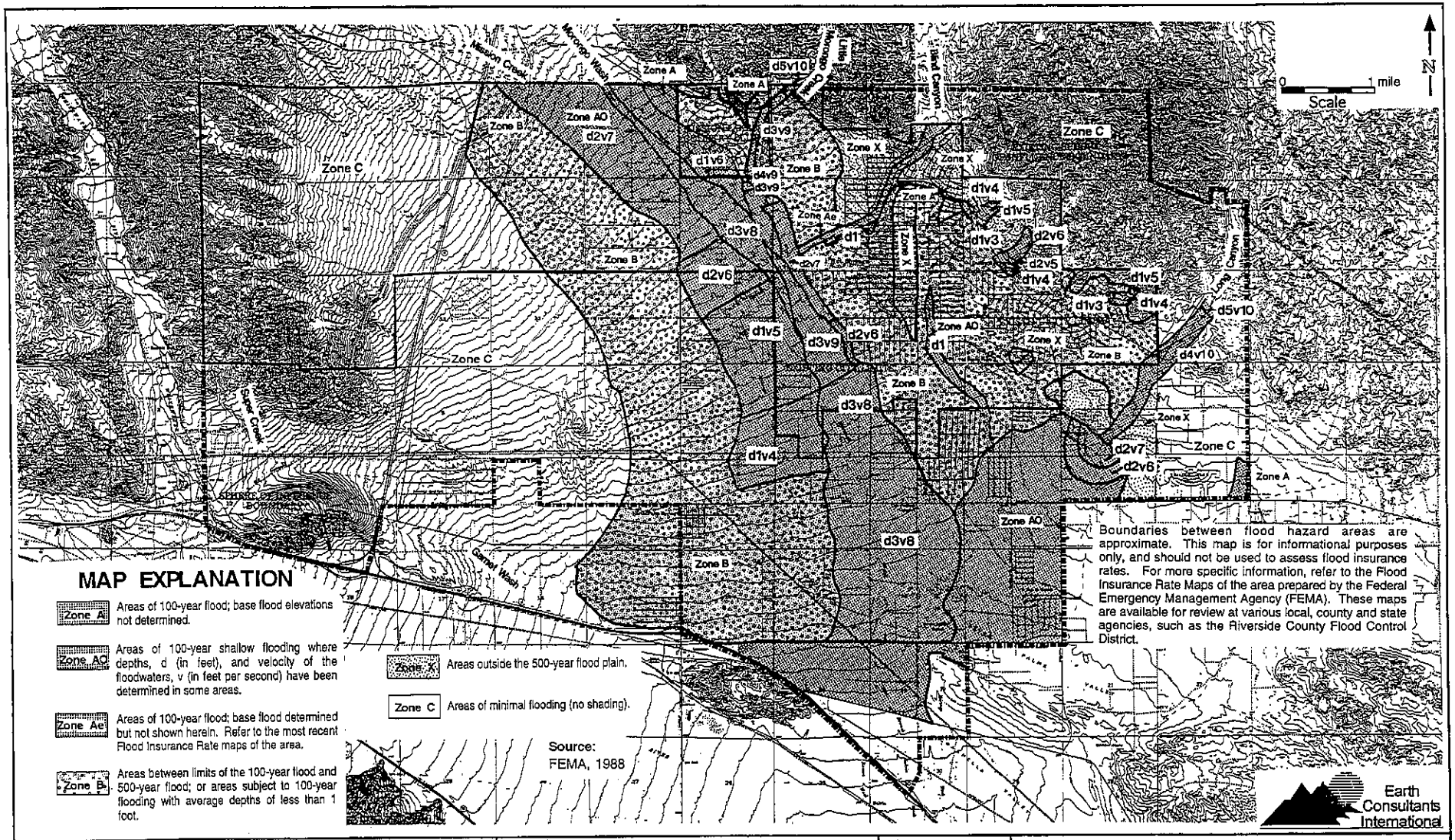
Flooding in the desert can also result when unusually warm conditions in early spring cause the snow pack on the adjacent mountains to melt quickly. In fact, most of the surface water in the northern Coachella Valley is derived from snow melt off the slopes of the San Bernardino, Little San Bernardino and San Jacinto mountains. Small intermittent streams tributary to Whitewater River and the other major creeks in the area convey the melted snow to the larger channels, who in turn drain onto the desert floor. The water is generally absorbed rapidly by the porous sands and gravels in the valley floor, unless these sediments are already saturated, as would be the case if it had rained recently. The absorbed water then continues to flow underground. The regional direction of flow for both surface and ground waters is to the southeast, toward the Salton Sea.

The most widely distributed flood map product is the Flood Insurance Rate map (FIRM). The Flood Emergency Management Agency (FEMA) conducts engineering studies (referred to as Flood Insurance Studies - FIS) to evaluate the flooding hazard in flood-prone communities. Flood risk assessments shown on FIRMs are based on historical, meteorological, hydrological and hydraulic data. Open-space conditions, existing flood control works, and existing development are also considered. From the data collected from the FIS, FEMA engineers and cartographers delineate Special Flood Hazard Areas (SFHAs) on FIRMs. SFHAs are those areas subject to inundation by a flood that has a 1-percent or greater chance of being equaled or exceeded during any given year (a 100-year flood or base flood). A base food has a 26-percent chance of occurring during a 30-year period, the length of most home mortgages (FEMA, 1997). Although the recurrence interval represents a long-term average period between floods of a given magnitude, floods could and do occur at shorter time intervals, occasionally even within the same year. The base flood is a standard used by Federal agencies and most states to administer floodplain management programs. The base flood is also used by the National Flood Insurance Program as the basis for insurance requirements nationwide.

The City of Desert Hot Springs and the County of Riverside (for the unincorporated areas within the Sphere of Influence) participate in the National Flood Insurance Program. Flood Insurance Rate Maps have been prepared for all of the General Plan area. The most recent FEMA maps available for the area include Community Panels 060251-0005C, 060245-0925B, and 060245-0900C. All three maps are dated September 30, 1988. The last two community panels cover most of the unincorporated areas in the southern portion of the Sphere of Influence. These maps were used to construct the Flood Hazard Map shown on Figure 3-1. Recently, panel 060245-0900 was re-issued (as number 060245-0900D, dated November 20, 1996), to exclude an area that has since been incorporated to the City of North Palm Springs. The flood areas shown in the new panel, however, did not change.

The flood hazard in the City of Desert Hot Springs and its Sphere of Influence is related primarily to storm flooding on the alluvial fans that drain the San Bernardino and Little San Bernardino mountains. Floodwaters on fans can cause significant damage because the waters move at high velocities and contain considerable amounts of debris (often including large boulders, trees, etc.). The floodwaters are also not confined to a single channel, but rather spread across a broad area (FEMA, 1987). Since most of the City and its Sphere of Influence are located on alluvial fans, the hazard posed by flooding is significant.

Figure 3-1 shows that the eastern and central portions of the General Plan area, where extensive urbanization has occurred, are located within either the 100-year of 500-year flood zones. Areas down gradient of the major canyons are generally contained within the 100-year floodplain. Flows emanating from Little Morongo and Blind canyons are channeled and diverted southwestward toward Morongo Wash. 100-year flood waters emanating from Little Morongo Wash can be as much as 5 feet deep, and have a velocity of up to 10 feet per second (fps). Flood hazard factors determined for Morongo Wash, where the flow is not contained, indicate that, for a 100-year flood, surface waters can be as much as 3 feet deep, with velocities of as much as 9 fps. These regions are shown in Figure 3-1, although some areas are too narrow to show to scale. Given the high flow velocities, flooding in these areas has the potential to do considerable damage.



MAP EXPLANATION

- Zone A: Areas of 100-year flood; base flood elevations not determined.
- Zone AO: Areas of 100-year shallow flooding where depths, d (in feet), and velocity of the floodwaters, v (in feet per second) have been determined in some areas.
- Zone Ae: Areas of 100-year flood; base flood determined but not shown herein. Refer to the most recent Flood Insurance Rate maps of the area.
- Zone B: Areas between limits of the 100-year flood and 500-year flood; or areas subject to 100-year flooding with average depths of less than 1 foot.
- Zone X: Areas outside the 500-year flood plain.
- Zone C: Areas of minimal flooding (no shading).

Source: FEMA, 1988

Boundaries between flood hazard areas are approximate. This map is for informational purposes only, and should not be used to assess flood insurance rates. For more specific information, refer to the Flood Insurance Rate Maps of the area prepared by the Federal Emergency Management Agency (FEMA). These maps are available for review at various local, county and state agencies, such as the Riverside County Flood Control District.

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Flooding Hazards in Desert Hot Springs and its Sphere of Influence

The older, most heavily urbanized sections of the City are generally located between the limits of the 100-year and 500-year floods. Similarly, a large area to the west of Morongo Wash is located between the limits of the 100-year and 500-year flood, or where the 100-year flood waters are not expected to be more than 1 foot deep. Some areas at the foot of the Little San Bernardino Mountains, but not within or adjacent to the creeks draining the mountains, are located outside the 500-year floodplain. All of the western portion of the General Plan area is mapped as an area of minimal flooding.

As indicated above, the FIRMs used to construct Figure 3-1 are of 1988 vintage. This means that the data upon which the FIRMs are based were obtained in the mid 1980s, and represent the conditions existing in the community at the time of that study. Since 1988, there has been additional growth in the City, such as the large residential tracts in the Mission Lakes Country Club area, in the northern reaches of the valley floor. Development typically results in an increase in impervious surfaces (paved roads, sidewalks, roofs, etc.), which in turn results in increased surface runoff. Often, flood control structures downgradient are not modified to handle the increasing amount of runoff, and during periods of intensive flow, are easily overwhelmed. Therefore, in some areas, higher flows and depths than those shown on Figure 3.1 may occur.

3.3 Seismically Induced Inundation

Seismically induced inundation refers to flooding as a result of water retention structures (such as dams) failing during an earthquake. There are no major dam-impounded reservoirs in the City or upstream of the City that may be subject to failure. The Colorado Aqueduct skirts the General Plan area on the north, and actually extends across the City on the west. The aqueduct intersects the San Andreas fault just north of the study area, within the floodplain of Morongo Wash. A surface-rupturing earthquake on either the Coachella or San Bernardino Mountains segments of the San Andreas fault (these segments come together right in this area, in Morongo Wash) could damage the aqueduct. Water released from the aqueduct as a result of structural failure would flow into the alluvial sediments underlying the aqueduct, and flow southeastward, downgradient along the channel of Morongo Wash. If the water released from the aqueduct is under substantial pressure, it could erode the creek sediments in the northern reaches of the General Plan area. Repairs to the aqueduct could take two weeks or longer (Toppozada and others, 1993). The Colorado Aqueduct is operated by the Metropolitan Water District.

Other, smaller flood control improvements, such as canals, culverts, levees, and retention basins may crack and suffer some structural damage during an earthquake, especially in areas prone to ground failure. These facilities could pose an inundation hazard if they contain water at the time of the seismic event, or if they are not repaired soon after an earthquake and prior to the next wet season.

The Horton Plant is a waste-treatment facility located in the City of Desert Hot Springs, in the area of Mission Springs Park. The facility handles about 1 million gallons of effluent per day. The waste water is contained in reinforced concrete tanks, and the treated water is pumped into percolation ponds. The soil materials underlying these ponds are very permeable, so water percolates into and through these soils at a rapid rate. According to Mr. Thacker of the Mission Springs Water District, the percolation ponds rarely have more than 1 foot of water in them. Therefore, in the event of an

earthquake, significant amounts of water are not anticipated to slosh out of either the concrete tanks or the percolation ponds. The waste treatment facility is protected on the east by a berm maintained by the Mission Springs Water District. The berm is designed to keep water from the percolation ponds from flowing offsite, while preventing flood waters flowing in from the northeast from impacting the waste-treatment facility (G. Thacker, personal communication, 1997). Water treatment facilities in the Los Angeles area generally performed well during the 1994 Northridge earthquake. Minor damage reported was associated with leaks at construction and expansion joints, leaks in chlorine solution lines, non-structural damage such as overturned bookshelves, and sloshing damage to gratings and wood baffles in the basins (EERI, 1995).

3.3.1 Water Tanks

Seismically induced inundation can also occur if strong ground shaking causes structural damage to above-ground water tanks. If a tank is not adequately braced and baffled, sloshing water can lift a tank off its foundation, splitting the shell, damaging the roof, and bulging the bottom of the tank (elephants foot) (EERI, 1992). Movement can also shear off the pipes leading to and out of the tank, allowing water to be released through the broken pipes. These types of damage were reported as a result of the Landers, Big Bear, and Northridge earthquakes. In all, about 40 steel tanks were rendered non-functional by the Northridge earthquake (EERI, 1995), including a tank in the Santa Clarita area that failed and inundated several houses downgradient.

There are twenty above-ground water storage tanks in the Desert Hot Springs area (see Table 3-1 and Figure 3-2), with a combined total storage capacity of 17.15 million gallons. These are operated by the Mission Springs Water District, and are used to store ground water pumped from the ground water basin underlying the area. Several of these tanks are of 1960s to 1980s vintage, and although built to the water-tank specifications applicable at that time, it is questionable whether some of the tanks can perform satisfactorily during a near-source earthquake on either the Coachella Valley (a.k.a. Mission Creek) segment of the San Andreas fault or the Banning fault. None of the tanks in the City are baffled, however, most of the tanks are fitted with flexible coupling on the pipes leading into and out of the tanks (G. Thacker, written communication, 1997), (Table 3-1). The flexible couplings can accommodate some movement, and are therefore less likely to shear off during an earthquake.

Most of the tanks are located on the northern reaches of the City, on the flanks of the Little San Bernardino Mountains. The tanks are typically at some elevation above the desert floor so that water can be gravity-fed to the community. Unfortunately, if some of these tanks are damaged during an earthquake, the water released has the potential of impacting structures down gradient. Whether structures downgradient are impacted would depend on: 1) the amount of water released, i.e., the holding capacity of the tank; 2) the rate at which the water is released; 3) the slope of the land downgradient of the tank; and 4) the location of the tank relative to nearby buildings, and to flood control structures that could contain the flow of water.

Redbud, Highland, Desert View (1 & 2), Northridge, and Vista are relatively small tanks. Water released catastrophically from these tanks is not anticipated

to result in significant damage to structures downgradient of the damaged tanks. High Northridge, Terrace (1, 2 & 3), and Mission Lakes are larger tanks located upstream of developed areas that do have the potential, should they fail catastrophically, to impact structures downgradient. Water under pressure can erode significantly the area around the tank, including maintenance roads leading to the tank and any surrounding slopes or terrain downgradient from the tank. Alternatively, if water is released slowly from these tanks, for example as a result of pipe failure, most of the water is anticipated to be contained within surrounding channels and streets.

Similarly, water released catastrophically from the tank on Quail Road has the potential of impacting structures down gradient (south) of the tank. Annandale is located adjacent to the channel for Little Morongo Canyon, so water released from this tank in anticipated to be mostly contained by the channel, significantly reducing the hazard of inundation in the developed areas down gradient. However, in the event of a characteristic (or maximum credible) earthquake on the Coachella Valley segment (Mission Creek) of the San Andreas fault, or on the Pinto Mountain-Morongo fault, both the Mission Lakes and Annandale tanks will experience very strong ground motions.

The Two Bunch reservoirs are located very close to the Coachella Valley segment of the San Andreas (Mission Creek fault). If the fault ruptures through this area, these water tanks are likely to get damaged extensively (in addition to the potential for surface rupture beneath or immediately adjacent to the tanks, the tanks are going to be exposed to very strong ground motions). If either one of these tanks is damaged catastrophically, the water released will flow south and southwest, toward Verbena Drive and streets to the west. Ultimately, the water would flow into the channel east of Mission Springs Park. Similarly, the Valley View and Overhill reservoirs are located relatively close to the Banning fault, and are therefore likely to experience very strong ground motions. Overhill Reservoir, located on the flanks of Painted Hill may experience unusually high accelerations. This area is also susceptible to seismically induced ground deformations, such as ridge top shattering, that could impact negatively the reservoir.

Water released by any of these tanks during an earthquake can reduce the water resources available to suppress earthquake-induced fires. Damaged tanks and water mains can also limit the amount of water available to residents. Since the planning area relies primarily on ground water (stored in the reservoirs discussed above) for its water supply, it is of paramount importance that the water storage tanks in the area retain their structural integrity during an earthquake, so water demands after the earthquake can be met. This of course requires that the tanks be kept at or near full capacity at all times.

Table 3-1: Water Storage Tanks in the City of Desert Hot Springs and Vicinity

Reservoir Name	Capacity (million gallons)	Height (feet)	Diameter (feet)	Year Built	Type	Flex Coupling	Approx. Distance to Closest Fault* (feet)
Quail Road	1.0	24	85	1989	WS	No	6000
Highland	0.055	16	25	1967	WS	No	8000
Redbud	0.30	31	41	1959	WS	No	8000
Desert View #1	0.225	28	40	Unk.	WS	Yes	5000
Desert View #2	0.10	30	40	Unk.	WS	Yes	5000
High Desert View #1	1.0	24	87	1992	WS	Yes	6500
High Desert View #2	0.5	24	60	1993	WS	Yes	6500
Two Bunch # 1	0.42	24	55	Unk.	BS	Yes	<100
Two Bunch # 2	1.0	24	85	1988	WS	Yes	<100
Terrace #1	1.75	20	125	1968	WS	No	3000
Terrace #2	2.0	20	135	1984	WS	Yes	3000
Terrace #3	2.0	20	135	1993	WS	Yes	3000
Northridge	0.25	27	36	Unk.	WS	No	6500
High Northridge	1.0	16	105	1981	WS	Yes	7500
Vista	0.3	32	40	1966	WS	No	8000
Annandale	2.5	24	135	1989	WS	Yes	4000
Mission Lakes	1.95	30	96	1971	WS	No	1000
Gateway	0.25	24	43	1988	WS	Yes	1500
Overhill	0.25	21	47	1988	WS	Yes	1000
Valley View	0.3	24	47	1980	WS	Yes	7000

* Only the Coachella Valley (a.k.a. Mission Creek) segment of the San Andreas and the Banning faults were considered for this assessment

Key: WS= welded steel; BS= bolted steel; Unk.= unknown

Source: Mission Springs Water District, written communication, 1997

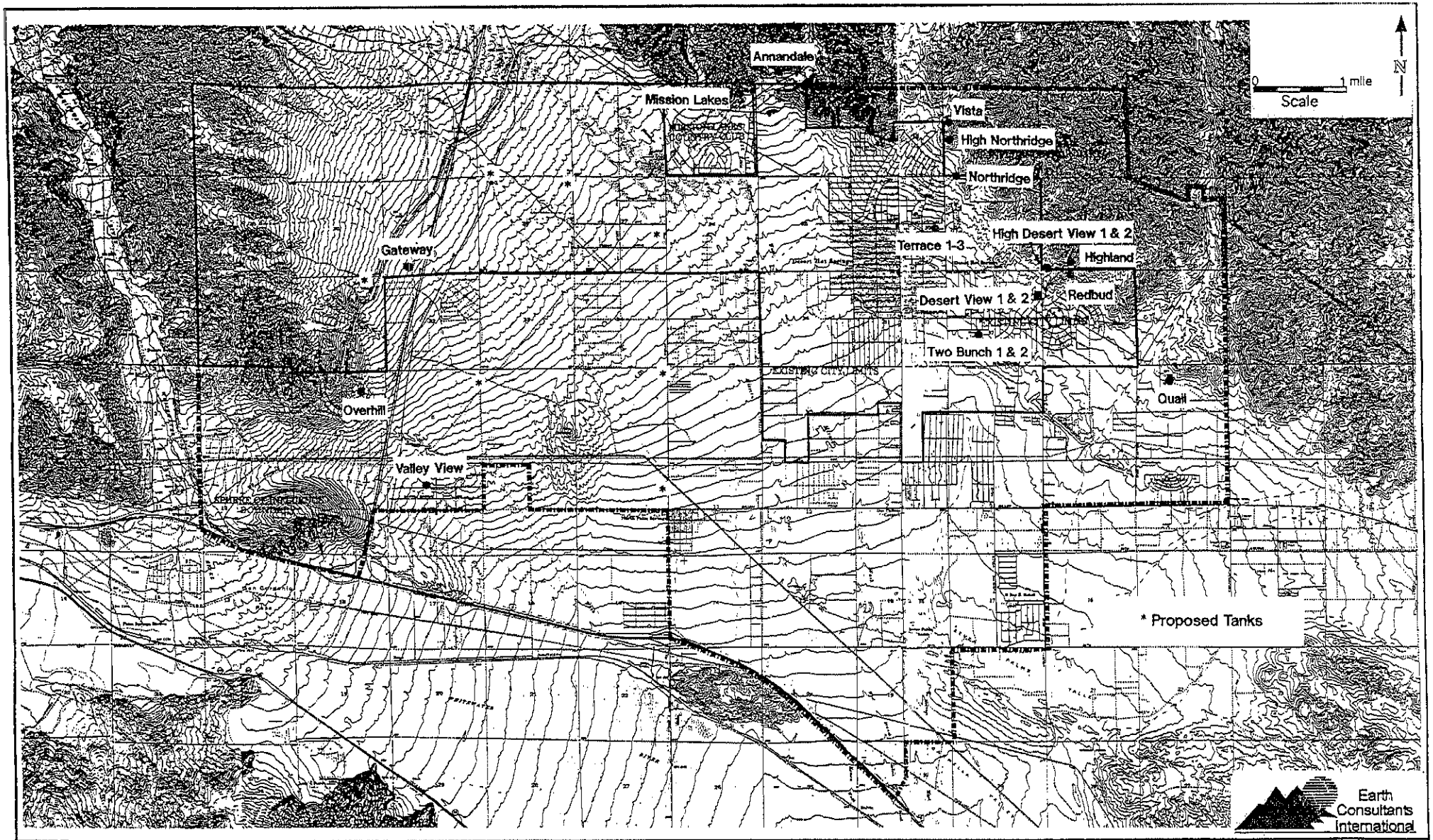

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Figure 3-2
Water Tanks in the Desert Hot Springs Area

According to maps provided by the Mission Springs Water District, at least eight more water storage tanks are proposed for the area, in the western portion of the City. When these tanks will be built and put to service is unclear. However, it seemed appropriate to review the proposed locations to assess whether any of the tanks will be located on or immediately adjacent to a fault trace. Our review indicates that none of the tanks currently proposed are located on either the Coachella Valley segment of the San Andreas fault, or the Banning fault. However, two of the proposed tanks are located relatively close to the Banning fault (within 500 feet). This fault may generate high peak horizontal and vertical ground accelerations during a maximum credible earthquake. These tanks should be designed to withstand strong ground motions caused by a seismic source nearby.

3.4 Issues and Opportunities

1. Flood insurance rate maps for the City of Desert Hot Springs and its Sphere of Influence show that most of the eastern and central portions of General Plan area are located within either the 100-year flood zone, or between the 100-year and 500-year flood zones. Most of the older, more heavily developed areas of the City are located within these flood hazard areas. Flood waters in the General Plan area can be expected to flow at high velocities, with the potential for significant damage to structures, and loss of life or property. Structures for human occupancy should not be constructed within the 100-year flood zone. Critical facilities should not be constructed within the 500-year flood zone without properly engineered and constructed mitigation measures approved by Riverside County Flood Control and the City Engineer.

2. For those sections of the General Plan area that have already been developed within either the 100-year or between the 100- and 500-year flood zones, the City should prepare and implement flood warning systems and evacuation plans. Warning systems should also be considered for the alluvial fan areas in the Sphere of Influence, where flash flooding could pose an immediate threat to life and property. Development in the alluvial fans (with emphasis on the Morongo Wash fan) should be prohibited or restricted, contingent on whether acceptable engineering measures can be applied to reduce the hazard. Campgrounds and other similar types of activities should also be prohibited or regulated carefully in these high-risk areas.

3. The hazard of earthquake-induced dam inundation in the Desert Hot Springs area is considered nil. A surface rupturing earthquake on either the Coachella Valley or San Bernardino Mountains segments of the San Andreas fault can damage the Colorado aqueduct, especially where it crosses the fault zone, in the Morongo Wash area. Water released from the ruptured aqueduct is most likely going to infiltrate the very permeable alluvial fan sediments without posing a hazard to the General Plan area. If water is released under high pressure, it could locally erode sediments within the channel of Morongo Wash.

4. There are twenty water tanks in the City with a combined total storage capacity of 17.15 million gallons. Above-ground storage tanks can be severely damaged during an earthquake if not properly braced and baffled, posing an inundation

hazard to areas down gradient. More significantly, these water tanks should be upgraded as needed to be seismic resistant so that water demands can be met immediately after an earthquake. Some of the most critical tanks, which hold large volumes of water, and are located upgradient from heavily developed areas, should be upgraded to conform with the most recent AWWA Standards for Design of Steel Water tanks, following the new criteria for seismic design. Refer to Chapter 1 for a discussion of the peak ground accelerations estimated for the area in the event of an earthquake on the Coachella Valley and San Bernardino Mountains segments of the San Andreas fault, and the Banning fault.

APPENDIX A
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APPENDIX A
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APPENDIX B
PERTINENT SECTIONS OF HART (1994)
REGARDING SURFACE FAULT RUPTURE

FAULT-RUPTURE HAZARD ZONES IN CALIFORNIA

Alquist-Priolo Earthquake Fault Zoning Act
with Index to Earthquake Fault Zones Maps

REVISED 1994

by

EARL W. HART
Geologist

1994

California Department of Conservation
DIVISION OF MINES AND GEOLOGY
801 K Street, MS 14-33
Sacramento, California 95814-3531

CONTENTS

INTRODUCTION 1
PROGRAM FOR ZONING AND EVALUATING FAULTS 2
Requirements of the Act 2
Program for zoning faults 2
Definitions, policies, rationale 2
Delineating the Earthquake Fault Zones 5
Fault Evaluation and Zoning Program 7
Uses and limitations of Earthquake Fault Zones Maps 9
INDEX TO MAPS OF EARTHQUAKE FAULT ZONES 9
Availability of Earthquake Fault Zones Maps 9
REFERENCES 9
APPENDICES 21
A. Alquist-Priolo Earthquake Fault Zoning Act 21
B. Policies and Criteria of the State Mining and Geology Board 24
C. Guidelines for evaluating the hazard of surface fault rupture 25
D. General guidelines for reviewing geologic reports 28
E. Products of the Fault Evaluation and Zoning Program 30
F. Waiver procedure for the Alquist-Priolo Act 34

ILLUSTRATIONS

Figure 1. Principal active faults in California zoned under the Alquist-Priolo Earthquake Fault Zoning Act 4
Figure 2. Geologic time scale 5
Figure 3. Example of Earthquake Fault Zones Map 5
Figure 4. Index of Earthquake Fault Zones Maps issued 10

Table 1. Summary of responsibilities under the Alquist-Priolo Earthquake Fault Zoning Act 1
Table 2. Summary of Policies and Criteria of State Mining and Geology Board 1
Table 3. Dates of issue of Official Maps of Earthquake Fault Zones 2
Table 4. Cities and Counties affected by Earthquake Fault Zones 3
Table 5. Surface faulting associated with earthquakes in California, 1975-1993 8

PREFACE

The purpose of the Alquist-Priolo Earthquake Fault Zoning Act is to regulate development near active faults so as to mitigate the hazard of surface fault-rupture.

The report summarizes the various responsibilities under the Act and details the actions taken by the State Geologist and his staff to implement the Act.

This is the ninth revision of Special Publication 42, which was first issued in December 1973 as an "Index to Maps of Special Studies Zones." A text was added in 1975 and subsequent revisions were made in 1976, 1977, 1980, 1985, 1988, 1990, and 1992. The latest edition has been updated to reflect changes in the index map, the Division's Fault Evaluation and Zoning Program, and amendments to the Act.

On January 1, 1994, the name of the Alquist-Priolo Special Studies Zones Act was changed to the Alquist-Priolo Earthquake Fault Zoning Act, and the name Special Studies Zones was changed to Earthquake Fault Zones as a result of a July 25, 1993 amendment. A notice announcing these name changes has been sent to appropriate local and state agencies to facilitate assimilation of these changes. Other recent amendments are included in the revised Alquist-Priolo Act in Appendix A.

Information on new and revised Earthquake Fault Zones Maps will be provided as supplements until the next revision of this report.

FAULT-RUPTURE HAZARD ZONES IN CALIFORNIA

By

Earl W. Hart

INTRODUCTION

The Alquist-Priolo Earthquake Fault Zoning Act was signed into law December 22, 1972, and went into effect March 7, 1973. The Act, codified in the Public Resources Code as Division 2, Chapter 7.5, has been amended ten times. A complete text of the Act is provided in Appendix A. The purpose of this Act is to prohibit the location of most structures for human occupancy across the traces of active faults and to mitigate thereby the hazard of fault-rupture (Section 2621.5).

This law initially was designated as the Alquist-Priolo Geologic Hazard Zones Act. The act was renamed the Alquist-Priolo Special Studies Zones Act effective May 4, 1975 and the Alquist-Priolo Earthquake Fault Zoning Act effective January 1, 1994. The original designation "Special Studies Zones" was changed to "Earthquake Fault Zones" when the Act was last renamed.

Under the Act, the State Geologist (Chief of the Division of Mines and Geology) is required to delineate "earthquake fault zones" (EFZs) along known active faults in California. Cities and counties affected by the zones must regulate certain development "projects" within the zones. They must withhold development permits for sites within the zones until geologic investigations demonstrate that the sites are not threatened by surface displacement from future faulting. The State Mining and Geology Board provides additional regulations (Policies and Criteria) to guide cities and counties in their implementation of the law (California Code of Regulations, Title 14, Div. 2) [1]. A summary of principal responsibilities and functions required by the Alquist-Priolo Act is given in Table 1. The Policies and Criteria are summarized in Table 2, and the complete text is provided in Appendix B.

This publication identifies and describes (1) actions taken by the State Geologist to delineate Earthquake Fault Zones, (2) policies used to make zoning decisions, and (3) Official Maps of Earthquake Fault Zones issued to date. A continuing program to evaluate faults for future zoning or zone revision also is summarized. Other aspects of the Alquist-Priolo Earthquake Fault Zoning Act and its implementation are discussed by Hart (1978 and 1986). The effectiveness of the AP Act and program was evaluated by Reitherman and Leeds (1990). The program is implementing many of the recommendations in that report.

Information presented here is based on various in-house documents and publications of this author and others of the Division (see Appendix E). The assistance of Perry Wong (compilation of faults on Figure 4 and proofing), Richard R. Moar (drafting), Dinah Maldonado and Joy Sullivan (layout and design), and other technical and clerical staff of the Division in revising this report is gratefully acknowledged.

[1] At the time this publication was revised, the Board had not yet revised the regulations to reflect the changes in the names of the act and zones.

Table 1. Summary of responsibilities and functions under the Alquist-Priolo Earthquake Fault Zoning Act (see Appendix A for full Text of Act).

State Mining and Geology Board
1. Formulates policies and criteria to guide cities and counties (Sec. 2621.5 and 2623). (See Appendix B.)
2. Serves as Appeals Board (Sec. 673).
State Geologist
1. Delineates Earthquake Fault Zones; compiles and issues maps to cities, counties, and state agencies (Sec. 2622). a. Preliminary Review Maps. b. Official Maps.
2. Reviews new data (Sec. 2622). a. Revises existing maps. b. Compiles new maps.
3. Approves requests for waivers initiated by cities and counties (Sec. 2623).
Cities and Counties
1. Must adopt zoning laws, ordinances, rules, and regulations; primary responsibility for implementing Act (Sec. 2621.5).
2. Must post notices of new Earthquake Fault Zones Maps (Sec. 2621.9 and 2622).
3. Regulates specified "projects" within Earthquake Fault Zones (Sec. 2623). a. Determines need for geologic reports prior to project development. b. Approves geologic reports prior to issuing development permits. c. May initiate waiver procedures. (See Appendix F.)
Other
1. *Seismic Safety Commission*–advises State Geologist and State Mining and Geology Board (Sec. 2630).
2. *State Agencies*–prohibited from siting structures for human occupancy across active fault traces (Sec. 2621.5).
3. *Disclosure*–prospective buyers of any real property located within an Earthquake Fault Zone must be notified of that fact (Sec. 2621.9).

Table 2. Summary of policies and criteria adopted by the State Mining and Geology Board and codified in California Code of Regulations (see Appendix B for full text).

Policies
1. Defines active fault (equals potential hazard) as a fault that has had surface displacement during Holocene time (last 11,000 years) (Sec. 3601).
2. Defines "structure for human occupancy" and other terms (Sec. 3601).

3. Provides opportunity for public to comment on Preliminary Review Maps of Earthquake Fault Zones[1] (Sec. 3602).
4. Provides for comments and recommendations to State Geologist regarding Preliminary Review Maps (Sec. 3602).
Specific Criteria for Lead Agencies (Sec. 3603)
1. No structure for human occupancy defined as a "project" is permitted on the trace of an active fault. Unless proven otherwise, the area within 50 feet of an active fault is presumed to be underlain by active branches of the fault.
2. Requires disclosure of Earthquake Fault Zones to the public.
3. Requires that buildings converted to structures for human occupancy comply with provisions of the Act.
4. Requires geologic reports directed at the problem of potential surface faulting for all projects defined by the Act.
5. Requires cities and counties to review geologic reports for adequacy.
6. Requires that geologic reports be submitted to the State Geologist for open-file.

PROGRAM FOR ZONING AND EVALUATING FAULTS

Requirements of the Act

Section 2622 of the Alquist-Priolo Earthquake Fault Zoning Act (Appendix A) requires the State Geologist to:

1. "Delineate...appropriately wide earthquake fault zones to encompass all potentially and recently active traces of the San Andreas, Calaveras, Hayward, and San Jacinto faults, and such other faults, or segments thereof, as the State Geologist determines to be sufficiently active and well-defined as to constitute a potential hazard to structures from surface faulting or fault creep."

2. Compile maps of Earthquake Fault Zones and submit such maps to affected cities, counties, and state agencies for their review and comment. Following appropriate reviews, the State Geologist must provide Official Maps to the affected cities, counties, and state agencies.

3. Continually review new geologic and seismic data to revise the Earthquake Fault Zones or delineate additional zones.

These requirements constitute the basis for the State Geologist's fault-zoning program and for many of the policies devised to implement the program.

Program for Zoning Faults

As required under the Act, the State Geologist initiated a program early in 1973 to delineate Earthquake Fault Zones to encompass potentially and recently active traces of the San Andreas, Calaveras, Hayward, and San Jacinto faults, and to compile and distribute maps of these zones. A project team was established within the Division to develop and conduct a program for delineation of the zones.

Initially, 175 maps of Earthquake Fault Zones were delineated for the four named faults. These zone maps, issued as Preliminary Review Maps, were distributed for review by local and state government agencies on December 31, 1973. Following prescribed 90-day review and revision periods, Official Maps were issued on July 1, 1974. At that time, the Earthquake Fault Zones became effective and the affected cities and counties were required to implement programs to regulate development within the mapped zones. A second set of Official Maps–81 maps of new zones and five maps of revised zones–was issued on January 1, 1976 to delineate new and revised zones. Additional Official Maps of new and revised zones were issued in succeeding years, as summarized in Table 3.

[1] At the time this publication was revised, the Board had not yet revised the regulations to reflect the changes in the names of the Act and zones.

All of the Earthquake Fault Zones Maps issued prior to January 1, 1977 were based almost solely on the mapping of others. Later maps are based extensively on interpretations of the Fault Evaluation and Zoning Program staff.

Table 3. Official Maps of Earthquake Fault Zones issued 1974 through 1993.

DATE OF ISSUE	NEW MAPS	REVISED MAPS	WITHDRAWN MAPS
July 1, 1974	175		
January 1, 1976	81	5	-
January 1, 1977			
January 1, 1978	1	-	-
July 26, 1979	4		
January 1, 1979	4	7	-
January 1, 1980	2	3	
January 1, 1982	13	27	2
July 1, 1985	8	2	
January 1, 1985	33	10	-
July 1, 1986	16	1	
March 1, 1988	58	4	-
January 1, 1990	50	2	
November 1, 1991	48	8	-
July 1, 1993	1	10	2
Totals	535	134	4

As of January 1, 1994, 535 Official Maps of Earthquake Fault Zones have been issued. Of these, 134 have been revised since their initial issue and four have been withdrawn. The maps are identified by quadrangle map name and the date of issue or revision on the Index to Maps of Earthquake Fault Zones (Figure 4).

The maps delineate regulatory zones for the faults generally identified in Figure 1. Additional faults will be zoned in the future, and some zones will be revised. Thirty-six counties and 94 cities are affected by the existing Earthquake Fault Zones. These jurisdictions are listed in Table 4.

Definitions, Policies, Rationale

For the State Geologist to carry out the mandate to establish regulatory zones, certain terms identified in Section 2622 of the Act had to be defined and policies had to be developed to provide a consistent and reasonable approach to zoning. After the zoning program was underway and the surface fault-rupture process was better understood, other terms were defined and some zoning policies were modified.

*Table 4. Cities and counties affected by Earthquake Fault Zones as of January 1, 1994**

CITIES (94)			COUNTIES (36)	
American Canyon	Hollister	San Bruno	Alameda	Sonoma
Arcadia	Huntington Beach	San Diego	Alpine	Stanislaus
Arcata	Indio	San Fernando	Butte	Ventura
Bakersfield	Inglewood	San Jacinto	Contra Costa	Yolo
Banning	La Habra	San Jose	Fresno	
Barstow	La Habra Heights	San Juan Bautista	Humboldt	
Benicia	Lake Elsinore	San Leandro	Imperial	
Berkeley	Livermore	San Luis Obispo	Inyo	
Bishop	Loma Linda	San Marino	Kern	
Brea	Long Beach	San Pablo	Lake	
Carson	Los Angeles	San Ramon	Lassen	
Cathedral City	Mammoth Lakes	Santa Clarita	Los Angeles	
Coachella	Milpitas	Santa Rosa	Marin	
Colton	Monrovia	Seal Beach	Mendocino	
Compton	Moreno Valley	Signal Hill	Merced	
Concord	Morgan Hill	South Pasadena	Modoc	
Corona	Murrieta	South San Francisco	Mono	
Culver City	Oakland	Temecula	Monterey	
Daly City	Pacifica	Trinidad	Napa	
Danville	Palmdale	Twentynine Palms	Orange	
Desert Hot Springs	Palm Springs	Union City	Riverside	
Dublin	Palo Alto	Ventura (San Buenaventura)	San Benito	
El Cerrito	Pasadena	Walnut Creek	San Bernardino	
Fairfield	Pleasanton	Whittier	San Diego	
Fontana	Portola Valley	Willits	San Luis Obispo	
Fortuna	Rancho Cucamonga	Windsor	San Mateo	
Fremont	Redlands	Woodside	Santa Barbara	
Gardena	Rialto	Yorba Linda	Santa Clara	
Glendale	Richmond	Yucaipa	Santa Cruz	
Hayward	Ridgecrest	Yucca Valley	Shasta	
Hemet	Rosemead		Siskiyou	
Highland	San Bernardino		Solano	

*To inquire about local government policies and regulations or to consult (obtain) copies of specific Earthquake Fault Zones maps, address the Planning Director of each county or city. Some jurisdictions have replotted the EFZ boundaries on large-scale parcel maps.

Fault and Fault Zone

A *fault* is defined as a fracture or zone of closely associated fractures along which rocks on one side have been displaced with respect to those on the other side. Most faults are the result of repeated displacement that may have taken place suddenly and/or by slow creep. A fault is distinguished from those fractures or shears caused by landsliding or other gravity-induced surficial failures. A *fault zone* is a zone of related faults that commonly are braided and subparallel, but may be branching and divergent. A fault zone has significant width (with respect to the scale at which the fault is being considered, portrayed, or investigated), ranging from a few feet to several miles.

Fault Trace

A *fault trace* is the line formed by the intersection of a fault and the earth's surface. It is the representation of a fault as depicted on a map, including maps of the earthquake fault zones.

Active Fault

For the purposes of this Act, an *active fault* is defined by the State Mining and Geology Board as one which has "had surface displacement within Holocene time (about the last 11,000 years)" (see Appendix B, Section 3601). This definition does not, of course, mean that faults having no evidence for surface displacement within Holocene time are necessarily inactive. A fault may be presumed to be inactive based on satisfactory geologic evidence; however, the evidence necessary to prove inactivity sometimes is difficult to obtain and locally may not exist.

Potentially Active Fault

Because the Alquist-Priolo Act requires the State Geologist to establish Earthquake Fault Zones to encompass all "potentially and recently active" traces of the San Andreas, Calaveras, Hayward, and San Jacinto faults, additional definitions were needed (Section 2622). Initially, faults were defined as *potentially active*, and were zoned, if they showed evidence of surface displacement during Quaternary time (last 1.6 million years, Figure 2). Exceptions were made for certain Quaternary (i.e., Pleistocene) faults that were presumed to be inactive based on direct geologic evidence of inactivity during all of Holocene time or longer. The term "recently active" was not defined, as it was considered to be

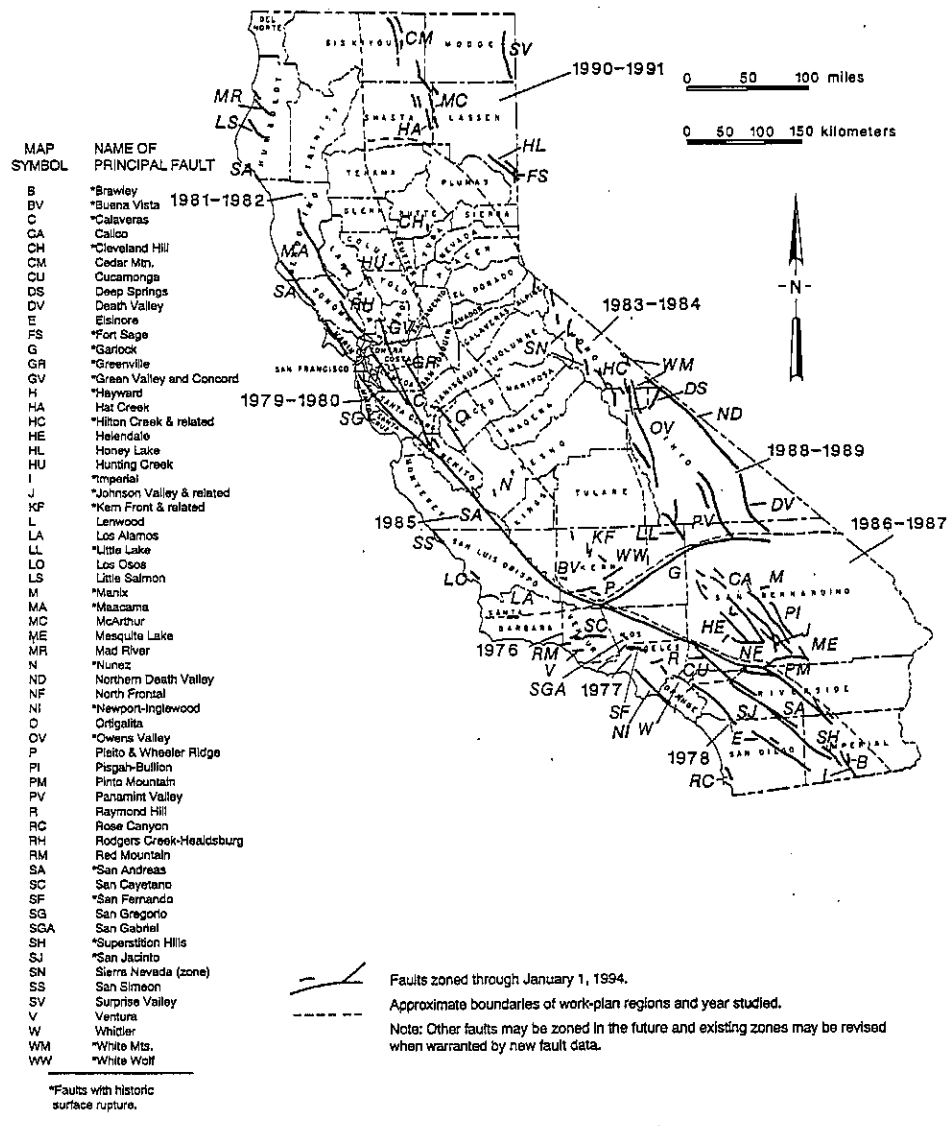


Figure 1. Principal active faults in California zoned under the Alquist-Priolo Earthquake Fault Zoning Act. Dashed lines and dates identify recently completed work-plan for 10 regions and when studied.

covered by the term "potentially active." Beginning in 1977, evidence of Quaternary surface displacement was no longer used as a criterion for zoning. However, the term "potentially active" continued to be used as a descriptive term on map explanations on EFZ maps until 1988.

Sufficiently Active and Well-defined

A major objective of the Division's continuing fault evaluation and zoning program is to evaluate the hundreds of remaining potentially active faults in California for zoning consideration. However, it became apparent as the program progressed that there are so many potentially active (i.e., Quaternary) faults in the State (Jennings, 1975) that it would be meaningless to zone all of them. In late 1975, the State Geologist made a policy decision to zone only those potentially active faults that have a relatively high potential for ground rupture. To facilitate this, the terms "sufficiently active" and "well-defined," from Section 2622 of the Act, were defined for application in zoning faults other than the four named in the Act. These two terms constitute the present criteria used by the State Geologist in determining if a given fault should be zoned under the Alquist-Priolo Act.

Sufficiently active. A fault is deemed sufficiently active if there is evidence of Holocene surface displacement along one or more of its segments or branches. Holocene surface displacement may be directly observable or inferred; it need not be present everywhere along a fault to qualify that fault for zoning.

Well-defined. A fault is considered well-defined if its trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The fault may be identified by direct observation or by indirect methods (e.g., geomorphic evidence; Appendix C). The critical consideration is that the fault, or some part of it, can be located in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

Determining if a fault is sufficiently active and well-defined is a matter of judgment. However, these definitions provide standard, workable guidelines for establishing Earthquake Fault Zones under the Act.

The evaluation of faults for zoning purposes is done with the realization that not all active faults can be identified. Furthermore, certain faults considered to be active at depth, because of known seismic activity, are so poorly defined at the surface that zoning is impractical. Although the map explanation indicates that "potentially active" (i.e., Quaternary) faults are identified and zoned (with exceptions) on the Official Maps of Earthquake Fault Zones until 1988, this is basically true only for those maps issued July 1, 1974 and January 1, 1976. Even so, all of the principal faults zoned in 1974 and 1976 were active during Holocene time, if not historically. Beginning with the maps of January 1, 1977, all faults zoned meet the criteria of "sufficiently active and well-defined."

Delineating the Earthquake Fault Zones

Earthquake Fault Zones are delineated on U.S. Geological Survey topographic base maps at a scale of 1:24,000 (1 inch equals 2,000 feet). The zone boundaries are straight-line segments defined by turning points (Figure 3). Most of the turning points are intended to coincide with locatable features on the ground (e.g., bench marks, roads, streams). Neither the turning points nor the connecting zone boundaries have been surveyed to verify their mapped locations.

Locations of Earthquake Fault Zone boundaries are controlled by the position of fault traces shown on the Official Maps of Earthquake Fault Zones. With few exceptions, the faults shown on the 1974 and 1976 Earthquake Fault Zones maps were not field-checked during the compilation of these maps. However, nearly all faults zoned since January 1, 1977, have been field-checked to verify that they do meet the criteria of being sufficiently active and well-defined.

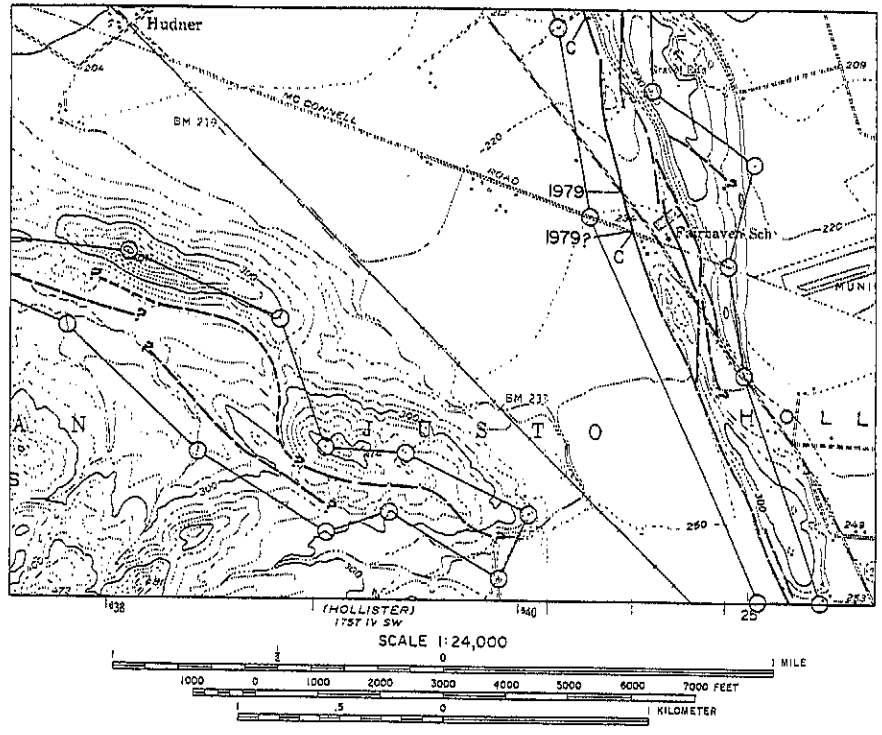
Zone boundaries on early maps were positioned about 660 feet (200 meters) away from the fault traces to accommodate imprecise locations of the faults and possible existence of active branches. The policy since 1977 is to position the EFZ boundary about 500 feet away from major active faults and

GEOLOGIC AGE			YEARS BEFORE PRESENT (estimated)
Era	Period	Epoch	
CENOZOIC	QUATERNARY	Historic	
		Holocene	200
			11,000
		Pleistocene	
			1,600,000
	TERTIARY	Pliocene	
			5,000,000
		pre-Pliocene	
			66,000,000
pre-CENOZOIC time			
Beginning of geologic time			4,600,000,000

Faults along which movement has occurred during this interval are defined as *active* by Policies and Criteria of the State Mining and Geology Board.

Faults defined as *potentially active* for the purpose of evaluation for possible zonation.

Figure 2. Geologic time scale.



MAP EXPLANATION

Active Faults

1906 C

Faults considered to have been active during Holocene time and to have a relatively high potential for surface rupture; solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by creep or possible creep.

Earthquake Fault Zone Boundaries

These are delineated as straight-line segments that connect encircled turning points so as to define earthquake fault zone segments.

Seaward projection of zone boundary.

Figure 3. Example of Earthquake Fault Zones map and explanation of map symbols.

Table 5. Surface faulting associated with earthquakes in California, 1974-June 1994. List excludes fault creep and faulting triggered by shaking or movement on a different fault[1]. See Bonilla (1970), Jennings (1985), and Grantz and Barlow (1977) for earlier faulting events.

Fault (County where located)	Year of rupture	Magnitude (Richter)of associated earthquake	Surface rupture[2] Maximum displacement (cm)	Total length[3] (km)	Main Sense of displacement[4]	Comments
1. Brawley (Imperial)	1975	4.7[6]	20	10.4	N	Also ruptured in 1940 and 1979; fault creep in part.
2. Galway Lake (San Bernardino)	1975	5.3	1.5	6.8	RL	Fault previously unknown.
3. Cleveland Hill (Butte)	1975	5.7	5	5.7	N	Fault not previously known to be Holocene-active.
4. Stephens Pass (Siskiyou)	1978	4.3	30	2+	N	Fault previously unknown.
5. Homestead Valley (San Bernardino)	1979	5.2	8	3.3	RL	Also minor rupture on Johnson Valley fault.
6. *Calaveras (San Benito, Santa Clara)	1979	5.9	1	39(?)	RL	Minor, discontinuous rupture mostly in creep-active segment.
7. *Imperial *Brawley (Imperial) Rico fault	1979	6.6	55 15 10	30 13 1	RL N N	Creep triggered on San Andreas and Superstition Hills faults; also ruptured in 1940. Rico fault not previously known.
8. Greenville (Alameda)	1980	5.6	3	6.5	RL	Minor left-lateral slip also occurred on Las Positas fault.
9. Hilton Creek-Mammoth Lakes (Mono)	1980	6.0-6.5	30	20	N	Rupture on many minor faults; may relate to volcanic activity.
10. "Lompoc quarry" (Santa Barbara)	1981	2.5	25	0.6	R	Flexural slip on flank of syncline triggered by quarrying; do not plan to zone.
11. Little Lake (Kern)	1982	5.2	0+	10	RL/N	Fracture zones on monoclines.
12. "Coalinga Nose" (Fresno)	1983	6.7	5	.005	R	Secondary fault(?) associated with 43cm of anticlinal uplift; too minor to zone.
13. Nunez (Fresno)	1983	5.2-5.9	60	3.4	R	Aftershocks associated with event (12) above.
14. *Calaveras (Santa Clara)	1984	6.1	20(?)	1.2	RL	Questionable faulting; triggered afterslip in 15-km long creep-zone to south.
15. *Banning (Riverside)	1986	5.8	7	9	RL	Minor slip also triggered locally on Garnet Hill and Desert Hot Springs (?) faults as well as more distant faults.
16. *White Mountains (Mono, Inyo)	1986	6.4	11	13	RL/N	Also extensional cracks on faults in Volcanic Tableland in 40km x 12km area.
17. Elmore Ranch (Imperial)	1987	6.2	12	12	LL	Also lesser left-lateral rupture on nearby faults.
18. *Superstition Hills (Imperial)	1987	6.6	90	28	RL	Much of rupture occurred as afterslip; associated with event 17.
19. San Andreas (Santa Cruz)	1989	7.1	2.5	11	RL	Surface rupture possibly triggered slip; slip also triggered on nearby Calaveras and San Andreas faults outside of aftershock zone. Secondary faulting may have occurred with ridgetop spreading fissures.
20. *Johnson Valley *Homestead Valley (San Bernardino) *Emerson (San Bernardino) *Camp Rock (San Bernardino)	1992	7.3	480-600	85	RL	Most significant fault rupture since 1906; ruptures connected several separate faults; triggered slip also occurred on at least 10 other faults.
21. "Eureka Valley" (Inyo)	1993	6.1	0	1.5+	RL/N	Two zones of left-stepping fractures along pre-existing fault scarps; incompletely mapped; remote area, not zoned.
22. "Stevenson Ranch" (Los Angeles)	1994	6.7	19	0.6	R	Flexural slip faults on limb of fold near Newhall; related to blind thrust faulting. Minor slip also triggered on Mission Wells fault, which ruptured in 1971.

[1] Tectonic (aseismic) fault-creep and triggered slip have occurred along various segments of the San Andreas, Hayward, Calaveras, Concord, Imperial, Superstition Hills, Maacama, Garlock, and more than 10 other faults.
Man-induced fault-creep has been reported on at least 12 other faults due to withdrawal of groundwater or oilfield fluids.
[2] Includes some afterslip. Rupture length measured from distal ends of rupture, which often is discontinuous.
[3] N = normal displacement; R = reverse displacement; RL = right-lateral displacement; LL = left-lateral displacement.
[4] Coseismic surface faulting occurred mostly or entirely within existing Earthquake Fault Zones during eight events.

about 200 to 300 feet away from well-defined, minor faults. Exceptions to this policy exist where faults are locally complex or where faults are not vertical.

Fault Evaluation and Zoning Program

The current Fault Evaluation and Zoning Program was initiated in early 1976 for the purpose of evaluating those "other faults" identified in the Act as "sufficiently active and well-defined" (see definition above) after it was recognized that effective future zoning could not rely solely on the limited fault data of others. Justification of this program is discussed in more detail in Special Publication 47 of the California Division of Mines and Geology (1976; also see Hart, 1978).

The program was originally scheduled over a 10-year period. The state was divided into 10 regions or work areas (Figure 1), with one region scheduled for evaluation each year. However, the work in some regions was extended due to heavy work loads. The fault evaluation work includes limited field mapping and the interpretation of aerial photographs, as well as the use of other geologists' work. A list of faults to be evaluated in a target region was prepared and priorities assigned. The list included potentially active faults not yet zoned, as well as previously zoned faults or fault-segments that warranted zone revisions (change or deletion). Faults also were evaluated in areas outside of scheduled regions, as the need arose (e.g., to map fault rupture immediately after an earthquake). The fault evaluation work was completed in early 1991. The work is summarized for each region in Open-File Reports (OFR) 77-8, 78-10, 79-10, 81-3, 83-10, 84-52, 86-3, 88-1, 89-16, and 91-9 (see Appendix E).

For each fault evaluated, a Fault Evaluation Report (FER) was prepared, summarizing data on the location, recency of activity, and sense and magnitude of displacement. Each FER contains recommendations for or against zoning. These in-house reports are filed at the Division's Bay Area Regional Office at 185 Berry Street, #3600, San Francisco 94107, where they are available for reference. Reference copies of the FERs are filed in the Division's Los Angeles office. An index to FERs prepared 1976 to April 1989 is available as OFR 90-9 (see Appendix E). This list and an index map identify the faults that have been evaluated. Microfiche copies of all FERs prepared through April 1989 are available in five regional sets as Open-File Reports OFR 90-10 to 90-14 (see Appendix E).

Under the AP Act (Sec. 2622), the State Geologist has an on-going responsibility to review "new geologic and seismic data" in order to revise the earthquake fault zones and to delineate new zones "when warranted by new information."

Beginning July 1991 a new five-year plan to evaluate faults was initiated and will be carried out in three phases-each about 20 months long. Efforts will be directed mainly at evaluating or re-evaluating faults in the more populated or developing areas of the state.

As a result of the fault evaluations made since 1976, 279 new and 129 revised Earthquake Fault Zones Maps have been issued and four maps have been withdrawn (Table 3).

The faults zoned are considered to meet the criteria of "sufficiently active and well-defined" (see Definitions above). Many other faults did not appear to meet the criteria and were not zoned. It is important to note that it is sometimes difficult to distinguish between slightly active faults and inactive ones, because the surface features formed as a result of minor, infrequent rupture are easily obliterated by geologic processes (erosion, sedimentation, mass wasting) or the activities of man. Even large scale fault-rupture can be obscured in complex geologic terranes or high-energy environments. Recent fault-rupture also is difficult to detect where it is distributed as numerous breaks or warps in broad zones of deformation. As a consequence of these problems, it is not possible to identify and zone all active faults in California. For the most part, rupture on faults not identified as active is expected to be minor.

Since zones were first established in 1974, there have been 22 earthquakes or earthquake sequences associated with surface faulting in various parts of California (Table 5). This is an average of 1.1 fault-rupture events per year. Most of the recent surface faulting has been relatively minor, either in terms of amount of displacement or length of surface rupture (Table 5). However, 30 cm (one foot) or more displacement occurred during six events in 20 years. Earlier records (incomplete) suggest that displacements of a meter (3 feet) or more occurs at least once every 15 to 20 years in California (Bonilla, 1970; Grantz and Barlow, 1977). Many of the recent coseismic events occurred on faults that were not yet zoned, and a few were on faults not considered to be potentially active or not even mapped. However, coseismic rupture also occurred on faults mostly or entirely within the Earthquake Fault Zones in eight of the 22 rupture events (Table 5). In addition, aseismic fault creep has occurred on many zoned faults in the last 20 years (see footnote, Table 5). Most fault creep is tectonically induced, although some is induced by man (mainly by fluid withdrawal).

In addition to evaluating and zoning faults, program staff also performs other functions necessary to the implementation of the APEFZ Act. Regulations (Section 3603, Appendix B) require that cities and counties file geologic reports for "project" sites in Earthquake Fault Zones with the State Geologist. By the end of 1993, 2,726 site-geologic reports had been filed for public reference (available at the Division's Bay Area Regional Office). Index maps and a directory of these reports have been prepared to make others aware of this resource (see OFRs 84-31, 89-5, and 90-15 in Appendix E). Appendix E is a complete list of publications and products of the Fault Evaluation and Zoning Program.

In order to improve the quality of site investigations and reports, guidelines were prepared in 1975 to assist others in evaluating faults. These guidelines have been slightly revised and appear as Appendix C.

General guidelines for reviewing geologic reports for adequacy, required by Section 3603 of the regulations, are provided in Appendix D.

If a city or county considers that a geologic investigation of a proposed "project" is unnecessary, it may request a waiver from the State Geologist (Section 2623, Appendix A). A waiver form detailing the procedures

waiver requests have been processed by program staff.

Another important activity is to provide information on the APEFZ Act, the Division's Fault Evaluation and Zoning Program, and fault-rupture hazards to both the public and private sectors. Program staff responds to about 3,000 inquiries each year from geologists, planners, building officials, developers, realtors, financial institutions, and others.

Uses and Limitations of Earthquake Fault Zones Maps

The Earthquake Fault Zones are delineated to define those areas within which special geologic site studies are required prior to building structures for human occupancy. Traces of faults are shown on the maps mainly to justify the locations of zone boundaries. These fault traces are plotted as accurately as the sources of data permit; yet the plots are not sufficiently accurate to be used as the basis for building set-back requirements, and they should not be so used.

The fault information shown on the maps is not sufficient to meet the requirement for special geologic studies. Local governmental units must require the developer to have specific sites within the Earthquake Fault Zones evaluated to determine if a potential hazard from any fault, whether heretofore recognized or not, exists with regard to proposed structures and their occupants.

The surface fault-ruptures associated with historic earthquake and creep events are identified where known. However, no degree of relative potential for future surface displacement or degree of hazard is implied for the faults shown. Surface ruptures resulting from the secondary effects of seismic shaking (e.g., landsliding, differential settlement, liquefaction) are omitted from the map and do not serve as a basis for zoning.

Active faults may exist outside the Earthquake Fault Zones on any zone map. Therefore, fault investigations are recommended for all critical and important developments proposed outside the Earthquake Fault Zones.

INDEX TO MAPS OF EARTHQUAKE FAULT ZONES

The following pages (Figures 4A to 4J) indicate the names and locations of the Official Maps of Earthquake Fault Zones delineated by the California Division of Mines and Geology under the Alquist-Priolo Earthquake Fault Zoning Act (Appendix A). These index pages identify all Official Maps of Earthquake Fault Zones released by the State Geologist through 1993. The official maps are compiled on U.S. Geological Survey 7.5-minute topographic quadrangle maps at a scale of 1 inch equals 2,000 feet (Figure 3). Cities and counties affected by these maps are listed in Table 4.

Because Earthquake Fault Zones maps are issued every year or two to delineate revised and additional zones, users of these maps should check with the Division of Mines and Geology for up-to-date information on new and revised Earthquake Fault Zones maps. A change in zones also may affect different local governments. This index to Official Maps of Earthquake Fault Zones (Figures 4A to 4J) will be revised in future years as new maps are issued.

The Earthquake Fault Zones maps are available for purchase as indicated under Availability of Earthquake Fault Zones Maps. Also, they may be consulted at any office of the Division of Mines and Geology and at the planning departments of all cities and counties affected locally by Earthquake Fault Zones (Table 4).

Availability of Earthquake Fault Zones Maps

Reproducible masters, from which copies of local Earthquake Fault Zones maps (scale 1:24,000) can be made, have been provided to each of the cities and counties affected by the zones. Requests for copies of particular Earthquake Fault Zones maps of local areas should be directed to the Planning Director of the appropriate city or county. Refer to the index of Earthquake Fault Zones maps for the quadrangle names of the maps needed.

Arrangements also have been made with BPS Reprographic Services, San Francisco, to provide blue line copies of the Earthquake Fault Zones maps to those who cannot get them conveniently from the cities and counties.

BPS Reprographic Services
149 Second Street
San Francisco, CA 94105
Telephone: (415) 512-6550

Each map must be ordered by quadrangle name as shown on the index map. The cost of the maps is nominal; handling and C.O.D. charges are extra. These maps are not sold by the Division of Mines and Geology.

REFERENCES

(See Appendix E for Complete list of AP Products)

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Reitherman, R., and Leeds, D.J., 1990, A study of the effectiveness of the Alquist-Priolo program: California Division of Mines and Geology Open-File Report 90-18, 131 p.

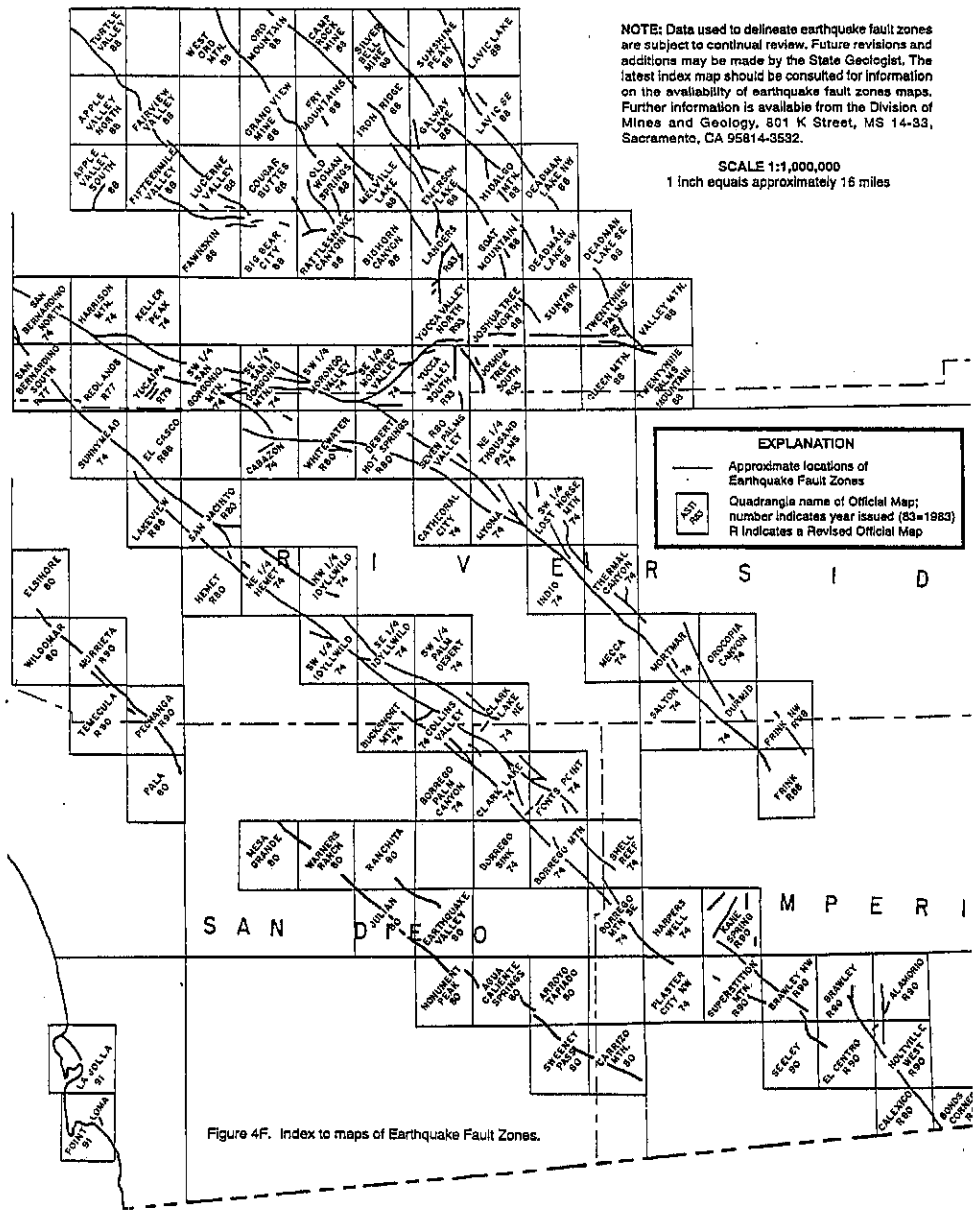

Figure 4F. Index to maps of Earthquake Fault Zones.

APPENDICES

Data are presented herein to provide city and county officials, property owners, developers, geologists, and others with specific information they may need to effectuate the Act.

Because the Act must be implemented at the local government level, it is imperative that the local entities understand its various complex aspects.

Appendix A

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT[1]

Excerpts from California Public Resources Code

DIVISION 2. Geology, Mines and Mining
CHAPTER 7.5 Earthquake Fault Zones[2]

2621. This chapter shall be known and may be cited as the Alquist-Priolo Earthquake Fault Zoning Act.[1]

2621.5. (a) It is the purpose of this chapter to provide for the adoption and administration of zoning laws, ordinances, rules, and regulations by cities and counties in implementation of the general plan that is in effect in any city or county. The Legislature declares that this chapter is intended to provide policies and criteria to assist cities, counties, and state agencies in the exercise of their responsibility to prohibit the location of developments and structures for human occupancy across the trace of active faults. Further, it is the intent of this chapter to provide the citizens of the state with increased safety and to minimize the loss of life during and immediately following earthquakes by facilitating seismic retrofitting to strengthen buildings, including historical buildings, against ground shaking.

(b) This chapter is applicable to any project, as defined in Section 2621.6, which is located within a delineated earthquake fault zone, upon issuance of the official earthquake fault zones maps to affected local jurisdictions, except as provided in Section 2621.7.

(c) The implementation of this chapter shall be pursuant to policies and criteria established and adopted by the Board.[3]

2621.6. (a) As used in this chapter, "project" means either of the following:

(1) Any subdivision of land which is subject to the Subdivision Map Act, (Division 2 (commencing with Section 66410) of Title 7 of the Government Code), and which contemplates the eventual construction of structures for human occupancy.

(2) Structures for human occupancy, with the exception of either of the following:

(A) Single-family wood-frame or steel-frame dwellings to be built on parcels of land for which geologic reports have been approved pursuant to paragraph (1).

(B) A single-family wood-frame or steel-frame dwelling not exceeding two stories when that dwelling is not part of a development of four or more dwellings.

(b) For the purposes of this chapter, a mobilehome whose body width exceeds eight feet shall be considered to be a single-family wood-frame dwelling not exceeding two stories.

2621.7. This chapter, except Section 2621.9, shall not apply to any of the following:

(a) The conversion of an existing apartment complex into a condominium.

(b) Any development or structure in existence prior to May 4, 1975, except for an alteration or addition to a structure that exceeds the value limit specified in subdivision (c).

(c) An alteration or addition to any structure if the value of the alteration or addition does not exceed 50 percent of the value of the structure.

(d) (1) Any structure located within the jurisdiction of the City of Berkeley or the City of Oakland which was damaged by fire between October 20,1991, and October 23, 1991, if granted an exemption pursuant to this subdivision.

(2) The city may apply to the State Geologist for an exemption and the State Geologist shall grant the exemption only if the structure located within the earthquake fault zone is not situated upon a trace of an active fault line, as delineated in an official earthquake fault zone map or in more recent geologic data, as determined by the State Geologist.

(3) When requesting an exemption, the city shall submit to the State Geologist all of the following information:

(A) Maps noting the parcel numbers of proposed building sites that are at least 50 feet from an identified fault and a statement that there is not any more recent information to indicate a geologic hazard.

(B) Identification of any sites within 50 feet of an identified fault.

(C) Proof that the property owner has been notified that the granting of an exemption is not any guarantee that a geologic hazard does not exist.

[1]Known as the Alquist-Priolo Special Studies Zones Act prior to January 1, 1994.
[2]Known as Special Studies Zones prior to January 1, 1994.
[3]State Mining and Geology Board.

(4) The granting of an exemption does not relieve a seller of real property or an agent for the seller of the obligation to disclose to a prospective purchaser that the property is located within a delineated earthquake fault zone, as required by Section 2621.9.

(e) (1) Alterations which include seismic retrofitting, as defined in Section 8894.2 of the Government Code, to any of the following listed types of buildings in existence prior to May 4, 1975:

(A) Unreinforced masonry buildings, as described in subdivision (a) of Section 8875 of the Government Code.

(B) Concrete tilt-up buildings, as described in Section 8893 of the Government Code.

(C) Reinforced concrete moment resisting frame buildings as described in Applied Technology Council Report 21 (FEMA Report 154).

(2) The exemption granted by paragraph (1) shall not apply unless a city or county acts in accordance with all of the following:

(A) The building permit issued by the city or county for the alterations authorizes no greater human occupancy load, regardless of proposed use, than that authorized for the existing use permitted at the time the city or county grants the exemption. This may be accomplished by the city or county making a human occupancy load determination that is based on, and no greater than, the existing authorized use, and including that determination on the building permit application as well as a statement substantially as follows: "Under subparagraph (A) of paragraph (2) of subdivision (e) of Section 2621.7 of the Public Resources Code, the occupancy load is limited to the occupancy load for the last lawful use authorized or existing prior to the issuance of this building permit, as determined by the city or county."

(B) The city or county requires seismic retrofitting, as defined in Section 8894.2 of the Government Code, which is necessary to strengthen the entire structure and provide increased resistance to ground shaking from earthquakes.

(C) Exemptions granted pursuant to paragraph (1) are reported in writing to the State Geologist within 30 days of the building permit issuance date.

(3) Any structure with human occupancy restrictions under subparagraph (A) of paragraph (2) shall not be granted a new building permit that allows an increase in human occupancy unless a geologic report, prepared pursuant to subdivision (d) of Section 3603 of Title 14 of the California Code of Regulations in effect on January 1, 1994, demonstrates that the structure is not on the trace of an active fault, or the requirement of a geologic report has been waived pursuant to Section 2623.

(4) A qualified historical building within an earthquake fault zone that is exempt pursuant to this subdivision may be repaired or seismically retrofitted using the State Historical Building Code, except that, notwithstanding any provision of that building code and its implementing regulations, paragraph (2) shall apply.

2621.8. Notwithstanding Section 818.2 of the Government Code, a city or county which knowingly issues a permit that grants an exemption pursuant to subdivision (e) of Section 2621.7 that does not adhere to the requirements of paragraph (2) of subdivision (e) of Section 2621.7, may be liable for earthquake-related injuries or deaths caused by failure to so adhere.

2621.9. (a) A person who is acting as an agent for a seller of real property which is located within a delineated earthquake fault zone, or the seller if he is acting without an agent, shall disclose to any prospective purchaser the fact that the property is located within a delineated earthquake fault zone, if the maps prepared pursuant to this chapter, or the information contained in the maps, are reasonably available.

(b) For the purposes of this section, in all transactions that are subject to Section 1102 of the Civil Code, disclosure shall be provided by one of the following means:

(1) The real estate transfer disclosure statement set out in Section 1102.6 of the Civil Code.

(2) The local option real estate transfer disclosure statement set out in subdivision (a) of Section 1102.6 of the Civil Code.

(3) The real estate contract and receipt for deposit.

(c) For the purposes of this section:

(1) "Reasonably available" means that for any county that includes areas covered by a delineated earthquake fault zone map, a notice has been posted at the offices of the county recorder, county assessor, and county planning commission that identifies the location of the map and the effective date of the notice, which shall not exceed 10 days beyond the date the county received the map from the State Geologist.

(2) "Real estate contract and receipt for deposit" means the document containing the offer to sell or purchase real property, that when accepted, becomes a binding contract, and that serves as an acknowledgment of a deposit if one is received.

(d) For purposes of the disclosures required by this section, the following persons shall not be deemed agents of the transferor:

(1) Persons specified in Section 1102.11 of the Civil Code.

(2) Persons acting under a power of sale regulated by Section 2924 of the Civil Code.

(e) For purposes of this section, Section 1102.13 of the Civil Code shall apply.

2622. (a) In order to assist cities and counties in their planning, zoning, and building-regulation functions, the State Geologist shall delineate, by December 31, 1973, appropriately wide earthquake fault zones to encompass all

potentially and recently active traces of the San Andreas, Calaveras, Hayward, and San Jacinto Faults, and such other faults, or segments thereof, as the State Geologist determines to be sufficiently active and well-defined as to constitute a potential hazard to structures from surface faulting or fault creep. The earthquake fault zones shall ordinarily be one-quarter mile or less in width, except in circumstances which may require the State Geologist to designate a wider zone.

(b) Pursuant to this section, the State Geologist shall compile maps delineating the earthquake fault zones and shall submit the maps to all affected cities, counties, and state agencies, not later than December 31, 1973, for review and comment. Concerned jurisdictions and agencies shall submit all comments to the State Mining and Geology Board for review and consideration within 90 days. Within 90 days of such review, the State Geologist shall provide copies of the official maps to concerned state agencies and to each city or county having jurisdiction over lands lying within any such zone.

(c) The State Geologist shall continually review new geologic and seismic data and shall revise the earthquake fault zones or delineate additional earthquake fault zones when warranted by new information. The State Geologist shall submit all revised maps and additional maps to all affected cities, counties, and state agencies for their review and comment. Concerned jurisdictions and agencies shall submit all comments to the State Mining and Geology Board for review and consideration within 90 days. Within 90 days of that review, the State Geologist shall provide copies of the revised and additional official maps to concerned state agencies and to each city or county having jurisdiction over lands lying within the earthquake fault zone.

(d) In order to ensure that sellers of real property and their agents are adequately informed, any county that receives an official map pursuant to this section shall post a notice within five days of receipt of the map at the offices of the county recorder, county assessor, and county planning commission, identifying the location of the map and the effective date of the notice.

2623. (a) The approval of a project by a city or county shall be in accordance with policies and criteria established by the State Mining and Geology Board and the findings of the State Geologist. In the development of such policies and criteria, the State Mining and Geology Board shall seek the comment and advice of affected cities, counties, and state agencies. Cities and counties shall require, prior to the approval of a project, a geologic report defining and delineating any hazard of surface fault rupture. If the city or county finds that no undue hazard of that kind exists, the geologic report on the hazard may be waived, with the approval of the State Geologist.

(b) After a report has been approved or a waiver granted, subsequent geologic reports shall not be required, provided that new geologic data warranting further investigations is not recorded.

(c) The preparation of geologic reports that are required pursuant to this section for multiple projects may be undertaken by a geologic hazard abatement district.

2624. Notwithstanding any provision of this chapter, cities and counties may do any of the following:

(1) Establish policies and criteria which are stricter than those established by this chapter.

(2) Impose and collect fees in addition to those required under this chapter.

(3) Determine not to grant exemptions authorized under this chapter.

2625. (a) Each applicant for approval of a project may be charged a reasonable fee by the city or county having jurisdiction over the project.

(b) Such fees shall be set in an amount sufficient to meet, but not to exceed, the costs to the city or county of administering and complying with the provisions of this chapter.

(c) The geologic report required by Section 2623 shall be in sufficient detail to meet the criteria and policies established by the State Mining and Geology Board for individual parcels of land.

2630. In carrying out the provisions of this chapter, the State Geologist and the board shall be advised by the Seismic Safety Commission.

SIGNED INTO LAW DECEMBER 22, 1972; AMENDED SEPTEMBER 16, 1974, MAY 4, 1975, SEPTEMBER 28, 1975
SEPTEMBER 22, 1976, SEPTEMBER 27, 1979, SEPTEMBER 21, 1990, JULY 29, 1991
AUGUST 16, 1992, JULY 25, 1993, AND OCTOBER 7, 1993

Appendix B

POLICIES AND CRITERIA OF THE STATE MINING AND GEOLOGY BOARD

With Reference to the Alquist-Priolo Special Studies Zones Act[1]

(Excerpts from the California Code of Regulations, Title 14, Division 2)

3600. Purpose.

It is the purpose of this subchapter to set forth the policies and criteria of the State Mining and Geology Board, hereinafter referred to as the "Board," governing the exercise of city, county, and state agency responsibilities to prohibit the location of developments and structures for human occupancy across the trace of active faults in accordance with the provisions of Public Resources Code Section 2621 et seq. (Alquist-Priolo Special Studies Zones Act). The policies and criteria set forth herein shall be limited to potential hazards resulting from surface faulting or fault creep within special studies zones delineated on maps officially issued by the State Geologist.

NOTE: Authority cited: Section 2621.5, Public Resources Code. Reference: Sections 2621- 2630, Public Resources Code.

3601. Definitions.

The following definitions as used within the Act and herein shall apply:

(a) An "active fault" is a fault that has had surface displacement within Holocene time (about the last 11,000 years), hence constituting a potential hazard to structures that might be located across it.

(b) A "fault trace" is that line formed by the intersection of a fault and the earth's surface, and is the representation of a fault as depicted on a map, including maps of special studies zones.

(c) A "lead agency" is the city or county with the authority to approve projects.

(d) "Special studies zones" are areas delineated by the State Geologist, pursuant to the Alquist–Priolo Special Studies Zones Act (Public Resources Code Section 2621 et seq.) and this subchapter, which encompass the traces of active faults.

(e) A "structure for human occupancy" is any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year.

(f) "Story" is that portion of a building included between the upper surface of any floor and the upper surface of the floor next above, except that the topmost story shall be that portion of a building included between the upper surface of the topmost floor and the ceiling or roof above. For the purpose of the Act and this subchapter, the number of stories in a building is equal to the number of distinct floor levels, provided that any levels that differ from each other by less than two feet shall be considered as one distinct level.

NOTE: Authority cited: Section 2621.5, Public Resources Code. Reference: Sections 2621 - 2630, Public Resources Code.

3602. Review of Preliminary Maps.

(a) The Board shall provide an opportunity for receipt of public comments and recommendations during the ninety (90) day period provided by Public Resources Code Section 2622, which shall include at least one public meeting scheduled for that purpose.

(b) Following the end of the 90-day review period, the Board shall forward its comments and recommendations, with supporting data received, to the State Geologist for consideration prior to his officially issuing the maps.

NOTE: Authority cited: Section 2621.5, Public Resources Code. Reference: Section 2622, Public Resources Code.

3603. Specific Criteria.

The following specific criteria shall apply within special studies zones and shall be used by affected lead agencies in complying with the provisions of the act:

(a) No structure for human occupancy, identified as a project under Section 2621.6 of the Act, shall be permitted to be placed across the trace of an active fault. Furthermore, as the area within fifty (50) feet of such active faults shall be presumed to be underlain by active branches of that fault unless proven otherwise by an appropriate geologic investigation and report prepared as specified in Section 3603(d) of this subchapter, no such structures shall be permitted in this area.

(b) Affected lead agencies, upon receipt of official special studies zones maps, shall provide for disclosure of delineated special studies zones to the public. Such disclosure may be by reference in general plans, specific plans, property maps, or other appropriate local maps.

(c) No change in use or character of occupancy, which results in the conversion of a building or structure from one not used for human occupancy to one that is so used, shall be permitted unless the building or structure complies with the provisions of the Act.

(d) Application for a development permit for any project within a delineated special studies zone shall be accompanied by a geologic report prepared by a geologist registered in the State of California, which is directed to the problem of potential surface fault displacement through the project site, unless such report is waived pursuant to Section 2623 of the Act. The required report shall be based on a geologic investigation designed to identify the location, recency, and nature of faulting that may have affected the project site in the past and may affect the project site in the future. The report may be combined with other geological or geotechnical reports.

(e) A geologist registered in the State of California, within or retained by each lead agency, shall evaluate the geologic reports required herein and advise the lead agency.

[1] On January 1, 1994, the name of the act was changed to Alquist-Priolo Earthquake Fault Zoning Act and the name of the zones changed to Earthquake Fault Zones. At the time of this printing these name changes had not yet been reflected in the regulations.

(f) One (1) copy of all such geologic reports shall be filed with the State Geologist by the lead agency within thirty (30) days following the report's acceptance. The State Geologist shall place such reports on open file.

NOTE: Authority cited: Section 2621.5, Public Resources Code. Reference: Sections 2621.5, 2622, 2623, and 2625(c), Public Resources Code.

ADOPTED NOVEMBER 23, 1973; REVISED JULY 1, 1974, AND JUNE 26, 1975.
CODIFIED IN CALIFORNIA CODE OF REGULATIONS JANUARY 31, 1979;
REVISED OCTOBER 18, 1984 (EFFECTIVE 30 DAYS THEREAFTER).

Appendix C

GUIDELINES FOR EVALUATING THE HAZARD OF SURFACE FAULT RUPTURE

(These guidelines are not part of the Policies and Criteria of the State Mining and Geology Board. The guidelines are slightly revised and reprinted from DMG Note 49.)

These guidelines are to assist geologists who investigate faults relative to the hazard of primary surface rupture. Subsequent to the passage of the Alquist-Priolo Earthquake Fault Zoning Act (1972), it became apparent that many fault investigations conducted in California were incomplete or otherwise inadequate for the purpose of evaluating the potential of surface fault rupture. It was further apparent that statewide standards for investigating faults would be beneficial.

The investigation of sites for the possible hazard of surface fault rupture is a deceptively difficult geologic task. Many active faults are complex, consisting of multiple breaks. Yet the evidence for identifying active faults traces is generally subtle or obscure and the distinction between recently active and long-inactive faults may be difficult to make. Once a structure is sited astride an active fault, the resulting fault-rupture hazard cannot be mitigated unless the structure is relocated, whereas when a structure is placed on a landslide, the hazard from landsliding often can be mitigated. Further, it is impractical from an economic, engineering, and architectural point of view to design a structure to withstand serious damage under the stress of surface fault rupture. Thus, the evaluation of a site for the hazard of surface fault rupture is a difficult and delicate procedure.

Because of the complexity of evaluating surface and near surface faults and because of the infinite variety of site conditions, no single investigative method will be the best, or even useful, at all sites. Nonetheless, certain investigative methods are more helpful than others in locating faults and evaluating the recency of activity.

The evaluation of a given site with regard to the potential hazard of surface fault rupture is based extensively on the concepts of *recency* and *recurrence* of faulting along existing faults. In a general way, the more recent the faulting the greater the probability for future faulting (Allen, 1975). Stated another way, faults of known historic activity during the last 200 years, as a class, have a greater probability for future activity than faults classified as Holocene age (last 11,000 years) and a much greater probability of future activity than faults classified as Quaternary age (last 1.6 million years). However, it should be kept in mind that certain faults have recurrent activity measured in tens or hundreds of years whereas other faults may be inactive for thousands of years before being reactivated. Other faults may be characterized by creep-type rupture. The magnitude, sense, and nature of fault rupture also vary for different faults or even along different segments of the same fault. Even so, future faulting generally is expected to recur along pre-existing faults (Bonilla, 1970, p. 68). The development of a new fault or reactivation of a long-inactive fault is relatively uncommon and generally need not be a concern in site development.

As a practical matter, fault investigations should be directed at the problem of locating existing faults and then attempting to evaluate the recency of their activity. It is pointed out that data are obtained both from the site and outside the site area. The most direct method of evaluating recency is to observe (in a trench or road cut) the youngest geologic unit faulted and the oldest unit that is not faulted. Recently active faults may also be identified by direct observation of young, fault-related geomorphic (i.e. topographic) features in the field, on aerial photographs, or on remotely obtained images. Other indirect and more interpretive methods are identified in the outline below. Some of these methods are discussed in Slemmons (1977), Bonilla (1982), Wallace (1977), Taylor and Cluff (1973), Sherard and others (1974), Hatheway and Leighton (1979), the National Research Council (1986), the Utah Section of the Association of Engineering Geologists (1987), and Slemmons and dePolo (1992), but no comprehensive manual on the subject of fault investigation and evaluation exists at this time. Many other useful references exist and are listed in the bibliographies of the references cited here.

The following annotated outline provides guidelines for a comprehensive fault investigation that may be applied to any project site, large or small. Fault investigations may be conducted in conjunction with other geological and geotechnical investigations [see DMG Notes 42 and 44]. Although not all investigative techniques need to be or can be employed in evaluating a given site, the outline provides a checklist for preparing complete and well-documented reports. Since most reports on fault investigations are filed with and reviewed by local and state government agencies,

it is necessary that the reports be documented adequately and written carefully to facilitate that review. The importance of the review process is emphasized here, because it is the reviewer who must evaluate the adequacy of reports, interpret or set standards where they are unclear, and advise the governing agency as to their acceptability (Hart and Williams, 1978) (see Appendix D).

The scope of the investigation is dependent not only on complexity and economics of a project, but also on the level of risk acceptable for the proposed structure or development (Joint Committee on Seismic Safety, 1974, p.9). Obviously, a more detailed investigation should be made for hospitals, high-rise buildings, and other critical or sensitive structures than for low-occupancy structures such as wood-frame dwellings that are comparatively safe. The conclusions drawn from any given set of data, however, must be consistent and unbiased. Recommendations must be clearly separated from conclusions, since recommendations are not totally dependent on geologic factors. The final decision as to whether, or how, a given project should be developed lies in the hands of the owner and the governing body that must review and approve the project.

Suggested Outline for Geologic Reports on Faults

The following subjects should be addressed, or at least considered, in any geologic report on faults. Some of the investigative methods listed below should be carried out well beyond the site being investigated. However, it is not expected that all of the methods identified would be used in a single investigation.

I. Text.
   - A. Purpose and scope of investigation.
   - B. Geologic setting.
   - C. Site description and conditions. Include information on geologic units, graded and filled areas, vegetation, existing structures, and other factors that may affect the choice of investigative methods and the interpretation of data.
   - D. Methods of investigation.
     1. Review of published and unpublished literature and records concerning geologic units, faults, groundwater barriers, and other factors.
     2. Stereoscopic interpretation of aerial photographs and other remotely sensed images to detect fault-related topography, vegetation and soil contrasts, and other lineaments of possible fault origin.
     3. Surface observations, including mapping of geologic and soil units, geologic structures, geomorphic features, springs, deformation of manmade structures due to fault creep, both on and beyond the site.
     4. Subsurface investigations.
        - a. Trenching and other excavations to permit detailed and direct observation of continuously exposed geologic units, soils and structures; must be of adequate depth and be carefully logged (see Taylor and Cluff, 1973).
        - b. Borings and test pits to permit collection of data on geologic units and ground water at specific locations. Data points must be sufficient in number and spaced adequately to permit valid correlations and interpretations.
     5. Geophysical investigations. These are indirect methods that require a knowledge of specific geologic conditions for reliable interpretations. They should seldom, if ever, be employed alone without knowledge of the geology (Chase and Chapman, 1976). Geophysical methods alone never prove the absence of a fault nor do they identify the recency of activity. The types of equipment and techniques used should be described.
        - a. Seismic reflection.
        - b. Seismic refraction.
        - c. Ground-penetrating radar
        - d. Other (e.g., magnetic intensity, electrical resistivity, gravity).
     6. Other methods should be included when special conditions permit, or requirements for critical structures demand, a more intensive investigation.
        - a. Aerial reconnaissance overflights.
        - b. Geodetic and strain measurements, microseismicity monitoring, or other monitoring techniques.
        - c. Radiometric analysis (14C, K-Ar), stratigraphic correlation (fossils, mineralogy), soil profile development, paleomagnetism (magnetostratigraphy), or other age-dating techniques to identify the age of faulted or unfaulted units or surfaces.
   - E. Conclusions.
     1. Location and existence (or absence) of hazardous faults on or adjacent to the site.
     2. Type of faults and nature of anticipated offset, including sense and magnitude of displacement, if possible.
     3. Probability of or relative potential for future surface displacement. The likelihood of future ground rupture seldom can be stated mathematically, but may be stated in semiquantitative terms such as low, moderate, or high, or in terms of slip rates determined for specific fault segments.
     4. Degree of confidence in and limitations of data and conclusions.
   - F. Recommendations.
     1. Setback distances from hazardous faults, if appropriate. State and local law may dictate minimum standards (see Appendix B).
     2. Need for additional studies.
     3. Risk evaluation relative to the proposed development–opinions are acceptable. But remember that the ultimate decision as to whether the risk is acceptable lies with the governing body.

II. References.
   - A. Literature and records cited or reviewed; citations should be complete.
   - B. Aerial photographs or images interpreted–list type, date, scale, source, and index numbers.

C. Other sources of information, including well records, personal communications, and other data sources.

III. Illustrations–these are essential to the understanding of the report and to reduce the length of text.

A. Location map–identify site locality, significant faults, geographic features, regional geology,seismic epicenters, and other pertinent data; 1:24,000 scale is recommended.

B. Site development map–show site boundaries, existing and proposed structures, graded areas, streets, exploratory trenches, borings, geophysical traverses, and other data; recommended scale is 1 inch equals 200 feet, or larger.

C. Geologic map–shows distribution of geologic units (if more than one), faults and other structures, geomorphic features, aerial photo lineaments, and springs; on topographic map 1:24,000 scale or larger; can be combined with III (A) or III (B).

D. Geologic cross-sections, if needed to provide 3-dimensional picture.

E. Logs of exloratory trenches, and borings–show details of observed features and conditions; should not be generalized or diagrammatic. Trench logs should show topographic profile and geologic structure at a 1:1 horizontal to vertical scale.

F. Geophysical data and geologic interpretations.

IV. Appendix: Supporting data not included above (e.g., water well data).

V. Authentication: Signature and registration number of investigating geologist.

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Appendix D

GENERAL GUIDELINES FOR REVIEWING GEOLOGIC REPORTS

(Note: These general guidelines are slightly modified from an article titled "Geologic Review Process" by Hart and Williams (1978) and published in California Geology.)

The purpose of this article is to provide general guidance for those geologists who review geologic reports of consultants on behalf of agencies having approval authority over specific developments.

The geologic review is a critical part of the evaluation process of a proposed development. It is the responsibility of the reviewer to assure that each geologic investigation, and the resulting report, adequately addresses the geologic conditions that exist at a given site. In addition to geologic reports for tentative tracts and site development, a reviewer evaluates Environmental Impact Reports, Seismic Safety and Public Safety Elements of General Plans, as-graded geologic reports, and final, as-built geologic maps and reports. In a sense, the geologic reviewer enforces existing laws and regulations to assure that significant geologic factors (hazards, mineral and water resources, geologic processes) are properly considered, and potential problems are mitigated prior to project development. Generally, the reviewer acts on behalf of a governing agency–city, county, regional, state, federal–not only to protect the government's interest but also to protect the interest of the community at large. Examples of the review process in a state agency are described by Stewart and others (1976). Review at the local level has been discussed by Leighton (1975), Berkland (1992), Larson (1992), and others. Grading codes, inspections, and the review process are discussed in detail by Scullin (1983). Nelson and Christenson (1992) specifically discuss review guidelines for reports on surface faulting.

The need to review geologic reports is emphasized by the fact that geologic hazards and factors are extremely difficult and complex to evaluate. No individual can be totally competent to employ all of the techniques and tools available to the geologic profession. An experienced reviewer, familiar with local geologic conditions, often can identify deficiencies of an investigation merely by closely examining a report. It is important to note that most consultants see themselves, to varying degrees, as proponents for their clients (that is, the developers). By providing a different perspective, the reviewer is able to assist the investigator and to protect the interests of the agency and the public.

THE REVIEWER

Qualifications

In order to make appropriate evaluations of geologic reports, the reviewer must be an experienced geologist familiar with the investigative methods employed and the techniques available to the profession. Even so, the reviewer must know his or her limitations, and at times ask for the opinions of others more qualified in specialty fields (for example, geophysics, mineral exploitation and economics, ground water, foundation and seismic engineering, seismology). In California, the reviewer must be licensed by the State Board of Registration for Geologists and Geophysicists in order to practice. The Board also certifies engineering geologists (Wolfe, 1975). Local and regional agencies may have additional requirements.

The reviewer must have the courage of his or her convictions and should not approve reports if an inadequate investigation has been conducted. Like any review process, there is a certain "give-and-take" involved between the reviewer and investigator. If there is clear evidence of incompetence or misrepresentation in a report, this fact should be reported to the reviewing agency or licensing board. Clearly, the reviewer needs to have the support of his or her agency in order to carry out these duties.

The reviewer should bear in mind that some geologic investigators are not accomplished writers, and almost all are working with restricted budgets. Thus, while a reviewer should demand that certain standards be met, he or she should avoid running rough-shod over the investigator. The mark of a good reviewer is the ability to sort out the important from the insignificant and to make constructive comments and recommendations.

A reviewer may be employed full time by the reviewing agency or part-time as a consultant. Also, some reviewing agencies (such as a city) contract with another agency (such as a county) to perform a geologic review on a contract basis. The best reviews generally are performed by experienced reviewers. Thus, the use of multiple, part-time reviewers by a given agency tends to prevent development of high-quality and efficient reviews. One of the reasons for this is that different reviewers have different standards, which results in inconsistent treatment of development projects. The primary purpose of the review procedure should always be kept in mind–namely, to assure the adequacy of geologic investigations.

Other Review Functions

Aside from his or her duties as a reviewer, the reviewing geologist also must interpret the geologic data reported to other agency personnel who regulate development (for example, planners, engineers, inspectors). Also, the reviewing geologist sometimes is called upon to make investigations for his or her own agency. This is common where a city or county employs only one geologist. In fact, some reviewers routinely divide their activities between reviewing the reports of others and performing one or several other tasks for the employing agency (such as advising other agency staff and boards on geologic matters; making public presentations) (see Leighton, 1975).

Conflict of Interest

In cases where a reviewing geologist also must perform geological investigations, he or she should never be placed in the position of reviewing his or her own report, for that is no

review at all. A different type of conflict commonly exists in a jurisdiction where the geologic review is performed by a consulting geologist who also is practicing commercially (performing geological investigations) within the same jurisdictional area. Such situations should be avoided, if at all possible.

GEOLOGIC REVIEW

The Report

The critical item in evaluating specific site investigations for adequacy is the resulting geologic report. A report that is incomplete or poorly written cannot be evaluated and should not be approved. As an expediency, some reviewers do accept inadequate or incomplete reports because of their personal knowledge of the site. However, unless good reasons can be provided in writing, it is recommended that a report not be accepted until it presents the pertinent facts correctly and completely.

The conclusions presented in the report regarding the geologic hazards or problems must be separate from and supported by the investigative data. An indication regarding the level of confidence in the conclusions should be provided. Recommendations based on the conclusions should be made to mitigate those geology-related problems which would have an impact on the proposed development. Recommendations also should be made concerning the need for additional geologic investigations.

Report Guidelines and Standards

An investigating geologist may save a great deal of time (and the client's money), and possibly misunderstandings, if he or she contacts the reviewing geologist at the initiation of the investigation. The reviewer should not only be familiar with the local geology and sources of information, he or she also should be able to provide specific guidelines for investigative reports and procedures to be followed. Guidelines and check-lists for geologic or geotechnical reports have been prepared by a number of reviewing agencies and are available to assist the reviewer in his or her evaluation of reports (for example, CDMG Notes 42, 44, 46, 48, and 49). A reviewer also may wish to prepare his or her own guidelines or check-lists for specific types of reviews.

If a reviewer has questions about an investigation, these questions must be communicated in writing to the investigator for response. After the reviewer is satisfied that the investigation and resulting conclusions are adequate, this should be clearly indicated in writing to the reviewing agency so that the proposed development application may be processed promptly.

The biggest problem the reviewer faces is the identification of standards. These questions must be asked: "Are the methods of investigation appropriate for a given site?" and "Was the investigation conducted according to the existing state-of-the-art standards?". Answers to these questions lie in the report being reviewed. For example, a reported landslide should be portrayed on a geologic map of the site. The conclusion that a hazard is absent, where previously reported or suspected, should be documented by stating which investigative steps were taken and precisely what was seen. The reviewer must evaluate each investigative step according to existing standards. Often the reviewer is forced to clarify the standards, or even introduce new ones, for a specific purpose.

Depth (Intensity) of Review

The depth of the review is determined primarily by the need to assure that an investigation and resulting conclusions are adequate, but too often the depth of review is controlled by the time and funds available. A report on a subdivision may be simply evaluated against a check-list to make certain it is complete and well-documented. Additionally, the reviewer may wish to check cited references or other sources of data, such as aerial photos and unpublished records.

Reviewers also may inspect the development site and examine excavations and borehole samples. Ideally, a field visit may not be necessary if the report is complete and well-documented. However, field inspections are of value, and often are necessary, to determine if field data are reported accurately and completely. Also, if the reviewer is not familiar with the general site conditions, a brief field visit provides perspective and a visual check on the reported conditions. Whether or not on-site reviews are made, it is important to note that the geologic review process is not intended to replace routine grading inspections that may be required by the reviewing agency to assure performance according to an approved development plan.

Appeals

In cases where the reviewer is not able to approve a geologic report, or can accept it only on a conditional basis, the developer may wish to appeal the review decision or recommendations. However, every effort should be made to resolve problems informally prior to making a formal appeal. An appeal may be handled through existing legal procedures (such as a hearing by a County Board of Supervisors, or a City Council) or by a specially appointed Review and Appeals Board. Adequate notice should be given to allow time for both sides to prepare their cases. After an appropriate hearing, the appeals decision must be made promptly and in writing as part of the permanent record.

Another way to remedy conflicts between the investigator and the reviewer is by means of a third party review. Such a review can take different paths ranging from the review of existing reports to in-depth field investigations. Third party reviews are usually done by consultants not normally associated with the reviewing/permitting agency.

REFERENCES

DMG Notes of California Division of Mines and Geology:

Note 42 -- Guidelines to geologic/seismic reports

Note 44 -- Guidelines for preparing engineering geologic reports

Note 46 -- Guidelines for geologic/seismic considerations in environmental impact reports

Note 48 -- Checklists for the review of geologic/seismic reports

Note 49 -- Guidelines for evaluating the hazard of surface fault rupture

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Leighton, F.B., 1975, Role of geotechnical consultants and reviewers for the County of San Mateo: California Geology, v.28, p. 178-181.

Nelson, C.V., and Christenson, G.E., 1992, Establishing guidelines for surface fault rupture hazard investigations--Salt Lake County, Utah: in Stout, M.L., editor, Association of Engineering Geologists Proceedings, 35th Annual Meeting, p. 242-249.

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Stewart, R.M., Hart, E.W., and Amimoto, P.Y., 1976, The review process and the adequacy of geologic reports: Bulletin of the International Association of Engineering Geology, no. 14, p. 83-88. (Reprinted in California Geology, October 1977, p. 224-229.)

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Appendix E

PRODUCTS OF THE FAULT EVALUATION AND ZONING PROGRAM

(Modified from California Geology, March 1991)

Since the passage of the AP Act, staff of the Fault Evaluation and Zoning Program have published numerous reports on the Act and the surface fault rupture hazard. These, as well as unpublished files of geologic information, are listed below. A notation next to each entry is the publication number: CG-- California Geology, N-- DMG Note, SP-- Special Publication, SR-- Special Report, o.p. -- report is out of print, * an outside publication not available from DMG. Numbers alone (e.g., 89-16) are Open File Report numbers. The publications are listed chronologically by groups below.

AVAILABILITY

Reports listed here are available for reference at offices of the Division of Mines and Geology in Sacramento, San Francisco, and Los Angeles. Some reports are also available for reference at county and university libraries. Copies of available DMG reports may be purchased by mail order or over-the-counter from any office (see exceptions below):

OFFICES OF THE DIVISION OF MINES AND GEOLOGY:

GEOLOGIC INFORMATION AND PUBLICATIONS
801 K Street
MS 14-33
Sacramento, CA 95814-3532
(916) 445-5716

BAY AREA REGIONAL OFFICE
185 Berry Street, #3600
San Francisco, CA 94107
(415) 904-7707

SOUTHERN CALIFORNIA REGIONAL OFFICE
107 South Broadway, Room 1065
Los Angeles, CA 90012-4402
(213) 620-3560

IMPLEMENTATION OF THE ALQUIST-PRIOLO ACT

Official Maps of Special Studies Zones, by California Division of Mines and Geology, 1974-1993. As of January 1, 1994, 535 new and revised Official APSSZ maps have been issued. Special Publication 42 provides an index to these maps and describes how they can be purchased.

SP 42 **Fault-rupture hazard zones in California,** by E.W. Hart, 1994, 34 p. Includes an index map which identifies all 7.5-minute topographic maps in which AP Earthquake Fault Zones are located.(Revised periodically.)

CG **Zoning for surface fault hazards in California--The New Special Studies Zones maps,** by E.W. Hart, 1974: v. 27, n. 10, p. 227-230.

N 49 **Geologic guidelines for evaluating the hazard of surface fault rupture,** by E.W. Hart, 1975 (also Appendix C in SP 42.)

SP 47 o.p. **Active fault mapping and evaluation program--10-year program to implement Alquist-Priolo Special Studies Zones Act, 1976.**

CG **The review process and the adequacy of geologic reports,** by R.M. Stewart, E.W. Hart, and P.Y. Amimoto, 1976: Bulletin of the International Association of Engineering Geology, no.14, p. 83-88. (Reprinted in California Geology, v. 30, n. 10, p. 224-229).

CG **Geologic review process,** by E.W. Hart and J.W. Williams, 1978: v. 31, n. 10, p. 235-236.

* **Zoning for the hazard of surface fault rupture in California,** by E.W. Hart, 1978, in **Proceedings of the Second International Conference on Microzonation,** San Francisco, Nov. 26 - Dec. 1, 1978: NSF Special Publication, p. 635-645.

CG **Fault Evaluation and Zoning Program,** by E.W. Hart, 1980: v. 33, n. 7, p. 147-152.

* **Zoning for surface-faulting in California,** by E.W. Hart, 1986, in **Proceedings of Conference XXXII–Workshop on Future directions in evaluating earthquake hazards in southern California,** Nov. 12-13, 1985: U.S. Geological Survey Open-File Report 86-401, p. 74-83.

90-18 **A study of the effectiveness of the Alquist-Priolo Program,** by R. Reitherman and D.J. Leeds, 1990.

POST-EARTHQUAKE INVESTIGATIONS

CG **Ground rupture associated with faulting - Oroville earthquake, August 1975,** by E.W. Hart, 1975: v. 28, p. 274-276.

SR 124 **Ground rupture along the Cleveland Hill fault,** by E.W. Hart and J.S. Rapp, 1975, in R.W. Sherburne and C.J. Hauge, editors, **Oroville, California, Earthquake 1 August 1975,** p. 61-72.

* **Geologic setting, historical seismicity and surface effects of the Imperial Valley earthquake, October 15, 1979, Imperial County, California,** by E. Leivas, E.W. Hart, R.D. McJunkin, and C.R. Real, 1980, in **Imperial County, California, Earthquake, October 15, 1979 :** EERI Reconnaissance Report, February 1980, p. 5-19.

81-5 **Preliminary map of October 1979 fault rupture, Imperial and Brawley faults, Imperial County, California,** by E.W. Hart, 1981.

80-12 o.p. **Preliminary map of surface rupture associated with the Mammoth Lakes earthquakes,** May 25 and 27, 1980, by W.A. Bryant, G.C. Taylor, E.W. Hart, and J.E. Kahle, 1980.

SR 150 **Surface rupture associated with the Mammoth Lakes earthquakes of 25 and 27 May, 1980,** by G.C. Taylor and W.A. Bryant, 1980, in R.W. Sherburne, editor, **Mammoth Lakes, California earthquakes of May 1980,** p. 49-67.

SR 150 **Rockfalls generated by the Mammoth Lakes earthquakes of May 25 and 27, 1980,** by W.A. Bryant, 1980, in R.W. Sherburne, editor, **Mammoth Lakes, California earthquakes of May 1980,** p. 69-73.

SR 150 **Planned zoning of active faults associated with the Mammoth Lakes earthquakes of May 1980,** by E.W. Hart, 1980, in R.W. Sherburne, editor, **Mammoth Lakes, California earthquakes of May 1980,** p. 137-141.

CG **Ground rupture, Coalinga earthquake of 10 June 1983,** by R.D. McJunkin and E.W. Hart, 1983: v. 36, n. 8, p. 182-184.

SP 66 **Surface faulting northwest of Coalinga, California, June and July 1983,** by E.W. Hart and R.D. McJunkin, 1983, in J.H. Bennett and R.W. Sherburne, editors, **The 1983 Coalinga, California earthquakes,** p. 201-219.

SP 68 **Evidence for surface faulting associated with the Morgan Hill earthquake of April 24, 1984,** by E.W. Hart, 1984, in J.H. Bennett and R.W. Sherburne, editors, 1984, **The 1984 Morgan Hill, California earthquake,** p. 161-173.

CG **Fault rupture associated with the July 21, 1986 Chalfant Valley Earthquake, Mono and Inyo Counties, California,** by J.E. Kahle, W.A. Bryant, and E.W. Hart, 1986: v. 39, n. 11, p. 243-245.

CG **Magnitude 5.9 North Palm Springs earthquake, July 8, 1986, Riverside County, California: Lifeline damage,** by Glenn Borchardt and M.W. Manson, 1986: v. 39, n. 11, p. 248-252.

CG **Preliminary report: Surface rupture, Superstition Hills earthquakes of November 23 and 24, 1987,** by J.E. Kahle, C.J. Wills, E.W. Hart, J.A. Treiman, R.B. Greenwood, and R.S. Kaumeyer, 1988: v. 41, n. 4, p. 75-84.

CG **Liquefaction at Soda Lake: Effects of the Chittenden earthquake swarm of April 18, 1990, Santa Cruz County, California,** by C.J. Wills and M.W. Manson, 1990: v. 43, n. 10, p. 225-232.

* **Surface fissures and the mapping of CDMG Special Studies Zones,** by E.W. Hart, 1990, in George Reid, editor, **What we have learned from the October 17, 1989 7.1M Loma Prieta earthquake:** 16th Annual Saber Society Symposium Proceedings Volume, p. 87-99.

SP 104 **The search for fault rupture and the significance of ridge-top fissures, Santa Cruz Mountains, California,** by E.W. Hart, W.A. Bryant, C.J. Wills, and J.A. Treiman, 1990, in S.R. McNutt and R.H. Sydnor, editors, **The Loma Prieta Earthquake of October 17, 1989,** p. 83-94.

CG **The Mono Lake earthquake of October 23, 1990,** by S.R. McNutt, W.A. Bryant, and R. Wilson, 1991: v. 44, n. 2, p. 27-32.

* **Eureka Peak and Burnt Mountain faults, two "new" faults in Yucca Valley, San Bernardino County, California,** by J.A. Treiman, in **Landers earthquake of June 28, 1992, San Bernardino County, California, Field Trip Guidebook: Southern California Section of Association of Engineering Geology,** 1992, p. 19-22.

CG **Surface faulting associated with the June 1992 Landers earthquake, California,** by E.W. Hart, W.A. Bryant, and J.A. Treiman, 1993, v. 46, p. 10-16.

STUDIES OF INDIVIDUAL FAULTS

FERs **Fault Evaluation Reports,** by Fault Evaluation and Zoning Project Staff, 1976-1991, copies of the unpublished FERs are available for reference in the Bay Area and Southern California regional offices of DMG. An index to FERs and copies of FERs on microfiche are now available as Open File Reports 90-9 to 90-14 (see below).

81-6 **Evidence of Holocene movement of the San Andreas fault zone, northern San Mateo County, California,** by T.C. Smith, 1981.

81-7 **Sargent, San Andreas and Calaveras fault zones: evidence for recency in the Watsonville East, Chittenden and San Felipe quadrangles, California,** by W.A. Bryant, D.P. Smith, and E.W. Hart, 1981.

81-8 **Recently active strands of the Greenville fault, Alameda, Contra Costa and Santa Clara Counties, California,** by E.W. Hart, 1981.

81-9 **Evidence for recent faulting, Calaveras and Pleasanton faults, Diablo and Dublin quadrangles, California,** by E.W. Hart, 1981.

SP 62 **Southern Hayward fault zone, Alameda and Santa Clara Counties, California,** by W.A. Bryant, 1982, in **Proceedings–Conference on earthquake hazards of the Eastern San Francisco Bay area,** p. 35-44.

* **Self- guided field trip No. 4–Fault creep along the Hayward fault** in the Richmond - San Pablo area, by T.C. Smith, 1982, in Conference on Earthquake Hazards of the [Eastern] San Francisco Bay Area, Field Trip Guidebook: California State University, Hayward.

84-54 **Evidence of recent faulting along the Owens Valley, Round Valley, and White Mountains fault zones, Inyo and Mono Counties, California,** by W.A. Bryant, 1984.

84-55 **Evidence of recent faulting along the Mono Lake fault zone, Mono County, California,** by W.A. Bryant, 1984.

84-56 **Evidence of recent faulting along the Antelope Valley fault zone, Mono County, California,** by W.A. Bryant, 1984.

88-14 **Recently active traces of the Newport-Inglewood fault zone, Los Angeles and Orange Counties, California,** by W.A. Bryant, 1988.

CG **A neotectonic tour of the Death Valley fault zone,** by C.J. Wills, 1989: v. 42, no. 9, p. 195-200.

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90-9 **Index to fault evaluation reports prepared 1976-1989 under the Alquist-Priolo Special Studies Zones Act,** by C.J. Wills, P. Wong, and E.W. Hart, 1990.

90-10 **Microfiche copies of Fault Evaluation Reports for northern California,** by Division of Mines and Geology Staff.

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90-12 **Microfiche copies of Fault Evaluation Reports for the Transverse Ranges,** by Division of Mines and Geology Staff.

90-13 **Microfiche copies of Fault Evaluation Reports for the Peninsular Ranges,** by Division of Mines and Geology Staff.

90-14 **Microfiche copies of Fault Evaluation Reports for eastern California,** by Division of Mines and Geology Staff.

CG **Active faults north of Lassen Volcanic National Park,** by C.J. Wills, 1991, v.44, p.51-58.

SP113 **Progress in understanding the Concord fault through site specific studies,** by C.J. Wills and E.W. Hart in **Proceedings–Conference on Earthquake Hazards in the Eastern San Francisco Bay Area, 1992,** p. 311-317.

SP 113 **The elusive Antioch fault,** by C.J. Wills, in **Proceedings–Conference on Earthquake Hazards in the Eastern San Francisco Bay Area, 1992,** p. 325-331.

SP 113 **Pseudo-mole tracks from clay beds east of Healdsburg,** by M.D. Malone, G. Borchardt, E.W. Hart, and S.R. Korbay in **Proceedings–Conference on Earthquake Hazards in the Eastern San Francisco Bay Area, 1992,** p. 419-425.

92-7 **Recently active traces of the Rodgers Creek fault, Sonoma County, California,** by E.W. Hart, 1992, 14 p.

93-2 **The Rose Canyon fault zone, southern California,** by J.A. Treiman, 1993, 45 p.

* **Holocene slip rate and earthquake recurrence on the Honey Lake fault zone, northeastern California,** by C.J. Wills and G. Borchardt, 1993, Geology, v. 21, p. 853-856

REGIONAL SUMMARY REPORTS

77-8 **Summary report–Fault Evaluation Program, 1976 area (western Transverse Ranges),** by E.W. Hart, E.J. Bortugno, and T.C. Smith, 1977.

78-10 **Summary report–Fault Evaluation Program, 1977 area (Los Angeles Basin region),** by E.W. Hart, D.P. Smith, and T.C. Smith, 1978.

79-10 **Summary report–Fault Evaluation Program, 1978 area (Peninsular Ranges-Salton Trough region)**, by E.W. Hart, D.P. Smith, and R.B. Saul, 1979.

81-3 **Summary report–Fault Evaluation Program, 1979-1980 area (southern San Francisco Bay region)**, by E.W. Hart, W.A. Bryant, and T.C. Smith, 1981.

SP 62 **California's Fault Evaluation Program–southern San Francisco Bay region**, by E.W. Hart, T.C. Smith, and W.A. Bryant, 1982, in **Proceedings–Conference on earthquake hazards of the eastern San Francisco Bay area**, p. 395-404.

83-10 **Summary report–Fault Evaluation Program, 1981-1982 area (northern Coast Ranges region)**, by E.W. Hart, W.A. Bryant, and T.C. Smith, 1983.

84-52 **Summary report: Fault Evaluation Program, 1983 area (Sierra Nevada region)**, by E.W. Hart, W.A. Bryant, and T.C. Smith, 1984.

86-3 **Summary report: Fault evaluation program, 1984-1985, southern Coast Ranges region and other areas**, by E.W. Hart, W.A. Bryant, M.W. Manson, and J.E. Kahle, 1986.

88-1 **Summary report: Fault evaluation program, 1986-1987, Mojave Desert region and other areas**, by E.W. Hart, W.A. Bryant, J.E. Kahle, M.W. Manson, and E.J. Bortugno, 1987.

89-16 **Summary report: Faults evaluated 1987-1988 in the southwestern Basin and Range and supplemental areas**, by E.W. Hart, W.A. Bryant, C.J. Wills, J.A. Treiman, and J.E. Kahle, 1989.

91-9 **Summary report: Fault Evaluation Program, 1989-1990, northeastern California and supplemental areas**, by E.W. Hart, W.A. Bryant, J.A. Treiman, C.J. Wills, and R.H. Sydnor, 1991.

CONSULTANTS REPORTS

A-P File, reports by consulting geologists, 1974-1993: reports for sites within Special Studies Zones submitted to the Division of Mines and Geology in compliance with the APSSZ Act. Over 2700 reports on file.

C File, reports by consulting geologists that predate the Special Studies Zones, are outside the Zones, or are for developments that are exempt under the APSSZ act. About 800 reports on file.

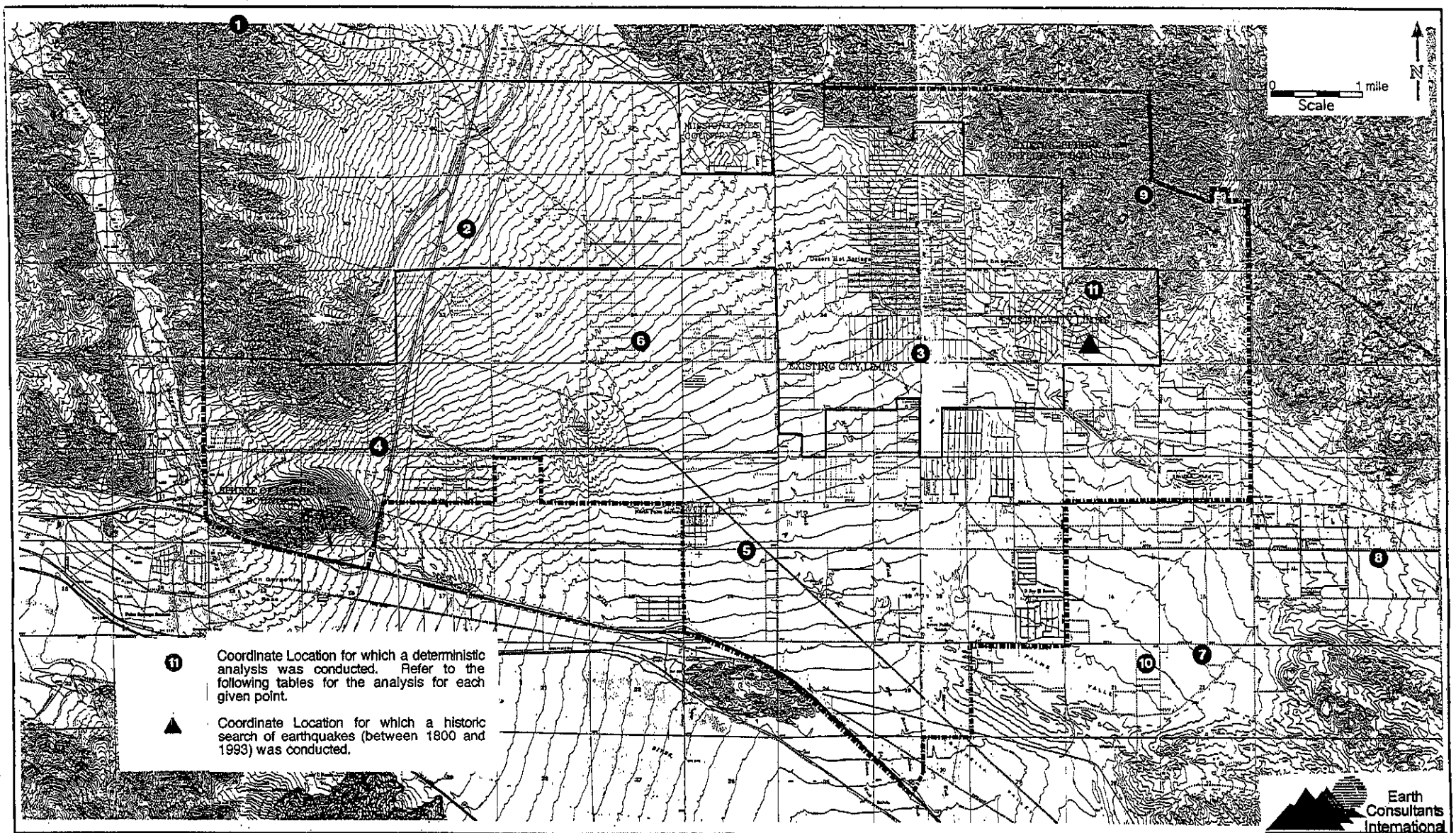
77-6 o.p. **Index to geologic reports for sites within Special Studies Zones**, by W.Y.C. Lo and J.G. Moreno, 1977 (superseded by OFR 84-31).

84-31 **Index to geologic reports for sites within Special Studies Zones**, by P. Wong, 1984. (Index map to the AP File reports).

89-5 **Index to geologic reports for development sites within Special Studies Zones in California, July 1, 1984 to December 31, 1988**, by P. Wong, 1989. (Update for OFR 84-31).

90-15 **Directory of fault investigation reports for development sites within Special Studies Zones in California**, 1974-1988, by P. Wong, E.W. Hart, and C.J. Wills, 1990. (Listing of all AP File reports through December 1988).

APPENDIX C
SEISMIC PARAMETERS FOR THE DESERT HOT SPRINGS AREA



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CITY OF DESERT HOT SPRINGS GENERAL PLAN

City Limits:
Sphere of Influence:
Date: 2/18/97
Base Maps: Desert Hot Springs, and Seven Palms Valley USGS 7.5' Quad Maps

Figure C-1

Deterministic Seismic Analysis Locations

E Q F A U L T Ver. 2.20
JOB NUMBER: 978102-001 JOB NAME: Desert Hot Springs SE
SITE COORDINATES: LATITUDE: 34N LONGITUDE: 116.52W SEARCH RADIUS: 62 mi
ATTENUATION RELATION: 21 Campbell & Bozorgnia (1994) Horiz.-SoftRock

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT: MAX. CRED. MAG.	MAX. CREDIBLE EVENT: PEAK SITE ACC. g	MAX. CREDIBLE EVENT: SITE INTENS MM	MAX. PROBABLE EVENT: MAX. PROB. MAG.	MAX. PROBABLE EVENT: PEAK SITE ACC. g	MAX. PROBABLE EVENT: SITE INTENS MM
BLUE CUT	22 (35)	7.00	0.113	VII	6.00	0.049	VI
BORREGO MTN. (San Jacinto)	60 (97)	6.50	0.017	IV	6.20	0.013	III
CALICO - NEWBERRY	34 (55)	7.20	0.072	VII	5.70	0.019	IV
CAMP ROCK-EMER.-COPPER MTN	27 (43)	7.00	0.087	VII	5.80	0.031	V
CASA LOMA-CLARK (S.Jacin.)	24 (39)	7.00	0.099	VII	7.00	0.099	VII
CHINO	54 (87)	7.00	0.030	V	5.40	0.008	III
COYOTE CREEK (San Jacinto)	37 (60)	7.00	0.054	VI	6.10	0.024	V
CUCAMONGA	48 (78)	6.90	0.033	V	6.10	0.018	IV
ELSINORE	46 (74)	7.50	0.061	VI	6.60	0.028	V
GLN.HELEN-LYTLE CR-CLREMNT	23 (37)	7.00	0.106	VII	6.70	0.083	VII
HELENDALE	19 (30)	7.30	0.172	VIII	5.50	0.039	V
HOMESTEAD VALLEY	23 (37)	7.50	0.153	VIII	4.80	0.015	IV
HOT S-BUCK RDG.(S.Jacinto)	20 (32)	7.00	0.125	VII	6.10	0.060	VI
JOHNSON VALLEY	16 (26)	7.50	0.234	IX	5.20	0.037	V
LENWOOD-OLD WOMAN SPRINGS	22 (35)	7.30	0.144	VIII	5.50	0.031	V
LUDLOW	52 (83)	7.00	0.034	V	5.70	0.011	III
NORTH FRONTAL FAULT ZONE	23 (37)	7.70	0.177	VIII	6.00	0.045	VI
PINTO MOUNTAIN - MORONGO	2 (3)	7.30	0.595	X	5.80	0.383	X
PISGAH - BULLION	37 (59)	7.00	0.055	VI	6.00	0.023	IV
SAN ANDREAS (Coachella V.)	3 (4)	8.00	0.611	X	6.80	0.531	X
SAN ANDREAS (Mojave)	53 (85)	8.00	0.077	VII	7.40	0.046	VI
SAN ANDREAS (S. Bern.Mtn.)	1 (2)	8.00	0.664	XI	6.70	0.597	X
SAN GORGONIO - BANNING	4 (7)	7.50	0.630	X	6.60	0.557	X
SAN JOSE	60 (97)	6.70	0.021	IV	5.00	0.004	I
SIERRA MADRE-SAN FERNANDO	60 (97)	7.30	0.032	V	6.30	0.015	IV

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT: MAX. CRED. MAG.	MAX. CREDIBLE EVENT: PEAK SITE ACC. g	MAX. CREDIBLE EVENT: SITE INTENS MM	MAX. PROBABLE EVENT: MAX. PROB. MAG.	MAX. PROBABLE EVENT: PEAK SITE ACC. g	MAX. PROBABLE EVENT: SITE INTENS MM
WHITTIER - NORTH ELSINORE	57 (92)	7.10	0.032	V	6.00	0.012	III

-END OF SEARCH- 26 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE SAN ANDREAS (S. Bern.Mtn.) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 1.1 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.664 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.597 g

E Q F A U L T Ver. 2.20
JOB NUMBER: 973102-001 JOB NAME: Desert Hot Springs SE
SITE COORDINATES: LATITUDE:33.966N LONGITUDE:116.583W SEARCH RADIUS: 62 mi
ATTENUATION RELATION: 2) Campbell & Bozorgnia (1994) Horiz. - Soft Rock

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT: MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS MM	MAX. PROBABLE EVENT: MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS MM
BLUE CUT	19 (31)	7.00	0.133	VIII	6.00	0.058	VI
BORREGO MTN. (San Jacinto)	57 (92)	6.50	0.018	IV	6.20	0.014	IV
CALICO - NEWBERRY	35 (56)	7.20	0.071	VI	5.70	0.019	IV
CAMP ROCK-EMER.-COPPER MTN	26 (42)	7.00	0.090	VII	5.80	0.032	V
CASA LOMA-CLARK (S.Jacin.)	24 (38)	7.00	0.102	VII	7.00	0.102	VII
CHINO	56 (90)	7.00	0.029	V	5.40	0.008	III
COYOTE CREEK (San Jacinto)	35 (56)	7.00	0.060	VI	6.10	0.027	V
CUCAMONGA	51 (82)	6.90	0.031	V	6.10	0.016	IV
ELSINORE	46 (74)	7.50	0.061	VI	6.60	0.028	V
GLN.HELEN-LYTLE CR-CLREMNT	23 (38)	7.00	0.103	VII	6.70	0.081	VII
HELENDALE	22 (35)	7.30	0.144	VIII	5.50	0.032	V
HOMESTEAD VALLEY	24 (39)	7.50	0.146	VIII	4.80	0.014	IV
HOT S-BUCK RDG.(S.Jacinto)	20 (32)	7.00	0.126	VIII	6.10	0.060	VI
JOHNSON VALLEY	16 (26)	7.50	0.227	IX	5.20	0.035	V
LENWOOD-OLD WOMAN SPRINGS	24 (38)	7.30	0.129	VIII	5.50	0.028	V
LUDLOW	52 (83)	7.00	0.034	V	5.70	0.011	III
NORTH FRONTAL FAULT ZONE	26 (41)	7.70	0.156	VIII	6.00	0.039	V
PINTO MOUNTAIN - MORONGO	5 (7)	7.30	0.492	X	5.80	0.258	IX
PISGAH - BULLION	37 (59)	7.00	0.056	VI	6.00	0.023	IV
SAN ANDREAS (Coachella V.)	2 (4)	8.00	0.621	X	6.80	0.545	X
SAN ANDREAS (Mojave)	56 (90)	8.00	0.072	VI	7.40	0.043	VI
SAN ANDREAS (S. Bern.Mtn.)	3 (4)	8.00	0.612	X	6.70	0.523	X
SAN GORGONIO - BANNING	2 (4)	7.50	0.749	XI	6.60	0.721	XI
WHITTIER - NORTH ELSINORE	59 (95)	7.10	0.031	V	6.00	0.011	III

-END OF SEARCH- 24 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE SAN ANDREAS (Coachella V.) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 2.4 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.749 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.721 g

E Q F A U L T Ver. 2.20 *
JOB NUMBER: 978102-001 JOB NAME: Desert Hot Springs SE
SITE COORDINATES: LATITUDE:33.95N LONGITUDE: 116.5W SEARCH RADIUS: 62 mi

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT: MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS MM	MAX. PROBABLE EVENT: MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS MM
BLUE CUT	14 (23)	7.00	0.209	VIII	6.00	0.097	VII
BORREGO MTN. (San Jacinto)	55 (88)	6.50	0.028	V	6.20	0.021	IV
CALICO - NEWBERRY	33 (54)	7.20	0.096	VII	5.70	0.026	V
CAMP ROCK-EMER.-COPPER MTN	23 (37)	7.00	0.128	VIII	5.80	0.046	VI
CASA LOMA-CLARK (S.Jacin.)	26 (41)	7.00	0.111	VII	7.00	0.111	VII
CHINO	60 (97)	7.00	0.036	V	5.40	0.010	III
COYOTE CREEK (San Jacinto)	34 (54)	7.00	0.080	VII	6.10	0.036	V
CUCAMONGA	56 (90)	6.90	0.037	V	6.10	0.019	IV
ELSINORE	49 (78)	7.50	0.077	VII	6.60	0.035	V
GLN.HELEN-LYTLE CR-CLREMNT	27 (44)	7.00	0.103	VII	6.70	0.080	VII
HELENDALE	25 (40)	7.30	0.147	VIII	5.50	0.032	V
HOMESTEAD VALLEY	23 (38)	7.50	0.182	VIII	4.90	0.018	IV
HOT S-BUCK RDG.(S.Jacinto)	22 (35)	7.00	0.135	VIII	6.10	0.064	VI
JOHNSON VALLEY	15 (25)	7.50	0.270	IX	5.20	0.043	VI
LENWOOD-OLD WOMAN SPRINGS	25 (40)	7.30	0.148	VIII	5.50	0.032	V
LUDLOW	49 (79)	7.00	0.049	VI	5.70	0.015	IV
NORTH FRONTAL FAULT ZONE	28 (45)	7.70	0.175	VIII	6.00	0.042	VI
PINTO MOUNTAIN - MORONGO	8 (13)	7.30	0.374	IX	5.80	0.152	VIII
PISGAH - BULLION	34 (54)	7.00	0.080	VII	6.00	0.033	V
SAN ANDREAS (Coachella V.)	0 (1)	8.00	0.530	X	6.80	0.487	X
SAN ANDREAS (Mojave)	60 (97)	8.00	0.090	VII	7.40	0.054	VI
SAN ANDREAS (S. Bern.Mtn.)	6 (9)	8.00	0.493	X	6.70	0.355	IX
SAND HILLS	61 (98)	8.00	0.089	VII	6.60	0.026	V
SAN GORGONIO - BANNING	3 (5)	7.50	0.606	X	6.60	0.564	X

-END OF SEARCH- 24 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE SAN ANDREAS (Coachella V.) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 0.4 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.606 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.564 g

JOB NUMBER: 978102-001 JOB NAME: Desert Hot Springs SE
SITE COORDINATES: LATITUDE:33.933 N LONGITUDE:116.6 W SEARCH RADIUS: 62 mi
ATTENUATION RELATION: 2) Campbell & Bozorgnia (1994) Horiz. - Soft Rock

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS MM	MAX. PROBABLE EVENT MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS MM
BLUE CUT	20 (32)	7.00	0.127	VIII	6.00	0.056	VI
BORREGO MTN. (San Jacinto)	56 (90)	6.50	0.019	IV	6.20	0.015	IV
CALICO - NEWBERRY	37 (60)	7.20	0.064	VI	5.70	0.017	IV
CAMP ROCK-EMER.-COPPER MTN	28 (45)	7.00	0.081	VII	5.80	0.028	V
CASA LOMA-CLARK (S.Jacin.)	21 (34)	7.00	0.118	VII	7.00	0.118	VII
CHINO	54 (88)	7.00	0.030	V	5.40	0.008	III
COYOTE CREEK (San Jacinto)	33 (53)	7.00	0.065	VI	6.10	0.030	V
CUCAMONGA	51 (82)	6.90	0.031	V	6.10	0.016	IV
ELSINORE	44 (71)	7.50	0.066	VI	6.60	0.030	V
GLN.HELEN-LYTLE CR-CLREMNT	22 (35)	7.00	0.115	VII	6.70	0.091	VII
HELENDALE	23 (38)	7.30	0.130	VIII	5.50	0.028	V
HOMESTEAD VALLEY	27 (43)	7.50	0.129	VIII	4.90	0.012	III
HOT S-BUCK RDG.(S.Jacinto)	18 (28)	7.00	0.148	VIII	6.10	0.072	VI
JOHNSON VALLEY	19 (30)	7.50	0.195	VIII	5.20	0.029	V
LENWOOD-OLD WOMAN SPRINGS	26 (42)	7.30	0.114	VII	5.50	0.024	V
LUDLOW	54 (87)	7.00	0.032	V	5.70	0.010	III
NORTH FRONTAL FAULT ZONE	28 (45)	7.70	0.142	VIII	6.00	0.034	V
PINTO MOUNTAIN - MORONGO	7 (11)	7.30	0.419	X	5.80	0.187	VIII
PISGAH - BULLION	39 (62)	7.00	0.051	VI	6.00	0.021	IV
SAN ANDREAS (Coachella V.)	5 (8)	8.00	0.543	X	6.80	0.427	X
SAN ANDREAS (Mojave)	56 (90)	8.00	0.072	VI	7.40	0.043	VI
SAN ANDREAS (S. Bern.Mtn.)	5 (8)	8.00	0.537	X	6.70	0.400	X
SAN GORGONIO - BANNING	0 (0)	7.50	0.880	XI	6.60	0.890	XI
WHITTIER - NORTH ELSINORE	58 (93)	7.10	0.031	V	6.00	0.012	III

-END OF SEARCH- 24 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE SAN GORGONIO - BANNING FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 0.1 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.880 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.890 g

JOB NUMBER: 978102-001 JOB NAME: Desert Hot Springs SE
SITE COORDINATES: LATITUDE:33.916 N LONGITUDE:116.533 W SEARCH RADIUS: 62 mi
ATTENUATION RELATION: 1) Campbell & Bozorgnia (1994) Horiz. - Alluvium

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT			MAX. PROBABLE EVENT		
		MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS MM	MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS MM
BLUE CUT	16 (26)	7.00	0.188	VIII	6.00	0.095	VII
BORREGO MTN. (San Jacinto)	53 (86)	6.50	0.029	V	6.20	0.022	IV
CALICO - NEWBERRY	36 (58)	7.20	0.086	VII	5.70	0.023	IV
CAMP ROCK-EMER.-COPPER MTN	26 (41)	7.00	0.111	VII	5.80	0.039	V
CASA LOMA-CLARK (S.Jacin.)	23 (36)	7.00	0.129	VIII	7.00	0.129	VIII
CHINO	58 (93)	7.00	0.038	V	5.40	0.010	III
COYOTE CREEK (San Jacinto)	31 (50)	7.00	0.087	VII	6.10	0.040	V
CUCAMONGA	55 (88)	6.90	0.038	V	6.10	0.020	IV
ELSINORE	46 (74)	7.50	0.083	VII	6.60	0.038	V
GLN.HELEN-LYTLE CR-CLREMNT	25 (40)	7.00	0.116	VII	6.70	0.091	VII
HELENDALE	26 (42)	7.30	0.140	VIII	5.50	0.030	V
HOMESTEAD VALLEY	26 (42)	7.50	0.161	VIII	4.80	0.016	IV
HOT S-BUCK RDG.(S.Jacinto)	19 (30)	7.00	0.159	VIII	6.10	0.077	VII
JOHNSON VALLEY	18 (29)	7.50	0.233	IX	5.20	0.035	V
LENWOOD-OLD WOMAN SPRINGS	27 (43)	7.30	0.134	VIII	5.50	0.028	V
LUDLOW	52 (84)	7.00	0.046	VI	5.70	0.014	IV
NORTH FRONTAL FAULT ZONE	30 (48)	7.70	0.163	VIII	6.00	0.039	V
PINTO MOUNTAIN - MORONGO	9 (14)	7.30	0.334	IX	5.80	0.138	VIII
PISGAH - BULLION	37 (59)	7.00	0.072	VI	6.00	0.030	V
SAN ANDREAS (Coachella V.)	3 (5)	8.00	0.516	X	6.80	0.434	X
SAN ANDREAS (Mojave)	60 (96)	8.00	0.092	VII	7.40	0.055	VI
SAN ANDREAS (S. Bern.Mtn.)	6 (10)	8.00	0.483	X	6.70	0.330	IX
SAND HILLS	61 (98)	8.00	0.089	VII	6.60	0.026	V
SAN GORGONIO - BANNING	0 (0)	7.50	0.623	XI	6.60	0.690	XI
WHITTIER - NORTH ELSINORE	61 (99)	7.10	0.040	V	6.00	0.015	IV

-END OF SEARCH- 25 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE SAN GORGONIO - BANNING FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 0.3 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.683 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.690 g

JOB NUMBER: 978102-001 JOB NAME: Desert Hot Springs SE
SITE COORDINATES: LATITUDE:33.95N LONGITUDE:116.55W SEARCH RADIUS: 62 mi
ATTENUATION RELATION: 1) Campbell & Bozorgnia (1994) Horiz. - Alluvium

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT: MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS MM	MAX. PROBABLE EVENT: MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS MM
BLUE CUT	17 (28)	7.00	0.174	VIII	6.00	0.078	VII
BORREGO MTN. (San Jacinto)	56 (90)	6.50	0.027	V	6.20	0.021	IV
CALICO - NEWBERRY	35 (56)	7.20	0.091	VII	5.70	0.024	V
CAMP ROCK-EMER.-COPPER MTN	25 (40)	7.00	0.114	VII	5.80	0.041	V
CASA LOMA-CLARK (S.Jacin.)	24 (38)	7.00	0.121	VII	7.00	0.121	VII
CHINO	57 (92)	7.00	0.038	V	5.40	0.011	III
COYOTE CREEK (San Jacinto)	34 (54)	7.00	0.080	VII	6.10	0.036	V
CUCAMONGA	53 (86)	6.90	0.039	V	6.10	0.021	IV
ELSINORE	47 (75)	7.50	0.081	VII	6.60	0.037	V
GLN.HELEN-LYTLE CR-CLREMNT	25 (40)	7.00	0.117	VII	6.70	0.091	VII
HELENDALE	23 (38)	7.30	0.157	VIII	5.50	0.034	V
HOMESTEAD VALLEY	24 (39)	7.50	0.174	VIII	4.80	0.017	IV
HOT S-BUCK RDG.(S.Jacinto)	20 (32)	7.00	0.146	VIII	6.10	0.070	VI
JOHNSON VALLEY	16 (26)	7.50	0.256	IX	5.20	0.040	V
LENWOOD-OLD WOMAN SPRINGS	25 (39)	7.30	0.149	VIII	5.50	0.032	V
LUDLOW	51 (82)	7.00	0.047	VI	5.70	0.015	IV
NORTH FRONTAL FAULT ZONE	27 (44)	7.70	0.180	VIII	6.00	0.044	VI
PINTO MOUNTAIN - MORONGO	6 (10)	7.30	0.411	X	5.80	0.187	VIII
PISGAH - BULLION	36 (57)	7.00	0.074	VII	6.00	0.031	V
SAN ANDREAS (Coachella V.)	2 (3)	8.00	0.525	X	6.80	0.465	X
SAN ANDREAS (Mojave)	58 (93)	8.00	0.095	VII	7.40	0.057	VI
SAN ANDREAS (S. Bern.Mtn.)	4 (6)	8.00	0.512	X	6.70	0.409	X
SAN GORGONIO - BANNING	2 (3)	7.50	0.641	X	6.60	0.624	X
WHITTIER - NORTH ELSINORE	61 (97)	7.10	0.041	V	6.00	0.015	IV

-END OF SEARCH- 24 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE SAN GORGONIO - BANNING FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 2.1 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.641 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.624 g

JOB NUMBER: 978102-001
JOB NAME: Desert Hot Springs SE
SITE COORDINATES: LATITUDE: 33.9 N LONGITUDE: 116.45 W SEARCH RADIUS: 62 mi
ATTENUATION RELATION: 1) Campbell & Bozorgnia (1994) Horiz. - Alluvium

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT: MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS MM	MAX. PROBABLE EVENT: MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS MM
BLUE CUT	11 (18)	7.00	0.260	IX	6.00	0.128	VIII
BORREGO MTN. (San Jacinto)	50 (81)	6.50	0.031	V	6.20	0.023	IV
CALICO - NEWBERRY	35 (57)	7.20	0.089	VII	5.70	0.024	V
CAMP ROCK-EMER.-COPPER MTN	23 (37)	7.00	0.124	VII	5.80	0.045	VI
CASA LOMA-CLARK (S.Jacin.)	25 (40)	7.00	0.116	VII	7.00	0.116	VII
COYOTE CREEK (San Jacinto)	30 (49)	7.00	0.090	VII	6.10	0.041	V
CUCAMONGA	60 (96)	6.90	0.033	V	6.10	0.018	IV
ELSINORE	48 (77)	7.50	0.078	VII	6.60	0.036	V
GLN.HELEN-LYTLE CR-CLREMNT	29 (46)	7.00	0.096	VII	6.70	0.075	VII
HELENDALE	29 (47)	7.30	0.122	VII	5.50	0.026	V
HOMESTEAD VALLEY	26 (42)	7.50	0.161	VIII	4.80	0.016	IV
HOT S-BUCK RDG.(S.Jacinto)	20 (33)	7.00	0.144	VIII	6.10	0.069	VI
JOHNSON VALLEY	18 (29)	7.50	0.233	IX	5.20	0.035	V
LENWOOD-OLD WOMAN SPRINGS	28 (46)	7.30	0.126	VIII	5.50	0.027	V
LUDLOW	50 (80)	7.00	0.049	VI	5.70	0.015	IV
NORTH FRONTAL FAULT ZONE	32 (52)	7.70	0.150	VIII	6.00	0.035	V
PINTO MOUNTAIN - MORONGO	13 (20)	7.30	0.283	IX	5.80	0.095	VII
PISGAH - BULLION	34 (55)	7.00	0.078	VII	6.00	0.033	V
SAN ANDREAS (Coachella V.)	1 (2)	8.00	0.529	X	6.80	0.476	X
SAN ANDREAS (S. Bern.Mtn.)	10 (16)	8.00	0.430	X	6.70	0.239	IX
SAND HILLS	57 (91)	8.00	0.037	VII	6.60	0.029	V
SAN GORGONIO - BANNING	1 (2)	7.50	0.669	XI	6.60	0.669	XI

-END OF SEARCH- 22 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE SAN GORGONIO - BANNING FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 1.1 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.669 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.669 g

JOB NUMBER: 979102-001
JOB NAME: Desert Hot Springs SE
SITE COORDINATES: LATITUDE: 33.9166 N LONGITUDE: 116.4166 W SEARCH RADIUS: 62 mi
ATTENUATION RELATION: 1) Campbell & Bozorgnia (1994) Horiz. - Alluvium

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT: MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS MM	MAX. PROBABLE EVENT: MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS MM
BLUE CUT	9 (15)	7.00	0.300	IX	6.00	0.157	VIII
BORREGO MTN. (San Jacinto)	51 (82)	6.50	0.030	V	6.20	0.023	IV
BRISTOL MOUNTAIN	62 (100)	7.00	0.037	V	5.70	0.011	III
CALICO - NEWBERRY	33 (54)	7.20	0.095	VII	5.70	0.026	V
CAMP ROCK-EMER.-COPPER MTN	21 (34)	7.00	0.138	VIII	5.80	0.050	VI
CASA LOMA-CLARK (S.Jacin.)	27 (43)	7.00	0.106	VII	7.00	0.106	VII
COYOTE CREEK (San Jacinto)	32 (51)	7.00	0.085	VII	6.10	0.039	V
CUCAMONGA	61 (98)	6.90	0.032	V	6.10	0.017	IV
ELSINORE	50 (81)	7.50	0.074	VII	6.60	0.034	V
GLN.HELEN-LYTLE CR-CLREMNT	31 (50)	7.00	0.098	VII	6.70	0.068	VI
HELENDALE	29 (47)	7.30	0.121	VII	5.50	0.025	V
HOMESTEAD VALLEY	25 (40)	7.50	0.170	VIII	4.80	0.017	IV
HOT S-BUCK RDG.(S.Jacinto)	23 (36)	7.00	0.129	VIII	6.10	0.061	VI
JOHNSON VALLEY	17 (27)	7.50	0.247	IX	5.20	0.038	V
LENWOOD-OLD WOMAN SPRINGS	28 (44)	7.30	0.130	VIII	5.50	0.027	V
LUDLOW	47 (76)	7.00	0.052	VI	5.70	0.016	IV
NORTH FRONTAL FAULT ZONE	32 (51)	7.70	0.151	VIII	6.00	0.036	V
PINTO MOUNTAIN - MORONGO	13 (20)	7.30	0.281	IX	5.80	0.094	VII
PISGAH - BULLION	32 (51)	7.00	0.085	VII	6.00	0.036	V
SAN ANDREAS (Coachella V.)	1 (1)	8.00	0.530	X	6.80	0.485	X
SAN ANDREAS (S. Bern.Mtn.)	11 (17)	8.00	0.419	X	6.70	0.224	IX
SAND HILLS	56 (90)	8.00	0.099	VII	6.60	0.029	V
SAN GORGONIO - BANNING	3 (5)	7.50	0.614	X	6.60	0.577	X

-END OF SEARCH- 23 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE SAN ANDREAS (Coachella V.) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 0.6 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.614 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.577 g

JOB NUMBER: 978102-001
JOB NAME: Desert Hot Springs SE
SITE COORDINATES: LATITUDE: 33.975 N LONGITUDE: 116.4583 W SEARCH RADIUS: 62 mi
ATTENUATION RELATION: 3) Campbell & Bozorgnia (1994) Horiz. - Hard Rock

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT: MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS MM	MAX. PROBABLE EVENT: MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS MM
BLUE CUT	13 (20)	7.00	0.192	VIII	6.00	0.087	VII
BORREGO MTN. (San Jacinto)	56 (89)	6.50	0.015	IV	6.20	0.011	III
BRISTOL MOUNTAIN	61 (97)	7.00	0.020	IV	5.70	0.006	II
CALICO - NEWBERRY	31 (49)	7.20	0.067	VI	5.70	0.018	IV
CAMP ROCK-EMER.-COPPER MTN	20 (32)	7.00	0.104	VII	5.80	0.038	V
CASA LOMA-CLARK (S.Jacin.)	28 (46)	7.00	0.063	VI	7.00	0.063	VI
COYOTE CREEK (San Jacinto)	36 (57)	7.00	0.045	VI	6.10	0.021	IV
CUCAMONGA	58 (93)	6.90	0.019	IV	6.10	0.010	III
ELSINORE	52 (83)	7.50	0.040	V	6.60	0.018	IV
GLN.HELEN-LYTLE CR-CLREMNT	30 (48)	7.00	0.058	VI	6.70	0.045	VI
HELEMDALE	25 (40)	7.30	0.098	VII	5.50	0.021	IV
HOMESTEAD VALLEY	21 (34)	7.50	0.138	VIII	4.90	0.014	IV
HOT S-BUCK RDG.(S.Jacinto)	24 (39)	7.00	0.078	VII	6.10	0.037	V
JOHNSON VALLEY	13 (21)	7.50	0.232	IX	5.20	0.039	V
LENWOOD-OLD WOMAN SPRINGS	23 (37)	7.30	0.106	VII	5.50	0.023	IV
LUDLOW	46 (74)	7.00	0.031	V	5.70	0.010	III
NORTH FRONTAL FAULT ZONE	27 (44)	7.70	0.116	VII	6.00	0.028	V
PINTO MOUNTAIN - MORONGO	8 (13)	7.30	0.317	IX	5.80	0.129	VIII
PISGAH - BULLION	31 (49)	7.00	0.056	VI	6.00	0.024	IV
SAN ANDREAS (Coachella V.)	2 (4)	8.00	0.551	X	6.80	0.483	X
SAN ANDREAS (S. Bern.Mtn.)	7 (11)	8.00	0.415	X	6.70	0.275	IX
SAND HILLS	61 (97)	8.00	0.049	VI	6.60	0.014	IV
SAN GORGONIO - BANNING	6 (9)	7.50	0.476	X	6.60	0.390	X

-END OF SEARCH- 23 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE SAN ANDREAS (Coachella V.) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 2.4 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.551 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.483 g

Desert Hot Springs - Point 9

JOB NUMBER: 978102-001
JOB NAME: Desert Hot Springs SE
SITE COORDINATES: LATITUDE: 33.9 N LONGITUDE: 116.4583 W SEARCH RADIUS: 62 mi
ATTENUATION RELATION: 2) Campbell & Bozorgnia (1994) Horiz. - Soft Rock

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT			MAX. PROBABLE EVENT		
		MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS MM	MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS MM
BLUE CUT	12 (19)	7.00	0.235	IX	6.00	0.115	VII
BORREGO MTN. (San Jacinto)	51 (81)	6.50	0.022	IV	6.20	0.017	IV
CALICO - NEWBERRY	35 (57)	7.20	0.069	VI	5.70	0.018	IV
CAMP ROCK-EMER.-COPPER MTN	24 (38)	7.00	0.102	VII	5.80	0.037	V
CASA LOMA-CLARK (S.Jacin.)	24 (39)	7.00	0.098	VII	7.00	0.098	VII
COYOTE CREEK (San Jacinto)	30 (49)	7.00	0.072	VI	6.10	0.033	V
CUCAMONGA	59 (95)	6.90	0.024	V	6.10	0.013	III
ELSINORE	48 (77)	7.50	0.058	VI	6.60	0.027	V
GLN.HELEN-LYTLE CR-CLREMNT	28 (46)	7.00	0.079	VII	6.70	0.061	VI
HELENDALE	29 (46)	7.30	0.099	VII	5.50	0.021	IV
HOMESTEAD VALLEY	26 (42)	7.50	0.131	VIII	4.80	0.013	III
HOT S-BUCK RDG.(S.Jacinto)	20 (32)	7.00	0.125	VII	6.10	0.060	VI
JOHNSON VALLEY	18 (29)	7.50	0.202	VIII	5.20	0.030	V
LENWOOD-OLD WOMAN SPRINGS	28 (45)	7.30	0.102	VII	5.50	0.021	IV
LUDLOW	50 (80)	7.00	0.035	V	5.70	0.011	III
NORTH FRONTAL FAULT ZONE	32 (51)	7.70	0.119	VII	6.00	0.028	V
PINTO MOUNTAIN - MORONGO	12 (20)	7.30	0.268	IX	5.80	0.090	VII
PISGAH - BULLION	34 (55)	7.00	0.061	VI	6.00	0.025	V
SAN ANDREAS (Coachella V.)	2 (3)	8.00	0.642	X	6.80	0.576	X
SAN ANDREAS (S. Bern.Mtn.)	10 (16)	8.00	0.421	X	6.70	0.238	IX
SAND HILLS	57 (92)	8.00	0.069	VI	6.60	0.020	IV
SAN GORGONIO - BANNING	1 (1)	7.50	0.850	XI	6.60	0.853	XI

-END OF SEARCH- 22 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE SAN GORGONIO - BANNING FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 0.9 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.850 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.853 g

Desert Hot Springs - Point 10

JOB NUMBER: 978102-001
JOB NAME: Desert Hot Springs SE
SITE COORDINATES: LATITUDE: 33.9583 N LONGITUDE: 116.4833 W SEARCH RADIUS: 62 mi
ATTENUATION RELATION: 1) Campbell & Bozorgnia (1994) Horiz. - Alluvium

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROX. DISTANCE mi (km)	MAX. CREDIBLE EVENT: MAX. CRED. MAG.	PEAK SITE ACC. g	SITE INTENS. MM	MAX. PROBABLE EVENT: MAX. PROB. MAG.	PEAK SITE ACC. g	SITE INTENS. MM
BLUE CUT	14 (22)	7.00	0.220	IX	6.00	0.103	VII
BORREGO MTN. (San Jacinto)	55 (88)	6.50	0.027	V	6.20	0.021	IV
CALICO - NEWBERRY	32 (52)	7.20	0.099	VII	5.70	0.027	V
CAMP ROCK-EMER.-COPPER MTN	22 (35)	7.00	0.135	VIII	5.80	0.049	VI
CASA LOMA-CLARK (S.Jacin.)	27 (43)	7.00	0.106	VII	7.00	0.106	VII
CHINO	61 (99)	7.00	0.035	V	5.40	0.010	III
COYOTE CREEK (San Jacinto)	34 (55)	7.00	0.078	VII	6.10	0.036	V
CUCAMONGA	57 (91)	6.90	0.036	V	6.10	0.019	IV
ELSINORE	50 (80)	7.50	0.075	VII	6.60	0.034	V
GLN.HELEN-LYTLE CR-CLREMNT	28 (46)	7.00	0.098	VII	6.70	0.076	VII
HELENDALE	25 (40)	7.30	0.147	VIII	5.50	0.032	V
HOMESTEAD VALLEY	23 (36)	7.50	0.188	VIII	4.80	0.019	IV
HOT S-BUCK RDG.(S.Jacinto)	23 (36)	7.00	0.128	VIII	6.10	0.060	VI
JOHNSON VALLEY	15 (23)	7.50	0.282	IX	5.20	0.046	VI
LENWOOD-OLD WOMAN SPRINGS	24 (39)	7.30	0.152	VIII	5.50	0.033	V
LUDLOW	48 (77)	7.00	0.051	VI	5.70	0.016	IV
NORTH FRONTAL FAULT ZONE	28 (45)	7.70	0.176	VIII	6.00	0.043	VI
PINTO MOUNTAIN - MORONGO	8 (13)	7.30	0.372	IX	5.80	0.151	VIII
PISGAH - BULLION	32 (52)	7.00	0.063	VII	6.00	0.035	V
SAN ANDREAS (Coachella V.)	1 (1)	8.00	0.530	X	6.80	0.485	X
SAN ANDREAS (Mojave)	61 (98)	9.00	0.089	VII	7.40	0.053	VI
SAN ANDREAS (S. Bern.Mtn.)	6 (10)	8.00	0.488	X	6.70	0.342	IX
SAND HILLS	61 (98)	8.00	0.089	VII	6.60	0.026	V
SAN GORGONIO - BANNING	4 (7)	7.50	0.577	X	6.60	0.514	X

-END OF SEARCH- 24 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE SAN ANDREAS (Coachella V.) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 0.6 MILES AWAY.

LARGEST MAXIMUM-CREDIBLE SITE ACCELERATION: 0.577 g

LARGEST MAXIMUM-PROBABLE SITE ACCELERATION: 0.514 g

DATE: Wednesday, April 23, 1997

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(Estimation of Peak Horizontal Acceleration
From California Earthquake Catalogs)

SEARCH PERFORMED FOR: TerraNova

JOB NUMBER: 978102-001

JOB NAME: Desert Hot Springs SE

SITE COORDINATES:
LATITUDE: 33.95 N
LONGITUDE: 116.5 W

TYPE OF SEARCH: RADIUS
SEARCH RADIUS: 100 mi

SEARCH MAGNITUDES: 4.0 TO 9.0

SEARCH DATES: 1800 TO 1993

ATTENUATION RELATION: 1) Campbell (1993) Horiz. - 0=Soil 1=Rock

UNCERTAINTY (M=Mean, S=Mean+1-Sigma): M

SCOND: 0

FAULT TYPE ASSUMED (DS=Reverse, SS=Strike-Slip): DS

COMPUTE PEAK HORIZONTAL ACCELERATION.

EARTHQUAKE-DATA FILE USED: ALLQUAKE.DAT

TIME PERIOD OF EXPOSURE FOR STATISTICAL COMPARISON: 50 years

SOURCE OF DEPTH VALUES (A=Attenuation File, E=Earthquake Catalog): A

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (GMT) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	33.000	117.300	11/22/1800	2130 0.0	3.0	6.50	0.012	III	80 [129]
MGI	32.800	117.100	5/25/1803	0 0 0.0	7.3	5.00	0.003	I	87 [139]
DMG	33.700	117.900	12/ 8/1812	15 0 0.0	3.0	6.90	0.016	IV	82 [132]
MGI	34.100	118.100	7/11/1855	415 0.0	3.0	6.30	0.008	II	92 [148]
MGI	33.000	117.000	9/21/1856	730 0.0	7.3	5.00	0.005	II	72 [115]
T-A	32.670	117.170	12/ 0/1856	0 0 0.0	7.3	5.00	0.002	-	96 [155]
MGI	34.000	117.500	12/16/1858	10 0 0.0	3.0	7.00	0.034	V	57 [92]
T-A	34.170	117.320	12/ 2/1859	2210 0.0	7.3	4.30	0.006	II	49 [79]
MGI	34.100	118.200	1/27/1860	830 0.0	7.3	4.30	0.001	-	98 [157]
DMG	32.700	117.200	5/27/1862	20 0 0.0	4.0	5.90	0.005	II	95 [153]
T-A	32.670	117.170	10/21/1862	0 0 0.0	7.3	5.00	0.002	-	96 [155]
T-A	32.670	117.170	1/25/1863	1020 0.0	7.3	4.30	0.001	-	96 [155]
T-A	32.670	117.170	4/15/1865	840 0.0	7.3	4.30	0.001	-	96 [155]
T-A	32.670	117.170	5/24/1865	0 0 0.0	7.3	5.00	0.002	-	96 [155]
T-A	33.500	115.820	5/ 0/1868	0 0 0.0	3.0	6.30	0.025	V	50 [80]
T-A	34.080	117.250	10/ 7/1869	0 0 0.0	7.3	4.30	0.007	II	44 [71]
T-A	33.500	117.070	12/29/1880	7 0 0.0	7.3	4.30	0.007	II	45 [73]
T-A	34.170	118.170	3/ 7/1889	1554 0.0	7.3	4.30	0.001	-	97 [156]
T-A	34.000	117.420	4/12/1888	1315 0.0	7.3	4.30	0.005	II	53 [85]
DMG	34.100	116.700	2/ 7/1889	520 0.0	6.5	5.30	0.063	VI	15 [25]
DMG	34.100	117.900	8/28/1889	215 0.0	6.8	5.20	0.004	I	81 [130]
DMG	33.400	116.300	2/ 9/1890	12 6 0.0	3.0	6.30	0.037	V	40 [64]
DMG	32.700	116.300	2/24/1892	720 0.0	3.0	6.70	0.012	III	87 [140]
DMG	33.200	116.200	5/28/1892	1115 0.0	3.0	6.30	0.022	IV	55 [88]
DMG	34.200	117.500	6/14/1892	1325 0.0	7.3	4.90	0.006	II	60 [96]
DMG	34.300	117.600	7/30/1894	512 0.0	4.0	5.90	0.011	III	67 [108]
DMG	32.800	116.800	10/23/1894	23 3 0.0	5.0	5.70	0.006	II	81 [131]
DMG	34.200	117.400	7/22/1899	046 0.0	5.8	5.50	0.012	III	54 [87]
DMG	34.300	117.500	7/22/1899	2032 0.0	3.0	6.50	0.020	IV	62 [100]
DMG	33.800	117.000	12/25/1899	1225 0.0	3.0	6.60	0.068	VI	30 [49]
MGI	34.100	117.300	12/27/1901	11 0 0.0	7.3	4.60	0.008	II	47 [76]
MGI	33.800	117.900	5/22/1902	740 0.0	7.3	4.30	0.002	-	81 [130]
DMG	33.700	117.100	6/11/1902	245 0.0	7.3	4.50	0.010	III	39 [62]
MGI	33.700	117.900	7/ 8/1902	945 0.0	7.3	4.00	0.002	-	82 [132]
DMG	33.800	117.600	9/16/1903	1210 0.0	7.3	4.00	0.003	I	64 [103]
MGI	34.000	118.000	12/25/1903	1745 0.0	7.3	5.00	0.003	I	86 [138]
MGI	34.100	117.300	7/15/1905	2041 0.0	6.5	5.30	0.013	III	47 [76]
DMG	33.000	117.000	3/ 3/1906	2025 0.0	7.3	4.50	0.003	I	72 [115]
MGI	32.700	117.200	4/19/1906	028 0.0	7.3	4.30	0.001	-	95 [153]
MGI	34.000	117.400	5/22/1907	652 0.0	7.3	4.60	0.007	II	52 [83]
DMG	34.200	117.100	9/20/1907	154 0.0	3.5	6.00	0.031	V	38 [62]
MGI	33.000	115.500	3/23/1908	1357 0.0	7.3	4.60	0.002	-	87 [140]
DMG	34.000	117.500	7/ 3/1908	1255 0.0	7.3	4.00	0.003	I	57 [92]
DMG	33.700	117.400	4/11/1910	757 0.0	7.3	5.00	0.008	III	54 [88]
DMG	33.700	117.400	5/13/1910	620 0.0	7.3	5.00	0.008	III	54 [88]
DMG	33.700	117.400	5/15/1910	1547 0.0	3.5	6.00	0.017	IV	54 [88]
MGI	33.250	115.500	12/27/1910	1715 0.0	7.3	4.60	0.003	I	75 [121]
DMG	33.800	116.700	8/11/1911	1820 0.0	7.3	4.00	0.025	V	15 [25]
DMG	33.800	116.700	8/11/1911	2340 0.0	7.3	4.50	0.036	V	15 [25]
MGI	34.100	117.300	11/22/1911	257 0.0	7.3	4.00	0.008	II	47 [76]
MGI	34.200	117.300	4/13/1913	1045 0.0	7.3	4.00	0.005	I	49 [79]
DMG	33.800	118.000	10/21/1913	938 0.0	7.3	4.00	0.001	-	87 [139]
MGI	33.000	117.000	12/29/1914	10 0 0.0	7.3	4.00	0.002	-	72 [115]
MGI	33.100	116.600	2/16/1915	1330 0.0	7.3	4.00	0.003	I	59 [95]
MGI	33.100	116.600	3/ 4/1915	1250 0.0	7.3	4.00	0.003	I	59 [95]
MGI	33.000	115.500	4/28/1915	310 0.0	7.3	4.00	0.001	-	87 [140]
MGI	33.000	115.500	4/30/1915	820 0.0	7.3	4.00	0.001	-	87 [140]
MGI	33.100	116.600	5/11/1915	1145 0.0	7.3	4.00	0.003	I	59 [95]

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (GMT) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi	[km]
DMG	32.800	115.500	6/23/1915	359 0.0	3.0	6.25	0.006	II	98	[158]
DMG	32.800	115.500	6/23/1915	456 0.0	3.0	6.25	0.006	II	98	[158]
MGI	32.800	115.500	7/ 3/1915	2345 0.0	7.3	4.60	0.002	-	98	[158]
MGI	32.800	115.500	7/ 4/1915	045 0.0	7.3	4.60	0.002	-	98	[158]
MGI	32.800	115.500	7/ 4/1915	5 0 0.0	7.3	4.60	0.002	-	98	[158]
MGI	32.800	115.500	8/18/1915	2240 0.0	7.3	4.00	0.001	-	98	[158]
MGI	32.800	115.500	8/19/1915	4 0 0.0	7.3	4.00	0.001	-	98	[158]
MGI	32.800	115.500	8/19/1915	2240 0.0	7.3	4.00	0.001	-	98	[158]
MGI	32.800	115.500	8/20/1915	4 0 0.0	7.3	4.00	0.001	-	98	[158]
MGI	32.700	117.200	9/ 8/1915	742 0.0	7.3	4.00	0.001	-	95	[153]
MGI	34.200	116.900	10/10/1915	5 6 0.0	7.3	4.00	0.011	III	29	[46]
MGI	34.300	116.900	12/ 1/1915	14 5 0.0	7.3	4.00	0.009	III	33	[54]
MGI	34.100	118.200	5/ 2/1916	1432 0.0	7.3	4.00	0.001	-	98	[157]
DMG	34.700	117.000	7/16/1916	1150 0.0	7.3	4.50	0.005	II	59	[95]
DMG	34.700	117.000	7/16/1916	1230 0.0	7.3	4.00	0.003	I	59	[95]
DMG	33.500	116.500	9/30/1916	211 0.0	7.3	5.00	0.020	IV	31	[50]
MGI	33.500	116.000	9/30/1916	425 0.0	7.3	4.00	0.006	II	42	[68]
MGI	33.500	116.800	11/26/1916	17 5 0.0	7.3	4.00	0.008	II	36	[57]
MGI	34.000	118.200	2/13/1917	13 5 0.0	7.3	4.60	0.002	-	97	[157]
MGI	33.800	117.800	5/19/1917	635 0.0	7.3	4.00	0.002	-	75	[121]
MGI	33.800	117.800	5/19/1917	719 0.0	7.3	4.00	0.002	-	75	[121]
MGI	33.800	117.800	5/20/1917	945 0.0	7.3	4.00	0.002	-	75	[121]
MGI	33.000	115.500	5/27/1917	930 0.0	7.3	4.00	0.001	-	87	[140]
MGI	33.100	116.600	5/28/1917	1017 0.0	7.3	4.00	0.003	I	59	[95]
MGI	33.000	115.500	5/31/1917	210 0.0	7.3	4.60	0.002	-	87	[140]
MGI	33.500	116.800	5/31/1917	435 0.0	7.3	4.00	0.008	II	36	[57]
MGI	33.500	116.800	6/ 2/1917	435 0.0	7.3	4.00	0.008	II	36	[57]
MGI	33.000	116.600	6/11/1917	354 0.0	7.3	4.00	0.003	-	66	[106]
MGI	32.800	115.500	6/18/1917	6 0 0.0	7.3	4.00	0.001	-	98	[158]
MGI	34.000	118.200	6/26/1917	424 0.0	7.3	4.00	0.001	-	97	[157]
MGI	34.000	118.200	6/26/1917	2115 0.0	7.3	4.60	0.002	-	97	[157]
MGI	34.000	118.200	6/26/1917	2120 0.0	7.3	4.60	0.002	-	97	[157]
MGI	34.000	118.200	6/26/1917	2130 0.0	7.3	4.60	0.002	-	97	[157]
MGI	33.700	116.200	8/12/1917	11 0 0.0	7.3	4.00	0.014	IV	24	[39]
MGI	33.100	116.600	8/19/1917	710 0.0	7.3	4.00	0.003	I	59	[95]
MGI	33.750	116.250	11/19/1917	1730 0.0	7.3	4.00	0.018	IV	20	[32]
DMG	33.000	115.500	12/20/1917	825 0.0	7.3	4.00	0.001	-	87	[140]
MGI	32.700	116.700	3/21/1918	2325 0.0	7.3	4.00	0.001	-	87	[140]
MGI	33.500	116.800	3/30/1918	16 5 0.0	7.3	4.60	0.012	III	36	[57]
DMG	33.750	117.000	4/21/1918	223225.0	3.0	6.80	0.074	VII	32	[51]
MGI	33.800	117.600	4/22/1918	2115 0.0	7.3	5.00	0.006	II	64	[103]
MGI	33.800	116.900	4/23/1918	1415 0.0	7.3	4.00	0.013	III	25	[40]
MGI	33.800	116.900	4/29/1918	2 0 0.0	7.3	4.00	0.013	III	25	[40]
MGI	32.600	116.500	5/ 3/1918	425 0.0	7.3	4.00	0.001	-	93	[150]
MGI	33.100	115.500	5/11/1918	8 5 0.0	7.3	4.60	0.002	-	82	[132]
DMG	33.750	117.000	6/ 6/1918	2232 0.0	7.3	5.00	0.020	IV	32	[51]
MGI	33.800	116.900	6/14/1918	1024 0.0	7.3	4.00	0.013	III	25	[40]
MGI	33.100	116.800	6/22/1918	557 0.0	7.3	4.00	0.003	I	61	[98]
DMG	33.400	116.500	10/11/1918	4 0 0.0	7.3	4.00	0.007	II	38	[61]
DMG	32.750	116.000	2/19/1919	458 0.0	7.3	4.50	0.002	-	88	[141]
DMG	33.200	116.700	1/ 1/1920	235 0.0	7.3	5.00	0.008	III	53	[85]
MGI	33.100	116.600	2/ 9/1920	220 0.0	7.3	4.00	0.003	I	59	[95]
DMG	33.000	116.000	5/18/1920	625 0.0	7.3	4.50	0.003	I	72	[115]
MGI	32.700	117.200	5/20/1920	1330 0.0	7.3	4.00	0.001	-	95	[153]
T-A	34.000	117.420	9/10/1920	1415 0.0	7.3	4.30	0.005	II	53	[85]
MGI	33.200	116.600	10/12/1920	1748 0.0	6.5	5.30	0.011	III	52	[84]
MGI	33.800	116.900	12/18/1920	1726 0.0	7.3	4.00	0.013	III	25	[40]
MGI	33.000	115.500	12/20/1920	529 0.0	7.3	4.00	0.001	-	87	[140]

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (GMT) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi	[km]
DMG	33.000	115.500	12/20/1920	1447 0.0	7.3	4.50	0.002	-	87	[140]
DMG	33.000	115.500	12/21/1920	1452 0.0	7.3	4.50	0.002	-	87	[140]
MGI	34.200	118.000	1/ 9/1921	530 0.0	7.3	4.60	0.002	-	88	[141]
MGI	34.100	118.200	4/21/1921	1538 0.0	7.3	4.00	0.001	-	98	[157]
MGI	33.100	116.600	8/10/1921	19 6 0.0	7.3	4.00	0.003	I	59	[95]
MGI	33.100	116.600	8/10/1921	2151 0.0	7.3	4.00	0.003	I	59	[95]
MGI	33.100	116.600	2/ 5/1922	1915 0.0	7.3	4.00	0.003	I	59	[95]
MGI	34.100	117.200	4/23/1923	2113 0.0	7.3	4.00	0.006	II	41	[67]
DMG	34.000	117.000	6/30/1923	022 0.0	7.3	4.50	0.016	IV	29	[46]
MGI	33.200	117.000	7/20/1923	7 0 0.0	7.3	4.00	0.003	I	59	[95]
DMG	34.000	117.250	7/23/1923	73026.0	3.0	6.25	0.031	V	43	[69]
T-A	33.000	115.500	10/23/1924	739 0.0	7.3	4.30	0.002	-	87	[140]
MGI	33.000	115.500	10/24/1924	739 0.0	7.3	4.60	0.002	-	87	[140]
DMG	33.500	117.000	8/ 8/1925	1013 0.0	7.3	4.50	0.009	III	42	[68]
MGI	33.000	115.500	8/31/1925	1 7 0.0	7.3	4.00	0.001	-	87	[140]
DMG	34.000	116.000	4/ 3/1926	20 8 0.0	5.8	5.50	0.033	V	29	[46]
MGI	33.800	117.800	11/ 4/1926	2238 0.0	7.3	4.60	0.003	I	75	[121]
MGI	33.800	117.800	11/ 7/1926	1948 0.0	7.3	4.60	0.003	I	75	[121]
MGI	33.800	117.800	11/ 9/1926	1535 0.0	7.3	4.60	0.003	I	75	[121]
MGI	33.800	117.800	11/10/1926	1723 0.0	7.3	4.60	0.003	I	75	[121]
MGI	32.800	115.500	2/12/1927	858 0.0	7.3	4.60	0.002	-	98	[158]
MGI	32.800	116.800	8/14/1927	1448 0.0	7.3	4.60	0.003	-	81	[131]
MGI	33.900	118.200	10/ 8/1927	1914 0.0	7.3	4.60	0.002	-	97	[157]
DMG	34.000	116.000	9/ 5/1928	1442 0.0	7.3	5.00	0.023	IV	29	[46]
DMG	32.900	115.700	10/ 2/1928	19 1 0.0	7.3	5.00	0.003	I	86	[138]
MGI	34.000	118.000	5/ 5/1929	1 7 0.0	7.3	4.60	0.002	-	86	[138]
MGI	34.000	118.000	5/ 5/1929	735 0.0	7.3	4.00	0.001	-	86	[138]
DMG	32.900	118.100	7/ 8/1929	1646 6.7	7.3	4.70	0.002	-	92	[148]
MGI	32.800	116.200	7/23/1929	1155 0.0	7.3	4.30	0.002	-	81	[131]
DMG	34.830	116.520	9/26/1929	20 022.7	7.1	5.10	0.007	II	61	[98]
MGI	34.000	117.700	12/ 3/1929	9 5 0.0	7.3	4.00	0.002	-	69	[111]
DMG	34.180	116.920	1/16/1930	02433.9	6.8	5.20	0.026	V	29	[46]
DMG	34.180	116.920	1/16/1930	034 3.6	7.1	5.10	0.024	V	29	[46]
MGI	34.100	118.000	1/27/1930	2026 0.0	7.3	4.60	0.002	-	86	[139]
DMG	33.000	115.500	2/26/1930	230 0.0	7.3	5.00	0.003	I	87	[140]
DMG	33.000	115.500	3/ 1/1930	23 5 0.0	7.3	4.50	0.002	-	87	[140]
DMG	33.000	115.500	3/ 1/1930	2344 0.0	7.3	4.50	0.002	-	87	[140]
DMG	33.000	115.500	3/ 2/1930	150 0.0	7.3	4.50	0.002	-	87	[140]
DMG	33.200	116.300	5/12/1930	414 0.0	7.3	4.00	0.004	I	53	[85]
DMG	33.200	116.720	5/12/1930	172548.5	7.3	4.20	0.005	I	53	[86]
DMG	34.100	117.300	2/16/1931	1327 0.0	7.3	4.00	0.005	II	47	[76]
DMG	34.100	117.800	3/31/1931	2033 0.0	7.3	4.00	0.002	-	75	[121]
DMG	34.350	116.280	4/27/1931	23 759.6	7.3	4.00	0.010	III	30	[49]
DMG	33.800	116.600	9/10/1931	436 0.0	7.3	4.00	0.034	V	12	[19]
DMG	34.417	116.850	2/11/1932	231120.0	7.3	4.00	0.007	II	38	[61]
DMG	34.933	116.883	4/27/1932	233518.3	7.3	4.00	0.002	-	71	[115]
DMG	33.167	116.500	6/23/1932	22552.7	7.3	4.00	0.004	I	54	[87]
DMG	33.167	116.500	6/23/1932	23037.1	7.3	4.00	0.004	I	54	[87]
DMG	34.850	116.583	7/30/1932	71359.7	7.3	4.50	0.004	I	62	[100]
DMG	34.000	117.250	11/ 1/1932	445 0.0	7.3	4.00	0.006	II	43	[69]
DMG	33.917	116.750	1/25/1933	1444 0.0	7.3	4.00	0.027	V	15	[23]
DMG	32.833	115.750	2/24/1933	1933 0.0	7.3	4.50	0.002	-	88	[142]
DMG	33.617	117.967	3/11/1933	154 7.8	3.0	6.30	0.009	III	87	[140]
DMG	33.750	118.083	3/11/1933	2 4 0.0	7.3	4.90	0.002	-	92	[148]
DMG	33.750	118.083	3/11/1933	2 5 0.0	7.3	4.30	0.001	-	92	[148]
DMG	33.750	118.083	3/11/1933	2 9 0.0	7.3	5.00	0.003	-	92	[148]
DMG	33.750	118.083	3/11/1933	210 0.0	7.3	4.60	0.002	-	92	[148]
DMG	33.750	118.083	3/11/1933	211 0.0	7.3	4.40	0.002	-	92	[148]

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (GMT) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi	APPROX. DISTANCE [km]
DMG	33.700	118.067	7/20/1940	4 113.0	7.3	4.00	0.001	-	92	[147]
DMG	33.167	115.983	7/21/1940	836 3.0	7.3	4.40	0.004	I	62	[99]
DMG	34.050	116.283	8/ 1/1940	193140.0	7.3	4.00	0.027	V	14	[23]
DMG	34.050	116.283	8/ 4/1940	181520.0	7.3	4.00	0.027	V	14	[23]
DMG	33.133	116.083	10/ 6/1940	181953.0	7.3	4.00	0.003	I	61	[99]
DMG	33.133	116.083	10/16/1940	175213.0	7.3	4.00	0.003	I	61	[99]
DMG	33.117	116.417	10/21/1940	64933.0	7.3	4.50	0.005	II	58	[93]
DMG	33.633	118.200	11/ 1/1940	20 046.0	7.3	4.00	0.001	-	100	[161]
DMG	33.967	118.050	1/30/1941	13446.9	7.3	4.10	0.001	-	89	[143]
DMG	33.500	116.483	2/23/1941	183614.0	7.3	4.50	0.014	IV	31	[50]
DMG	33.517	118.100	3/22/1941	82240.0	7.3	4.00	0.001	-	97	[155]
DMG	34.217	117.467	3/25/1941	234341.0	7.3	4.00	0.003	I	58	[94]
DMG	33.950	117.583	4/11/1941	12024.0	7.3	4.00	0.003	I	62	[100]
DMG	33.817	118.217	10/22/1941	65718.5	7.3	4.90	0.002	-	99	[159]
DMG	32.700	115.850	11/ 1/1941	142434.0	7.3	4.00	0.001	-	94	[151]
DMG	32.600	116.100	12/24/1941	73012.0	7.3	4.50	0.002	-	96	[155]
DMG	34.400	116.917	1/25/1942	215133.0	7.3	4.00	0.007	II	39	[63]
DMG	34.400	116.917	2/ 1/1942	151555.0	7.3	4.00	0.007	II	39	[63]
DMG	34.400	116.917	2/ 1/1942	151828.0	7.3	4.50	0.010	III	39	[63]
DMG	34.400	116.917	2/ 1/1942	16 334.0	7.3	4.50	0.010	III	39	[63]
DMG	34.333	117.000	2/27/1942	1 853.0	7.3	4.00	0.007	II	39	[63]
DMG	34.083	116.467	3/ 1/1942	104631.0	7.3	4.00	0.043	VI	9	[15]
DMG	34.000	115.750	3/ 3/1942	1 324.0	7.3	5.00	0.012	III	43	[69]
DMG	34.000	115.750	3/ 4/1942	11 212.0	7.3	4.00	0.006	II	43	[69]
DMG	33.200	116.233	4/ 5/1942	92039.0	7.3	4.00	0.004	I	54	[87]
DMG	33.950	116.733	4/26/1942	151023.0	7.3	4.00	0.029	V	13	[21]
DMG	34.450	116.783	5/22/1942	151829.0	7.3	4.00	0.007	II	38	[61]
DMG	32.983	115.983	5/23/1942	154729.0	7.3	5.00	0.004	I	73	[118]
DMG	33.333	116.233	6/ 9/1942	5 633.0	7.3	4.00	0.005	II	45	[73]
DMG	33.233	115.833	6/14/1942	213623.0	7.3	4.00	0.003	I	63	[101]
DMG	33.233	115.833	6/14/1942	222549.0	7.3	4.00	0.003	I	63	[101]
DMG	33.233	115.833	6/24/1942	235240.0	7.3	4.00	0.003	I	63	[101]
DMG	34.300	116.417	8/ 7/1942	11533.0	7.3	4.50	0.020	IV	25	[40]
DMG	34.300	116.417	8/ 7/1942	12358.0	7.3	4.00	0.014	III	25	[40]
DMG	34.300	116.417	8/ 7/1942	15314.0	7.3	4.00	0.014	III	25	[40]
DMG	34.117	116.750	8/22/1942	125913.0	7.3	4.00	0.020	IV	18	[30]
DMG	34.350	116.283	9/20/1942	161414.0	7.3	4.00	0.010	III	30	[49]
DMG	33.533	116.633	9/21/1942	7 754.0	7.3	4.00	0.010	III	30	[48]
DMG	32.967	116.000	10/21/1942	162213.0	3.0	6.50	0.014	IV	74	[119]
DMG	32.967	116.000	10/21/1942	162519.0	7.3	5.00	0.004	I	74	[119]
DMG	32.967	116.000	10/21/1942	162654.0	7.3	5.00	0.004	I	74	[119]
DMG	32.967	116.000	10/21/1942	163439.0	7.3	4.50	0.003	I	74	[119]
DMG	32.967	116.000	10/21/1942	1638 6.0	7.3	4.50	0.003	I	74	[119]
DMG	32.967	116.000	10/21/1942	191028.0	7.3	4.50	0.003	I	74	[119]
DMG	32.967	116.000	10/21/1942	214928.0	7.3	4.50	0.003	I	74	[119]
DMG	32.967	116.000	10/21/1942	225031.0	7.3	4.00	0.002	-	74	[119]
DMG	33.233	115.717	10/22/1942	15038.0	5.8	5.50	0.008	III	67	[108]
DMG	32.967	116.000	10/22/1942	113951.0	7.3	4.00	0.002	-	74	[119]
DMG	32.967	116.000	10/22/1942	125553.0	7.3	4.00	0.002	-	74	[119]
DMG	32.967	116.000	10/22/1942	181326.0	7.3	5.00	0.004	I	74	[119]
DMG	32.950	116.150	10/25/1942	185939.0	7.3	4.00	0.002	-	72	[116]
DMG	33.233	115.717	10/26/1942	3 215.0	7.3	4.50	0.004	I	67	[108]
DMG	33.233	115.717	10/26/1942	34316.0	7.3	4.00	0.002	-	67	[108]
DMG	32.967	116.000	10/26/1942	434 4.0	7.3	4.00	0.002	-	74	[119]
DMG	33.233	115.717	10/26/1942	615 4.0	7.3	4.50	0.004	I	67	[108]
DMG	32.967	116.000	10/29/1942	1556 0.0	7.3	4.50	0.003	I	74	[119]
DMG	32.967	116.000	10/29/1942	162157.0	7.3	4.50	0.003	I	74	[119]
DMG	32.967	116.000	10/29/1942	173552.0	7.3	4.00	0.002	-	74	[119]

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (GMT) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi	APPROX. DISTANCE [km]
DMG	32.967	116.000	10/30/1942	53545.0	7.3	4.50	0.003	I	74	[119]
DMG	32.967	116.383	10/31/1942	15 758.0	7.3	4.00	0.002	-	68	[110]
DMG	32.967	116.000	11/ 2/1942	125942.0	7.3	4.50	0.003	I	74	[119]
DMG	32.967	116.000	11/ 3/1942	5 629.0	7.3	4.50	0.003	I	74	[119]
DMG	32.967	116.000	11/ 3/1942	101834.0	7.3	4.00	0.002	-	74	[119]
DMG	32.967	116.000	11/ 7/1942	439 6.0	7.3	4.00	0.002	-	74	[119]
DMG	34.617	116.000	11/ 9/1942	203425.0	7.3	4.50	0.006	II	54	[87]
DMG	32.967	116.000	11/12/1942	0 737.0	7.3	4.00	0.002	-	74	[119]
DMG	33.200	115.600	11/12/1942	175612.0	7.3	4.00	0.002	-	73	[118]
DMG	32.967	116.000	11/22/1942	63951.0	7.3	4.00	0.002	-	74	[119]
DMG	33.417	116.417	1/ 2/1943	141118.0	7.3	4.50	0.011	III	37	[60]
DMG	32.967	116.000	1/ 8/1943	024 3.0	7.3	4.00	0.002	-	74	[119]
DMG	32.850	117.483	2/23/1943	92112.0	7.3	4.00	0.001	-	95	[152]
DMG	32.967	116.000	2/24/1943	15831.0	7.3	4.00	0.002	-	74	[119]
DMG	32.967	116.000	3/ 7/1943	205631.0	7.3	4.00	0.002	-	74	[119]
DMG	32.967	116.000	3/26/1943	62957.0	7.3	4.00	0.002	-	74	[119]
DMG	32.967	116.000	4/ 7/1943	34614.0	7.3	4.00	0.002	-	74	[119]
DMG	32.967	116.000	4/27/1943	32833.0	7.3	4.00	0.002	-	74	[119]
DMG	32.967	116.000	4/30/1943	155256.0	7.3	4.00	0.002	-	74	[119]
DMG	33.333	116.100	6/12/1943	192141.0	7.3	4.00	0.005	II	48	[78]
DMG	33.117	116.117	6/18/1943	161546.0	7.3	4.50	0.004	I	62	[99]
DMG	32.967	116.000	8/17/1943	155058.0	7.3	4.00	0.002	-	74	[119]
DMG	34.267	116.967	8/29/1943	34513.0	5.8	5.50	0.025	V	35	[56]
DMG	34.267	116.967	8/29/1943	35754.0	7.3	4.00	0.008	III	35	[56]
DMG	34.267	116.967	8/29/1943	51630.0	7.3	4.00	0.008	III	35	[56]
DMG	34.333	116.883	10/14/1943	142844.0	7.3	4.50	0.012	III	34	[55]
DMG	34.350	116.867	10/15/1943	1650 1.0	7.3	4.50	0.012	III	35	[56]
DMG	33.933	117.367	10/24/1943	02921.0	7.3	4.00	0.004	I	50	[80]
DMG	33.783	116.200	10/31/1943	131210.0	7.3	4.50	0.025	V	21	[33]
DMG	32.967	116.000	11/ 2/1943	164759.0	7.3	4.50	0.003	I	74	[119]
DMG	32.967	116.000	11/ 2/1943	165716.0	7.3	4.00	0.002	-	74	[119]
DMG	32.967	116.000	11/ 2/1943	175041.0	7.3	4.50	0.003	I	74	[119]
DMG	32.967	116.000	11/ 2/1943	1753 5.0	7.3	4.00	0.002	-	74	[119]
DMG	32.967	116.000	11/ 2/1943	18 134.0	7.3	4.00	0.002	-	74	[119]
DMG	32.967	116.000	11/16/1943	18 9 9.0	7.3	4.00	0.002	-	74	[119]
DMG	33.917	116.700	11/17/1943	112841.0	7.3	4.50	0.048	VI	12	[19]
DMG	34.333	115.800	12/22/1943	155028.0	5.8	5.50	0.015	IV	48	[77]
DMG	34.000	116.383	5/ 5/1944	134715.0	7.3	4.00	0.052	VI	8	[12]
DMG	34.014	116.771	6/10/1944	111150.5	7.3	4.50	0.034	V	16	[26]
DMG	33.973	116.769	6/10/1944	111531.9	7.3	4.00	0.025	V	15	[25]
DMG	33.976	116.721	6/12/1944	104534.7	7.1	5.10	0.067	VI	13	[21]
DMG	33.994	116.712	6/12/1944	111636.0	6.5	5.30	0.080	VII	13	[20]
DMG	33.981	116.702	6/12/1944	222119.5	7.3	4.20	0.039	V	12	[19]
DMG	33.867	118.217	6/19/1944	0 333.0	7.3	4.50	0.001	-	99	[159]
DMG	33.867	118.217	6/19/1944	3 6 7.0	7.3	4.40	0.001	-	99	[159]
DMG	32.967	116.000	8/20/1944	113310.0	7.3	4.00	0.002	-	74	[119]
DMG	34.000	116.700	8/25/1944	73025.0	7.3	4.20	0.038	V	12	[19]
DMG	33.317	116.067	9/ 4/1944	125528.0	7.3	4.10	0.005	II	50	[81]
DMG	33.283	116.183	10/26/1944	225410.0	7.3	4.20	0.005	II	50	[80]
DMG	33.933	116.750	10/28/1944	183016.0	7.3	4.40	0.036	V	14	[23]
DMG	34.250	116.167	3/20/1945	2155 7.0	7.3	5.00	0.023	IV	28	[45]
DMG	34.283	116.183	3/29/1945	4 417.0	7.3	4.20	0.012	III	29	[47]
DMG	34.433	116.983	4/18/1945	458 2.0	7.3	4.30	0.007	II	43	[70]
DMG	33.217	116.133	8/15/1945	175624.0	5.0	5.70	0.014	III	55	[88]
DMG	33.033	115.883	8/27/1945	112520.0	7.3	4.00	0.002	-	73	[117]
DMG	33.967	116.800	9/ 7/1945	153424.0	7.3	4.30	0.027	V	17	[28]
DMG	33.000	115.833	1/ 8/1946	185418.0	6.2	5.40	0.006	II	76	[122]
DMG	32.983	115.617	1/16/1946	11 654.0	7.3	4.20	0.001	-	90	[144]

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (GMT) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi	APPROX. DISTANCE [km]
DMG	34.400	117.900	2/24/1946	6 752.0	7.3	4.10	0.002	-	80	[130]
DMG	33.867	115.700	4/28/1946	173123.0	7.3	4.40	0.007	II	46	[74]
DMG	33.917	115.700	6/ 4/1946	12 524.0	7.3	4.80	0.009	III	46	[74]
DMG	32.600	116.317	6/15/1946	194653.0	7.3	4.80	0.002	-	94	[151]
DMG	34.533	115.983	7/18/1946	142758.0	5.4	5.60	0.015	IV	50	[80]
DMG	33.917	116.250	8/15/1946	19 1 8.0	7.3	4.00	0.027	V	15	[23]
DMG	33.233	115.700	8/30/1946	111645.0	7.3	4.60	0.004	I	68	[109]
DMG	33.950	116.850	9/28/1946	719 9.0	7.3	5.00	0.037	V	20	[32]
DMG	34.983	116.550	4/10/1947	1558 6.0	3.0	6.20	0.012	III	71	[115]
DMG	34.967	116.550	4/10/1947	16 3 0.0	7.1	5.10	0.005	II	70	[113]
DMG	34.933	116.517	4/10/1947	171218.0	7.3	4.40	0.003	I	68	[109]
DMG	34.967	116.550	4/10/1947	1713 0.0	7.3	4.30	0.003	I	70	[113]
DMG	34.950	116.533	4/10/1947	171822.0	7.3	5.00	0.005	II	69	[111]
DMG	34.967	116.550	4/10/1947	182759.0	7.3	4.30	0.003	I	70	[113]
DMG	34.933	116.517	4/10/1947	222723.0	7.3	4.20	0.003	I	68	[109]
DMG	34.950	116.533	4/11/1947	2 711.0	7.3	4.10	0.002	-	69	[111]
DMG	34.933	116.517	4/11/1947	33210.0	7.3	4.30	0.003	I	68	[109]
DMG	34.967	116.550	4/11/1947	747 0.0	7.3	5.00	0.005	II	70	[113]
DMG	34.933	116.517	4/11/1947	184340.0	7.3	4.10	0.003	-	68	[109]
DMG	34.933	116.517	4/12/1947	18 434.0	7.3	4.00	0.002	-	68	[109]
DMG	34.933	116.517	4/12/1947	234852.0	7.3	4.20	0.003	I	68	[109]
DMG	34.967	116.550	4/19/1947	229 9.0	7.3	4.70	0.004	I	70	[113]
DMG	34.933	116.517	4/21/1947	191529.0	7.3	4.40	0.003	I	68	[109]
DMG	34.933	116.550	5/ 4/1947	25039.0	7.3	4.00	0.002	-	68	[109]
DMG	34.233	116.333	5/11/1947	5 620.0	7.3	4.90	0.031	V	22	[35]
DMG	34.933	116.517	5/22/1947	439 0.0	7.3	4.00	0.002	-	68	[109]
DMG	34.017	116.500	7/24/1947	221046.0	5.8	5.50	0.224	IX	5	[7]
DMG	34.017	116.500	7/24/1947	225341.0	7.3	4.30	0.090	VII	5	[7]
DMG	34.017	116.500	7/24/1947	225426.0	7.3	4.90	0.135	VIII	5	[7]
DMG	34.017	116.500	7/25/1947	04631.0	7.3	5.00	0.145	VIII	5	[7]
DMG	34.017	116.500	7/25/1947	15647.0	7.3	4.60	0.111	VII	5	[7]
DMG	34.017	116.500	7/25/1947	51752.0	7.3	4.30	0.090	VII	5	[7]
DMG	34.017	116.500	7/25/1947	61949.0	6.8	5.20	0.172	VIII	5	[7]
DMG	34.017	116.500	7/25/1947	75730.0	7.3	4.20	0.084	VII	5	[7]
DMG	34.017	116.500	7/25/1947	161453.0	7.3	4.50	0.103	VII	5	[7]
DMG	34.017	116.500	7/26/1947	12415.0	7.3	4.20	0.084	VII	5	[7]
DMG	34.017	116.500	7/26/1947	24941.0	7.1	5.10	0.158	VIII	5	[7]
DMG	34.017	116.500	7/26/1947	23 425.0	7.3	4.50	0.103	VII	5	[7]
DMG	34.017	116.500	7/26/1947	231351.0	7.3	4.10	0.078	VII	5	[7]
DMG	34.017	116.500	7/29/1947	163615.0	7.3	4.20	0.084	VII	5	[7]
DMG	34.017	116.500	7/30/1947	52217.0	7.3	4.20	0.084	VII	5	[7]
DMG	35.000	117.000	8/ 1/1947	154230.0	7.3	4.00	0.002	-	78	[125]
DMG	34.017	116.500	8/ 1/1947	17 137.0	7.3	4.10	0.078	VII	5	[7]
DMG	34.017	116.500	8/ 8/1947	64745.0	7.3	4.00	0.073	VII	5	[7]
DMG	35.037	116.940	8/13/1947	20 9 0.1	7.3	4.30	0.002	-	79	[127]
DMG	34.400	116.417	11/10/1947	22255.0	7.3	4.50	0.014	IV	31	[51]
DMG	34.983	116.550	11/17/1947	14 710.0	7.3	4.30	0.003	I	71	[115]
DMG	34.967	116.933	12/30/1947	191914.0	7.3	4.00	0.002	-	74	[120]
DMG	34.167	117.533	3/ 1/1948	81213.0	7.3	4.70	0.005	II	61	[98]
DMG	34.183	117.583	10/ 3/1948	24628.0	7.3	4.00	0.003	I	64	[103]
DMG	35.033	116.867	11/10/1948	235613.0	7.3	4.10	0.002	-	78	[125]
DMG	33.933	116.383	12/ 4/1948	234317.0	3.0	6.50	0.347	IX	7	[11]
DMG	33.933	116.367	12/ 5/1948	0 721.0	7.3	4.90	0.095	VII	8	[12]
DMG	33.933	116.350	12/ 5/1948	04032.0	7.3	4.40	0.061	VI	9	[14]
DMG	33.967	116.433	12/ 5/1948	04235.0	7.3	4.60	0.119	VII	4	[6]
DMG	34.000	116.467	12/ 5/1948	05057.0	7.3	4.40	0.105	VII	4	[6]
DMG	34.000	116.467	12/ 6/1948	245 8.0	7.3	4.30	0.098	VII	4	[6]
DMG	33.933	116.400	12/10/1948	204257.0	7.3	4.40	0.083	VII	6	[9]

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (GMT) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi	APPROX. DISTANCE [km]
DMG	33.967	116.450	12/11/1948	161220.0	7.3	4.50	0.123	VII	3	[5]
DMG	34.950	116.950	12/18/1948	234517.0	7.3	4.40	0.003	I	74	[119]
DMG	34.000	116.050	12/27/1948	1119 4.0	7.3	4.00	0.013	III	26	[42]
DMG	33.483	116.700	12/28/1948	125341.0	7.3	4.00	0.008	III	34	[55]
DMG	34.967	116.550	1/ 3/1949	134340.0	7.3	4.80	0.004	I	70	[113]
DMG	33.283	116.033	3/16/1949	18 027.0	7.3	4.00	0.004	I	53	[86]
DMG	35.156	117.004	3/20/1949	193449.7	7.3	4.40	0.002	-	88	[142]
DMG	33.283	116.350	4/13/1949	75336.0	7.3	4.10	0.005	II	47	[75]
DMG	34.017	115.767	5/ 2/1949	112458.0	7.3	4.60	0.009	III	42	[68]
DMG	34.017	115.683	5/ 2/1949	112547.0	4.0	5.90	0.021	IV	47	[76]
DMG	34.017	115.683	5/ 2/1949	143521.0	7.3	4.20	0.006	II	47	[76]
DMG	34.017	115.683	5/ 2/1949	1841 3.0	7.3	4.20	0.006	II	47	[76]
DMG	34.017	115.683	5/ 6/1949	326 6.0	7.3	4.10	0.005	II	47	[76]
DMG	34.017	115.683	5/10/1949	4 633.0	7.3	4.70	0.008	III	47	[76]
DMG	34.017	115.683	5/22/1949	232127.0	7.3	4.00	0.005	II	47	[76]
DMG	34.017	115.683	5/25/1949	173146.0	7.3	4.50	0.007	II	47	[76]
DMG	34.883	116.667	9/20/1949	41411.0	7.3	4.10	0.003	I	65	[105]
DMG	33.959	116.651	9/23/1949	214440.1	7.3	4.00	0.046	VI	9	[14]
DMG	33.850	115.850	10/13/1949	42040.0	7.3	4.00	0.007	II	38	[61]
DMG	33.183	116.383	10/14/1949	02925.0	7.3	4.10	0.004	I	53	[86]
DMG	33.939	118.205	1/11/1950	214135.0	7.3	4.10	0.001	-	98	[157]
DMG	33.963	116.425	1/13/1950	5 719.4	7.3	4.10	0.081	VII	4	[7]
DMG	33.117	115.567	7/27/1950	954 0.0	7.3	4.10	0.002	-	79	[127]
DMG	33.117	115.567	7/27/1950	112926.0	7.3	4.80	0.003	I	79	[127]
DMG	33.117	115.567	7/27/1950	12 2 0.0	7.3	4.20	0.002	-	79	[127]
DMG	33.117	115.567	7/27/1950	2251 0.0	7.3	4.50	0.003	-	79	[127]
DMG	33.117	115.567	7/28/1950	325 0.0	7.3	4.70	0.003	I	79	[127]
DMG	33.117	115.567	7/28/1950	1624 0.0	7.3	4.00	0.002	-	79	[127]
DMG	33.117	115.567	7/28/1950	1727 0.0	7.3	4.70	0.003	I	79	[127]
DMG	33.117	115.567	7/28/1950	1730 0.0	7.3	4.10	0.002	-	79	[127]
DMG	33.117	115.567	7/28/1950	175048.0	6.2	5.40	0.005	II	79	[127]
DMG	33.117	115.567	7/28/1950	175812.0	7.3	4.80	0.003	I	79	[127]
DMG	33.117	115.567	7/28/1950	1817 0.0	7.3	4.20	0.002	-	79	[127]
DMG	33.117	115.567	7/28/1950	1840 0.0	7.3	4.00	0.002	-	79	[127]
DMG	33.117	115.567	7/28/1950	1949 0.0	7.3	4.20	0.002	-	79	[127]
DMG	33.117	115.567	7/28/1950	2113 0.0	7.3	4.10	0.002	-	79	[127]
DMG	33.117	115.567	7/29/1950	017 0.0	7.3	4.50	0.003	-	79	[127]
DMG	33.117	115.567	7/29/1950	143632.0	5.8	5.50	0.006	II	79	[127]
DMG	33.117	115.567	7/29/1950	15 9 0.0	7.3	4.50	0.003	-	79	[127]
DMG	33.117	115.567	7/29/1950	1714 0.0	7.3	4.30	0.002	-	79	[127]
DMG	33.117	115.567	7/29/1950	1843 0.0	7.3	4.70	0.003	I	79	[127]
DMG	33.117	115.567	8/ 1/1950	83720.0	7.3	4.70	0.003	I	79	[127]
DMG	34.317	116.800	8/12/1950	21717.0	7.3	4.30	0.012	III	31	[49]
DMG	33.117	115.567	8/14/1950	1916 0.0	7.3	4.70	0.003	I	79	[127]
DMG	34.307	116.835	8/28/1950	194526.4	7.3	4.20	0.011	III	31	[50]
DMG	34.967	116.817	8/30/1950	1659 4.0	7.3	4.20	0.002	-	73	[117]
DMG	33.650	116.750	9/ 5/1950	191956.0	7.3	4.80	0.024	IV	25	[41]
DMG	33.417	116.567	12/22/1950	2 536.0	7.3	4.00	0.007	II	37	[60]
DMG	33.200	116.117	12/28/1950	52211.0	7.3	4.20	0.004	I	56	[91]
DMG	32.983	115.733	1/24/1951	717 2.6	5.4	5.60	0.006	II	80	[129]
DMG	32.983	115.733	1/24/1951	733 7.0	7.3	4.00	0.002	-	80	[129]
DMG	32.967	115.533	2/13/1951	1716 0.0	7.3	4.20	0.002	-	88	[141]
DMG	32.967	115.533	2/13/1951	174634.0	7.3	4.10	0.001	-	88	[141]
DMG	33.483	116.500	2/15/1951	104759.0	7.3	4.80	0.017	IV	32	[52]
DMG	33.483	116.500	2/15/1951	104957.0	7.3	4.80	0.017	IV	32	[52]
DMG	33.283	116.033	3/29/1951	233929.0	7.3	4.40	0.005	II	53	[86]
DMG	33.267	115.667	8/10/1951	1130 8.0	7.3	4.40	0.003	I	67	[108]
DMG	33.200	116.000	8/15/1951	1227 9.0	7.3	4.00	0.003	I	59	[95]

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (GMT) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi	[km]
GSP	34.088	116.402	8/15/1992	082414.7	7.3	4.80	0.063	VI	11	[18]
GSP	34.195	116.862	8/17/1992	204152.1	6.5	5.30	0.031	V	27	[43]
GSP	34.198	116.862	8/18/1992	094640.7	7.3	4.20	0.014	IV	27	[43]
GSP	35.033	116.990	8/23/1992	064044.5	7.3	4.00	0.002	-	80	[128]
GSP	34.273	116.774	8/24/1992	135146.0	7.3	4.30	0.015	IV	27	[44]
GSP	34.456	116.469	8/31/1992	092540.6	7.3	4.30	0.010	III	35	[56]
GSP	35.077	116.996	9/ 9/1992	114455.0	7.3	4.20	0.002	-	83	[133]
GSP	33.947	116.330	9/ 9/1992	125045.1	7.3	4.30	0.051	VI	10	[16]
GSP	34.064	116.361	9/15/1992	084711.3	6.8	5.20	0.083	VII	11	[18]
GSP	35.115	116.723	9/22/1992	185233.3	7.3	4.10	0.002	-	81	[131]
GSP	34.602	116.635	10/ 2/1992	071957.4	7.3	4.30	0.006	II	46	[74]
GSP	34.944	116.798	10/11/1992	123812.5	7.3	4.50	0.003	I	71	[114]
GSP	35.045	116.976	11/25/1992	024024.9	7.3	4.10	0.002	-	80	[129]
GSP	34.979	116.951	11/26/1992	214117.2	7.3	4.00	0.002	-	76	[122]
GSP	34.340	116.900	11/27/1992	160057.5	6.5	5.30	0.021	IV	35	[57]
GSP	34.364	116.904	11/27/1992	183225.0	7.3	4.10	0.008	III	37	[59]
GSP	34.370	116.880	11/29/1992	142120.5	7.3	4.00	0.008	II	36	[58]
GSP	34.369	116.897	12/ 4/1992	020857.5	6.5	5.30	0.020	IV	37	[59]
GSP	34.377	116.918	12/ 4/1992	052511.2	7.3	4.80	0.013	III	38	[61]
GSP	34.361	116.913	12/ 4/1992	125942.1	7.3	4.20	0.009	III	37	[59]
GSP	34.362	116.923	12/ 7/1992	033331.5	7.3	4.00	0.007	II	37	[60]
GSP	34.272	116.403	12/11/1992	013834.2	7.3	4.10	0.016	IV	23	[37]
GSP	34.092	116.414	12/21/1992	114402.9	7.3	4.00	0.036	V	11	[18]
GSP	35.026	116.972	2/11/1993	123937.0	7.3	4.50	0.002	-	79	[127]
GSP	34.405	116.464	2/15/1993	075933.2	7.3	4.20	0.011	III	31	[51]
GSP	34.245	116.429	7/ 8/1993	225744.9	7.3	4.00	0.017	IV	21	[33]
GSP	34.029	116.321	8/21/1993	014638.4	7.3	5.00	0.069	VI	12	[19]
GSP	34.947	116.652	10/26/1993	092407.4	7.3	4.00	0.002	-	69	[112]

-END OF SEARCH- 1130 RECORDS FOUND

COMPUTER TIME REQUIRED FOR EARTHQUAKE SEARCH: 2.1 minutes

MAXIMUM SITE ACCELERATION DURING TIME PERIOD 1800 TO 1993: 0.347g

MAXIMUM SITE INTENSITY (MM) DURING TIME PERIOD 1800 TO 1993: IX

MAXIMUM MAGNITUDE ENCOUNTERED IN SEARCH: 7.60

NEAREST HISTORICAL EARTHQUAKE WAS ABOUT 3 MILES AWAY FROM SITE.

NUMBER OF YEARS REPRESENTED BY SEARCH: 194 years

RESULTS OF PROBABILITY ANALYSES

TIME PERIOD OF SEARCH: 1800 TO 1993
LENGTH OF SEARCH TIME: 194 years
ATTENUATION RELATION: 1) Campbell (1993) Horiz. - 0=Soil 1=Rock
*** TIME PERIOD OF EXPOSURE FOR PROBABILITY: 50 years

PROBABILITY OF EXCEEDANCE FOR ACCELERATION

ACC. g	NO.OF TIMES EXCED	AVE. OCCUR. #/yr	RECURR. INTERV. years	COMPUTED PROBABILITY OF EXCEEDANCE in 0.5 yr	in 1 yr	in 10 yr	in 50 yr	in 75 yr	in 100 yr	in *** yr
0.01	324	1.670	0.599	0.5661	0.8118	1.0000	1.0000	1.0000	1.0000	1.0000
0.02	196	1.010	0.990	0.3966	0.6359	1.0000	1.0000	1.0000	1.0000	1.0000
0.03	133	0.686	1.459	0.2902	0.4962	0.9989	1.0000	1.0000	1.0000	1.0000
0.04	101	0.521	1.921	0.2292	0.4058	0.9945	1.0000	1.0000	1.0000	1.0000
0.05	74	0.381	2.622	0.1736	0.3171	0.9779	1.0000	1.0000	1.0000	1.0000
0.06	60	0.309	3.233	0.1433	0.2660	0.9546	1.0000	1.0000	1.0000	1.0000
0.07	41	0.211	4.732	0.1003	0.1905	0.8792	1.0000	1.0000	1.0000	1.0000
0.08	31	0.160	6.258	0.0768	0.1477	0.7977	0.9997	1.0000	1.0000	0.9997
0.09	22	0.113	8.818	0.0551	0.1072	0.6783	0.9966	0.9998	1.0000	0.9966
0.10	16	0.082	12.125	0.0404	0.0792	0.5617	0.9838	0.9979	0.9997	0.9838
0.11	13	0.067	14.923	0.0330	0.0648	0.4883	0.9649	0.9934	0.9988	0.9649
0.12	11	0.057	17.636	0.0280	0.0551	0.4328	0.9413	0.9858	0.9966	0.9413
0.13	9	0.046	21.556	0.0229	0.0453	0.3712	0.9017	0.9692	0.9903	0.9017
0.14	8	0.041	24.250	0.0204	0.0404	0.3379	0.8728	0.9546	0.9838	0.8728
0.15	7	0.036	27.714	0.0179	0.0354	0.3029	0.8354	0.9332	0.9729	0.8354
0.16	6	0.031	32.333	0.0153	0.0305	0.2660	0.7870	0.9017	0.9546	0.7870
0.17	6	0.031	32.333	0.0153	0.0305	0.2660	0.7870	0.9017	0.9546	0.7870
0.18	4	0.021	48.500	0.0103	0.0204	0.1863	0.6433	0.7870	0.8728	0.6433
0.19	3	0.015	64.667	0.0077	0.0153	0.1433	0.5385	0.6864	0.7870	0.5385
0.20	3	0.015	64.667	0.0077	0.0153	0.1433	0.5385	0.6864	0.7870	0.5385
0.21	3	0.015	64.667	0.0077	0.0153	0.1433	0.5385	0.6864	0.7870	0.5385
0.22	3	0.015	64.667	0.0077	0.0153	0.1433	0.5385	0.6864	0.7870	0.5385
0.23	2	0.010	97.000	0.0051	0.0103	0.0980	0.4028	0.5385	0.6433	0.4028
0.24	2	0.010	97.000	0.0051	0.0103	0.0980	0.4028	0.5385	0.6433	0.4028
0.25	2	0.010	97.000	0.0051	0.0103	0.0980	0.4028	0.5385	0.6433	0.4028
0.26	2	0.010	97.000	0.0051	0.0103	0.0980	0.4028	0.5385	0.6433	0.4028
0.27	1	0.005	194.000	0.0026	0.0051	0.0502	0.2272	0.3206	0.4028	0.2272
0.28	1	0.005	194.000	0.0026	0.0051	0.0502	0.2272	0.3206	0.4028	0.2272
0.29	1	0.005	194.000	0.0026	0.0051	0.0502	0.2272	0.3206	0.4028	0.2272
0.30	1	0.005	194.000	0.0026	0.0051	0.0502	0.2272	0.3206	0.4028	0.2272
0.31	1	0.005	194.000	0.0026	0.0051	0.0502	0.2272	0.3206	0.4028	0.2272
0.32	1	0.005	194.000	0.0026	0.0051	0.0502	0.2272	0.3206	0.4028	0.2272
0.33	1	0.005	194.000	0.0026	0.0051	0.0502	0.2272	0.3206	0.4028	0.2272
0.34	1	0.005	194.000	0.0026	0.0051	0.0502	0.2272	0.3206	0.4028	0.2272

PROBABILITY OF EXCEEDANCE FOR MAGNITUDE

MAG.	NO.OF TIMES EXCED	AVE. OCCUR. #/yr	RECURR. INTERV. years	COMPUTED PROBABILITY OF EXCEEDANCE in 0.5 yr	in 1 yr	in 10 yr	in 50 yr	in 75 yr	in 100 yr	in *** yr
4.00	1130	5.825	0.172	0.9457	0.9970	1.0000	1.0000	1.0000	1.0000	1.0000
4.50	402	2.072	0.483	0.6452	0.8741	1.0000	1.0000	1.0000	1.0000	1.0000
5.00	140	0.722	1.386	0.3029	0.5140	0.9993	1.0000	1.0000	1.0000	1.0000
5.50	52	0.268	3.731	0.1254	0.2351	0.9315	1.0000	1.0000	1.0000	1.0000
6.00	27	0.139	7.185	0.0672	0.1299	0.7514	0.9990	1.0000	1.0000	0.9990
6.50	11	0.057	17.636	0.0280	0.0551	0.4328	0.9413	0.9858	0.9966	0.9413
7.00	2	0.010	97.000	0.0051	0.0103	0.0980	0.4028	0.5385	0.6433	0.4028
7.50	1	0.005	194.000	0.0026	0.0051	0.0502	0.2272	0.3206	0.4028	0.2272

GUTENBERG & RICHTER RECURRENCE RELATIONSHIP:

a-value= 4.034
b-value= 0.826

beta-value= 1.903

APPENDIX D

BIOLOGICAL ASSESSMENT
FOR THE CITY OF DESERT HOT SPRINGS
GENERAL PLAN UPDATE

FOR

THE CITY OF DESERT HOT SPRINGS

PREPARED BY:

JOHN MINCH AND ASSOCIATES, INC.
DR. THOMAS A. LESLIE, Cal EPA REA

JULY, 1995

NOTICE ON APPENDIX REDUCTION

This technical appendix has been reduced by 50% and printed double-sided to conserve paper and to allow the technical appendices to be incorporated in the EIR. If you wish to have a full-sized copy of this appendix, please contact the City of Desert Hot Springs at (760)329-6411.

John Minch & Associates, Inc.
Natural Resources & Environmental
Assessments - Planning - Management

BIOLOGICAL RESOURCES ASSESSMENT FOR THE CITY OF DESERT HOT SPRINGS AND SPHERE OF INFLUENCE, RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

City of Desert Hot Springs
Planning Department
65950 Pierson Blvd.
Desert Hot Springs, CA 92240

Prepared by:

John Minch and Associates, Inc.

Contact Person:

Dr. Thomas A. Leslie, Cal EPA REA
Principal

July 1995

26461 Crown Valley Parkway, Suite 200, Mission Viejo, CA 92691, (714) 367-1000, Fax (714) 367-0117

TABLE OF CONTENTS

I. PURPOSE OF THE BIOLOGICAL ASSESSMENT 1

II. METHODS AND RESULTS 2

A. Records Search For Previously Prepared Biological Assessments 2

B. Biological Assessments Available For Review 2

C. The Portion Of The Planning Area Assessed By 1978-1994 Biological Assessments 4

D. 1994 And 1995 Field Surveys Of Selected Portions Of The Planning Area 5

E. 1995 Focused Sensitive Species Surveys 6

F. Vegetation And Sensitive Species/Habitat Maps Of The Planning Area 6

III. REGIONAL AND LOCAL BIOLOGICAL SETTING 6

A. Regional Biological Setting 6

B. Local Biological Setting 7

C. Vegetational Variations Within The Planning Area 7

IV. DESCRIPTIONS AND VEGETATIONAL MAP 8

A. Sonoran Creosote Bush Scrub 8

B. Sonoran Mixed Woody and Succulent Scrub 10

C. Native Succulent Stands ("Gardens") 11

Photo Plate No. 1: Dense Spring 1995 Grass And Herbaceous Ground Cover Understory At Succulent Garden Near Mission Lakes 13

Photo Plate No. 2: Red Pigmy Weed; Dense Ground Cover Understory Occuring Under Shrub-stratum 14

D. Desert Dry Wash Woodland 15

E. Desert Fan Palm Oasis Woodland 16

F. Desert (Mesquite) Dune, Sand Plain And Wind Shadow "Dunes" 17

Photo Plate No. 3: Sparse Ground Cover On Mesquite - San Dune Areas; Desert Spider Beetle On Mesquite - Sand Dune 19

Photo Plate No. 4: Wind Shadow Sand "Dune" On Northern Slope of Whitewater Hill; Wind Shadow Sand "Dune" And Adjacent Wildlife trail 20

G. Ephemeral Desert Dry Wash, Gully And Drainage Areas 22

H. Mountain Foothills Of The San Bernardino And Little San Bernardino Mountains 24

V. PLANT AND WILDLIFE SPECIES OF THE PLANNING AREA 25

A. Plant Species And Habitat Types Of The Planning Area 26

B. Wildlife Species Of The Planning Area 27

C. Vegetation And Sensitive Plant And Wildlife Species Maps Of The Planning Area 27

VI. SENSITIVE SPECIES AND HABITAT TYPES OF THE PLANNING AREA 30

A Summary 30

Photo Plate No. 5: Coachella Valley Milk Vetch Identified During Spring 1995 Field Surveys of the Planning Area 35

B. Sensitive Plant Species 34

C. Sensitive Habitat 40

D. Sensitive Wildlife Species 40

VII. IMPACTS RELATED TO CONTINUED DEVELOPMENT WITHIN THE PLANNING AREA 53

A. Direct Impacts to Biological Resources 53

B. Indirect Impacts Of Continued Development 56

C. Regional And Cumulative Impacts Of Continued Development 57

VIII. BIOLOGICAL CONSTRAINTS LIKELY TO AFFECT CONTINUING DEVELOPMENT 57

A. Locations And Distributions Of Sensitive Biological Elements 58

B. Adequacy Of Biological Investigations And Reports Of Results And Findings 59

C. Construction Crew And Equipment 59

D. Access Roads 59

E. Wind Breaks 60

F. Construction Schedule 60

IX. MITIGATION MEASURES 60

Impacts to Sensitive Species 63

Burrowing Owl 64

Partial Mitigation Of Cumulative Impacts 65

Open Space 65

X. APPENDICES

APPENDIX A: Floral Compendium for the City of Desert Hot Springs and Sphere of Influence

APPENDIX B: Wildlife Compendium for the City of Desert Hot Springs and Sphere of Influence

APPENDIX C: Bird Checklists for the Coachella Valley and Living Desert, Riverside County, California

APPENDIX D: County of Riverside, Biological Impact Report Outline and a Draft Standard Biological Report Scope of Work

APPENDIX E: Explanation of California Department of Fish and Game California Natural Diversity Data Base Priority Ranks and CNDDB Rare Find Report Search Results

APPENDIX F: *Approximate Locations of 1978-1994 Biological Assessments of the City of Desert Hot Springs and Sphere of Influence*

APPENDIX G: *Sensitive Biological Resources Map for the City of Desert Hot Springs and Sphere of Influence*

APPENDIX H: *Generalized Vegetation Map of the City of Desert Hot Springs and Sphere of Influence*

I. PURPOSE OF THE BIOLOGICAL ASSESSMENT

The following biological resources assessment of the City Of Desert Hot Springs and Sphere Of Influence (Planning Area) was prepared by John Minch and Associates, Inc's. (JMA) project biologists. The assessment was primarily based on data gathered during (a) 1994 and 1995 literature reviews of seventeen biological assessments conducted within the Planning Area between 1978 and 1994, (b) 1994/1995 field surveys of the Planning Area, and (c) reviews of California Natural Diversity Data Base Rare Find report records. The biological resources assessment includes the following elements:

Section II. Methods and results.

Section III. Descriptions of the regional and local biological setting.

Section IV. Descriptions of the plant communities, plant and wildlife species, and a *Generalized Vegetational Map* of the Planning Area.

Section V. Lists (compendia) and discussions of the common plant and wildlife species of the Planning Area.

Section VI. A listing and discussion of the sensitive habitat types and plant and wildlife species known or expected to occur within the planning area, and a *Sensitive Biological Resources Map* depicting the approximate locations and boundaries of sensitive habitat types and plant and wildlife species previously observed within the Planning Area (Appendix G). The map data reflects results and findings of September 1994 and March and April 1995 field surveys of the entire Planning Area.

Section VII. A listing and discussion of the biological constraints likely to affect continuing development within the Planning Area.

Section VIII. Impacts related to continued development within the Planning Area.

Section IX. Mitigation measures designed to ensure adequate biological assessments are conducted and to mitigate development impacts.

Purpose Of 1994 And 1995 Literature Reviews

The purpose of the literature review included the following:

a. search for and obtain copies of previously conducted biological assessments prepared for development projects within the Planning Area,

b. review available biological assessments to determine the types of biological resources present within the boundaries of the Planning Area, including vegetational habitat types, plant and wildlife species inventories, lists of known or expected sensitive species and habitat types, potential biological constraints to future developments, and measures previously recommended to partially or entirely avoid, minimize, or mitigate potential development impacts,

c. synthesize available biological information into a single document describing the existing biological resources of the entire Planning Area, which would be useful for general planning purposes in that it would identify and map locations and boundaries of specific known or expected sensitive biological resources, identify potential biological constraints to future development, and describe potential unmitigable cumulative impacts of future development; and

d. identify areas within the Planning Area which should be field checked in 1995 to determine the current status of sensitive biological resources described in previously prepared, project specific biological assessment.

It must be emphasized that JMA's 1994-1995 biological assessment will not serve as an appropriate substitute for the individual technical studies which must be prepared to meet the requirements of the California Environmental Quality Act (CEQA, 1992) for future proposed site specific development projects. The results and findings of the literature review, biological resources assessment are contained in the following document and depicted on the following maps:

- Appendix F: *Approximate Locations of 1978-1994 Biological Assessments of the Planning Area,*
- Appendix G: *Sensitive Biological Resources Map of the Planning Area*, and
- Appendix H: *Generalized Vegetation Map of the Planning Area.*

II. METHODS AND RESULTS

A. Records Search For Previously Prepared Biological Assessments

A biological resources records search of available documents relevant to the Planning Area was conducted between September 1994 and January and March 1995 by JMA biologists. A complete listing of the documents reviewed and/or cited is provided in a separate, accompanying *Annotated Bibliography* (JMA, 1995). The records search primarily entailed at least a search of City Planning Department files; biological sections of seventeen, previously prepared consultant biological documents including environmental impact reports (EIR), 1994 and 1995 California Department of Fish & Game (CDFG) Natural Diversity Data Base (CNDDB) *Rare Find* search record results and velum overlay for the Seven Palms Valley and Desert Hot Springs, California USGS 7.5 minute topographic quadrangles, Bureau of Land Management's Palm Springs office reference library records, San Gorgonio Pass Wind Energy Project Map showing Rare, Threatened, Endangered, And Sensitive Plant And Animal Species of the Planning Area vicinity, local plant and wildlife checklists, the Coachella Valley Master Environmental Assessment, and Desert, and southern California habitat and sensitive species location distribution maps. A photocpoy of the January 1995 CNDDB search record results are included in Appendix E.

B. Biological Assessments Available For Review

The results of the biological resources records search are described in the following report. It is possible that biological resources records regarding the Planning Area, such as reports, maps, site records, etc., may exist that were not available for review and/or are not recorded with any of the above entities. For example, on page 22 of a 1978 "Draft EIR for 155.8 Acre Parcel" the EIR preparer stated "a complete list of (wildlife) species is on file at the City's Planning Department" (1978 b.). This list could not be located by JMA or City staff. Therefore, only the available, recorded biological resources records were reviewed and addressed in this report and the 1995 Annotated Bibliography during JMA's biological resources records search. The biological resources and conditions described in this report apply only to seventeen (17) specific development areas within the boundaries of the Planning Area: twelve within the City Limits (Report Nos. 1, 3, 4, 8, and 10-17) and five in the Sphere of Influence (Report Nos. 2, 5, 6, 7, and 9). Photo copies of the seventeen documents reviewed have been provided to the City in a three-ring binder (JMA, 1995). The documents will be invaluable reference materials to biologists conducting further biological investigations within the Planning Area.

Table 1 lists the seventeen biological assessments which were available for review during preparation of the 1994-1995 literature review biological assessment of the biological resources of the Planning Area. Table 1 chronologically lists the date each assessment was prepared by decade, the name and approximate size of each development area, whether it is located within the City limits or Sphere of influence, the consultant firm or individual who prepared each assessment, and the known month(s) the field surveys of the assessments were conducted. The approximate locations of the seventeen biological assessment areas, obtained from map figures or project location descriptions contained in each of the seventeen assessments, are plotted on a map of the Planning Area located in Appendix F: *Approximate Locations of 1978-1994 Biological Assessments Of The Planning Area.*

Table 1: 1978-1994 Biological Assessments Of The Planning Area

Name Of Development And Decade Assessment Was Conducted In	Reported Size Of Development And Location (City Limits Or Sphere Of Influence)	Consultant Preparer Of The Assessment; Date Prepared; And Date Biological Survey(S) Conducted, If Known
1970's		
155.8 Acre Parcel	155.8 acres; City Limits	The Planning Center, November 1978; biological survey dates and biologist(s) name not cited in document.
1980's		
Seven Palms Ranch	640 acres; Sphere of Influence	WESTEC Services, Inc., 1980; February 25, 1980.
Mission Lakes Property	960 acres; City Limits	PSBS, 1980; Nov. 26 and 27, 1979, Mar. 1980, Apr. 1980.
City Redevelopment Agency, Project Area No. 1	Size not provided in portion of document available for review; City Limits	The Redevelopment Agency Staff; biological survey dates and biologist(s) not cited
San Gorgonio Pass Wind Energy Project FEIR	360 acres; Sphere of Influence	BLM/DOI, 1982; biological survey dates and biologist(s) not cited in document, prob. 1981 by BLM staff.
San Gorgonio Wind Resource Study DEIR #158	Size not provided in portion of document available for review; but it encompasses entire Planning Area.	Wagstaff and Brady, March 1982; biological survey dates and biologist(s) not cited in document, probably 1981 by BLM staff.
San Gorgonio Wind Resource Site Specific Projects DEIR #156	a. Proj. #443, 329 acres b. Proj. #451, 0.92 acres c. Proj. #462, 230 acres; Sphere of Influence	Wagstaff and Brady, November 1982; biological survey dates and biologist(s) not cited in document, prob. 1981 by BLM staff.
Desert Hot Springs Redevelopment Project No. 2	587 acres; City Limits	Rod Gunn & Associates, Inc., 1984; biological survey dates and biologist(s) not cited
So. CA. Edison Co's. Devers-Palo Verde #2 Transmission Line Proj. DEIR.	50 acres within Planning Area; Sphere of Influence	Western Ecological Services Company, Inc. (WESCO) in March 1987; biological survey dates and biologist(s) not cited
TT No. 22757 (Indian Hills EIR)	129 acres; City Limits	Marsh and Marsh, Jan. 4 and 5, 1988; Barrows, Dec. 1986 and May 22, 1988; PSBS, 1980.

Table 1: Continued

1990's		
Olympus Golf Course	530 acres; City Limits	Barrows, 1990; Aug./Sept., 1980.
Cornerstone Specific Plan	515 acres; City Limits	Tierra Madre Consultants, 1990 for Terra Nova Planning, 1991; Nov. 26, 28, 30, 1990.
Rancho Morongo Country Club	157 acres; City Limits	Chambers Group, 1991; Dec. 18, 1990.
Annexation No. 21 (Previously proposed only)	5,087 acres; City Limits	Terra Nova, 1991; no new bio. surveys conducted, used existing survey data.
Rancho Royale Specific Plan	2,240 acres; City Limits	Terra Nova Planning, 1992a,b; Apr./Aug., 1989 and Mar./Apr., 1992.
Annexation No. 22	8,715 acres; City Limits	Terra Nova Planning, 1992d; no new bio. surveys, used Olympus/Rancho Royal studies.
Desert Hot Springs 12-Acre Project	12-Acres; City Limits	Cornett, 1994; July 20 and 21, 1994.

C. The Portion Of The Planning Area Assessed By 1978-1994 Biological Assessments

Review of the seventeen biological assessments listed in Table 1 showed that approximately two-thirds of the Planning Area has not been systematically investigated and mapped by biologists. The seventeen documents were reviewed to gather data used (a) to prepare an initial inventory of the existing biological resources of the Planning Area and (b) determine and map the approximate, generalized locations and distribution of terrestrial natural plant communities and known or expected sensitive biological resources of the Planning Area. However, several of these documents exhibit deficiencies which prevented compilation of an accurate, complete up to date species inventory and vegetational and sensitive species maps. The primary deficiencies of the 1978-1994 assessments involved the lack of plant and wildlife species inventory lists, and the absence of sensitive species and plant community habitat maps and/or the age of the data. For example, the available portions of the three of the seventeen (Table 1) biological assessments reviewed, numbers 1, 4 and 8, did not contain project specific biological assessment technical reports, vegetational maps, or plant and wildlife inventories. In addition, references for other biological assessments, noted during the 1994 and 1995 literature reviews did not exist or were not available for review (e.g., Draft Environmental Assessment for Annexation No. 21; 155.8 Acre Parcel; 116.47 acre project). An attempt was made to locate unavailable documents or missing portions of documents by contacting City staff and the preparer's of the documents; however, the results were negative. Due to, the documents' recent age and as a result of discussions with persons knowledgeable with the contents of the unavailable documents, it is unlikely that significant additional information would have been provided as a result of a review of unavailable documents.

An additional deficiency with the seventeen assessments involves the failure to report sensitive biological elements to the CNDDB. The following fourteen (14) sensitive species and habitat types were observed within seven (7) of the seventeen Table 1 biological assessments prepared between 1978-1994. A review of the 1995 (a, b) *Rare Find* data base search report results showed that none of the 14 sensitive element occurrences records for the Planning Area, listed in the 14 reports, were reported to the California Department of Fish & Game (CDFG) Natural Diversity Data Base (CNDDB).

Table 2: Sensitive Species And Habitat Types Previously Observed Within The Planning Area But Not Reported To The CNDDB

1. Badger
2. Bendire's Thrasher
3. Black-Tailed Gnatcatcher
4. Burrowing Owl
5. California Leafnose Bat
6. Class 2 Desert Tortoise Habitat
7. Cooper's Hawk
8. Desert Tortoise
9. Palm Springs Round-Tailed Ground Squirrel
10. Le Conte's Thrasher
11. Loggerhead Shrike
12. Northern Red Diamond Rattlesnake
13. Palm Springs Pocket Mouse
14. Palm Springs Round-Tailed

According to the CDFG, the CNDDB "is the most single source of information on California's sensitive species and natural communities." (CDFG, 1994b,c). The CNDDB will only remain an important, useful source of information if new or more accurate data is provided to the CNDDB. Therefore, it is recommended that the City report these and all subsequent observations of sensitive biological elements within the Planning Area to the CNDDB. The most efficient way for the City to report data to the CNDDB is to require that preparer's of subsequent biological assessments complete a *California Native Species Survey Form* and *California Natural Community Field Survey Form* for sensitive elements identified within the boundaries of proposed development areas. For informational purposes, a copy of each of these two forms is included in Appendix E. The completed forms should be included in an appendix of all subsequent biological assessment reports of findings. At the direction of the City, the biological assessments preparer will mail the completed forms to the CNDDB.

Use Of The 1978-1994 Biological Assessments Locations Map

The approximate locations of the seventeen biological assessments, conducted within the Planning Area between 1978 and 1994, are described in the assessment text and/or shown project location maps included in each assessment. Using data gathered during the 1995 and 1995 literature reviews, the Appendix F: *Approximate Locations Of 1978-1994 Biological Assessments Of The Planning Area* map was prepared. The Appendix F map can be used by City staff to determine which portions of the Planning Area have been the subject of previous biological field surveys and which have not. This information will also be useful to biologists conducting literature reviews for assessments of future development areas.

Updating Of The 1978-1994 Biological Assessments Locations Map

As site specific biological resources maps are prepared for future development parcels within the Planning Area, their locations should be plotted by City staff on the Appendix F biological assessments location map.

D. 1994 And 1995 Field Surveys Of Selected Portions Of The Planning Area

In September 1994 and March and April 1995, field surveys of selected portions of the Planning Area were conducted to (a) field check selected parts of the plant and wildlife inventory data provided in these seventeen biological assessments, (b) record previously undetected sensitive plant and wildlife species and habitat types, and (c) construct a map depicting the boundaries of the predominant vegetation types and locations of sensitive plant and wildlife species within the Planning Area. The Appendix H: *Generalized Vegetation Map Of The Planning Area* was prepared using vegetational map data provided in five of the seventeen Table 1 biological assessments reviewed. Field checking of the five previously prepared vegetational maps was conducted during March and April 1995 Planning Area field surveys.

E. 1995 Focused Sensitive Species Surveys

Focused sensitive plant and wildlife species surveys were conducted during March and April 1995, Planning Area field surveys. The focused field surveys were conducted in March and April because it was the time of year coinciding with the known flowering periods of sensitive annual and perennial plant species and subspecies of concern and/or during periods of pheonological development when sensitive species and subspecies of concern are both present and identifiable. The flowering times of sensitive plant species surveyed for are provided below in Table 3: *Sensitive Plant Species Observed Or Expected Within The City Of Desert Hot Springs and Adjacent Areas*. Focused sensitive wildlife surveys were scheduled when migratory, nocturnal, or dormant (e.g., hibernating, aestivating, etc.) species of concern were present, observable, and active. No nocturnal or small mammal live-trapping surveys were conducted in 1995, because no listed threatened or endangered nocturnal bats or small mammals are expected to occur within the Planning Area.

It must be emphasized that the results and findings of the 1995 focused sensitive species surveys of the Planning Area will not serve as an appropriate substitute for the individual focused sensitive species surveys which must be prepared to meet the requirements of CEQA for future proposed site specific development projects. Focused sensitive species surveys are usually only valid for one year from the date they were completed and must be repeated to determine the current status of parcels being proposed for development. A complete, comprehensive inventory of the existing biological resources of any undeveloped parcel being proposed for future development must be conducted and include, at least, nocturnal small mammal live-trapping surveys.

F. Vegetation And Sensitive Species/Habitat Maps Of The Planning Area

No regional or Planning Area wide vegetational maps, showing the locations and distributions of sensitive botanical and wildlife species and boundaries of existing plant communities of the Planning Area, were located during the review of the seventeen biological assessments listed previously in Table 1. A *Sensitive Biological Resources Map Of The Planning* Area and *Generalized Vegetation Map of the Planning Area* were prepared using the data gathered during (a) the September 1994 and March and April 1995, field surveys of selected portions of the Planning Area, and (b) the specific locations and distributions of botanical resources determined during surveys of specific development projects conducted between 1978 and 1994 (Table 1). These maps are discussed in the following report and located in map pockets in Appendix G and H respectively.

III. REGIONAL AND LOCAL BIOLOGICAL SETTING

A. Regional Biological Setting

The Planning Area lies within the northwestern end of the Coachella Valley and is bounded by the Little San Bernardino Mountains on the northeast and the San Bernardino Mountains on the northwest. Both of these ranges are part of the eastern Transverse Ranges Geomorphic Province of California. The remainder of the Planning Area is situated on the foothills, bajadas and alluvial fan desert flats and associated washes, gullies, ravines, etc. to the south of these two mountains ranges.

California deserts are part of the great Sonoran Biotic province (Jaeger, 1940). Most biogeographers recognize two major subdivisions of the California desert: the Sonoran Desert (a.k.a. Colorado Desert: Jaeger, 1940) and the Mojave Desert. The Planning Area is located in a relatively undisturbed transitional area between these two deserts, and is known or expected to provide habitat for some plant and animal species characteristic of both deserts. This transitional area is one of the hottest and driest of the major North American deserts, and has been designated variously as the northern limit of the Sonoran Desert or the southern limit of

the Mojave Desert. Most local studies place the Coachella Valley and the Planning Area within the Sonoran (Colorado) Desert. The Mojave Desert lies to the north of the Planning Area and Orocopia Mountains in the vicinity of the Joshua Tree National Park.

The Sonoran Desert lies within a biogeographical region called the "Lower Colorado River Valley Biome Subdivision" of the "Sonoran Desert Scrub Biome". This biogeographical region extends from the Little San Bernardino Mountains, south and eastward into Baja California, southern Arizona and the mainland Mexican state of Sonora. The significance of the boundary between these two deserts is primarily biogeographical. One sees no drastic changes in vegetation structure or species composition, and no major shift in fauna when traveling from one desert to the other. However, species of various kinds do tend to reach the limits of their ranges at about this line or are to be found with more abundance and regularity above or below it. The most obvious example of this is the Joshua tree which is considered to be a Mojave Desert species, and which is found only north of the mapped boundary between these two deserts. Most of the terrain of the Planning Area and surrounding Coachella Valley region consists of uniform, low angle alluvial fan terrain and low hills which support primarily a sparse cover of the common and widespread Sonoran Creosote Bush Scrub vegetation (WESCO, 1982). The fan terrain is interrupted by wash and steeper mountain (or rockland) habitats, blow sand areas, occasional palm oasis, and riparian communities. No riparian habitat exists within the Planning Area; only two small, nautral palm oasis occur.

The Sonoran Desert biome is remarkable for it's dryness (i.e., the average annual precipitation is between 2 and 8 inches), low humidity, and diurnal and seasonally fluctuating extremes in air temperature (e.g., extreme heat in the summer, cool nights in the winter, etc.) (Wagstaff and Brady, 1982). Like all other biomes, the Sonoran Desert biome exhibits a major ecological community characterized by distinctive vegetation types and associated wildlife species.

B. Local Biological Setting

Eight distinctive vegetation types have been identified within the Coachella Valley area (Comarc, 1981). Each vegetation type supports a characteristic plant community identifiable and predominated by a distinctive group of indicator plant species and associated wildlife species. The predominant vegetation type of the Sonoran Desert, Coachella Valley, and the Planning Area is the widespread, non-sensitive Sonoran Creosote Bush Scrub (Holland, 1986). This vegetation type is the most abundant of all those vegetation types represented in the Sonoran Desert biome which includes the Planning Area and surrounding Coachella Valley and encompasses almost all of the urbanizing areas of the region (Comarc, 1981). Terra Nova (1992a,b) described two sub-associations within the Sonoran Creosote Bush Scrub: Brittlebush-Creosote Scrub and Mixed Shrub-Succulent (Terra Nova, 1992 a,b). JMA uses the plant community descriptions and nomenclature developed by Holland (1986) for use by the California Department of Fish and Game. These two vegetation types occurring within the Planning Area match most closely the Holland's (1986) descriptions of Sonoran Creosote Bush Scrub and Sonoran Mixed Woody and Succulent Scrub, respectively. In addition, several other minor, localized vegetational variations occur in conjunction and locally intermixed with Sonoran Creosote Bush Scrub.

C. Vegetational Variations Within The Planning Area

While the flatter portions of the Planning Area alluvial fan terrain are dominated by a simple and almost monotonously uniform cover of Sonoran Creosote Bush Scrub, minor localized vegetational variations occur in conjunction and locally intermixed with Sonoran Creosote Bush Scrub throughout the Planning Area. These variations are primarily related to varying water availability, which in turn is strongly influenced by such factors as landscape position (slope aspect or exposure), soils, etc. For example, the upper portions of alluvial fans and bajadas generally support a rather better developed and more lush vegetation type than the lower elevation creosote bush scrub flats. The higher elevation areas usually have greater moisture conditions, arising apparently from greater proximity to rain producing mountains and from better soil conditions.

The greatest vegetational variations and densest vegetation are found in the better developed, innumerable washes, gullies and drainages dissecting the fan terrain. The lower rocky mountain slopes of the San Bernardino and Little San Bernardino Mountains, bordering the Planning Area on the northeast and west, support vegetation similar to that of the upper portions of the bajadas, with subtle variations related to rock type, exposure, edaphip factors, age of the surface, etc. However, rocky slopes, which accumulate runoff and which contain good soil between the boulders can, in many instances, support some of the richest vegetation of the hotter desert, and frequently have the most spectacular displays of succulents, such as the fishhook cacti, barrel cactus, and the beavertail cactus. Discussions of the more common, notable minor vegetational variations follow the description of the Sonoran Creosote Bush Scrub plant community and it's two associations and include the following plant communities, vegetation types, and habitat types: Sonoran Mixed Woody and Succulent Scrub; Desert Dry Wash Woodland; Desert Fan Palm Oasis Woodland; Native Succulent Stands ("Gardens"); stabilized and partially stabilized Desert (Mesquite) Dunes, Desert Sand Fields And Wind Shadow "Dunes" and associated blow sand accumulations; Ephemeral Desert Dry Wash, Gully And Drainage Areas; and mountain foothills. Other minor vegetational variations, not discussed here, may occur within the Planning Area which will be addressed in site specific biological assessments prepared for future proposed developments.

IV. DESCRIPTIONS AND VEGETATIONAL MAP

This section describes the predominant plant communities and minor vegetational variations occurring within the Planning Area, the common plant and wildlife species of the Planning Area, and a generalized vegetational map of the plant communities identified during 1994-1995 literature reviews and field surveys. Each plant community and minor vegetational variation discussion includes a brief description of such things as it's structure, a list of the predominate indicator plant species by which they are identifiable, a description of the associated, characteristic wildlife species, the site factors (i.e., soils, climate, etc.) required to support them, their distribution, an assessment of habitat value, an impact analysis related to continuing development on each plant community of the Planning Area, etc. The discussion regarding the generalized vegetational map assesses it's accuracy and use and the importance of annual updates. A brief description of the habitat values for major habitat types within the Planning Area is provided in the Bureau of Land Management's Final Environmental Statement for Southern California Edison's Company *500 kV Palo Verde-Devers Power Transmission Line Palo Verde Generating Plant, Arizona To Devers Substation, California* (BLM, 1982, Table 2-6). Habitat values for habitat types not addressed by the BLM are based on 1994 and 1995 field observations. An assessment of the habitat value for major habitat types occurring within the Planning Area is provided in the following habitat type discussions.

A. Sonoran Creosote Bush Scrub (Element Code 33100)

The predominant vegetation type of the Sonoran Desert, Coachella Valley, and the Planning Area is Sonoran Creosote Bush Scrub (Holland, 1986). The boundaries of this vegetational type are mapped on the Appendix G generalized vegetational map. Sonoran Creosote Bush Scrub is identifiable by a distinctive group of predominant indicator plant species including Bursage (*Ambrosia dumosa*), Brittlebush (*Encelia farinosa*), Ocotillo (*Fouquieria splendens*), and Creosote Bush (*Larrea tridentata*). According to Holland (1986), this habitat type is comprised of widely spaced, 0.5-3 m tall (1.6 to 9.8 feet), shrubs with bare ground between (Holland, 1986). In years when sufficient precipitation is provided by winter and spring rains, the bare areas are occupied from January to May with flowering "ephemeral" herbaceous species which complete their life cycles in a few weeks time. Sonoran Creosote Bush Scrub is very similar in appearance to Mojave Creosote Bush Scrub (Element Code: 34100), but with greater species and life form diversity including several succulents. Growth occurs from winter to early spring (or rarely at other seasons) if rainfall is sufficient. Shrubs may be dormant during drought for long periods. Many species of ephemeral herbs may flower in late February and March (earlier than in Mojave Creosote Bush Scrub) if the winter rains are sufficient. This is the basic Creosote Scrub of the Sonoran Desert.

Sonoran Creosote Bush Scrub characteristically occurs primarily at elevations below 910 meters (3,000 feet) in areas where winter temperatures seldom drop below freezing on well-drained secondary soils of slopes, bajadas, alluvial fans and valleys, rather than on upland sites with thin residual soils or sites with high soil salinity. Sonoran Creosote Bush Scrub occurs within the Sonoran Desert region from the Little San Bernardino Mountains, south and eastward into Baja California, southern Arizona and Sonora, Mexico where it is the dominant plant community below 2,500 or 3,000 feet (760 or 910 m). It intergrades broadly with Mojave Creosote Bush Scrub in southeastern San Bernardino County and eastern Riverside County.

Terra Nova (1992a,b) described two sub-associations within the Sonoran Creosote Bush Scrub: Brittlebush-Creosote Scrub and Mixed Shrub-Succulent (Terra Nova, 1992 a,b). JMA uses the plant community descriptions and nomenclature developed by Holland (1986) for use by the California Department of Fish and Game. These two vegetation types occurring within the Planning Area match most closely the Holland's (1986) descriptions of Sonoran Creosote Bush Scrub and Sonoran Mixed Woody and Succulent Scrub, respectively. The Sonoran Mixed Woody and Succulent Scrub plant community is described in the following section.

Extensive drainage systems occur within the Planning Area with a substrate of gravel and cobbles, bordered by vegetation typical of such areas including such species as Desert Willow (*Chilopsis linearis*) and Catclaw Acacia (*Acacia greggii*). There are also heavily disturbed areas showing evidence of past fires, cattle grazing, target shooting, off-road vehicle activity, and or trash dumping. Thus habitat quality and characteristics vary considerably within this vegetation type.

Characteristic Wildlife Species Of Sonoran Creosote Bush Scrub

Of the eight ecosystems in the Coachella Valley, five are inhabited by similar animal species as characterized by the Sonoran Scrub of the valley proper (Comarc, 1981). The Sonoran Creosote Bush Scrub supports a low diversity assemblage of mammals, birds, and reptiles. That is, the creosote bush scrub is a relatively depauperate habitat for wildlife, at least with respect to breeding species (WESCO, 1987). Those species which do occupy habitat dominated by Sonoran Creosote Bush Scrub and it's associations are usually present in lower density (numbers) than in other adjacent habitat types. The lower density of wildlife is related to the lower availability and value of the biological resources available for wildlife species in these communities (i.e., food, water, nesting sites, etc.) (TMC, 1990). A complete list of the plant and wildlife species; identified within the Planning Area is provided in the Appendix A Floral Compendium and Appendix B Wildlife Compendium of this report.

Most of the desert mammals are nocturnal, adopting this activity pattern to escape the heat of the day. Burrowing is another habit that has been adopted by the desert species to escape the heat. The Planning Area presents a diverse substrate including sand, gravel, desert pavement and rock. This is probably one of the major contributing factors to the relatively diverse assemblage of burrowing rodent species within the Planning Area. The common rodent species of the Planning Area include the antelope ground squirrel, San Diego pocket mouse, long-tailed pocket mouse, little pocket mouse, desert pocket mouse, desert kangaroo rat, Merriam kangaroo rat, canyon mouse, cactus mouse, deer mouse, white-throated woodrat, and desert woodrat. The antelope ground squirrel is one of the few rodent species that is able to remain active during the day, although it will become inactive during times of extreme heat. The only common medium-sized mammal in the desert region is the black-tailed Jack rabbit. Predator species include the kit fox, coyote, and mountain lion in the higher elevations of the northern and western portions of the Planning Area. One large mammal species, Nelson's bighorn sheep (*Ovis canadensis nelsoni*), occurs in the northeastern part of the Planning Area in the Little San Bernardino Mountains. Although not listed as a threatened species, it is fully protected by California law in Section 4700 of the Fish and Game Regulations.

San Gorgonio Pass and Morongo Valley Canyon lie along a major migratory route for birds flying between the Imperial Valley region and areas to the north and west. Within the Planning Area, bird movement primarily occurs north to southeast from Morongo Canyon to Coachella Valley (Wagstaff and Brady, 1982). According to the *Birds Of The Coachella Valley* checklist,

approximately 340 bird species and 6 races have been identified in the Coachella Valley (Glenn, 1983). Not all 340 species were reported in the Planning Area. In fact compared to the surrounding region, the avifauna observed inhabiting or migrating through the Planning Area is low. Only 61 species or 18% (61/340) of the birds of the Coachella Valley have been reported within the Planning Area by the Table 1 Biological Assessments (Appendix B). Other studies conducted by Southern California Edison indicate that over 100 bird species were observed in Morongo Valley Canyon in 1981, but most were migrants not nesting in the Planning Area or utilizing it's meager resources on a regular basis.

Due to the extreme climatic conditions and diversity of vegetation and soil habitats in the Coachella Valley, "some 54 species of amphibians and reptiles occur in the desert" including Desert Tortoise and several lizard species. "Many desert species exist in great numbers and are commonly seen during evening hours in the summer or sporadically after summer rains'" (Comarc, 1981). However, only 31 were observed during the 17 previous recent surveys within the Planning Area. This represents only 57% of the species occurring in the Coachella Valley. The relatively low density of birds, amphibians, and reptiles in the Planning Area is likely due to such factors as human disturbances, lack of surface water, etc.

Habitat Value

According to the BLM, the habitat value of Sonoran Creosote Bush Scrub has been determined to be low. In a natural condition it is not a rare or high density habitat type, does not provide habitat for watershed wildlife, and only supports a low diversity of wildlife species (BLM, 1982, Table 2-6). The BLM considers wildlife species that require relatively mesic habitat, "watershed wildlife", to be more sensitive than wildlife species able to exist in xeric environments. Heavily disturbed areas occurring within the Planning Area show evidence of past fires, cattle grazing, target shooting, off-road vehicle activity, and trash dumping. Thus habitat quality and characteristics vary considerably within the Sonoran Creosote Bush Scrub of the Planning Area.

Impacts To Sonoran Creosote Bush Scrub Related To Continuing Development

Since Sonoran Creosote Bush Scrub is so wide spread throughout the "Lower Colorado River Valley Biome Subdivision" of the "Sonoran Desert Scrub Biome,"that it is not a sensitive habitat type and has no current or proposed protection status. Therefore, its existence as a habitat type will not be threatened by continued development. The significance of the loss of Sonoran Creosote Bush Scrub from a regional perspective is low (Barrows, 1992). However, clearing of this habitat type for development in the Planning Area could impact wildlife feeding and migrational movement corridors, restrict mate finding behavior, create isolated sub-populations, reduce "gene flow" and reproduction, etc. In addition, clearing could result in the loss of wildlife escape cover, foraging areas, nesting sites and materials, food sources, etc. and loss of the few sensitive plant and wildlife species which do utilize the depauperate resources of the Planing Area. Under CEQA, significant impacts to habitat supporting sensitive biological elements should be avoided or mitigated to non-significant levels.

B. Sonoran Mixed Woody and Succulent Scrub (Element Code 33220)

Holland (1986) describes this plant community as "the only Colorado (a.k.a. Sonoran) Desert community with substantial dominance of cacti and other stem succulents" which "is dominated by shrubs...similar in aspect to Sonoran Creosote Scrub but more varied and usually denser." It "includes species from Sonoran Creosote Scrub, and Desert Wash Woodland (62200), with no clear dominant." The distribution of this community is similar to that of Sonoran Creosote Bush Scrub but it is more localized. That is, it occurs on rocky, well drained slopes and alluvial fans, usually between 300 and 1,210m, at the base of mountains, in areas that have a slightly greater availability of moisture than those vegetated by Sonoran Creosote Bush Scrub (TMC, 1990; Holland, 1986).

Habitat Value

The habitat value of Sonoran Mixed Woody and Succulent Scrub was not provided by the BLM in 1982, but based on 1994 and 1995 Planning Area wide field observations of this habitat type, it's value was determined to be low. In a natural condition it is not a rare or high density habitat type, does not provide habitat for watershed wildlife, and only supports a low diversity of wildlife species (BLM, 1982, Table 2-6).

Direct Impacts Related To Continuing Development

The impact discussion for Sonoran Creosote Bush Scrub applies to this plant community as well. This community is not listed by the CNDDB as a high inventory priority (CDFG, 1990). It has no legal protection status.

C. Native Succulent Stands ("Gardens")

Two non-sensitive, unlisted stands ("gardens") of native succulents are described as occurring within the Planning Area (Cornett, 1994). These "gardens" are most likely assignable to Holland's (1986) terrestrial plant community description of Sonoran Mixed Woody And Succulent Shrub (Element Code 33220) habitat type described above. The boundaries of the two "gardens" are mapped on the Appendix G *Generalized Vegetational Map*. The two "gardens" are briefly discussed below.

Devil's Garden

The first succulent "garden" is called Devil's Garden. The name Devil's Garden is shown on the Desert Hot Springs USGS topographic quadrangle in T2SR3ES25. Devil's Garden is described as being located about one mile west of Highway 62 on Pierson Boulevard (Cornett, 1980). This "garden" is discussed in a small publication called the *Coachella Valley Nature Guide* published by Nature Trails Press (Cornett, 1980). 1995 field surveys indicate that the succulent vegetation of Devil's Garden probably extends westward from Highway 62 to the foothills of the San Bernardino Mountains approximately between 14th Avenue and the northern boundary of the Planning Area (it probably extends northward at least to Mission Creek). The eastern portion of the Devil's Garden area has been burned approximately between 0.75 miles to 1.25 miles west of Highway 62. Visual observations indicate that the vegetational cover of the burned area is less dense than the burned portions of Devil's Garden. The approximate boundaries of the Devil's Garden succulent vegetation area are shown on the Appendix G *Sensitive Biological Resources Map*.

Second Unnamed Stand Of Succulents

According to Cornett (1994), the second stand of native succulents is located west of West avenue, north of Mission Lakes boulevard and east of Little Morongo Road. It has been reported that this garden was, "one of the most outstanding biological features of Desert Hot Springs" and "the most dense of Coachella Valley" (The Planning Center, 1978b). 1995 field surveys indicate that the clockwise boundaries of the unnamed succulent stand are as follows: bounded on the north by the foothills of the Little San Bernardino Mountains; on the east by Sonora Drive and Cholla Drive; on the south by West 8TH Avenue; and on the west by Little Morongo Road. The approximate boundaries of the unnamed succulent garden succulent vegetation area are also shown on the Appendix G *Sensitive Biological Resources Map*.

Characteristic Plant And Wildlife Species Of Native Succulent Stands

A preliminary plant and wildlife list of these two succulent "gardens" was compiled during March and April 1995 Planning Area field surveys. Two vegetational strata were obvious in the succulent gardens: a shrub-succulent stratum and a grass-herbaceous stratum (understory or ground cover). The plant and wildlife species of these two strata are briefly described below.

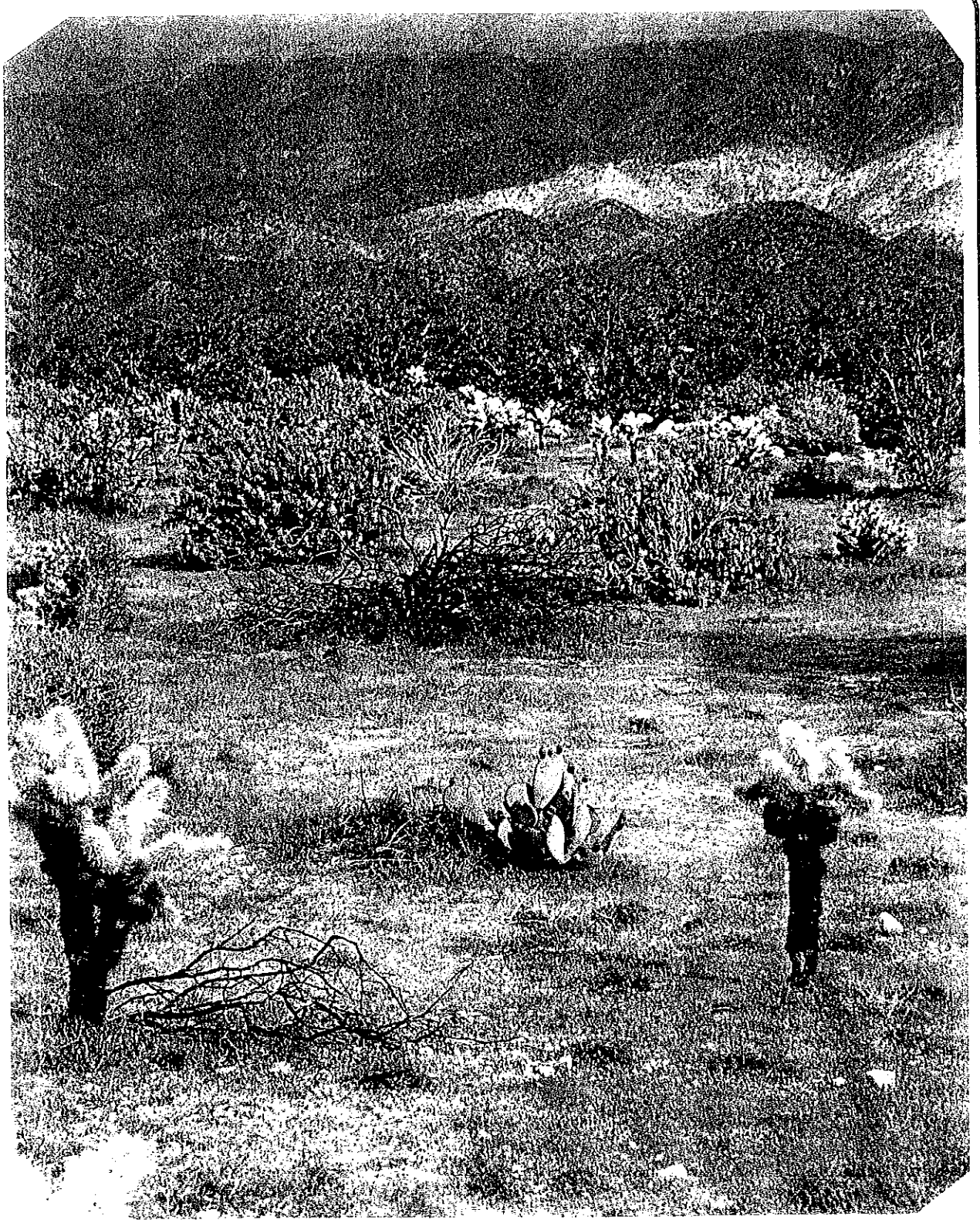
Shrub-Succulent Stratum

The most abundant species of the succulent and shrub stratum are beavertail cactus (*Opuntia basilaris*), calico cactus (*Echinocereus engelmannii*), California barrel cactus (*Ferocactus cylindraceu*), golden cholla (*Opuntia echinocarpa*), nipple cactus (*Mammillaria tetrancistra*), teddy-bear (Jumping) cholla (*Opuntia bigelovii*), bladderpod (*Isomeris arborea*), brittlebush (*Encelia farinosa*), burro-weed (*Ambrosia dumosa*), creosote bush (*Larrea tridentata*), dalea (*Psorothamnus* sp.), hop-sage (*Grayia spinosa*) and wishbone bush (*Mirabilis bigelovii var. retrorsa).*

Grass-Herbaceous Understory Stratum

The barren desert ground, as observed during the dry season, can be converted in years of good rainfall into lush carpets of grasses and colorful annual plants. As shown in Photo Plate Nos. 1 and 2, in March 1995, the desert "floor" (grass-herbaceous stratum or understory) was literally carpeted with a dense, conspicuous ground cover consisting of numerous spring understory grasses and forbs. The dominant grasses were non-native Mediterranean Grass (*Schismus barbatus*), non-native brome grasses (*Bromus* sp.), and native fluff-grass (*Erioneuron pulchellum*). A number of herbaceous annual spring species were interspersed among the grass species including cryptantha (*Cryptantha* sp.), desert chicory (*Rafinesquia neomexicana*), desert dandelion (*Malacothrix glabrata*), pigmy weed (*Crassula* [Tillaea] *connata*), recurved and broadfruit pectocarya, (*Pectocarya recurvata* and *P. platycarpa*), red-stemmed filaree (*Erodium cicutarum*), sawtooth plant (*Camissonia californica*), spurge (*Chamaesyce* sp.) and Wallace's woolly sunflower (*Eriophyllum walllacei*).

The most obvious dominants of the grass-herbaceous stratum were the green Mediterranean Grass and fluff-grass and red pigmy weed. Mediterranean Grass is a widespread low, common naturalized annual occurring in disturbed soils on open ground, along roadsides and in dry drainages of the Sonoran Desert below 1,200 meters. Fluff-grass is widely spread throughout the Planning Area and the Coachella Valley and often abundant on sites of low productivity, disturbed soils, dry rocky slopes, and among desert shrubs on very open sites from desert flats to foothills, throughout California and the southwest at altitudes up to 5,500 feet. It is generally considered to be of little or no forage value and avoided by grazing animals for the most part. It's fluffiness contrasts with the stark, open background of it's relatively barren habitat (Gould, 1973; MacMahon, 1987). Pigmy weed is a minute, abundant widespread native herb in California and the western Americas from Oregon to Chile (Benson, 1959). In the spring, Pigmy weed was the most obvious component of the ground cover understory because of it's bright red color (Photo Plate No. 2).



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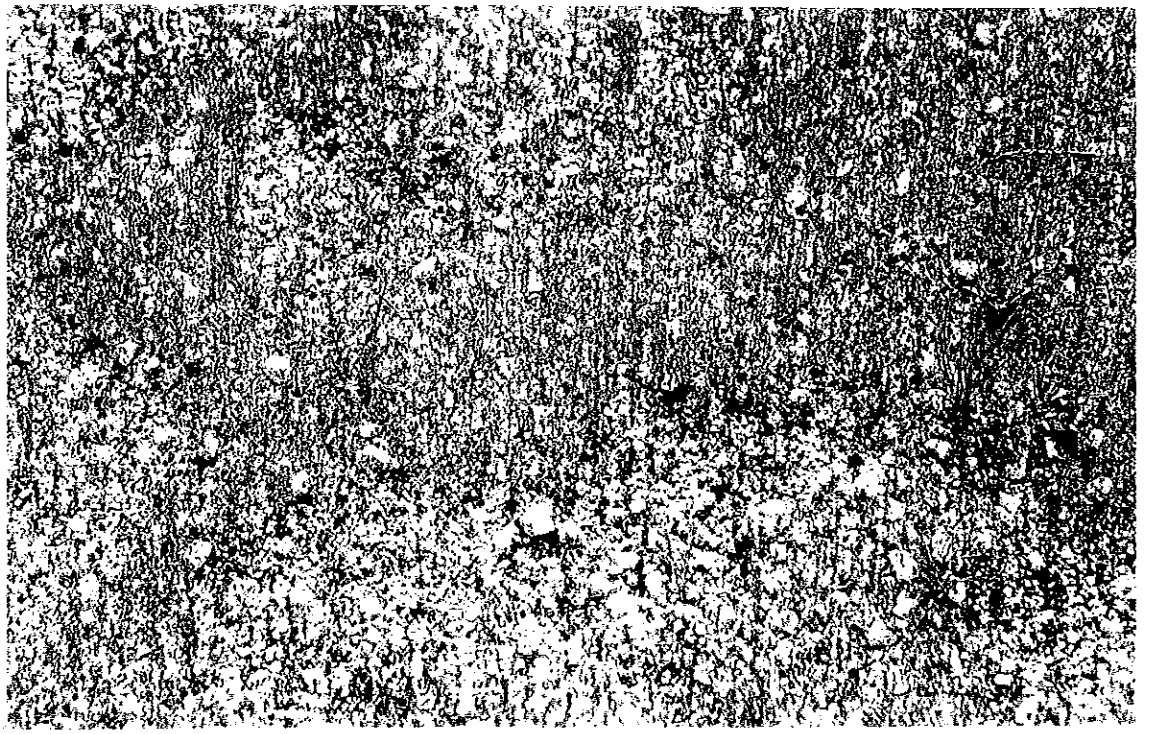
ASSESSMENTS - PLANNING - MANAGEMENT

Photo Plate 1:
Dense Spring 1995 Grass And
Herbaceous Ground Cover Understory
At Succulent Garden
Near Mission Lakes



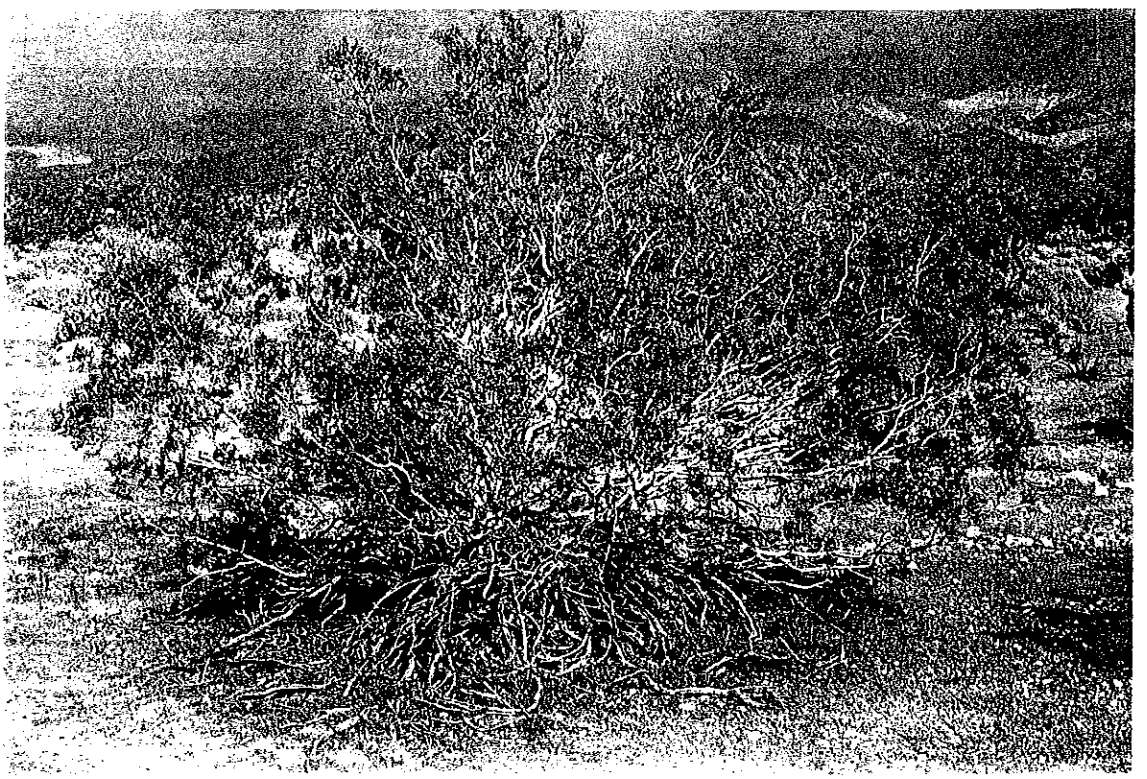


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Photo Plate 2:

Top: Red Pigmy Weed (*Crassula connata*).

Bottom: Dense Ground Cover Understory Occuring Under Shrub-stratum.

In general, the wildlife observed in the two succulent "ganders" included only a few locally common, abundant bird species such as black-tailed gnatcatcher (*Polioptila melanura*), northern mockingbird (*Mimus polyglottos*), western meadowlark (*Sturnella neglecta*) and white-crowned sparrow (*Zonotrichia leucophrys*). Only one sensitive species, the San Diego (coastal) cactus wren (*Campylorhynchus brunneicappillus sandiegoense*), a federal Candidate 2 and California Species Of Concern, was observed in the unnamed succulent stand, in the vicinity of Mission Lakes Country Club.

Habitat Value

The habitat value of Native Succulent stands habitat types was not provided by the BLM in 1982, but based on 1994 and 1995 Planning Area wide field observations of this habitat type, it's value was determined to be low to medium. In a natural condition, the native succulents habitat areas within the Planning Area are not considered rare habitat types and they do not provide habitat for watershed wildlife do not support a high diversity of wildlife species, or a high density of plant species support a significant number of non-native species, etc.

Direct Impacts To Native Succulents

The impact discussion for Sonoran Creosote Bush Scrub applies to this community as well. Unfortunately, these stands may be rapidly disappearing due to illegal succulent collecting. Today you are seeing only remnants of what existed just twenty years ago (The Planning Center, 1978b). Nonetheless, these areas probably represent the most diverse stands of cacti remaining in the Coachella Valley (Cornett, 1994). These stands have no legal protection status, therefore, they are not mapped on the Appendix G: *Sensitive Biological Resources Map* (CDFG, 1994b,c).

D. Desert Dry Wash Woodland (Element Code 62200)

This community is described as an open to dense, 30-60 foot tall, small-leafed riparian thorn scrub woodland which loses its leaves during droughts. Washes that dissect the Sonoran Creosote Bush Scrub habitat of the Planning Area support a greater diversity of plants in terms of both species and structural (layering) composition and hence a greater variety of wildlife (WESCO, 1987).

Characteristic Plant And Wildlife Species Of Desert Dry Wash Woodland

The dominant plants of this woodland are Catclaw Acacia, California Dalea (*Psorothamnus arborescens* var. *simplicifolius*), Desert Willow (*Chilopsis linearis*) and Burrobrush (*Hymenoclea salsola*). This community occurs along the larger drainages of the lower Mojave Desert and more generally through the Sonoran Desert. As described in several of the seventeen biological assessments reviewed for the Planning Area, it occurs in conjunction and locally intermixed with Sonoran Creosote Bush Scrub. Several sub-association habitat types are identified including Mesquite Wash and Wash Complex. No wildlife species are particularly characteristic of Desert Dry Wash Woodland habitat.

Habitat Value

The habitat value of Desert Dry Wash Woodland habitat types was not provided by the BLM in 1982. Based on 1994 and 1995 Planning Area wide field observations of this habitat type, the habitat value of Desert Dry Wash Woodland and sub-associations within the Planning Area is low to medium. According to the BLM, in a natural condition it is not a rare or high density habitat type, but it does provide low to moderate habitat for watershed wildlife and often supports a high diversity of wildlife species (BLM, 1982, Table 2-6). The relatively tall trees and shrubs provide nesting, foraging and perching sites not available on the surrounding desert terraces.

Direct Impacts Related To Continuing Development

Although this habitat type is a CNDDB highest inventory priority community, it is not a legally protected habitat but impacts to this habitat may be considered significant under CEQA. Since Desert Dry Wash Woodland is so wide spread throughout the "Lower Colorado River Valley Biome Subdivision" of the "Sonoran Desert Scrub Biome," it is not a sensitive habitat type and has no current or proposed protection status. Therefore, its existence as a habitat type will not be threatened by continued development.

E. Desert Fan Palm Oasis Woodland (Element Code 62300)

The Desert Fan Palm Oasis Woodland is a unique and significant, though relatively rare, desert vegetation type (Comarc, 1981; CVMEA, 1981). In their Desert Plan, The Bureau of Land Management has designated this habitat as unique, extremely valuable and especially sensitive (vulnerable) (BLM, 1980). Although palm oasis are not legally protected habitat types they are listed by the California Department of Fish and Game as "communities with highest inventory priorities" because they are "restricted in range" and moderately threatened by development, hikers, etc. (CNDDB, 1994b,c, and 1995, a, b; CDFG, 1992).

Few of these oasis exceed a few acres in extent, and most of the largest ones are found along drainages. In the Coachella Valley, palm oasis are typically associated with earth faults, either directly as these phenomena can facilitate the upward movement of moisture, or indirectly as in Palm Canyon where the fault formed canyon directs the flow of runoff from surrounding mountains (Cornett, 1980). These oasis can survive only where there is a reliable source of water very near the surface. Therefore, the palm tree is a certain indicator of a spring, seepage, or groundwater rich area (Comarc, 1981). Scores of oasis occur throughout the Coachella Valley. The most spectacular oasis of the surrounding region, located in Palm Canyon, supports over 3,000 palms (Cornett, 1980). This habitat type supports wildlife species and plants of high water requirement which would not otherwise occur in the region. The associated species and vulnerability of this habitat type are briefly discussed below.

1995 Status Of The Two Planning Area Desert Fan Palm Oasis Woodland

The two palm groves at the Two Bunch Palms Resort and Spa are the only naturally occurring palm oasis remaining in the Planning Area. The location of this vegetational type is mapped on the Appendix G: *Generalized Vegetational Map*. They represent the most northern occurrence of the California Fan Palm (*Washingtonia filifera)* in the Coachella Valley, and as such, they are of historical, as well as biological, significance (Cornett, 1994). A "grove" of 7 palms was formerly located in the Seven Palms Valley, at the Seven Palms Ranch. This grove is listed by the CNDDB (1995a,b) as extirpated. Palms presently growing on the former Seven Palms Ranch property are introduced ornamental species or native species that occur there as a result of increased water availability (WESTEC, 1980). Before being eliminated by a flash flood, a lone palm occurred in Little Morongo Canyon but this location was north of the Planning Area (Cornett, 1994). It was determined during April 1995 field surveys that the northern most "bunch" of palms, located at the Two Bunch Palms Resort and Spa, has been incorporated into a guest pool/ resort office complex. Although the southeastern "bunch" of palms appears to be in a somewhat natural state, it is surrounded by resort spa structures and roads. No palm recruitment was apparent in either of the two "bunches".

Characteristic Plant And Wildlife Species Of Palm Oasis

As the name suggests, these oasis are areas dominated by palms. There is only a single species, the California Fan Palm (*Washingtonia filifera*), present in the Planning Area and they are by far the largest and most imposing native desert trees of the Planning Area (Comarc, 1981). Many animals, including prehistoric and historic man, are attracted to the palm groves since they offer water, shade, and good cover.

Habitat Value

The habitat value of Desert Fan Palm Oasis Woodland habitat type was not provided by the BLM (BLM, 1982, Table 2-6). In the Coachella Valley, the Desert Fan Palm Oasis Woodland is a rare, high density habitat type providing habitat for watershed wildlife (BLM, 1982, Table 2-6). The single Desert Fan Palm Oasis Woodland area of the Planning Area, consisting of two small groves located at the Two Bunch Palms Resort And Spa, has been incorporated into the resort's landscape area. Therefore, based on 1995 field observations of this habitat type, it's value was determined to be low because they (a) do not exist in a natural condition, (b) are not apparently regenerating or expanding, and (c) provide only limited resources for native wildlife due to on-going human disturbances (e.g., noise, lighting, resort guest foot traffic, etc.). The southeast bunch of palms is used for nesting by barn owls; however, the owls could use other landscape trees or structures to nest in, in the absence of the palms.

Direct Impacts To Palm Oasis

It appears that the two natural palm groves of the Planning Area are not in danger of being destroyed because they are part of the Two Bunch Palms Resort And Spa's landscape. As such, they are valued and protected as part of the resort's amenities and ambiance.

According to the Center for Regional Environmental Studies (CRES) at San Diego State University, man's activities have had serious impact on Coachella Valley's palm groves, most of it negative. Some groves are so heavily visited that everything around them is trampled, and most animals have been frightened off or reduced in numbers (CRES, 1976). In some oasis, the reproduction (recruitment) of palms is non-existent, and the future of the groves is seriously in doubt. Because the palms are rather long-lived, it may take several decades or more before the true degree of impact is noted. It is not inconceivable that in the next fifty years many of the small palm groves of the region could become extinct. Some believe that when this happens, there will be an invasion by tamarisk and other less desirable species, precluding the natural establishment of palms. In any case, the groves need protection from overuse. For this reason, they should be carefully avoided whenever possible (Cornett, 1994 and 1980).

F. Desert (Mesquite) Dune, Sand Plain, And Wind Shadow "Dunes"

Many desert alluvial soils are fine-grained and easily moved by wind and water. Three general types of blow sand deposits, that occur in a mosaic pattern in the Planning Area, have been identified (England Nelson, 1976). They are stabilized and partially-stabilized desert dune landforms, Desert Sand Fields, and wind shadow "dunes". The general areas where these blow sand deposits occur are mapped on the Appendix H *Generalized Vegetational Map*. Each of the three types of blow sand deposits are briefly described below.

Stabilized And Partially-Stabilized Desert Dunes

The desert dune and sand accumulation areas of the northern Coachella Valley, including the Planning Area, rise up off of a large, gentle alluvial plain to heights of approximately 30 feet in some places, and form a somewhat discontinuous band of dunes roughly 1,500 feet wide and 5 miles long. Two major blow sand deposits/accumulations occur in the Planning Area. The largest desert dune and sand accumulation area trends northwest to southeast, roughly paralleling the portion of the Devers-Palo Verde power line route located in the northern portion of the Seven Palms Valley. Desert dune and sand accumulation areas also occur in the Painted Hills Road area on the top of the bluffs east of Whitewater River Wash. The sand dunes of both areas are relatively small and well stabilized by vegetation, primarily Mesquite with some Saltbush, Indigo Bush, and Creosote Bush. The areas are depicted on the Appendix G *Sensitive Biological Resources Map* and Appendix H: *Generalized Vegetational Map*.

Painted Hills Dune Sand Accumulations

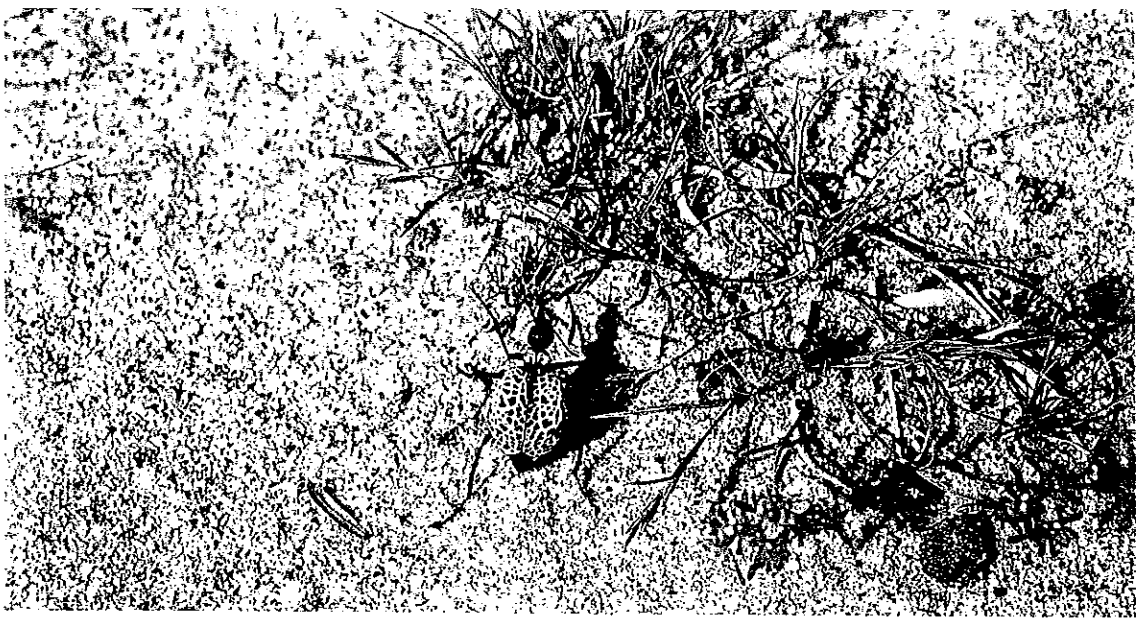
The southwestern portions of the sphere of influence, surrounding Painted Hills Road (formerly Old Morongo Valley Road), between Whitewater Hill, Whitewater Canyon, the foothills of the San Bernardino Mountains and State Highway 62 contain dune (blow) sand accumulations. The Whitewater River Wash is the most likely sand source for the blow sand accumulations of the Painted Hills area. That is, the sands of the Planning Area are carried upward and eastward into the Painted Hills from Whitewater River Wash. As shown on the Appendix G *Sensitive Biological Resources Map* and the 1989-1991 Coachella Valley Water District Orthophotographs of the Planning Area, two types of sand accumulations occur in this region including (1) a narrow, liner dune area located along the bluffs forming the eastern side of Whitewater Canyon and (2) wind shadow "dunes" developed on the down wind sides of larger shrubs on the northern slopes of Whitewater Hill. Dune sands hold water. As a result, they are more densely vegetated with more robust sized shrubs than drier interdunal areas (Photo Plate No. 3). In addition, dunes provide the type of burrowing substrates preferred by some rodents and reptiles. Therefore, rodent burrows are more frequent on dunal sand accumulations where they can take advantage of a wetter, more mesic environment, larger quantities of forage and seeds, and more favorable burrowing substrate. Interdunal areas are drier and support only sparsely distributed and smaller sized grasses and forbs, and therefore represent a harsher environment for desert wildlife. As shown on Photo Plate No. 3 the grass and herbaceous (forb) ground cover understory of Planning Area dune regions is sparser than other areas of the Planning Area. For example, contrast the sparse dune understory shown on Photo Plate No. 3 with the dense grass and herbaceous understory shown on Photo Plate No. 1.

Wind Shadow Sand "Dunes"

Less obvious blow sand deposits are wind shadow sand "dunes", also located in the Painted Hills area on the northern slopes of Whitewater Hill between Whitewater Canyon and State Highway 62. The wind shadow "dunes" were previously identified as sand hummocks by England Nelson (1976) and Wagstaff and Brady (1982a). The Whitewater River Wash is also the most likely sand source for these blow sand accumulations. As shown in Photo Plate No. 4, the Whitewater Hill wind shadow "dunes" are approximately 2' to 5' high aeolian (wind blown) sand deposits developed on the down wind (leeward) side of larger shrubs. As a result of sand accumulation and subsequent increased water retention they are more densely vegetated with more robust sized grasses and forbs than interdunal areas. In addition, rodent burrows are more frequent on dunal sand accumulations where they can take advantage of a more mesic environment, larger quantities of forage and seeds, and more favorable burrowing substrate. Interdunal areas are drier and support more sparsely distributed and smaller sized grasses and forbs and are therefore provide a harsher environment for desert wildlife. However, as evidenced by numerous wildlife trails, such as the one visible in Photo Plate No. 4, animals make extensive use the interdunal areas.

Seven Palms Valley Dune Sand Accumulations

As shown on the Appendix H map and the 1989-1991 Coachella Valley Water District Orthophotographs of the Planning Area, a series of disjunct, low stabilized and partially-stabilized desert dune landforms occur in the northwestern portion of Seven Palms Valley. Although these are not the theatrical dunes of the Sahara Desert, some of the sand accumulations of the Planning Area have been worked into obvious sand accumulation landforms whose size and shape are determined by the wind and associated stabilizing vegetation. The sand accumulation landforms of the Seven Palms Valley have been described by WESTEC (1980) as a "desert dune and sand plant community." Most of the larger sand accumulation areas of this valley most closely fit Holland's (1986) terrestrial natural community description of Stabilized and Partially-Stabilized Desert Dune (Element Code: 22200). The dunes of this type of dune habitat are typically lower than active dunes and are stabilized and partially-stabilized by evergreen and/or deciduous shrubs, scattered low annuals



John Minch and Associates, Inc.

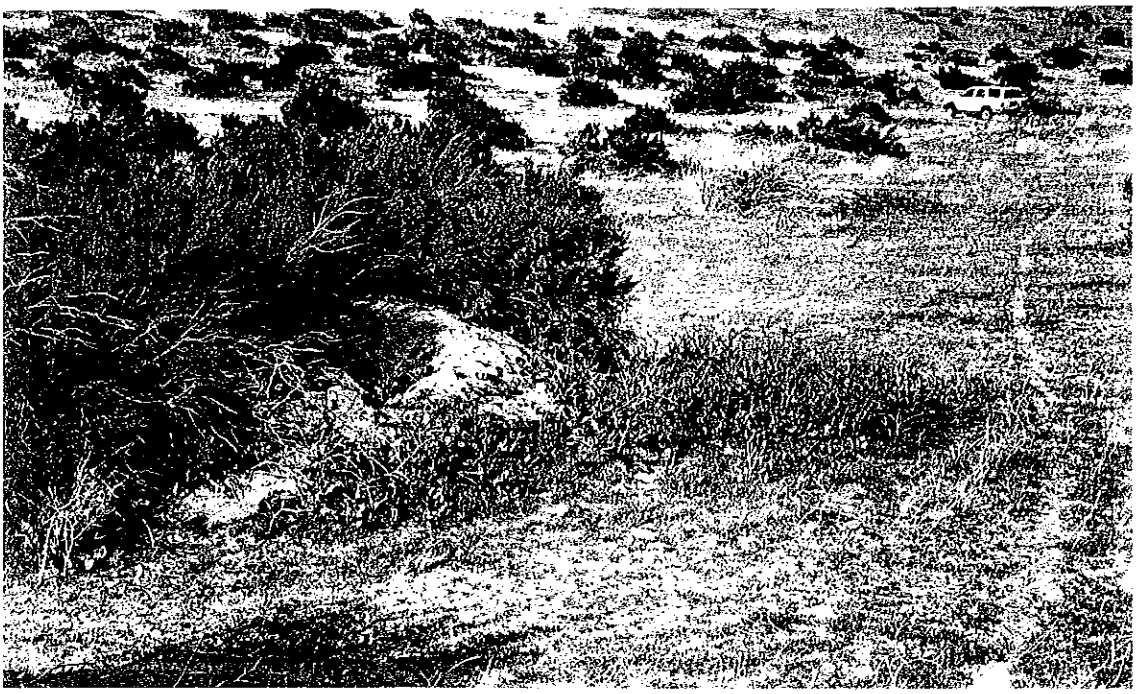
NATURAL RESOURCES & ENVIRONMENTAL
ASSESSMENTS - PLANNING - MANAGEMENT

Photo Plate 3:

Top: Sparse Ground Cover On Mesquite - Sand Dune Areas.

Bottom: Desert Spider Beetle (*Crysodermis armatus*) On Mesquite - Sand Dune.

Down Wind Side



Down Wind Side

Wild-life Trail

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Photo Plate 4:

Top: Wind Shadow Sand "Dune" On Northern Slope Of Whitewater Hill

Bottom: Wind Shadow Sand "Dune" And Adjacent Wildlife (cf. Jack-Rabbit) trail.

and perennial grasses and forbs. The dominant plant species of the dune areas within the vicinity of the Seven Palms Valley are saltbush (*Atriplex canescens*) and mesquite (*Prosopis glandulosa*) (Wagstaff and Brady, 1982). In the Planning Area, these dune communities intergrade with lower elevation, peripheral Sonoran Creosote Bush Scrub and Desert Dry Wash Woodland habitats. The most uncommon and botanically rich dune area is located in the vicinity of the intersection of the Devers-Palo Verde #2 500 KV Transmission line and Mission Creek Wash in S13, T3S, R4W of the Desert Hot Springs USGS quadrangle (WESCO, 1987).

Surficial soils of the sand accumulations areas located between dunal landforms of the Planning Area, consist mostly of silts, sands (some of which are local aeolian sands), and gravels. A blanket of igneous and metamorphic clasts, ranging in size from pebbles to boulders, are sparsely to densely scattered over these interdunal surfaces (Devers-Mirage 220 kV, 1991).

Sand Fields

Other sand accumulations of the Planning Area are not as obviously worked into dune landforms but instead are characteristic of flatter sand accumulations or sand fields occurring throughout the surrounding Coachella Valley (Wagstaff and Brady, 1992a). These areas most closely fit Holland's (1986) natural community description of Stabilized and Partially-Stabilized Desert Sand Fields (Element Code: 22300). Sand Fields are most often found along the toe of Bajada slopes. The source of the dune sand is the alluvial deposits at the mouth of Whitewater Canyon, at the extreme northwestern end of the Coachella Valley (southwestern boundary of the Planning Area) (Cornett, 1980). In the region of the Planning Area, blow sands are moved east and south by prevailing westerly winds traveling through the San Gorgonio Pass (Cornett, 1980).

Characteristic Plant And Wildlife Species Of Desert (Mesquite) Dune, Sand Plain And Sand Hummocks

This community (stabilized desert dunes of Cheatham and Haller 1975) is different from the greater surrounding Creosote Bush Scrub vegetation because dunes support different species, lesser to ground cover, and a number of uncommon or restricted plants and animals. Blow sands are often the best place to find wildflowers in the spring growing between the ever-present creosote bush, one of the few perennials to live on the dunes. Recently the Russian Thistle or "tumbleweed" has become widespread in this habitat, choking out the native plant species. An extensive list of plant species associated with blow-sand deposits is located in Appendix 2 of the 1985 Coachella Valley Fringe-Toed Lizard Habitat Conservation Plan. As previously discussed and shown previously in Photo Plate No. 1, in the spring of 1995 the desert "floor" of the Planning Area was literally carpeted with a conspicuous ground cover consisting of numerous native and non-native spring understory grasses and forbs. During 1995 field surveys of the Planning Area, it was observed that the density, relative cover (dominance) and primary species components of the ground cover was obviously different within different vegetational communities. As shown in Photo Plate No. 3, in the spring of 1995 the most obvious species dominants of the desert dune and sand areas, located in the southeastern portion of the Planning Area, were native forb populations of cryptantha, pigmy weed and recurved and broadfruit pectocarya. A number of other annual and perennial spring grass and herbaceous species were infrequently interspersed among the dominant plant species including introduced fluff-grass, spurge and red-stemmed filaree.

Desert sand areas also support numerous interesting, unusual wildlife species. For example, the flightless phytophagus (plant eating) desert spider beetle (*Cysteodemus armatus*) was observed among the sparse ground cover of the sand dunes, located immediately west of the intersection of Palm Drive and 20th Avenue (Photo Plate No. 3). The back of this widespread, non-sensitive black blister beetle is blotched with a white waxy secretion. The presence of numerous other species of insect life were obvious as indicated by the presence of innumerable yellow and dark red insect eggs literally covering, and coloring vast expanses of approximately 1 cm high, immature cryptantha germinants. In addition, the sand areas support numerous vertebrate species. The endangered Coachella Valley Fringe-Toed Lizard (*Uma inornata*;

CVFTL) is the most commonly observed larger vertebrate species that is active during the day. This species is primarily restricted to the isolated hummocks of loose, windblown sand dune communities within the Coachella Valley (WESCO, 1987). CVFTL have been observed in the blow sand area in the southern and eastern portions of the Planning Area (Desert Hot Springs General Plan, 1987).

Habitat Value

The habitat value of sand dunes and other sand accumulation areas of the Planning Area is determined to be high because they are considered rare habitat types providing habitat for sensitive and watershed wildlife. According to the BLM, they support a high diversity of wildlife species and low to moderate density of plant species (BLM, 1982, Table 2-6). The sand dunes of the Coachella valley are classified by the California Natural Diversity Data Base (CNDDB 1985) as the equivalent of a "rare and threatened species or very rare and endangered and threatened subspecies" (CNDDB 1983). The blow sand areas are particularly valuable as known or potential habitat for Coachella fringe-toed lizard.

Direct Impacts To Desert Blow Sand Deposit Areas

Continued urbanization, implementation of wind erosion abatement procedures (e.g., planting of landscape windrows) to reduce air-borne sand and stabilize blowing sand on lands surrounding sand dune environments, landscaping and agricultural activities within the Planning Area could result in the disturbance, stabilization and/or destruction of remaining sand dune environments. This habitat type is essential to the survival of listed and proposed rare, threatened and endangered species commonly associated and adapted to dune environments such as the Coachella Valley Fringe-Toed Lizard. On the other hand, some biologists conclude that the planting of landscape windrows provides bird habitat replacement for roost and nest trees lost to continuing development within the Planning Area (Barrows, 1992) and that this effect partially mitigates impacts due to loss of blow sand areas.

G. Ephemeral Desert Dry Wash, Gully, And Drainage Areas

Ephemeral desert dry wash, gully and drainage areas are physiographic features that, in some places, support vegetation different from that in immediately adjacent plant communities. These areas are not assignable to a specific type of terrestrial natural community (Holland, 1986). For the purposes of this report, unlike ephemeral desert dry wash, gully and drainage areas differ from Desert Dry Wash Woodland in that Desert Dry Wash Woodland is a defined habitat type that occurs along the larger drainages in California deserts and is characterized by a specific group of indicator plant species.

The major variations in desert vegetation result from differences in the availability of water. Water availability is in turn closely related to the soil and to the location of a site relative to above and below ground sources of water. Dozens of major and innumerable minor washes occur within the Planning Area. Dry washes are commonly described as well-developed drainage areas created by periodic flooding and run-off from higher ground. They provide a unique habitat based on periodic flooding, substrate alteration (e.g., scouring and sedimentation), and a high water table. The most dense and lush vegetation in the desert is found adjacent to surface water. In such circumstances the vegetation has a strikingly different composition from the adjacent, less watered vegetation. Similarly, major drainages, such as Whitewater River, Mission Creek, Big and Little Morongo Washes, Little Morongo Canyon, Blind Canyon, Long Canyon, even if they contain surface water only infrequently (e.g., once a year or less), still support larger sized and denser vegetation than the surrounding higher, drier desert scrub covered flats because plants are able to tap the groundwater supply. Thus year-round moisture is available. Even minor drainage ways often support conspicuously different vegetation than adjacent areas a foot or two higher. The least favorable moisture conditions exist in heavier soils on upland slopes. The dominant plant species of these areas include Palo Verde (*Cercidium floridum*) and ironwood (*Olneya tesota*) (Wagstaff and Brady, 2982a).

The wash-dependent woodlands are important woody communities in the otherwise uniform and less diverse alluvial fan areas vegetated by creosote bush scrub vegetation (WESCO, 1987). Subtle differences in the type of vegetation in washes can be explained by differences in soil texture, depth, and rockiness. As shown in Photo Plate No. 1, the barren ground, observed in the desert during the dry season, can be converted in years of good rainfall into lush carpets of grasses and colorful annual plants.

Riparian Habitat

Riparian habitat is a plant community commonly associated with more mesic washes and drainages elsewhere in Southern California. With the exception of the artificial, manmade Riparian habitat surrounding the large lake at Mission Lakes Country Club, this "habitat" type is absent from the Planning Area (Cornett, 1994).

A preliminary plant and wildlife list of the Mission Lakes Country Club artificial Riparian "habitat" was compiled during March 1995 field surveys of the Planning Area. The club house lake is completely surrounded by mown golf course turf. One large specimen of the non-native, upland pampas grass (*Cortaderia sellouna*) and one large patch of the native emergent narrow-leaved cattail (*Typha angustifolium*) occur respectively along the western and southern portions of the lake. The wildlife observed on or around the club house lake included locally common, abundant species such as American coot (*Fulica americana*), American wigeon (*Anas americana*), cinnamon teal (*Anas cyanoptera*), common merganser (*Mergus merganser*), great egret (*Casmerodiua albus*), killdeer (*Charadrius vociferus*) and mallard (*Anas platyrhynchos*). No sensitive species were observed.

Characteristic Plant And Wildlife Species Of Wash, Gully And Drainage Areas

Washes that dissect the creosote bush scrub support a great diversity of plants in terms of both species and structural (layering) composition and, hence, a greater variety of wildlife relative to the surrounding creosote bush scrub community. Wash communities are characterized by woodland-like stands of taller (up to 20 feet) wash-dependent woody species which are largely restricted to wash habitats such as blue palo verde, ironwood, smoke tree, and mesquite intermixed with creosote bush and other common desert scrub plants (WESCO, 1987) Typical wildlife of the wash habitat include Gamble's quail (*Callipepla gambelii*), dove (*Zenaida asiatica* and *Z. macroura*), road runner (*Geococcyx californianus*), loggerhead shrike (*Lanius ludovicianus*), northern flicker (*Colaptes auratus*), ash-throated flycatcher (*Myiarchus cinerascens*), and verdin (*Auriparus flaviceps*).

Wildlife Movement Corridors

The washes, gullies and drainages of the Planning Area may provide certain wildlife species (e.g., coyote, deer, sheep, etc.) with wildlife movement corridors between the mountainous northerly corners of the Planning Area and the Coachella Valley (Terra Nova Planning & Research, Inc., 1991; Tierra Madre Consultants, 1990).

Habitat Value

In general within the Planning Area, the habitat value of Desert Dry Wash, Gully, and Drainage Areas is medium to high. According to the BLM, in a natural condition these habitat types are not considered to be a rare habitat type but they do provide habitat for watershed wildlife and often support a high diversity of wildlife and relatively dense vegetational cover (BLM, 1982, Table 2-6). Desert dry wash community (Cheatham and Haller 1975) is listed by CNDDB (1985B) as having highest inventory priorities, but only at element rank level II: "possibly threatened, needs more information" (CNDDB 1985a).

Direct Impacts Related To Development Within Wash, Gully And Drainage Areas

Potential impacts to washes, gullies and drainage areas include such things as the disruption of water courses, increased sedimentation within the drainages, changes in down-stream hydrology, destruction of natural plant communities, negative impacts on associated wildlife, etc. Any development proposing to alter any wash or drainage area may fall under the jurisdiction of, and therefore subject to, permitting by at least the following state and federal regulatory agencies: California Department of Fish and Game (1601-1603 agreements), U.S. Army Corps of Engineers (404 permit). US Fish and Wildlife Service, and California Regional Water Quality Control Board (401 permit). These agencies must be consulted before proceeding with proposed alterations. As part of the permitting process, mitigation measures may be required to avoid or mitigate unavoidable project impacts to these wash or drainage areas.

Since washes, gullies and drainages act as potential wildlife movement and migrational routes, continuing development will also significantly impact movement corridors by forcing the use of alternate routes, reducing foraging territory, dislocating migration patterns, creating isolated populations, restricting mate-finding behavior, reducing "gene flow" between existing sub populations, etc.

H. Mountain Foothills of the San Bernardino and Little San Bernardino Mountains

The foothills of these mountain ranges extend into the northeastern and northwestern portions of the Planning Area. They support a local variation of the Sonoran Creosote Bush Scrub habitat type which some biologists have defined as "rocky canyon habitat" or rocklands (Tierra Madre Consultants, 1990; WESCO. 1987). This habitat type occurs on rock-dominated surfaces of slopes and within ravines, and possesses a sparse shrub vegetation cover of which cacti are an important component (PSBS. 1980). The "rocky canyon habitat" within the Planning Area also provides wildlife movement corridors between the mountainous northerly corners of the Planning Area, the Whitewater River, and the Coachella Valley (Tierra Madre Consultants, 1990).

Characteristic Plant and Wildlife Species Of Mountainous Foothills

Although the rugged rocklands are not particularly unusual or sensitive, they apparently provide more suitable habitat for plant species which are not as abundant on the gentler, flat alluvial fans of the Planning Area (e.g., ocotillo, wishbone bush, etc.). These areas are also somewhat more prone to long-term disturbance because of their lower revegetation potential and harsher growing conditions (i.e., lower water holding capacity, less soil, etc.) (WESCO, 1987).

The lower rocky mountain slopes of the San Bernardino and Little San Bernardino Mountains bordering the Planning Area on the northeast and west support Sonoran Creosote Bush Scrub vegetation similar to that of the upper portions of the bajadas, with subtle variations related to rock type, exposure, and age of the surface. However, rocky slopes which for some reason do accumulate runoff and which contain good soil between the boulders can, in many instances, support some of the richest vegetation of the hotter desert, and frequently exhibit spectacular displays of succulents, such as the fishhook cacti, barrel cactus, and beavertail cactus.

As previously discussed and shown in Photo Plate Nos. 1 and 3, in the spring of 1995 the desert floor was literally "carpeted" with a conspicuous ground cover understory consisting of numerous native and non-native spring understory grasses and herbaceous species. In 1995, the foothills of the Little San Bernardino and San Bernardino Mountains were similarly, lushly vegetated with a conspicuous ground cover understory. The most obvious species dominants of the mountainous foothills were dense native grass and forb populations of native woolly plantain (*Plantago ovata*), fluff-grass, saw-toothed plant, and pectocarya. A number of other "showy" annual and perennial spring species were infrequently interspersed among the dominant species including native pygmy gold-poppy (*Eschscholzia minuteflora*) and introduced wild mustard (*Brassica tournefortii*), desert chicory, spurge and filaree.

The wildlife of the foothills is similar to that of other Sonoran Creosote Bush Scrub areas with the exception of two subspecies of the desert bighorn sheep. Nelson's bighorn sheep (*Ovis canadensis nelsoni*), occurs in the northeastern part of the Planning Area in the Little San Bernardino Mountains. Peninsular bighorn sheep (*Ovis canadensis cremnobates*) may enter the Planning Area from the San Jacinto mountains on the south (Wagstaff and Brady, 1992a). Although not listed as a threatened species, the sheep species are fully protected by California law in Section 4700 of the Fish and Game Regulations.

Habitat Value

The habitat value of the mountainous habitat types bordering the western, northern and northeastern boundaries of the Planning Area was not provided by the BLM in 1982. Based on 1994 and 1995 Planning Area wide field observations of this habitat type, it's value was determined to be low. In a natural condition the mountainous areas are not considered rare habitat types because they do not provide habitat for watershed wildlife, only support a low to moderate diversity of wildlife species and vegetational cover, and are generally not threatened by human impacts to the extent that lowland areas are.

Impacts to Mountainous Foothills and Bajadas

Sheep habitat is being threatened by continued development within the Planning Area. Specific threats involve erection of fences or other linear obstructions to sheep movement by developments adjacent to sheep habitat, loss of food and cover essential to the survival of the sheep, and undue amounts of disturbances of the surrounding sheep habitat by activities associated with construction or occupation of developments (e.g., building pads, landscaping, road alignments, flood control improvements, fairways, etc.) and recreational use of sheep habitat by residents of adjacent developments. Impacts can be avoided or minimized by preservation of as much of on-site sheep habitat as feasible, and designing and implementing construction activities to avoid or minimize disturbances to the surrounding habitat.

V. PLANT AND WILDLIFE SPECIES OF THE PLANNING AREA

During preparation of the biological sections for the Master Environmental Impact Report and General Plan update of the Planning Area, seventeen biological assessments were reviewed to obtain plant and wildlife species inventories for each of these development sites. These biological assessments are listed in Table 1 and mapped on the Appendix F *Approximate Locations of 1978-1994 Biological Assessment Sites of the Planning Area* map. Of the seventeen available assessments, only the following nine biological assessments contained some type of plant and wildlife species inventory list:

- Annexation No. 22
- Rancho Royale Specific Plan
- Olympus Golf Course
- Mission Lakes Property
- Tentative Tract No. 22757 (Indian Hills EIR)
- Rancho Morongo Country Club
- Cornerstone Specific Plan
- Desert Hot Springs 12-Acre Project
- Seven Palms Ranch

Adequacy of the 1978-1994 Plant and Wildlife Compendia

During reviews of the seventeen biological assessments conducted within the Planning Area between 1978-1994, it was determined that many of the surveys were relatively short, e.g., some as short as 1 to 1.5 hours long (Marsh and Marsh, 1988; Barrows, 1988), and/or diurnal fall/winter surveys, e.g. four of the nine were conducted between November and January. Only two of the seventeen 1978-1994 assessments conducted nocturnal surveys (PSBS, 1980 and Cornett, 1994), and no biological assessments were located which conducted surveys of the Planning Area during May or October of any year. In addition most of the surveys were

conducted in a season of the year or time of day when the activities of specific animal species were suppressed (e.g., when animals were dormant or had migrated off-site; when it was too hot or too cold; during times of day when specific species, including nocturnal bats, raptors, and rodents, were inactive; etc.). In recognition of the limiting factors, which reduce survey accuracy, the surveying biologists recommended conducting additional longer diurnal and nocturnal surveys during the appropriate seasons and times. It could not be determined if these recommendations were subsequently implemented. Therefore, 1995 field surveys of the Planning Area were conducted during more optimal survey conditions.

March and April 1995 Field Surveys of the Planning Area

Field surveys were conducted in March and April 1995 to (a) field check selected parts of the plant and wildlife inventory data provided in the nine biological assessments listed above, (b) search for and record previously undetected sensitive plant and wildlife species and habitat types; (c) obtain a more complete and representative cataloguing of the plant species occurring in the soil "seed bank" of the Planning Area; (d) correct, update and expand previously prepared species inventories; and (e) construct a vegetational map depicting the 1995 boundaries of the predominant vegetational habitat types within the Planning Area.

The spring of 1995 was an exceptionally "wet" year, and therefore it is likely that a majority of the plant species of the "seed bank" of the Planning Area soils would have germinated and were therefore present for identification.

As a result of the literature review and 1994/1995 field surveys, current lists (compendia) of the botanical and wildlife species and a *Generalized Vegetation Map* of the Planning Area were prepared. They are located in Appendix A, B and H respectively. The Appendix A and B plant and wildlife compendia are not purported to be complete inventories of the species of the Planning Area. However, it is highly likely that the majority of the native species occurring within the Planning Area have now been identified, and it is unlikely that they will not be significantly expanded during future Planning Area field surveys. An analysis of both the Appendix A Floral Compendium and Appendix B Wildlife Compendium, and discussion of the vegetational map are briefly summarized below. More detailed analysis of the plant and wildlife compendia and vegetation map preface Appendices A, B, and H, respectively.

A. Plant Species and Habitat Types of the Planning Area

Appendix A shows that a total of 194 plant species have been recorded as observed within the boundaries of the Planning Area during 1978 to 1995 field surveys. Most of the plant species observed and identified are locally common and abundant species typically associated with Sonoran Creosote Bush Scrub (Holland, 1986). Table 3 lists the sensitive plant species observed or expected to occur within the Planning Area. Only two (2) sensitive plant species have been observed or have a high probability of occurring in the Planning Area - the Coachella Valley Milk Vetch (observed) and Little San Bernardino Mountains Gilia (expected). Sensitive species are discussed in more detail in the following Section VI. These species have no state protection, but are federally proposed for listing as endangered and a Candidate 1 species for federal listing respectively. These two species represent only approximately 1% (2/194) of the total plant species identified for the Planning Area. The known location of the milk vetch is depicted on the Appendix G *Sensitive Biological Resources Map of the Planning Area*. Eight other sensitive species, previously listed as potentially occurring within the Planning Area, have never been observed and have therefore been assigned a low probability of occurrence and are not expected to occur within the Planning Area (Table 3). Although several "sensitive" habitat types occur within the Planning Area, no Planning Area habitat types are currently state or federally listed or proposed for listing.

Non-Native Plants

Thirty-one (31) species of non-native plants occur within the undeveloped portions of the Planning Area. This represents approximately 16% (31/194) of the total plant species identified for the Planning Area. The presence of non-natives is indicative plant communities that have been significantly modified of (disturbed) (e.g., surficial grading, off-highway vehicle use, construction of access roads, fires, etc.).

Landscape Materials of the Urbanized Portions of the Planning Area

The urbanized portions of the Planning Area are primarily devoid of native species and habitat and have been extensively landscaped with non-native plant species. Tamarisk (*Tamarix* sp.) and oleander (*Nerium oleander*) have been extensively planted as wind breaks near highways, railroad lines, homes, commercial structures, etc. No attempt was made to inventory the hundreds of species of landscape materials growing in the urbanized pieces. The landscape materials are an eclectic mixture of non-natives and natives.

B. Wildlife Species of the Planning Area

An analysis of Appendix B shows that a total of 124 wildlife species have been recorded as observed within the boundaries of the Planning Area during 1978-1995 field surveys of the Planning Area. The majority of the animal species observed and identified are locally common and abundant species typically associated with Sonoran Desert habitats and vegetation. However, as indicated on Table 4, thirty-six (36) wildlife species considered sensitive by the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) are known to occur in the Planning Area. Of these 36 species, six (6) are listed as threatened or endangered by the federal government (USFWS) or State of California (CDFG). The remaining 30 species are considered sensitive but do not have endangered or threatened status. The 6 threatened or endangered species represent only approximately 4% (5/124) of the total wildlife species identified for the Planning Area. The known and possible locations of listed and unlisted but observed sensitive species are depicted on the Appendix G: *Sensitive Biological Resources Map* Of The Planning Area. The probability of occurrence of 16 unlisted never observed species are summarized on Table 4 and discussed in Section VI: *Sensitive Species And Habitat Types Of The Planning Area.*

The Coachella Valley Association of Governments (CVAG) is currently conducting a number of focused sensitive species surveys throughout the Coachella Valley, including the Planning Area. The results of their work may identify additional sensitive species within the Planning Area which could be included on Table 4. For example, in 1995, CVAG contracted small mammal live trapping studies for use in establishing a biological data base to be used in preparation of the Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP). As of April 24, 1995, one species not reported in the seventeen reviewed studies had been trapped and identified - the white-throated wood rat (*Neotoma albigua*) (Dodd, pers. comm., April 24, 1995). Additional species could be identified by the end of the projected June 1995 completion date of the small mammal trapping studies. Additional species identified beyond April 24, 1995, are not included in this.

C. Vegetation And Sensitive Plant And Wildlife Species Maps Of The Planning Area

No regional or Planning Area wide vegetational or sensitive wildlife species habitat maps specifically developed to plot the locations and distributions of sensitive plant and wildlife species, boundaries of plant communities, or wildlife habitat boundaries of the Planning Area were located during the 1994 and 1995 reviews of the seventeen biological assessments. The specific locations and distributions of sensitive plant and wildlife species and plant communities or wildlife habitat boundaries were plotted on the Appendix G: *Sensitive Biological Resources Map*, and Appendix H: *Generalized Vegetation Map*, using the data gathered during 1994-1995 literature reviews and field surveys of the entire Planning Area .

Appendix G and H Sensitive Biological Resources and Vegetation Maps

The generalized vegetation map and sensitive biological resources maps of the Planning Area were plotted using maps and descriptions of sensitive biological resources and plant communities recorded in the seventeen available biological assessments. The data shown on both maps also reflects the results and findings of JMA's September 1994 and March and April 1995 field surveys of the Planning Area, plant habitat and species locality data recorded in CNDDB Rare Find records and quad sheet velum overlays, and other available maps showing the reported locations and distributions of habitats and species within the Planning Area (e.g., *San Gorgonio Pass Wind Energy Project* Map No. 3-5 showing *Rare, Threatened, Endangered, And Sensitive Plant And Animal Species, SCE Co.'s Devers-Palo Verde #2 500 kV Transmission Line Project DEIR* Figure 4.5-1 Major Vegetation Types, etc.). With only a few localized exceptions, the undeveloped portions of the Planning Area are primarily vegetated with the non-sensitive, unlisted Sonoran Creosote Bush Scrub habitat.

Accuracy Of The Appendix G and H Maps

At the City's request, the current status (e.g., presence/absence, extent, boundaries, etc.) of previously reported and mapped vegetational habitat and sensitive species locations and distributions was field checked during March and April 1995 field surveys. The field studies were conducted during the appropriate season and time of day when the sensitive plant and wildlife species listed in Tables 3 and 4 as observed or expected within the Planning Area would be both present and identifiable. As a result, the two maps accurately show the general locations and distributions of sensitive botanical and wildlife species and plant community or wildlife habitat boundaries of the Planning Area.

Use of the Appendix G and H Maps

The sensitive biological resources map was prepared at a level of accuracy which will enable City Planning Department staff to use it as a constraints analysis tool to determine (a) what type of sensitive biological elements occur or potentially occur within the boundaries of projects being proposed, (c) the nature, extent, and significance of potential project related impacts, and (d) what types of mitigation measure will be required to reduce significant project impacts to less than significant. City Planning Department staff can use the results of their constraints analysis to determine the nature and level of project specific biological surveys and studies they must require for each project.

Updating the Appendix G and H Maps

It is possible that the results of subsequent, project specific botanical and wildlife investigations could change the exact locations, distributions and boundaries of resources depicted on the Appendix H And G maps. Therefore, site specific biological details, provided by sensitive biological element maps prepared for future development sites, should be used by City staff to annually update, and thereby increase the detail and accuracy of, the Appendix G and H maps. Up-to-date accurate assessments of the known or expected locations and distribution of sensitive botanical resources within the Planning Area can only be made using the current year's survey data. The Appendix G and H maps can be updated by plotting and labeling the locations, distributions, and boundaries of terrestrial natural plant communities and sensitive plant species using data from detailed biological resources maps prepared in the future for proposed development areas.

Conducting Adequate Field Surveys/Species Inventories

The sensitive biological resources of each proposed development area, which could potentially constrain implementation of a preferred project, can only be determined by conducting adequate site specific biological investigations. It is not uncommon for biological assessments to be incomplete, inaccurate, inclusive, etc. It is critical that these investigations be conducted in a manner that provides at least the following:

a. a complete, comprehensive inventory of the existing biological resources of the entire parcel being proposed for development;

b. an accurate identification and mapping of all sensitive biological resources of the proposed development site;

c. an "overlay" of the proposed development plan, on the mapped locations of sensitive biological resources, and an accurate assessment of potential project impacts to observed or expected sensitive biological resources;

d. an assessment of the types and significance of potential direct, indirect, and cumulative project impacts to sensitive resources; and

e. development of recommendations to avoid, minimize, or mitigate unavoidable impacts resulting from implementation of the proposed development.

Adequate surveys and species inventories can only be (a) conducted by experienced biologists expert in the taxonomy of the types of plants wildlife being surveyed for and (b) conducted in accordance with currently accepted U.S. Fish and Wildlife Service, California Native Plant Society, California Department of Fish and Game, CVAG, etc. survey protocols.

Threatened and Endangered plant and wildlife species can only be surveyed by state and/or federally permitted biologists. In order to prevent "take" or "harassment" of listed or proposed Threatened and Endangered (T & E) species, the City must require and check to ensure that surveys for T&E species are conducted by state and/or federally permitted biologists. In order to develop accurate inventories of the plant and wildlife species inhabiting or utilizing a specific development area, it is essential to conduct surveys in the following manner.

1. Conduct an adequate number (3-5 nights) of appropriately lengthy, dawn to dusk diurnal and nocturnal observational surveys during all seasons of the year.

2. Conduct surveys in the proper season, at the appropriate time of day and when temperatures are optimal for maximum wildlife activity.

3. Conduct nocturnal small mammal live-trapping studies to determine the presence or absence and subspecies identities of on-site small mammals.

4. Botanical and wildlife surveys must be conducted by an experienced biologist with the appropriate taxonomic skills enabling accurate species and subspecies determinations.

5. If/as appropriate, prevent "take" or "harassment" of sensitive species by requiring surveys for those species be conducted by permitted biologists (e.g., CDFG collectors permit or Memorandum of Understanding, federal threatened or endangered species 10(a) permit, etc.).

6. In order to detect annual and ephemeral species, botanical field surveys must be comprehensive, of an appropriate duration to adequately cover the proposed development parcel, and conducted at the "proper time of year", when spring flowering species are both evident and identifiable. It is likely that numerous additional annual plant species would be identified. The "proper time of year" "coincide(s) with known flowering periods" (CDFG, 1984).

7. If the initial field surveys are conducted "out-of-season", follow-up surveys during the proper season must be conducted. The results of the follow-up surveys must be incorporated into a final biological assessment, and, as appropriate, a modified mitigation plan.

Biological Investigation Report Of Results And Findings

It is recommended that as a matter of policy, the City should require comprehensive site specific biological investigations, which at least include a comprehensive records search (e.g., CNDDB, Palm Springs Desert Museum records, etc.), literature and map review (e.g., CNDDB, USGS quad sheet velum overlays, applicable City and County plant communities and sensitive species maps, etc.), and field survey of the entire proposed development site.

The results and findings of the investigations must be documented in accordance with some current, adequate Biological Survey Report Guidelines. For example, the City may decide to develop it's own Biological Survey Report Guidelines outlining such things as report format, content, etc., or it may elect to adopt the most current County Of Riverside biological report outline or report guidelines of the Ecological Society Of America, etc. For illustrative purposes only, copies of a 1993 Riverside County Biological Impact Report Outline and a draft Standard Biological Report Scope Of Work, which include guidelines for preparation of an acceptable biological report, have been included in Appendix D.

Use And Value Of The Plant And Wildlife Compendia

As part of the CEQA process, the project biologist must inventory the existing biological resources of a proposed development and prepare a wildlife species inventory. The Planning Area wide Plant and Wildlife Compendia will assist project biologists in preparing comprehensive project specific wildlife species inventories by providing advanced knowledge of which plant and animal species are know or expected to occur within the proposed development area, and will assist in the identification of species which are taxonomically difficult to identify.

Plant and Wildlife Compendia will assist City staff as they review and determine the thoroughness and adequacy of project specific plant and wildlife species inventories. In order for them to remain a valuable tool, the Planning Area-wide Plant and Wildlife Compendia should be updated on an annual basis. This should be done by incorporating all/any new species as they are identified in subsequent botanical surveys.

Disposition of Plant And Wildlife Compendia

Plant And Wildlife Compendia are compilations of all plant and animal species identified on nine previously proposed development areas located within the Planning Area, and therefore, they are an invaluable reference for future proposed developments. They should be:

a. kept in the reference library of the City Planning Department,

a. kept on computer file in the City Planning Department, and

c. provided by City staff to all project proponents and biologists, for all developments being proposed within the Planning Area.

VI. SENSITIVE SPECIES AND HABITAT TYPES OF THE PLANNING AREA

A. Summary

JMA performed a biological literature and records review of the relevant available literature, previous surveys and studies, and the California Department of Fish and Game's Natural Diversity Data Base (CNDDB, 1994a,b,c,d; 1995a,b) for sensitive biological resources in the Planning Area. Mr. James W. Cornett, ecological consultant and biologist with the Palm Springs Desert Museum, was also contracted to conduct a biological literature and records review of his personal and the museum's biological records for the Planning Area. His review was focused on the biological resources that might be overlooked by biologists not familiar with the region. Of particular concern would be the local significance of certain species or populations or species that are regionally common but rare in the Planning Area.

Table 3: 1995 Sensitive Plant Species Observed or Expected Within the City of Desert Hot Springs and Adjacent Areas

SCIENTIFIC NAME	COMMON NAME	Flowering Period	Federal Status	CNDDB Rank	State Status	CNPS Rank	Probability Of Occurrence
PLANTS							
1. *Astragalus lentiginosus var. coachellae*	Coachella Valley Milk Vetch	Feb.-May	FPE	G5T2 S2.1	none	1B/ 2-2-3	O
2. *Astragalus tricarinatus*	Triple-Ribbed Milk Vetch	Feb.-May	FPE	G1 S1.2	none	1B/ 3-1-3	L
3. *Chamaesyce platysperma*	Flat-Seeded Spurge	Feb.-Sep.	C2	G3 S1.2?	none	1B/ 3-2-2	L
4. *Escobaria (Coryphantha) vivipara var. alversonii*	Foxtail Cactus	May-Jun	C2	G4T3 S2.2	none	1B/ 2-2-2	L
5. *Cryptantha costata*	Ribbed Cryptantha	Feb.-May	none	G3G4 S?	none	4/ 1-1-2	L
6. *Cryptantha holoptera*	Winged Cryptantha	Mar-Apr	none	G3G4 S?	none	4/ 1-1-2	L
7. *Gilia maculata*	Little San Bernardino Mountains Gilia	Apr-May	C1	G1 S1.1	none	1B/ 3-2-3	H
8. *Pilostyles thurberi*	Thurber's Pilostyles	Jan.	3c	G3 S3.2	none	4/ 1-1-1	L
9. *Salvia eremostachya*	Desert Sage	Mar-May	3c	G3? S?	none	4/ 1-1-1	L
10. *Ditaxis californica*	California Ditaxis	Mar-Dec	C2	G2 S2.2	none	1B/ 3-2-3	L
OTHER ELEMENTS							
HABITAT TYPE							
Desert Fan Palm Oasis Woodland			none	G3 S3.2	none		O

Table 4: 1995 Sensitive Wildlife Species Observed Or Expected Within The City Of Desert Hot Springs and Adjacent Areas

SCIENTIFIC NAME	COMMON NAME	Federal	CNDDB Status	State	Probability of Occurrence
INVERTEBRATES (2)					
1. *Eremarionta aquaealbae*	Whitewater Desert Snail	None	N/A	None	L
2. *Eremarionta morongoana*	Morongo (Colorado) Desert Snail	C2	G1G3S1	None	L
REPTILES (5)					
3. *Crotalus ruber ruber*	Northern Red Diamond Rattlesnake	C2	G?T?S?	CSC	O
4. *Phrynosoma coronatum blainvillei*	San Diego Horned Lizard	C2	G4T3T4 S2S3	CSC	O
5. *Phrynosoma mcalli*	Flat-Tailed Horned Lizard	FPT	G1 S1	CSC	O
6. *Uma inornata*	Coachella Valley Fringe-Toed Lizard	FT	G1Q S1	SE	O
7. *Xerobates agassizi*	Desert Tortoise	FT/FSS	G3 S2	ST	O
BIRDS (15)					
8. *Accipeter cooperi*	Cooper's Hawk	None	G4 S3	CSC	O
9. *Aquila chrysaetos*	Golden Eagle	EPA	G4 S3	CSC	H
10. *Buteo regalis*	Ferruginous Hawk	C2	G4 S?	CSC	H
11. *Buteo swainsoni*	Swainson's Hawk	None	G4 S2	ST	L
12. *Campylorhynchus brunneicappillus sandiegoense*	San Diego (Coastal) Cactus Wren	C2	G4T1S1	CSC	O
13. *Circus cyaneus*	Northern Harrier	None	G5 S3	CSC	L
14. *Falco mexicanus*	Prairie Falcon	None	G5 S3	CSC	H
15. *Lanius ludovicianus*	Loggerhead Shrike	C2	G4 S?	CSC	O
16. *Polioptila melanura*	Black-Tailed Gnatcatcher	None	G5 S2	CSC	O
17. *Speotyto (Athene) cunicularia*	Burrowing Owl	None	G4 S2	CSC	O
18. *Toxostoma bendirei*	Bendire's Thrasher	None	G5 S3	CSC	O
19. *Toxostoma crissale*	Crissal Thrasher	None	G5 S3	CSC	L
20. *Toxostoma lecontei*	Le Conte's Thrasher	None	G4 S3	CSC	O
21. *Vireo bellii pusillus*	Least Bells Vireo	FE	G5T2S2	SE	L-O
MAMMALS (14)					
22. *Antrozous pallidus*	Pallid Bat	None	G5 S?	CSC	H
23. *Choeronycteris mexicana*	Mexican Long-Tongued Bat	C2	G2 S?	CSC	H
24. *Euderma maculatum*	Spotted Bat	C2	G4 S?	CSC	H
25. *Eumops perotis californicus*	California Mastiff Bat	C2	G5T? S?	CSC	H
26. *Macrotus californicus*	California Leafnose Bat	C2	G4 S2S3	CSC	O
27. *Myotis lucifugus occultus*	Occult Little Brown Bat	C2	G5T? S?	CSC	H
28. *Myotis velifer brevis*	Southwestern Cave Myotis Bat	C2	G4T3T4 S1	CSC	H
29. *Neotoma lepida intermedia*	San Diego Desert Woodrat	C2	G?T?S?	CSC	O
30. *Ovis canadensis cremnobates*	Peninsular Bighorn Sheep	PE	G4T1S1	ST	L
31. *Ovis canadensis nelsoni*	Nelson's Bighorn Sheep	None	G4T3 S3	SP	O
32. *Perognathus longimembris bangsi*	Palm Springs Pocket Mouse	C2	G?T? S?	CSC	O
33. *Plecotus townsendii pallescens*	Pale Big-Eared Bat	None	G5T? S2S3	CSC	H
34. *Plecotus townsendii townsendii*	Townsend's Western Big-Eared Bat	C2	G5T4 S?	CSC	H
35. *Spermophilus tereticaudus chlorus*	Palm Springs Round-Tailed Ground Squirrel	C2	G5T1T2S1S2	CSC	O
36. *Taxidea taxus*	Badger	None	G5S2S3	*	L

N/A = not available; * = sensitive but status undetermined

Accuracy Of Sensitive Species Inventory

It is likely that more sensitive species exist within the Planning Area than have been previously observed and reported for the following reasons: (a) the 1978-1995 plant and wildlife field surveys were not conducted during all times of the year; (b) nocturnal wildlife surveys have only been conducted on three previously proposed development areas for bats, snakes, etc.; (c) Most of the 1978-1995 surveys were conducted during drought periods; and (d) the entire Planning Area has not been surveyed. Therefore, it is imperative that subsequent diurnal and nocturnal field surveys be conducted during the appropriate seasons and times of day/night when sensitive species are both present and identifiable.

It is likely that continued development of parcels within the city and it's sphere of influence will result in significant impacts to sensitive plant species. Significant impacts must be avoided or mitigated at least ten sensitive plant species occur or potentially occur within the Planning Area. These species are listed in Table 3 and briefly discussed below.

B. Sensitive Plant Species

1. Coachella Valley Milk Vetch (*Astragalus lentiginosus* var. *coachellae*)

Distribution

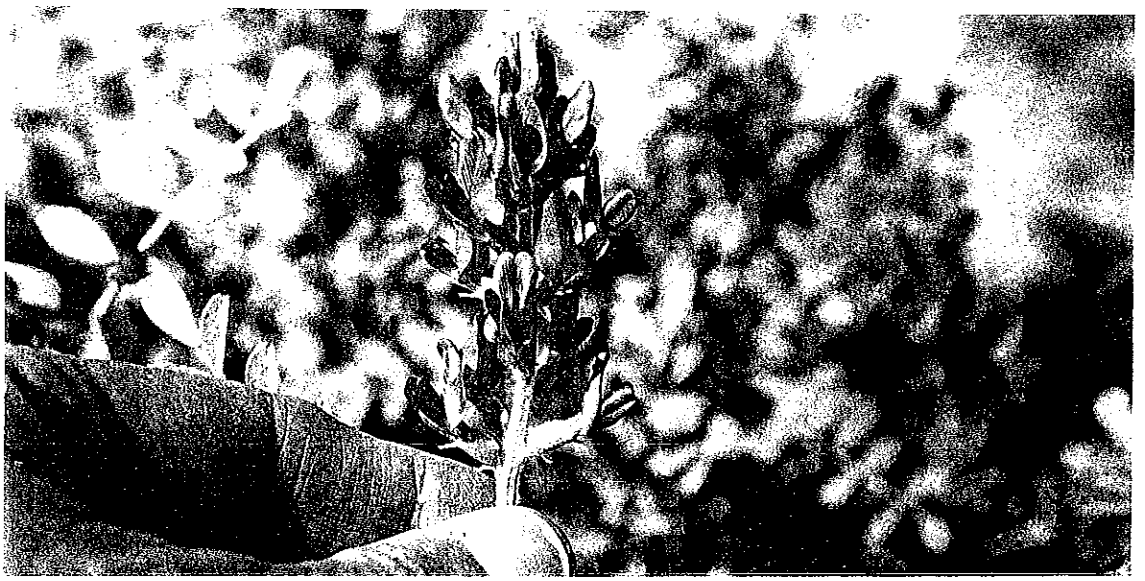
The Coachella Valley milk vetch, (*Astragalus lentiginosus* var. *coachellae*) occurs on sandy soils in washes, plains, and roadsides in creosote bush scrub habitat areas in the Coachella Valley below 1,200 feet. Individuals may occur as annuals or short-lived perennials, and are known only from the Coachella Valley. As is the case with many milk vetch species, individuals tend to be found in areas where disturbance is sufficiently frequent to remove possible competitors but is not so frequent as to inhibit survivorship (Chambers, 1991). Only three reported occurrences within the Planning Area were found in the literature search. One occurrence is a CNDDB record (Map Index Number 05541) of a population observed on a small berm along an access road in the extreme south portion of the Planning Area. The second occurrence was "near" the Mission Lakes property, reported by PSBS (1980). A third occurrence was identified within Link 16 of the route of Southern California Edison Company's Devers-Palo Verde #2,500 KV Transmission Line Project, mileposts 0.0 - 3.3 (WESCO, 1987, Table D.7). It has been reported that the Coachella Valley Milk Vetch can be expected through most of the planning area, particularly the area east of Indian Avenue and south of Dillon Road (Cornett, 1994a).

1995 Focused Survey Results

As a result of two focused spring 1995, surveys, conducted in the areas of the Planning Area of the areas where it was previously reported and where probable habitat was identified, two specimens of Coachella Valley milk vetch observed (Photo Plate No. 5). The two specimens were observed approximately 100 meters northeast of Varner Road, approximately 100 meters southeast of the intersection of Palm Drive and Varner Road, near three power line towers. The location of the specimens are mapped on the Appendix G *Sensitive Biological Resources Map of the Planning Area.*

Current Distribution And Future Survey Recommendations

Although this subspecies may once have been expected through most of the Planning Area it has apparently become nearly extirpated. Future focused field surveys should be conducted for *Astragalus lentiginosus var. coachellae* in the southeastern portion of the Planning Area. The focused surveys should only be required on undeveloped parcels proposed for future development in Sections 19 and 30, Township 3 south, Range 5 east of the Desert Hot Springs and Seven Palms Valley USGS 7.5 minute quadrangle topographic maps (see Appendix G).



John Minch and Associates, Inc.

NATURAL RESOURCES & ENVIRONMENTAL
ASSESSMENTS - PLANNING - MANAGEMENT

Photo Plate 5:

Coachella Valley Milk Vetch
(*Astragalus lentiginosus* var. *coachellae*).
Identified During Spring 1995 Field
Surveys Of The Planning Area.

Protection Status

The Coachella Valley milk vetch has been proposed to be federally listed as endangered (as of 1992) because there is sufficient information on file with the U.S. Fish and Wildlife Service (USFWS) to list the species as threatened or endangered. It is on the CNPS list 1B, meaning that the CNPS believes the species meets the definitions of the California Department of Fish and Game Code that would make it eligible for state listing (CNPS, 1994). According to the CNPS, the greatest threats to this variety are from destruction of habitat resulting from land development and off-highway vehicle use.

2. **Triple-Ribbed Milk Vetch (*Astragalus tricarinatus*)**

Distribution/Probability of Occurence

The triple-ribbed milk vetch, (*Astragalus tricarinatus*) occurs on hot, rocky slopes in canyons and along the edge of boulder strewn desert washes in association with Creosote and brittlebush from 1,400 to 4,000 feet elevation (CNDDB, 1994; Munz, 1974). The CNPS notes that this species is only known from approximately four occurrences near Whitewater and Morongo Valley (CNPS, 1994). The one closest to the Planning Area is located approximately 0.5 miles north of the Planning Area in the dry Morongo Wash. Although suitable habitat occurs for this species over much of the Planning Area; it has not been reported within the Planning Area. The likelihood of this species occurring in the Planning Area is considered to be low because this species is uncommon, it's reported distribution is limited, the absence of previously reported occurrences in the DHS vicinity and focused 1995 searches of the Planning Area where this species could be expected to occur were negative.

1995 Focused Survey Results

Focused spring 1995 foot searches conducted in the areas of the Planning Area where this species could be expected to occur were negative.

Protection Status

This species has been proposed to be listed as endangered by the federal government. The CNPS reports it threatened by vehicles, and it is on the CNPS list 1B (CNPS, 1994).

3. **Flat-Seeded Spurge (*Chamaesyce platysperma*)**

Distribution/Probability of Occurence

All sources reviewed indicate flat-seeded spurge (*Chamaesyce platysperma*) is a rare species occurring in sandy soil in Sonoran Creosote Bush Scrub in the Coachella Valley as well as the Sonoran Desert in Arizona. It was not observed during any of the various surveys reviewed (Table 1). However, this species is expected, with a low probability of occurrence, in proper habitat throughout the Planning Area, particularly in the area south of Dillon Road and east of Indian Avenue (Cornett, 1994, 1995). Cornett also stated that Southern California Edison has conducted biological surveys along the power line corridors established in the southern portion of the Planning Area, and that those reports may have some distributional data regarding the flat-seeded spurge. The Southern California Edison reports were not available for review at the time of this writing.

1995 Focused Survey Results

Focused spring 1995 foot searches conducted in the areas of the Planning Area where this species could be expected to occur were negative.

Protection Status

The Flat-Seeded Spurge is not protected at this time. It is a Federal Category 2 candidate species, meaning it is a species which is not listed as threatened or endangered but for which existing information indicates the taxa may warrant listing as Endangered or Threatened, but substantial biological information necessary to support a proposed rule is lacking. The flat-seeded spurge is also on the CNPS list 1B.

4. **Foxtail Cactus (*Escobaria [Coryphantha] vivipara var. alversonii*)**

Distribution/Probability of Occurence

Foxtail cactus (*Escobaria [Coryphantha] vivipara var. alversonii*) is rare, occurring in sand or rocky areas in Sonoran and Mojavean Creosote Bush Scrub from 75-600 meters (Hickman, 1993) This species was not observed within the Planning Area during the 1994 literature review. However, it is expected on the rocky slopes of the Mission Lakes Property in the southern foothills of the Little San Bernardino Mountains (PSBS, 1980). The literature reviewed indicates the Foxtail Cactus potentially occurs in the northeastern portion of the Planning Area in the foothills of the Little San Bernardino Mountains. The likelihood of this species occurring in the Planning Area is considered to be low because this species is uncommon, it's reported distribution is limited, the absence of previously reported occurrences in the DHS vicinity and focused 1995 searches of the Planning Area where this species could be expected to occur were negative.

1995 Focused Survey Results

Focused spring 1995 foot searches conducted in the areas of the Planning Area where this species could be expected to occur were negative.

Protection Status

The Foxtail Cactus is not protected at this time. It is a Federal Category 2 candidate species and is on the CNPS list 1B.

5. **Ribbed Cryptantha (*Cryptantha costata*)**

Distribution/Probability of Occurence

The ribbed cryptantha (*Cryptantha costata*) occurs throughout the Sonoran Colorado and Mojave Deserts. It grows on sandy soils in creosote scrub below 500 meters and is uncommon throughout its range (Hickman, 1994). The likelihood of this species occurring in the Planning Area is considered to be low because this species is uncommon, it's reported distribution is limited, the absence of previously reported occurrences in the DHS vicinity and focused 1995 searches of the Planning Area where this species could be expected to occur were negative.

1995 Focused Survey Results

Focused spring 1995 foot searches conducted in the areas of the Planning Area where this species could be expected to occur were negative.

Protection Status

The Ribbed Cryptantha (*Cryptantha costata*) is not protected and has no state or federal sensitive species listing status. It is on the List 4 CNPS "watch list".

6. **Winged Cryptantha (*Cryptantha holoptera*)**

Distribution/Probability of Occurence

The winged cryptantha (*Cryptantha holoptera*) occurs throughout the Sonoran, Colorado, and Mojave Deserts. It grows on sandy to rocky soils from 100 - 1,200 meters and is uncommon throughout its range (Hickman, 1994). The likelihood of this species occurring in the Planning Area is considered to be low because this species is uncommon, it's reported distribution is limited, the absence of previously reported occurrences in the DHS vicinity and focused 1995 searches of the Planning Area where this species could be expected to occur were negative.

1995 Focused Survey Results

Focused spring 1995 foot searches conducted in the areas of the Planning Area where this species could be expected to occur were negative.

Protection Status

The Winged Cryptantha (*Cryptantha holoptera*) is not protected and has no state or federal sensitive species listing status. It has been put on the List 4 "watch list" by the CNPS.

7. **San Bernardino Mountain Gilia (*Gilia [Linanthus] maculata*)**

Distribution/Probability of Occurence

San Bernardino Mountain gilia (*Gilia [Linanthus] maculata*) has never been reported within the Planning Area, but it can be expected through the entire Planning Area because it is a locally common species of washes and sandy places in Sonoran Creosote Bush Scrub habitat. It is known from several locations east of the Planning Area in Joshua Tree National Park (Barrows, 1990), and is known to occur approximately 0.5 miles north of the city limits (T2S; R4E; S15 NW Quarter, mapped on CNDDB velum in S15 since it occurred on the border of S15/16, of the Desert Hot Springs USGS quadrangle as a specific occurrence), and approximately 1.2 miles southeast of the sphere of influence (near Willow Hole, T3S; R5E; S28 of the Seven Palms Valley USGS quadrangle as a non-specific occurrence) (CDFG, 1994a,b,c,d and 1995a,b). Since this species occurs both north, east, and south of the Planning Area, there is a high probability that it will occur throughout the entire Planning Area.

1995 Focused Survey Results

Focused spring 1995 foot searches conducted in the areas of the Planning Area where this species could be expected to occur were negative.

Protection Status

This species is threatened by development, windmill construction, dumping, off road vehicle traffic, etc. The San Bernardino Mountain gilia (*Gilia [Linanthus] maculata*) has no state protection or listing status. It is a federal Category 1 candidate for listing by the USFWS, meaning there is sufficient biological information available to support a proposal to list the taxa as Endangered or Threatened. It is on the CNPS list 1B.

8. **Thurber's Pilostyles (*Pilostyles thurberi*)**

Distribution/Probability of Occurence

Thurber's pilostyles (*Pilostyles thurberi*) is uncommon, occurring in open desert Sonoran Creosote Bush Scrub in the southern Sonoran Desert below 300 meters (Hickman, 1994). This parasite, which grows inside the stems of *Psorothamnus* species, has not been reported in the Planning Area. The likelihood of this species occurring in the Planning Area is considered to be low because this species is uncommon, it's reported distribution is limited, the absence of previously reported occurrences in the DHS vicinity and focused 1995 searches of the Planning Area where this species could be expected to occur were negative.

1995 Focused Survey Results

Focused spring 1995 foot searches conducted in the areas of the Planning Area where this species could be expected to occur were negative.

Protection Status

Thurber's pilostyles (*Pilostyles thurberi*) has no state protection or listing status. It is a federal Category 3C candidate species. Federal sub category 3C comprises taxa once considered for listing that have been determined to be more abundant and/or widespread than previously thought and were therefore "delisted". Should new information suggest that any such taxon in the sub category is experiencing a numerical or distributional threat, it may be considered for transfer to category 2 or 1. It is on the CNPS List 4 watch list.

9. **Desert Sage (*Salvia eremostachya*)**

Distribution/Probability of Occurence

Desert sage (*Salvia eremostachya*) occurs in dry, rocky, and gravely places in lower pinyon/juniper woodlands from 700 - 1,400 meters from the west edge of the Sonoran Desert to northern Baja California. It is generally uncommon, but locally common where it occurs in southern California (Hickman, 1994). The majority of the Planning Area is too low in elevation and lacks the pinion/juniper woodland habitat this species occurs in. It might occur in the higher elevations of the San Bernardino Mountains at the western boundary of the Planning Area north of Whitewater Hill. The likelihood of this species occurring in the Planning Area is considered to be low because this species is uncommon, it's reported distribution is limited, the absence of previously reported occurrences in the DHS vicinity and focused 1995 searches of the Planning Area where this species could be expected to occur were negative.

1995 Focused Survey Results

Focused spring 1995 foot searches conducted in the areas of the Planning Area where this species could be expected to occur were negative.

Protection Status

Desert sage (*Salvia eremostachya*) has no state protection or listing status. It is a federal Category 3C candidate species and is on the CNPS List 4 watch list.

10. California Ditaxis (*Ditaxis californica*)

Distribution/Probability of Occurence

California ditaxis (*Ditaxis californica*) is rare, occurring in washes and canyons from 50 - 1,000 meters in the Mojave Desert (Hickman, 1994). It has not been reported within the Planning Area or immediate vicinity. California Ditaxis is known to occur in Deep Canyon in Palm Desert, California. The likelihood of this species occurring in the Planning Area is considered to be low because this species is uncommon, it's reported distribution is limited, the absence of previously reported occurrences in the DHS vicinity and focused 1995 searches of the Planning Area where this species could be expected to occur were negative.

1995 Focused Survey Results

Focused spring 1995 foot searches conducted in the areas of the Planning Area where this species could be expected to occur were negative.

Protection Status

California Ditaxis (*Ditaxis californica*) has no state protection or listing status. It is a federal Category 2 candidate species and is on CNPS List 1B.

Recommendations For Future Sensitive Plant Species Surveys

Comprehensive focused field surveys should be conducted on all undeveloped parcels being proposed for future development, for species listed above on Table 3 as previously observed within the Planning Area and those with a high probability for occurring within the Planning Area. Field surveys are not necessary for those with a low probability for occurring within the Planning Area.

C. SENSITIVE HABITATS

Desert Fan Palm Oasis Woodland

Distribution

Desert Fan Palm Oasis Woodland habitat type is rare and supports species which would not otherwise live in the Planning Area. The most visible plant species of the palm oasis is the native desert fan palm (*Washingtonia filifera*). The oasis at Two Bunch Palms Resort and Spa is the only remaining, naturally occurring palm oasis within the Planning Area. This palm oasis represents the most northern occurrence of *Washingtonia filifera* in the Coachella Valley and, as such they are of historical, as well as biological, significance. A "grove" of 7 palms was formerly located in the Seven Palms Valley at the Seven Palms Ranch. This grove is listed by the CNDDB as extirpated. Before being eliminated by a flash flood, a lone palm occurred in Little Morongo Canyon but this location was north of the Planning Area (Cornett, 1994).

Protection Status

Desert Fan Palm Oasis Woodland habitat has no state or federal protection or listing status; however it is considered sensitive by CDFG and extremely valuable and sensitive locally (CVMEA, 1981).

D. SENSITIVE WILDLIFE SPECIES

The continued development of parcels within the Planning Area will result in significant impacts to listed and proposed rare, threatened, and endangered invertebrate and vertebrate wildlife species.

1995 Focused Survey Results

Only the following four sensitive wildlife species were observed during focused spring 1995, surveys of the Planning Area: Black-tailed gnatcatcher; burrowing owl, San Diego (Coastal) Cactus Wren and Le Conte's thrasher. As shown on Table 4 fourteen (14) other sensitive wildlife species have been observed in the Planning Area.

Sensitive Invertebrates

Two rare endemic snail species, the Whitewater desert snail (*Eremarionta aquaealbae*) and the Morongo (Colorado) desert snail (*Eremarionta morongoana*), have been previously observed near the Rancho Royal Specific Plan Area (Terra Nova, 1992). No known occurrences of these snails are mapped or recorded by the CNDDB within the Planning Area (CDFG, 1994a,b,c,d and CDFG, 1995a,b). These snails are not known or expected to occur within the Planning Area, and therefore, will not be impacted by proposed development activities. The distribution and current protection status of these snails is briefly discussed below.

1. Whitewater Desert Snail (*Eremarionta aquaealbae*)

Distribution/Probability of Occurence

The Whitewater desert snail (*Eremarionta aquaealbae*) is a rare endemic species which occupies a highly restricted geographic range within the Colorado (Sonoran) Desert. The type locality of this species is located approximately one mile west of the Planning Area northwestern boundary (approximately 2 miles west of the Rancho Royal project site) in Whitewater Canyon. It has also been reported near Cabazon, so it may be less closely restricted to its type locality than the Morongo Desert Snail (Terra Nova, 1992). Terra Nova determined that the Whitewater Desert Snail is unlikely to occur on the Rancho Royal project site (Terra Nova, 1992a), and that no suitable habitat exists within the Annexation No. 22 (Terra Nova, 1992b). There have been no reports of this species occurring within the Planning Area. Due to the limited distribution of the Whitewater desert snail and the lack of reports of this species within the Planning Area, the potential for this species occurring within a proposed development area of the Planning Area is considered low.

1995 Focused Survey Results

Due to it's diminutive size, lack of sightings within the Planning Area, and low potential for occurrence, focused surveys were not conducted in the Planning Area for this species.

Protection Status

The Whitewater desert snail (*Eremarionta aquaealbae*) has no state or federal protection or listing status; however, Terra Nova reported in 1992 that its status is addressed in a monograph by Dr. Barry Roth to be published in the "near future" (Terra Nova, 1992).

2. Morongo (Colorado) Desert Snail (*Eremarionta morongoana*)

Distribution/Probability of Occurence

The Morongo (Colorado) desert snail (*Eremarionta morongoana*) is a rare endemic species which occupies a highly restricted geographic range within the Colorado (Sonoran) Desert. The type locality of this species is located approximately one mile north of the Planning Area's northwestern boundary (approximately 2 miles north of the Rancho Royal project site). The distribution of this species apparently has not been mapped in detail, but it has been found in association with talus slopes (defined as a slope formed by an accumulation of rock debris). A single damaged shell of the

Morongo (Colorado) desert snail (*Eremarionta morongoana*) was found during a survey of the Rancho Royal Specific Plan Area. However, suitable habitat for this species appears absent from the Planning Area, and it is likely that the shell was carried some distance along a watercourse before being deposited and discovered in the Rancho Royal Specific Plan Area (Terra Nova, 1992b,c). There are no other reported occurrences of this species within the Planning Area. The likelihood of this species occurring within the Planning Area is considered low due to the limited distribution, the lack of suitable habitat (talus slopes), and the lack of observations of this species on the site.

1995 Focused Survey Results

Due to it's diminutive size, lack of sightings within the Planning Area, and low potential for occurrence, focused surveys were not conducted of the Planning Area for this species.

Protection Status

The Morongo (Colorado) desert snail (*Eremarionta morongoana*) has no state or federal protection. It is a federal Category 2 candidate species.

Sensitive Amphibians

No sensitive amphibian species are known to occur within the Planning Area (Coronet, 1994). Results of an extensive literature review and analysis of current CNDDB (1994a,d) velum USGS quadrangle overlays and Rare Find records and search report results for the Desert Hot Springs and Seven Palm Valley USGS 7.5 minute quadrangles confirm that no sensitive amphibian species are known or expected to occur within the Planning Area (CDFG, 1994a,b,c,d and 1995a,b). None were observed during JMA's 1994 and 1995 field surveys.

Sensitive Reptiles

One snake species, three lizard species, and one tortoise species, that are considered sensitive, occur in or are likely to occur in the Planning Area. Each is described below.

3. **Red Diamondback Rattlesnake (*Crotalus ruber ruber*)**

Distribution/Probability of Occurence

The species *Crotalus ruber* occurs from Morongo Pass south to the tip of Baja California (Stebbins, 1985). On the desert slope it occurs in areas of mesquite and cactus on rocky alluvial fans near the base of the mountains. The sensitive subspecies *Crotalus ruber ruber* occurs in southwestern California. The Planning Area is the most northeastern range of the red diamondback rattlesnake. This subspecies occurs in the Planning Area; two specimens have been found near the intersection of Mission Lakes Boulevard and West Drive (Cornett, 1994), and it was recorded in the Cornerstone (Tierra Madre, 1990) and Mission Lakes (PSBS, 1980) properties.

Protection Status

The sensitive subspecies of the red diamondback rattlesnake is a federal Category 2 candidate and a State of California Species of Special Concern.

4. **San Diego Horned Lizard (*Phrynosoma coronatum blainvillei*)**

Distribution/Probability of Occurence

The San Diego horned lizard (*Phrynosoma coronatum blainvillei*) is found in fine soils in a variety of plant associations including canyon, coastal sage scrub, grassland, and open chaparral habitats. The CNDDB (1994b,c,d, 1995a,b) has recorded sightings of

this species in the Whitewater Canyon area located approximately 1 mile west of the Planning Area. None of the twelve surveys within the Planning Area reviewed reported the occurrence of the San Diego horned lizard. However, this subspecies has been recorded from the Planning Area one mile northeast of the intersection of Interstate 10 and Indian Avenue (Cornett, 1994). They are exceedingly rare in this area and the record above is the only one known within the Planning Area; however, they probably occur throughout the western half of the Project Area (Cornett, 1994).

Protection Status

The San Diego horned lizard, (*Phrynosoma coronatum blainvillei*) is a federal Category 2 candidate and a State of California Species of Special Concern. Habitat destruction caused by extensive urban and agricultural development is the major cause of the decline of this lizard species.

5. **Flat-tailed Horned Lizard (*Phrynosoma mcallii*)**

Distribution/Probability of Occurence

The Flat-tailed horned lizard (*Phrynosoma mcallii*) occurs in areas of fine sand and often occupies extremely barren country where vegetation is sparse or lacking (Stebbins, 1985). The Coachella Valley is the northernmost extent of this species' range. It has been reported in the Planning Area south of Dillon Road and east of Indian Avenue (Cornett, 1994). The species is not entirely restricted, as reported, to areas of loose, windblown alluvium; Jim Cornett has found them on stable compacted soil within the Planning Area (Cornett, 1994). The CNDDB (CDFG, 1994a,b,c,d and 1995a,b) has records of this species on the Desert Hot Springs quadrangle, approximately 4 miles west of Garnet (CDFG, 1994a,b,c,d and 1995a,b).

Protection Status

The flat-tailed horned lizard (*Phrynosoma mcallii*) is a federal Category 2 candidate and a State of California Species of Special Concern. Habitat destruction is the major cause of the decline of this species in the Coachella Valley (Chambers, 1991).

6. **Coachella Valley Fringe-Toed Lizard (*Uma inornata*)**

Distribution/Probability of Occurence

The Coachella Valley fringe-toed lizard (*Uma inornata*) is known to exist only in the Coachella Valley from where Snow Creek meets the Whitewater River south to two miles east of Indio. It is restricted to fine, windblown sands of dunes, flats, riverbanks, and washes in some of the most arid parts of the desert (Stebbins, 1985). Vegetation, consisting of creosote and other scrubby plants, is usually sparse in the fringe-toed lizard's habitat. The Coachella Valley fringe-toed lizard (CVFTL) occupies sand deposits of the Coachella Valley from near sea level to approximately 1600 feet. In large areas of its Coachella Valley range, it has been extirpated; that is, it has become locally extinct (Chambers, 1991). The CNDDB shows four reported occurrences within the Planning Area (CDFG, 1994a,b,c,d and 1995a,b).

As shown on the Appendix H: Generalized Vegetation Map of The Planning Area, the southeast quarter of the Planning Area encompasses the CVFTL Habitat Conservation Fee Area. Occupiable CVFTL habitat has been identified within the Planning Area. Occupiable habitat does not indicate currently occupied habitat, but rather is intended to denote areas within the species' historic range which could be inhabited over geologic time (TNC, 1985). Historically, CVFTL were observed north of Dillon Road (San Gorgonio Pass wind Energy Project Map No. 3-5). Actual occupied or potentially suitable windblown sand dune habitat is only present in scattered locations throughout the potentially occupiable habitat of the Planning Area (SGPWEP), May 1982). Cornett (1994) reports that, although CVFTL currently occur within the

Planning Area south of Dillon Road and east of Indian Avenue, he doubts that they can be found anywhere north of Dillon Road. The portion of the Planning Area where CVFTL can be expected to occur is plotted on the Appendix G *Sensitive Biological Resources Map*.

Protection Status

The Coachella Valley fringe-toed lizard (*Uma inornata*) is state endangered and federal threatened species protected by both state and federal law. Considering all of the above information it is probable that CVFTL are now restricted to the portion of the Planning Area south of 18th Avenue and their range is steadily contracting southward. The remaining acreage of habitat is primarily threatened by blow sand control and residential (e.g., resort RV parks, winter trailer, and RV homes, etc.) and wind energy development. In addition, habitat degradation could be occurring as a result of the progressive invasion of the Coachella Valley by the non-native Russian thistle (*Salsola tragus*) and to a lesser degree by wild mustard (*Brassica tournefortii*) and Mediterranean grass (*Schismus barbatus*). Russian thistle is thought to attain such high densities that it chokes out the native vegetation and stabilizes the soil thereby preventing the transport of wind blown sand. Biologists suspect that for both these reasons it is detrimental to the survival of the lizard. The true severity of invasive non-native plants on lizard habitat is unknown (CVFTL HCP, 1985).

7. **Desert Tortoise (*Xerobates agassizi*)**

Distribution/Probability of Occurence

The desert tortoise (*Xerobates agassizi*) *is* a completely terrestrial desert species that requires firm ground for the construction of burrows. It typically builds burrows in the banks of washes or in compacted sand. This species depends on annual plants, grasses, and cacti for its major food sources. Creosote is often present in its habitat, and it requires suitable ground moisture for survival of the eggs and young. Although apparently suitable habitat occurs throughout the Coachella Valley, and numerous focused surveys have been conducted, historically desert tortoises have only been observed in extremely low densities within the Coachella Valley.

In the years between 1978 and 1981 only seven (7) tortoises were collected, by the caretaker of the "T" Cross "K" Ranch, from areas within the northern portions of the Coachella and Morongo Valleys (Shepard, 1986). No tortoise sign was found during a 1989 survey of Section 28 of Annexation No. 22 (Barrows, 1990). Similarly, the findings of Terra Nova's March 1992 focused surveys for tortoise individuals were negative. They determined that although no tortoises were observed during surveys of the entire 2,240-acre Rancho Royale Specific Plan Area, tortoise sign, consisting of one inactive burrow and several inactive, collapsed burrows, was observed. The collapsed burrows were tentatively reported as being historic, inactive tortoise burrows (Terra Nova, 1992a,b). Terra Nova concluded that viable tortoise habitat is probably absent from the Rancho Royale Specific Plan Area; however, one tortoise was observed April 1992 by BLM staff on the shoulder of Worsley Road just south of Pierson Boulevard (Terra Nova, 1992a,b,c). This may have been a pet or a tortoise transported from outside and released along Worsley Road.

1987 WESCO studies indicated that suitable habitat for the desert tortoise was absent in the Coachella Valley portion of the Devers-Palo Verde #2 power line route, and therefore, presumed absent from the Planning Area. However, the entire Planning Area is mapped with the USFWS Class 3 Desert Tortoise Habitat classification with the exception of an area at the base of the Little San Bernardino Mountains and an area centered on Garnet Hill, which are mapped as Class 2 Desert Tortoise Habitat (Appendix G). Class 2 Desert Tortoise Habitat indicates a moderate probability of occurrence, and Class 3 Desert Tortoise Habitat indicates a low probability of encountering tortoises or their sign (Tierra Madre, 1990). Coronet (1994) reports that the desert tortoise is not native to the Coachella Valley, but has become naturalized and

is "clearly alive and reproducing in the Coachella Valley today." He states the oldest tortoise population appears to be in the Painted Hills region of the Planning Area, west of Highway 62.

Protection Status

The desert tortoise is currently listed as a federal and state threatened species due to decreases in tortoise numbers and available habitat. Grazing, urban and agricultural development, off-highway recreational activities, and other human related activities have been the major causes of the loss of tortoise habitat. In addition, decreases in tortoise numbers have occurred as a result of an upper respiratory disease that has invaded the wild population. Drought conditions over the past several years have also contributed to the decline of this species (Chambers, 1991).

Sensitive Birds

As indicated in Table 3, despite the observed low avian diversity of the Planning Area, at least 13 sensitive bird species are known or anticipated to occur within the Planning Area. Of these species, only the Swainson's hawk (*Buteo swainsoni*) and least Bell's vireo (*Vireo bellii pusillus*) are presently listed as threatened or endangered by either the state or federal government. The golden eagle (*Aquila chrysaetos*) is protected under the Federal Bald Eagle Act of 1940 and 1963 (Chambers, 1991). The remaining species are presently classified as California Species of Special Concern, and three of these are Federal Category 2 candidate species. Although these bird species are not protected by the State or Federal Endangered Species Acts, impacts to all sensitive species and the habitat supporting them are defined as potentially significant under the California Environmental Quality Act (CEQA).

8. **Cooper's Hawk (*Accipeter cooperi*)**

Distribution/Probability of Occurence

The Cooper's hawk (*Accipeter cooperi*) is an uncommon inhabitant of open woodlands, wood margins, river groves, and wooded city areas where they feed mainly on small birds and mammals. The Cooper's hawk occurs throughout most of North America and is a year-round resident in California and the Coachella Valley. The CNDDB did not have a record of Cooper's hawks within the Planning Area (CDFG, 1994a,b,c,d and 1995a,b). Although, Cooper's hawks have previously been observed within the Planning Area, only limited nesting habitat occurs in the Planning Area.

Protection Status

The Cooper's hawk (*Accipeter cooperi*) is not a federal or stated listed species and therefore does not have any legal protection status. However, this species is considered a California Department of Fish and Game Species of Special Concern.

9. **Golden Eagle (*Aquila chrysaetos*)**

Distribution/Probability of Occurence

The golden eagle (*Aquila chrysaetos*) typically inhabits mountainous or hilly terrain, where it hunts over the open country for small mammals, snakes, birds, and carrion. Nesting usually takes place on a rocky ledge or crag rather than in a tree. The Golden eagle occurs throughout most of North America and is a year-round resident in California. The CNDDB has records of nesting golden eagles in the Whitewater Canyon area located approximately 1 mile west of the Planning Area's west boundary (CDFG, 1994a,b,c,d and 1995a,b). Suitable nesting habitat may occur in the foothills of the San Bernardino and Little San Bernardino Mountains. Open scrub areas within the Planning Area can be considered suitable foraging habitat for golden eagles;

although no individuals of this species were observed during the 1978 - 1995 field surveys. The probability of golden eagles occurring on the project site is considered high because of the availability of foraging habitat and the ability of this species to cover large distances.

Protection Status

The golden eagle (*Aquila chrysaetos*) is fully protected under the Bald Eagle Act of 1940. Protection under this act was extended to golden eagles in April 1963. This species is also considered a California Department of Fish and Game Species of Special Concern.

10. **Ferruginous Hawk (*Buteo regalis*)**

Distribution/Probability of Occurence

The ferruginous hawk (*Buteo regalis*) inhabits unbroken terrain in the Great Plains and arid inter-mountain regions of western Canada and the United States. Suitable nesting habitat may occur in the foothills of the San Bernardino and Little San Bernardino Mountains. This species is a winter visitor over much of the open areas of Riverside and San Bernardino Counties. This species is fairly common, but its numbers may be declining over much of its range (Chambers, 1991). Open scrub areas within the Planning Area can be considered suitable foraging habitat for the ferruginous hawk; however, no individuals of this species were seen during the surveys reviewed by JMA or JMA's 1994 - 1995 field surveys. The CNDDB has no recorded sightings of ferruginous hawks on the Desert Hot Springs or Seven Palms Valley quadrangles (CDFG. 1994a,b,c,d and 1995a,b). The probability of the ferruginous hawk wintering on the project site is considered high because of the availability of foraging habitat and the ability of the species to cover large distances.

Protection Status

The ferruginous hawk (*Buteo regalis*) is a federal Category 2 candidate species and a California Species of Special Concern.

11. **Swainson's Hawk (*Buteo swainsoni*)**

Distribution/Probability of Occurence

The Swainson's hawk (*Buteo swainsoni*) is most commonly found over open plains and prairies in the Great Plains and relatively arid areas of western North America. It builds rather flimsy nests in shrubs and trees along wetlands and drainages and in windbreaks in fields and around farmsteads. The primary wintering grounds for this species are in Argentina (Stebbins, 1985; Chambers, 1991). The Swainson's hawk is not a frequent visitor to the Southern California area but this species may occur in low numbers in the vicinity of the Planning Area. Open scrub and golf course areas within the Planning Area can be considered marginally suitable foraging habitat for the Swainson's hawk; as this species prefers grasslands. pasture lands, and croplands. No individuals of this species were observed during the 1978 - 1995 field surveys. The CNDDB has no recorded sightings of Swainson's Hawks on the Desert Hot Springs or Seven Palms Valley quadrangles. The probability of Swainson's hawks occurring on the project site is considered low due to the marginal foraging habitat and the relatively low population densities in the Southern California region.

Protection Status

The Swainson's hawk is listed as a threatened species by the California Department of Fish and Game and is considered a Federal Category 3C Candidate Species. Subcategory 3C comprises taxa that are now considered to be more abundant and/or widespread than previously thought. Should new information suggest that any such

taxon in this sub-category is experiencing a numerical or distributional threat, it may be considered for transfer to category 1 or 2.

12. **San Diego (Coastal) Cactus Wren (*Campylorhynchus brunneicappillus sandiegoensis*)**

Distribution/Probability of Occurence

The San Diego (coastal) cactus wren (*Campylorhynchus brunneicappillus sandiegoens*) is a common inhabitant of the deserts of the southwestern United States and Baja California and mainland Mexico. They generally occur below 4,000' on arid hillsides with clumps of yucca, mesquite and among thorny shrubs and large cacti. Suitable foraging and nesting habitat occur throughout the Planning Area. The CNDDB has no recorded sightings of San Diego (coastal) cactus wren on the Desert Hot Springs or Seven Palms Valley quadrangles (CDFG, 1994a,b,c,d and 1995a,b). This species was observed foraging in ground litter and nesting in a teddy-bear cholla (*Opuntia bigelovii*) on a vacant lot located north of West 10TH Street between Sonora Drive and Cholla Drive and Little Morongo Road during JMA's 1995 field surveys. The approximate location of the sighting is shown on the Appendix G: *Sensitive Biological Resources Map*.

Protection Status

The San Diego (coastal) cactus wren (*Campylorhynchus brunneicappillus sandiegoens*) is a federal Category 2 candidate species and a California Species of Special Concern.

13. **Northern Harrier (*Circus cyaneus*)**

Distribution/Probability of Occurence

Northern harriers are year-round residents in southern California. They occur in marshlands, grasslands. and prairies. Open scrub and golf course areas within the Planning Area can be considered marginally suitable foraging habitat for this species. No individuals of this species were seen during the 1978 - 1995 field surveys. The CNDDB has no recorded sightings of northern harriers on the Desert Hot Springs or Seven Palms Valley quadrangles. The probability of northern harriers occurring on the project site is considered low due to the marginal foraging habitat and the relatively low population densities in the Southern California region.

Protection Status

The northern harrier (*Circus cyaneus*) is a California Species of Special Concern.

14. **Prairie Falcon (*Falco mexicanus*)**

Distribution/Probability of Occurence

The prairie falcon (*Falco mexicanus*) is a locally uncommon to fairly common bird that breeds in the mountains, foothills, and riverine escarpments of western North America. This species nests almost exclusively on suitable ledges of cliffs and low escarpments or, occasionally, in stick nests constructed on cliffs by ravens, hawks, or eagles (Chambers, 1991). There are few potential nesting areas within the Planning Area as there are few cliffs or escarpments within the Planning Area; these would occur in the foothills of the San Bernardino and Little San Bernardino Mountains. Suitable foraging habitat does exist in open spaces throughout the Planning Area. Prairie falcons were not observed during the 1978 - 1995 field surveys; however, the CNDDB has numerous recorded sightings of this species on the Desert Hot Springs and Seven Palms Valley quadrangles and surrounding quadrangles (CDFG, 1994a,b,c,d and 1995a,b). The probability of occurrence of the prairie falcon within the Planning Area is considered high because of the availability of foraging habitat, the ability of the

species to cover large distances, and the location of sighting in the nearby, surrounding Coachella Valley (CDFG. 1995. a,b). Food chain contamination by persistent pesticides and other contaminants, illegal take by falconers, human disturbance, and occasional shooting have contributed to the decline in prairie falcon populations.

Protection Status

The prairie falcon *(Falco mexicanus)* was formerly listed as threatened by the federal government but is currently listed as status undetermined. This species is considered a Special Concern Species by the California Department of Fish and Game, and is considered sensitive during nesting.

15. Loggerhead Shrike (*Lanius ludovicianus*)

Distribution/Probability of Occurence

The loggerhead shrike (*Lanius ludovicianus*) is a year-round resident in Southern California occurring in semi-open country with lookout posts, such as wires, trees and scrub (Stebbins, 1985). They breed throughout the Planning Area (Cornett, 1994) but are not common. They were observed on the Annexation No. 22 (Terra Nova, 1992), Mission Lakes (PSBS, 1990), and Desert Hot Springs 12-acres (Cornett, 1994 c) properties.

Protection Status

The loggerhead shrike (*Lanius ludovicianus*) is a federal Category 2 candidate species and a California Species of Special Concern.

16. Black-Tailed Gnatcatcher (*Polioptila melanura*)

Distribution/Probability of Occurence

The black-tailed gnatcatcher *(Polioptila melanura)* is a small, active bird that primarily inhabits wooded desert washes and also arid desert scrub, particularly in winter. This species nests in desert wash habitat containing mesquite, palo verde, ironwood, and acacia. In general, the habitat within the Planning Area is not considered good nesting habitat for the black-tailed gnatcatcher, but it is considered to provide fair winter foraging habitat. The CNDDB has no specific records of black-tailed gnatcatchers in the vicinity of the Planning Area, but the database does have general records of this species on the Desert Hot Springs quadrangle. This species was observed within the Planning Area on the Rancho Royal Specific Plan Area and Annexation No. 22 (Terra Nova, 1992).

Protection Status

The black-tailed gnatcatcher is a California State Species of Special Concern.

17. Burrowing Owl (*Speotyto [Athene] cunicularia*)

Distribution/Probability of Occurence

The burrowing owl (*Athene cunicularia*) is a small, diurnal owl that inhabits desert and open grasslands of western and midwestern North America. It is common throughout the Planning Area and surrounding vicinity (Cornett, 1994). Although, burrowing owls are declining in many areas of the country, their decline is more severe in southern California coastal areas where habitat destruction and prey eradication are prevalent. Desert populations of burrowing owl are probably faring better than those on the coast. Although the destruction of wildlife should be prevented whenever possible, it is unlikely that continuing development within the Planning Area will significantly impact this species or its habitat.

Protection Status

This species is considered a Species of Special Concern by the California Department of Fish and Game, and the population of this species is being actively monitored. The burrowing owl is protected during the nesting season (March-June) by the Migratory Bird Act (Chambers, 1991).

18. Bendire's Thrasher (*Toxostoma benderei*)

Distribution/Probability of Occurence

Bendire's thrasher *(Toxostoma bendirei)* is a fairly common but very localized thrasher that inhabits desert scrub habitats, containing some cholla and thorny bushes, in scattered areas of the desert. This species is also found in open farmlands and grasslands on occasion. There are no CNDDB records of this species on the project site or in the vicinity, but the habitat on site is considered good potential habitat for this species. This species was observed within the Planning Area on the Rancho Royal Specific Plan Area and Annexation No. 22 (Terra Nova, 1992).

Protection Status

This species is a California State Species of Special Concern.

19. Crissal Thrasher (*Toxostoma crissale*)

Distribution/Probability of Occurence

The crissal thrasher *(Toxostoma crissale)* typically inhabits dense brush along desert streams, mesquite thickets, and also in low-desert chaparral. This species is very secretive and "patchily" distributed in California. One historic record, from 1920, of an occurrence of a crissal thrasher near Palm Springs does occur in the CNDDB (CDFG, 1995a,b). The surveys within the Planning Area did not reveal the presence of any individuals of this species. Appropriate vegetation for this species only occurs in the mesquite thickets along the Banning Fault in Seven Palms Valley, so the probability of this species occurring on the site is considered low.

Protection Status

This species is a California State Species of Special Concern.

20. Le Conte's Thrasher (*Toxostoma lecontei*)

Distribution/Probability of Occurence

Le Conte's thrasher typically inhabits deserts with scant vegetation consisting mostly of creosote and cholla. It commonly nests in dense, spiny shrub or densely branched cactus in desert wash habitat. This species is uncommon over most of its range; however, lands within the Planning Area west of West Drive and east of Highway 62 continue to support nesting pairs of Le Conte's thrasher (Cornett, 1994). Le Conte's thrashers were observed on the Olympus Golf Club (Barrows, 1990) and Annexation No. 22 (Terra Nova, 1992 c) properties. Historically, the land north of Two Bunch Palms Road, east of Indian Avenue, south of the Planning Area's northern border and west of West Drive has been a particularly important breeding area (Cornett, 1994). Currently, it can be expected to occur throughout the Planning Area.

Protection Status

This species is a California State Species of Special Concern.

21. **Least Bell's Vireo** (*Vireo bellii pusillus*)

Distribution/Probability of Occurence

The least Bell's vireo (*Vireo bellii pusillus*) is a winter migrant that breeds in willow thickets in riparian habitat in coastal Southern California (Stebbins, 1985). The only record of this species was made by Cornett who saw least Bell's vireo in the manmade riparian habitat surrounding the large manmade lake at Mission Lakes Country Club (Cornett, 1994). Although, it was reported in Morongo Canyon in 1982 by Wagstaff and Brady, the probability of this species presently occurring in the Planning Area is considered extremely low due to the lack of appropriate riparian habitat (Wagstaff and Brady, 1982a).

Protection Status

The least Bell's vireo (*Vireo bellii pusillus*) is listed as a state and federal threatened species.

Sensitive Mammals

22-27, 32, and 33 **Bats**

Distribution/Probability of Occurence

Numerous sensitive species of bats potentially occur within the project area. Bats generally roost in caves, mine tunnels, crevices in rocks, and hollow trees. The lowland portions of the Planning Area provide few potential roosting sites; however these lowland areas do provide foraging habitat for insectivorous bats. The upland areas, Garnet Hill, Whitewater Hill, the foothills of the San Bernardino Mountains to the northwest and the foothills of the Little San Bernardino Mountains to the northeast, provide potential roosting sites for bat species and may be utilized by sensitive bat species. Sensitive bat species reported as potentially occurring on or utilizing the Planning Area include the pallid bat (*Antrozous pallidus*), Mexican long-tongued bat (*Choeronycteris mexicana*), spotted bat (*Euderma maculatum*), California mastiff bat (*Eumops perotis californicus*), California leafnose bat (*Macrotus californicus*), occult little brown bat (*Myotis lucifugus occultus*), southwestern cave myotis bat (*Myotis velifer brevis*), pale big-eared bat (*Plecotus townsendii pallescens*), and Townsend's Western big-eared bat (*Plecotus townsendii townsendii*). The probability of these species occurring within the Planning Area is considered high due to the availability of suitable habitat; however, definitively determining the presence or absence of these nocturnal animals is difficult.

Protection Status

As shown on Table 4, none of these species are protected or have a Federal status greater than Category 2 candidate or a State status greater than California Species of Special Concern.

28. **San Diego Desert Woodrat** (*Neotoma lepida intermedia*)

Distribution/Probability of Occurence

The San Diego desert woodrat is found in a variety of habitats in the southern half of California on desert floors or rocky slopes with scattered cactus, yucca, or other low vegetation (Jameson and Peeters, 1988; Burt and Grossenheider, 1964). The desert woodrat is typically associated with cacti, for these succulents provide food and probably protection (Jameson and Peeters, 1988). It is also known to occupy old burrows of California ground squirrels (*Spermophilus beecheyi*) or kangaroo rats (*Dipodomys* sp.). Woodrats often build stick houses on the ground or beneath the cover of a small rock ledge. A desert woodrat stick house was observed on the ground

in the middle of a creosote bush (*Larrea tridentata*), approximately fifty feet south of Dillon Road, immediately west of the intersection of Dillon Road and Worsley Road, west of Lokter Road, during JMA's March 1995 field surveys of the Planning Area.

Protection Status

The San Diego desert woodrat is a federal Category 2 candidate species and a State of California Species of Special Concern.

29. **Peninsular Bighorn Sheep** (*Ovis canadensis cremnobates*)

Distribution/Probability of Occurence

The peninsular bighorn sheep (*Ovis canadensis cremnobates*) is a subspecies of the bighorn sheep. This subspecies is characteristically found on open desert slopes below 4,000 feet in elevation from San Gorgonio Pass south into Mexico. Optimal habitat for this species includes steep walled canyons and ridges bisected by rocky or sandy washes,that have available water (Jameson and Peeters, 1988; Chambers, 1991).

According to the CRES at San Diego State University (1976), there were an estimated 500 bighorn in the Santa Rosa Mountains and 80 in the San Jacinto Mountains in 1976. The total estimated bighorn sheep population in California in 1978 was placed at 1,170 by the Department of Fish and Game. The population within the Coachella Valley region accounted for approximately half of all those reported in the State at that time. A population of approximately 60 individuals inhabits the San Jacinto Mountains, according to a relatively recent record (1986) in the CNDDB (CDFG, 1994a,b,c,d and 1995a,b). This population has been declining from a 1970 estimate of 280 individuals. Disease has played a major role in the decreasing numbers of this population (Chambers, 1994). The lowlands comprising the majority of habitat within the Planning Area are not considered suitable for this species due to the flat topography. The probability that this species may occur on the slopes of the San Bernardino and Little San Bernardino Mountains within the Planning Area is considered low.

Protection Status

The peninsular bighorn sheep is listed as threatened by the California Department of Fish and Game and is proposed as endangered by the U. S. Fish and Wildlife Service.

30. **Desert Bighorn Sheep** (*Ovis canadensis nelsoni*)

Distribution/Probability of Occurence

The range of Nelson's bighorn sheep (*Ovis canadensis nelsoni*) covers a large area, but the number of sheep is estimated at a total of 40 for the entire region. The range includes the Orocopia Mountains, the Mecca Hills, and the Little San Bernardino Mountains in Joshua Tree National Park. Nelson's bighorn sheep have been known to visit the most southerly limits of the Little San Bernardino Mountains within the northeastern portion of the Planning Area. Such visits are rare but do occur (Cornett, 1994).

The major threats to the bighorn sheep population are lack of adequate water and various forms of human disturbance. Increased access to back country areas by off road vehicles together with poaching are the major disturbance factors to these populations. The bighorn's range is seldom continuous, and the animal is dependent upon small patches of prime habitat for its continued existence off-road vehicles cause disturbance of the browse in the bighorn's range and contamination of water holes along with increased noise and activity levels. These activities are detrimental to continued existence of bighorn sheep in their present day range. Even if water supplies are not affected, a high level of human activity for a prolonged period of time

could decrease use of the area by sheep, and is likely to cause the herd to move away from that area. It is thought that in some cases herds will not return to an abandoned area if the memory of it passes from the herd through the attrition of the older animals. This means that displacement of a herd, even if it is of minor short-run significance to the herd, could result in a contraction of its range.

Bighorn sheep are quite non-aggressive in pioneering new areas, even though they provide potentially good habitat. Less intense or less prolonged disruptions would probably have less serious consequences, but it is difficult to generalize about how little disruption is too little. To make intelligent predictions, it would be necessary to know the time of the year, nature, and location of the disruption activity, along with the size and vigor of the herd concerned. For example, disruption of lambing sites during the spring lambing season could have a profound affect upon the reproduction success of that year, and move a small local herd closer to extinction. Because of the attractiveness of bighorns as trophies, poaching is a serious source of loss. With a population as small as this one, mortality from this source cannot be tolerated.

Protection Status

Nelson's bighorn sheep is fully protected by Section 4700 of the Fish and Game Regulations, indicating that take, possession and sale are prohibited.

31. Palm Springs Pocket Mouse (*Perognathus longimembris bangsi*)

Distribution/Probability of Occurence

The Palm Springs pocket mouse (*Perognathus longimembris bangsi*) is a geographically restricted subspecies of the more widespread, non-sensitive pocket mouse (*Perognathus longimembris*). It can be expected throughout the Planning Area, and is locally common (Cornett 1994, 1995). *Perognathus longimembris* was observed during the Rancho Royal Specific Plan and Annexation No. 22 surveys, but was not identified to subspecies (Terra Nova, 1992). Cornett stated that *Perognathus longimembris* observed within the Planning Area are most likely of the sensitive subspecies *bangsi* (Cornett, 1995 pers. comm.). This was confirmed by CVAG during 1995 live trapping studies (Dodd, 1995).

Protection Status

The Palm Springs pocket mouse (*Perognathus longimembris bangsi*) is a federal Category 2 candidate species and a State of California Species of Special Concern

32. Palm Springs Round-Tailed Ground Squirrel (*Spermophilus tereticaudus chlorus*)

Distribution/Probability of Occurence

The Palm Springs round-tailed ground squirrel (*Spermophilus tereticaudus chlorus*) is restricted to the Coachella Valley where it inhabits desert succulent scrub, desert washes, alkali scrub, and levees. It prefers open, flat, grassy areas in fine-textured, sandy soil. The density of this species is correlated with winter rainfall (Chambers, 1991). This squirrel is a distinct subspecies of the round-tailed ground squirrel (*Spermophilus tereticaudus*), a species that has a wide distribution in the Mojave and Sonoran Deserts. Like the related Mojave ground squirrel (*S. mohavensis*) found farther north, the round-tail often is hard to detect during field surveys because it remains inactive much of the time and does not reliably enter traps. It is most likely to be active in hot weather, starting in May or June. The Palm Springs round-tailed ground squirrel was observed during the Annexation No. 22 (Terra Nova, 1992) and Mission Lakes Property (PSBS, 1980) surveys. This subspecies should be considered to occur throughout the Planning Area (Cornett, 1994).

Protection Status

The Palm Springs round-tailed ground squirrel is a federal Category 2 candidate species and a State of California Species of Special Concern.

33. American Badger (*Taxidea taxus*)

Distribution/Probability of Occurence

The American badger (*Taxidea taxus*) typically inhabits open grasslands and deserts. This species is primarily nocturnal but is often abroad during the daylight hours. The last badgers known from the Coachella Valley have been recorded from the Planning Area, near the intersection of Indian and Peirson Avenues (Cornett, 1994). At one time they were found throughout the Coachella Valley. The probability of this species occurring on the project site is low, but it may occur throughout the region in low numbers.

Protection Status

The American badger (*Taxidea taxus*) is considered a California State Species of Special Concern due to declining numbers.

VII. IMPACTS RELATED TO CONTINUED DEVELOPMENT WITHIN THE PLANNING AREA.

The literature review biological assessment of the Planning Area determined that significant biological resources will be impacted directly, indirectly and cumulatively by continuing development. The primary impacts involve "harassment" and/or "take" of listed or unlisted but sensitive species and removal of vegetational cover (habitat) from large areas of undeveloped open space and associated loss of plant and wildlife species. In general, the species composition and diversity of existing fauna of the Planning Area will be permanently changed from the natural condition in and immediately surrounding areas developed in the future. While a number of native species inhabiting the Planning Area will be reduced, displaced and/or eliminated, certain native and non-native species adapted to human disturbance (e.g., "urban-tolerant fauna" such as starlings, mourning doves, house mice, house finches, etc.) will be attracted to inhabit or visit newly developed parcels.

In-depth assessment of specific potential impacts, resulting from each future development project within the Planning Area, will be required as a part of the CEQA process. A detailed analysis of specific impacts is not possible here. Such analyses are best conducted for specific projects. The following paragraphs summarize the general categories of impacts likely to occur to the existing biological resources of the Planning Area as a result of continuing development within the Planning Area.

A. Direct Impacts to Existing Biological Resources

Most of the sensitive plant and wildlife species that have been observed or are expected to occur within the proposed Planning Area are not officially listed as Threatened or Endangered by either the U.S. Fish and Wildlife Service or the California Fish and Game Commission, but are or may be proposed for listing by state and federal resource conservation agencies or are currently California Species of Special Concern. Although such unlisted species are not protected by either the federal or state Endangered Species Acts, the California Environmental Quality Act (CEQA) defines impacts to species proposed for listing as significant. Biological resources, particularly wildlife, could be affected by future proposed development, including wind energy projects, in many ways. Particularly sensitive in the San Gorgonio Pass area would be birds, bighorn sheep, and the threatened Coachella Valley Fringe-Toed Lizard (BLM, 1982). The most common development related direct impacts to species and habitat are listed and briefly discussed below.

Habitat Loss

Development of natural habitat areas results in the loss of that habitat for use by plant and wildlife species. Construction activities such as clearing, excavation, and filling result in the destruction of plants and animals that are unable to escape. Relatively mobile animals that are able to escape construction or that are not present on the site at the time of construction are forced to utilize adjacent natural habitat areas, if any are available. This results in temporarily increased wildlife population densities in habitat areas adjacent to recent developments. The increased population density results in increased competition for the limited resources available (i.e. food, water, shelter, mates, etc.) as the displaced animals are forced to compete with the original inhabitants. Eventually, competition for resources will result in decreases in wildlife populations to levels similar to those existing in the adjacent natural habitat area before the construction activities. The net result is the loss of wildlife roughly equal to that which originally inhabited the project site.

Habitat Degradation

Habitat degradation caused by human disturbance results in a decrease in the quantity and/or quality of resources available to plant and wildlife species. The loss of resources results in decreases in populations of plant and wildlife species that normally utilize those resources as these species disperse to other areas or die due to lack of resources. Examples of human activities that degrade the environment include off road vehicle use, trash dumping, noise, predation by dogs, cats and children, etc.

Bird Species

Continued development within the Planning Area will result in reduction of the diversity and abundance of common and sensitive bird species inhabiting or utilizing proposed development areas. An increased human population means more dogs and cats, more dirt bikes, more noise, and less native vegetation, all factors that can significantly and adversely impact sensitive bird species. Pre-construction surveys for sensitive bird species and development of appropriate mitigation measures is required as a part of the CEQA process prior to implementation of any development. Certain bird species adapted to human presence will continue to inhabit proposed development areas, while less tolerant species will avoid or only occasionally visit developed areas.

Bird/Wind Turbine Collisions and Bird Migration

The potential exists for low incident rates of collision between birds and wind turbine generators. This would be especially of concern in two areas: near the Whitewater Settling Ponds and on the ridge crest east of lower Whitewater Canyon. Migratory birds using the ponds could collide with the dense arrays of turbines proposed immediately adjacent to the ponds. The large turbines on the Whitewater Canyon crest pose a potential collision threat for soaring birds and migratory birds utilizing the riparian areas on the floor of the canyon. Placement of large turbines along ridge tops may impact the behavior of large soaring birds which utilize air currents deflected upwards by the terrain as a source of lift. This is of particular concern to the east of Whitewater Canyon. Evidence collected during bird studies, supported by Southern California Edison in 1982, suggested that effects on migrant bird populations should be minimal, but additional, current information is needed to fully assess the cumulative impact of development (BLM, 1982). The presence of turbines near high quality riparian areas may divert birds to lower quality areas. However, no riparian areas exist within the Planning Area, therefore, this is not an issue. Development of additional windmills will likely impact bird populations.

Raptor Foraging Habitat

The Planning Area supports significant populations of rodents, rabbits, and other small animals which provide food for various species of raptors (birds of prey). Continued development within the Planning Area will result in the loss of a significant raptor forage area (Terra Nova Planning, 1992). For example, build-out the Rancho Royale Specific Plan and the Olympus Golf Club would destroy nearly 2,800 acres of raptor foraging habitat in scrub areas. This impact will be significant in view of the large size of the area and the rapid destruction of raptor foraging habitat by development throughout southern California.

Coachella Valley Fringe-Toed Lizard

The Coachella Valley fringe-toed lizard has been federally listed as threatened and state listed as endangered. The lizard spends most of its time within three inches of the surface, therefore it is very vulnerable to crushing and other direct impacts from construction projects such as residential, commercial, recreational, highway, wind energy project turbine and road construction, etc. Noise induced hearing losses, both from construction and operation of wind energy project turbines, could increase the lizard's vulnerability to predation. Lizard habitat could be fragmented by road construction on public lands. These impacts would occur mainly where most of the lizard habitat in the study area occurs (Appendix G). There is also a possibility that wind turbines could interfere with sand transport and deposition, a mechanism upon which the maintenance of lizard habitat depends. The most damaging proposals would be those with large numbers of turbines requiring extensive road systems (BLM, 1982).

Desert Bighorn Sheep

The continued development of wind energy turbines within the Planning Area may cause Desert Bighorn sheep to retreat up to one mile from the nearest turbines in the North Whitewater area. This impact could be especially true for the highly visible strings of large turbines on top of the ridges north of Alta Mesa.

Burrowing Wildlife

Continued development will result in the reduction or elimination of most burrowing wildlife including small mammals and reptiles within development areas. Some species will reinvade following completion of project construction, but the species composition and diversity will not return to pre-construction conditions.

Wildlife Movement Corridors

The washes, gullies, drainages, ravines and ridge lines of the Planning Area may provide certain wildlife species (e.g., coyote, deer, sheep, etc.) with wildlife movement corridors between the mountainous northerly corners of the Planning Area and the Coachella Valley (Terra Nova, 1991; Tierra Madre Consultants, 1990). The loss of washes, gullies, drainages, ravines and ridge lines that are potential wildlife movement and migration corridors may contribute to the cumulative regional disruption of wildlife movement. Continuing development will significantly impact movement and migration by forcing wildlife to use alternate routes which may reduce foraging territory, dislocate migration patterns, create isolated populations, restrict mate-finding behavior, or reduce "gene flow" between existing sub-populations.

Canyon Wildlife

Morongo Valley Canyon lies along a major migratory route for birds flying between the Imperial Valley region and areas to the North and West, over 100 species of birds have been identified in this canyon alone (Wagstaff and Brady, 1982, EIR #156 and #158; McKernan, 1981). Most of the migratory species of Morongo Valley Canyon do not rest in the area. Migrants are primarily song-birds, with some shorebirds and waterfowl. Morongo Canyon is also an important resting area for songbirds.

Sensitive Species

As shown on Tables 3 and 4, several sensitive species are known or potentially present in the Planning Area. Continuing development within the Planning Area will eventually directly impact sensitive plant species and plant habitat types because development encourages human population growth, increased construction grading, dirt biking, presence of domestic animals, introduction of exotic plants, and other sources of disturbance. Any future project involving construction or grading will potentially have direct impacts and will require additional surveys for sensitive species.

Impacts to Non-sensitive Species

The species occupying or utilizing sites being developed will either be eliminated or displaced into adjacent undeveloped areas and disturb the existing species-survival resources (e.g., food, shelter, water, etc.) equilibrium in those areas. Displaced species will cause crowding, and increase competition for survival resources. Displaced species are particularly vulnerable to elimination by disease, predation and competition for food and territory until a new equilibrium is reached.

Impacts To Sonoran Desert Scrub Habitat And Associated Wildlife

Continued development of parcels within the Planning Area will result in the irreversible removal of large open space areas supporting natural Sonoran Creosote Bush Scrub habitat and associated wildlife. People, dirt bikes, dogs, cats, and noise adversely impact many animal species in rather obvious ways; by scaring them, running over them, eating them, or by making it difficult for them to rear their young or to escape from predators, etc. Grading an area for development removes or displaces essentially all naturally occurring biological resources and associated wildlife. After the development area is landscaped for its intended purpose, a remnant native flora and fauna returns to the unlandscaped areas but a portion of the original native desert scrub habitat and associated wildlife, indigenous to the Planning Area, is permanently lost. Therefore, the loss of large open space areas containing wildlife ranges and completely, easily (or economically) foraging habitat is a direct and cumulative significant unavoidable impact that can not be mitigated to less than significant levels. Where feasible, partial mitigation can be achieved by preservation of on-site natural open space and mandatory landscaping with locally indigenous (native) Sonoran Creosote Bush Scrub plant species which tend to be drought tolerant, habitat and food providing, and fire retardant. However, after mitigation the impacts related to continued development would remain significant and cumulative.

B. Indirect Impacts Of Continued Development

Future growth and development in the Planning Area will have indirect impacts. Increased noise and vehicular traffic, reduced air quality, and increased numbers of domestic animals and exotic plants are inevitable impacts of any project that encourages growth. These factors, in turn, impact native wildlife and vegetation. Even projects which are determined not to directly impact sensitive biological elements will indirectly affect biological resources of the Planning Area because they will encourage growth and development in the surrounding areas.

Indirect impacts result from indirect damage to vegetational cover of adjacent to development areas as a result of accidental trampling by construction personnel or equipment and post-construction increased noise and vehicular traffic, reduced air quality, and increased numbers of invasive introduced plants and domestic animals, horse-back ridding, exploration by residents and visitors, off-road vehicles, etc. These will all impact the native biota by reducing, degrading, displacing or eliminating pre-development native plant and wildlife species and natural habitat types of undeveloped land surrounding the proposed development areas.

C. Regional and Cumulative Impacts of Continued Development

CEQA requires an assessment of cumulative impacts from related projects that are known to be pending or in progress. Although it may be determined that a specific development proposal within the Planning Area will have no direct impact to existing on-site biological resources, it's implementation will encourage development in other nearby areas. The cumulative impact of several adjacent projects could result in the destruction of large areas of native vegetation and open space supporting desert vegetation, elimination of habitat for several sensitive species, loss of raptor foraging and wintering habitat, reduction in open space availability of "home ranges" for predators, etc. The loss of native vegetation and open space is an incremental contribution to the cumulative regional impact of the reduction of foraging habitat utilized by ranging species of wildlife. For example, raptors are territorial and depend on large areas of contiguous open space for their home ranges. Removal of the vegetation that supports the prey populations that predatorial raptors and other wildlife feed on will result in a corresponding decline in the numbers of predators in the region.

The loss of washes, gullies, drainages, ravines and ridge lines for use as potential wildlife movement and migration corridors may contribute to the cumulative regional disruption of wildlife movement.

The areas most likely to significantly add to the cumulative impacts of continuing development within the Planning Area include the Tesoro Specific Plan (Shepard, 1986), which would impact an area of nearly 4 square miles immediately north of Annexation Area No. 22 and continuing development in the North Palm Springs Area and the former Annexation Area No. 21.

Cumulative impacts can only be partially mitigated. After implementation of project specific mitigation, cumulative impacts will remain significant. These impacts must be dealt with in the environmental impact report or other CEQA documents for each specific development as it is proposed within the Planning Area.

VIII. BIOLOGICAL CONSTRAINTS LIKELY TO AFFECT CONTINUING DEVELOPMENT

This section summarizes the general categories of impacts which are likely to constrain implementation of the preferred project within the Planning Area. Property owners will eventually propose a project to the City as the one they would prefer to implement on a specific parcel within the Planning Area. However, the preferred project may impact existing listed or unlisted but sensitive biological resources (i.e., natural habitat types and plant and wildlife species) or the physical environment supporting them (i.e., drainages, watersheds, blow sand, slope aspect, groundwater hydrology, etc.) in such a way that it constrains development of the preferred project. This may compel the project proponent and/or City to assess the necessity and feasibility of altering the preferred project to avoid or minimize potential impacts or implementing an alternative project. Project alternatives which are most commonly considered include: (a) redesigning the preferred project in a manner that avoids or reduces project impacts to less than significant; (b) developing on or off-site mitigation plans to mitigate project impacts to less than significant; (c) implementing the preferred project on a different parcel where it will not impact sensitive biological resources; (d) preparation of a finding of overriding considerations which would allow implementation of the preferred project despite the significance of the impacts; or (e) no project.

The constraints likely to affect implementation of the preferred project are listed and briefly discussed below and include the following: the locations and distributions of sensitive biological elements, adequacy of biological investigations and reports of results and findings, construction crews and equipment, and construction of access roads.

The specific biological constraints of each proposed development area, which could constrain implementation of the preferred project, can only be determined by conducting comprehensive on-site specific biological investigations. This biological constraints section is followed by a mitigation measures section providing proposed measures intended to avoid, minimize, or mitigate unavoidable potential project related impacts to non-significant levels.

A. Locations and Distributions of Sensitive Biological Elements

As mentioned above, the most common biological constraints, which could affect implementation of a preferred project, are those related to potential impacts to sensitive biological elements (i.e., listed or unlisted but sensitive rare, threatened, or endangered plant and wildlife species and habitat types) located within or immediately adjacent to the boundaries of the proposed development site. In an effort to provide City planners and project proponents with an idea of the approximate known locations and distributions of sensitive biological elements within the Planning Area a *Sensitive Biological Resources Map* of the Planning Area has been provided in a map pocket in Appendix G.

The *Sensitive Biological Resources Map* was developed by plotting the approximate locations and distributions of sensitive biological elements obtained primarily from the following sources:

a. September 1994 and January 1995 California Department of Fish and Game Natural Diversity Data Base (CNDDB) *Rare Find* search records and 1994 velum overlay data for the Seven Palms and Desert Hot Springs USGS quadrangles;

b. Reviews of the sensitive biological element discussions and/or maps contained in the twelve 1978-1994 biological assessments reviewed for the Planning Area (Table 1); and

c. A limited amount of older information available on local government, state and federal resources agencies sensitive species and habitat publications and maps (e.g., Riverside County General Plan, Riverside County Coachella Valley Fringe-Toed Lizard Fee Assessment Area map, Coachella Valley Association of Governments MEA, BLM, San Gorgonio Pass Wind Energy Project maps, etc.).

d. Field data obtained during March and April 1995, focused plant and wildlife surveys.

The *Sensitive Biological Resources Map* is intended for use as a planning tool to determine the sensitive biological resources previously identified as occurring or potentially occurring in the vicinity of future proposed developments. This compilation of previously acquired and 1995 field survey data will enable City Planning Department staff, project proponents, biological consultants, and other interested parties to identify potential biological constraints to development prior to performing specific site surveys. It should be noted that these maps and the text in this literature review biological assessment only report previously identified sensitive biological resources and constraints, and do not preclude the necessity of conducting site specific biological surveys to determine the current site specific presence or absence of sensitive biological resources constraints to development.

Even if it is determined that a specific project will not directly affect listed or proposed sensitive biological elements, it will be likely to indirectly and/or cumulatively affect sensitive resources.

CEQA requires an assessment of indirect and/or cumulative impacts from projects in the same vicinity that are known to be pending or in progress. Although, it may be determined that a specific development proposal will have no direct impact to existing on-site biological resources of the parcel being developed, it is likely that it's implementation will impact the biological resources of other nearby portions of the Planning Area. For example, implementation of a specific project will result in increased noise and vehicular traffic related to increased human use of the development site, increased travel to and from the site, reduced air quality, and increased numbers of domestic animals and exotic plants are inevitable impacts of continued development, because it will encourage growth and development within the Planning Area. These impacts will occur regardless of the specific details of each proposed development project. The cumulative impact of several adjacent projects could result in the destruction of large areas of desert vegetation, including habitat for several sensitive species, raptor foraging and wintering habitat, etc. Therefore, an assessment of more specific impacts resulting from each proposed development project will be required as a part of the CEQA process for each specific project.

B. Adequacy of Biological Investigations and Reports of Results And Findings

The specific biological constraints of each future proposed development area, which could potentially constrain implementation of the preferred project, can only be determined by conducting adequate project site specific biological investigations. It is not uncommon for biological assessments to be incomplete, inaccurate, inclusive, conducted at the wrong time of year, conducted by unqualified persons, etc. As previously discussed, it is critical that these investigations be conducted by qualified biologists in a manner that provides the type of data enabling a thorough assessment of potential project impacts to known or expected sensitive species and habitats of proposed development areas.

C. Construction Crew And Equipment

During construction of development sites, on and off-site natural open space areas not being developed may be impacted by construction personnel or equipment activities resulting in the accidental disruption, trampling or destruction of natural vegetational habitat, washes, drainages, etc. Construction related impacts to wildlife may result in loss or abandonment of nest sties, lowered reproductive rates, avoidance of preferred use areas, and increased stress (WESCO, 1987). Negative impacts to undeveloped natural open space areas should be avoided to the maximum extent feasible through sensitive design of construction grading plans, etc. During construction, this can be achieved by temporarily fencing natural open space areas with orange colored "safety" fencing and by restricting construction vehicle traffic and vehicle staging areas from areas designated for preservation, restoration, or creation as active/passive open space. After construction, this can be achieved by development and implementation of a permanent fencing and security plan to prevent habitat degradation by destructive human activities in all permanent active/passive open space areas while allowing relatively unrestricted site access for small animals.

D. Access Roads

The construction of access roads to and within development parcels will result in the elimination (take) of few animals. Once in place, access roads would not directly impact the desert ecosystem. However, the existence of any access road in the desert seems to encourage people to drive over it, even if it only leads to a "dead end", fence, or a locked gate. The most likely consequence of the construction of any type of access road, into an otherwise undisturbed, pristine area, will be trash dumping, off-road vehicle use, target shooting, social gatherings, "parking," etc. These impacts can be minimized by reducing the number and extent of access roads constructed, disking access roads and returning them to open space at the conclusion of construction, restricting access to the roads with fences and gates, etc.

E. Wind Breaks

Tamarisk trees and oleander have been planted extensively throughout the Planning Area as wind breaks near highways, railroad lines, and homes. While these non-native species are not biologically sensitive, they are potentially valuable resources because they provide roosting areas, nest building materials and sites, and cover from inclement weather, predators, humans, etc. When feasible, wind breaks should be preserved. However, planting of new wind breaks is not recommended because they disturb natural wind patterns which, in turn, leads to stabilization of blow sand areas which provide potential habitat for the Coachella Valley fringe-toed lizard. In addition, tamarisk and oleander are invasive species which could potentially escape the windrows and invade and disrupt undeveloped native habitat.

F. Construction Schedule

Sensitive wildlife species could potentially be adversely affected by construction work scheduled during their breeding and/or migratory seasons. Therefore, construction related activities should be scheduled to occur during the times of the year when the affected species are less sensitive. Construction schedules will be determined by conducting project specific pre-construction biological assessments to determine which sensitive wildlife species occur on-site. The biological assessment will specify the times of the year when construction can be scheduled to minimize impacts to sensitive species.

IX. MITIGATION MEASURES

This section presents mitigation measures intended to avoid, minimize, or partially or completely mitigate development impacts to known and potential sensitive biological resources resulting from continuing development of parcels within the Planning Area. The primary sensitive biological resources, which will potentially be impacted by continuing development, include sensitive native plant and wildlife species and natural habitat types.

Mitigation measures are urged as "advisable courses of action" following an evaluation of the biological resources on a specific proposed development site in order to protect those species judged to be of significant biological value and the habitat they utilize. If the recommended mitigation measures are adopted, direct and indirect project impacts to sensitive biological resources of the Planning Area can be partially or entirely avoided, minimized, or mitigated to non-significant levels for the most part. Cumulative impacts related to continuing development within the Planning Area can only be partially mitigated and will remain significant even with implementation of the following proposed mitigation measures.

The following list of mitigation measures is derived from those proposed in the seventeen 1978-1994 Table 1 biological assessments and from JMA's own experience.

Availability of Biological Assessments/Bibliographies

- Copies of all subsequent biological assessments should be kept separately on file at the City Planning Department Reference Library. These assessments must be made available for review by biologists conducting literature reviews for proposed development sites within the Planning Area.
- Subsequent biological assessments should be referenced in a "Master Biological Bibliography" on file at the City Planning Department Reference Library. This bibliography must be made available to assist biologists conducting literature reviews for proposed development sites within the Planning Area.

Subsequent Biological Assessments

- As a matter of policy, the City should require comprehensive, site specific biological investigations which at least include a comprehensive records search, a literature and map review, and field survey of the entire proposed development site to inventory and map, and accurately describe the sensitive biological resources of the entire Planning Area.
- Subsequent biological assessments of specific development sites should be used by the City staff or consultants to add detail to the general biological inventory and map.
- Field surveyors must use the most currently accepted survey protocols (methodologies).
- All general and focused biological field investigations for proposed development properties must be conducted by qualified, experienced field biologists during the proper seasons when all sensitive plant and wildlife species, potentially occurring on the property, would be both present and identifiable.
- An adequate number of appropriately lengthy, dawn to dusk diurnal and nocturnal observational surveys must be conducted during the appropriate times of day and season(s) of the year.
- In order to detect annual and ephemeral species, botanical field surveys must be comprehensive, of an appropriate duration to adequately cover the proposed development parcel and conducted at the proper time of year, when spring flowering plant species are both evident and identifiable. The proper time of year coincide(s) with known flowering periods.
- The results of surveys conducted during periods when the presence or absence of sensitive species can not be determined can only be used to assess the potential of the site to support sensitive species. Such surveys must be supplemented with additional survey(s) conducted during the times of year when rare, threatened, or endangered species would be present, observable, and active (e.g., hibernating, aestivating, migrated out of the area, etc.).
- Botanical and wildlife surveys must be conducted by an experienced biologist with the appropriate taxonomic skills enabling accurate species and subspecies determinations.
- If/as appropriate, "take" or "harassment" of sensitive species should be prevented by requiring that surveys for those species be conducted by permitted biologists (e.g., holders of current CDFG collectors permit or Memorandum of Understanding, federal threatened or endangered species 10(a) permit, etc.).
- A detailed, large scale vegetational map must be prepared showing the locations of all existing habitat types and locations of areas potentially supporting sensitive plant and wildlife species. The locations of the habitat types and potential sensitive species areas are to be plotted on a 1:25,000 or 1:24,000 scale USGS quadrangle map of the project site and a larger scale (1:40, 1:100, etc.) topographic base project map clearly showing the project boundaries and thereby landmarks (e.g., roads, streets, hills, streams, and parcel map boundaries).
- The results and findings of the investigations must be documented in accordance with the guidelines of some type of current, adequate *Biological Survey Report Guidelines*.

- Regardless of how well a species inventory is done, the plant and/or wildlife populations of a given site can change radically from year to year. Therefore, surveys for sensitive biological elements will only be valid for one year and must be repeated to confirm the continued presence or absence of native biological resources from a proposed development area and thereby ensure development and implementation of appropriate mitigation measures.

- The City should require that a copy of all biological resources technical reports, prepared for each proposed development property, be sent to the California Department of Fish and Game, U.S. Fish and Wildlife, and Riverside County Planning Department for use in preparation of local/regional Multi-Species Habitat Conservation Plans (e.g., Coachella Valley Association of Governments), Coachella Valley-wide biological resource assessments, etc.).

- The locations of all sensitive plants, wildlife, and habitat types should be reported to the CNDDB by the City or City's consultant on the appropriate CDFG form(s).

Impacts To Sonoran Creosote Bush Scrub

- Require that all proposed development projects retain significant areas of natural passive open space within their boundaries. This can be accomplished by preserving, enhancing, and/or restoring, existing natural habitat areas. Golf courses, improved parks, etc. will not count as natural open space because native wildlife will not utilize human use areas to any significant extent.

- Design preserved/created open space areas in such a way that they are interconnected to adjacent open space areas and to one another. Isolated "biological islands" have little biological value.

- Protect preserved or created open space areas to allow their continued use by wildlife. This can be accomplished by designing effective buffer zones around open space areas to restrict access by humans and domestic dogs and cats.

- Minimize the construction of trails and access roads to remote portions of proposed development sites.

- Whenever feasible, undisturbed areas should be left without trails to reduce human access and disturbance and allow maximal use by wildlife.

- All access roads, potentially allowing access to natural areas, must be gated to reduce their use and associated impacts to undeveloped, natural areas of the Planning Area.

Desert Fan Palm Oasis Woodland

- Preserve remaining fan palm oasis habitat.

Sand Dune/Sand Field Environments

- Project proponents will be required to preserve as much of all on-site sand environments as feasible.

- As feasible, construction activities (such as construction or improvement of access roads, staging areas, parking areas, etc.) should be designed to avoid prime sand environment areas.

- When feasible, landscaping and agricultural activities should not be approved within sand environments.

- When feasible, implementation of wind erosion abatement procedures to stabilize blowing sand on lands surrounding sand environments should not be approved.

Wash, Gullies And Drainage Areas

- Minimize the use and degradation of major and minor drainages, intermittent streams, and open space preserves within the Planning Area by constructing permanent deterrents to off-road vehicle use of the more remote portions of all proposed development sites.

- If any alteration of a streambed is proposed, a wetlands and "waters of the U.S." delineation must be performed to determine the acreages of jurisdictional riparian habitat being impacted by the proposed roadway reconstruction and widening project shall be prepared, prior to commencement of any grading.

- If the results of the delineation justify it, a mitigation plan must be prepared to mitigate the loss of vegetation associated with the jurisdictional habitat at a replacement ratio acceptable to the California Department of Fish and Game and U.S. Army Corps of Engineers.

- Prior to commencement of any grading, the applicant must notify appropriate agencies and obtain streambed alteration approvals (as required) from the California Department of Fish and Game (1601 Agreement), State Water Resources Department (401 permit or waiver), and Army Corps of Engineers (404 Permit). The mitigation plan developed will be used to complete applications for permits, agreements, waiver, etc. required to permit the alteration of jurisdictional riparian habitat and filling of the existing drainage. As required by the resources agencies, the mitigation plan will be appended to the applications for permits, agreements, waiver, etc.

- The revegetation of wash, gully and drainage areas, including channels and intercept and debris basins, shall be conducted using endemic vegetation.

Dry Wash Woodland

- Avoid impacts to washes and wash vegetation whenever feasible.

- Proposed alterations of dry wash woodland habitat may be subject to Army Corps of Engineers 401/404 and/or California Department of Fish and Game 1601/1603.

Impacts to Sensitive Species

- The City should require that any future construction projects within the Planning Area be scheduled to avoid the nesting season of the sensitive bird species found in the area that are anticipated to be affected by the proposed development.

- The City should support development of a multi-species habitat conservation plan for the Planning Area and surrounding region. Although the initial cost of such a plan is high, in the long term it could actually encourage development, since areas set aside for wildlife are defined, and the permitting process for individual projects outside those areas is greatly facilitated.

- Prior to grading, the applicant must develop a plan to reduce the impacts of night lighting on open space and/or mitigation areas adjacent to the project area.

- When feasible, proposed developments will preserve natural open space areas to minimize the loss of raptor foraging habitat.

- Native California plant species shall be incorporated into the landscaping plans of proposed development areas, to the greatest extent possible, to encourage native animal species to return to revegetated portions of preserved natural and/or created/enhanced open space areas.

- The City Planning Department shall verify that native species have been included in all landscaping plans and shall delete any non-native invasive species included on proposed landscaping plant lists.

- The City Planner shall visit the site following each phase of development to verify that approved landscaping plans are implemented.

- Development activities will be limited during the spring and early summer in sensitive bird nesting areas.

- Small wildlife watering basins will be placed in open space areas to enhance wildlife carrying capacity. The basins should be supported by piped water from adjacent proposed development areas.

Desert Bighorn Sheep

- Pre-construction presence or absence surveys for desert bighorn sheep should be conducted for each future development site proposed within the extreme northeastern portion of the Planning Area (General Plan, Resource Management Element, 1987).

- As feasible, developments adjacent to sheep habitat should not erect fences or other linear obstructions to sheep movement.

- Project proponents will be required to preserve as much of on-site sheep habitat and to avoid or minimize the loss of food and cover essential to the survival of the sheep as feasible.

- As feasible development will be designed to avoid or minimize disturbances to an undue amount of the surrounding habitat.

Coachella Valley Fringe-toed Lizard

- No parcel of land, within the CVFTL Fee Area, will be issued any permit or development approval prior to the payment of the mitigation fee to the Nature Conservancy.

- Once The Nature Conservancy has verified that the mitigation fee has been paid the city will issue a sub-permit allowing "take" of the CVFTL upon the land for which the fee has been paid during the course of otherwise lawful development activities.

- Focused surveys for CVFTL should be conducted in May or June when soil temperatures are between 80-100 degrees Fahrenheit.

Burrowing Owl

- Surveys for burrowing owls should be conducted on all proposed development sites if earth disturbing project related activities are scheduled during the nesting period of March-June when their habitat is protected by the Migratory Bird Act.

- Impacts to Burrowing Owl can be reduced by evacuation of owls and destruction of existing Burrowing Owl nests during the non-nesting season (July-February) prior to initiation of development activities.

Partial Mitigation Of Cumulative Impacts

- Where feasible, partial mitigation of cumulative impacts can be achieved by requiring landscaping with indigenous Sonoran Desert Scrub native vegetation.

- Where feasible, partial mitigation of cumulative impacts can be achieved by preservation of on-site natural open space.

- Partial mitigation of cumulative impacts can be achieved by salvaging desirable desert plant species, that would be destroyed by project implementation, for use in landscape areas.

Open Space

- All proposed developments will incorporate the maximum amount of existing on-site natural open space and native vegetation into the project and landscaping.

- Projects should be designed to cluster residential dwellings and commercial development so as to leave larger areas within the Planning Area undeveloped.

- Natural open space areas shall be preserved as natural open space through dedication, open space easements, or other legal mechanisms as appropriate.

- Use existing access roads to the greatest extent possible thereby minimizing new road construction and the associated ground disturbance.

- Future specific plans should be required to include retention of significant acreages of existing natural desert habitat. These areas should be part of a master designed system of interconnected open space areas or corridors.

- When feasible, proposed developments will assist the City in meeting recommendations of the National Parks and Recreation Association (NPRA) to preserve adequate park space for passive and active recreational uses within the Planning Area. The mechanisms for meeting NPRA goals within the Planning Area will be addressed in the Recreational Facility Standards of the Resource Management Element of the 1995 General Plan.

- During construction, this can be achieved by temporarily fencing natural open space areas and by limiting construction vehicle traffic and vehicle staging areas in areas designated for preservation, restoration, or creation as active/passive open space.

- After construction, protection of natural open space areas can be achieved by development and implementation of a permanent fencing and security plan to prevent habitat degradation by destructive human activities in all permanent active/passive open space areas while allowing relatively unrestricted site access for small animals.

- Where feasible, existing native shrubs and/or trees and non-native ornamental trees should be retained in open space areas and incorporated into the project design as reflected in the final Grading Plan and Landscape Plan. Trees to remain shall be identified on the final development plan.

- "Leash laws" must be implemented and enforced to prevent damage of natural open space preserves and native plant revegetation landscape areas/projects by domesticated dogs and cats.

Desert Tortoise

- If any desert tortoise are observed on a project site, work areas or access roads, all development activities must stop immediately in the immediate vicinity of the encountered tortoise(s). A City approved biologist must be called to determine the appropriate course of action. Development activities can only resume upon receipt of written authorization by the biologist to proceed.

Salvage Of Desirable Desert Plant Species For Use In Landscape Areas

- When feasible, larger specimens of desert cactus species (e.g., *Ferocactus* and *Escobaria*) should be salvaged from areas where they would be destroyed by proposed development.
- Salvaged cactus specimens should be held for replanting in on-site landscape areas and/or open space areas, offered to other developments, or relocated to open space preserves within the Planning Area.
- The US Department of Agriculture must be contacted to determine if a permit is required to move salvaged plant materials on highways or surface streets within the Planning Area. A copy of any such permitting or a letter stating no permit(s) is required must be submitted to the Planning Department.
- Other native flora should be salvaged for on and off-site landscaping purposes as feasible.

AB 3180

- A CEQA AB 3180 5-year Mitigation Monitoring and Reporting Plan, Implementation Schedule, and Verification Mechanism (form) will be developed, by the project biologist of all development projects, for verifying the success of all project specific biological mitigation measures.
- It is the City's responsibility to verify the implementation of AB 3180 monitoring plans.

X. APPENDICES

The appendices of the literature review biological assessment include the following.

- Appendix A: Floral Compendium.
- Appendix B: Wildlife Compendium.
- Appendix C: Bird Checklists for the Coachella Valley and Living Desert, Riverside County, California.
- Appendix D: County of Riverside, Biological Impact Report Outline and a Draft Standard Biological Report Scope of Work.
- Appendix E: An Explanation of the CNDDB Data Base Priority Ranks and CNDDB Rare Find Report Search Results.

- Appendix F: Approximate Locations Of 1978-1994 Biological Assessments Of The Planning Area
- Appendix G: Sensitive Biological Resources Map.
- Appendix H: Generalized Vegetation Map.

APPENDIX A

FLORAL COMPENDIUM FOR THE CITY OF DESERT HOT SPRINGS AND SPHERE OF INFLUENCE

INTRODUCTION

During preparation of the biological section for the Master Environmental Report and General Plan update for the Planning Area, the seventeen biological assessments listed in Table 1 and mapped on the Appendix F, *Approximate Locations Of 1978-1994 Biological Assessments Of The Planning Area*, map were reviewed to obtain plant species inventories for each of these development sites. Nine biological assessments contained some type of plant species inventory. In addition, between September 1994 and March and April 1995, JMA's biologists conducted field surveys of the entire Planning Area to (a) field check selected parts of the plant inventory data provided in the seventeen biological assessments, (b) record previously undetected or unidentified plant species, and (c) construct the Appendix H *Generalized Vegetation Map of the Planning Area* depicting the approximate boundaries of the predominant vegetation types within the Planning Area. As a result of these efforts a separate list (compendium) of the botanical (floral) resources currently occurring within the Planning Area was prepared.

The following Floral Compendium was prepared by combining the nine plant species inventory lists, obtained from the literature review, with previously undetected and/or unidentified species identified during JMA's 1994 and 1995, Planning Area field surveys. The plant compendium is not purported to be complete inventories of the botanical species of the Planning Area. However, it is highly likely that most of the plant species, occurring within the Planning Area, have now been identified. That is, it is unlikely that the compendium will be significantly expanded during future field surveys conducted within the Planning Area. The compendium only lists those plants listed as actually observed within the boundaries of the Planning Area during 1978-1995 field surveys of the Planning Area. A few annual or seasonal herbs, exotic landscape species, or very uncommon native, non-native or cultivar species may have been undetectable or overlooked during the on-site 1978-1995 field surveys because they were not obviously visible or identifiable (e.g., had not germinated, had not developed morphological structures necessary for identification to species, were not flowering, etc.). The Floral Compendium is comprised of thirteen columns providing the following information.

COLUMN 1: NON-NATIVE

Each non-native plant type observed and identified between 1978 and 1994 during botanical field surveys is indicated by a bolded "X". The presumed origins of plant species follow those listed in Hickman (1993) and Munz (1974). Thirty-one non-native plant types were observed within the Planning Area. This represents 16% (31/194) of the one hundred ninety-four plant types identified within the Planning Area. The presence of non-natives is an indicator of disturbance (e.g., grading, off-highway vehicle use, fires, etc.).

COLUMN 2: FAMILY, GENUS AND SPECIES SCIENTIFIC NAMES

All plant species observed within the Planning Area, during 1978 to 1995 botanical field surveys, were identified to scientific family, genus and species name whenever possible. Floral taxonomic naming used in this report and APPENDIX A follows those of Hickman (1993) and Munz (1974). Families are listed in alphabetical order in accordance with Hickman (1993); within each family the genus and species names are alphabetically arranged.

COLUMN 3: FAMILY AND GENUS AND SPECIES COMMON NAMES

Common family and species plant names also follow Hickman (1993) and Munz (1974). Common names may vary among biologists, published botanical literature, and regions, but scientific names are "universal". Whenever possible, Jepson manual (Hickman, 1993) common names were given precedent. When no common name was provided in Jepson and when available, common names listed in Munz (1974), Stewart (1993) or De Decker (1984) were used. The total number of plant types identified on-site (194) is indicated in parentheses at the head of this column.

Table 3: Plant Species Observed Within The City Of Desert Hot Springs and Sphere of Influence*

NON-NATIVE (X) 31/194 = 16%	FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (194)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
			1	2	3	4	5	6	7	8	9	10
	KINGDOM PLANTAE											
	DIVISION TRACHEOPHYTA	VASCULAR PLANTS										
	I. NON-SEED PLANTS	Plants without seeds										
	FAMILY PTERIDACEAE	BRAKE FAMILY										
	Notholaena californica	California Cloak Fern							X			
	FAMILY SELAGINELLACEAE	SPIKE-MOSS FAMILY										
	Selaginella eremophila	Desert Spike-Moss	X	X		X			X			
	II. CONE-BEARING PLANTS	Seeds usually produced by cones or flowers										
	FAMILY EPHEDRACEAE	EPHEDRA FAMILY										
	Ephedra californica	Desert Tea	X	X	X	X	X	X				
	III. FLOWERING SEED PLANTS											
	Class Angiospermae											
	A. Subclass Dicotyledonae	Cotyledons (seed leaves) two										
	FAMILY APOCYNACEAE	DOGBANE FAMILY										
	Nerium oleander	Oleander									X	
	FAMILY ASCLEPIADACEAE	MILKWEED FAMILY										
	Asclepias albicans	White Stemmed Milkweed										X
	Asclepias subulata	Ajamete							X			

*** DEVELOPMENT AREAS**

1. Annexation No. 22
2. Rancho Royale Specific Plan
3. Olympus Golf Course
4. Mission Lakes Property
5. TT No. 22757 (Indian Hills EIR)
6. Rancho Morongo Country Club
7. Cornerstone Specific Plan
8. Desert Hot Springs 12-Acre Project
9. Seven Palms Ranch

JMA 1994/1995 PLANNING AREA SURVEYS:

10. 9-25-94; 9-26-94; 3-10-95; 3-11-95; 4-11-95.

COLUMNS 4-12: PLANT SPECIES IDENTIFIED FROM 1978 TO 1994

Only 9 of the twelve biological assessments reviewed contained an applicable plant species list. Each of the 9 species lists was numbered 1 through 9. The species identified in each development area is indicated by a bolded "X". Columns 4-12 are organized 1, 2, 3, etc. from the Northwest corner of the planning area and lists plant inventories obtained from projects in the order they would be encountered if one was to start at the northwestern boundary of the Planning Area and travel eastward across the Planning Area. If more previously completed biological assessments had been available, it would have been possible to develop a map showing the range of specific species and habitat types throughout the Planning Area.

COLUMN 10: 1994 AND 1995 BOTANICAL FIELD SURVEYS

As previously discussed, between September 1994 and April 1995 JMA's biologists conducted field surveys of the entire Planning Area. The surveys were conducted partially to (a) field check the accuracy of the plant inventory data provided in the seventeen Table 1 biological assessments, (b) record previously undetected or unidentified species growing within the Planning Area and (c) prepare an updated floral compendium. As indicated by a bolded "X" seventeen (17) previously undetected or unidentified species were identified during the 1994/1995 field surveys. This represents a 9% (17/194) increase in the number of species identified within the Planning Area. It is highly likely that the majority of the native plant species, occurring within the Planning Area, have now been identified.

Table 3: Plant Species Observed Within The City Of Desert Hot Springs and Sphere of Influence*

NON-NATIVE (X) 31/194 = 16%	FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (194)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
			1	2	3	4	5	6	7	8	9	10
	FAMILY BIGNONIACEAE	**BIGNONIA FAMILY**										
	Chilopsis linearis	Desert-Willow	X	X	X	X						
	FAMILY BORAGINACEAE	**BORAGE FAMILY**										
	Amsinckia tessellata	Devils Lettuce	X	X								
	Cryptantha angustifolia	Narrow-Leaved Cryptantha	X	X		X				X		
	Cryptantha barbigera	Beard Cryptantha				X						
	Cryptantha circumcissa	Western Cryptantha	X	X								
	Cryptantha intermedia	Nievitas Cryptantha	X	X								
	Cryptantha sp.	Forget-Me-Not					X		X			
	Pectocarya platycarpa	Broadfruit Pectocarya				X	X					
	Pectocarya recurvata	Recurved Pectocarya				X						
	FAMILY BRASSICACEAE	**MUSTARD FAMILY**										
X	*Brassica tournefortii*	Wild Mustard			X		X			X		
	Descurania pinnata ssp. glabra	Tansy Mustard				X						
	Descurania pinnata ssp. menziesii	Tansy Mustard				X						
	Dithyrea californica	Spectacle-pod				X				X		
X	*Hirschfeldia incana*	Short-Pod Mustard	X	X	X							
	Lepidium lasiocarpum	Peppergrass	X	X								
X	*Sisymbrium altissimum*	Tumble Mustard				X						
X	*Sisymbrium irio*	London Rocket					X					
	Streptanthus sp.	Jewelflower				X						
	Tiquilia plicata	Plicata Coldenia					X			X	X	
	FAMILY CACTACEAE	**CACTUS FAMILY**										
	Echinocereus engelmannii	Hedgehog (Calico) Cactus	X	X	X				X			
	Ferocactus cylindraceus	California Barrel Cactus	X	X	X	X	X		X			
	Mammillaria milleri	Fish-Hook Cactus	X						X			
	Mammillaria tetrancistra	Nipple (Corkseed) Cactus		X								
	Opuntia ramosissima	Diamond Cholla	X		X				X			
	Opuntia basilaris	Beavertail Cactus	X	X	X	X	X	X	X			
	Opuntia bigelovii	Teddy-Bear (Jumping) Cholla	X	X	X	X	X	X	X		X	

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			1	2	3	4	5	6	7	8	9	10
	FAMILY ASTERACEAE	SUNFLOWER FAMILY										
	Acamptopappus sphaerocephalus	Goldenhead	X	X								
	Ambrosia dumosa	Burro-Weed	X	X	X	X	X	X	X	X	X	
	Artemisia californica	California Sagebrush	X	X								
	Baccharis brachyphylla	Gray Shortleaf Baccharis				X						
	Baccharis salicifolia	Mule Fat				X						
	Bebbia juncea	Sweetbush	X	X	X	X	X	X	X	X		
	Brikellia desertorum	Brickellbush										X
	Chaenactis fremontii	Desert Pincushion				X	X			X		
	Chaenactis sp.	Pincushion	X	X								
	Chrysothamnus paniculatus	Black-Stem Shrub	X	X	X	X	X	X		X		
	Chrysothamnus teretifolius	Green Rabbitbrush	X	X								
	Dicoria canescens	Desert Dicoria				X				X	X	
	Encelia farinosa	Brittlebush	X	X	X	X	X	X	X	X		
	Ericameria linearifolia	Interior Goldenbush							X			
	Eriophyllum wallacei	Wallace's Woolly Sunflower				X						
	Haplopappus acradenius	Alkali Goldenbush										
	Hymenoclea salsola	Cheesebush	X	X	X	X	X			X	X	
	Lasthenia californica	California Goldfields				X						
	Lepidospartum squamatum var. palmeri	Scale-Broom	X	X	X	X		X				
	Malacothrix glabrata	Desert Dandelion				X	X			X		
	Monoptilon bellioides	Desert Star				X						
	Palafoxia arida	Spanish Needle	X				X			X		
	Palafoxia arida var. arida	Desert Spanish Needle		X								
	Pectis papposa	Chinch-Weed	X	X	X							
	Peucephyllum schottii	Pygmy-Cedar					X					
	Pleurocoronis pleuriseta	Arrow-Leaf	X		X	X	X					
	Psathyrotes ramosissima	Turtleback								X		
	Rafinesquia neomexicana	Desert Chicory				X	X			X		
X	*Sonchus oleraceus*	Common Sow Thistle				X						
	Stephanomeria exigua	Stephanomeria								X		
	Stephanomeria pauciflora	Wire-Lettuce	X	X	X	X	X					
	Viguiera parishii	Parish's Goldeneye	X	X	X	X						

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			1	2	3	4	5	6	7	8	9	10
	Ditaxis neomixicana	Ditaxis	X		X							
	Stillingia linearifolia	Stillingia	X	X	X	X	X					
	Stillingia spinulosa	Broad-Leaved Stillingia									X	
	FAMILY FABACEAE	PEA FAMILY										
	Acacia greggii	Catclaw	X	X	X	X			X	X		
	Astragalus lentiginosus var. coachellae	Coachella Valley Milkvetch										X
	Cassia armata	Desert Senna									X	
	Cercidium floridum ssp. floridum	Blue Palo Verde										X
	Dalea emoryi	Indigo Bush								X	X	
	Dalea sp.	Dalea							X			
	Lotus rigidus	Broom Lotus	X	X								
	Lotus scoparius	California Broom	X	X								
	Lotus strigosa	Lotus										X
	Lupinus arizonicus	Arizona Lupine								X		
	Lupinus sp.	Lupine								X		
X	*Medicago polymorpha*	California Burclover				X						
	Prosopis glandulosa	Mesquite									X	
	Psorothamnus arborescens var. simplicifolius	California Dalea	X	X	X	X	X			X		
	Psorothamnus emoryi	Emory's Dalea				X	X					
	Psorothamnus polydenius	Psorothamnus										X
	Psorothamnus spinosus	Smoke Tree				X		X				X
	Psorothamnus schottii	Psorothamnus										X
	FAMILY GERANIACEAE	GERANIUM FAMILY										
X	*Erodium cicutarium*	Red-Stemmed Filaree	X	X	X	X	X			X		

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			1	2	3	4	5	6	7	8	9	10
	Opuntia echinocarpa	Golden Cholla	X	X	X	X	X		X	X	X	
	FAMILY CAPPARACEAE	CAPER FAMILY										
	Isomeris arborea	Bladderpod	X	X	X	X	X	X		X	X	
	FAMILY CARYOPHYLLACEAE	PINK FAMILY										
	Achyronchia cooperi	Frost-Mat				X						
	FAMILY CHENOPODIACEAE	GOOSEFOOT FAMILY										
	Atriplex canescens	Four-Winged Saltbush									X	
	Atriplex polycarpa	Saltbush					X	X			X	
X	*Chenopodium murale*	Nettle-leaved Goosefoot					X					
	Grayia spinosa	Hop-Sage	X	X								
X	*Salsola tragus*	Russian Thistle		X							X	
	Suaeda torreyana	Inkweed									X	
	FAMILY CRASSULACEAE	STONECROP FAMILY										
	Crassula connata	Pigmy-Weed				X	X					
	Crassula erecta	Water Stonecrop				X	X					
	Dudleya saxosa	Desert Savior	X	X			X					
	Dudleya saxosa ssp. aloides	Desert Savior							X			
	FAMILY CURBURBITACEAE	GOURD FAMILY										
	Brandegea bigelovii	Brandegea	X	X								
	Cucurbita palmata	Coyote Melon	X	X		X						
	FAMILY CUSCUTACEAE	DODDER FAMILY										
	Cuscuta californica	Dodder										X
	FAMILY EUPHORBIACEAE	SPURGE FAMILY										
	Chamaesyce albomarginata	Rattlesnake Spurge	X	X								
	Chamaesyce polycarpa	Desert Sand Mat	X		X	X	X		X	X		
	Croton californicus	Croton				X						

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			1	2	3	4	5	6	7	8	9	10
	FAMILY NYCTAGINACEAE	**FOUR O'CLOCK FAMILY**										
	Abronia villosa	Sand-Verbena				X						
	Allionia incarnata	Windmills								X		
	Mirabilis bigelovii	Wishbone Bush	X	X								
	Mirabilis bigelovii var. retrorsa	Wishbone Bush			X	X	X					
	FAMILY OLEACEAE	**OLIVE FAMILY**										
X	*Olea europaea*	Olive				X	X					
	FAMILY ONAGRACEAE	**EVENING PRIMROSE FAMILY**										
	Camissonia boothii	Bottle Washer								X		
	Camissonia californica	Sun Cup										X
	Camissonia claviformis var. piersonii	Brown-Eyed Evening-Primrose				X	X		X	X		
	FAMILY PAPAVERACEAE	**POPPY FAMILY**										
	Eschscholzia minutiflora	Pygmy Gold-Poppy	X	X		X	X					
	PLANTAGINACEAE	**PLANTAIN FAMILY**										
	Plantago ovata	Woolly Plantain	X	X	X	X	X			X		
	FAMILY POLEMONIACEAE	**PHLOX FAMILY**										
	Eriastrum eremicum	Desert Woolly-Star		X						X		
	Eriastrum sapphirinum	Sapphire Eriastrum				X	X					
	Loeseliastrum schottii	Schott's Calico				X						
	FAMILY POLYGONACEAE	**BUCKWHEAT FAMILY**										
	Chorizanthe brevicornu	Brittlestar Spineflower				X						
	Chorizanthe rigida	Desert Spiny-Bastard				X						
	Eriogonum deflexum	Flat-Topped Buckwheat				X						
	Eriogonum fasciculatum ssp. polifolium	Wild Buckwheat			X	X	X	X				
	Eriogonum fasciculatum	California Buckwheat	X	X					X			
	Eriogonum gracile	Desert Trumpet	X	X	X	X	X		X	X	X	
	Eriogonum inflatum ssp. deflatum	Desert Trumpet										X

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			1	2	3	4	5	6	7	8	9	10
	FAMILY HYDROPHYLLACEAE	**WATERLEAF FAMILY**										
	Nama demissum	Desert Purple Mat				X						
	Phacelia campanularia	Phacelia										X
	Phacelia cf. minor	Canterbury-Bells					X					
	Phacelia distans	Wild-Heliotrope		X		X	X			X		
	Phacelia sp.	Wild-Heliotrope	X		X	X						
	FAMILY KRAMERIACEAE	**RHATANY FAMILY**										
	Krameria erecta	Pima Rhatany	X		X	X	X					
	Krameria grayi	White Rhatany	X	X				X		X		
	FAMILY LAMIACEAE	**MINT FAMILY**										
	Hyptis emoryi	Desert Lavender								X		
	Salazaria mexicana	Bladder Sage	X	X	X	X	X					
	Salvia apiana	White Sage							X	X		
	Salvia columbariae	Chia	X	X		X	X		X	X		
	Salvia vaseyi	Vasey's Sage				X	X					
	FAMILY LOASACEAE	**LOASA FAMILY**										
	Mentzelia albicaulis	Blazing Star	X	X								
	Petalonyx thurberi	Sandpaper Plant	X	X	X	X	X	X	X	X	X	
	FAMILY MALVACEAE	**MALLOW FAMILY**										
	Sphaeralcea ambigua	Apricot Mallow	X	X		X	X					
	FAMILY MYRTACEAE	**MYRTLE FAMILY**										
X	*Eucalyptus rudis*	Desert Gum					X					
X	*Eucalyptus sp.*	Eucalyptus				X					X	

Table 3: Plant Species Observed Within The City Of Desert Hot Springs and Sphere of Influence*

NON-NATIVE (X) 31/194 = 16%	FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (194)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
			1	2	3	4	5	6	7	8	9	10
X	FAMILY SOLANACEAE	NIGHTSHADE FAMILY										
	Datura wrightii	Jimson Weed	X	X						X		
	Lycium andersonii	Box-Thorn	X	X								
	Lycium andersonii var. deserticola	Narrow-Leaved Thornbush					X					
X	*Nicotiana glauca*	Tree Tobacco										X
	Physalis crassifolia	Ground Cherry	X		X				X			
	FAMILY TAMARICACEAE	TAMARISK FAMILY										
X	*Tamarix aphylla*	Athel Tree								X		
X	*Tamarix ramosissima*	Tamarisk				X					X	
	Tamarix sp.	Tamarisk					X					
	FAMILY VISCACEAE	MISTLETOE FAMILY										
	Phoradendron californicum	Desert Mistletoe									X	
	FAMILY ZYGOPHYLLACEAE	CALTROP FAMILY										
	Fagonia laevis	Smooth-Leaf Fagonia				X						
	Larrea tridentata	Creosote Bush	X	X	X	X	X	X	X	X	X	
X	*Tribulus terrestris*	Puncture Vine								X		

Table 3: Plant Species Observed Within The City Of Desert Hot Springs and Sphere of Influence*

NON-NATIVE (X) 31/194 = 16%	FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (194)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
			1	2	3	4	5	6	7	8	9	10
	Eriogonum inflatum	Slender Buckwheat				X						
	Eriogonum plumatella	Wild Buckwheat				X						
	Eriogonum thomasii	Thomas' Wild Buckwheat				X						
X	*Polygonum sp.*	Knotweed					X					
	Pterostegia drymarioides	Pterostegia					X					
	FAMILY RANUNCULACEAE	CROWFOOT FAMILY										
	Delphinium parishii ssp. parishii	Desert Larkspur	X	X								
	FAMILY ROSACEAE	ROSE FAMILY										
	Prunus fasciculata	Desert Almond	X	X								
	FAMILY RUBIACEAE	MADDER FAMILY										
	Galium stellatum var. eremicum	Desert Bedstraw				X	X					
	FAMILY RUTACEAE	RUE FAMILY										
	Thamnosma montana	Turpentine-Broom	X								X	
	FAMILY SALICACEAE	WILLOW FAMILY										
	Populus fremontii	Freemont Cottonwood				X					X	
X	*Salix babylonica*	Weeping Willow				X						
	Salix exigua	Narrow-Leaved Willow				X						
	Salix gooddingii	Goodding's Black Willow				X						
	Salix lasiolepis	Arroyo Willow				X						
	FAMILY SCROPHULARIACEAE	FIGWORT FAMILY										
	Mohavea confertiflora	Ghost Flower				X						
	FAMILY SIMONDSIACEAE	JOJOBA FAMILY										
	Simmondsia chinensis	Jojoba				X						

APPENDIX B

WILDLIFE COMPENDIUM FOR THE CITY OF DESERT HOT SPRINGS AND SPHERE OF INFLUENCE

Table 3: Plant Species Observed Within The City Of Desert Hot Springs and Sphere of Influence*

NON-NATIVE (X) 31/194 = 16%	FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (194)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
			1	2	3	4	5	6	7	8	9	10
	Class Angiospermae											
	B. Subclass Monocotyledonae	**Cotyledons (seed leaf) One**										
X	**FAMILY ARECACEAE**	**PALM FAMILY**										
X	*Phoenix dactylifera*	Date Palm				X						
	Washingtonia filifera	California Fan Palm				X					X	
	FAMILY LILIACEAE	**LILY FAMILY**										
	Yucca schidigera	Mojave Yucca	X	X	X							
	Yucca whipplei	Our Lord's Candle	X	X								
	FAMILY POACEAE	**GRASS FAMILY**										
	Achnatherum hymenoides	Indian Ricegrass										X
	Achnatherum speciosum	Desert Needlegrass	X									
	Achnatherum stillmanii	Needlegrass		X								
	Aristida adscensionis	Six-Weeks Three-Awn				X				X		
	Aristida hamulosa	Hook Three-Own								X		
X	*Arundo donax*	Giant Reed									X	
X	*Avena barbata*	Slender Wild Oat										X
X	*Avena fatua*	Wild Oat	X	X								
X	*Bouteloua barbata var. barbata*	Six Weeks Grama										X
X	*Bromus madritensis ssp. rubens*	Foxtail Chess	X	X	X	X	X			X		
X	*Bromus tectorum*	Downy Brome	X	X								
X	*Cortaderia selloana*	Pampas Grass										X
X	*Cynodon dactylon*	Bermuda Grass	X	X		X				X	X	
	Erioneuron pulchellum	Fluff-Grass				X			X	X	X	X
	Leymus triticoides	Rye Gras								X		
X	*Pennisetum setaceum*	Fountaingrass										X
	Pleuraphis rigida	Big Galleta	X	X	X	X	X				X	
X	*Schismus barbatus*	Mediterranean Grass	X	X	X	X	X			X		
	FAMILY TYPHACEAE	**CATTAIL FAMILY**										
	Typha angustifolium	Narrow-Leaved Cattail										X

INTRODUCTION

During preparation of the biological section for the Master Environmental Report and General Plan update for the Planning Area, the seventeen biological assessments listed in Table 1 and mapped on the Appendix F, *Approximate Locations Of 1978-1994 Biological Assessments Of The Planning Area*, map were reviewed to obtain wildlife species inventories for each of these development sites. Nine biological assessments contained some type of wildlife species inventory. In addition, between September 1994 and March and April 1995, JMA's biologists conducted field surveys of the entire Planning Area to (a) field check selected parts of the wildlife inventory data provided in the seventeen biological assessments and (b) record previously undetected or unidentified wildlife species. As a result of these efforts a separate lists(compendium) of the wildlife resources currently occurring within the Planning Area was prepared.

The following Wildlife Compendium was prepared by combining the nine wildlife species inventory lists, obtained from the literature review, with the species identified during the 1994 Planning Area field surveys. It only lists those animals actually observed within the boundaries of the Planning Area during 1978-1994 field surveys of nine development areas located within the Planning Area. Some species may not have been detectable or may have been undetectable or overlooked during the on-site 1978-1995 field surveys because they were not obviously present, visible or identifiable (e.g., had migrated out of the area for the winter, were secreted in subterranean boroughs, were foraging off-site, etc.). The Wildlife Compendium is comprised of twelve columns providing the following information.

COLUMN 1: FAMILY, GENUS AND SPECIES SCIENTIFIC NAMES

All wildlife species observed within the Planning Area, during 1978 to 1995 wildlife field surveys, were identified to scientific family, genus and species name whenever possible. Scientific taxonomic naming used in the Wildlife Compendium follows that of Clarke (1989), Glenn (1983) and Holt (1990) for birds of southern California, Jameson and Peters (1988), Cornett (1980) and Ryan (1968) for California mammals, Peterson (1990) for western birds, and Stebbins (1966) for reptiles and amphibians. Classes and families are listed in phylogenetic order in accordance with Clarke, Holt, Jameson and Peters, Peterson, and Stebbins; within each family the genus and species names are alphabetically arranged. The number of genera identified on-site in each class is indicated in parentheses after each phylum or class name.

COLUMN 2: FAMILY AND GENUS AND SPECIES COMMON NAMES

Common family and wildlife names also follow Clarke, Glenn, Holt, Jameson and Peters, Cornett, Ryan, Peterson and Stebbins. Common names may vary among biologists, published botanical literature, and regions, but scientific names are "universal". Whenever possible, common names listed in Clarke, Jameson and Peters, Peterson and Stebbins were given precedent. When no common name was provided in these references and when available, common names listed in Glenn, Holt, Cornett, and/or Ryan were used. The total number of wildlife species identified on-site (124) is indicated in parentheses at the head of this column.

COLUMNS 3-11 WILDLIFE SPECIES IDENTIFIED FROM 1978 TO 1994

Only nine (9) of the seventeen Table 1 biological assessments reviewed contained a wildlife species list. Each of the 9 species lists was numbered 1 through 9. The species identified in each development area is indicated by a bolded "X". Columns 4-12 are organized 1, 2, 3, etc. from the Northwest corner of the planning area and lists plant inventories obtained from projects in the order they would be encountered if one was to start at the northwestern boundary of the Planning Area and travel eastward across the Planning Area. If more previously completed biological assessments had been available it would have been possible to develop a species and vegetational habitat distribution map showing the range of specific species and habitat types within the Planning Area.

COLUMN 10: 1994 AND 1995 WILDLIFE FIELD SURVEYS

As previously discussed, during September 1994 and March and April 1995 JMA's biologists conducted field surveys of the entire Planning Area. The surveys were conducted partially to (a) field check the accuracy of the wildlife inventory data provided in the seventeen Table 1 biological assessments, (b) record previously undetected or unidentified species growing within the Planning Area and (c) prepare an updated wildlife compendium. As indicated by a bolded "**X**" twelve (12) previously undetected or unidentified wildlife species were identified during the 1994/1995 field surveys. This represents a 10% (12/124) increase in the number of animal species identified within the Planning Area. It is highly likely that the majority of the wildlife species, occurring within the Planning Area, have now been identified.

Table 4: Wildlife Species Observed Within The City Of Desert Hot Springs and Sphere of Influence*

FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (127)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
		1	2	3	4	5	6	7	8	9	10
II. CLASS REPTILIA (29)	REPTILES										
FAMILY TESTUDINIDAE	WATER AND BOX TURTLES, TORTOISES AND ALLIES										
Xerobates agassizi	Desert Tortoise	X	X								
FAMILY GEKKONIDAE	GECKOS										
Coleonyx variegatus	Banded Gecko	X	X						X		
FAMILY IGUANIDAE	IGUANIDS										
Callisaurus draconoides	Zebra-Tailed Lizard	X	X		X				X		
Gambelia wislizenii	Long-Nosed Leopard Lizard	X	X		X	X			X		
Dipsosaurus dorsalis	Desert Iguana								X		
Phrynosoma platyrhhinos	Desert Horned Lizard								X		
Sceloporus magister	Desert Spiny Lizard	X	X						X		
Urosaurus graciosus	Long-Tailed Brush Lizard							X	X		
Uta stansburiana	Side-Blotched Lizard	X	X		X	X		X	X	X	
FAMILY IGUANIDAE	IGUANIDS										
Callisaurus draconoides	Zebra-Tailed Lizard	X	X		X				X		
Gambelia wislizenii	Long-Nosed Leopard Lizard	X	X		X	X			X		
Dipsosaurus dorsalis	Desert Iguana								X		
Phrynosoma platyrhhinos	Desert Horned Lizard								X		
Sceloporus magister	Desert Spiny Lizard	X	X						X		
Urosaurus graciosus	Long-Tailed Brush Lizard							X	X		
Uta stansburiana	Side-Blotched Lizard	X	X		X	X		X	X	X	
FAMILY TEIIDAE	WHIPTAILS & THEIR ALLIES										
Cnemidophorous tigris	Western Whiptail	X	X		X				X		
Xantusia vigilis	Yucca night lizard								X		
FAMILY LEPTOTYPHLOPIDAE	SLENDER BLIND SNAKES										
Leptotyphiops humeriis	Western Blind Snake								X		

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FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (127)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
		1	2	3	4	5	6	7	8	9	10
INVERTEBRATES											
PHYLUM ARTHROPODA (3)											
CLASS INSECTA	SNAILS, LIMPETS										
Family Sphingidae	Sphynx Moths										
Hyles lineata	White-lined Sphynx										X
Family Nymphalidae	Brush-Footed Butterflies										
Vanessa cardui	Painted lady										X
Family Meloidae	Blister Beetles										
Cysteodemus armatus armatus	Desert Spider Beetle										X
PHYLUM MOLLUSCA (1)											
CLASS GASTROPODA	SNAILS, LIMPETS										
Eremarionta morongoana	Morongo Desert Snail	X	X								
VERTEBRATES											
I. CLASS AMPHIBIA (2)											
FAMILY BUFONIDAE	TRUE TOADS										
Bufo boreas	Western Toad								X		
Bufo punctatus	Red-spotted Toad								X		

* DEVELOPMENT AREAS
1. Annexation No. 22
2. Rancho Royale Specific Plan
3. Olympus Golf Course
4. Mission Lakes Property
5. TT No. 22757 (Indian Hills EIR)
6. Rancho Morongo Country Club
7. Cornerstone Specific Plan
8. Desert Hot Springs 12-Acre Project
9. Seven Palms Ranch

JMA 1994/1995 PLANNING AREA SURVEYS:
10. 9-25-94; 9-26-94; 3-10-95; 3-11-95; 4-15-95.

Table 4: Wildlife Species Observed Within The City Of Desert Hot Springs and Sphere of Influence*

FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (127)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
		1	2	3	4	5	6	7	8	9	10
FAMILY FALCONIDAE	FALCONS AND CARACARAS										
Falco mexicanus	Prairie Falcon								X		
Falco sparverius	American Kestrel	X	X	X	X	X	X		X	X	
FAMILY PHASIANIDAE	QUAILS, PARTRIDGES, AND PHEASANTS										
Callipepla gambelii	Gambel's Quail	X	X	X	X	X		X	X		
Callipepla california	California Quail									X	
FAMILY ARDEIDAE	HERONS AND BITTERNS										
Casmerodius albus	Great Egret										X
FAMILY CHARADRIIDAE	PLOVERS										
CharadRius vociferus	Killdeer										X
FAMILY RALLIDAE	RAILS, GALLINULES AND COOTS										
Fulica americana	American Coot										X
FAMILY LARIDAE	SKUAS, JAEGERS, GULLS, TERNS										
Sterna caspia	Caspian Tern	X	X								
FAMILY COLUMBIDAE	PIDGEONS AND DOVES										
Zenaida macroura	Mourning Dove	X	X		X	X		X	X	X	
Columba livia	Rock Dove								X		
FAMILY CUCULIDAE	CUCKOOS, ROADRUNNERS, ETC.										
Geococcyx californianus	Great Roadrunner	X	X		X	X	X		X		
TYTONIDAE	OWLS										
Asio flammeus	Short-Eared Owl	X	X								
Athene cunicularia	Burrowing Owl	X	X	X	X						
Bubo virginianus	Great Horned Owl				X				X		
Tyto alba	Barn Owl				X				X		

Table 4: Wildlife Species Observed Within The City Of Desert Hot Springs and Sphere of Influence*

FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (127)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
		1	2	3	4	5	6	7	8	9	10
FAMILY BOIDAE	BOAS										
Lichanura trivirgata	Rosy Boa								X		
FAMILY COLUBRIDAE	COLUBIRDS										
Chionactis occipitalis	Western Shovel-nosed Snake								X		
Lampropeltis getulus	Common Kingsnake								X		
Masticophis flagellum	Coachwhip								X		
Phyllorhynchus decurtatus	Spotted Leaf-nosed Snake								X		
Pituophis melanoleucus	Gopher Snake								X		
Rhinocheilus lecontei	Long-nosed Snake								X		
FAMILY VIPERIDAE	VIPERS										
Crotalus cerastes	Sidewinder								X		
Crotalus mitchellii	Speckled Rattlesnake								X		
Crotalus ruber ruber	Northern Red Diamond Rattlesnake	X			X	X					
III. CLASS AVES (62)	BIRDS										
FAMILY ANATIDAE	NORTHERN PINTAIL										
Anas acuta	Green-winged Teal				X						
Anas cyanoptera	Cinamon teal										X
Anas americana	American Wigeon										X
Anas platyrhynchos	Mallard										X
Mergus merganser	Common Merganser										X
FAMILY CATHARTIDAE	AMERICAN VULTURES										
Cathartes aura	Turkey Vulture	X	X								
FAMILY ACCIPITRIDAE	HAWKS, EAGLES, KITES, HARRIKERS										
Accipiter cooperii	Cooper's Hawk	X	X		X						
Buteo jamaicensis	Red-Tailed Hawk	X	X		X						
Buteo lagopus	Rough-Legged Hawk	X			X					X	

Table 4: Wildlife Species Observed Within The City Of Desert Hot Springs and Sphere of Influence*

FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (127)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
		1	2	3	4	5	6	7	8	9	10
FAMILY TROGLODYTIDAE	WRENS										
Campylorhynchus brunneicapillus sandiegoense	San Diego (coastal) Cactus Wren (individuals and nest)	X	X		X			X			
Salpinctes obsoletus	Rock Wren	X	X		X		X	X			
Thryomanes bewickii	Bewick's Wren	X	X	X	X						
Troglodytes aedon	House Wren	X	X								
FAMILY MIMIDAE	MIMIC THRUSHES										
Toxostoma bendirei	Bendire's Thrasher	X	X								
Toxostoma lecontei	LeConte's Thrasher	X	X	X							
FAMILY MOTACILLIDAE	WIGTAILS AND PIPITS										
Anthus spinoletta	Water Pipit				X						
FAMILY LANIIDAE	SHRIKES										
Lanius ludovicianus	Loggerhead Shrike	X	X		X						
Mimus polyglottos	Northern Mockingbird	X	X	X	X				X		
Sturnus vulgaris	European Starling				X				X		
FAMILY EMBERIZIDAE	WARBLERS AND SPARROWS										
Amphispiza belli	Sage Sparrow	X	X		X		X				
Amphispiza bilineata	Black-Throated Sparrow	X	X		X	X		X	X		
Euphagus cyanocephalus	Brewer's Blackbird	X	X						X		
Icterus cucullatus	Hooded Oriole								X		
Spizella breweri	Brewer's Sparrow	X									
Sturnella neglecta	Western Meadowlark	X	X		X						
Zonotrichia leucophrys	White-Crowned Sparrow	X			X						
FAMILY VIREONIDAE	VIREOS										
Dendroica coronata	Yellow-Rumped Warbler						X				
FAMILY PASSERIDAE	OLD WORLD SPARROWS										
Passer domesticus	House Sparrow		X						X		

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		1	2	3	4	5	6	7	8	9	10
FAMILY CAPRIMULGIDAE	NIGHTJARS										
Chordeiles acutipennis	Lesser Nighthawk								X		
Phalaenoptilus nuttallii	Common Poorwill								X		
FAMILY TROCHILIDAE	HUMMINGBIRDS										
Calypte anna	Anna's Hummingbird				X	X			X		
Calypte costae	Costa's Hummingbird	X	X		X	X			X		
FAMILY PICIDAE	WOODPECKERS										
Colaptes auratus	Northern Flicker				X		X				
Picoides scalaris	Ladder-Backed Woodpecker	X	X			X					
FAMILY TYRANNIDAE	TYRANT FLYCATCHERS										
Myiarchus cinerascens	Ash-Throated Flycatcher	X	X						X		
Sayornis Saya	Say's Phoebe				X	X	X		X		
Tyrannus verticalis	Western Kingbird	X	X		X						
FAMILY HIRUNDINIDAE	SWALLOWS										
Hirundo pyrrhonota	Cliff Swallow	X	X								
Tachycineta thalassina	Violet-Green Swallow	X	X								
FAMILY ALAUDIDAE	LARKS										
Eremophila alpestris	Horned Lark	X	X								
FAMILY CORVIDAE	JAYS, CROWS, AND MAGPIES										
Corvus corax	Common Raven	X	X	X	X	X	X	X	X		
FAMILY MUSCICAPIDAE	WRENTITS										
Polioptila caerulea	Blue-Gray Gnatcatcher				X						
Polioptila melanura	Black-Tailed Gnatcatcher	X	X		X						
FAMILY REMIZIDAE	VERDINS										
Auriparus flaviceps	Verdin	X		X			X		X		

Table 4: Wildlife Species Observed Within The City Of Desert Hot Springs and Sphere of Influence*

FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (127)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
		1	2	3	4	5	6	7	8	9	10
FAMILY HETEROMYIDAE	KANGAROO RATS, KANGAROO MICE AND POCKET MICE										
Chaetodipus formosus	Long-Tailed Pocket Mouse	X	X								
Chaetodipus penicillatus	Desert Pocket Mouse	X	X	X	X						
Chaetodipus fallax	San Diego Pocket Mouse										CVAG
Chaetodipus spinatus	Spiny Pocket Mouse	X	X								
Dipodomys deserti	Desert Kangaroo Rat	X		X	X						
Dipodomys merriami	Merriam's Kangaroo Rat	X	X	X	X	X			X		
Dipodomys sp.	Kangaroo Rat									X	
Perognathus longimembris	Little Pocket Mouse	X	X								
Perognathus longimembris bangsi	Palm Springs Little Pocket Mouse										CVAG
Peromyscus crinitus	Canyon Mouse										CVAG
Peromyscus eremicus	Cactus Mouse	X	X	X	X						
FAMILY CRICETIDAE	DEER MICE AND WOOD RATS										
Neotoma albigula	White Throated Wood Rat										X
Neotoma lepida	Desert Wood Rat	X	X	X	X	X		X			
Onychomys torridus	Southern Grasshopper Mouse				X				X		
Peromyscus eremicus	Cactus Mouse								X		
Peromyscus maniculatus	Deer Mouse	X	X						X		
FAMILY LEPORIDAE	RABBITS AND HARES										
Lepus californicus	Black-Tailed Jackrabbit	X	X	X	X	X	X	X	X		
Sylvilagus audubonii	Audubon's Cottontail	X	X	X	X	X			X		

Table 4: Wildlife Species Observed Within The City Of Desert Hot Springs and Sphere of Influence*

FAMILY, GENUS, AND SPECIES SCIENTIFIC NAMES	FAMILY AND SPECIES COMMON NAMES (127)	Presence (X); * Development Areas (Nos. 1-9); 1994/1995 Field Survey List (No. 10)									
		1	2	3	4	5	6	7	8	9	10
FAMILY FRINGILLIDAE	FINCHES										
Carduelis psaltria	Lesser Goldfinch				X						
Carduelis tristis	American Goldfinch										X
Carpodacus mexicanus	House Finch	X	X		X	X	X		X		
Carpodacus purpureus	Purple Finch										X
IV. CLASS MAMMALIA (27)	MAMMALS										
FAMILY VESPERTILIONIDAE	VESPER BATS										
Antrozous pallidus	Pallid Bat								X		
Myotis californicus	California Bat	X	X						X		
Pipistrellus hesperus	Western Pipistrelle	X	X						X		
FAMILY CANIDAE	DOGS, WOLVES AND FOXES										
Canis familianis	Domestic Dog				X						
Canis latrans	Coyote	X	X	X	X	X	X		X	X	
Urocyon genteus	Gray Fox				X	X					
Vulpes macrotis	Kit Fox	X	X	X		X				X	
FAMILY MUSTELIDAE	WEASELS AND MARTEN										
Taxidea taxus	Badger	X	X								
FAMILY FELIDAE	CATS										
Lynx rufus	Bobcat							X			
SCIURIDAE	SQUIRRELS										
Ammospermophilus leucurus	White-Tailed Antelope Squirrel	X	X	X	X	X	X		X	X	
Spermophilus tereticaudus	Round-Tailed Ground Squirrel			X	X		X				
FAMILY GEOMYIDAE	POCKET GOPHERS										
Thomomys bottae	Botta's Pocket Gopher	X	X		X	X		X	X		

APPENDIX C

BIRD CHECKLISTS FOR THE COACHELLA VALLEY AND LIVING DESERT, RIVERSIDE COUNTY, CALIFORNIA

INTRODUCTION

According to the *Birds Of The Coachella Valley* checklist approximately 340 bird species and 6 races have been identified in the Coachella Valley (Glenn, 1983). Not all 340 species occur in the Planning Area. The avifauna observed inhabiting, utilizing, or migrating through the Planning Area consists of only 56 species. The low diversity is due to environmental factors such as human disturbance, lack of surface water, etc., as well as the relatively small number of surveys performed and the relatively small portion of the Planning Area surveyed.

Copies of the following two bird checklists are provided to assist biologists conducting bird surveys within proposed development areas of the Planning Area.

Glenn, Theodora J. October 1983. *Birds of the Coachella Valley.* A Checklist. Coachella Valley Audubon Society.

The Living Desert Museum. Undated. *The Birds of the Living Desert.* Checklist pamphlet. Palm Springs, California.

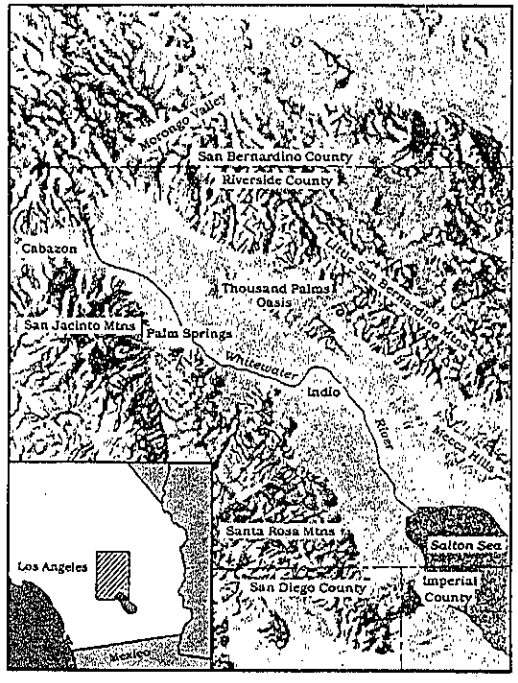
Additional bird references useful for conducting avian surveys and bird species identifications are contained in the 1995 *Annotated Bibliography* on file at the City (JMA, 1995).

a	b	c		W	S	S	F
			LARKS				
			• Horned Lark	a	a	a	a
			SWALLOWS				
			Purple Martin		c		c
			Tree Swallow (Migrant)	a	a	a	a
			Violet-green Swallow (Migrant)	a	a	a	a
			• Northern Rough-winged Swallow	a	a	f	a
			Bank Swallow	•	f	c	f
			Cliff Swallow (Migrant)	•	a	f	a
			• Barn Swallow	•	u	u	a
			CROWS & JAYS				
			Steller's Jay	c			
			• Scrub Jay	u	u	u	u
			Clark's Nutcracker	c			c
			• American Crow	r	r	r	r
			• Common Raven	f	f	f	f
			CHICKADEES & TITMICE				
			Mountain Chickadee	r			r
			Plain Titmouse	r	r	r	r
			VERDIN				
			• Verdin	a	a	a	a
			BUSHTIT				
			• Bushtit	r	r	r	r
			NUTHATCHES				
			Red-breasted Nuthatch	c			r
			White-breasted Nuthatch	c			c
			Pygmy Nuthatch		•		
			CREEPERS				
			Brown Creeper	c			c
			WRENS				
			• Cactus Wren	a	a	a	a
			• Rock Wren	a	a	a	a
			• Canyon Wren	u	u	u	u
			• Bewick's Wren	u	u	u	u
			• House Wren	u	u	u	f
			Winter Wren		•		
			• Marsh Wren	f	f	f	f
			DIPPERS				
			American Dipper		•		
			KINGLETS, GNATCATCHERS, & THRUSHES				
			Ruby-crowned Kinglet	a	f		a
			• Blue-gray Gnatcatcher	f	u	u	f
			• Black-tailed Gnatcatcher	f	f	f	f
			Western Bluebird	f	r		u
			Mountain Bluebird	r	r		r
			Townsend's Solitaire	r	r		r
			Swainson's Thrush		a		r
			Hermit Thrush	u	u		u
			American Robin	f	f		f
			Varied Thrush	c			c
			Wrentit		•		
			MOCKINGBIRDS & THRASHERS				
			• Northern Mockingbird	a	a	a	a
			Sage Thrasher	r	f		u
			Brown Thrasher				•
			Bendire's Thrasher		•		
			• California Thrasher	f	f	f	f
			• Crissal Thrasher	u	u	u	u
			• Le Conte's Thrasher	u	u	u	u
			PIPITS & WAGTAILS				
			Water Pipit	a	a		a
			WAXWINGS				
			Cedar Waxwing	u	u		u
			SILKY-FLYCATCHERS				
			• Phainopepla	a	f	u	a
			SHRIKES				
			• Loggerhead Shrike	a	f	f	a
			STARLINGS				
			• European Starling	a	a	a	a
			VIREOS				
			• Bell's Vireo		r	r	•
			Gray Vireo		•		
			Solitary Vireo		f		f
			Hutton's Vireo	•			
			Warbling Vireo		a		a

a	b	c		W	S	S	F
			WOOD WARBLERS, TANAGERS, ORIOLES & SPARROWS				
			(WOOD WARBLERS)				
			Golden-winged Warbler				•
			Orange-crowned Warbler	f	a		a
			Nashville Warbler		a		
			Virginia's Warbler		c		
			• Lucy's Warbler		r	r	
			Yellow Warbler		a	u	a
			Chestnut-sided Warbler	•	c		•
			Magnolia Warbler				•
			Black-throated Blue Warbler				•
			Yellow-rumped Warbler				
			"Audubon's"	a	a		a
			"Myrtle"	u	u		u
			Black-throated Gray Warbler		f		f
			Townsend's Warbler		f		u
			Hermit Warbler		u		
			Black-throated Green Warbler	•	•		•
			Blackburnian Warbler		•		
			Palm Warbler		•		
			Bay-breasted Warbler		•		
			Blackpoll Warbler				•
			Black-and-white Warbler		•		
			American Redstart	r	u		u
			Louisiana Waterthrush			•	
			MacGillivray's Warbler		f		f
			• Common Yellowthroat	f	f	f	f
			Wilson's Warbler		a		•
			Canada Warbler				u
			• ? Yellow-breasted Chat		u		
			(TANAGERS)				
			• Summer Tanager		u	u	r
			Western Tanager		a		f
			(GROSBEAKS & BUNTINGS)				
			Rose-breasted Grosbeak		r		r
			Black-headed Grosbeak		a	c	r
			• Blue Grosbeak		u	u	r
			Lazuli Bunting		a	c	f
			Indigo Bunting		c		
			(SPARROWS)				
			Green-tailed Towhee	r	u		r
			• Rufous-sided Towhee	r	r		r
			• Brown Towhee	f	r	f	c
			• Abert's Towhee	f	f	f	
			Cassin's Sparrow		•		
			• Rufous-crowned Sparrow	r	r	r	f
			Chipping Sparrow	f	f		a
			Brewer's Sparrow	a	u		
			• Black-chinned Sparrow		u	u	
			Vesper Sparrow	u	c		u
			• Lark Sparrow	f	u	u	f
			• Black-throated Sparrow	f	f	f	u
			Sage Sparrow	a	u		
			Lark Bunting		c		a
			Savannah Sparrow	a	a		r
			Fox Sparrow	r	c		f
			• Song Sparrow	f	f	f	c
			Lincoln's Sparrow	f	u		u
			Swamp Sparrow		c		
			Golden-crowned Sparrow	r	u		a
			White-crowned Sparrow	a	f		
			Dark-eyed Junco				f
			"Oregon"	f	r		r
			"Slate-colored"	r	c		r
			"Pink-sided"	r			r
			"Gray-headed"	r	c		r
			(BLACKBIRDS & ORIOLES)				
			Bobolink				•
			• Red-winged Blackbird	a	a	a	a
			• Western Meadowlark	a	a	a	a
			• Yellow-headed Blackbird	f	a	a	f
			• Brewer's Blackbird	a	a		a
			• Great-tailed Grackle		r	r	
			Bronzed Cowbird			•	
			• Brown-headed Cowbird	a	a	a	a
			Orchard Oriole	•			
			• Hooded Oriole	a	a	a	r
			• Northern ("Bullock's") Oriole	f	f	f	f
			Scott's Oriole	r	c		c

a	b	c		W	S	S	F
			FINCHES				
			Purple Finch	r	•		
			Cassin's Finch	r	r		r
			• House Finch	a	a	a	a
			Pine Siskin	u	r		u
			• Lesser Goldfinch	u	f	f	f
			Lawrence's Goldfinch	c	r	u	u
			American Goldfinch	u	u		u
			Evening Grosbeak		c		c
			WEAVER FINCHES				
			• House Sparrow	a	a	a	a

October 1983



Date _____ Time _____

Localities Visited: a) _____

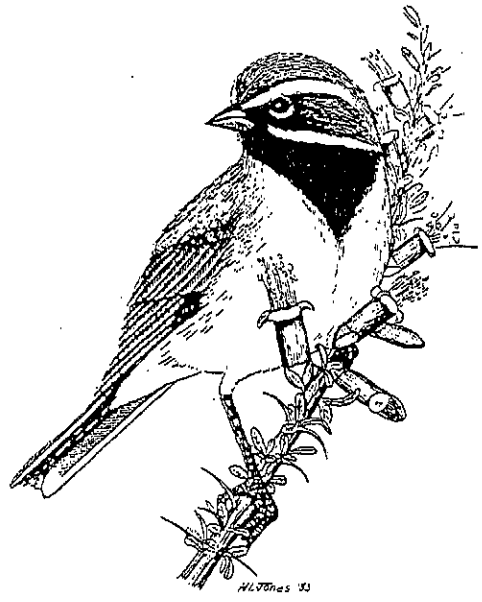
b) _____

c) _____

Habitat(s) _____

Weather _____

Observer(s) _____



Birds of the Coachella Valley

CHECKLIST

Prepared by

Theodora J. Glenn

Palm Springs Desert Museum

Published by

Coachella Valley Audubon Society

Welcome to the Coachella Valley. Desert scrub is the dominant bitat here, but the influences of nearby agriculture, urbanization id natural and ornamental oases add to the richness of the ifauna. This checklist lists all species observed in the Coachella lley. In this checklist, the Coachella Valley includes primarily esote bush scrub and is bounded by chaparral and pinyon-niper woodland (at approximately 1,500 foot elevation in the rthwest and northeast and 2,500 foot in the southwest and utheast). Specifically, then, this excludes Morongo Valley and cludes Cabazon and Whitewater Canyon up to the chapparal. The uthern limit is rather arbitrarily the Riverside/Imperial County ne and therefore includes the north end of the Salton Sea, one of the ost outstanding and unique birding spots in the United States. is list includes 340 species and 6 additional races that can asonably be identified in the field.

The names and phylogenetic order are based on the Thirty-fourth pplement to the American Ornithologists' Union Checklist of rth American Birds which previews the upcoming, long-awaited xth edition of the checklist.

As with any checklist, it must be continuously revised. Any ldditional information will be welcomed. Please include a detailed scription or preferably a photograph when reporting species of sual occurrence to us.

Keep in mind that the artificial seasonal designations do not cessarily indicate wintering, breeding or early or late migrational atus. The relative abundance designations used indicate the most mmon status of a species at some time during that three month riod. For example, most shorebirds are absent or casual during me, but fall migration may be from July through October.

My sincere appreciation for their assistance goes to Eugene A. ardiff, Robert L. McKernan, Jon Dunn, Norman D. Hogg and Guy cCaskie.

ne abbreviations used are defined as follows:

W December, January and February
S March, April and May
S June, July and August
F September, October and November

a common to abundant: in proper habitat almost always encountered.
f fairly common: usually encountered in proper habitat, not in large numbers.
u uncommon: encountered in small numbers or only locally.
r rare; occurs regularly, in very small numbers.
c casual: records are few and irregular.
* only ten or fewer records.

• Breeds in the Coachella Valley
X Extirpated as a breeding bird.

a	b	c		W	S	S	F
			LOONS				
			Arctic Loon	*	•		
			Common Loon		r		c
			GREBES				
			• Pied-billed Grebe	f	f	f	f
			Horned Grebe	c	c	*	c
			• Eared Grebe	a	a	f	a
			• Western Grebe	f	f	f	f
			ALBATROSSES				
			Laysan Albatross		•		
			SHEARWATERS				
			Buller's Shearwater			•	
			STORM-PETRELS				
			Least Storm-Petrel				•
			BOOBIES				
			Blue-footed Booby		•	c	c
			Brown Booby			•	•

a	b	c		W	S	S	F
			PELICANS				
			American White Pelican	r	a	f	a
			Brown Pelican	•	c	r	u
			CORMORANTS				
			• Double-crested Cormorant	a	a	a	a
			Olivaceous Cormorant			•	
			FRIGATEBIRDS				
			Magnificent Frigatebird	•		r	c
			HERONS & BITTERNS				
			American Bittern	f	u	r	u
			• Least Bittern	r	u	f	u
			• Great Blue Heron	a	a	a	a
			• Great Egret	a	a	a	a
			• Snowy Egret	a	a	a	a
			• Little Blue Heron		•	•	
			Tricolored Heron		•	•	
			Reddish Egret		•	•	
			• Cattle Egret	a	a	a	a
			• Green-backed Heron	f	f	f	f
			• Black-crowned Night-Heron	f	f	f	f
			IBISES				
			White Ibis			•	
			• White-faced Ibis	f	f	u	f
			Roseate Spoonbill			•	
			STORKS				
			Wood Stork			•	
			SWANS, GEESE & DUCKS				
			Fulvous Whistling-Duck			•	
			Tundra Swan	•			
			Greater White-fronted Goose	•	•	•	•
			Snow Goose	u	c		
			Ross' Goose	r	•		
			Brant		r	c	
			Canada Goose	a	a	c	a
			Wood Duck			•	
			Green-winged Teal	a	f	r	a
			• Mallard	f	u	r	f
			• Northern Pintail	a	u	f	a
			Blue-winged Teal		r	c	r
			• Cinnamon Teal	f	a	a	a
			Northern Shoveler	a	a	r	a
			Gadwall	u	u	c	u
			Eurasian Wigeon	c			
			American Wigeon	a	a	r	a
			Canvasback	a	f	r	a
			• Redhead	u	u	u	u
			Ring-necked Duck	r	r	•	r
			Greater Scaup	r	r	•	r
			Lesser Scaup	a	f	c	f
			Oldsquaw	•	•	•	•
			Black Scoter		•	•	
			Surf Scoter	c	r	c	c
			White-winged Scoter	c	c	c	c
			Common Goldeneye	f	r	c	c
			Barrow's Goldeneye	•			
			Bufflehead	f	f	c	f
			Hooded Merganser	r	r		r
			Common Merganser	r	•	r	•
			Red-breasted Merganser	r	f	f	u
			• Ruddy Duck	a	a	f	a
			VULTURES				
			Turkey Vulture	c	a	u	a
			HAWKS				
			Osprey	c	r	r	r
			Black-shouldered Kite	r	c		
			Bald Eagle	c			
			Northern Harrier	f	f	r	f
			Sharp-shinned Hawk	u	r		f
			• Cooper's Hawk	f	u	r	f
			Red-shouldered Hawk	r	r	r	u
			Swainson's Hawk		r		r
			• Red-tailed Hawk	a	a	f	a
			Ferruginous Hawk	a			u
			• Golden Eagle	r	u	u	u

a	b	c		W	S	S	F
			FALCONS				
			• American Kestrel	a	a	u	a
			Merlin	r			r
			Peregrine Falcon	c	c	c	c
			• Prairie Falcon	u	u	u	u
			QUAIL				
			• Gambel's Quail	a	a	a	a
			• California Quail	f	f	f	f
			Mountain Quail	c	c	c	c
			RAILS				
			• Black Rail	c	r	r	c
			• Clapper Rail	r	u	u	u
			• Virginia Rail	f	f	r	f
			• ? Sora	u	u	u	u
			• Common Moorhen	u	u	u	u
			• American Coot	a	a	a	a
			CRANES				
			Sandhill Crane		•		
			PLOVERS				
			Black-bellied Plover	f	f	f	f
			Lesser Golden-Plover		c	•	c
			• Snowy Plover	r	f	f	f
			Semipalmated Plover	r	a	f	r
			• Killdeer	a	a	a	a
			Mountain Plover	u	c		u
			OYSTERCATCHERS				
			American Oystercatcher			•	
			STILTS & AVOCETS				
			• Black-necked Stilt	a	a	a	a
			• American Avocet	a	a	a	a
			SANDPIPERS & PHALAROPES				
			Greater Yellowlegs	f	f	f	f
			Lesser Yellowlegs	r	u	f	f
			Spotted Redshank		•		
			Solitary Sandpiper	•	a	r	r
			Willet	a	•	•	a
			Wandering Tattler		a	•	
			Spotted Sandpiper	f	f	f	f
			Whimbrel		a	a	
			Long-billed Curlew	a	a	f	a
			Hudsonian Godwit				•
			Marbled Godwit	f	f	f	f
			Ruddy Turnstone		r		c
			Black Turnstone		•	•	
			Surfbird		•		
			Red Knot		f	u	u
			Sanderling	r	f	f	u
			Semipalmated Sandpiper		r		
			Western Sandpiper	f	a	a	a
			Least Sandpiper	a	a	a	a
			White-rumped Sandpiper			•	
			Baird's Sandpiper		•	•	r
			Pectoral Sandpiper				•
			Dunlin	u	f		f
			Stilt Sandpiper		•		•
			Short-billed Dowitcher		a	a	r
			Long-billed Dowitcher	a	a	c	a
			Common Snipe	f	f	a	f
			Wilson's Phalarope		a	a	a
			Red-necked Phalarope	•	f	a	a
			Red Phalarope		c	c	c
			GULLS & TERNS				
			Pomarine Jaeger		•		•
			Parasitic Jaeger				•
			Long-tailed Jaeger				•
			Laughing Gull		•	u	u
			Franklin's Gull		r	c	r
			Little Gull		•		•
			Bonaparte's Gull	r	a	f	f
			Heermann's Gull		•	r	
			Mew Gull		r		
			Ring-billed Gull	f	a	f	a
			California Gull	a	a	f	a
			Herring Gull	a	a	c	a
			Thayer's Gull	r	c		a
			Yellow-footed Gull	r	r	u	r
			Glaucous-winged Gull	r	r	c	r

a	b	c		W	S	S	F
			Glaucous Gull	*	*	*	*
			Black-legged Kittiwake	•	•	•	•
			Sabine's Gull			•	•
			Gull-billed Tern	•	u	u	a
			Caspian Tern	r	a	a	a
			Common Tern		r	a	f
			• Forster's Tern	u	a	a	f
			Least Tern			c	
			Black Tern		a	a	f
			• Black Skimmer	c	f	f	f
			AUKS, MURRES & PUFFINS				
			Ancient Murrelet?				
			PIGEONS & DOVES				
			• Rock Dove	a	a	a	a
			Band-tailed Pigeon	•	c		c
			• Spotted Dove	u	u	u	u
			• White-winged Dove		a	a	a
			• Mourning Dove	a	f	f	a
			• Common Ground-Dove	f	f	f	f
			CUCKOOS				
			Yellow-billed Cuckoo		c	c	
			• Greater Roadrunner	r	f	r	f
			OWLS				
			• Common Barn-Owl	a	a	a	a
			• Western Screech-Owl	u	u	r	u
			• Great Horned Owl	f	f	f	f
			• Burrowing Owl	f	u	r	f
			• Long-eared Owl	u			u
			Short-eared Owl	r	c		r
			Northern Saw-whet Owl	c			c
			NIGHTJARS				
			• Lesser Nighthawk	c	f	a	u
			• Common Poorwill	f	f	f	f
			SWIFTS				
			Black Swift			r	c
			Vaux's Swift		r	f	
			• White-throated Swift	r	f	f	f
			HUMMINGBIRDS				
			Broad-billed Hummingbird				•
			• Black-chinned Hummingbird		f	f	
			• Anna's Hummingbird	f	f	f	f
			• Costa's Hummingbird	u	a	a	u
			Calliope Hummingbird		u		c
			Rufous Hummingbird		u		f
			KINGFISHERS				
			Belted Kingfisher	u	u		u
			WOODPECKERS				
			Acorn Woodpecker				c
			x Gila Woodpecker				•
			Yellow-bellied Sapsucker				r
			"Red-naped"	r			•
			"Eastern"	•			r
			Red-breasted Sapsucker	r			c
			Williamson's Sapsucker	•			f
			• Ladder-backed Woodpecker	f	f	f	
			Downy Woodpecker	•			
			Hairy Woodpecker		•		
			White-headed Woodpecker	•			
			Northern Flicker				•
			"Red-shafted"	f	u	r	u
			"Yellow-shafted"	c			c
			TYRANT FLYCATCHERS				
			Olive-sided Flycatcher		u		u
			Western Wood-Pewee		a	f	a
			x Willow Flycatcher		f		u
			Hammond's Flycatcher		f		r
			Dusky Flycatcher		r		u
			Gray Flycatcher	r	u		u
			Western Flycatcher		f		u
			• Black Phoebe	u	f	r	r
			• Say's Phoebe	f	r	r	f
			x Vermilion Flycatcher	r	r	a	r
			• Ash-throated Flycatcher		c	r	f
			• ? Brown-crested (Wied's) Flycatcher	•	r	a	r
			Cassin's Kingbird			•	c
			• Western Kingbird				r
			Scissor-tailed Flycatcher				•

Other Sightings and Comments:

We are interested in your observations! Please notify the Education Department if you identify species not included on this list.

SA/KG 1992

The Birds

of The Living Desert

___Pied-billed Grebe	RV
___Eared Grebe	Rw
___American White Pelican	Uw
___Double-Crested Cormorant	RV
___Black-crowned Night Heron	UV
___Green-backed Heron	CV
___Cattle Egret	UV
___Snowy Egret	UV
___Great Egret	CV
___Great Blue Heron	UV
___Mallard	CV
___Sora	Uw
___Common Moorhen	UV
___American Coot	Cp
___Greater Yellowlegs	UV
___Killdeer	UV
___Common Snipe	Rw
___Turkey Vulture	Um
___Golden Eagle	Uw
___Sharp-shinned Hawk	Uw
___Cooper's Hawk	Cp
___Red-tailed Hawk	Cw
___Harris' Hawk	Rt
___American Kestrel	Cp
___Prairie Falcon	Uw
___Gambel's Quail	Cp
___Mourning Dove	Cp
___White-winged Dove	Cs
___Common Ground Dove	Cp
___Greater Roadrunner	Cp
___Common Barn-Owl	Up
___Great Horned Owl	Up
___Western Screech Owl	Rp
___Lesser Nighthawk	Cs
___Common Poorwill	Rp
___White-throated Swift	Uw
___Vaux's Swift	Rm
___Black-chinned Hummingbird	Up
___Costa's Hummingbird	Cp
___Anna's Hummingbird	Up
___Rufous Hummingbird	Um
___Allen's Hummingbird	Rm
___Belted Kingfisher	UV
___Northern Flicker	Uw
___Ladder-backed Woodpecker	Up
___Cassin's Kingbird	Rm
___Western Kingbird	Cs
___Ash-throated Flycatcher	Um
___Olive-sided Flycatcher	Rm
___Western Wood Pewee	Um
___Black Phoebe	Cp
___Say's Phoebe	Cp
___Western Flycatcher	Um
___Horned Lark	RV
___Tree Swallow	Um
___Violet-green Swallow	Um
___Northern Rough-winged Swallow	Cs
___Barn Swallow	Cm
___Scrub Jay	Rw
___Common Raven	Cp
___Verdin	Cp
___House Wren	Um
___Winter Wren	Rt
___Bewick's Wren	Cp
___Canyon Wren	Up
___Rock Wren	Cp
___Cactus Wren	Cp
___Ruby-crowned Kinglet	Cw
___Blue-gray Gnatcatcher	Uw
___Black-tailed Gnatcatcher	Cp
___Western Bluebird	Cw
___Mountain Bluebird	Uw
___Hermit Thrush	Rm
___American Robin	Cw
___Loggerhead Shrike	UV
___Northern Mockingbird	Cp
___Cedar Waxwing	Cw
___Phainopepla	Cp
___European Starling	Cp
___Solitary Vireo	Um
___Warbling Vireo	Um
___Orange-crowned Warbler	Cw
___Nashville Warbler	Cm
___Virginia's Warbler	Rm
___Black-and-white Warbler	Ut
___Yellow-rumped Warbler	Cw
___Black-throated Gray Warbler	Cm
___Townsend's Warbler	Um
___Hermit Warbler	Um
___Yellow Warbler	Cm
___MacGillivray's Warbler	Um
___Wilson's Warbler	Cm
___Common Yellowthroat	Up
___Yellow-breasted Chat	RV
___Western Tanager	UV
___Rose-breasted Grosbeak	Rt
___Black-headed Grosbeak	Um
___Green-tailed Towhee	Rw
___Rufous-sided Towhee	Um
___Abert's Towhee	Cp
___Lark Sparrow	RV
___Black-throated Sparrow	Cp
___Sage Sparrow	UV
___Chipping Sparrow	UV
___Brewer's Sparrow	Um
___White-crowned Sparrow	Cw
___Lincoln's Sparrow	Uw
___Western Meadowlark	RV
___Brewer's Blackbird	RV
___Brown-headed Cowbird	RV
___Northern Oriole	Cs
___Hooded Oriole	Cs
___Western Tanager	Um
___House Sparrow	Cp
___Lesser Goldfinch	Up
___House Finch	Cp

KEY:

C	Abundant or common
U	Uncommonly seen
R	Rarely seen visitant
V	Irregular visitor from local area
p	permanent resident
s	summer resident
w	winter resident
m	migrant
t	out of normal range

APPENDIX D

COUNTY OF RIVERSIDE BIOLOGICAL IMPACT REPORT OUTLINE AND A DRAFT STANDARD BIOLOGICAL REPORT SCOPE OF WORK

INTRODUCTION

It is recommended that as a matter of policy, the City should require comprehensive, site specific biological investigations which at least include a comprehensive records search (e.g., CNDDB, Palm Springs Desert Museum records, etc.), literature and map review (e.g., CNDDB, USGS quad sheet velum overlays, applicable City and County plant communities and sensitive species maps, etc.), and field survey of the entire proposed development site.

The results and findings of the investigations must be documented in accordance with the guidelines of some type of current, adequate *Biological Survey Report Guidelines*. For example, the City may decide to develop it's own Biological Survey Report Guidelines outlining such things as report format, content, etc. or it may elect to adopt the most current County Of Riverside biological report outline, report guidelines of the Ecological Society Of America, etc. For illustrative purposes only, a copy of an example of a 1993 Riverside County *Biological Impact Report Outline* and a draft *Standard Biological Report Scope Of Work*, which include guidelines for preparation of an acceptable biological report, has been included in Appendix D.

STANDARD BIOLOGICAL REPORT SCOPE OF WORK (1993)

The consultant proposes to investigate the biological resources of the site by performing the following tasks:

1. The consultant will request data from the California Natural Diversity Data Base, a unit of the California Department of Fish and Game. The information obtained will identify the known locations of rare, threatened, and endangered species and significant natural communities in the region and assist in identifying the potential on-site presence of such species.

2. The consultant will contact the local field office of the California Department of Fish and Game and the U.S. Fish and Wildlife Service to identify agency concerns regarding the site (i.e.: sensitive biological elements which potentially occur on the site).

3. A literature search of environmental documents from adjacent and nearby areas will be conducted. The literature search will include a review of pertinent maps which identify occurrences of sensitive biological elements, scientific literature and regional biological field guides.

4. Field surveys will be initiated after the literature review and records checks. Field surveys shall be conducted using methodologies accepted by the scientific community. Field work will be conducted at a time when the habitat can be adequately surveyed for evidence of the presence of, or the potential to support, sensitive biological resources.

The consultant's report and biological assessment will conform to the County's guidelines and provide:

1. A discussion of the existing plant communities and wildlife habitat found on the site.

2. Documentation of the date, time, season, and weather conditions at the time of survey, site accessibility and both on- and off-site activities including a discussion of how these or other conditions may have affected the field survey results and field methods used in surveying the site.

3. Documentation and mapping of the plant and animal resources on site. Discuss any species which is identified as a category or candidate species as well as any rare, threatened, or endangered species or significant natural communities.

4. A discussion of anticipated impacts resulting from the proposal and alternatives, including potential indirect and off-site impacts, and cumulative impacts. This discussion shall include consideration of any development plans for the project area that have been proposed or adopted.

DRAFT

5. A discussion of any public agency plans that concern biological resources, such as the Stephan's kangaroo rat Habitat Conservation Plan or the BLM South Coast Region Resource Management Plan that may affect lands adjacent to or including the project site.

6. A discussion of the suitability of each mitigation approach listed in CEQA Guidelines Section 15370 for use with the project and the proposed mitigation measures that will reduce impacts to biological resources to a level of insignificance. The consultant will focus on specific mitigation measures that will protect any sensitive biological resources that are located on the property. If applicable, the exact location of sensitive species, buffer areas and the boundaries of proposed mitigation measures will be mapped at a scale large enough to allow implementation. A monitoring program for the implementation of proposed mitigation measures will be included.

7. A list of all plant and animal species which were observed or detected during field surveys. A separate list of species expected to be present seasonally during the year shall also be included.

8. Maps of biological survey data, including the location of all sample points, transects and additional areas surveyed in the vicinity of the project site.

9. A discussion of any additional focused surveys which may be required to address sensitive species, including species which could not be detected due to their seasonal occurrence or for which an absolute determination of presence on-site is beyond the scope of the biological assessment.

DRAFT

RIVERSIDE COUNTY
BIOLOGICAL IMPACT REPORT OUTLINE

The following format shall be used for the preparation of biological reports.

I. INFORMATION SUMMARY

A. Report date

B. Project location (include U.S.G.S. - Township, Range, and Section)

C. Assessor's Parcel Number and any applicable Planning Permit numbers

D. Owner/Applicant:
Address:
Phone:

E. Principal Investigators:
Address:
Phone:

F. Report Summary: Briefly state the results of the report, habitat type, rare, endangered, or unique species present, anticipated impacts, proposed mitigation measures, and recommendations. Include the dates of the field surveys.

II. PROJECT AND PROPERTY DESCRIPTION

A. Describe the proposed project and property, including the size, topographic characteristics, water resources, soil types, weather conditions and land uses on the property and in the vicinity, up to a radius of one-quarter mile. It is expected that the level of detail and the extent of the study will be proportioned to the scale of the proposed project, the diversity of the site, total species distributions and the significance of the habitats impacted by the project.

B. Include a map of the project site and surrounding area from the USGS 7.5 minute quadrangle series with the project site clearly outlined.

III. METHODOLOGY

Briefly describe the survey methods used in preparing the report and show on an appropriately scaled map the location of sample points, transects, and any additional areas surveyed in the vicinity of the project.

IV. RESULTS

At length, describe the botanical and zoological resources of the project.

A. Include a discussion of the existing plant associations, including disturbed areas, and list the dominant (indicator) species of each vegetative association.

B. Include a biological resources map (at least one copy must be on a project plan map) showing the distribution of plant species occurring on the site and the relationship to the development proposal.

C. Indicate the extent of each plant association or habitat type on the property in acres and show it on the biological resources map(s). If hectares are used, a conversion to acres must be included, whether in parenthesis or in footnotes.

D. Include quantitative and transect data when appropriate.

E. Include in the report a complete listing of all plants, including all species of concern[1] observed.

F. Indicate the plant association or habitat in which each species was found and which of those species are not native to the area.

G. If a plant species of concern was once or could be expected to be present, but was not observed, indicate where the suitable soils and habitat are located on the site. Reintroduction of the species may be a valid mitigation recommendation.

H. Provide a list of all vertebrate species observed or detected which are either directly or indirectly impacted by the project.

I. Indicate estimates of population sizes of individual species detected or observed during the field survey. Captive/release studies are not necessarily required.

J. Note indications of breeding activity, (i.e., nests, dens, etc.) on the property and include known home range data based on the most recent data available.

---

[1] Species of concern shall be any unique, rare, endangered, or threatened species. It shall include species used to delineate wetlands and riparian corridors. It shall also include any host, perching, or food plants used by any animals listed as rare, endangered, threatened or candidate species by either State, or Federal regulations or for Riverside County as listed by the Natural Diversity Data Base (NDDB).

K. The occurrence of each species should be related to the vegetation associations or wildlife habitat types on or in the immediate vicinity of the property, whenever possible.

L. Indicate the relative amounts, or extent, of each wildlife habitat type occurring on the site in acres and show it on the biolocial resources map(s). If hectares are used, a conversion to acres must be included, whether in parenthesis or in footnotes. Include, on the biolgical resources map(s), habitat type relationships to the development proposal.

M. Only site-specific lists are acceptable; however, listing of particular expected species, especially raptors, or listed species, may be appropriate, but their absence should be explained (migratory, estivating, nocturnal species, etc.).

N. Include a list of and discuss invertebrates in special situations, i.e., rare, threatened or endangered species, and unusual species concentrations, or where there is a unique or symbiotic relationship between an invertebrate and vertebrate, plant species or specific habitat, such as vernal pools.

O. If a species reported on the property is considered a rare or unusual occurrence in the region, verify its identification with a specific description or by photography.

P. Include a copy of a California Native Plant Society Plant Field Survey Form and/or a Natural Community Field Survey form when unusual communities are found.

V. RARE, ENDANGERED OR SENSITIVE SPECIES AND HABITATS

The report shall contain:

A. A separate discussion of any species occurring on or using areas directly or indirectly affected by the project, which are recognized by a government agency or conservation or scientific group as being potentially depleted, depleted, declining, rare, locally endemic, endangered, or threatened, and/or any species nominated for or on a state or federal rare, endangered, or threatened species list.

1. The plant species discussed shall be based on the California Native Plant Society list (Special Publication No. 1, 4th ed. Smith, 1988) or more recent data.

2. For each such species, indicate the number of individuals observed on site during this survey and immediately off-site.

3. Include an estimate of the total population present both on and off-site.

4. Identify their exact location(s) on the vegetation map.

5. Discuss the site suitability for <u>each</u> such species.

6. If the species are not found on site, discuss the reasons for their absence, particularly if the survey was done when the organism would not be evident or identifiable.

7. Based on the most recent data available, discuss the <u>known</u> growth, food and range requirements of the species, including required soil types, exposure, elevation, availability of water, season, etc.

8. Confirm the identification of rare, endangered, or threatened plant species, by a species description or photography.

B. Discuss the importance of rare plant or animal populations with consideration of nearby populations and species distributions.

VI. IMPACTS AND RECOMMENDATIONS

List all direct and indirect impacts of the proposed project.

A. Include an evaluation of the perceived cumulative biological impacts associated with the project. For example, for impacts to raptor foraging habitat, include an analysis of the impact at buildout, of approved and proposed developments, on the suitable habitat of the project site.

B. List and discuss all probable impacts to threatened, rare, endangered or unique species either listed or proposed by a Federal or State agency, or the California Native Plant Society, both onsite and within an area of one quarter-mile radius from the project location.

C. The consultant shall recommend an appropriate program to adequately mitigate the impacts of the project proposal, based on CEQA guidelines. The types of mitigation for environmental impacts as listed in CEQA (Section 15370) are listed below in the sequence in which they should be considered. For example, when a proposed mitigation is based on the third measure, the report must state why the previous two measures were rejected.

(1) Avoiding the impact altogether by not taking a certain action.
(2) Minimizing impacts by limiting the degree or magnitude of the action.
(3) Rectifying the impact by repairing, rehabilitating or restoring the impacted environment.
(4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the project.
(5) Compensating for the impact by replacing or providing substitute resources or environments.

D. Tabulate by impact all feasible mitigation measures proposed to reduce the level of impact and explain how such measures will be successful. Any mitigation measures regarding the on site protection of critical resources must be accompanied by a map of appropriate scale, indicating the location of the sensitive resource(s), appropriate buffer areas and the boundaries of areas in which the mitigation proposals wil be implemented. Monitoring measures are required for each mitigation proposal under AB 3180.

E. Indicate, in the recommendations section of the report, areas of the project site where additional investigations (such as seasonal flora surveys or trapping studies) should be completed prior to considering a project for approval.

F. Prior to project approval, should the site be modified by grading or otherwise disturbed and such activity results in the loss of sensitive species or their habitats as identified in the biological reports, the Building and Safety Department shall be notified, and such action shall be considered cause for denial of the proposal; however, if the damage can be repaired, a restoration plan may be required.

VII. REFERENCES, VOUCHERS, ETC.

The report shall include:
A. a bibliography,
B. references cited,
C. persons contacted,
D. herberia and collections visited,
E. disposition of voucher specimens, and
F. current photos of the site, taken at the time of report preparation, clearly indicating the extant condition of the land and land uses with the location of the site clearly indicated.

VIII. CERTIFICATION

The report must include the certification statement as shown below:

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: SIGNED:

APPENDIX E

EXPLANATION OF CALIFORNIA DEPARTMENT OF FISH AND GAME CALIFORNIA NATURAL DIVERSITY DATA BASE PRIORITY RANKS,

CNDDB RARE FIND REPORT SEARCH RESULTS,

PHOTOCOPIES OF:

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

CALIFORNIA NATURAL COMMUNITY FIED SURVEY FORM

CALIFORNIA NATURAL DIVERSITY DATA BASE (CNDDB) PRIORITY RANKS

All elements listed in the CNDDB are ranked on either a global (G) or State (S) basis. In either case the ranking criteria are the same. The only thing that varies is the perspective (global or statewide) in which the overall distribution of the element is viewed. Subspecies have a "G" and a "T" rank where "G" indicates the global rank of the species and the "T" rank indicates the global rank of the subspecies or variety. The following describes global ranks. Substitute an "S" for the "G" when deriving state ranks and considering state-wide distribution.

GLOBAL RANKS: worldwide status - G1 to G5

G1 = extremely endangered
G2 = endangered
G3 = restricted range, rare
G4 = apparently secure
G5 = demonstrably secure

"T" RANKS: status of subspecies, T1 to T5

Definitions same as used above in "Global Ranks" (e.g., T1-T5).

STATE RANKS: status within state, S1 to S5

Definitions same as used above in "Global Ranks"

EXAMPLE: silly salamander = G5T3S1

G5- Ambystoma macrodactylum is found throughout the Pacific northwest
T3- Subspecies A. m. silly is restricted in its range globally
S1- the subspecies is endangered in California due to low numbers of populations and threats

A more precise degree of threat to a specific CNDDB element is sometimes expressed by a decimal followed by a number. The possible range of values is 1-3 with 1 signifying the most threatened and 3 signifying the least threatened. Example: A species which is ranked S2.1 would be endangered and extremely threatened in California (CDFG, June, 1991).

Status

USFWS = US. Fish and Wildlife Service (1987)
CDFG = California Department of Fish and Game (1988a)
CNPS = California Native Plant Society (1988)

Federal Candidate Species Designations

C1 = USFWS has sufficient biological information to support a proposal to list as threatened or endangered
C2 = Taxa for which existing information may warrant listing, but for which substantial biological data to support a proposed rule are lacking

C3a = Extinct
C3b = Taxonomically invalid
C3c = Too widespread and/or not threatened

CNPS Lists

List 1: Plants of highest priority
List 1a: Plants presumed extinct in California
List 1b: Plants rare or endangered in California and elsewhere
List 2: Plants rare or endangered in California, but more common elsewhere
List 3: Plants about which we need more information
List 4: Plants of limited distribution (a watch list)

CNPS R-E-D Code

R (Rarity)

1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
2 = Occurrence confined to several populations or to one extended population.
3 = Occurrence limited to one or a few highly restricted populations, or present in such numbers that it is seldom reported.

E (Endangerment)

1 = Not endangered
2 = Endangered in a portion of its range
3 = Endangered throughout its range

D (Distribution)

1 = More or less widespread outside California
2 = Rare outside California
3 = Endemic to California

** California Department of Fish and Game ***** Natural Diversity Data Base **

FALCO MEXICANUS
Prairie Falcon

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G5 CDFG: Special Concern
State: None State: S3 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: INHABITS DRY, OPEN TERRAIN, EITHER LEVEL OR HILLY.
Microhabitat: BREEDING SITES LOCATED ON CLIFFS. FORAGES FAR AFIELD, EVEN TO MARSHLANDS AND OCEAN SHORES.
** Element ID: ABNKD06090 **********

Occurrence Number: 124 --Dates Last Seen--
Quality: Unknown Element: 1977/05/24
Type: Natural/Native occurrence Site: 1977/05/24
Presence: Presumed Extant
Trend: Unknown
Main Info Source: CDFG RAPTOR NEST FILES 1981 (PERS)

Quad Summary: Seven Palms Valley (3311684)
County(ies): Riverside
* SENSITIVE *
Location: Locational Information Supressed - Call Local California Department of Fish and Game Office for Details

Lat/Long: Township:
UTM: Range:
Mapping Precision: Section: Qtr
Symbol Type: Meridian:
Group Number: More Information? Acres: 0
Map Index Number: More Map Detail? Elevation:

Threats:

Comments: Locational Information Supressed - Call Local California Department of Fish and Game Office for Details

** California Department of Fish and Game ***** Natural Diversity Data Base **

FALCO MEXICANUS
Prairie Falcon

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G5 CDFG: Special Concern
State: None State: S3 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: INHABITS DRY, OPEN TERRAIN, EITHER LEVEL OR HILLY.
Microhabitat: BREEDING SITES LOCATED ON CLIFFS. FORAGES FAR AFIELD, EVEN TO MARSHLANDS AND OCEAN SHORES.
** Element ID: ABNKD06090 **********

Occurrence Number: 151 --Dates Last Seen--
Quality: Unknown Element: 1980/05/05
Type: Natural/Native occurrence Site: 1980/05/05
Presence: Presumed Extant
Trend: Unknown
Main Info Source: CDFG RAPTOR NEST FILES 1981 (PERS)

Quad Summary: White Water (3311686), Desert Hot Springs (3311685), Catclaw Flat (3411616), Morongo Valley (3411615)
County(ies): Riverside
SENSITIVE *
Location: Locational Information Supressed - Call Local California Department of Fish and Game Office for Details

Lat/Long: Township:
UTM: Range:
Mapping Precision: Section: Qtr
Symbol Type: Meridian:
Group Number: More Information? Acres: 0
Map Index Number: More Map Detail? Elevation:

Threats:

Comments: Locational Information Supressed - Call Local California Department of Fish and Game Office for Details

** California Department of Fish and Game ***** Natural Diversity Data Base **

FALCO MEXICANUS
Prairie Falcon

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G5 CDFG: Special Concern
State: None State: S3 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: INHABITS DRY, OPEN TERRAIN, EITHER LEVEL OR HILLY.
Microhabitat: BREEDING SITES LOCATED ON CLIFFS. FORAGES FAR AFIELD, EVEN TO MARSHLANDS AND OCEAN SHORES.
*** Element ID: ABNKD06090 **********

Occurrence Number: 406 --Dates Last Seen--
Quality: Unknown Element: 1980/05/0
Type: Natural/Native occurrence Site: 1980/05/0
Presence: Presumed Extant
Trend: Unknown
Main Info Source: CDFG RAPTOR NEST FILES 1981 (PERS)

Quad Summary: White Water (3311686), Desert Hot Springs (3311685)
County(ies): Riverside
* SENSITIVE *
Location: Locational Information Supressed - Call Local California Department of Fish and Game Office for Details

Lat/Long: Township:
UTM: Range:
Mapping Precision: Section: Qtr
Symbol Type: Meridian:
Group Number: More Information? Acres: 0
Map Index Number: More Map Detail? Elevation:

Threats:

Comments: Locational Information Supressed - Call Local California Department of Fish and Game Office for Details

** California Department of Fish and Game ***** Natural Diversity Data Base **

FALCO MEXICANUS
Prairie Falcon

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G5 CDFG: Special Concern
State: None State: S3 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: INHABITS DRY, OPEN TERRAIN, EITHER LEVEL OR HILLY.
Microhabitat: BREEDING SITES LOCATED ON CLIFFS. FORAGES FAR AFIELD, EVEN TO MARSHLANDS AND OCEAN SHORES.
*** Element ID: ABNKD06090 **********

Occurrence Number: 430 --Dates Last Seen--
Quality: Unknown Element: 1984/01/2
Type: Natural/Native occurrence Site: 1984/01/2
Presence: Presumed Extant
Trend: Unknown
Main Info Source: CARLSON, BARBARA A. (OBS)

Quad Summary: Cathedral City (3311674), Seven Palms Valley (3311684)
County(ies): Riverside
* SENSITIVE *
Location: Locational Information Supressed - Call Local California Department of Fish and Game Office for Details

Lat/Long: Township:
UTM: Range:
Mapping Precision: Section: Qtr
Symbol Type: Meridian:
Group Number: More Information? Acres: 0
Map Index Number: More Map Detail? Elevation:

Threats: ORV USE OF CANYON BELOW NESTS.

Comments: Locational Information Supressed - Call Local California Department of Fish and Game Office for Details

** California Department of Fish and Game ***** Natural Diversity Data Base **

TOXOSTOMA LECONTEI
Le Contes Thrasher

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G4 CDFG: Special Concern
State: None State: S3 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.
Microhabitat: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.
*** Element ID: ABPBK06100 ***

Occurrence Number: 30 --Dates Last Seen--
Quality: Unknown Element: 1968/09/2(
Type: Natural/Native occurrence Site: 1968/09/2(
Presence: Presumed Extant
Trend: Unknown
Main Info Source: BLM 1980 (PERS)

Quad Summary: Desert Hot Springs (3311685)
County(ies): Riverside

Location: 1.75 NW OF DESERT HOT SPG (NEAR JCT OF MORONGO DR & W 16TH ST).

Lat/Long: 33d 58m 48s / 116d 31m 20s Township: 02S
UTM: Zone-11 N3759846 E544133 Range: 04E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 24 SW Qtr
Symbol Type: POINT Meridian: S
Group Number: 05495 More Information? N Acres: 0
Map Index Number: 05495 More Map Detail? N Elevation: 1240 ft

Threats:

Comments: General Notes - #80666 LACM.

** California Department of Fish and Game ***** Natural Diversity Data Base **

TOXOSTOMA LECONTEI
Le Contes Thrasher

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G4 CDFG: Special Concern
State: None State: S3 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.
Microhabitat: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.
*** Element ID: ABPBK06100 ***

Occurrence Number: 67 --Dates Last Seen--
Quality: Unknown Element: 1930/02/23
Type: Natural/Native occurrence Site: 1930/02/23
Presence: Presumed Extant
Trend: Unknown
Main Info Source: HANNA, W. C. NO #WFVZ (MUS)

Quad Summary: White Water (3311686), Desert Hot Springs (3311685)
County(ies): Riverside

Location: WHITEWATER.

Lat/Long: 33d 55m 15s / 116d 38m 17s Township: 03S
UTM: Zone-11 N3753715 E533841 Range: 03E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 11 SE Qtr
Symbol Type: POINT Meridian: S
Group Number: 05272 More Information? N Acres: 0
Map Index Number: 05272 More Map Detail? N Elevation: 1360 ft

Threats:

Comments: General Notes - EGG SET FROM NEST IN CHOLLA.

** California Department of Fish and Game ***** Natural Diversity Data Base **

TOXOSTOMA LECONTEI
Le Contes Thrasher

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G4 CDFG: Special Concern
State: None State: S3 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: DESERT RESIDENT; PRIMARILY OF OPEN DESERT WASH, DESERT SCRUB, ALKALI DESERT SCRUB, AND DESERT SUCCULENT SCRUB HABITATS.
Microhabitat: COMMONLY NESTS IN A DENSE, SPINY SHRUB OR DENSELY BRANCHED CACTUS IN DESERT WASH HABITAT, USUALLY 2-8 FEET ABOVE GROUND.
*** Element ID: ABPBK06100 **********

Occurrence Number: 82 --Dates Last Seen--
Quality: Unknown Element: 1984/02/0
Type: Natural/Native occurrence Site: 1984/02/0
Presence: Presumed Extant
Trend: Unknown
Main Info Source: CARLSON, BARBARA A. (OBS)

Quad Summary: Seven Palms Valley (3311684)
County(ies): Riverside

Location: INDIO HILLS. APPROX 4 MI NNW OF THOUSAND PALMS.

Lat/Long: 33d 52m 43s / 116d 25m 18s Township: 03S
UTM: Zone-11 N3748653 E553485 Range: 05E
Mapping Precision: NON-SPECIFIC (1/5 Mile) Section: 25 SW Qt
Symbol Type: POINT Meridian: S
Group Number: 05616 More Information? N Acres: 0
Map Index Number: 05616 More Map Detail? N Elevation: 1160 ft

Threats: HEAVY ORV USE.

Comments: Distribution Notes - SITE UTILIZED FOR FORAGING AND BREEDING. 1-10 INDIVS OBS. Ecological Notes - ASSOC W/CREOSOTE BUSH SCRUB. SUBSTRATE IS COARSE SAND.

** California Department of Fish and Game ***** Natural Diversity Data Base **

SPERMOPHILUS TERETICAUDUS CHLORUS
Palm Springs Ground Squirrel

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Category 2 Global: G5T1T2 CDFG: Special Concern
State: None State: S1S2 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: RESTRICTED TO THE COACHELLA VALLEY. PREFERS DESERT SUCCULENT SCRUB, DESERT WASH, DESERT SCRUB, ALKALI SCRUB, & LEVEES.
Microhabitat: PREFERS OPEN, FLAT, GRASSY AREAS IN FINE-TEXTURED, SANY SOIL. DENSITY CORRELATED WITH WINTER RAINFALL.
*** Element ID: AMAFB05161 **********

Occurrence Number: 1 --Dates Last Seen--
Quality: Unknown Element: 1940/01/1
Type: Natural/Native occurrence Site: 1940/01/1
Presence: Presumed Extant
Trend: Unknown
Main Info Source: BLM-MVZ 1940

Quad Summary: Desert Hot Springs (3311685), San Jacinto Peak (3311676), Palm Springs (3311675), White Water (3311686)
County(ies): Riverside

Location: BLAISDELL CANYON 2 MI SE PALM SPRINGS STN.

Lat/Long: 33d 52m 50s / 116d 37m 08s Township: 03S
UTM: Zone-11 N3748783 E535244 Range: 03E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 25 NE Qt
Symbol Type: POINT Meridian: S
Group Number: 05306 More Information? N Acres: 0
Map Index Number: 05306 More Map Detail? N Elevation: 1100 ft

Threats:

Comments: General Notes - MVZ #90066.

** California Department of Fish and Game ***** Natural Diversity Data Base **

OVIS CANADENSIS CREMNOBATES
Peninsular Bighorn Sheep

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Proposed Endangered Global: G4T1 CDFG:
State: Threatened State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: OPEN DESERT SLOPES BELOW 4,000 FT ELEVATION FROM SAN GORGONIO PASS SOUTH INTO MEXICO.
Microhabitat: OPTIMAL HABITAT INCLUDES STEEP WALLED CANYONS AND RIDGES BISECTED BY ROCKY OR SANDY WASHES, WITH AVAILABLE WATER.
*** Element ID: AMALE04012 **********

Occurrence Number: 7 --Dates Last Seen--
Quality: Unknown Element: 1986/06/X
Type: Natural/Native occurrence Site: 1986/06/X
Presence: Presumed Extant
Trend: Decreasing
Main Info Source: WEAVER, R. A. 1986 (PERS)

Quad Summary: Palm Springs (3311675), San Jacinto Peak (3311676), White Water (3311686), Desert Hot Springs (3311685)
County(ies): Riverside

Location: SAN JACINTO MOUNTAINS.

Lat/Long: 33d 51m 22s / 116d 37m 09s Township: 04S
UTM: Zone-11 N3746076 E535241 Range: 04E
Mapping Precision: SPECIFIC (0 Mile) Section: 05 W Qt
Symbol Type: POLYGON Meridian: S
Group Number: 05338 More Information? Y Acres: 10554.6
Map Index Number: 05338 More Map Detail? N Elevation: 2000 ft

Threats: MAIN THREAT TO HERD IS DISEASE.

Comments: Distribution Notes - SHEEP USUALLY OCCUR BELOW 400 FEET. Ecological Notes - HABITAT CONSISTS OF STEEP FAULT SCARPS AND VERY ERODED CANYONS. General Notes - POPULATION ESTIMATE OF 60, DOWN FROM A 1970 ESTIMATE OF 280 ANIMALS, MAINLY DUE TO DISEASE, ACCORDING TO WEAVER. Owner/Manager - PVT, USFS-SAN BERNARDINO NF

** California Department of Fish and Game ***** Natural Diversity Data Base **

OVIS CANADENSIS NELSONI
Nelsons Bighorn Sheep

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G4T3 CDFG:
State: None State: S3 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: WIDELY DISTRIBUTED FROM THE WHITE MTNS IN MONO CO. TO THE CHOCOLATE MTS IN IMPERIAL CO.
Microhabitat: OPEN, ROCKY, STEEEP AREAS WITH AVAILABLE WATER AND HERBACEOUS FORAGE
*** Element ID: AMALE04013 **********

Occurrence Number: 14 --Dates Last Seen--
Quality: Unknown Element: 1986/XX/X
Type: Natural/Native occurrence Site: 1986/XX/X
Presence: Presumed Extant
Trend: Unknown
Main Info Source: WEAVER, R.A. 1971 (LIT)

Quad Summary: East Deception Canyon (3311683), Thermal Canyon (3311661), West Berdoo Canyon (3311672), Rockhouse Canyon (3311671), Desert Hot Springs (3311685), Seven Palms Valley (3311684), Keys View (3311682), Malapal Hill (3311681), Morongo Valley (3411615), 2 Additional Quad(s) NOT Listed
County(ies): Riverside, San Bernardino

Location: LITTLE SAN BERNARDINO MOUNTAINS

Lat/Long: 33d 55m 60s / 116d 16m 25s Township: 02S
UTM: Zone-11 N3754793 E567124 Range: 06E
Mapping Precision: SPECIFIC (0 Mile) Section: UN XX Qt
Symbol Type: POLYGON Meridian: S
Group Number: 05686 More Information? Y Acres: 140891.3
Map Index Number: 05686 More Map Detail? N Elevation:

Threats:

Comments: Distribution Notes - THIS RANGE BECOMES MORE ARID TO THE EAST AND THE SHEEP POPULATION BECOMES LESS DENSE AND IS USED LESS FREQUENTLY THAN THE WESTERN PORTION. General Notes - POPULATION ESTIMATE OF 100 INDIVIDUALS; RECENT INCREASES IN POPULATION NUMBERS. Owner/Manager - NPS-JOSHUA TREE NM

** California Department of Fish and Game ***** Natural Diversity Data Base **

PHRYNOSOMA CORONATUM BLAINVILLEI
San Diego Horned Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Category 2 Global: G4T3 CDFG: Special Concern
State: None State: S2 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: INHABITS COASTAL SAGE SCRUB AND CHAPARRAL IN ARID AND
SEMI-ARID CLIMATE CONDIT
Microhabitat: PREFERS FRIABLE, ROCKY, OR SHALLOW SANDY SOILS.
** Element ID: ARACF12021 **********

ccurrence Number: 220 --Dates Last Seen--
Quality: Unknown Element: 1967/XX/X
Type: Natural/Native occurrence Site: 1967/XX/X
Presence: Presumed Extant
Trend: Unknown
Main Info Source: BRODE, J. 1986 (PERS)

uad Summary: White Water (3311686), Desert Hot Springs (3311685)
County(ies): Riverside

Location: ONE MILE UP WHITEWATER RIVER CANYON, APPROX 10 MI NW OF PALMSPRINGS.

Lat/Long: 33d 56m 22s / 116d 38m 16s Township: 03S
UTM: Zone-11 N3755292 E533476 Range: 04E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 25 SW Qt
Symbol Type: POINT Meridian: S
Group Number: 05273 More Information? N Acres: 0
Map Index Number: 05273 More Map Detail? N Elevation: 560 ft

Threats:

Comments: General Notes - LACM SPECIMEN. Owner/Manager - UNKNOWN

** California Department of Fish and Game ***** Natural Diversity Data Base **

PHRYNOSOMA MCALLI
Flat Tailed Horned Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Proposed Threatened Global: G3 CDFG: Special Concern
State: None State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: RESTRICTED TO DESERT WASHES AND DESERT FLATS IN CENTRAL
RIVERSIDE, EASTERN SAN DIEGO, AND IMPERIAL COUNTIES.
Microhabitat: CRITICAL HABITAT ELEMENT IS FINE SAND, INTO WHICH LIZARDS
BURROW TO AVOID TEMP EXTREMES; REQUIRE VEG COVER AND ANTS.
*** Element ID: ARACF12040 **********

ccurrence Number: 25 --Dates Last Seen--
Quality: Unknown Element: 1979/06/2
Type: Natural/Native occurrence Site: 1979/06/2
Presence: Presumed Extant
Trend: Unknown
Main Info Source: TURNER, ET. AL. 1980 (LIT)

Quad Summary: Desert Hot Springs (3311685)
County(ies): Riverside

Location: 4 MI W OF GARNET.

Lat/Long: 33d 53m 49s / 116d 36m 23s Township: 03S
UTM: Zone-11 N3750605 E536393 Range: 04E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 19 XX Qt
Symbol Type: POINT Meridian: S
Group Number: 05324 More Information? N Acres: 0
Map Index Number: 05324 More Map Detail? N Elevation: 960 ft

Threats:

Comments: General Notes - ONE OBS.

** California Department of Fish and Game ***** Natural Diversity Data Base **

UMA INORNATA
Coachella Valley Fringe Toed Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Threatened Global: G1Q CDFG:
State: Endangered State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: LIMITED TO SAND DUNES IN THE COACHELLA VALLEY, RIVERSIDE COUNTY.
Microhabitat: REQUIRE FINE, LOOSE, WINDBLOWN SAND (FOR BURROWING), INTERSPERSED WITH HARDPAN AND WIDELY SPACED DESERT SHRUBS.
*** Element ID: ARACF15010 **********

Occurrence Number: 29 --Dates Last Seen--
Quality: Unknown Element: 1964/05/0
Type: Natural/Native occurrence Site: 1964/05/0
Presence: Possibly Extirpated
Trend: Unknown
Main Info Source: BARROWS, C. 1988 (PERS)

Quad Summary: Desert Hot Springs (3311685)
County(ies): Riverside

Location: 9 MI N OF PALM SPRINGS. (2 MI WSW OF DESERT HOT SPRINGS)

Lat/Long: 33d 56m 44s / 116d 31m 50s Township: 03S
UTM: Zone-11 N3756024 E543380 Range: 04E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 02 NE Qt
Symbol Type: POINT Meridian: S
Group Number: 05476 More Information? N Acres: 0
Map Index Number: 05476 More Map Detail? N Elevation: 1200 ft

Threats:

Comments: Ecological Notes - HABITAT HAS BEEN DEGRADED, POSSIBLY EXTIRPATED. General Notes - CSPU SPECIMEN #195 COLLECTED MAY 1964 & MVZ SPECIMEN #98173 COLLECTED MAY 1971.

** California Department of Fish and Game ***** Natural Diversity Data Base **

UMA INORNATA
Coachella Valley Fringe Toed Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Threatened Global: G1Q CDFG:
State: Endangered State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: LIMITED TO SAND DUNES IN THE COACHELLA VALLEY, RIVERSIDE COUNTY.
Microhabitat: REQUIRE FINE, LOOSE, WINDBLOWN SAND (FOR BURROWING), INTERSPERSED WITH HARDPAN AND WIDELY SPACED DESERT SHRUBS.
*** Element ID: ARACF15010 **********

Occurrence Number: 33 --Dates Last Seen--
Quality: Unknown Element: XXXX/XX/X
Type: Natural/Native occurrence Site: XXXX/XX/X
Presence: Possibly Extirpated
Trend: Unknown
Main Info Source: BARROWS, C. 1988 (PERS)

Quad Summary: Desert Hot Springs (3311685)
County(ies): Riverside

Location: 6 MI N OF PALM SPRINGS.

Lat/Long: 33d 55m 32s / 116d 32m 44s Township: 03S
UTM: Zone-11 N3753800 E542004 Range: 04E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 10 NE Qt
Symbol Type: POINT Meridian: S
Group Number: 05449 More Information? N Acres: 0
Map Index Number: 05449 More Map Detail? N Elevation: 840 ft

Threats:

Comments: Ecological Notes - HABITAT EXTIRPATED OR DEGRADED. POSSIBLY EXTIRPATED. General Notes - CAS SPECIMEN #86840 COLLECTION DATE UNKNOWN, LACM #9761 COLLECTED IN 1957 AND LACM #52750 COLLECTED IN 1968.

** California Department of Fish and Game ***** Natural Diversity Data Base **

UMA INORNATA
Coachella Valley Fringe Toed Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Threatened Global: G1Q CDFG:
State: Endangered State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: LIMITED TO SAND DUNES IN THE COACHELLA VALLEY, RIVERSIDE COUNTY.
Microhabitat: REQUIRE FINE, LOOSE, WINDBLOWN SAND (FOR BURROWING), INTERSPERSED WITH HARDPAN AND WIDELY SPACED DESERT SHRUBS.
*** Element ID: ARACF15010 **********

Occurrence Number: 38 --Dates Last Seen--
Quality: None Element: 1964/04/XX
Type: Natural/Native occurrence Site: 1964/04/XX
Presence: Possibly Extirpated
Trend: Unknown
Main Info Source: BARROWS, C. 1988 (PERS)

Quad Summary: Desert Hot Springs (3311685)
County(ies): Riverside

Location: SOUTH GARNET.

Lat/Long: 33d 53m 54s / 116d 32m 49s Township: 03S
UTM: Zone-11 N3750781 E541889 Range: 04E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 22 NE Qtr
Symbol Type: POINT Meridian: S
Group Number: 05445 More Information? N Acres: 0
Map Index Number: 05445 More Map Detail? N Elevation: 680 ft

Threats:

Comments: Ecological Notes - WINDMILLS THROUGHOUT HABITAT. PROBABLY NO LIZARDS. General Notes - MVZ SPECIMEN #80383 COLLECTED IN 1964 AND LACM #97606-9 COLLECTED IN 1966.

** California Department of Fish and Game ***** Natural Diversity Data Base **

UMA INORNATA
Coachella Valley Fringe Toed Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Threatened Global: G1Q CDFG:
State: Endangered State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: LIMITED TO SAND DUNES IN THE COACHELLA VALLEY, RIVERSIDE COUNTY.
Microhabitat: REQUIRE FINE, LOOSE, WINDBLOWN SAND (FOR BURROWING), INTERSPERSED WITH HARDPAN AND WIDELY SPACED DESERT SHRUBS.
*** Element ID: ARACF15010 **********

Occurrence Number: 44 --Dates Last Seen--
Quality: Unknown Element: 1967/06/XX
Type: Natural/Native occurrence Site: 1967/06/XX
Presence: Possibly Extirpated
Trend: Unknown
Main Info Source: BARROWS, C. 1988 (PERS)

Quad Summary: Seven Palms Valley (3311684), Palm Springs (3311675), Cathedral City (3311674), Desert Hot Springs (3311685)
County(ies): Riverside

Location: 4 MI SE OF THE N PALM SPRINGS POST OFFICE.

Lat/Long: 33d 52m 38s / 116d 29m 38s Township: 03S
UTM: Zone-11 N3748463 E546818 Range: 05E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 30 SE Qtr
Symbol Type: POINT Meridian: S
Group Number: 05531 More Information? N Acres: 0
Map Index Number: 05531 More Map Detail? N Elevation: 560 ft

Threats: HABITAT DEGRADED BY OFF-ROAD VEHICLES.

Comments: Ecological Notes - FEW IF ANY LIZARDS EXTANT. General Notes - LACM #52749.

** California Department of Fish and Game ***** Natural Diversity Data Base **

UMA INORNATA
Coachella Valley Fringe Toed Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Threatened Global: G1Q CDFG:
State: Endangered State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: LIMITED TO SAND DUNES IN THE COACHELLA VALLEY, RIVERSIDE COUNTY.
Microhabitat: REQUIRE FINE, LOOSE, WINDBLOWN SAND (FOR BURROWING), INTERSPERSED WITH HARDPAN AND WIDELY SPACED DESERT SHRUBS.
*** Element ID: ARACF15010 **********

Occurrence Number: 48 --Dates Last Seen--
Quality: None Element: 1957/03/2
Type: Natural/Native occurrence Site: XXXX/XX/X
Presence: Possibly Extirpated
Trend: Unknown
Main Info Source: BARROWS, C. 1988 (PERS)

Quad Summary: Seven Palms Valley (3311684)
County(ies): Riverside

Location: 5 MI E, 1 MI N OF GARNET.

Lat/Long: 33d 55m 01s / 116d 27m 24s Township: 03S
UTM: Zone-11 N3752873 E550233 Range: 05E
Mapping Precision: NON-SPECIFIC (1/5 Mile) Section: 15 NW Qt
Symbol Type: POINT Meridian: S
Group Number: 05568 More Information? N Acres: 0
Map Index Number: 05568 More Map Detail? N Elevation: 880 ft

Threats:

Comments: Ecological Notes - HABITAT AND LIZARDS POSSIBLY EXTIRPATED OR NEARLY SO. General Notes - LACM #97565-6.

** California Department of Fish and Game ***** Natural Diversity Data Base **

UMA INORNATA
Coachella Valley Fringe Toed Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Threatened Global: G1Q CDFG:
State: Endangered State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: LIMITED TO SAND DUNES IN THE COACHELLA VALLEY, RIVERSIDE COUNTY.
Microhabitat: REQUIRE FINE, LOOSE, WINDBLOWN SAND (FOR BURROWING), INTERSPERSED WITH HARDPAN AND WIDELY SPACED DESERT SHRUBS.
*** Element ID: ARACF15010 **********

Occurrence Number: 51 --Dates Last Seen--
Quality: None Element: 19XX/XX/X
Type: Natural/Native occurrence Site: 19XX/XX/X
Presence: Extirpated
Trend: Unknown
Main Info Source: BARROWS, C. 1988 (PERS)

Quad Summary: White Water (3311686), Desert Hot Springs (3311685)
County(ies): Riverside

Location: WHITEWATER.

Lat/Long: 33d 55m 15s / 116d 38m 17s Township: 03S
UTM: Zone-11 N3753252 E533465 Range: 03E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 11 S Qt
Symbol Type: POINT Meridian: S
Group Number: 05272 More Information? N Acres: 0
Map Index Number: 05272 More Map Detail? N Elevation: 1301 ft

Threats:

Comments: Ecological Notes - HABITAT AND LIZARDSS EXTIRPATED. General Notes - MUSEUM COLLECTION SDNHM #2752. COLLECTION DATE UNKNOWN.

** California Department of Fish and Game ***** Natural Diversity Data Base **

UMA INORNATA
Coachella Valley Fringe Toed Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Threatened Global: G1Q CDFG:
State: Endangered State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: LIMITED TO SAND DUNES IN THE COACHELLA VALLEY, RIVERSIDE COUNTY.
Microhabitat: REQUIRE FINE, LOOSE, WINDBLOWN SAND (FOR BURROWING), INTERSPERSED WITH HARDPAN AND WIDELY SPACED DESERT SHRUBS.
*** Element ID: ARACF15010 **********

Occurrence Number: 80 --Dates Last Seen--
Quality: None Element: 1966/04/3(
Type: Natural/Native occurrence Site: 1966/04/3(
Presence: Possibly Extirpated
Trend: Unknown
Main Info Source: BARROWS, C. 1988 (PERS)

Quad Summary: White Water (3311686), Desert Hot Springs (3311685)
County(ies): Riverside

Location: 1.4 MI SE PALM SPRINGS STATION DEPOT. 700 FT.

Lat/Long: 33d 53m 60s / 116d 37m 32s Township: 03S
UTM: Zone-11 N3750937 E534620 Range: 03E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 24 NW Qt
Symbol Type: POINT Meridian: S
Group Number: 05301 More Information? N Acres: 0
Map Index Number: 05301 More Map Detail? N Elevation: 1070 ft

Threats: HABITAT DEGRADED BY OFF-ROAD VEHICLES.

Comments: Ecological Notes - POSSIBLY EXTIRPATED OR NOT A VIABLE POPULATION ACCORDING TO BARROWS. General Notes - LACM COLLECTION #97614 FROM 4/16/1966. OBSERVED BY BRODE AND CORDON (FIELD #254). LACM #97610 & 97611 COLLECTED 4/30/66.

** California Department of Fish and Game ***** Natural Diversity Data Base **

UMA INORNATA
Coachella Valley Fringe Toed Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Threatened Global: G1Q CDFG:
State: Endangered State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: LIMITED TO SAND DUNES IN THE COACHELLA VALLEY, RIVERSIDE COUNTY.
Microhabitat: REQUIRE FINE, LOOSE, WINDBLOWN SAND (FOR BURROWING), INTERSPERSED WITH HARDPAN AND WIDELY SPACED DESERT SHRUBS.
*** Element ID: ARACF15010 **********

Occurrence Number: 88 --Dates Last Seen--
Quality: Unknown Element: 19XX/XX/X
Type: Natural/Native occurrence Site: 19XX/XX/X
Presence: Possibly Extirpated
Trend: Unknown
Main Info Source: BARROWS, C. 1988 (PERS)

Quad Summary: Desert Hot Springs (3311685), Morongo Valley (3411615)
County(ies): Riverside

Location: INDIAN AVE, 8 MI N OF DILLON RD.

Lat/Long: 33d 59m 57s / 116d 33m 48s Township: 02S
UTM: Zone-11 N3761955 E540326 Range: 04E
Mapping Precision: NON-SPECIFIC (1/5 Mile) Section: 16 NE Qt
Symbol Type: POINT Meridian: S
Group Number: 05399 More Information? N Acres: 0
Map Index Number: 05399 More Map Detail? N Elevation: 1580 ft

Threats:

Comments: Ecological Notes - SITE NOT DEVELOPED ALTHOUGH NOT CORRECT FOR SPECIES. POSSIBLY EXTIRPATED. General Notes - DATE LAST OBSERVED UNKNOWN.

** California Department of Fish and Game ***** Natural Diversity Data Base **

UMA INORNATA
Coachella Valley Fringe Toed Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Threatened Global: G1Q CDFG:
State: Endangered State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: LIMITED TO SAND DUNES IN THE COACHELLA VALLEY, RIVERSIDE COUNTY.
Microhabitat: REQUIRE FINE, LOOSE, WINDBLOWN SAND (FOR BURROWING), INTERSPERSED WITH HARDPAN AND WIDELY SPACED DESERT SHRUBS.
*** Element ID: ARACF15010 **********

Occurrence Number: 94 --Dates Last Seen--
Quality: Good Element: 1988/06/0(
Type: Natural/Native occurrence Site: 1988/06/0(
Presence: Presumed Extant
Trend: Increasing
Main Info Source: BARROWS, C. 1988 (PERS)

Quad Summary: Desert Hot Springs (3311685), Palm Springs (3311675)
County(ies): Riverside

Location: SOUTH OF I-10 AND SOUTHERN PACIFIC RR, 1.5 MI SE GARNET

Lat/Long: 33d 52m 59s / 116d 31m 38s Township: 03S
UTM: Zone-11 N3749096 E543720 Range: 04E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 25 XX Qt
Symbol Type: POINT Meridian: S
Group Number: 05489 More Information? Y Acres: 0
Map Index Number: 05489 More Map Detail? N Elevation: 590 ft

Threats: ORV TRESPASS.

Comments: Distribution Notes - TOTAL OF 35 LIZARDS CAPTURED AND MARKED (TURNER STUDY PLOTS 9 & 10) IN 1980. LIZARDS OCCUR IN SECTIONS 25 & 26 BUT MORE LIZARDS OCCUR IN 25. Ecological Notes - HABITAT IS SANDY HUMMOCKS. HABITAT AND LIZARDS WERE EXTANT IN 1980. GOOD HABITAT. GOOD NUMBER OF LIZARDS. SPARSE VEGETATION; LARREA, DICORIA, TEQUILIA, CROTON. General Notes - LACM #6147 COLLECTED MAY 1967. 32 CAUGHT IN 1988. Owner/Manager - TNC-COACHELLA VALLEY PRESERVE

** California Department of Fish and Game ***** Natural Diversity Data Base **

UMA INORNATA
Coachella Valley Fringe Toed Lizard

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Threatened Global: G1Q CDFG:
State: Endangered State: S1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: LIMITED TO SAND DUNES IN THE COACHELLA VALLEY, RIVERSIDE COUNTY.
Microhabitat: REQUIRE FINE, LOOSE, WINDBLOWN SAND (FOR BURROWING), INTERSPERSED WITH HARDPAN AND WIDELY SPACED DESERT SHRUBS.
*** Element ID: ARACF15010 **********

Occurrence Number: 97 --Dates Last Seen--
Quality: Poor Element: 1984/02/0
Type: Natural/Native occurrence Site: 1984/02/0
Presence: Presumed Extant
Trend: Decreasing
Main Info Source: BARROWS, C. 1988 (PERS)

Quad Summary: Seven Palms Valley (3311684)
County(ies): Riverside

Location: INDIO HILLS. APPROX 4.5 MI NNW OF THOUSAND PALMS.

Lat/Long: 33d 53m 16s / 116d 24m 55s Township: 03S
UTM: Zone-11 N3749681 E554059 Range: 05E
Mapping Precision: NON-SPECIFIC (1/5 Mile) Section: 25 NW Qt
Symbol Type: POINT Meridian: S
Group Number: 05627 More Information? N Acres: 0
Map Index Number: 05627 More Map Detail? N Elevation: 1300 ft

Threats: SOME ORV USE. ENCROACHING SAND/GRAVEL MINING OPERATIONS MAY HAVE DESTROYED THE SMALL AMOUNT OF HABITAT THAT REMAINS.

Comments: Distribution Notes - 1-10 INDIVIDUALS OBSERVED. POSSIBLY A FEW LIZARDS STILL PRESENT. Ecological Notes - BLOW SAND AREA ASSO WITH CREOSOTE BUSH SCRUB.

** California Department of Fish and Game ***** Natural Diversity Data Base **

DESERT FAN PALM OASIS WOODLAND
Desert Fan Palm Oasis Woodland

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G3 CDFG:
State: None State: S3.2 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: Not available at this time.
Microhabitat: Not available at this time.
** Element ID: CTT62300CA **********

Occurrence Number: 67 --Dates Last Seen--
Quality: Unknown Element: 1966/XX/XX
Type: Natural/Native occurrence Site: 1966/XX/XX
Presence: Presumed Extant
Trend: Unknown
Main Info Source: VOGL & MCHARGUE, 1966 (LIT)

Quad Summary: Seven Palms Valley (3311684)
County(ies): Riverside

Location: TWO BUNCH PALMS. SE OF DESERT HOT SPRINGS (JUST W OF MIRACLE HILL).

Lat/Long: 33d 56m 54s / 116d 29m 19s Township: 02S
UTM: Zone-11 N3756361 E547260 Range: 05E
Mapping Precision: NON-SPECIFIC (1/5 Mile) Section: 32 SW Qtr
Symbol Type: POINT Meridian: S
Group Number: 05536 More Information? N Acres: 0
Map Index Number: 05536 More Map Detail? N Elevation: 1000 ft

Threats:

Comments: Distribution Notes - WASHINGTONIA FILIFERA ALONG MISSION CR BRANCH OF SAN ANDREAS FAULT. 47 PALMS COUNTED IN 1966.

** California Department of Fish and Game ***** Natural Diversity Data Base **

DESERT FAN PALM OASIS WOODLAND
Desert Fan Palm Oasis Woodland

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G3 CDFG:
State: None State: S3.2 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: Not available at this time.
Microhabitat: Not available at this time.
** Element ID: CTT62300CA **********

Occurrence Number: 74 --Dates Last Seen--
Quality: None Element: 1977/03/XX
Type: Natural/Native occurrence Site: 1977/03/XX
Presence: Extirpated
Trend: Unknown
Main Info Source: SHELBY, R. 1977 (LIT)

Quad Summary: Seven Palms Valley (3311684)
County(ies): Riverside

Location: SEVEN PALMS OASIS (MAPPED IN SEVEN PALMS VALLEY).

Lat/Long: 33d 53m 57s / 116d 28m 56s Township: 03S
UTM: Zone-11 N3750910 E547860 Range: 05E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 20 N Qtr
Symbol Type: POINT Meridian: S
Group Number: 05546 More Information? N Acres: 0
Map Index Number: 05546 More Map Detail? N Elevation: 720 ft

Threats:

Comments: Distribution Notes - WASHINGTONIA FILIFERA GROVE REPORTED AS EXTINCT 1977, 7 PALMS PREVIOUSLY.

** California Department of Fish and Game ***** Natural Diversity Data Base **

ASTRAGALUS TRICARINATUS
Triple-ribbed Milk-vetch

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Proposed Endangered Global: G1 CDFG:
State: None State: S1.2 Audubon:
CNPS List: 1B
---Habitat Associations--- CNPS RED Code: 3-1-3
General: JOSHUA TREE WOODLAND, SONORAN DESERT SCRUB
Microhabitat: HOT, ROCKY SLOPES IN CANYONS AND ALONG EDGE OF BOULDER-STREWN DESERT WASHES, W/LARREA AND ENCELIA, 1500-1850(4000)FT.
** Element ID: PDFAB0F920 **********

currence Number: 5 --Dates Last Seen--
Quality: Unknown Element: 1922/05/0
Type: Natural/Native occurrence Site: 1922/05/0
Presence: Presumed Extant
Trend: Unknown
Main Info Source: MUNZ & JOHNSTON #5196 CAS (HERB)

ad Summary: Desert Hot Springs (3311685), Morongo Valley (3411615)
County(ies): Riverside

Location: DRY MORONGO WASH, S OF MORONGO VALLEY.

Lat/Long: 33d 59m 50s / 116d 34m 01s Township: 02S
UTM: Zone-11 N3761749 E540006 Range: 04E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 16 NE Qt
Symbol Type: POINT Meridian: S
Group Number: 05389 More Information? N Acres: 0
Map Index Number: 05389 More Map Detail? N Elevation: 1600 ft

Threats:

Comments: Owner/Manager - UNKNOWN

** California Department of Fish and Game ***** Natural Diversity Data Base **

ASTRAGALUS LENTIGINOSUS VAR COACHELLAE
Coachella Valley Milk-vetch

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Proposed Endangered Global: G5T2 CDFG:
State: None State: S2.1 Audubon:
CNPS List: 1B
---Habitat Associations--- CNPS RED Code: 2-2-3
General: SONORAN DESERT SCRUB
Microhabitat: SANDY FLATS, WASHES, OUTWASH FANS, SOMETIMES ON DUNES, FROM 20 FT BELOW SEA LEVEL TO 1200 FT ABOVE AROUND COACHELLA V.
** Element ID: PDFAB0FB97 **********

currence Number: 5 --Dates Last Seen--
Quality: Unknown Element: 1982/XX/X
Type: Natural/Native occurrence Site: 1982/XX/X
Presence: Presumed Extant
Trend: Unknown
Main Info Source: KOBALY, R. 1983 (MAP)

ad Summary: Cathedral City (3311674), Seven Palms Valley (3311684)
County(ies): Riverside

Location: (MORONGO WASH, APPROX 1.5 AIR MI WNW OF FLAT TOP MTN SUMMIT.)

Lat/Long: 33d 52m 24s / 116d 29m 23s Township: 03S
UTM: Zone-11 N3748033 E547198 Range: 05E
Mapping Precision: NON-SPECIFIC (1/5 Mile) Section: 32 NW Qt
Symbol Type: POINT Meridian: S
Group Number: 05537 More Information? N Acres: 0
Map Index Number: 05537 More Map Detail? N Elevation: 540 ft

Threats:

Comments: General Notes - NONE Owner/Manager - BLM

** California Department of Fish and Game ***** Natural Diversity Data Base **

ASTRAGALUS LENTIGINOSUS VAR COACHELLAE
Coachella Valley Milk-vetch

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Proposed Endangered Global: G5T2 CDFG:
State: None State: S2.1 Audubon:
CNPS List: 1B
---Habitat Associations--- CNPS RED Code: 2-2-3
General: SONORAN DESERT SCRUB
Microhabitat: SANDY FLATS, WASHES, OUTWASH FANS, SOMETIMES ON DUNES, FROM 20 FT BELOW SEA LEVEL TO 1200 FT ABOVE AROUND COACHELLA V.
*** Element ID: PDFAB0FB97 **********

ccurrence Number: 6 --Dates Last Seen--
Quality: Unknown Element: 1985/04/0
Type: Natural/Native occurrence Site: 1985/04/0
Presence: Presumed Extant
Trend: Unknown
Main Info Source: EMERY, D. 1981 (MAP)

ad Summary: Desert Hot Springs (3311685), Seven Palms Valley (3311684)
County(ies): Riverside

Location: ABOUT 3.0 MI SE OF NORTH PALMS SPRINGS, ALONG ROAD.

Lat/Long: 33d 53m 52s / 116d 30m 20s Township: 03S
UTM: Zone-11 N3750748 E545704 Range: 05E
Mapping Precision: SPECIFIC (0 Mile) Section: 29 NW Qt
Symbol Type: POLYGON Meridian: S
Group Number: 05541 More Information? N Acres: 380.3
Map Index Number: 05541 More Map Detail? Y Elevation: 600 ft

Threats: ORV ACTIVITY AND TRASH DUMPING.

Comments: Ecological Notes - ON SMALL BERM OF ACCESS ROAD ON SANDY SOIL IN CREOSOTE BUSH SCRUB/LARREA-AMBROSIA COMPLEX. General Notes - LESS THAN 1000 SEEN IN 1982, BUT ONLY A FEW REMAINED IN 1985. Owner/Manager - SCE

** California Department of Fish and Game ***** Natural Diversity Data Base **

ASTRAGALUS LENTIGINOSUS VAR COACHELLAE
Coachella Valley Milk-vetch

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Proposed Endangered Global: G5T2 CDFG:
State: None State: S2.1 Audubon:
CNPS List: 1B
---Habitat Associations--- CNPS RED Code: 2-2-3
General: SONORAN DESERT SCRUB
Microhabitat: SANDY FLATS, WASHES, OUTWASH FANS, SOMETIMES ON DUNES, FROM 20 FT BELOW SEA LEVEL TO 1200 FT ABOVE AROUND COACHELLA V.
*** Element ID: PDFAB0FB97 **********

ccurrence Number: 8 --Dates Last Seen--
Quality: Unknown Element: 1982/XX/X
Type: Natural/Native occurrence Site: 1982/XX/X
Presence: Presumed Extant
Trend: Unknown
Main Info Source: KOBALY, R. 1983 (MAP)

ad Summary: Desert Hot Springs (3311685)
County(ies): Riverside

Location: (E EDGE OF WINDY POINT, SAN GORGONIO PASS.)

Lat/Long: 33d 53m 47s / 116d 37m 15s Township: 03S
UTM: Zone-11 N3750538 E535058 Range: 03E
Mapping Precision: NON-SPECIFIC (1/5 Mile) Section: 24 E Qt
Symbol Type: POINT Meridian: S
Group Number: 05303 More Information? N Acres: 0
Map Index Number: 05303 More Map Detail? N Elevation: 1020 ft

Threats:

Comments: General Notes - 20 PLANTS SEEN IN 1982. Owner/Manager - BLM, STATE, PVT

** California Department of Fish and Game ***** Natural Diversity Data Base **

ASTRAGALUS LENTIGINOSUS VAR COACHELLAE
Coachella Valley Milk-vetch

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Proposed Endangered Global: G5T2 CDFG:
State: None State: S2.1 Audubon:
CNPS List: 1B
---Habitat Associations--- CNPS RED Code: 2-2-3
General: SONORAN DESERT SCRUB
Microhabitat: SANDY FLATS, WASHES, OUTWASH FANS, SOMETIMES ON DUNES, FROM 20 FT BELOW SEA LEVEL TO 1200 FT ABOVE AROUND COACHELLA V.
*** Element ID: PDFAB0FB97 **********

Occurrence Number: 14 --Dates Last Seen--
Quality: Unknown Element: 1984/05/0
Type: Natural/Native occurrence Site: 1984/05/0
Presence: Presumed Extant
Trend: Unknown
Main Info Source: BOYD, S 1984 (OBS)

Quad Summary: Seven Palms Valley (3311684)
County(ies): Riverside

Location: COACHELLA VALLEY, S OF SEVEN PALMS VALLEY, N SIDE OF VARNER RD.

Lat/Long: 33d 53m 28s / 116d 29m 12s Township: 03S
UTM: Zone-11 N3750010 E547461 Range: 05E
Mapping Precision: NON-SPECIFIC (1/5 Mile) Section: 20 SW Qt
Symbol Type: POINT Meridian: S
Group Number: 05543 More Information? N Acres: 0
Map Index Number: 05543 More Map Detail? Y Elevation: 680 ft

Threats: WIND ENERGY CONVERSION SYSTEM PLANNED FOR THE AREA.

Comments: Ecological Notes - IN CREOSOTE BUSH SCRUB ON COARSE-COBBLY SAND. ASSOCIATED WITH BURRO-BRUSH. General Notes - LESS THAN 10 PLANTS SEEN. Owner/Manager - PVT

** California Department of Fish and Game ***** Natural Diversity Data Base **

GILIA MACULATA
Little San Bernardino Mtns Gilia

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Category 1 Global: G1 CDFG:
State: None State: S1.1 Audubon:
CNPS List: 1B
---Habitat Associations--- CNPS RED Code: 3-2-3
General: DESERT DUNES, SONORAN DESERT SCRUB, MOJAVE DESERT SCRUB AND JOSHUA TREE WOODLAND.
Microhabitat: SANDY PLACES BETWEEN 500-4000 FEET.
*** Element ID: PDPLM041Y0 **********

Occurrence Number: 2 --Dates Last Seen--
Quality: Unknown Element: 1952/04/0
Type: Natural/Native occurrence Site: 1985/XX/X
Presence: Presumed Extant
Trend: Decreasing
Main Info Source: LEWIS, H. SN RSA (HERB)

Quad Summary: Seven Palms Valley (3311684), Cathedral City (3311674)
County(ies): Riverside

Location: AQUEDUCT RD, 5.2 MI S (ESE) OF GARNET, COACHELLA VALLEY. NEAR WILLOW HOLE.

Lat/Long: 33d 53m 03s / 116d 28m 10s Township: 03S
UTM: Zone-11 N3749245 E549063 Range: 05E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 28 XX Qt
Symbol Type: POINT Meridian: S
Group Number: 05558 More Information? N Acres: 0
Map Index Number: 05558 More Map Detail? N Elevation: 640 ft

Threats: DISTURBED BY WINDMILL CONSTRUCTION AND ORV'S.

Comments: General Notes - SEARCHED FOR BUT NOT FOUND IN 1985.
Owner/Manager - UNKNOWN

** California Department of Fish and Game ***** Natural Diversity Data Base **

GILIA MACULATA
Little San Bernardino Mtns Gilia

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Category 1 Global: G1 CDFG:
State: None State: S1.1 Audubon:
CNPS List: 1B
---Habitat Associations--- CNPS RED Code: 3-2-3
General: DESERT DUNES, SONORAN DESERT SCRUB, MOJAVE DESERT SCRUB AND JOSHUA TREE WOODLAND.
Microhabitat: SANDY PLACES BETWEEN 500-4000 FEET.
** Element ID: PDPLM041Y0 **********

ccurrence Number: 10 --Dates Last Seen--
Quality: Unknown Element: 1992/04/2(
Type: Natural/Native occurrence Site: 1992/04/2(
Presence: Presumed Extant
Trend: Unknown
Main Info Source: DE GOUVENAIN, R. 1992 (OBS)

iad Summary: Desert Hot Springs (3311685)
County(ies): Riverside

Location: DRY MORONGO WASH, 4 MI NORTHWEST OF DESERT HOT SPRINGS.

Lat/Long: 33d 59m 51s / 116d 33m 42s Township: 02S
UTM: Zone-11 N3761770 E540471 Range: 04E
Mapping Precision: SPECIFIC (80m Mile) Section: 15 NW Qtr
Symbol Type: POINT Meridian: S
Group Number: More Information? N Acres: 0
Map Index Number: 24347 More Map Detail? N Elevation: 1560 ft

Threats: OHV USE AND DUMPING

Comments: Distribution Notes - 200' NORTH OF INDIAN AVE ON WEST SIDE OF DIRT ROAD WEST OF PIPELINE VALVE WITH CYCLONE FENCE (MAPPED ALONG SECTION 15/16 BORDER, JUST NORTH OF INDIAN ROAD). Ecological Notes - GROWING ON SANDY SOILS IN CREOSOTE BUSH SCRUB/ALLUVIAL SCRUB ASSOCIATION WITH LARREA TRIDENTATA, AMBROSIA DUMOSA, AND NEMACLADUS SP. IN ADDITION TO MANY OTHER ANNUALS. General Notes - ONLY 3 PLANTS OBSERVED IN 1992. SPECIES ALSO COLLECTED IN THIS AREA IN 1973 (THORNE #42656 RSA #357775). Owner/Manager - UNKNOWN

California Native Species Field Survey Form

Mail to:
Natural Diversity Data Base
alifornia Dept. of Fish and Game
1416 Ninth Street, 12th Floor
Sacramento, CA 95814

For office use only
Source Code _____ Quad Code _____
Elm Code _____ Occ # _____
Copy to _____ Map Index # _____

of field work: ___ mo ___ day ___ year

tific Name (no codes):

s Found? [ ] [ ] _____
yes no If not, why?

Individuals: _____ Subsequent visit? [ ]yes [ ]no

ared to your last visit: [ ]more [ ]same [ ]fewer

is an existing NDDB occurrence? [_____] [ ] [ ]
Yes, Occ. # no unk.

tion? If yes: _____ _____
number Museum/Herbarium

Reporter: _____
Address: _____
Phone: ( ) _____
Other knowledgeable individuals (name/address/phone):

Plant Information:
ology: _____ _____ _____
% vegetative % flowering % fruiting

Animal Information:
Age Structure: _____ _____ _____
adults # juveniles # unknown
Site Function: [ ] [ ] [ ] [ ] [ ] [ ]
breeding foraging wintering roosting burrow site other

ion: *(Please also attach or draw map on back.)*

/: _____ Landowner/Mgr: _____
d Name: _____ Elevation: _____ UTM: _____
: ___R___ ___ 1/4 of ___ 1/4 Sec ___ T___R___ ___ 1/4 of ___ 1/4 Sec ___

itat Description: *(Plant communities, dominants, associates, substrate/soils, aspect/slope)*

rare spp.?

formation: Current/surrounding land use:

disturbances, possible threats:

ll site quality: [ ]*Excellent* [ ]*Good* [ ]*Fair* [ ]*Poor* Comments:

nation: *(Check one or more, fill in the blanks)*
yed in a site reference: _____
Compared with specimen housed at: _____
mpared with photo/drawing in: _____
another person (name): _____
Other: _____

Photographs: (Check one or more)	*Slide*	*Print*
Plant/animal	___	___
Habitat	___	___
Diagnostic Feature	___	___
Other	___	___

May we obtain duplicates at our expense? [ ]yes [ ]no

California Natural Community Field Survey Form

Mail to:
Natural Diversity Data Base
California Dept. of Fish and Game
1416 Ninth Street
Sacramento, CA 95814
(916) 324-6857

For office use only

Source Code_____ Quad Code_____

Community Code _____ Occ #_____

Map Index #_____ Update Y _____ N _____

Please provide as much of the following information as you can. Please attach a map (if possible, based on the USGS 7.5 minute series) showing the site's location and boundaries. Use the back if needed.

Community name:_____

Reporter:_____ Phone _____
Affiliation and Address_____
Date of field work:_____ County:_____
Location:_____

Quad name: _____T____R____ ____ ¼ of___ ¼ sec____ Meridian_____
UTM Zone __ __ Northing __ __ __ __ __ __ __ Easting __ __ __ __ __ __
Landowner/Manager: _____ Photographs: Slide ☐ Print ☐
Elevation: _____Aspect: _____ Slope (indicate % or °)_____ Drainage:_____
Site acreage: _____ Evidence of disturbance/threats: _____

Current land use: _____
Substrate/Soils: _____

General description of community: _____

Any Special Plants or Animals present: _____

Successional status/Evidence of regeneration of dominant taxa:_____

Overall site quality: Excellent____ Good ____Fair ____Poor ____Comments: _____

Basis for report: Remote image ____Binocular/Telescopic survey _____
Windshield survey ____ Brief walk-thru ____ Detailed survey ____ Other _____
Relevé: In the space below, indicate each species cover % within the following growth form categories:

Trees	Shrubs	Herbs/Graminoids

Continue on back if needed. Thank you for your contribution.

Trees	Shrubs	Herbs/Graminoids

FG/NHD/1748 Rev. 7/92
survy.br

APPENDIX F

APPROXIMATE LOCATIONS OF 1978-1994 BIOLOGICAL ASSESSMENTS OF THE CITY OF DESERT HOT SPRINGS AND SPHERE OF INFLUENCE

INTRODUCTION

The locations of eighteen (18) areas, where biological assessments have been previously conducted within the Planning Area, are mapped on the Appendix F map: *Approximate Locations Of 1978-1994 Biological Assessments Of The Planning Area* map. As previously discussed and listed on Table 1, only seventeen (17) of the 18 biological assessments were available for review in 1994 and 1995 (number 1 was not available). Photo copies of the 17 available biological assessments have been provided to the City in a three-ring binder accompaning this report entitled *"Seventeen Biological Assessments Conducted Within The City Of Desert Hot Springs And Sphere Of Influence Between 1978 And 1994."*

Table 5 numerically lists the name of the biological assessment area, the reported size of each development area and the name of the consultant or firm who prepared the biological assessment for each proposed development project. Each assessment area was assigned a number (Assessment Number) as they were located during the 1994 and 1995 literature reviews. The locations of the 18 biological assessment areas were obtained from map figures or project location descriptions obtained during 1994 and 1995 literature reviews. One biological assessment, San Gorgonio Wind Resource Study DEIR #158, was not mapped because it 's boundaries were so large it could not be shown on the Appendix F map. The study area boundaries, of San Gorgonio Wind Resource Study DEIR #158, encompassed the entire Planning Area (Wagstaff and Brady, 1982, Figure III-18). Assessment Numbers 13, 14, and 17 are documented in and part of one environmental report: San Gorgonio Wind Resource Site Specific Projects DEIR #156 and are listed as one assessment in Table 1 of DEIR #156.

Table 5: 1978-1994 Biological Assessments Of The Planning Area

Assessment Number	Name Of Development	Reported Size Of Development	Consultant Or Firm Name Of Preparer Of The Assessment
1.	*116.47 Acre Parcel*	116.47	The Planning Center, November 1978b
2.	*155.8 Acre Parcel*	155.8	The Planning Center, November 1978b
3.	*Seven Palms Ranch*	640 acres	WESTEC Services, Inc., 1980.
4.	*Mission Lakes Property*	960 acres	PSBS, 1980.
5.	*TT No. 22757 (Indian Hills EIR)*	129 acres	Marsh and Marsh, 1988; Barrows, 1986 and 1988; PSBS, 1980.
6.	Desert Hot Springs Redevelopment Project No. 2	587 acres	Rod Gunn & Associates, Inc., 1984.
7.	*Olympus Golf Course*	530 acres	Barrows, 1990.
8.	*Cornerstone Specific Plan*	515 acres	Tierra Madre Consultants, 1990 for Terra Nova Planning, 1991.
9.	*Rancho Morongo Country Club*	157 acres	Chambers Group, 1991 (Dec. 18, 1990).
10.	*Rancho Royale Specific Plan*	2,240 acres	Terra Nova Planning, 1992a,b.
11.	*Annexation No. 22*	8,715 acres	Terra Nova Planning, 1992d; no new bio. surveys, used Olympus/Rancho Royal studies.
12.	*Desert Hot Springs 12-Acre Project*	12-Acres	Cornett, 1994

Table 1: Continued

13.	San Gorgonio Wind Resource Site Specific Projects DEIR #156	Proj. #451, 0.92 acres	Wagstaff and Brady, 1982.
14.	San Gorgonio Wind Resource Site Specific Projects DEIR #156	Proj. #462, 230 acres	Wagstaff and Brady, 1982.
15.	So. CA. Edison Co's. Devers-Valley 500kV, Serrano-Valley 500kV, and Serrano-Villa Park 220kV Transmission Line Project Draft EIS/EIR	Sizes not provided in portion of document available for review.	Southern California Edison Company, 1981
16.	So. CA. Edison Co's. Devers-Palo Verde #2, 500 kV Transmission Line Proj. DEIR.	126 linear miles (50± acres) of this 238 mile long linear project	Western Ecological Services Company, Inc. (WESCO), 1987.
17.	San Gorgonio Wind Resource Site Specific Projects DEIR #156	Proj. #443, 329 acres	Wagstaff and Brady. November 1982.
18.	City of Desert Hot Springs. April 1982. Draft EIR, Desert Hot Springs Redevelopment Agency Project Area No. 1.	Size not provided in portion of document available for review;	The Redevelopment Agency Staff, 1982.

Use/Value Of The Appendix F Map

The Appendix F map can be used by City staff to determine if a biological assessment has been previously conducted within or in the immediate vicinity of future proposed development parcels.

Previously Prepared Biological Assessment Available

If a pertinent, previously prepared biological assessment exists, City staff should require an biological assessment update field survey and literature review be conducted and documented to inventory currently existing resources to determine if any changes have occurred since it was prepared, check any previously prepared sensitive biological resources map to determine the current status of previously mapped sensitive biological resources, determine potential significant impacts of the proposed development plan upon sensitive biological resources and develop a plan to mitigate significant impacts to less than significant. Photo copies of sixteen of the 17 available biological assessments have been provided to the City in a three-ring binder accompaning this report entitled "*Seventeen Biological Assessments Conducted Within The City Of Desert Hot Springs And Sphere Of Influence Between 1978 And 1994.*" A copy of the So. CA. Edison Co's. Devers-Valley 500kV, Serrano-Valley 500kV, and Serrano-Villa Park 220kV Transmission Line Project Draft EIS/EIR was not included in the binder because it did not contain biological information.

No Previous Biological Assessment

If no such biological assessment has been prepared for a proposed development parcel, City staff should require a thorough, complete biological assessment be conducted and documented to inventory existing resources, develop a map of sensitive biological resources, determine potential significant impacts of the proposed development plan upon sensitive biological resources and develop a plan to mitigate significant impacts to less than significant.

Updating Of The 1978-1994 Biological Assessments Locations Map

As site specific biological resources maps are prepared for future development parcels within the Planning Area, their locations should be plotted by City staff on the Appendix F biological assessments location map.

APPENDIX G

SENSITIVE BIOLOGICAL RESOURCES MAP FOR THE CITY OF DESERT HOT SPRINGS AND SPHERE OF INFLUENCE

INTRODUCTION

No regional or Planning Area wide sensitive species/habitats maps, showing the locations and distributions of sensitive biological elements (species and habitat types) of the Planning Area, were located during 1994 and 1995 reviews of the seventeen biological assessments listed above in Table 1. Therefore, one was prepared as described below.

How The Sensitive Species/Habitats Map Was Prepared

The *Sensitive Biological Resources Map* of the Planning Area was constructed in 1994 by plotting the mapped locations and distributions of sensitive biological elements recorded in the available Table 1, 1978-1994, consultant project specific, site maps and at least the documents listed above. The sensitive biological resources map was refined using qualitative observational data gathered during (a) March and April 1995, field surveys of the Planning Area and (b) 1994-1995 reviews of museum and consultant biological records, biological field surveys, consultant biological assessments of the Planning Area, County and consultant sensitive species maps, regional master environmental assessments, U.S. Fish and Wildlife Service biological maps and documents, etc., depicting the specific locations and distributions of sensitive species/habitats. The literature and records reviewed included at least those listed below:

The Appendix G *Sensitive Biological Resources Map* of the Planning Area was prepared

1. Review of current CDFG CNDDB *Rare Find* search record results and velum overlays for the Seven Palms Valley and Desert Hot Springs, California USGS 7.5 minute topographic quadrangles (CDFG, 1994a,b,c,d, and 1995a,b).

2. Results of a 1994 review of the sensitive biological elements of the Planning Area prepared by James W. Cornett, biological consultant/biologist Palm Springs Desert Museum.

3. September 1994 and March and April 1995, field surveys, of the Planning Area.

4. Specific locations and distributions of sensitive biological resources determined during surveys of specific development projects conducted between 1978 and 1994 (Table 1).

5. Review of Map No. 3-5: Map showing *Rare, Threatened, Endangered, And Sensitive Plant And Animal Species* of the San Gorgonio Pass Wind Energy Project.

6. County of Riverside's General Plan 1982 Endangered, Rare, & Threatened Wildlife Ranges & Habitats Map.

7. Coachella Valley Final MEA Document and Fringe-Toed Lizard Habitat Conservation Plan (Comarc, 1981).

8. U.S. Department of the Interior, U.S. Fish and Wildlife Service Desert Tortoise habitat maps, survey protocols, critical habitat unit and category maps, etc.

1995 Focused Sensitive Species Surveys

Focused surveys for sensitive plant and wildlife species were conducted during March and April 1995, because it was the time of year coinciding with the known flowering periods of sensitive annual and perennial plant species and subspecies of concern and/or during periods of pheonological development when sensitive species and subspecies of concern are both present and identifiable. The flowering times of sensitive plant species surveyed for were provided previously in Table 3: *Sensitive Plant Species Observed Or Expected Within The City Of Desert Hot Springs and Adjacent Areas.* Focused sensitive wildlife surveys were scheduled when migratory, nocturnal, or dormant (e.g., hibernating, aestivating, etc.) species of concern were present, observable, and active. No nocturnal or small mammal live-trapping surveys were conducted in 1995. Focused nocturnal or small mammal live-trapping surveys should be conducted in the year future development projects are proposed.

It must be emphasized that the results and findings of the 1995 focused sensitive species surveys of the Planning Area will not serve as an appropriate substitute for the individual focused sensitive species surveys which must be prepared to meet the requirements of CEQA for future proposed site specific development projects. Focused sensitive species surveys are usually only valid for one year from the date they were completed and must be repeated to determine the current status of parcels being proposed for development. A complete, comprehensive inventory of the existing biological resources of any undeveloped parcel being proposed for future development must be conducted and include at least three to five nights of nocturnal small mammal live-trapping surveys to adequately determine the presence or absence of sensitive small mammals.

Accuracy And Use Of The Sensitive Biological Resources Map

The sensitive biological resources map was prepared at a level of accuracy which will enable City Planning Department staff to use it as a constraints analysis tool to determine (a) what type of sensitive biological elements occur or potentially occur within the boundaries of projects being proposed, (c) the nature, extent, and significance of potential project related impacts, and (d) what types of mitigation measure will be required to reduce significant project impacts to less than significant. City Planning Department staff can use the results of their constraints analysis to determine the nature and level of project specific biological surveys and studies they must require for each project.

Elements Of The Sensitive Biological Resources Map

The *Sensitive Biological Resources Map* depicts the boundaries of the Coachella Valley Fringe-Toed Lizard Conservation Fee Area and the approximate locations and distributions, of five sensitive biological elements occurring in specific definable areas, of the Planning Area. As shown on Tables 3 and 4 and previously discussed in the *Sensitive Species And Habitat Types Of The Planning Area*, other sensitive biological elements are know or potentially occur throughout the entire Planning Area. The specific locations and distributions of sensitive biological elements potentially occurring throughout the Planning Area were not mapped. The Desert Fan Palm Oasis Woodland, located at the Two Bunch Palms resort and Spa, is not mapped because it is unlikely that it will be impacted by future development. The resort's two palm groves are valued and protected as part of the resort's amenities and ambiance.

1. Stabilized And Partially-Stabilized Desert Dunes And Desert Sand Fields

   Two major blow sand deposits occur in the Planning Area. The largest desert dune and sand accumulation area trends northwest to southeast, roughly paralleling the portion of the Devers-Palo Verde power line route located in the northern portion of the Seven Palms Valley. Desert dune and sand accumulation areas also occur in the Painted Hills Road area on the top of the bluffs east of Whitewater River Wash. The sand dunes of both areas are relatively small and well stabilized by vegetation, primarily mesquite with some saltbush, indigo bush, and creosote bush. When feasible, development in these two areas should be limited. Mitigation may be required to mitigate project impacts if projects are approved in these areas.

2. **Coachella Valley Fringe-Toed Lizard Potential Habitat**

   A solid line, with arrow heads pointing southward, depicts the portion of the Planning Area where CVFTL can be expected to occur. Focused surveys must be conducted on all future proposed development parcels to determine the presence of absence of CVFTL. Focused surveys for CVFTL should be conducted in May or June when soil temperatures are between 80-100 degrees Fahrenheit.

3. **Coachella Valley Fringe-Toed Lizard Habitat Conservation Fee Area**

   A solid line, with small solid squares, depicts the boundaries of the Planning Area CVFTL Fee Area. No parcel of land, within the CVFTL Fee Area, occupied or not, will be issued any permit or development approval prior to the payment of the mitigation fee to the Nature Conservancy. Once The Nature Conservancy has verified that the mitigation fee has been paid the city will issue a sub-permit allowing "take" of the CVFTL upon the land for which the fee has been paid during the course of otherwise lawful development activities.

4. **Desert Tortoise Class 2 Potential Habitat**

   Two ovoid, stippled areas, depict the boundaries of potential Class 2 Desert Tortoise habitat within the Planning Area. Class 2 Desert Tortoise Habitat indicates a moderate probability of occurrence. Focused surveys must be conducted on all future proposed development parcels to determine the presence of absence of the federal and state threatened Desert Tortoise. If any desert tortoise are observed on a project site, work areas or access roads, all development activities must stop immediately in the immediate vicinity of the encountered tortoise(s). A City approved biologist must be called to determine the appropriate course of action. Development activities can only resume upon receipt of written authorization to proceed. All other portions of the Planning Area are Class 3 which indicates a low probability of encountering tortoises or their sign (Tierra Madre, 1990).

5. **Bighorn Sheep (*Ovis canadensis*) Potential Habitat**

   A solid line, with arrow heads pointing northeastward, depicts the boundaries of Planning Area potential bighorn sheep habitat. Pre-construction presence or absence surveys for desert bighorn sheep should be conducted for each future development site proposed within the extreme northeastern portion of the Planning Area (General Plan, Resource Management Element, 1987). As feasible, developments adjacent to sheep habitat (a) should not erect fences or other linear obstructions to sheep movement, (b) should be required to preserve as much of on-site sheep habitat and to avoid or minimize the loss of food and cover essential to the survival of the sheep as feasible., and (c) as feasible proposed developments will be designed to avoid or minimize disturbances to an undue amount of the surrounding habitat.

Updating Of The *Sensitive Biological Resources Map*

The *Sensitive Biological Resources Map* should be updated, by City staff, on an annual basis. Updating can be accomplished by plotting site specific locations and distributions of new sensitive biological elements, provided by sensitive biological element maps prepared for future development sites. This will increase the detail and accuracy of the Appendix G map. Up-to-date accurate assessments of the known or expected locations and distribution of sensitive biological elements within the Planning Area can only be made using the current year's data.

APPENDIX H

GENERALIZED VEGETATION MAP OF THE CITY OF DESERT HOT SPRINGS AND SPHERE OF INFLUENCE

INTRODUCTION

No regional or Planning Area wide vegetational maps, delineating the boundaries of the plant communities of the Planning Area, were located during the review of the seventeen biological assessments listed previously in Table 1. A *Generalized Vegetation Map of the Planning Area* was prepared using the data gathered during (a) the September 1994 and March and April 1995, field surveys of selected portions of the Planning Area and (b) the specific locations and distributions of botanical resources determined during field surveys of specific development projects conducted between 1978 and 1994 (Table 1).

How The Map Was Prepared

The ***Generalized Vegetation Map of the Planning Area*** was constructed by plotting the mapped and/or described plant communities boundaries recorded in the available Table 1, 1978-1994, consultant project specific, site maps. The vegetational map was refined using the results and findings of March and April 1995, field surveys of the Planning Area, plant habitat locality data recorded in CNDDB Rare Find records, plotted on 1994 CNDDB quad sheet velum overlays and other available maps showing the reported locations and distributions of botanical habitat and species within the Planning Area (e.g., *SCE Co.'s Devers-Palo Verde #2, 500 kV Transmission Line Project DEIR* Figure 4.5-1 Major Vegetation Types, etc.).

Elements Of The Vegetational Map

The vegetational map depicts the following four terrestrial plant communities:

1. **Sonoran Creosote Scrub** (Element Code 33100)

Habitat Description

With only a few localized exceptions, the predominant vegetation type of the Sonoran Desert, Coachella Valley, and the Planning Area is non-sensitive, unlisted Sonoran Creosote Bush Scrub (Holland, 1986). Sonoran Creosote Bush Scrub is identifiable by a distinctive group of predominant indicator plant species including Bursage (*Ambrosia dumosa*), Brittlebush (*Encelia farinosa*), Ocotillo (*Fouquieria splendens*), and Creosote Bush (*Larrea tridentata*). According to Holland (1986) this habitat type is comprised of widely spaced, 0.5-3 m tall (1.6 to 9.8 feet), shrubs with bare ground between (Holland, 1986). In years when sufficient precipitation is provided by winter and spring rains, the bare areas are occupied from January to May with flowering "ephemeral" herbaceous species which complete their life cycles in a few weeks time. Sonoran Creosote Bush Scrub is very similar in appearance to Mojave Creosote Bush Scrub (Element Code: 34110), but with greater species and life form diversity including several succulents. Growth occurs from winter to early spring (or rarely at other seasons) if rainfall is sufficient. Shrubs may be dormant during drought for long periods. Many species of ephemeral herbs may flower in late February and March (earlier than in Mojave Creosote Bush Scrub) if the winter rains are sufficient. This is the basic Creosote Scrub of the Sonoran Desert.

Habitat Distribution

Sonoran Creosote Bush Scrub characteristically occurs primarily at elevations below 910 meters (3,000 feet) in areas where winter temperatures seldom drop below freezing on well-drained secondary soils of slopes, bajadas, alluvial fans and valleys rather than upland sites with thin residual soils or sites with high soil salinity. Sonoran Creosote Bush Scrub occurs within the Sonoran Desert region from the Little San Bernardino Mountains, south and eastward into Baja California, southern Arizona and Sonora, Mexico where it is the dominant plant community below 2,500 or 3,000 feet (760 or 910 m). It intergrades broadly with Mojave Creosote Bush Scrub in southeastern San Bernardino County and eastern Riverside County.

2. **Sonoran Mixed Woody And Succulent Shrub** (Element Code 33220)

Habitat Description

Two non-sensitive, unlisted stands ("gardens") of native succulents are described as occurring within the Planning Area (Cornett, 1994). These "gardens" are assignable to Holland's (1986) terrestrial plant community description of Sonoran Mixed Woody And Succulent Shrub. Holland describes this plant community as "the only Colorado (a.k.a. Sonoran) Desert community with substantial dominance of cacti and other stem succulents" which "is dominated by shrubs...similar in aspect to Sonoran Creosote Scrub (3310) but more varied and usually denser." It "includes species from Sonoran Creosote Scrub (33100), and Desert Wash Woodland (63200), with no clear dominant.".

Habitat Distribution

The general distribution of Sonoran Mixed Woody And Succulent Shrub is similar to Sonoran Creosote Scrub. That is, it occurs on rocky, well drained slopes and alluvial fans, usually between 300 and 1,210m at the bases of mountains where the terrain is more varied and moisture supply is greater.

3. **Desert Fan Palm Oasis Woodland** (Element Code 62300)

Habitat Description

The Desert Fan Palm Oasis Woodland is an *unlisted, but sensitive* unique and significant, relatively rare, desert vegetation type (Comarc, 1981; CVMEA, 1981). In their Desert Plan, The Bureau of Land Management has designated this habitat as unique, extremely valuable and especially sensitive (vulnerable) (BLM, 1980). Although palm oasis are not legally protected habitat types they are listed by the California Department of Fish and Game as "communities with highest inventory priorities" because they are "restricted in range" and moderately threatened by development, hikers, etc. (CNDDB, 1994b,c, and 1995, a, b; CDFG, 1992).

Habitat Distribution

The two palm groves at the Two Bunch Palms Resort And Spa are the only naturally occurring palm oasis remaining in the Planning Area. They represents the most northern occurrence of *Washingtonia filifera* in the Coachella Valley and as such they are of historical, as well as biological, significance (Cornett, 1994). In the Coachella Valley, palm oasis are typically associated with earth faults, either directly as these phenomena can facilitate the upward movement of moisture, or indirectly as in Palm Canyon where the fault formed canyon directs the flow of runoff from surrounding mountains (Cornett, 1980).

4. **Stabilized And Partially Stabilized Desert Dunes** (Element Code 22200) **And Desert Sand Fields** (Element Code 22300)

Habitat Description

Three general types of sand deposits, occurring in a mosaic pattern in the Planning Area, have been identified and include stabilized and partially-stabilized desert dune landforms, sand plains, and wind shadow "dunes".

Habitat Distribution

Two major sand deposit areas are identifiable within the Planning Area.

a. Sand dunes, sand plains, and wind shadow "dunes" occur in the Painted Hills Road area on the top of the bluffs east of Whitewater River Wash. The dunes of this area are relatively small and well stabilized by vegetation, primarily consisting of creosote bush (Photo Plate No. 4).

b. A series of disjunct, low stabilized and partially-stabilized desert dune landforms occur in the northwestern portion of Seven Palms Valley. They trend northwest to southeast, roughly paralleling the Devers-Palo Verde power line route, along the southwest edge of the Seven Palms Valley, and extend to the southeast, ending near Willow Hole. Although these are not the theatrical dunes of the Sahara Desert, they have been worked into obvious sand accumulation landforms whose size and shape are apparently determined by the wind and associated stabilizing vegetation. These sand accumulation landforms of the Seven Palms Valley have been described by WESTEC (1980) as a "desert dune and sand plant community". Most of the larger sand accumulation areas of this valley most closely fit Holland's (1986) terrestrial natural community description of Stabilized and Partially-Stabilized Desert Dune (Element Code: 22200). The dunes of this type of dune habitat are typically lower than active dunes and are stabilized and partially-stabilized by evergreen and/or deciduous shrubs, scattered low annuals and perennial grasses and forbs. The dominant plant species of the dune areas within the vicinity of the Seven Palms Valley are saltbush (*Atriplex canescens*) and mesquite (*Prosopis glandulosa*) (Wagstaff and Brady, 1982). In the Planning Area these dunes communities intergrade with lower elevation, peripheral Sonoran Creosote Bush Scrub and Desert Dry Wash Woodland habitats. The most uncommon and botanically rich dune area is located in the vicinity of the intersection of the Devers-Palo Verde #2 500 KV Transmission line and Mission Creek Wash in S13, T3S, R4W of the Desert Hot Springs USGS quadrangle (WESCO, 1987).

Accuracy Of The Vegetational Map

At the City's request, the current status (e.g., species composition, extent, boundaries, etc.) of previously reported and mapped vegetational habitat was field checked during March and April 1995, field surveys. As a result of extensive qualitative observational data gathered during 1995 field studies the general, existing plant communities boundaries of the Planning Area have been depicted on the generalized vegetational map.

Use Of The Vegetational Map

The generalized vegetational map was prepared at a level of accuracy which will enable City Planning Department staff to (a) use it as a constraints analysis tool, (b) determine what type of plant communities occur within the boundaries of projects being proposed, and (c) determine the type and significance of potential project related impacts, to existing plant communities. City Planning Department staff can use the results of their constraints analysis to determine the nature and level of project specific biological surveys and studies they must require for each project.

Updating The Vegetational Map

It is possible that the results of subsequent, project specific botanical investigations could change the exact locations, distributions and boundaries of the terrestrial plant communities depicted on the Appendix H map. Therefore, site specific botanical details, provided by vegetational maps prepared by project biologists for future development sites, should be used by City staff to annually update and thereby increase the detail and accuracy of the Appendix H map. Up-to-date accurate assessments of the known or expected locations and distribution of terrestrial plant communities within the Planning Area can only be made using the current year's survey data. Updating the Appendix H map can be accomplished by plotting and labeling the boundaries of terrestrial natural plant communities identified on detailed biological resources maps prepared for each and all future proposed development areas.

APPENDIX E

DESERT HOT SPRINGS
GENERAL PLAN UPDATE
AIR QUALITY BACKGROUND STUDY BASELINE

FOR

THE CITY OF DESERT HOT SPRINGS

PREPARED BY:

ENDO ENGINEERING
GREGORY ENDO

NOVEMBER, 1994

NOTICE ON APPENDIX REDUCTION

This technical appendix has been reduced by 50% and printed double-sided to conserve paper and to allow the technical appendices to be incorporated in the EIR. If you wish to have a full-sized copy of this appendix, please contact the City of Desert Hot Springs at (760)329-6411.

Desert Hot Springs General Plan Update
Air Quality Background Study
Baseline

Endo Engineering

November 16, 1994

Endo Engineering Traffic Engineering Air Quality Studies Noise Assessments

November 16, 1994

Mr. Paul Crawford
Crawford Multari & Starr
641 Higuera Street - Suite 202
San Luis Obispo, CA 93401

SUBJECT: ***Desert Hot Springs General Plan Update***
Air Quality Background Study Baseline

Dear Mr. Crawford;

Endo Engineering is pleased to submit this summary of existing conditions related to air quality throughout the City of Desert Hot Springs for your use in preparing a General Plan Update. The data provided herein will establish a foundation for the assessment of future air quality impacts on the community and the development of planning and development strategies to minimize the potential for adverse impacts. The pages which follow document: (1) fundamentals of air pollution; (2) local and regional air quality; (3) the regulatory setting; and (4) relevant air quality planning programs.

We trust that the information provided herein will be of immediate and continuing value to the City of Desert Hot Springs. It is sufficiently detailed to be used in the preparation of the Master Environmental Impact Report for the General Plan Update. Should questions or comments develop regarding the findings and recommendations within this report, please do not hesitate to contact our offices at (714) 768-4333.

Cordially,

ENDO ENGINEERING

Vicki Lee Endo

Vicki Lee Endo
Registered Professional
Traffic Engineer TR 1161

REGISTERED PROFESSIONAL ENGINEER
VICKI LEE ENDO
TR 1161
12/31/94
TRAFFIC
STATE OF CALIFORNIA

95 Argonaut - Suite 115, Aliso Viejo, California 92656-1487
(714) 768-4333 FAX (714) 768-0718

Table of Contents

Section	Title	Page
1.0	**INTRODUCTION**	1-1
2.0	**EXISTING AIR QUALITY**	2-1
2.1	**Air Pollution Fundamentals** - Criteria Air Pollutants - Ambient Air Quality Standards - Effects of Pollutants on Sensitive Receptors	2-1
2.2	**Regional Air Quality** - Regional Climate and Meteorology - Regional Ambient Air Quality	2-5
2.3	**Local Air Quality** - Local Climate and Meteorology - Local Ambient Air Quality - Existing Sensitive Receptors - Local Sources of Air Contaminants	2-8
2.4	**Regulatory Setting** - Federal Clean Air Act Requirements - The California Clean Air Act - Air Quality Management Plan - Coachella Valley PM10 SIP - SCAQMD Rules and Regulations - Desert Hot Springs General Plan and Municipal Code	2-14
	APPENDIX - Glossary - Ambient Air Quality Standards - Episode Criteria - Ambient Air Quality Data - CALINE 4 Assumptions - 1991 AQMP Tier I Control Measures - PM10 SIP Control Measures	

List of Figures

Number	Title	Following Page
1-2	Regional Location	1-1
1-2	Vicinity Map	1-2
2-1	SEDAB Monitoring Stations Operating During 1992	2-1
2-2	Annual Surface Wind Rose Summary	2-8
2-3	Relevant Ozone Data	2-10
2-4	Relevant PM10 Data	2-10
2-5	Receptors Sensitive to Air Quality	2-12
2-6	Air Pollutant Analysis Locations	2-12
2-7	Blowsand Hazard Zone	2-14

List of Tables

Number	Title	Page
2-1	Health Effects of Air Pollutants	2-5
2-2	PM10 Area Source Emissions	2-11
2-3	Existing Carbon Monoxide Concentrations Adjacent to Key Intersections	2-13
2-4	1990 Regional Emission Inventory Comparison	2-16

1.0 INTRODUCTION

Air pollution is a major concern in southern California because of public health effects and property damage caused by air contaminants. It is also a regional problem which does not respect jurisdictional boundaries. The City of Desert Hot Springs must recognize its place as both a generator and receptor of regional air pollution. The General Plan is intended to protect the health and welfare of the community by promoting development which is conducive to the attainment of state and federal ambient air quality standards.

State and federal legislation mandating regional plans to improve air quality to healthful levels has resulted from concerns over air pollutant problems. Both the Southern California Association of Governments (SCAG) and the South Coast Air Quality Management District (SCAQMD) are responsible for preparing an Air Quality Management Plan (AQMP) for the South Coast Air Basin (SCAB) and portions of the South East Desert Air Basin (SEDAB). The City of Desert Hot Springs is located within the SEDAB.

1.1 Purpose and Scope

This report is the baseline portion of the air quality technical background study developed to support the preparation of the Desert Hot Springs General Plan update and Master EIR. It evaluates the current air quality in the planning area and was designed to fulfill state and local environmental requirements related to air quality. It addresses: fundamentals of air pollution, regional and local air quality, the regulatory setting and relevant planning programs.

1.2 Project Location

In 1994, the City of Desert Hot Springs had a population of 14,150 and an area of 10.0 square miles. It is located in the Coachella Valley, north of Interstate 10 and 53 miles east of the Riverside Downtown Civic Center. Figure 1-1 is a Regional Location Map that illustrates the City of Desert Hot Springs in its regional context. Figure 1-2 is a Vicinity Map that depicts the City boundary.

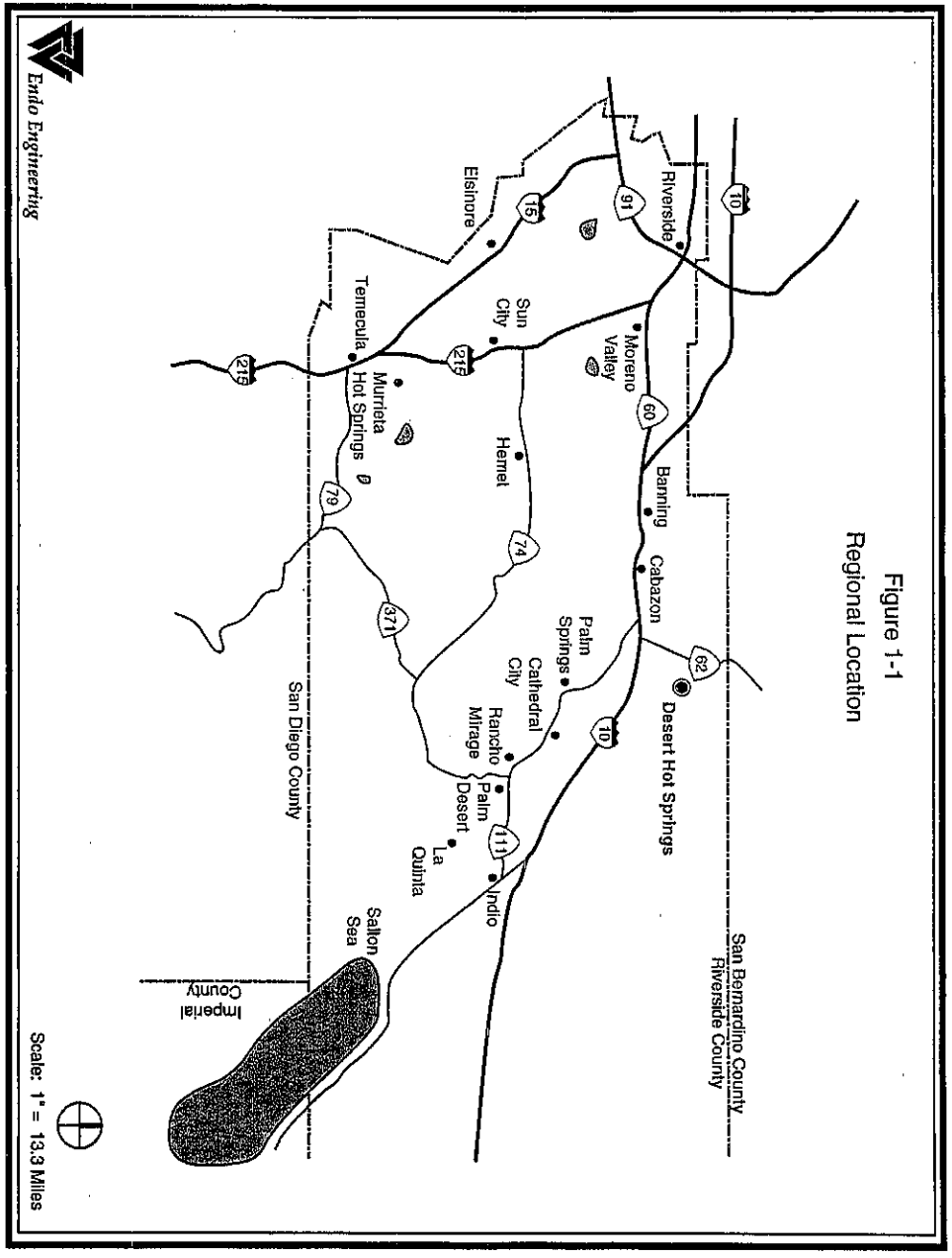


Figure 1-1
Regional Location

2.0 EXISTING AIR QUALITY

2.1 Air Pollution Fundamentals

Air pollution is comprised of many substances generated from a variety of sources, both man-made and natural. Since the rapid industrialization of the twentieth century, almost every human endeavor, especially those relying on the burning of fossil fuels, creates air pollution. Most contaminants are actually wasted energy in the form of unburned fuels or by-products of the combustion process.

Motor vehicles are by far the most significant source of air pollutants in urban areas, emitting photochemically reactive hydrocarbons (unburned fuel), carbon monoxide, and oxides of nitrogen. These primary pollutants chemically react in the atmosphere with sunlight and the passage of time to form secondary pollutants such as ozone.

Although significant air quality improvements have been made in California over the past twenty years, Southern California still experiences severe air pollution problems. Oxidants and PM_{10} (suspended particulate matter with a mean aerodynamic diameter of less than 10 micrometers) represent the major air quality problems basin-wide. As shown in Figure 2-1, the City of Desert Hot Springs is located within the Southeast Desert Air Basin (SEDAB), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SEDAB is comprised of 32,420 square miles located in the eastern portions of San Bernardino, Riverside, Kern, Los Angeles and San Diego Counties, as well as all of Imperial County.

The air quality of the Southeast Desert Air Basin is determined by the primary pollutant emissions added daily, and by the primary and secondary pollutants already present in the air mass. Primary pollutants are those emitted directly from a source and include: carbon monoxide (CO), nitric oxide (NO), sulfur dioxide (SO_2), particulates, and various hydrocarbons and other reactive organic gases (ROG). Secondary pollutants are created with the passage of time in the air mass and include: photochemical oxidants (90% of which are ozone), photochemical aerosols, peroxyacetylnitrate (PAN), and nitrogen dioxide (NO_2). A glossary of various air quality terms and phrases is included in the Appendix.

Criteria Air Pollutants

Photochemical oxidant (O_3) can include several different pollutants, but consists primarily of ozone (90%) and a group of chemicals called organic peroxynitrates. Ozone is a pungent, colorless toxic gas which is produced by the photochemical process. Photochemical oxidant is created by complex atmospheric reactions involving oxides of nitrogen and reactive organic gases, in the presence of ultraviolet energy from sunlight.

Motor vehicles are the major source of oxides of nitrogen and reactive organic gases in the air basin. Conditions throughout the basin are ideal for photochemical smog formation because of the area's dependence on the automobile. Vehicles on area roadways result in hydrocarbon and NOx emissions that can be trapped by prevailing atmospheric inversions and exposed to sunshine.

Photochemical oxidant, characteristic of southern California smog, reaches its highest concentrations during the summer and early fall. During winter, early morning low clouds and fog prevail in urbanized coastal areas reducing the amount of ultraviolet energy and thereby reducing the production of photochemical oxidants and the exposure of downwind receptor areas to high ozone concentrations.

Particulate matter consists of particles in the atmosphere as a by-product of fuel combustion, through abrasion such as tire wear, and through soil erosion by the wind. Particulates can also be formed through photochemical reactions in the atmosphere. PM10 refers to finely divided solids or liquids such as soot, dust, and aerosols which are 10 microns or less in diameter and can enter the lungs.

About 90% of the total particulates are less than 5 microns in diameter, while the aerosols formed in the atmosphere (primarily sulfate and nitrate) are usually smaller than 1 micron. Particulate concentrations are generally higher in the winter near major sources, when more fuel is burned and meteorological conditions favor the build-up of directly-emitted contaminants.

Carbon monoxide (CO) is a colorless, odorless, toxic gas formed by incomplete combustion of fossil fuels. Carbon monoxide concentrations are generally higher in the winter, when meteorological conditions favor the build-up of directly emitted contaminants. Carbon monoxide health warnings and emergency episodes occur almost entirely during the winter. The most significant source of carbon monoxide is gasoline powered automobiles, as a result of inefficient fuel usage in internal combustion engines. Various industrial processes also emit carbon monoxide.

Oxides of nitrogen (NOx) are primary receptors of ultraviolet light initiating the photochemical reactions that produce smog. Nitric oxide combines with oxygen in the presence of reactive hydrocarbons and sunlight to form nitrogen dioxide and ozone. Oxides of nitrogen are contributors to other air pollution problems including: high levels of fine particulate matter, poor visibility and acid deposition.

Seven oxides of nitrogen and two hydrated oxides can theoretically exist in the atmosphere, but only four are present in noticeable amounts. Two of these are classified as pollutants. These are nitric oxide (NO), a colorless, odorless gas and nitrogen dioxide (NO_2), a reddish-brown gas formed by the combination of nitric oxide with oxygen. Nitric oxide is far less toxic than nitrogen dioxide in humans.

The primary sources of nitrogen oxides in the basin are incomplete combustion in motor vehicle engines, power plants, refineries and other industrial operations. Ships, railroads and aircraft are other significant emission sources.

Sulfur dioxide (SO_2) results from the combustion of high sulfur content fuels. Fuel combustion is the major source of SO_2, while chemical plants, sulfur recovery plants, and metal processing are minor contributors. Sulfates result from a reaction of sulfur dioxide and oxygen in the presence of sunlight. SO_2 levels are generally higher in the winter than in the summer (when sunlight is plentiful and sulfate is formed more readily).

Recent reductions in sulfur dioxide levels reflect the use of natural gas in power plants and boilers (since natural gas is very low in sulfur). Low sulfur fuel oil is also utilized within this air basin.

Hydrocarbon and other reactive organic compounds (ROC) are formed from combustion of fuels and the evaporation of organic solvents. Many hydrocarbon compounds are major air pollutants, and those classified as aromatics are highly photochemically reactive with NOx, forming photochemical smog. Hydrocarbon concentrations are generally higher in winter when sunlight is limited and photochemical reactions occur more slowly. During the winter, meteorological conditions are more favorable to their accumulating in the atmosphere before producing photochemical oxidants. Motor vehicles are the major source of organic gases in this basin.

Ambient Air Quality Standards

Ambient air quality is determined from data collected at air quality monitoring stations located throughout the air basin. The ambient air quality data is given in terms of state and federal standards. These standards represent air pollutant concentrations which are considered safe (with a reasonable margin of safety) to protect the public health and welfare.

Both California and the federal government have set air quality standards for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, PM10 and lead. The state and federal ambient air quality standards are detailed in the Appendix. The California standards are more stringent than the federal standards (particularly with regard to PM10 and sulfur dioxide).

Two types of national standards have been established. Primary standards that were designed to safeguard the health of people considered to be sensitive receptors while outdoors were adopted. Secondary standards designed to safeguard human welfare (by minimizing damage to plants, and the oxidation of rubber and paint etc.) were also established by the federal government.

Ambient air quality standards are designed to protect that segment of the population that is most susceptible to respiratory distress or infection such as: asthmatics, the very young, the elderly, people weak with illness or disease, or persons engaged in heavy work or exercise (i.e. sensitive receptors). Healthy adults can tolerate periodic exposures to air pollutant levels well above these standards before adverse health effects are observed.

California has adopted health advisory levels called episode criteria for ozone, carbon monoxide, sulfur dioxide, and ozone in combination with sulfates. Episode criteria represent short-term exposures at concentrations which actually threaten public health (refer to the Appendix for additional details).

Episode Criteria

The most effective means of mitigating adverse impacts associated with high pollution levels is to limit the amount of pollution generated and the activity of sensitive receptors during periods when pollutant concentrations are high. Currently, the South Coast Air Quality Management District monitors contaminant levels and meteorological factors on a daily basis in order to forecast high pollutant levels in stable atmospheric conditions. Such conditions are known as "episodes". Criteria for episodes are available for photochemical oxidants, carbon monoxide, sulfur dioxide, nitrogen dioxide, particulate matter and combinations of sulfur dioxide and particulate matter. Episodes are divided into three stages depending upon the concentration of the pollutant that is predicted or reached.

Stage 1 Episode (Health Advisory)

A health advisory is issued when the Stage 1 concentration of any pollutant is either predicted or reached. People with respiratory or coronary disease are notified through mass media to take precautions against exposure and exertion. Schools are notified through established channels so that student participation in strenuous activities is limited. Abatement actions for this stage are mainly voluntary, except for open burning of combustible refuse and the implementation of first stage-episode plans by specified industry, business and government agencies.

Stage 2 Episode (Warning)

A warning must be called when Stage 2 concentrations of any pollutant are predicted or reached. Since this is an intermediate stage, abatement action to reduce emissions of the pollutant of concern can range from voluntary reduction in vehicle operations and further industrial curtailment to the mandatory prohibition of incinerator use.

Stage 3 Episode (Emergency)

An emergency must be called when Stage 3 pollutant levels are predicted or reached. If local abatement efforts during a Stage 3 Episode are inadequate, the State of California can take action under the appropriate provisions of the State Peace-Time Emergency Plan. At this stage, vehicle use is prohibited and public activities can be stopped. Industrial operations may be shut down or curtailed.

Effects of Pollutants on Sensitive Receptors

The California Air Resources Board (CARB) has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65; children under 14; athletes; and people with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. These sensitive groups represent over 50% of the total California population.[1]

The elderly are most sensitive, since the loss of lung tissue is a natural process of aging. Inhalation of air pollution accelerates this loss by reducing lung volume, and functional lung tissue. Damaged and irritated lung tissue becomes susceptible to bacterial infection. This increases the likelihood of chronic respiratory disease by reducing the ability of the immune system to fight infection and resist disease.

Demonstrated effects of specific air contaminants on health and vegetation are briefly discussed below and summarized in Table 2-1. Oxidants at high enough concentrations can cause eye irritation; aggravate respiratory disease; suppress the body's capacity to fight infection; impair athletic performance and cause growth retardation in sensitive trees. Oxidants also cause cracking of untreated rubber.

Hydrocarbons in the presence of other primary pollutants (particularly oxides of nitrogen) lead to the formation of oxidants. Hydrocarbons also damage plants by inhibiting growth and causing flowers and leaves to fall.

Carbon monoxide is essentially colorless, odorless and toxic to humans. It enters the blood stream and interferes with the transfer of fresh oxygen, thereby depriving sensitive tissues in the heart and brain of oxygen. At high enough concentrations it can impair visual function, psychomotor performance and time discrimination.

Nitrogen dioxide at high enough exposures can cause fibrotic lung changes, bronchostriction, and acute bronchitis among infants and school children. Over several months, it can cause collapsed lesions near the leaf margin and moderate injury in sensitive plants.

Suspended particulates such as soot, dust, aerosols, fumes, and mists produce haze and reduce visibility. Health concerns focus on smaller particles that penetrate deeply into and then damage the human respiratory tract. Typically, industrial and agricultural operations, combustion, and photochemical reactions produce suspended particulates.

1. Source: CARB, "Facts About How Air Pollution Damages Health"; 1983.

Table 2-1
Health Effects of Air Pollutants[a]

Pollutant	Concentration/ Exposure Time	Observed Health Effects at Specified Concentrations
Ozone	0.25 ppm/1 hour	Increased frequency of asthma attacks.
	0.30 ppm/1 hour	Cough, chest discomfort and headache.
	0.37 ppm/2 hours	Decline in pulmonary function in healthy individuals.
Carbon Monoxide	15-18 ppm/8 hours	Can cause decreased exercise capacity in patients with angina pectoris.
	50 ppm/1 hour	Can cause impairment of time interval estimation and visual function.
Nitrogen Dioxide	0.11 ppm/few minutes	Sensory responses may be elicited or altered.
	Daily peak exceeds 0.45 ppm on 10% of days in 12 months	May cause some impairment of pulmonary function and increased incidence of acute respiratory disease.
	1.50 ppm/short term	Can cause difficulty in breathing in healthy as well as bronchitic groups.
Lead	3.2 ug/m^3 / 7 weeks	Increase in blood lead levels which may impair or decrease hemoglobin synthesis.
Sulfur Dioxide/ Total Suspended Particulate (TSP)	0.037 ppm SO annual average association with 100 ug/m^3 smoke[b]	May cause higher frequencies of acute respiratory symptoms and diminished ventilatory function in children.

a. SCAQMD, *1983 Annual Summary*.
b. Smoke is a British measure of particulate matter concentration.

Lead at high enough concentrations impairs hemoglobin synthesis by increasing the lead levels in the blood. Sulfur dioxide and suspended particulate exposures can each cause higher frequencies of acute respiratory symptoms and diminished ventilatory function in children. In addition, these two pollutants at lower concentrations can act in conjunction to cause greater harm by injuring lung tissue. Sulfur oxides, in combinations with moisture and oxygen, can yellow the leaves of plants, dissolve marble, and erode iron and steel.

2.2 Regional Air Quality

The SEDAB is sparsely populated, with the largest urban area represented by Palm Springs. The SEDAB population in 1989 was 955,754 compared to the 12,874,147 population of the 6,530 square mile South Coast Air Basin. Industrial sources in this basin are generally limited and localized. In 1990, this basin exceeded state hourly ozone standards on 149 days, despite efforts to control emissions from stationary pollutant sources and motor vehicles.

REPORT FOR FILE : EHAC_MOU

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	190.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	5.0 DEGREES	TEMP=	7.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. MOUNTAIN NL		300	300	300	600	AG	137	5.7	0.0	12.0
B. MOUNTAIN SL		300	300	300	0	AG	415	5.7	0.0	12.0
C. HACIENDA EL		300	300	600	300	AG	490	5.7	0.0	18.0
D. HACIENDA WL		300	300	0	300	AG	649	5.7	0.0	18.0

LINK	*	MIXW L (M)	R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

	X	Y	Z
RECEPTOR 1	315	285	1.3
RECEPTOR 2	330	270	1.3
RECEPTOR 3	346	254	1.3
RECEPTOR 4	361	239	1.3

RECEPTOR	*	PRED CONC (PPM)	*WIND * BRG *(DEG)*	CONC/LINK (PPM) A	B	C	D
RECPT 1	*	0.5	* 276 *	0.0	0.1	0.0	0.4
RECPT 2	*	0.3	* 279 *	0.0	0.1	0.0	0.2
RECPT 3	*	0.2	* 283 *	0.0	0.1	0.0	0.2
RECPT 4	*	0.2	* 284 *	0.0	0.1	0.0	0.1

1991 AQMP Control Measures Under Consideration for Adoption by Local Governments[a]

Control Measure Number	Title	Activities	Date[b]
SCAG Transportation, Land Use, and Energy Conservation Measures			
1a	Person Work Trip Reduction-local gov't employees (ROG, NOx, CO)	Ordinance Adoption	1994/1995
1b	Non-Motorized Transportation (ROG, NOx, CO)	Ordinance Adoption	1994/1995
2a	Employer Rideshare and Transit Incentives (ROG, NOx, CO)	Ordinance Adoption	1994/1995
2b	Parking Management (ROG, NOx, CO)	Ordinance Adoption	1995/1996
2d	Merchant Transportation Incentives (ROG, NOx, CO)	Ordinance Adoption	1995/1996
2e	Auto Use Restrictions (ROG, NOx, CO)	Ordinance Adoption	1995/1996
2f	HOV Facilities (ROG, NOx, CO)		TBD
2g	Transit Improvements (ROG, NOx, CO)		TBD
3a	Truck Dispatching, Rescheduling & Rerouting (ROG, NOx, CO)	Ordinance Adoption	1992/1994
4	Traffic Flow Improvements (ROG, NOx, CO)	Implement ATSAC[c]	1991/1991
5	Nonrecurrent Congestion (ROG,NOx,CO)	Ordinance Adoption	1991/1994
8	Airport Ground Access (ROG, NOx, CO)	Help Prepare Plan	1992/1994
12a	Paved Roads (PM10)-Clean Streets Program	Ordinance Adoption	1991/1994
12b	Unpaved Roads and Parking Lots (PM10)	Ordinance Adoption	7/1/94
16	High Speed Rail (ROG, NOx)	Initiate Study	7/1/91/1997
17	Growth Management (ROG, NOx, CO)	Ordinance Adoption	1992/1994
SCAQMD Stationary Source Control Measures-Area Sources			
A-D-2	Control of Emissions from Swimming Pool Heating (NOx)	Local Building Code	1991
A-D-3	Control of Emissions from Residential & Commercial Water Heating (NOx)	Local Building Code	1991
A-E-3	Control of Dust Emissions-Agricultural Tilling (PM10)	Ordinance Adoption	1994
A-F-2	Control of Emissions from Construction & Demolition Activities & On-Site Vehicular Flow (PM10)	Ongoing Cooperation	1992
A-F-4	Low Emission Methods & Materials for Building Construction (ROG, PM10)	Ongoing Cooperation	1991
A-F-5	Control of Dust Emissions from Wind Erosion	Ongoing Cooperation	1991

a. Proposed Corrections to the *1991 Draft Final AQMP*, 7/8/91.
b. Year/Year format is Proposed Adoption Date/Proposed Implementation Date.
c. ATSAC is Automated Traffic Surveillance and Control.

1991 AQMP Control Measures Under Consideration for Adoption by Local Governments[a]

Control Measure Number	Title	Activities	Date[b]
SCAQMD Mobile Source Control Measures			
M-G-6	Eliminate Excessive Car Dealership Cold Starts (ROG, NOx, CO)	Civil Enforcement	1994
M-G-7	Eliminate Excessive Curb Idling (ROG, CO)	Civil Enforcement	1994
M-G-9	Eliminate Emissions from Advertising Vehicles (All Pollutants)	Civil Enforcement	1994
M-H-1	Environmental Review Program (ROG, NOx, CO)	Monitoring	4/91
M-H-3	Supplemental Development Standards (All Pollutants)	Ordinance Adoption	9/92
M-H-4	Non-Work Trip Reduction (ROG, NOx, CO)	Ordinance Adoption	1994-'95
M-H-5	Enhanced Regulation XV (ROG, NOx, CO)	Monitoring	1992
M-H-6	Truck Programs	Administer Program	11/91
M-H-7	Registration Program	Effectiveness Assessment	10/91
M-I-7	Eliminate Leaf Blowers (All Pollutants)	Ordinance Adoption	1994
SCAG & SCAQMD Energy Conservation Measures			
D-2	Out-of-Basin Transportation of Biodegradable Solid Waste (All Pollutants)	Ordinance Adoption	1992
E-D-1a	Residential Sector-Electricity Savings (NOx)	Ordinance Adoption	1992
E-D-1b	Residential Sector-Natural Gas Savings (All Pollutants)	Ordinance Adoption	1993/2006
E-C-1a	Commercial Sector-Electricity Savings (NOx)	Ordinance Adoption	1993/2008
E-C-1b	Commercial Sector-Natural Gas Savings (All Pollutants)	Ordinance Adoption	1994/2009
E-C-2a	Industrial Sector-Electricity Savings (NOx)	Ordinance Adoption	1994/2008
E-C-2b	Industrial Sector-Natural Gas Savings (All Pollutants)	Ordinance Adoption	1995/2009
E-C-2c	Industrial Sector-Waste Recycling (NOx)	Ordinance Adoption	1991/1998
E-C-3	Local Government Conservation Programs (All Pollutants)	Ordinance Adoption	1995/2010

a. Proposed Corrections to the *1991 Draft Final AQMP*, 7/8/91.
b. Year/Year format is Proposed Adoption Date/Proposed Implementation Date.
c. ATSAC is Automated Traffic Surveillance and Control.

Recommended PM10 SIP Control Measures For Implementation in the Coachella Valley By 1995[1]

1. Control of Open Area Wind Erosion

a. Reduce blowsand adjacent to paved roads and residential areas by:
- chemically stabilizing soil surfaces within at least 100 feet (on the windward sides) of roadways or residential areas; or
- establishing snow fence windbreaks within 50 feet (on the windward sides) of roadways or residential areas.

b. Establish tree windbreaks immediately downwind of "habitat preserve" and other strategic open areas.

c. Require property owners of vacant lots with visible crustal disturbances or active blowsand accumulations within areas of incorporated cities to restore vegetative ground covering so that at least 50 percent of the surface area is covered by vegetation within one year of planting. As an option, property owners may use chemical stabilizers to cover at least 90 percent of the property on an annual basis.

d. Prohibit earth/soil moving operations on days when wind gusts exceed or are expected to exceed 30 mph per SCAQMD daily forecasts.

2. Control of Agricultural Wind Erosion Areas

a. Prohibit tilling operations on days when wind gusts exceed or are expected to exceed 30 mph.

3. Control of Emissions From Unpaved Roads

a. Chemically treat unpaved road surfaces:
- with activity level of at least 20 vehicle trips per day;
- with a targeted minimum of at least 30-percent of all qualifying unpaved roads;
- with priorities set by distance within and from population centers.

b. Control dust from primary farm roads:
- with activity level of at least 20 vehicles trips per day;
- by using chemical stabilizers or water saturation.

c. Require paving of unpaved parking lots:
- with a volume of at least 3000 vehicles per year. For infrequent, but high volume usage, where "infrequent" is defined as being totally unused for at least 330 days per year, chemical stabilization may be substituted for paving provided that chemical stabilizers are applied 10 to 20 days before an event.

d. Set maximum speed limit on all unpaved roads at 15 mph.

1. SCAQMD, *Final SIP for PM10 in the Coachella Valley*, November, 1990.

Recommended PM10 SIP Control Measures
For Implementation in the Coachella Valley By 1995[2]

4. Control of Emissions From Paved Roads

a. Establish sand-removal programs:
   - on a post-event basis, combined with routine street inspections.

b. Enhance routine street cleaning (sweeping) programs.

c. Reduce emissions from unpaved shoulders:
   - by chemical stabilization;
   - within 200 feet of intersections;
   - within 25 feet of driveways.

d. Require contractors to pave construction access roads as soon as access roads are created:
   - paving must extend from the paved roadway into the construction area at least 120 feet in length;
   - paving must be cleaned at the end of each work day.

5. Control of Emissions From Construction/Demolition Activities

a. Require watering of all active construction projects:
   - with multiple daily applications, if necessary, to assure proper dust control;
   - through the use of reclaimed or agricultural canal water when available.

b. Require the chemical treatment of unattended construction areas:
   - defined as disturbed lands within construction projects which have been or are expected to be unused for at least four consecutive days.

c. Prohibit all construction grading activities on days when the wind gusts exceed or are forecast to exceed 30 mph.

d. Require trucks to maintain at least two feet of freeboard.

e. Require all trucks hauling dirt, sand, soil, or other loose dirt material to be covered.

f. Require planting of tree windbreaks:
   - on the windward perimeter of construction projects;
   - only if adjacent to open lands or lots.

g. Encourage the planting of vegetative ground cover as soon as possible on construction sites.

2. SCAQMD, *Final SIP for PM10 in the Coachella Valley*, November, 1990.

APPENDIX F

DESERT HOT SPRINGS
GENERAL PLAN UPDATE
NOISE BACKGROUND STUDY

FOR

THE CITY OF DESERT HOT SPRINGS

PREPARED BY:

ENDO ENGINEERING
GREGORY ENDO

MARCH, 2000

NOTICE ON APPENDIX REDUCTION

This technical appendix has been reduced by 50% and printed double-sided to conserve paper and to allow the technical appendices to be incorporated in the EIR. If you wish to have a full-sized copy of this appendix, please contact the City of Desert Hot Springs at (760)329-6411.

Desert Hot Springs General Plan Update
Noise Background Study

Prepared by: Endo Engineering

March 2000

Endo Engineering *Traffic Engineering* *Air Quality Studies* *Noise Assessments*

March 27, 2000

Mr. John Criste
Terra Nova Planning and Research, Inc.
400 South Farrell, Suite B-205
Palm Springs, CA 92262

SUBJECT: ***Desert Hot Springs General Plan Noise Element Update Background Study***

Dear Mr. Criste;

Endo Engineering is pleased to submit this Noise Background Study summarizing our findings regarding the current and future noise environment throughout the City of Desert Hot Springs for your use in updating the Noise Element of the Desert Hot Springs General Plan. The data provided herein establishes a foundation for and assessment of future noise impacts on the community and the evolution of planning and development strategies to minimize the potential for adverse noise impacts within the planning area. The pages which follow document: (1) fundamentals of noise; (2) noise sensitive receptors; (3) major sources of noise; (4) current noise levels; (5) future noise levels upon buildout of the General Plan alternatives; and (6) techniques available to minimize community noise exposure within the planning area.

We trust that the information provided herein will be of immediate and continuing value to the City of Desert Hot Springs. It is sufficiently detailed to be used in the preparation of the Environmental Impact Report for the General Plan Update. Should questions or comments develop regarding the findings within this report, please do not hesitate to contact our offices at (949) 362-0020.

Cordially,
ENDO ENGINEERING
Vicki Lee Endo

Vicki Lee Endo
Registered Professional
Traffic Engineer TR 1161

28811 Woodcock Drive, Laguna Niguel, CA 92677-1330
(949) 362-0020 FAX: (949) 362-0015

DESERT HOT SPRINGS

NOISE ELEMENT UPDATE
BACKGROUND STUDY

March 27, 2000

Prepared For:

The City of Desert Hot Springs
65950 Pierson Boulevard
Desert Hot Springs, California 92240
(760) 329-6411

Prepared By:

Endo Engineering
28811 Woodcock Drive
Laguna Niguel, CA 92677-1330
(949) 362-0020

Table of Contents

Section	Title	Page
1.0	INTRODUCTION - Purpose and Scope - Project Location	1-1
2.0	FUNDAMENTALS OF NOISE - Noise Rating Schemes - Sound Propagation - Roadway Noise Fundamentals - Human Reactions to Sound	2-1
3.0	LAND USE COMPATIBILITY WITH NOISE - State Policies and Standards - Local Policies and Standards	3-1
4.0	EXISTING NOISE ENVIRONMENT - Noise Sensitive Receptors - Significant Noise Sources - Current Noise Levels	4-1
5.0	FUTURE NOISE ENVIRONMENT - Future Roadway Noise	5-1
6.0	NOISE ATTENUATION PRINCIPLES - Noise Control at the Source - Noise Control at the Receiver	6-1
7.0	CONCLUSIONS AND RECOMMENDATIONS - Conclusions - Recommendations	7-1
	APPENDIX A. Noise Element Requirements B. Glossary of Technical Terms C. FHWA Noise Model Input Parameters D. Noise Measurement System and Procedure	

List of Figures

Number	Title	Following Page
1-1	Regional Location	1-2
1-2	Existing Planning Area	1-2
1-3	General Plan Update Future Planning Area	1-2
2-1	Typical Noise Levels of Familiar Sources	2-1
2-2	Speech Communication As A Function of Background Noise Level	2-3
3-1	Land Use Compatibility for Community Noise Environments	3-1
3-2	Interior and Exterior Noise Land Use Planning Standards	3-3
4-1	Existing Noise Sensitive Receptors	4-1
4-2	Noise Measurement Locations	4-2
5-1	Desert Hot Springs Design Noise Levels	5-12
5-2	Typical Noise Levels Versus Speed and Volume (Urban Arterial)	5-12
5-3	Typical Noise Levels Versus Speed and Volume (Major Arterial and Minor Arterial/Major Collector)	5-12
5-4	Typical Noise Levels Versus Speed and Volume (Minor Collector/Secondary and Local Collector)	5-12
5-5	Typical Noise Levels Versus Truck Mix and Volume (Urban Arterial)	5-12
5-6	Typical Noise Levels Versus Truck Mix and Volume (Major Arterial and Minor Arterial/Major Collector)	5-12
5-7	Typical Noise Levels Versus Truck Mix and Volume (Minor Collector/Secondary and Local Collector)	5-12

List of Tables

Number	Title	Page
2-1	Harmful Effects of Noise	2-4
2-2	Effects of Noise On People	2-5
2-3	Percentage of Persons Highly Annoyed Who Register Complaints as a Function of Ldn	2-6
3-1	Corrections to be Added to the Measured CNEL to Obtain Normalized CNEL	3-2
4-1	Existing Exterior Noise Exposure Adjacent to City Roadways	4-3
4-2	Noise Measurement Findings	4-4
5-1	Preferred General Plan Buildout Exterior Noise Exposure Adjacent to Planning Area Roadways	5-2
5-2	Number of Master Planned Roadway Links Within Various Noise Level Ranges	5-5
5-3	Projected Buildout Noise Levels Compared to the Adopted General Plan Alternative	5-6
5-4	Change In Buildout CNEL Compared to the Adopted General Plan	5-9
5-5	Design Noise Levels Adjacent to Master Planned Roadways	5-11
6-1	Traffic Noise Versus Truck Mix	6-1
6-2	Traffic Noise Versus Speed	6-2
6-3	Noise Barrier Attenuation	6-3

1.0 INTRODUCTION

Noise has long been an accepted part of modern civilization and the urbanization process. The general background level of noise, however, seems to be rising as modern transportation systems develop and human dependence upon machines increases. As society becomes increasingly mobile and mechanization continues to increase, so does the need for a better understanding of the effects of noise exposure in the environment.

Noise has not received the degree of social attention and concern that has been given to air and water pollution, partially because noise cannot be seen (and its cumulative effects are still being studied), and partially because it is often a temporary noise event that causes annoyance. Interestingly, it is the noise of others that typically bothers us, not the noise we make ourselves. At any rate, not until recently have agencies and governments become vitally concerned about noise and its effects on the health and welfare of people.

The planning process has not traditionally been concerned with noise. In many instances, noise problems were identified only after the noise sources were allowed to establish in a community. It is now evident that these situations could have been avoided by considering noise generators and noise sensitive receptors as part of the comprehensive planning process.

1.1 PURPOSE AND SCOPE

New State laws have changed the General Plan requirements and General Plan Amendments have led to internal inconsistencies within the various General Plan Elements. Current community goals and standards for their implementation must be clearly defined to insure consistency as future growth occurs.

Noise analyses can provide valuable input to the Circulation, Land Use, and Housing Elements of the General Plan. For example, extremely noisy areas which result from adjacent transportation systems and industrial land uses would not be suitable locations for noise sensitive residential uses. The Noise Element can recognize the need for both remedial measures for existing noise problems, and preventative actions to protect future development.

The Noise Element of the General Plan is a mandatory component pursuant to State law (California Planning and Zoning Law, Section 65302(f), refer to Appendix A for additional details). It must recognize the guidelines adopted by the California Office of Noise Control pursuant to Section 46050.1 of the Health and Safety Code. It must also quantify the community noise environment in terms of CNEL or Ldn metrics for both current and projected levels of growth.

More importantly, the Noise Element should provide a systematic approach to: (1) the measurement and modeling of noise; (2) the establishment of noise standards; (3) the control of major noise sources; and (4) community planning for the regulation of noise. It is a guide to be used to identify and mitigate noise problems. The Noise Element establishes uniformity between City policy and programs undertaken to control and abate environmental noise. It also serves as a guideline for compliance with the state's noise insulation standards.

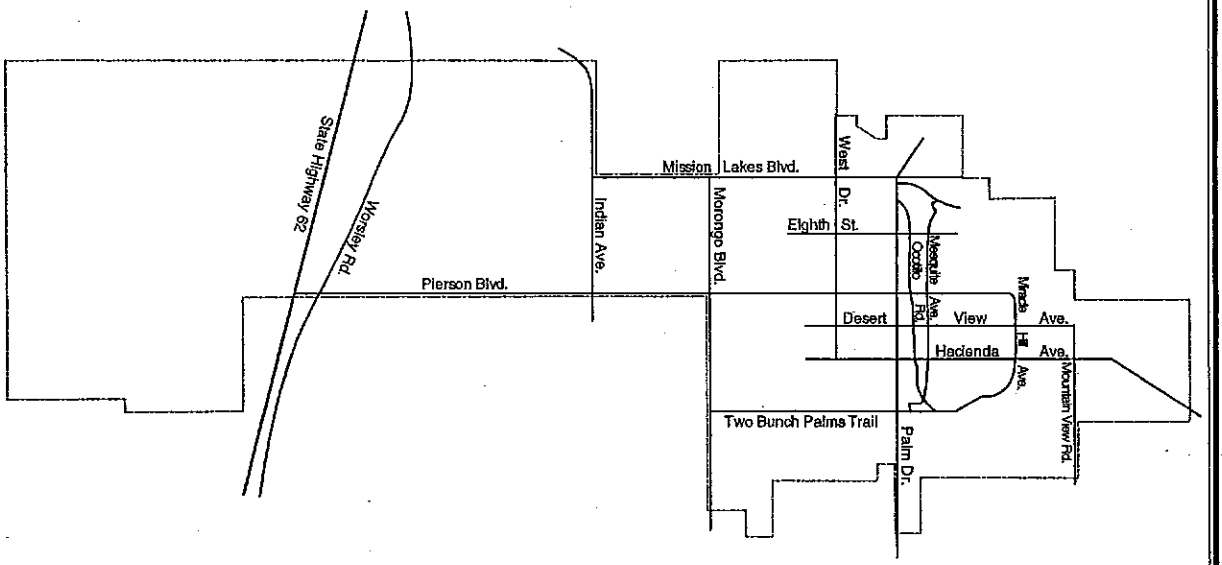
To protect citizens from excessive exposure to noise, the Noise Element must provide sufficient information to minimize noise impacts (and where possible eliminate noise pollution) throughout the community. In so doing, it fulfills its basic function: to protect the public health and welfare.

The analysis herein addresses the acoustic implications of the changes in the Land Use and Circulation Element Updates. The changes in the Land Use Element designations include the removal of existing uses and their subsequent replacement with new land uses. Consequently, the noise impact assessment herein addresses the change in noise levels resulting from both the removal and addition of traffic based upon these land use changes. The analysis is intended to provide consistency between the Land Use Element Update, the Circulation Element Update and the Noise Element Update.

1.2 PROJECT LOCATION

In 1994, the City of Desert Hot Springs had a population of 14,150 and an area of 10.0 square miles. It is located in the Coachella Valley, north of Interstate 10 and 53 miles east of the Riverside Downtown Civic Center. Figure 1-1 is a Regional Location Map that illustrates the City of Desert Hot Springs in its regional context. Figure 1-2 depicts the City boundary in 1994, which was the limit of the study area used for the baseline analysis. Figure 1-3 illustrates the future General Plan Update planning area used for the impact assessment. This area includes not only the City of Desert Hot Springs, but also its Sphere of Influence.

Figure 1-2
Existing Planning Area



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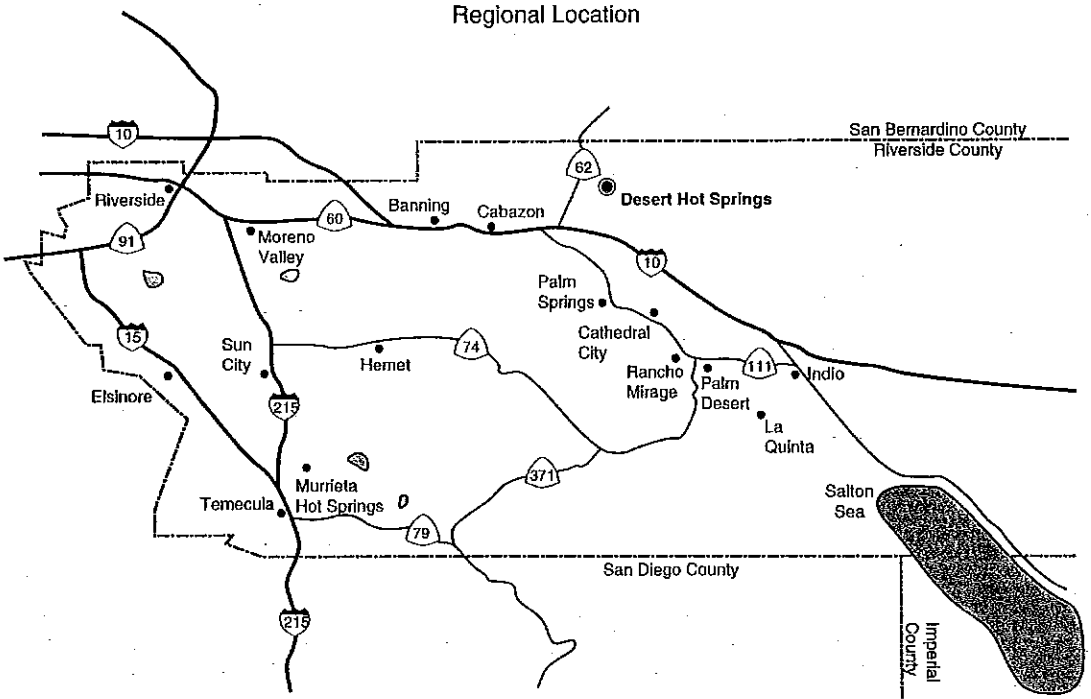
Scale: 1" = 1 Mile

Figure 1-1
Regional Location



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Scale: 1" = 13.3 Miles

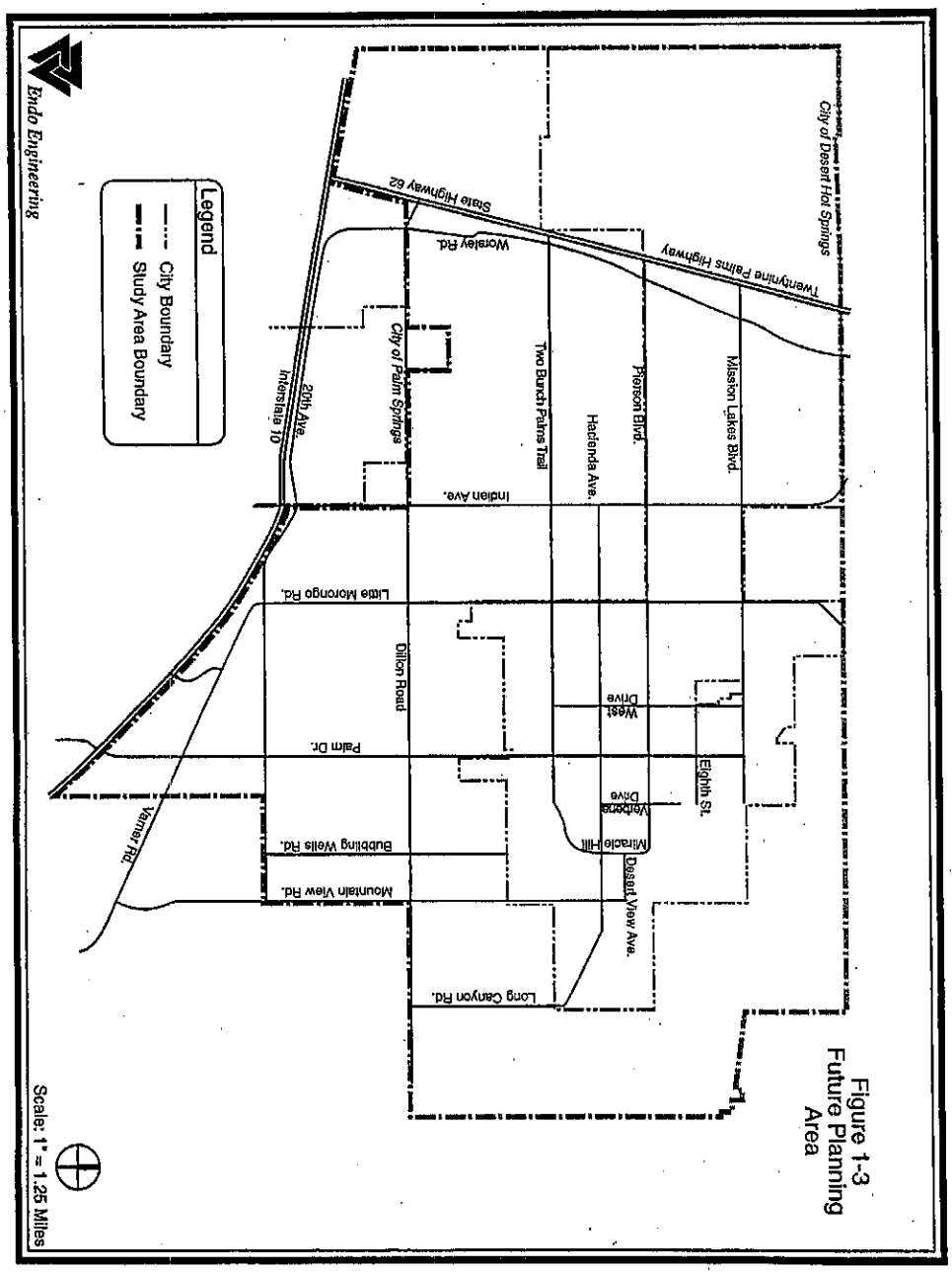


Figure 1-3
Future Planning Area

2.0 FUNDAMENTALS OF NOISE

Various noise rating schemes are introduced below followed by a discussion of typical noise levels of familiar noise sources, noise attenuation with distance, and other basic considerations related to noise in the environment. A Noise Glossary that defines technical terms used in the assessment of environmental noise is provided as Appendix B.

2.1 NOISE RATING SCHEMES

Noise levels are measured on a logarithmic scale in decibels. The measurements are then weighted and added over a specified time period to reflect not only the magnitude of the sound, but also its duration, frequency, and time of occurrence. In this manner, various acoustical scales and units of measurement have been developed such as: equivalent sound levels (Leq), day-night average sound levels (Ldn), Community Noise Equivalent Levels (CNELs), and Single Event Noise Exposure Levels (SENELs).

A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against the very low and high frequencies of the audible spectrum. They are essentially adjusted to reflect only those frequencies audible to the human ear. The decibel scale has a value of 1.0 dBA at the threshold of hearing and 140 dBA at the threshold of pain. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. Therefore, a 1.0 decibel increase is just audible whereas a 10 decibel increase means the sound is perceived as being twice as loud as before.

Examples of the decibel level of various noise sources are shown in Figure 2-1. They include: the quiet rustle of leaves (10 dBA), a library (35 dBA), normal conversation at 5 feet (55 dBA), a busy street at 50 feet (75 dBA), or a power motor at 3 feet (105 dBA).

Equivalent sound levels are not measured directly. They are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) is the constant level that, over a given time period, transmits the same amount of acoustic energy as the actual time-varying sound. Equivalent sound levels are the basis for both the Ldn and CNEL scales.

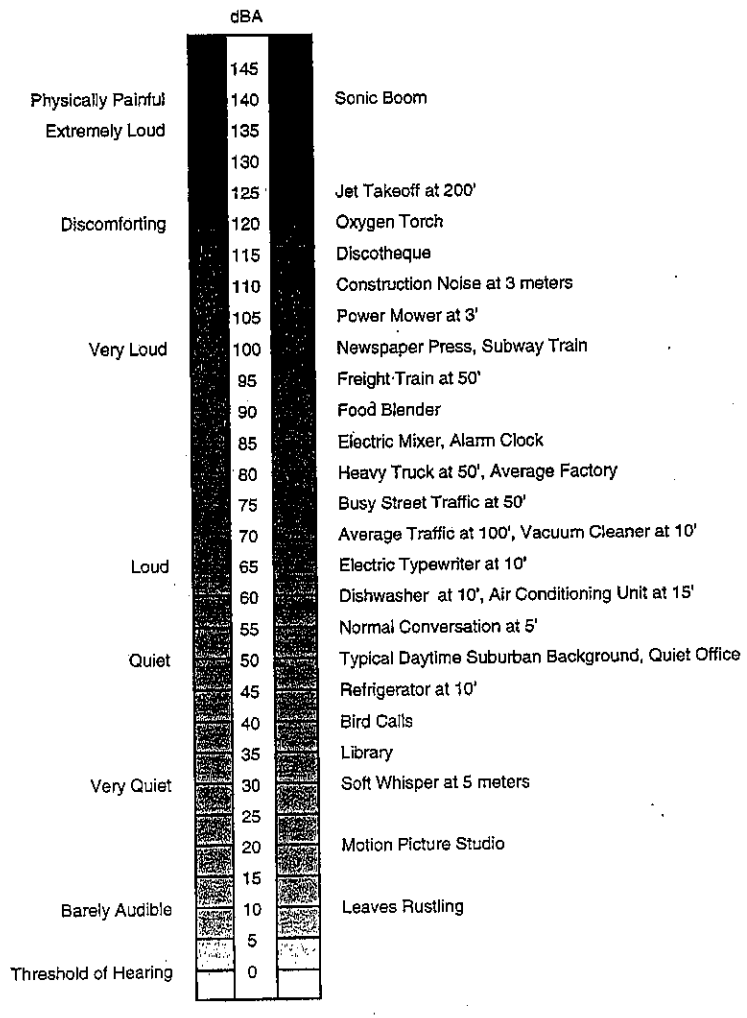
Day-night average sound levels are a measure of the cumulative noise exposure of the community. The Ldn value results from a summation of hourly Leq's over a 24-hour time period with an increased weighting factor applied to the nighttime period between 10:00 PM and 7:00 AM. This noise rating scheme takes into account those subjectively more annoying noise events which occur during the normal sleeping hours.

Community Noise Equivalent Levels (CNEL) also carry a weighting penalty for noises that occur during the nighttime hours. In addition, CNEL levels include a penalty for noise events that occur during the evening hours between 7:00 PM and 10:00 PM.

Because of the weighting factors applied, CNEL values at a given location will always be larger than Ldn values, which in turn will exceed Leq values. Experience with many noise sources has shown that these two indices consistently agree within 1.0 decibel. Consequently, CNEL and Ldn values are sometimes used interchangeably in planning documents.

Figure 2-1

Typical Noise Levels of Familiar Sources



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Sources: Tipler, Pav L.A. "Physics", New York: Worth Publishers, 1976.

The Single Event Noise Exposure Level (SENEL) is the most appropriate noise level-duration rating scale for a single noise occurrence. The SENEL, given in decibels, is the noise exposure level of a single event measured over the time interval between the initial and final times for which it exceeds the threshold noise level.[1] A single event is a solitary occurrence of noise exposure like an aircraft over flight.

2.2 Sound Propagation

Noise sources may either be a "line source" (e.g. a heavily traveled highway) or a "point source" (e.g. a stationary engine or compressor). Highway traffic noise on high volume roadways simulates a "line source" and the drop-off rate of sound with distance approaches "cylindrical spreading" wherein a nominal 3.0 dBA drop with each doubling of distance between the noise source and the noise receiver occurs.

Environmental factors such as the wind direction and speed, temperature gradients, the characteristics of the ground (hard or soft) and the air (relative humidity), the presence of grass, shrubbery, and trees, often combine to increase the actual attenuation achieved outside laboratory conditions to 4.5 decibels per doubling of distance. Thus, a noise level of 74.5 decibels at 50 feet from a highway centerline would attenuate to 70.0 decibels at 100 feet, 65.5 decibels at 200 feet, and so forth.

This is particularly true where the view of the roadway is interrupted by isolated buildings, clumps of bushes, scattered trees, or the intervening ground is soft or covered with vegetation and the source or receiver is located more than 3 meters above the ground. It should be noted, however, that the nominal value of 3.0 dBA with doubling applies to sound propagation from a "line source": (1) over the top of a barrier greater than 3 meters in height, or (2) when there is a clear unobstructed view of the highway, the ground is hard, there are no intervening structures, and the height of the line-of-sight averages more than 3 meters above the ground.[2]

In an area which is relatively flat and free of barriers, the sound resulting from a single "point source" of noise spreads in a spherical manner away from the source and drops by 6 decibels for each doubling of distance or 20 decibels for each factor of ten in distance. This applies to fixed noise sources and mobile noise sources which are temporarily stationary such as an idling truck or other heavy duty equipment operating within a confined area (such as industrial processes). Sound attenuation from a train resembles a line source near the railroad tracks and a point source at distances beyond three-tenths of the train length.

2.3 Roadway Noise Fundamentals

The noise levels adjacent to line sources of noise such as roadways increase by 3.0 dBA with each doubling in the traffic volume (provided that the speed and truck mix do not change). From the mathematical expression relating increases in the number of noise sources (motor vehicles) to the increase in the adjacent noise level, it can be shown that a 26 percent increase in the traffic volume will cause a 1.0 dBA increase in adjacent noise levels. Doubling the number of vehicles on a given route increases the adjacent noise levels by 3.0 dBA, but changing the vehicle speed has an even more dramatic effect.

1. Title 21 California Administrative Code, Airport Noise Regulation; Section 5006.
2. California Department of Transportation, "Noise Manual", 1980.

Increasing the vehicle speed from 35 to 45 mph raises the adjacent noise levels approximately 2.5 dBA. Reducing vehicle speeds from 35 to 30 mph decreases adjacent noise levels by 1.5 dBA on major roadways and 1.6 dBA on secondary and collector roadways. A speed decrease from 40 mph to 35 mph reduces adjacent noise levels by 1.3 dBA on majors and 1.4 dBA on secondaries and collectors. Consequently, lowering motor vehicle speeds can have a significant positive impact in terms of reducing adjacent noise levels.

The truck mix on a given roadway also has a significant effect on the adjacent noise levels. As the number of trucks increases and becomes a larger percentage of the total vehicle volume, the adjacent noise levels increase. This effect is more pronounced if the number of heavy duty (3+ axle) trucks is large when compared to the number of medium duty (2 axle) trucks.

2.4 Human Reactions to Sound

2.4.1 Physical and Psychological Responses to Sound

Noise can cause temporary physical and psychological responses in humans. Temporary physical reactions to passing noises range from a startle reflex to constriction in peripheral blood vessels, the secretion of saliva and gastric juices, and changes in: heart rate, breathing patterns, the chemical composition of the blood and urine, the dilation of the pupils of the eye, visual acuity, and equilibrium.

The chronic recurrence of these physical reactions has been shown to aggravate headaches, fatigue, digestive disorders, heart disease, and circulatory and equilibrium disorders. Moreover, as a source of stress, noise is a causal factor in stress-related ailments such as ulcers, high blood pressure and anxiety.

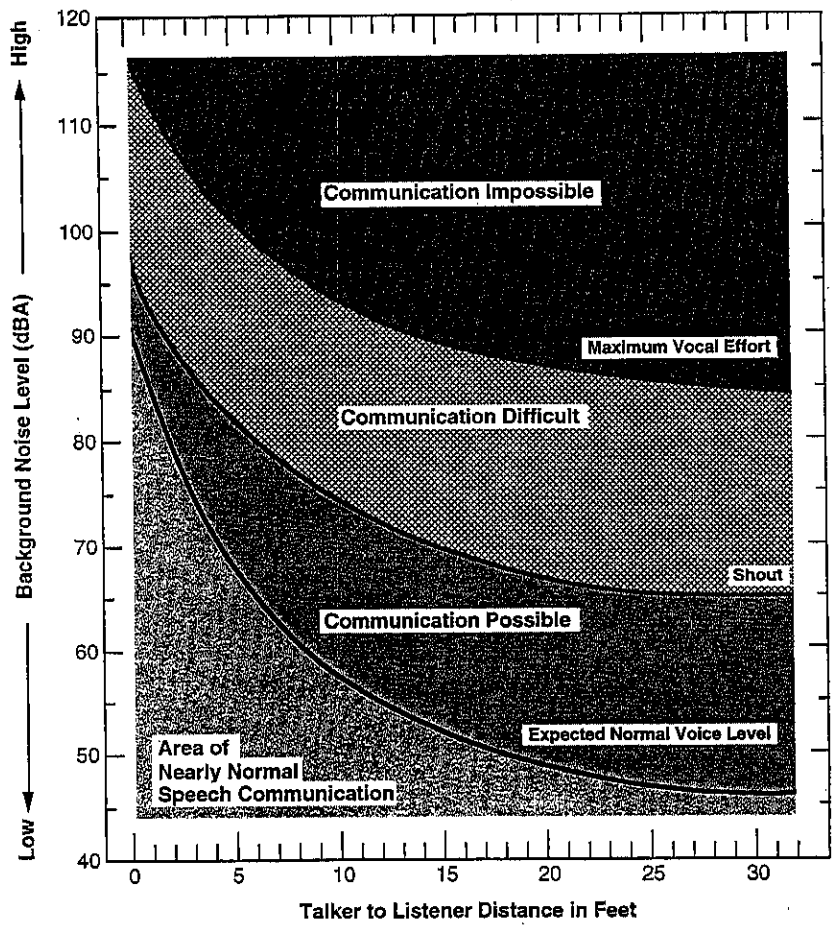
Three harmful effects of noise are speech interference, the interruption of sleep, and hearing loss. Figure 2-2 illustrates how excessive background noise can reduce the amount and quality of verbal exchange and thereby impact education, family lifestyles, occupational efficiency, and the quality of recreation and leisure time. As shown therein, speech interference begins to occur at about 40 to 45 decibels and becomes severe at about 60 decibels. Background noise levels affect performance and the learning process through distraction, reduced accuracy, increased fatigue, annoyance and irritability, and the inability to concentrate (particularly when complex tasks are involved or in schools where younger children exhibit imprecise speech patterns and short concentration spans).

Several factors determine whether a particular noise event will interfere with or prevent sleep. These factors include the noise level and characteristics, the stage of sleep, the individual's age and the motivation to waken. Ill or elderly people are particularly susceptible to noise-induced sleep interference, which can occur when intruding noise levels exceed the typical 35-45 decibel background noise level in bedrooms. Sleep prevention can occur when intruding noise levels exceed 50 dBA.

Hearing loss, which may begin to occur at 75 dBA (see Table 2-1), is one of the most harmful effects of noise on people. Approximately 20 million people in the United States currently have some degree of hearing loss. In many of these cases, exposures to very loud, impulsive or sustained noise caused damage to the inner ear which was substantial even before a hearing loss was actually noticed.

Figure 2-2

Speech Communication as a Function of Background Noise Level



Source: Miller, "Effects of Noise on People", Journal of Acoustical Society of America, V.56, No.3, 9/74

Endo Engineering

Table 2-2
Effects of Noise on People
(Residential Land Uses Only)

Effects[1] / Day-Night Average Sound Level in Decibels	Hearing Loss: Qualitative Description	Speech Interference: Indoor: % Sentence Intelligibility	Speech Interference: Outdoor: Distance in Meters for 95% Sentence Intelligibility	Annoyance[2]: % of Population[3] Highly Annoyed	Average Community Reaction[4]	General Community Attitude Towards Area
75 and above	May Begin to Occur	98%	0.5	37%	Very Severe	Noise is likely to be the most important of all adverse aspects of the community environment.
70	Will Not Likely Occur	99%	0.9	25%	Severe	Noise is one of the most important adverse aspects of the community environment.
65	Will Not Occur	100%	1.5	15%	Significant	Noise is one of the important adverse aspects of the community environment
60	Will Not Occur	100%	2.0	9%	Moderate to Slight	Noise may be considered an adverse aspect of the community environment.
55 and below	Will Not Occur	100%	3.5	4%		Noise considered no more important than various other environmental factors.

1. "Speech Interference" data are drawn from the following tables in EPA's "Levels Document": Table 3, Figure D-1, Figure D-2, Figure D-3. All other data from National Academy of Science 1977 report "Guidelines for Preparing Environmental Impact Statements on Noise, Report of Working Group 69 on Evaluation of Environmental Impact of Noise."
2. Depends on attitudes and other factors.
3. The percentages of people reporting annoyance to lesser extents are higher in each case. An unknown small percentage of people will report being "highly annoyed" even in the quietest surroundings. One reason is the difficulty all people have in integrating annoyance over a very long time.
4. Attitudes or other non-acoustic factors can modify this. Noise at low levels can still be an important problem, particularly when it intrudes into a quiet environment.

Note: Research implicates noise as a factor producing stress-related health effects such as heart disease, high-blood pressure and stroke, ulcers and other digestive disorders. The relationships between noise and these effects, however, have not as yet been quantified.

Source: U.S. Department of Transportation "Guidelines for Considering Noise in Land Use Planning and Control", 1980

Table 2-1
Harmful Effects of Noise[a]

Harmful Effect	Noise Levels At Which Harmful Effects Occur
Prevention Or Interruption of Sleep	35 - 45 dBA
Speech Interference	50 - 60 dBA
Extra Auditory Physiological Effects	65 - 75 dBA
Hearing Loss	75 - 85 dBA

Notes: a. California Department of Public Health Report to 1971 Legislature.

2.4.2 Community Response To Noise

Approximately 10 percent of the population has such a low tolerance for noise that they object to any noise not of their own making. Consequently, even in the quietest environment, some complaints will occur. Another 25 percent of the population will not complain even in very severe noise environments.[3] Thus, a variety of reactions can be expected from people exposed to any given noise environment. Despite this, the population as a whole can be expected to exhibit the following responses to changes in noise levels: an increase or decrease of 1.0 dBA cannot be perceived except in carefully controlled laboratory experiments; a 3.0 dBA increase is considered just noticeable outside of the laboratory; an increase of 5.0 dBA is often necessary before any noticeable change in community response (i.e. complaints) would be expected.[4]

The effects of noise on individuals living in various noise environments in a residential setting have been documented by the U.S. Department of Transportation in the document *Guidelines For Considering Noise in Land Use Planning and Control.* As shown in Table 2-2, hearing loss may begin to occur at 75+ Ldn and the noise environment will be highly annoying to 37 percent of the population. Residents who live in noise environments of 70 Ldn are not likely to experience hearing loss; however, 25 percent will be highly annoyed and noise will be viewed as one of the most important adverse aspects of the community environment. At 65 Ldn, hearing loss will not occur but 15 percent of the population will be highly annoyed by the noise environment.

Table 2-3 indicates the community reaction to noise as quantified from studies of complaints by individuals living around airports. As shown in Table 2-3, even at very low noise exposures, up to 13 percent of the population will display a high degree of annoyance even though no complaints will be registered. At the other end of the spectrum, even in communities exposed to noise levels between 75 and 80 Ldn, only 15 to 20 percent of the population will register a complaint despite the fact that more than half are highly annoyed by the noise environment.

3. Bolt, Beranek and Newman, "Literature Survey for the FHA Contract on Urban Noise", Report No. 1460, January 1967.
4. Caltrans, "Noise Manual"; 1980 and Highway Research Board, "National Cooperative Highway Research Program Report 117", 1971.

Table 2-3
Percentage of Persons Highly Annoyed Who
Register Complaints as a Function of Ldn[a]

Noise Level Ldn (dBA)	Percentage of Persons Highly Annoyed	Percentage of Complaints Registered
50	13	Less Than 1
55	17	1
60	23	2
65	33	5
70	44	10
75	54	15
80	62	Over 20

Notes: a. U.S. Environmental Protection Agency, "Public Health and Welfare Criteria for Noise", 7/27/73.

Community responses to noise may range from registering a complaint by telephone or letter to initiating court action, depending upon each individual's susceptibility to and personal attitudes about noise. Several factors are related to the level of community annoyance including:[5]

- fear associated with the aircraft activities (fear of a plane crash);
- socio-economic status and educational level of the residents;
- resident's belief that they are being treated fairly;
- attitudes regarding the usefulness of the flights; and
- resident's belief that the noise source could be controlled.

Recent studies have shown that changes in long-term noise levels, measured in units of Ldn or CNEL, are noticeable and that people respond. About 10 percent of the people exposed to traffic noise of 60 Ldn will report being highly annoyed with the noise, and each increase of one Ldn is associated with approximately 2 percent more people being highly annoyed.

When traffic noise exceeds 60 Ldn or aircraft noise exceeds 55 Ldn, people begin complaining. Group and legal actions to stop the noise should be expected to begin at traffic noise levels near 70 Ldn and aircraft noise levels near 65 Ldn.[6]

5. U.S. Environmental Protection Agency, "Public Health and Welfare Criteria for Noise", July 1973.
6. State of California, Department of Health Services, Dr. Jerome Lucas, July 11, 1984.

3.0 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches and residences are more sensitive to noise intrusion than commercial or industrial activities. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design of new developments. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work.

3.1 STATE GUIDELINES AND STANDARDS

Section 1092 of Title 25, Chapter 1, Subchapter 1, Article 4, of the California Administrative Code includes noise insulation standards which detail specific requirements for new multi-family structures (hotels, motels, apartments, condos, and other attached dwellings) located within the 60 CNEL contour adjacent to roads, railroads, rapid transit lines, airports or industrial areas.[1] An acoustic analysis is required showing that these multi-family units have been designed to limit interior noise levels with doors and windows closed to 45 CNEL in any habitable room. Title 21 of the California Administration Code (Subchapter 6, Article 2, Section 5014) also specifies that multi-family attached units incorporate noise reduction features sufficient to assure that interior noise levels in all habitable rooms do not exceed 45 CNEL.

Section 65302 (f) of the Government Code specifies that it is the responsibility of the local agency preparing the general plan to specify the manner in which the noise element will be integrated into the zoning plan and tied to the Land Use Element, Circulation Element, and the local Noise Ordinance. The Noise Element, once adopted, also becomes the guideline for determining compliance with the State noise insulation standards discussed above.

The Office of Noise Control, established by the California Noise Control Act of 1973, has developed criteria and guidelines for local agencies for use in setting standards for human exposure to noise and preparing noise elements. The noise standards developed by the Office of Noise Control and intended as guidelines for municipal noise elements are summarized in Figure 3-1.

Each locality, in developing a noise element, must make a determination regarding how much noise is too much. A community's sensitivity to noise may be taken into account by starting with the general guidelines in Figure 3-1 and then applying adjustment factors (shown in Table 3-1) which allow acceptability standards to be set which (1) reflect the desires of the community and its assessment of the relative importance of noise pollution, and (2) are below the known levels of health impairment.

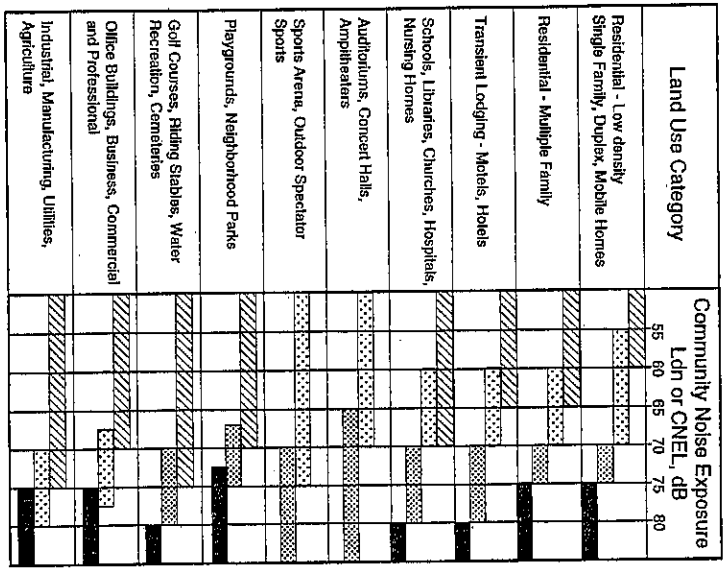
1. An exception is made for railroads where there are no nighttime (10 p.m. to 7 a.m.) operations and where daytime (7 a.m. to 10 p.m.) operations do not exceed four per day.

Table 3-1
Corrections To Be Added To The Measured CNEL
To Obtain Normalized CNEL[a]

Type of Correction	Description	Measured CNEL[b] Change (dB)
Seasonal Correction	Summer (or year-round operation).	0
	Winter only (or windows always closed).	-5
Correction for Outdoor Residual Noise Level	Quiet suburban or rural community (remote from large cities and from industrial activity and trucking).	+10
	Quiet suburban or rural community (not located near industrial activity).	+5
	Urban residential community (not immediately adjacent to heavily traveled roads and industrial areas.	0
	Noisy urban residential community (near relatively busy roads or industrial areas).	-5
	Very noisy urban residential community.	-10
Correction for Previous Exposure and Community Attitudes	No prior experience with the intruding noise.	+5
	Community has had some previous exposure to noise but little effort is being made to control the noise. This correction may also be applied in a situation where the community has not been exposed to the noise previously, but the people are aware that bona fide efforts are being made to control the noise.	0
	Community has had considerable previous exposure to the intruding noise and the noise maker's relations with the community are good.	-5
	Community aware that operation causing noise is very necessary and it will not continue indefinitely. This correction can be applied for an operation of limited duration and under emergency circumstances.	-10
Pure Tone or Impulse	No pure tone or impulsive in character.	0
	Pure tone or impulsive character present.	+5

Notes: a. Source: California Department of Health Services, "Guidelines for the Preparation and Content of Noise Elements of the General Plan", November 1990.
b. Corrections to be added to the measured CNEL to obtain normalized CNEL.

Figure 3-1
Land Use Compatibility for Community Noise Environments



Interpretation

Normally Acceptable

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements

Conditionally Acceptable

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with needed noise insulation features included in the design.

Clearly Unacceptable

New construction or development should generally not be undertaken.

Source: California Department of Health Services, "Guidelines for the Preparation and Content of the Noise Element of the General Plan," 1990

3.2 Local Policies and Standards

Policies and implementation programs outlined in the Noise Element focus on establishing noise projections for proper planning and reducing the noise impacts at sensitive receptor locations. They include:

- identifying noise sources and determining noise exposure levels;
- adopting acceptable levels of noise for land use categories;
- adopting a comprehensive noise ordinance;
- promoting effective enforcement of existing federal and state noise standards;
- requiring proper acoustical site planning and acoustical construction; and
- evaluating noise analyses which have been required for new development projects.

The City of Desert Hot Springs has adopted the state noise guidelines shown in Figure 3-1 and also has adopted specific interior and exterior noise standards that were included in the 1987 City of Desert Hot Springs General Plan Noise Element. These standards are shown in Figure 3-2 and insure integrated planning for compatibility between land uses and noise.

Figure 3-2

Interior and Exterior Noise Standards

Land Use Categories		Energy Average CNEL	
Categories	Uses	Interior [1]	Exterior [2]
Residential	Single Family Duplex, Multiple Family	45 [3]	65
	Mobile Home	—	65 [4]
Commercial Industrial Institutional	Hotel, Motel, Transient Lodging	45	65 [5]
	Commercial Retail, Bank, Restaurant	55	—
	Office Building, Research and Development, Professional Offices, City Office Building	50	—
	Ampitheatre, Concert Hall, Auditorium, Meeting Hall	45	—
	Gymnasium (Multipurpose)	50	—
	Sports Club	55	—
	Manufacturing, Warehousing, Wholesale, Utilities	65	—
	Movie Theatres	45	—
Institutional	Hospital, Schools' classroom	45	65
	Church, Library	45	—
Open Space	Parks	—	65

Interpretation

1. Indoor environment excluding: Bathrooms, toilets, closets, corridors.
2. Outdoor environment limited to: Private yard of single family
   Multi-family private patio or balcony which is served by a means of exit from inside.
   Mobile home park
   Hospital patio
   Park's picnic area
   School's playground
   Hotel and motel recreation area
3. Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided per Chapter 12, Section 1205 of UBC.
4. Exterior noise level should be such that interior noise level will not exceed 45 CNEL.
5. Except those areas affected by aircraft noise.

Endo Engineering

4.0 EXISTING NOISE ENVIRONMENT

As a prerequisite to an effective noise control program, a community must be cognizant of the location and extent of local noise problems; namely major noise source locations, the number of sensitive receptors exposed, and what levels of exposure exist. This data can be utilized to focus noise control and abatement efforts. In some cases, the control of offending noise sources will be beyond the City's jurisdiction; however, by recognizing these limitations more effective land use strategies can be developed.

4.1 NOISE SENSITIVE RECEPTORS

Land uses deemed noise sensitive by the State of California include: schools, hospitals, rest homes, long-term care and mental care facilities. Some jurisdictions elect to also consider day care centers, single family dwellings, mobile home parks, churches, libraries, and recreation areas sensitive to noise. Moderately sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs and equestrian clubs.

Relatively insensitive uses are business, commercial, and professional developments. Insensitive noise receptors include industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, motorcycle parks, rifle ranges, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Current land uses located within the City of Desert Hot Springs that are sensitive to intrusive noise include a hospital and three schools. Figure 4-1 details the location of noise sensitive receptors within the City.

4.2 SIGNIFICANT NOISE SOURCES

Two types of noise sources should be considered: stationary and mobile noise sources. Fixed sources of noise include: industrial and construction activities, air conditioning/ refrigeration units, whistles or bells (signaling school breaks or shift changes), high level radio, stereo or television usage, power tools, lawnmowers, appliances used in the home, and barking dogs. Mobile noise sources are typically transportation-related and include: aircraft over flights, automobiles, trucks, buses, motorcycles and off-road vehicles.

Although construction activities associated with public works projects or private development occur throughout the City, they are localized and temporary. Operating times for these sources are generally daylight hours when noise is less intrusive. Many of the fixed sources of noise are typically accepted as part of the ambient or background noise level.

Motor vehicles in the City are the major source of continuous noise. State Route 62 (Twentynine Palms Highway), Indian Avenue, Pierson Boulevard and Palm Drive carry appreciable volumes of both truck and commuter traffic. Land uses adjacent to these and other master planned roadways are affected by motor vehicle noise.

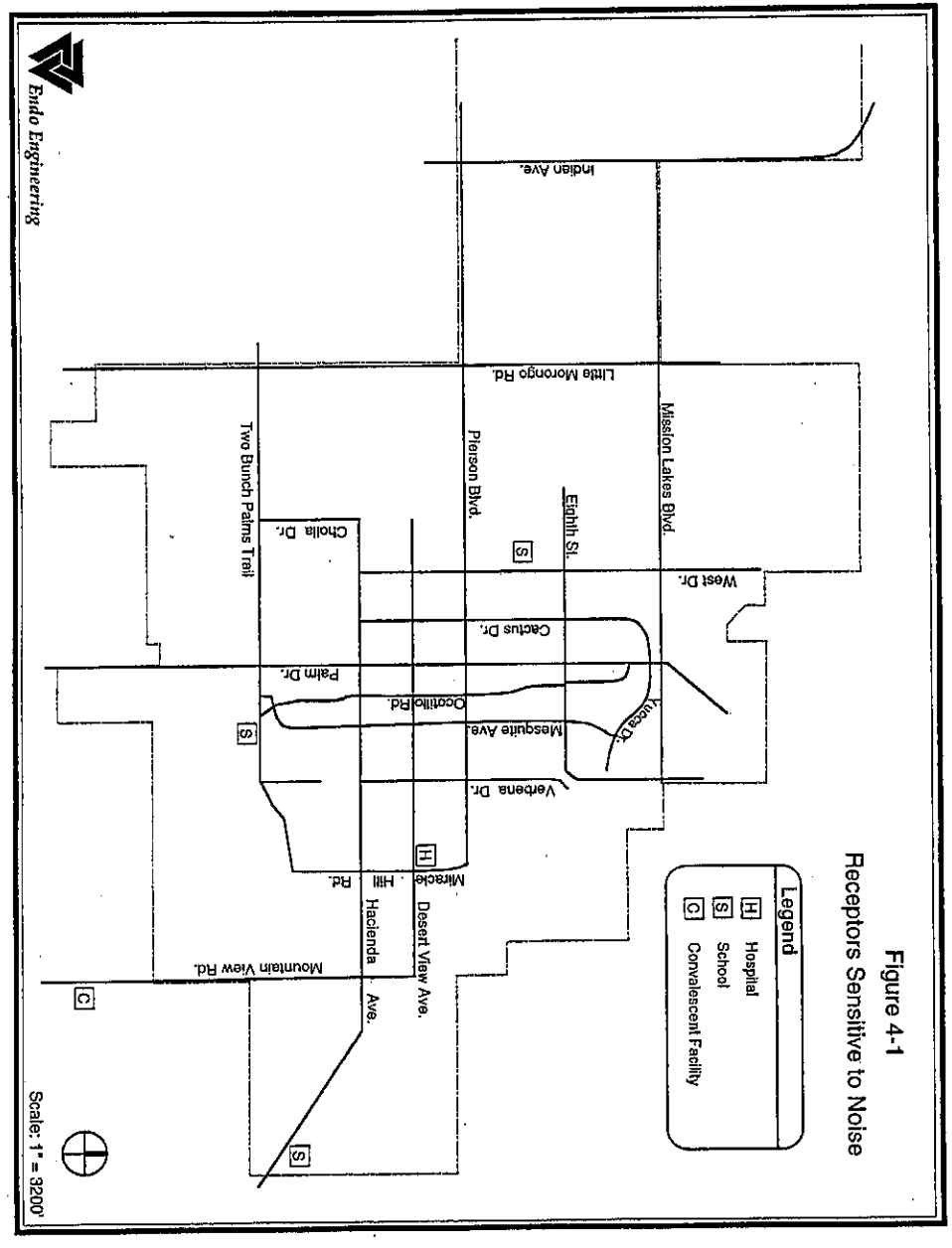


Figure 4-1
Receptors Sensitive to Noise

4.3 CURRENT NOISE LEVELS

4.3.1 Roadway Noise Modeling

The current noise levels adjacent to each of the master planned roadway links were modeled to determine the location and extent of current noise problems, based upon current traffic volumes, lane geometrics, and posted speed limits. The truck mix, temporal distribution and noise modeling assumptions for each link were based upon Riverside County Health Department guidelines and are included in Appendix C.

The noise levels at 100 feet from each roadway centerline shown in Table 4-1 were determined by modeling each facility with the Highway Traffic Noise Prediction Model developed by the Federal Highway Administration (RD-77-108). This model is currently in use nationwide and has been verified with extensive field measurements. It accepts various parameters including: the traffic volume, vehicle mix and speed, and roadway geometry in computing equivalent noise levels during typical daytime, evening, and nighttime hours. The resultant noise levels are then weighted, summed over 24 hours, and output as the CNEL value. CNEL contours are subsequently located through a series of computerized iterations designed to identify the 60, 65, and 70 CNEL contour locations.

As shown in Table 4-1, the roadways where current traffic volumes generate noise above acceptable levels for sensitive receptors at 100 feet from the centerline include:

- State Highway 62 (on both sides of Pierson Blvd.);
- Pierson Boulevard (on both sides of Little Morongo Road);
- Indian Avenue (on both sides of Pierson Blvd.); and
- Palm Drive (south of Eighth Street to the southern City Limit).

Palm Drive and State Route 62 presently carry the largest traffic volumes of all roadways within the City Limits. Of the 43 roadway links analyzed in the City of Desert Hot Springs, all but seven links generate a 70 CNEL contour that falls within the right-of-way. High noise levels are typically the result of: (1) large traffic volumes, (2) high vehicle speeds, and (3) high truck mixes. All of the roadway links generating sound levels in excess of 65.0 CNEL are designated as truck routes by the City.

4.3.2 Noise Measurements

Noise levels were measured adjacent to sensitive receptors at six locations throughout the City. Noise measurements were taken in sensitive areas to determine typical daytime noise levels. The types of sensitive receptors included: single family residences, a mobile home park, a motel, an elementary school, and a middle school. Measurement site locations are shown in Figure 4-2 and described in Table 4-2.

As shown in Table 4-2, the rural character with relatively low current traffic volumes in the City of Desert Hot Springs results in a fairly quiet noise environment. The only roadway facility that generates significant noise levels is Palm Drive, as shown with Site Number 3 and 5.

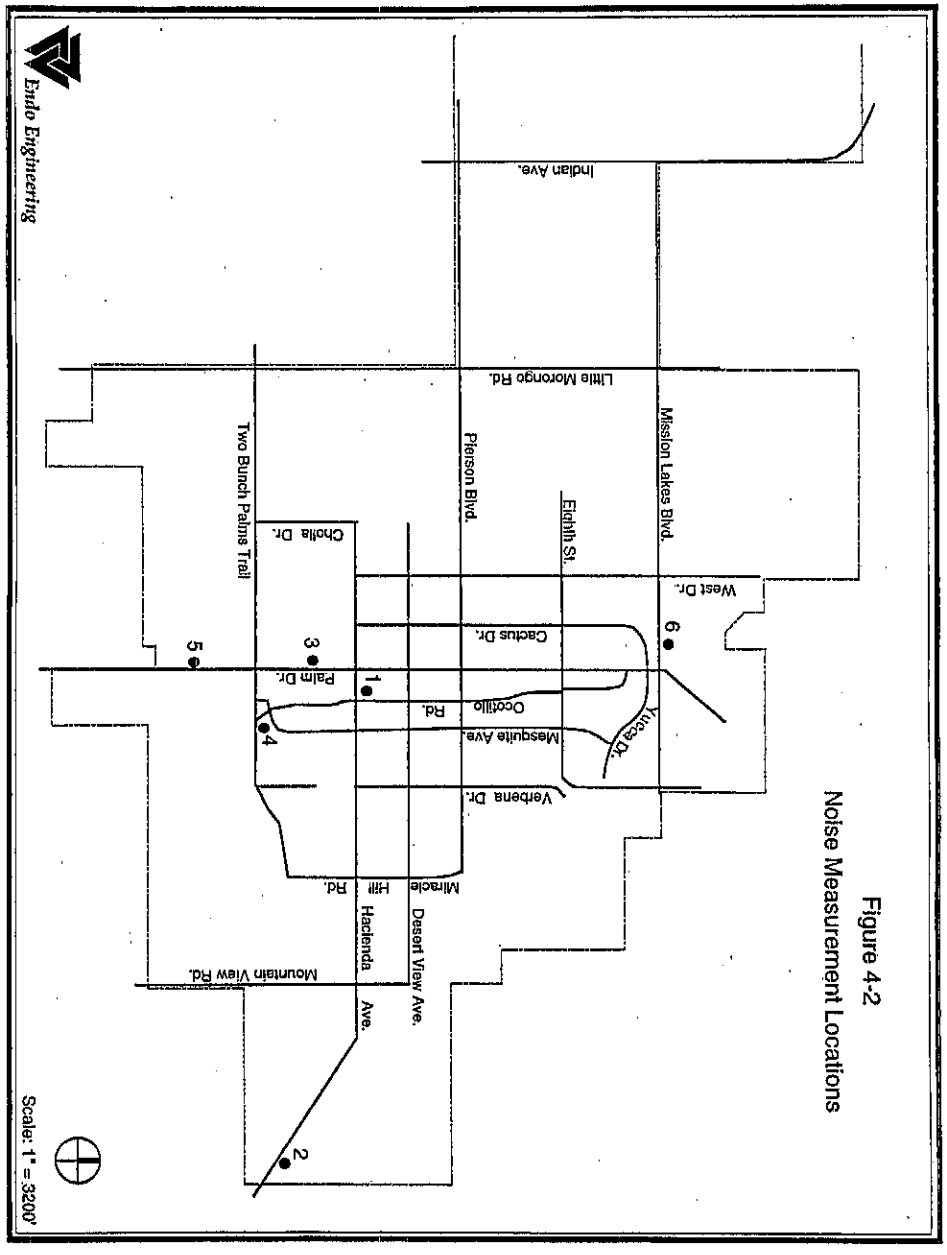


Figure 4-2
Noise Measurement Locations

Table 4-1
Existing Exterior Noise Exposure
Adjacent to City Roadways

Roadway	A.D.T.[a] (Veh./Day)	CNEL[b] @ 100 Feet	Distance to Contours (Ft.)[c] 70 dBA	65 dBA	60 dBA
Mission Lakes Boulevard					
- East of Indian Avenue	2,200	60.5	R/W	R/W	112
- West of West Drive	2,400	58.6	R/W	R/W	73
Pierson Boulevard					
- West of State Route 62	200	50.1	R/W	R/W	R/W
- East of State Route 62	1,100	57.5	R/W	R/W	56
- West of Indian Avenue	2,100	60.3	R/W	R/W	107
- East of Indian Avenue	4,100	63.2	R/W	66	209
- West of Little Morongo Road	4,300	65.1	R/W	102	315
- East of Little Morongo Road	5,500	66.2	R/W	130	405
- West of West Drive	6,000	64.8	R/W	96	294
- West of Cactus Drive	6,400	63.2	R/W	68	204
- West of Palm Drive	7,000	63.6	R/W	74	224
- East of Palm Drive	5,200	62.3	R/W	57	167
Hacienda Avenue					
- West of Palm Drive	3,400	61.5	R/W	50	139
- East of Palm Drive	6,000	63.9	R/W	79	240
- East of Ocotillo Road	6,700	63.0	R/W	63	199
- East of Mesquite Avenue	6,700	63.0	R/W	63	199
- West of Miracle Hill Road	5,800	62.4	R/W	55	174
- West of Mountain View Road	6,500	62.9	R/W	62	195
- East of Mountain View Road	4,900	61.7	R/W	R/W	148
- West of City Limits	1,900	54.9	R/W	R/W	R/W
Two Bunch Palms Trail					
- West of Palm Drive	6,700	63.4	R/W	71	214
- East of Palm Drive	6,100	59.9	R/W	R/W	98
State Route 62					
- North of Pierson Boulevard	19,000	71.7	144	446	1407
- South of Pierson Boulevard	15,000	70.6	113	347	1092
Indian Avenue					
- North of Mission Lakes Blvd.	6,000	64.8	R/W	96	302
- North of Pierson Boulevard	7,000	65.5	R/W	112	354
- South of Pierson Boulevard	8,300	66.2	R/W	132	416
Little Morongo Road					
- North of Pierson Boulevard	2,100	60.3	R/W	R/W	107
- South of Pierson Boulevard	1,900	59.8	R/W	R/W	96
- South of Two Bunch Palms Trail	3,000	61.8	R/W	R/W	151
West Drive					
- North of Pierson Boulevard	3,700	57.8	R/W	R/W	60
- South of Pierson Boulevard	3,400	57.4	R/W	R/W	55

Notes: a. A.D.T. means current average daily two-way traffic volume.
b. CNEL values are given at 100 feet from all roadway centerlines (see Appendix C for assumptions).
c. All distances are measured from the centerline. R/W means the contour falls within the right-of-way.

Table 4-1 (Continued)
Existing Exterior Noise Exposure
Adjacent to City Roadways

Roadway	A.D.T.[a] (Veh./Day)	CNEL[b] @ 100 Feet	Distance to Contours (Ft.)[c] 70 dBA	65 dBA	60 dBA
Palm Drive					
- North of Eighth Street	6,300	64.1	R/W	82	253
- North of Pierson Boulevard	10,500	66.3	R/W	133	415
- South of Pierson Boulevard	14,600	66.8	52	149	465
- North of Hacienda Avenue	18,800	67.9	64	191	599
- South of Hacienda Avenue	18,800	69.8	96	294	927
- South of Two Bunch Palms Trail	20,600	70.2	104	322	1017
- North of City Limits	23,400	70.6	115	362	1146
Miracle Hill Road					
- North of Hacienda Avenue	1,000	52.1	R/W	R/W	R/W
- South of Hacienda Avenue	400	48.1	R/W	R/W	R/W
Mountain View Road					
- North of Hacienda Avenue	1,400	53.5	R/W	R/W	R/W
- South of Hacienda Avenue	4,400	58.5	R/W	R/W	71

Notes: a. A.D.T. means current average daily two-way traffic volume.
b. CNEL values are given at 100 feet from all roadway centerlines (see Appendix C for assumptions).
c. All distances are measured from the centerline. R/W means the contour falls within the right-of-way.

Table 4-2
Noise Measurement Findings

Site Number	Distance to Centerline (ft.)	Receptor Type	Leq[a] (dBA)
1	61	Single-Family Residence	61.6
2	85	Elementary School	54.1
3	63	Motel	66.4
4	54	Middle School and S.F. Dwelling	60.4
5	38	In Front of Mobile Home Park	72.4
6	69	Single-Family Residence	58.1

Notes: a. The noise measurements were taken on November 4, 1994 between noon and 3 PM.

5.0 FUTURE NOISE ENVIRONMENT

5.1 FUTURE ROADWAY NOISE

5.1.1 Factors Affecting Roadway Noise

Noise levels adjacent to roadways vary with the volume of traffic, the mean vehicular speed, the truck mix, and the road cross-section. For instance, increasing the vehicle speed from 35 to 45 mph along a major roadway raises the adjacent noise levels approximately 2.7 dBA. Raising the speed from 45 to 50 mph increases adjacent noise levels by 1.0 dBA. A speed increase from 50 mph to 55 mph increases adjacent noise levels by 0.9 dBA. Consequently, lowering motor vehicle speeds can have a significant positive impact in terms of reducing adjacent noise levels.[1]

The truck mix on a given roadway also has a significant effect on the adjacent noise levels. As the number of trucks increases and becomes a larger percentage of the total vehicle volume, the adjacent noise levels increase. This effect is greater if the number of heavy duty (3+ axle) trucks is large compared to the number of medium duty (2 axle) trucks.

5.1.2 Future Traffic Noise Levels

The future noise levels adjacent to Interstate 10, State Highway 62, and the master planned street network within the planning area were modeled to determine the location and extent of future noise contours, based upon General Plan Buildout traffic volumes, master planned lane geometrics, and posted speed limits or, where necessary, estimated speeds. The truck mix, temporal distribution and noise modeling assumptions for each link are included in Appendix C. By assuming a sound drop off rate of 4.5 dBA with each doubling of distance, the locations of the future 70 CNEL, 65 CNEL and 60 CNEL noise contours used for land use compatibility purposes have been determined.

The Preferred General Plan

Table 5-1 provides the projected CNEL values at a distance of 100 feet from the centerline of each master planned roadway link, upon buildout of the Preferred General Plan. It also shows the anticipated daily traffic volume on each link and the distances to the future 70 CNEL, 65 CNEL and 60 CNEL noise contours. Table 5-1 permits projected future noise levels with the Preferred General Plan to be quantified at any point in the planning area that is near a master planned roadway.

Table 5-2 provides an overall picture of the expected noise environment upon General Plan Buildout, by dividing the master planned roadways into groups reflecting the magnitude of projected future noise levels. For example, Alternative 4 would result in the most links generating noise levels below 65 CNEL (14 links) and the smallest number of links with noise levels greater than 70 CNEL (54 links). By comparison, the Preferred General Plan would result in 13 links generating noise levels below 65 CNEL and 57 links generating noise levels that exceed 70 CNEL.

1. Source: Endo Engineering conclusions based upon computer runs of RD-77-108 with all variables held constant except vehicle speed.

Table 5-1
Preferred General Plan Buildout Exterior Noise Exposure
Adjacent to Planning Area Roadways

Roadway	A.D.T.[a] (Veh./Day)	CNEL[b] @ 100 Feet	Distance to Contours (Feet)[c] 70 CNEL	65 CNEL	60 CNEL
Mission Lakes Boulevard					
- East of State Route 62	11,900	69.5	93	194	416
- East of Worsley Road	5,800	66.4	61	123	259
- West of Indian Avenue	6,000	66.5	62	124	263
- East of Indian Avenue	15,500	70.6	109	230	492
- West of West Drive	13,100	68.5	81	167	357
- West of Palm Drive	13,100	68.5	81	167	357
- East of Palm Drive	3,500	61.9	R/W	64	133
Eighth Street					
- West of Palm Drive	800	54.7	R/W	R/W	47
- East of Palm Drive	8,400	65.0	49	100	213
Pierson Boulevard					
- East of Route 62	25,600	73.1	154	324	695
- East of Worsley Road	23,300	72.6	143	301	644
- West of Indian Avenue	46,000	75.6	223	474	1,019
- East of Indian Avenue	28,200	73.3	161	343	738
- East of Little Morongo Rd.	20,200	71.8	129	273	586
- East of West Drive	25,900	70.0	100	208	445
- East of Palm Drive	24,700	69.8	97	203	435
- West of Miracle Hill Rd.	18,700	70.1	101	213	456
Desert View Avenue					
- West of Mountain View Rd.	11,300	66.2	58	120	255
Hacienda Boulevard					
- East of Indian Avenue	12,900	69.8	97	203	435
- East of Little Morongo Rd.	15,700	68.6	82	170	362
- West of Palm Drive	17,000	68.9	86	178	379
- East of Palm Drive	8,200	66.4	59	123	263
- West of Miracle Hill Road	18,400	69.9	99	209	450
- West of Mountain View Rd.	16,700	69.5	93	197	423
- East of Mountain View Rd.	27,800	70.2	103	219	471
- West of City Limits	19,500	68.6	81	172	369
Two Bunch Palms Trail					
- East of State Route 62	5,000	64.2	44	89	188
- East of Worsley Road	4,700	64.0	R/W	86	183
- West of Indian Avenue	17,600	69.7	96	203	436
- East of Indian Avenue	14,300	68.8	84	177	380
- West of West Drive	10,100	65.8	55	113	240
- West of Palm Drive	11,900	66.5	60	125	267
- East of Palm Drive	6,800	65.6	53	109	233
Dillon Road					
- East of Route 62	33,300	74.2	181	383	823
- East of Worsley Road	11,500	69.6	95	192	407
- West of Indian Avenue	33,400	74.2	181	383	823
- West of Little Morongo Rd.	24,500	71.3	120	253	543

Notes: a. A.D.T. means the average daily two-way traffic volume upon buildout of the Preferred GP.
b. CNEL values are at 100 feet from all roadway centerlines (see Appendix C for assumptions).
c. All distances are measured from the centerline. R/W means that the CNEL contour falls within the right-of-way.

Table 5-1 (Continued)
Preferred General Plan Buildout Exterior Noise Exposure
Adjacent to Planning Area Roadways

Roadway	A.D.T.[a] (Veh./Day)	CNEL[b] @ 100 Feet	Distance to Contours (Feet)[c] 70 CNEL	65 CNEL	60 CNEL
Dillon Road					
- West of Palm Drive	27,200	71.8	129	273	586
- East of Palm Drive	28,000	71.9	131	278	595
- West of Mountain View Rd.	42,800	73.9	173	366	786
- East of Mountain View Rd.	49,700	74.6	192	407	874
- East of Long Canyon Road	43,200	75.3	213	453	974
20th Avenue					
- West of Indian Avenue	7,400	65.3	54	104	219
- West of Little Morongo Rd.	30,300	71.5	124	261	560
- West of Palm Drive	21,000	70.6	109	228	488
- East of Palm Drive	37,000	73.3	159	334	717
- West of Mountain View Rd.	17,200	69.0	87	179	382
Varner Road					
- West of Palm Drive	13,400	68.7	84	171	365
- East of Palm Drive	14,300	69.0	87	179	382
- East of Mountain View Rd.	49,500	74.6	192	407	874
Interstate 10					
- West of Route 62	115,800	85.5	832	1,789	3,852
- East of Route 62	98,800	85.5	832	1,789	3,852
- East of Indian Avenue	117,900	86.1	912	1,961	4,223
- West of Palm Drive	156,600	87.1	1,063	2,286	4,924
- East of Palm Drive	171,900	87.5	1,130	2,431	5,235
State Route 62					
- North of Mission Lakes Blvd.	25,100	74.5	192	410	881
- North of Pierson Boulevard	25,000	74.5	192	410	881
- N/O Two Bunch Palms Trail	40,900	76.6	264	565	1,216
- North of Dillon Road	43,300	76.9	276	592	1,273
- North of Interstate 10	75,900	79.6	396	850	1,830
Worsley Road					
- North of Mission Lakes Blvd.	100	46.7	R/W	R/W	R/W
- North of Pierson Boulevard	11,000	67.0	66	134	284
- N/O Two Bunch Palms Trail	21,500	69.9	99	207	442
- North of Dillon Road	25,800	70.7	111	233	500
- South of Dillon Road	7,000	65.1	52	101	213
- North of 20th Avenue	5,800	64.3	R/W	91	189
Indian Avenue					
- North of Mission Lakes Blvd.	10,600	69.0	87	179	382
- North of Pierson Boulevard	12,000	69.6	95	196	419
- North of Hacienda Avenue	33,400	72.9	150	315	674
- N/O Two Bunch Palms Trail	38,100	73.4	161	339	728
- S/O Two Bunch Palms Trail	38,600	73.5	163	345	739
- North of Dillon Road	38,300	73.4	161	339	728
- North of 20th Avenue	53,900	75.3	203	427	914
- South of Interstate 10	50,500	75.1	197	414	887

Notes: a. A.D.T. means the average daily two-way traffic volume upon buildout of the Preferred GP.
b. CNEL values are at 100 feet from all roadway centerlines (see Appendix C for assumptions).
c. All distances are measured from the centerline. R/W means that the CNEL contour falls within the right-of-way.

Table 5-1 (Continued)
Preferred General Plan Buildout Exterior Noise Exposure
Adjacent to Planning Area Roadways

Roadway	A.D.T.[a] (Veh./Day)	CNEL[b] @ 100 Feet	Distance to Contours (Feet)[c] 70 CNEL	65 CNEL	60 CNEL
Little Morongo Road					
- North of Mission Lakes Blvd.	13,400	69.9	99	209	450
- North of Pierson Boulevard	16,700	70.9	114	240	515
- North of Hacienda Avenue	29,600	73.4	165	352	756
- N/O Two Bunch Palms Trail	30,100	73.5	167	357	767
- S/O Two Bunch Palms Trail	39,800	73.6	166	350	750
- North of Dillon Road	43,500	74.0	176	372	798
- North of 20th Avenue	32,600	72.7	145	305	654
- South of 20th Avenue	49,800	74.6	192	407	874
- South of Varner Avenue	39,000	73.5	163	345	739
West Drive					
- South of Mission Lakes Blvd.	2,100	58.9	R/W	R/W	85
- North of Pierson Boulevard	1,200	56.5	R/W	R/W	60
- South of Pierson Boulevard	7,500	64.5	46	93	197
- South of Hacienda Avenue	4,300	62.0	R/W	65	135
Palm Drive					
- South of Mission Lakes Blvd.	14,800	68.3	79	162	346
- North of Pierson Boulevard	20,200	69.7	96	200	429
- North of Hacienda Avenue	32,100	71.2	118	243	520
- N/O Two Bunch Palms Trail	31,800	72.6	143	301	644
- S/O Two Bunch Palms Trail	50,500	74.6	192	407	874
- North of Dillon Road	43,500	74.0	176	372	798
- South of Dillon Road	50,000	75.0	194	408	873
- South of 20th Avenue	68,700	76.4	238	504	1,082
- South of Varner Avenue	72,600	76.6	245	520	1,115
- South of Interstate 10	62,000	76.0	224	474	1,018
Verbena Drive					
- North of Pierson Boulevard	2,800	60.2	R/W	50	103
- North of Hacienda Avenue	9,500	65.5	52	108	230
Miracle Hill Road					
- South of Pierson Boulevard	12,200	66.6	61	127	272
- South of Hacienda Avenue	4,600	62.3	35	67	141
Bubbling Wells Road					
- North of Dillon Road	15,500	67.6	70	148	316
- South of Dillon Road	21,200	69.0	86	183	392
Mountain View Road					
- North of Hacienda Avenue	13,800	67.1	66	137	293
- South of Hacienda Avenue	9,700	65.6	53	109	233
- North of Dillon Road	27,000	70.2	103	215	459
- South of Dillon Road	37,500	73.4	161	339	728
- North of Varner Avenue	41,500	73.8	171	361	774
Long Canyon Road					
- South of Hacienda Avenue	16,900	69.6	94	197	422
- North of Dillon Road	32,300	72.5	144	306	658

Notes: a. A.D.T. means the average daily two-way traffic volume upon buildout of the Preferred GP.
b. CNEL values are at 100 feet from all roadway centerlines (see Appendix C for assumptions).
c. All distances are measured from the centerline. R/W means that the CNEL contour falls within the right-of-way.

Table 5-2
Number of Master Planned Roadway Links
Within Various Noise Level Ranges[a]

Noise Level at 100 Feet	Preferred GP Links	Adopted GP Links	Alternative 3 Links	Alternative 4 Links
< 60 CNEL	4 (4%)	5 (5%)	6 (5%)	6 (5%)
60-65 CNEL	9 (8%)	8 (7%)	6 (5%)	8 (7%)
65-70 CNEL	40 (36%)	37 (34%)	36 (33%)	42 (38%)
70-75 CNEL	42 (38%)	47 (43%)	46 (42%)	40 (36%)
> 75 CNEL	15 (14%)	13 (12%)	16 (15%)	14 (13%)

Notes: a. The format is Number of Roadway Links (Percentage of All 110 Roadway Links Evaluated).

Upon buildout of the Preferred General Plan, 15 of the 110 links modeled (14 percent) are projected to generate noise levels at a distance of 100 feet that exceed 75 CNEL, as shown in Table 5-2. Forty-two of the links evaluated (38 percent) will generate noise levels at 100 feet that are between 70 CNEL and 75 CNEL. Forty links (36 percent of the links modeled) are projected to generate noise levels at 100 feet that are between 65 CNEL and 70 CNEL. Thirteen links (12 percent of the links modeled) will generate noise levels at 100 feet that are below 65 CNEL. Noise levels at 100 feet from nine of those links will range between 60 CNEL and 65 CNEL. Motor vehicles on four roadway links will generate noise levels below 60 CNEL.

Of the 110 links modeled in the planning area, thirteen (or 12 percent) were found to generate a 70 CNEL contour that will remain within the master planned right-of-way upon buildout. Four links (4 percent) were found to generate a 65 CNEL contour that will remain within the right-of-way. Only one link (1 percent) will generate 60 CNEL contours that remain within the right-of-way.

Table 5-3 provides the projected General Plan Buildout motor vehicle noise levels of three alternatives compared to the Adopted General Plan. The CNEL at a distance of 100 feet from each roadway centerline is shown for the Adopted General Plan, followed by the change in CNEL projected with the Preferred General Plan, Alternative 3 and Alternative 4. One hundred ten master planned roadway segments were modeled with each General Plan alternative.

Table 5-3 permits the noise level adjacent to each master planned link to be identified for each alternative. It also allows the significance of the change in noise levels associated with each alternative to be determined for each link.

Table 5-4 provides a more generalized overview of the change in buildout noise levels associated with each alternative, when compared to the Adopted General Plan. Since a change of 1.0 dBA is inaudible, roadway links with future noise levels that vary by 1.0 dBA or less should be considered to generate essentially the same ambient noise environment. A change of 3.0 dBA is clearly audible, therefore, roadway links with

future noise levels that vary by 3.0 dBA or more should be considered to generate significantly different noise environments.

Table 5-3
Projected Buildout Noise Levels
Compared to Adopted General Plan Alternative

Roadway Link	Adopted[a] General Plan CNEL	Preferred GP - Adopt. GP CNEL	Alternative 3 - Adopt. GP CNEL	Alternative 4 - Adopt. GP CNEL
Mission Lakes Boulevard				
- East of State Route 62	69.9	-0.4	-0.4	-0.5
- East of Worsley Road	66.4	0.0	-0.4	-0.4
- West of Indian Avenue	66.5	0.0	-0.4	-0.4
- East of Indian Avenue	69.9	0.7	0.3	0.1
- West of West Drive	68.4	0.1	0.1	-0.2
- West of Palm Drive	68.7	-0.2	0.1	-0.2
- East of Palm Drive	56.9	5.0	0.4	-3.4
Eighth Street				
- West of Palm Drive	55.7	-1.0	-1.0	-1.0
- East of Palm Drive	65.2	-0.2	0.8	-0.2
Pierson Boulevard				
- East of Route 62	72.9	0.2	0.3	0.0
- East of Worsley Road	72.7	-0.1	0.3	-0.4
- West of Indian Avenue	75.4	0.2	0.1	-0.3
- East of Indian Avenue	73.2	0.1	0.0	-0.3
- East of Little Morongo Road	71.9	-0.1	0.0	-0.3
- East of West Drive	70.1	-0.1	0.1	-0.2
- East of Palm Drive	70.0	-0.2	-0.2	-0.5
- West of Miracle Hill Road	70.2	-0.1	0.0	-0.5
Desert View Avenue				
- West of Mountain View Road	66.2	0.0	0.3	-0.1
Hacienda Boulevard				
- East of Indian Avenue	70.1	-0.3	0.3	0.1
- East of Little Morongo Road	68.7	-0.1	-0.2	-0.8
- West of Palm Drive	68.8	0.1	-0.1	-0.8
- East of Palm Drive	66.7	-0.3	0.3	-0.9
- West of Miracle Hill Road	70.4	-0.5	-0.3	-0.9
- West of Mountain View Road	69.8	-0.3	-0.2	-1.0
- East of Mountain View Road	70.3	-0.1	-0.1	-0.7
- West of City Limits	68.5	0.1	0.2	-0.9
Two Bunch Palms Trail				
- East of State Route 62	62.2	2.0	2.7	0.6
- East of Worsley Road	63.7	0.3	0.0	0.4
- West of Indian Avenue	68.3	1.4	2.6	0.5
- East of Indian Avenue	67.2	1.6	2.5	0.0
- West of West Drive	65.5	0.3	0.1	0.1
- West of Palm Drive	66.5	0.0	-0.3	-0.2
- East of Palm Drive	66.8	-1.2	-1.3	-1.7
Dillon Road				
- East of Route 62	73.9	0.3	0.3	-0.3
- East of Worsley Road	69.0	0.6	0.4	-0.3
- West of Indian Avenue	74.0	0.2	0.8	0.5
- West of Little Morongo Road	71.2	0.1	0.0	0.0

Notes: a. CNEL values shown are at a distance of 100 feet from each roadway centerline.

Table 5-3 (Cont.)
Projected Buildout Noise Levels
Compared to Adopted General Plan Alternative

Roadway Link	Adopted[a] General Plan CNEL	Preferred GP - Adopt. GP CNEL	Alternative 3 - Adopt. GP CNEL	Alternative 4 - Adopt. GP CNEL
Dillon Road				
- West of Palm Drive	71.7	0.1	0.3	-0.5
- East of Palm Drive	72.4	-0.5	0.0	-0.6
- West of Mountain View Road	73.2	0.7	0.4	-0.4
- East of Mountain View Road	74.2	0.4	0.4	0.0
- East of Long Canyon Road	75.4	-0.1	-0.1	-0.1
20th Avenue				
- West of Indian Avenue	64.2	1.1	1.1	1.0
- West of Little Morongo Road	71.6	-0.1	0.2	-0.3
- West of Palm Drive	71.4	-0.8	-0.4	-0.9
- East of Palm Drive	73.0	0.3	0.3	0.0
- West of Mountain View Road	70.4	-1.4	-0.4	-0.5
Varner Road				
- West of Palm Drive	70.0	-1.3	-0.6	-1.0
- East of Palm Drive	67.9	1.1	1.5	0.3
- East of Mountain View Road	74.0	0.6	0.5	0.3
Interstate 10				
- West of Route 62	85.7	0.0	0.0	0.0
- East of Route 62	85.8	-0.1	0.0	-0.1
- East of Indian Avenue	86.3	0.2	0.2	0.1
- West of Palm Drive	87.2	0.4	0.4	0.3
- East of Palm Drive	87.5	0.5	0.5	0.3
State Route 62				
- North of Mission Lakes Blvd.	74.4	0.0	0.0	-0.1
- North of Pierson Boulevard	74.1	0.2	0.3	0.2
- N/O Two Bunch Palms Trail	76.4	0.1	0.1	0.1
- North of Dillon Road	76.5	0.2	0.2	0.1
- North of Interstate 10	79.2	0.3	0.3	0.0
Worsley Road				
- North of Mission Lakes Blvd.	46.7	0.0	0.0	0.0
- North of Pierson Boulevard	67.0	0.0	-0.1	-0.1
- N/O Two Bunch Palms Trail	69.7	0.2	0.4	-0.3
- North of Dillon Road	70.3	0.4	0.6	0.0
- South of Dillon Road	63.6	1.5	1.6	1.2
- North of 20th Avenue	62.4	1.9	2.0	1.5
Indian Avenue				
- North of Mission Lakes Blvd.	69.0	0.0	-0.1	0.1
- North of Pierson Boulevard	69.5	0.1	-0.2	0.1
- North of Hacienda Avenue	72.6	0.3	0.1	-0.1
- N/O Two Bunch Palms Trail	73.2	0.2	0.3	0.0
- S/O Two Bunch Palms Trail	73.2	0.3	0.2	-0.1
- North of Dillon Road	73.1	0.3	0.2	0.0
- North of 20th Avenue	74.9	0.4	0.6	0.3
- South of Interstate 10	74.1	1.0	1.0	0.8

Notes: a. CNEL values shown are at a distance of 100 feet from each roadway centerline.

Table 5-3 (Cont.)
Projected Buildout Noise Levels
Compared to Adopted General Plan Alternative

Roadway Link	Adopted[a] General Plan CNEL	Preferred GP - Adopt. GP CNEL	Alternative 3 - Adopt. GP CNEL	Alternative 4 - Adopt. GP CNEL
Little Morongo Road				
- North of Mission Lakes Blvd.	69.8	0.1	0.1	0.1
- North of Pierson Boulevard	70.7	0.2	-0.1	-0.1
- North of Hacienda Avenue	73.4	0.0	-0.1	-0.1
- N/O Two Bunch Palms Trail	73.4	0.1	-0.1	-0.2
- S/O Two Bunch Palms Trail	73.4	0.2	0.2	0.0
- North of Dillon Road	73.5	0.5	0.3	-0.1
- North of 20th Avenue	72.1	0.6	0.8	0.9
- South of 20th Avenue	74.5	0.1	0.0	-0.1
- South of Varner Avenue	72.7	0.8	0.7	0.3
West Drive				
- South of Mission Lakes Blvd.	59.5	-0.6	-0.8	-0.8
- North of Pierson Boulevard	57.2	-0.7	-0.7	-0.7
- South of Pierson Boulevard	62.4	2.1	0.9	0.2
- South of Hacienda Avenue	60.9	1.1	0.9	-0.3
Palm Drive				
- South of Mission Lakes Blvd.	68.0	0.3	0.2	-0.1
- North of Pierson Boulevard	69.3	0.4	0.3	0.1
- North of Hacienda Avenue	70.9	0.3	0.3	0.1
- N/O Two Bunch Palms Trail	71.8	0.8	0.6	0.4
- S/O Two Bunch Palms Trail	74.0	0.6	0.4	0.2
- North of Dillon Road	73.1	0.9	0.6	0.4
- South of Dillon Road	74.7	0.3	0.6	0.3
- South of 20th Avenue	75.4	1.0	0.8	0.6
- South of Varner Avenue	76.2	0.4	0.4	0.2
- South of Interstate 10	75.8	0.2	0.3	0.0
Verbena Drive				
- North of Pierson Boulevard	60.8	-0.6	-1.5	-1.9
- North of Hacienda Avenue	66.1	-0.6	-1.0	-0.9
Miracle Hill Road				
- South of Pierson Boulevard	67.2	-0.6	-0.4	-0.9
- South of Hacienda Avenue	65.9	-3.6	-3.9	-3.9
Bubbling Wells Road				
- North of Dillon Road	66.9	0.7	0.7	0.7
- South of Dillon Road	66.2	2.8	1.3	1.1
Mountain View Road				
- North of Hacienda Avenue	66.9	0.2	0.3	-0.3
- South of Hacienda Avenue	65.4	0.2	0.6	0.8
- North of Dillon Road	70.1	0.1	0.3	-1.0
- South of Dillon Road	73.2	0.2	0.4	-0.1
- North of Varner Avenue	73.2	0.6	0.6	0.3
Long Canyon Road				
- South of Hacienda Avenue	68.8	0.8	0.4	-0.1
- North of Dillon Road	71.6	0.9	0.8	-0.2

Notes: a. CNEL values shown are at a distance of 100 feet from each roadway centerline.

Table 5-4
Change in General Plan Buildout CNEL
Compared to Adopted General Plan

Change in GP Buildout CNEL Compared to the Adopted GP	Preferred General Plan	Alternative 3	Alternative 4
Lower CNEL			
- Less Than 1.0 dBA	24 Links	23 Links	51 Links
- Between 1.0 and 3.0 dBA	4 Links	4 Links	6 Links
- More Than 3.0 dBA	1 Links	1 Links	2 Links
No Change in CNEL	10 Links	11 Links	13 Links
Higher CNEL			
- Less Than 1.0 dBA	60 Links	63 Links	35 Links
- Between 1.0 and 3.0 dBA	10 Links	8 Links	3 Links
- More Than 3.0 dBA	1 Link	None	None
Total	110 Links	110 Links	110 Links

Changes in future noise levels that range between 1.0 and 3.0 dBA are potentially audible. Therefore, alternatives shown in Table 5-4 with more roadway links in this category have a greater potential for noise impact, compared to the Adopted General Plan. Similarly, if one alternative either increases or decreases future noise levels by more than 3 dBA, the noise impact will be audible and could be significant if the resulting noise environment would exceed City noise standards for adjacent noise sensitive land uses.

The Adopted General Plan

A review of the projected noise levels along master planned roadways with the Adopted General Plan versus the Preferred General Plan (Table 5-4) indicates the following. Future buildout noise levels will be the same along ten roadway links (9% of those modeled). Future buildout noise levels will be lower with the Preferred General Plan along twenty-nine roadway links (26% of those modeled). Future buildout noise levels will be higher with the Preferred General Plan along seventy one roadway links (65% of those modeled).

The Adopted General Plan would generate clearly audible noise increases (greater than 3.0 dBA) on only one of the roadway links modeled and potentially audible noise increases (between 1.0 dBA and 3.0 dBA) along four of the links modeled (4%), compared to the Preferred General Plan. The Adopted General Plan would cause clearly audible noise decreases along one of the roadway segments and potentially audible noise decreases along ten of the links evaluated, compared to the Preferred General Plan. Along the remaining 94 links (85%) the differences in projected buildout noise levels are projected to be within 1.0 dBA and inaudible.

The roadway links with the most significant differences in future noise levels are: Mission Lakes Boulevard (east of Palm Drive) and Miracle Hill Road (south of Hacienda Avenue). As shown in Table 5-3, future noise levels are projected to be 5 dBA lower (56.9 CNEL) along Mission Lakes Boulevard (east of Palm Drive) with the Adopted General Plan. This results from the fact that the future traffic volume projected along this roadway link (1,100 vehicles per day) is less than one-third of that projected with the Preferred General Plan (3,500 vehicles per day). Conversely, the Adopted General Plan would result in 3.4 CNEL higher noise levels along this link than Alternative 4 (which generates only 500 vehicles per day on this link).

Alternative 3

Alternative 3 would result in the highest number of roadway links (62 links) generating buildout noise levels above 70 CNEL. This alternative would also have the smallest number of roadway links with noise levels below 65 CNEL (12 links). Therefore, from Table 5-2, it can be concluded that Alternative 3 would generate the most roadway noise.

As shown in Table 5-4, buildout noise levels with Alternative 3 would be essentially the same as the Adopted General Plan (within 1.0 dBA) along 97 of the roadway links modeled (88%). A potentially audible noise increase is projected to occur along eight roadway links, and a potentially audible noise decrease is projected to occur along four roadway links, compared to the Adopted General Plan. Alternative 3 would not cause any roadways to generate buildout noise levels that are 3.0 dBA or more above those with the Adopted General Plan. Therefore, no clearly audible adverse noise impacts would be expected with Alternative 3, when compared to the Adopted General Plan.

Alternative 4

Alternative 4 would result in the lowest number of roadway links (54 links) generating buildout noise levels above 70 CNEL. This alternative would also have the largest number of roadway links with noise levels below 65 CNEL (14 links). Therefore, from Table 5-2, it can be concluded that Alternative 4 would generate the lowest roadway noise levels.

As shown in Table 5-4, buildout noise levels with Alternative 4 would be essentially the same as the Adopted General Plan (within 1.0 dBA) along 99 of the roadway links modeled (90%). A potentially audible noise increase is projected to occur along three roadway links, and a potentially audible noise decrease is projected to occur along six roadway links, compared to the Adopted General Plan. Like Alternative 3, Alternative 4 would not cause any roadways to generate buildout noise levels that are 3.0 dBA or more above those with the Adopted General Plan. Therefore, no clearly audible adverse noise impacts would be expected with Alternative 4, when compared to the Adopted General Plan.

5.1.3 Typical and Design Noise Levels

Table 5-5 provides the projected noise levels at the right-of-way associated with each master planned roadway classification as well as at 100 feet from the roadway centerline. The distances to various CNEL contours used in determining land use compatibility for planning purposes are also provided. The values shown represent "worst case" conditions in that they assume the master planned streets are carrying daily traffic volumes equivalent to their daily design capacity.

The values shown in Table 5-5 were employed to develop Figure 5-1, which is a nomograph that depicts design noise levels adjacent to typical master planned roadways. This nomograph assumes daily volumes at the ultimate daily design capacity for each roadway type as well as typical design speeds and truck mix percentages. Figure 5-1 can be used to determine typical CNEL contours between 100 and 300 feet from the roadway centerlines, assuming flat terrain and no intervening barriers or buildings.

It is recommended that ultimate noise contours at the design capacity of each facility be used for planning purposes initially. Future noise projections can be refined when detailed site-specific acoustic reports are prepared for new developments at more detailed planning levels. Until that time, Figure 5-1 can serve as a general planning guide to determine the potential "worst case" future noise levels and the setbacks required to insure an acceptable noise environment for planned land uses.

For example, if development is being planned and the ultimate design noise level is needed at 200 feet from a master planned roadway, Figure 5-1 can be used to project the CNEL 200 feet from the roadway centerline. An urban arterial would generate 71 CNEL at 200 feet, if it were operating at the upper limit of its design capacity with an 8 percent truck mix. A major arterial would be expected to generate 70 CNEL at 200 feet. A minor arterial or major collector would generate 68 CNEL at 200 feet. A minor collector or secondary would generate 66 CNEL at 200 feet. A local collector would generate 58 CNEL at 200 feet from the roadway centerline.

Noise levels adjacent to roadways vary with the volume of traffic, the mean vehicular speed, the truck mix, and the road cross-section. Figures 5-2 through 5-4 provide nomographs for typical master planned roadways by classification that allow the CNEL at the right-of-way to be determined from the daily two-way traffic volume and the speed of the vehicles.

For example, a 6-lane major arterial carrying 40,000 ADT with a posted speed limit of 45 mph would generate 79 CNEL at the right-of-way. Lowering the speed to 35 mph would reduce the CNEL at the right-of-way to approximately 78 dBA. Similarly, at a speed of 55 mph, the noise level at the right-of-way would be 80 CNEL.

Figures 5-5 through 5-7 illustrate the effect of the truck mix on adjacent noise levels. As shown therein, a 6-lane major arterial carrying 40,000 ADT at 50 mph would generate approximately 79 CNEL at the right-of-way if the truck mix were 8.00 percent of the ADT. The CNEL would increase to 81 dBA at the right-of-way if the truck mix were 15 percent of the ADT. A 2.58 percent truck mix would result in 76.0 CNEL at the right-of-way.

Table 5-5
Design Noise Levels Adjacent to Master Planned Roadways

Classification	Typical Lane Configuration	Capacity[a] (Veh/Day)	CNEL Value At R/W[b]	CNEL Value At 100 Feet[c]	Distance to CNEL Contours (Feet)[d] 75 dBA	70 dBA	65 dBA	60 dBA
Urban Arterial	8 Lanes Divided	66,000	80.4	76.2	116	231	489	1,049
Major Arterial	6 Lanes Divided	48,500	79.8	74.5	94	189	401	861
Major Collector Minor Arterial	4 Lanes Divided	31,000	77.6	72.3	70	139	295	633
Minor Collector Secondary	4 Lanes Undivided	25,000	77.1	70.5	52	108	230	493
Local Collector	2 Lanes Undivided	15,000	70.9	62.9	R/W	34	73	156

Notes: a. A.D.T. is the average daily two-way traffic volume at the design capacity (upper limit of LOS D) associated with each roadway classification.

b. Assumes: (1) an 8 percent truck mix for divided roadways and a 2.58 percent truck mix for undivided roadways; (2) an 134-foot R/W with a 45 mph average travel speed for urban arterials; (3) an 110-foot R/W with a 45 mph average travel speed for major and minor arterials; (4) an 100-foot R/W with a 45 mph average travel speed for major collectors; (5) an 88-foot R/W with a 40 mph average travel speed for minor collectors; and (6) an 80 foot R/W and 40 mph average travel speed for secondaries; and (7) a 60-foot R/W with a 35 mph average travel speed for local collectors.

c. Values are at 100 feet from roadway centerline.

d. Assumes a sound attenuation rate of 4.5 dB per doubling of distance with all distances measured from the roadway centerline.

Figure 5-2

Typical Noise Levels Versus Speed and Volume
(Urban Arterial)

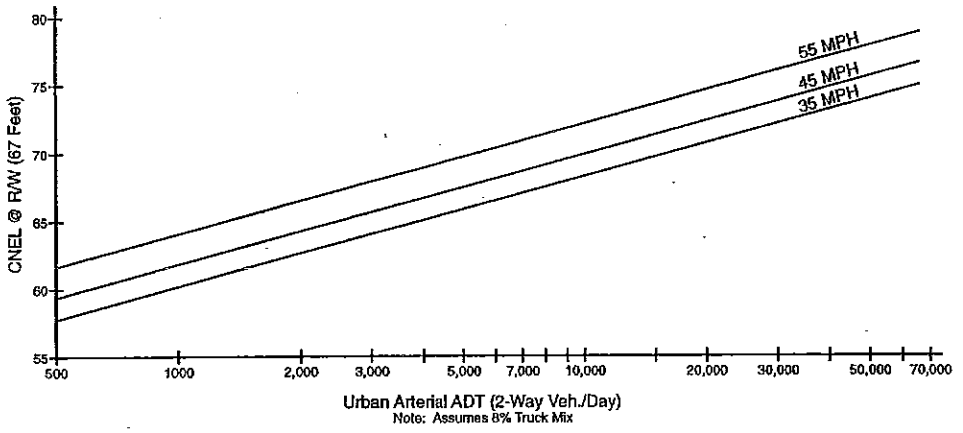


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Figure 5-1

Desert Hot Springs Design Noise Levels
(Assumes 8% Truck Mix)

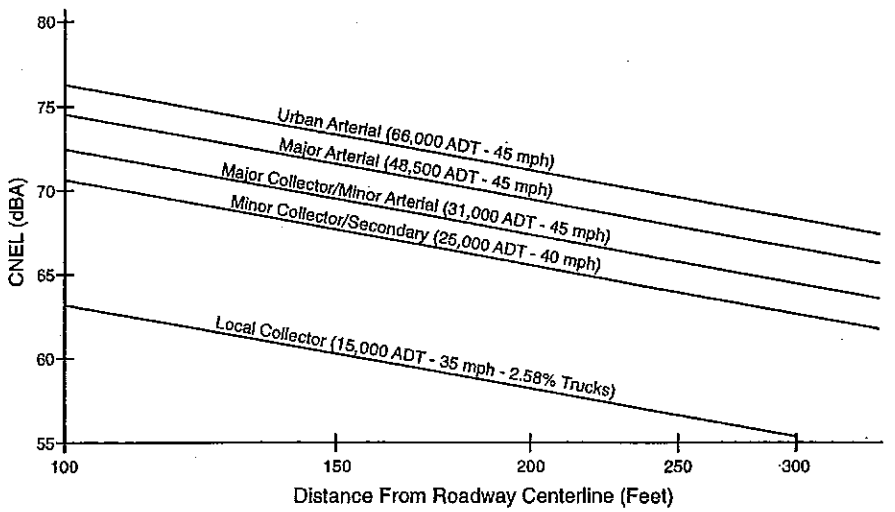

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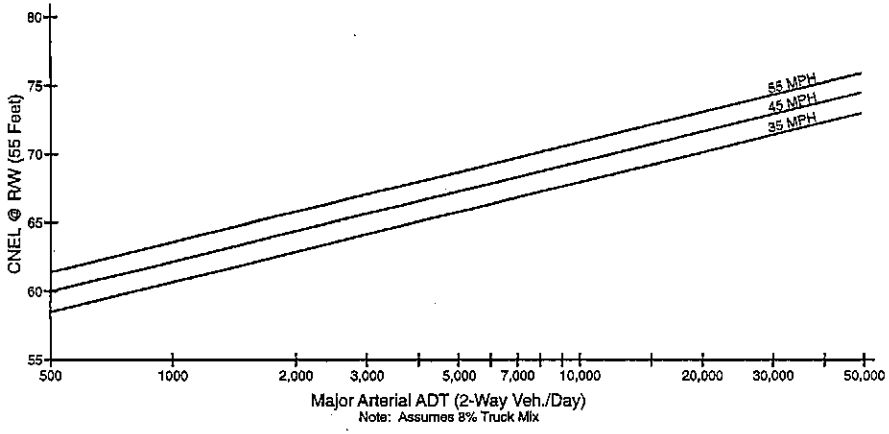
Figure 5-3

Typical Noise Levels
Versus Speed and Volume



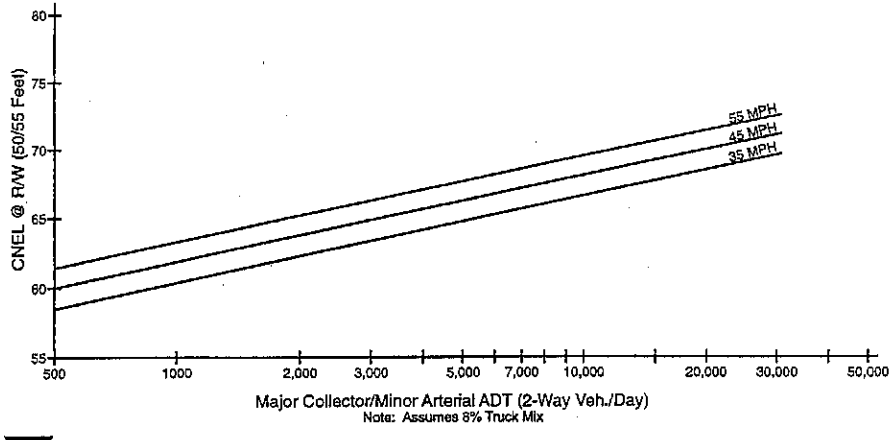


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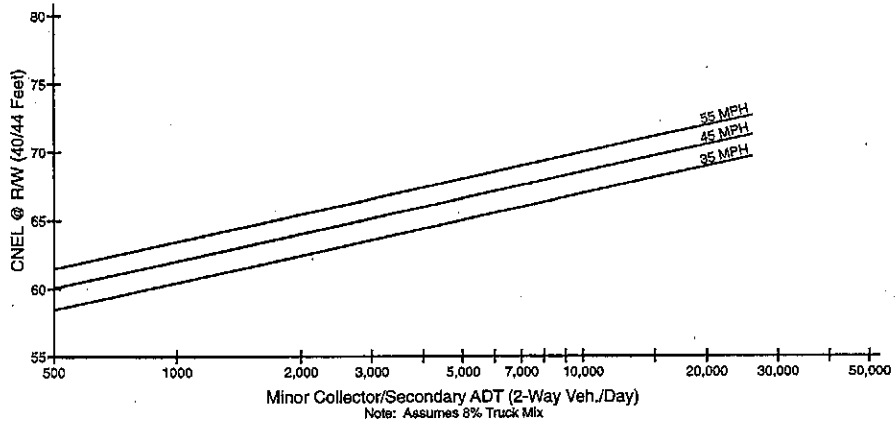
Figure 5-4

Typical Noise Levels
Versus Speed and Volume



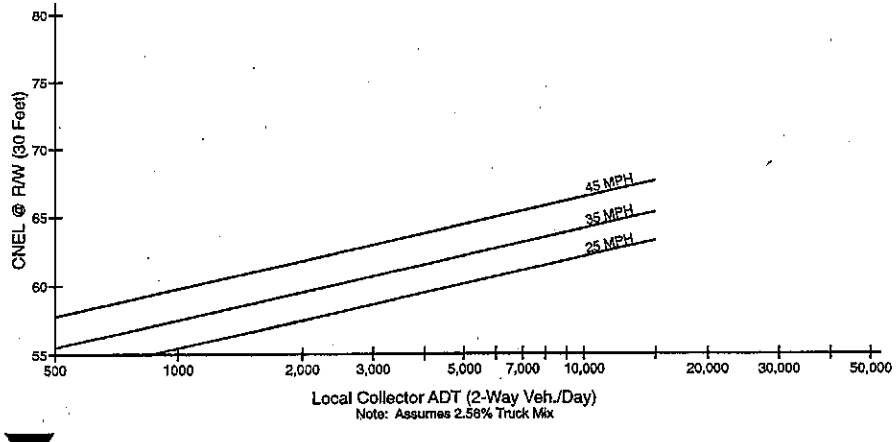


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Figure 5-6

Typical Noise Levels Versus Truck Mix and Volume

(Major Arterial and Major Collector/Minor Arterial)

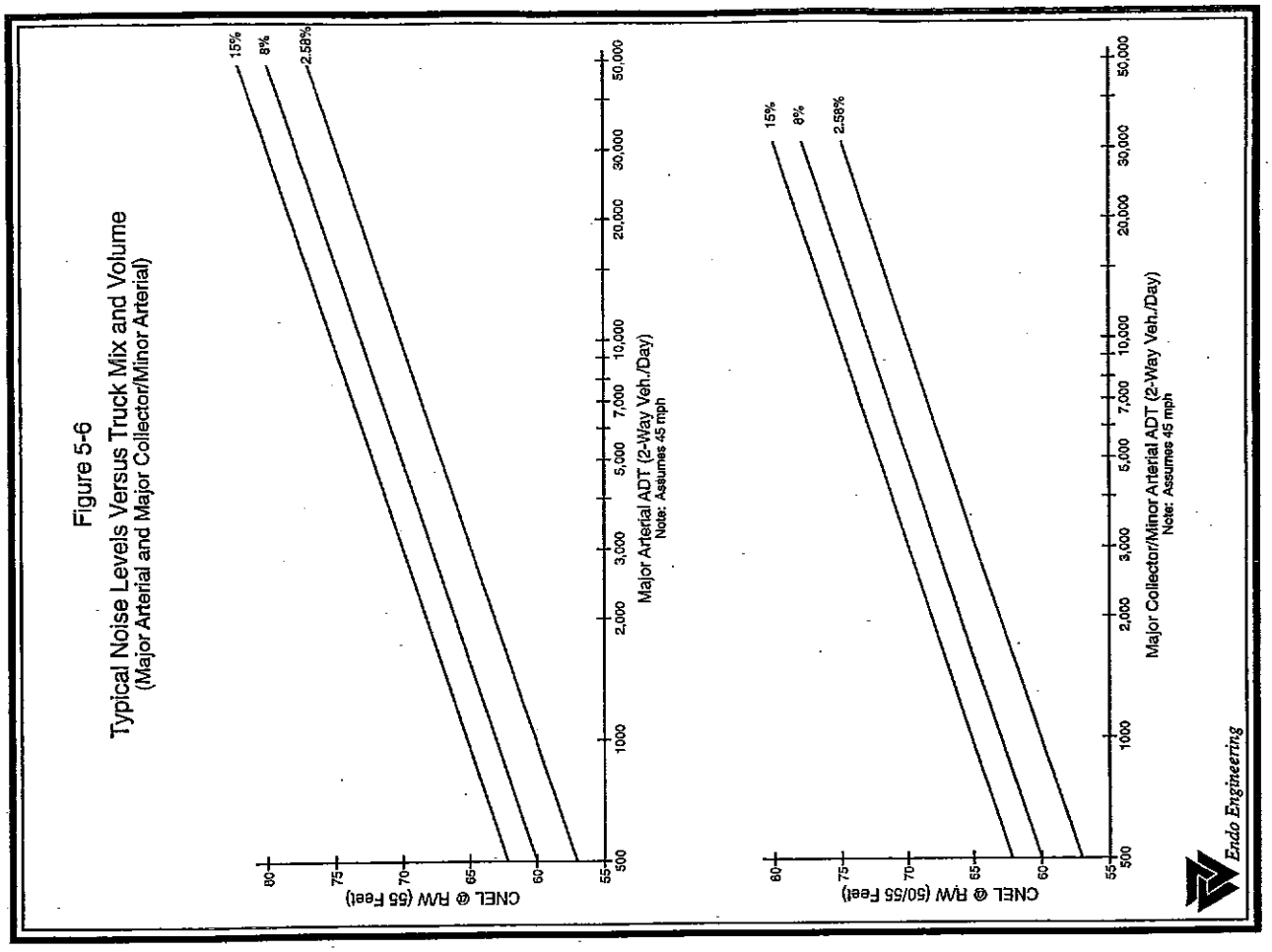

Figure 5-5

Typical Noise Levels Versus Truck Mix and Volume

(Urban Arterial)

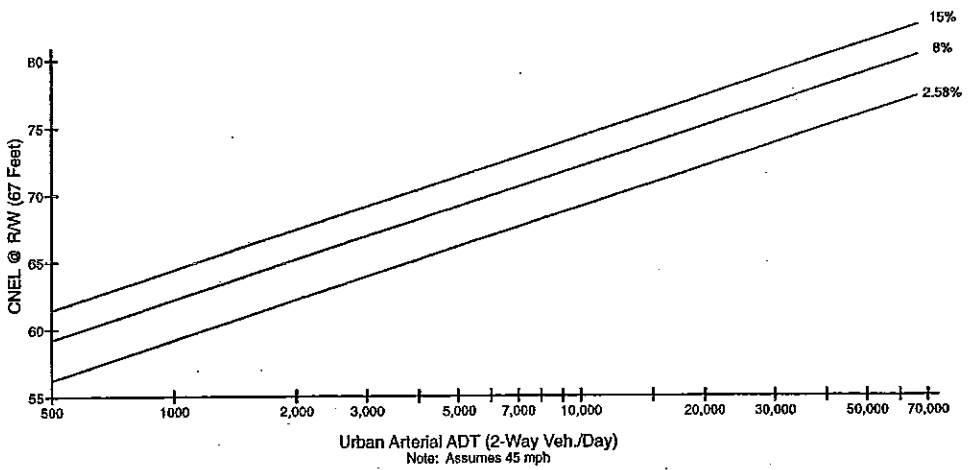

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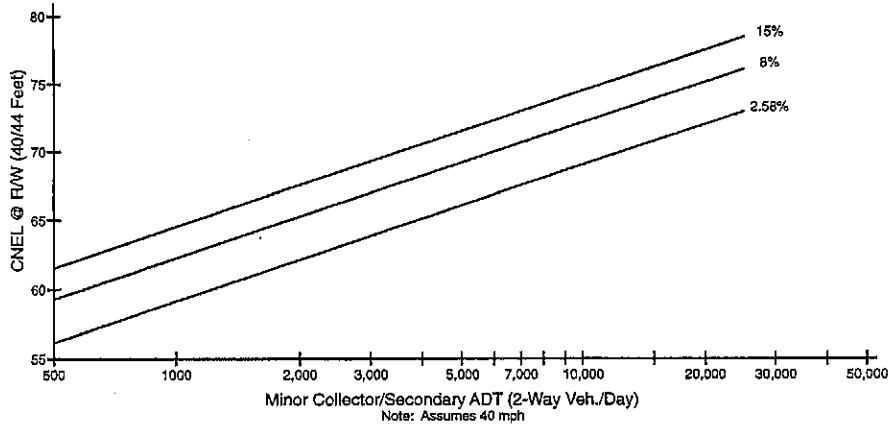
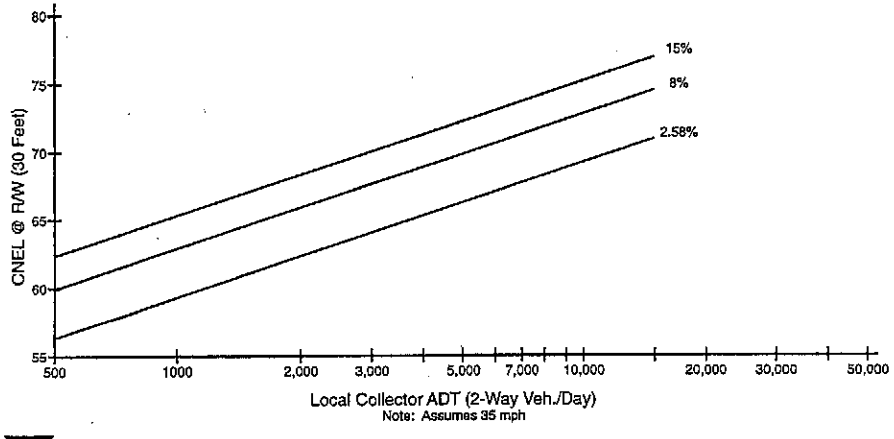
Figure 5-7

Typical Noise Levels Versus Truck Mix and Volume
(Minor Collector/Secondary and Local Collector)





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6.0 NOISE ATTENUATION PRINCIPLES

Control over environmental noise can be exercised either at the point of noise origination or at the point of noise reception. That is, either the source of the noise can be quieted, or those who are exposed to the noise can be shielded in some manner.

Reducing noise at its source is clearly the more desirable of these two approaches since it places the cost of noise mitigation upon those who are responsible for its generation. However, federal and state preemptive legislation limits the ability of local governments to directly regulate major noise sources. Therefore, local government efforts to achieve noise compatibility in land use must concentrate on indirect noise source control, measures designed to insulate noise-sensitive uses from noise sources, and regulations affecting the use or location of noise sources.

6.1 NOISE CONTROL AT THE SOURCE

6.1.1 Motor Vehicle Noise

The California Vehicle Code contains noise limits applicable to new vehicles at the time of manufacture and noise regulations pertaining to the operation of all vehicles on public roads. Evidence of compliance with the new vehicle standards is required before a vehicle can be registered. Operational limitations include quantitative noise standards, requirements that vehicle muffler systems be maintained in good repair, and prohibitions against modifying exhaust systems to create more noise than a stock system.

Other methods for reducing motor vehicle noise include enforcing use of truck routes, reducing vehicle speeds, and regulating traffic flow. Routing heavy trucks away from residential or other noise-sensitive areas and onto roads where fewer or less significant impacts would result can be a very effective solution to high traffic noise levels.

Table 6-1 illustrates the effect of reducing truck traffic for four-lane roadway segments with average vehicle speeds of 35 and 55 miles per hour. For example, a change from 10 to 5 percent truck traffic traveling at 35 mph will reduce overall highway noise by about 1.5 dB. The values in Table 6-1 are additive so that a change from 10% to 0% at 35 mph yields a 4.5 (1.5 + 3.0) dB reduction in traffic noise.

Table 6-1
Traffic Noise Versus Truck Mix[a]

Change in Truck Percentage		Reduction in Noise Level (Leq or Ldn) in dB	
From	To	35 mph	55 mph
10%	5%	1.5	1.0
5%	0%	3.0	2.0

Notes: a. Source: "Santa Barbara County Comprehensive Plan Noise Element", Revised February 11, 1986.

Traffic noise can also be reduced by limiting vehicle speed.[1] Table 6-2 shows how traffic noise levels would drop if lower speed limits were enforced. Tables 6-1 and 6-2 can be used together to determine the change in traffic noise that would result from both a change in truck percentage and vehicle speed.

Accelerating and decelerating traffic produces noise levels as much as 7 to 15 dB higher than an equivalent volume of traffic moving at constant speed. Minimization of stop-and-go traffic on local roads, by using synchronized signals at intersections for example, is an effective method to reduce motor vehicle noise at its source.

Table 6-2
Traffic Noise Versus Speed[a]

Change in Vehicle Speed (mph) From	To	Reduction in Noise Level (Leq or Ldn) in dB 0% Trucks	5% Trucks	10% Trucks
65	55	2.0	1.0	1.0
65	45	4.0	1.5	2.0
55	45	2.0	1.0	1.0
55	35	3.5	2.5	2.0
45	35	1.5	1.5	1.0

Notes: a. Source: "Santa Barbara County Comprehensive Plan Noise Element", Revised February 11, 1986.

The noise levels adjacent to roadways increase by 3.0 dBA with each doubling in the traffic volume (provided that the speed and truck mix do not change). From the mathematical expression relating increases in the number of noise sources (motor vehicles) to the increase in the adjacent noise level, it can be shown that a 26 percent increase in the traffic volume will cause a 1.0 dBA increase in adjacent noise levels. Doubling the number of vehicles on a given route increases the adjacent noise levels by 3.0 dBA.

One step removed from controlling motor vehicle noise directly at its source is the abatement of traffic noise in the planning and design of roads. The methods of abatement that are available include route selection, acquisition of extra right-of-way width to act as a buffer, depression of the roadway, and the use of noise barriers.

At the time new major roadways are planned, the route selection process should consider the noise sensitivity of lands through which the road will pass. Increasing the distance between the roadway and sensitive receptors such as schools, churches and residential areas will reduce the transmission of noise to these sensitive land uses. Acquiring wider rights-of-way will accomplish the same purpose; however, this alternative is relatively inefficient due to the distances required to achieve acceptable noise levels.

1. U.S. Department of Transportation, "Transportation Noise and Its Control", (Washington, D.C.: USGPO) 1972.

Noise levels from "line sources" such as highways typically decrease by 4.5 decibels per doubling of distance. Therefore, a noise level of 74.5 dB at 50 feet from a roadway centerline would attenuate to 70.0 dB at 100 feet and 65.5 dB at 200 feet.

In some cases, horizontal adjustments in alignment may be appropriate in order to take advantage of shielding by natural terrain. Depressing the roadway below the level of sideline terrain can produce a dramatic change in traffic noise radiation. A roadway depressed 20 feet below adjacent land may provide up to an 11 dB reduction in adjacent noise levels over an equivalent roadway at grade, but only beyond about 100 feet from the roadway (where vehicles will be completely screened from view).[2] As one approaches the roadway, the advantage of a depressed cross section diminishes because vehicles will come within direct line-of-sight of positions near the crest of the slope.

Acoustic barriers placed between the roadway and sensitive receptors are often the only method available to limit traffic noise propagation along uninterrupted stretches of road. Acoustic barriers can interfere with the path of sound waves. To be effective, a barrier must be high enough and long enough to at least block the line-of-sight to the vehicle noise source. A tall noise barrier (11 feet or more) is often needed to attenuate noise from heavy trucks, since truck exhaust stacks are often 10 feet or more above the ground.

The effectiveness of the barrier is influenced by the geometry of the source-barrier-receiver relationship. Very often, moving the barrier closer to the source blocks the line-of-sight and increases the barriers effectiveness. The barrier must be quite massive and must be impervious to air flow. Airborne sound travels readily through any opening and this can severely reduce the effectiveness of any barrier. For this reason wood fencing is virtually ineffective as a noise shield. Table 6-3 shows potential noise reduction values for several types of barriers.

Table 6-3
Noise Barrier Attenuation[a]

Barrier Type	Minimum Requirements	Noise Reduction
Earth Berm	Berm must be high enough to block the line-of-sight between source and receiver.	Up to 15 dB
Block Walls	Block walls must be high enough to block line-of-sight. Walls must be long enough to prevent noise from going around the ends of the structure.	Up to 15 dB
Trees and Shrubs	Trees and shrubs must be dense vegetation and at least 100 feet in depth.	3 to 5 dB

Notes: a. Source: City of Signal Hill "General Plan Noise Element", Revised February 7, 1986.

2. Beaton, John L. and Bourget, Louis, "Can Noise Radiation from Highways be Reduced by Design?", State of California, Transportation Agency, Department of Public Works, Division of Highways, Materials and Research Department, Sacramento, 1968.

Earth berms have noise reduction properties comparable to vertical walls which are used as barriers. They have additional advantages in that berms can be landscaped so that they are visually more attractive than a vertical barrier of equivalent height. Instead of reflecting noise from one side of the highway to the other (as walls may) and thus increasing the noise heard on the opposite side, berms tend to deflect sound upwards.

Berms have a disadvantage in the amount of land area needed to create a barrier of sufficient height to block the noise path. For example, a berm 12 feet high with 2 to 1 side slopes would have to be at least 48 feet in cross-section at its base. Using a lower berm with a wall on top is a better alternative from a cost effectiveness perspective.

Plantings in a buffer strip have some capability to absorb and scatter sound waves. However, their effectiveness is quite limited unless the planted area is very wide (100 feet or more) and the trees, shrubs, and ground cover are very dense. It has been suggested that the principal effect of landscaping is psychological. By blocking the view of the noise source, plantings can reduce annoyance and complaints about noise. The fact that people cannot see the highway can reduce their awareness of it even though the noise remains.

6.1.2 Commercial/Industrial Noise

Controlling noise from a commercial or industrial use is best accomplished at the time the facility is designed. Often, the site layout and building design can be arranged to reduce noise transmission from the commercial or industrial property. Opportunities may also exist when the physical plant is being extensively remodeled or when the use of an existing facility is being changed. Design and operational considerations include:

- Location of traffic access points, loading areas, parking lots, and solid waste collection areas.
- Enclosing or baffling machinery which must be placed outdoors.
- Using structures as noise barriers.
- Erecting solid walls around the perimeter of the site.
- Restricting use of loudspeaker paging systems or replacing them with radio or visual paging systems.
- Increasing the distance between the industrial "point source" and sensitive receptors. In an area relatively flat and free of barriers, the sound level resulting from a single "point source" drops off by 6 decibels for each doubling of distance or 20 decibels for each factor of ten in distance.

Noise from construction sites represents a special type of industrial noise. Since construction noise is temporary, people are usually more tolerant of it than permanent noise-producing installations. While acoustic "curtains" can be used around some stationary equipment, abatement is difficult because most construction activities cannot be enclosed. A reasonable way to limit construction noise impacts is to regulate the time of day when construction activities may occur. Curfews on evening, nighttime, and early morning work, exempting emergency work, can be imposed as a condition of project approval. Operational considerations related to construction noise include:

- Construction activities will take place only on the hours specified in the Desert Hot Springs City Noise Ordinance to reduce noise impacts during more sensitive time periods.

- All construction equipment, fixed or mobile, operated within 1000 feet of a dwelling shall be equipped with properly operating and maintained muffler exhaust systems.
- Project phasing includes initial development adjacent to residential areas which then shields them from noise generated during subsequent phases;
- Stationary equipment shall be placed such that emitted noise is directed away from sensitive noise receivers such as residential areas.
- Stockpiling and vehicle staging areas shall be located as far as practical from occupied dwellings.
- Every effort should be made to create the greatest distance between noise sources and receptors during construction.
- The noisiest construction operations should be arrange to occur together in the construction program to avoid continuing periods of greater annoyance.

6.1.3 Noise Sources Operated By Desert Hot Springs

The public works activities of the City involve use of some stationary mechanical equipment producing high noise levels. It would be desirable to establish a program for acquisition of quieter equipment when new or replacement equipment must be purchased. In soliciting bids to purchase equipment, the City should ask suppliers to provide information on equipment noise emission characteristics. In evaluating the cost-efficiency of quieter products, consideration should be given to where and how the equipment will be used. Buying a quieter, but more expensive device may not be beneficial if it is to be used only in a remote location where few people will be affected.

Where the City awards contracts with private firms for construction and maintenance projects and for services, the opportunity exists to encourage contractors to use lower noise emission equipment. Contractors and firms submitting contract proposals could be informed that noise control is a matter of City policy and that positive action on the part of contractors to minimize noise impacts will be expected.

6.2 Noise Control at the Receiver

The control of noise at the receiver primarily focuses on isolating noise-sensitive activities from noise sources. Methods for noise control at receptors include: locating less sensitive uses within the 60 dB CNEL, planning site layouts to mitigate or block noise transmission, incorporating design and construction techniques to insulate individual noise-sensitive buildings and redevelopment of existing noise-impacted areas with noise-compatible land uses.

An example of noise-mitigating site design includes effective site planning by locating less sensitive parking areas closest to the noise source. In addition, a structure can be used to shield the remaining buildings and outdoor living areas from noise intrusion. Incorporating noise insulation into noise-sensitive land uses can also be very effective.

Limiting the height of a structure can eliminate a direct noise transmission path from the source to the receiver. This can be a very effective means of noise control, particularly in areas where extensive variations in topography occur.

Noise mitigation actions at the receiver can include any of the methods listed below:

- **Acoustical Site Plan**
  - Increase the distance from noise source to receiver.
  - Minimize wall surfaces that are oriented directly toward noise source.
  - Cluster noise-sensitive development.

- **Acoustical Architectural Design**
  - Minimize window area oriented toward the noise source.
  - Reduce window-to-wall percentages (window area to wall size).
  - Locate noise-sensitive rooms away from the noise source.
  - Locate balconies on the sides of homes that are opposite the noise source.

- **Acoustical Construction**
  - Construct walls with greater sound insulation capabilities.
  - Provide air conditioning, thus lessening the need to open windows for cool ventilation.
  - Increase thickness of glass on windows.
  - Install double-glazed windows.
  - Install fixed-pane windows.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

The major sources of noise in Desert Hot Springs are transportation-related activities. Automobiles, trucks, buses and motorcycles all increase ambient noise levels. As shown in Table 4-1, 28 percent of the master planned roadway segments in Desert Hot Springs (12 links) currently generate noise levels at 100 feet that fall below 60 CNEL. Another 44 percent of the master planned roadway segments that exist today in Desert Hot Springs (19 links) currently generate noise levels at 100 feet that fall between 60 and 65 CNEL. Nineteen percent of the master planned roadway segments (8 links) currently generate noise levels at 100 feet that fall between 65 and 70 CNEL. The remaining 19 percent (4 links) generate noise levels between 70 and 75 CNEL.

As the population in Desert Hot Springs increases in the future, the use of various transportation modes will increase. Traffic generated by land uses within Desert Hot Springs is projected to increase dramatically by the time general Plan buildout occurs. Traffic volumes will increase gradually over many years, and the increase in ambient noise levels that results will also occur gradually.

Table 5-2 details the number of master planned roadway links that are projected to fall within various noise level ranges upon General Plan buildout. As shown therein, most of the master planned roadway segments in the future planning area (Figure 1-3) are projected to generate noise levels at 100 feet that fall between 65 and 75 CNEL. Upon General Plan buildout, only 10 to 12 percent of the roadway links modeled are expected to generate noise levels at 100 feet that are below 65 CNEL. Although no roadway links within the Desert Hot Springs City Limits currently generate noise levels at 100 feet that exceed 75 CNEL, 12 to 15 percent of the links within the future planning area are projected to do so.

The most significant differences in future noise levels between the General Plan alternatives will occur in the vicinity of: (1) Mission Lakes Boulevard (east of Palm Drive); and (2) Miracle Hill Road (south of Hacienda Avenue). The Preferred General Plan would generate the highest noise levels along Mission Lakes Boulevard (61.9 CNEL at 100 feet). The Adopted General Plan would generate the highest noise level adjacent to Miracle Hill Road (65.9 CNEL at 100 feet).

The Adopted General Plan would generate clearly audible noise increases along only one of the roadway links modeled and potentially audible noise increases along four of the links modeled, compared to the Preferred General Plan. The Adopted General Plan would cause clearly audible noise decreases along one of the roadway segments and potentially audible noise decreases along ten of the links evaluated, compared to the Preferred General Plan.

Alternative 3 would generate the most roadway noise. Alternative 3 would result in the highest number of roadway links generating buildout noise levels above 70 CNEL. This alternative would also have the smallest number of roadway links with noise levels below 65 CNEL.

Alternative 4 would generate the lowest roadway noise levels. This alternative would result in the lowest number of roadway links generating buildout noise levels above 70 CNEL and the largest number of roadway links with noise levels below 65 CNEL.

7.2 RECOMMENDATIONS

Since site specific development details are not known at the General Plan level of analysis, noise impacts should be evaluated on a project-by-project basis. Detailed noise studies should be required as part of the Development Review Process or as a condition of project approval, when there is the potential for significant noise impacts, to ensure that future developments are in conformance with the Noise Element of the Desert Hot Springs General Plan. In particular, noise sensitive land uses proposed in the vicinity of State Highway 62, Interstate 10, Palm Drive, Indian Avenue, and other arterials carrying significant traffic volumes should consider noise attenuation strategies early in the design process to ensure conformance with City noise policies.

Construction of noise sensitive land uses will only be allowed if it is demonstrated with a noise study that the exterior and interior noise environment will be mitigated to achieve the noise standards in the General Plan. Building setbacks and noise barriers should be considered and employed where appropriate in conjunction with specific development proposals.

To foster consistency between noise studies and ensure that a comprehensive analysis is undertaken to minimize the potential for future noise impacts on noise sensitive receptors, Desert Hot Springs should develop and adopt recommended minimum requirements for noise impact studies related to future development within the City.

Appendices

A. Noise Element Requirements
B. Glossary of Technical Terms
C. FHWA Noise Model Input Parameters
D. Noise Measurement System and Procedure

Appendix A

Noise Element Requirements

Appendix A
Noise Element Requirements

Section 65302(f) of the California Government Code requires the general plan to:

> *"identify and appraise noise problems in the community. The noise element shall recognize the guidelines established by the Office of Noise Control in the State Department of Health Services and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:*
>
> *(1) Highways and freeways.*
> *(2) Primary arterials and major local streets.*
> *(3) Passenger and freight on-line railroad operations and ground rapid transit systems.*
> *(4) Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.*
> *(5) Local industrial plants, including but not limited to, railroad classification yards.*
> *(6) Other ground stationary noise sources identified by local agencies as contributing to the community noise environment.*
>
> *Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive.*
>
> *The noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise.*
>
> *The noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards."* [1]

This report in conjunction with the proposed General Plan Update goals, policies and implementation measures fulfills the above requirements by providing information on the fundamentals of noise; current federal, state, and local regulations regarding noise; significant sources of noise; current noise levels; and techniques available to minimize exposure. The information in this report has been presented and analyzed in accordance with the Noise Element Guidelines prepared by the State Department of Health Services.

1. State of California, "Government Code", Section 65302 (f), Revised November 1990.

Appendix B

Glossary

Appendix B - Glossary

A-Weighted Sound Level (dBA) -- An A-weighted sound level is the sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and provides good correlation with subjective reactions to noise.

Ambient Noise Level -- The composite noise from all sources near and far is the ambient noise level. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Amplitude -- The amplitude of a sound is a measure of the pressure or force that sound can exert. Subjectively, we say a sound is louder if it has a larger amplitude than another sound. Thus, the amplitude of sounds can be described either in measurable magnitude or in relative terms of loudness.

Community Noise Equivalent Level (CNEL) -- CNEL is the average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels occurring during the evening from 7 p.m. to 10 p.m. and addition of ten decibels to sound levels occurring during the night from 10 p.m. to 7 a.m. The 5 and 10 decibel penalties are applied to account for increased noise sensitivity during the evening and nighttime hours. The CNEL represents the daily energy noise exposure averaged on an annual basis. The State of California uses the dBA CNEL noise index to relate community noise exposure to compatibility criteria.

CNEL -- See Community Noise Equivalent Level.

Day-Night Average Noise Level (Ldn) -- The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of 10 decibels to sound levels occurring during the nighttime from 10 p.m. to 7 a.m. The 10-decibel penalty is applied to account for increased noise sensitivity during the nighttime hours. The Ldn represents the daily energy noise exposure averaged on an annual basis and is typically within 1 dBA of the CNEL value.

dB -- See Decibel.

dBA -- See A-Weighted Sound Level.

Decibel (dB) -- A decibel is a unit of measurement on a logarithmic scale which describes the magnitude of a particular quantity of sound pressure or power with respect to a standard reference value. A decibel is equal to 10 times the logarithm (to the base 10) of the ratio of the measured sound pressure squared to a reference pressure (i.e., 20 micro-pascals) squared.

EIR -- Environmental Impact Report.

EPA -- Environmental Protection Agency.

Equivalent Sound Level (Leq) -- An Leq is the sound level corresponding to a steady state sound level containing the same total energy as a time varying sound level over a given sample period.

FHWA -- Federal Highway Administration.

Frequency (Hz) -- The frequency is the number of times per second that a sound pressure signal oscillates about the prevailing atmosphere. The unit of frequency is the hertz.

Habitable Room -- A habitable room is defined as any room meeting the requirements of the Uniform Building Code or other applicable regulations that is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms and similar spaces.

HUD -- United States Department of Housing and Urban Development.

Hz -- A unit of measurement of frequency, numerically equal to cycles per second (See Frequency).

Intrusive Noise -- That noise exceeding the existing ambient noise at a given location is termed an intrusive noise. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence and tonal or informational content, as well as prevailing ambient noise level.

Leq -- See Equivalent Sound Level.

Ldn -- See Day-Night Average Noise Level.

Line Source -- A noise source which generates sound along a line rather than at a single fixed point.

L Percentile -- L percentiles represent the A-weighted sound level exceeded for the identified percent of the sample time. For example, a value of 55 dBA L_{10} would mean that 55 dBA was exceeded 10 percent of the time. Other L percentiles commonly used include L_{50}, L_{90}, L_{99}, etc. The L_{50} corresponds to the average level of noise. The L_{10} corresponds to peaks of noise in the time history of environmental noise.

Noise -- Noise is any unwanted sound, or sound that is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "excessive undesirable sound".

Noise Attenuation -- Noise attenuation is the ability of a material substance, or medium to reduce the noise level from one place to another or between one room and another. Noise attenuation is specified in decibels.

Noise Contours -- The lines drawn around a noise source indicating constant or equal level of noise exposure from that source are termed noise contours. CNEL and Ldn are typical standards used for comparison.

Noise Sensitive Land Use -- Noise-sensitive land uses are land uses associated with indoor and/or outdoor human activities that may be subject to stress and/or significant interference from noise. They include residential (single-family and multi-family dwellings, mobile home parks, dormitories and similar uses); transient lodging (including hotels, motels and similar uses); hospitals, nursing homes, convalescent hospitals and other facilities for long-term medical care; and public or private educational facilities, libraries, churches and places of public assembly.

Noise Referral Zones -- Noise referral zones are defined as the area within the contour defining a Ldn level exceeding 60 decibels. It is the level at which either State or Federal laws and standards related to land use become important and, in some cases, superseded local laws and regulations. Any proposed noise sensitive development which may be impacted by a total noise environment of 60 dBA Ldn or more will be evaluated on a project specific basis.

Noise Zones -- Noise zones are areas or regions of a community wherein the noise levels are generally similar (within a range of 5 dBA). Locations within a noise zone would be approximately equal distances from noise sources, within similar noise contours, and would be exposed to similar levels of noise.

Outdoor Living Area -- Outdoor living area is a term used to define spaces that are associated with residential land uses and are typically used for passive recreational activities. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. Outdoor areas usually not included in this definition are front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses.

Point Source -- A stationary device which creates sounds while fixed or motionless.

Sound Level Meter -- A sound level meter is an instrument, including a microphone, amplifier and output meter, and frequency weighting networks for the measurement and determination of sound levels.

SEL -- Sound Exposure Level (Virtually the same as Single Event Noise Exposure Level)

Single Event Noise Exposure Level (SENEL) -- The noise level from a single event integrated over the time period the sound level exceeds the screening threshold value.

Ozone is formed through chemical reactions of reactive organic gases (ROG), oxides of nitrogen (NOx) and oxygen in the presence of sunlight. Peak ozone concentrations tend to occur in the South Coast Air Basin (SCAB) near the middle of the day in summer and early fall, when the solar radiation exposure of the air mass is the greatest, because the reactions that form ozone begin at sunrise and require sunlight to proceed.

The observed ozone concentration at a specific location is affected by the following parameters:

- the concentrations of ozone precursors (NOx and ROG);
- the ratio of precursor concentrations (amount of ROG versus NOx present, with NOx being the critical component);
- the spatial and temporal distribution of emissions; and
- meterological conditions (hot weather with lots of sunlight and strong temperature inversions).

The prevailing marine air currents throughout the SCAB typically carry polluted air inland as ozone-forming photochemical reactions proceed. That is why peak ozone concentrations in the SCAB are found in the inland valleys and adjacent mountains (between the San Fernando Valley and the Riverside-San Bernardino area), miles downwind of the largest concentrations of sources of precursor emissions. Far fewer ozone standard exceedances occur in the coastal, far inland, or desert areas than in Glendora, Fontana and Crestline.

Just as oxidant precursors from the coastal Los Angeles area aggravate oxidant problems inland at Riverside, precursor emissions from the central and eastern areas of the SCAB contribute to locally produced oxidant in the Coachella Valley. Although the extent to which the intrusion of ozone contributes to Coachella Valley ozone exceedances has not been documented numerically, "...it is ARB's judgement that oxidant problems in the Southeast Desert would be minimal if oxidants and oxidant precursors were effectively controlled in the South Coast Air Basin."[2]

The role of local emissions in the formation of oxidants in the Coachella Valley is difficult to quantify. Locally produced oxidant undoubtedly accounts for some standard exceedances. However, tracer studies and other recent studies of ozone levels by location, hour of day, day of week, etc. indicate that an oxidant cloud caused directly by transport from the SCAB causes exceedances in Palm Springs as late as 8 pm, when local photochemical activity has slowed. In addition, transported NOx and ROG left over from the previous day have been identified as major contributors to ozone concentrations at downwind desert locations.[3]

The air quality in the study area is a function of the primary pollutants emitted locally, the existing regional ambient air quality, and the meteorological and topographical factors that influence the intrusion of pollutants into the area from sources outside the immediate vicinity. Ozone and ozone precursors transported from the South Coast Air Basin across the mountain ranges and through the desert passes may be responsible for the occurrence of high ozone concentrations in the SEDAB.

2. SCAQMD and SCAG, *Air Quality Management Plan - Southeast Desert Air Basin, Riverside County* Preliminary Draft, October 1979.
3. SCAQMD and SCAG, *Air Quality Management Plan - Southeast Desert Air Basin, Riverside County* Preliminary Draft, October 1979.

There are three principle routes through the southern California mountains which border the SEDAB where pollutants may be transported. These mountain passes include Soledad Canyon (near Palmdale), Cajon Pass (near Victorville), and San Gorgonio Pass (near Palm Springs). The wind frequently flows through these mountain passes and transports photochemical smog into the SEDAB.[4]

Regional Climate and Meteorology

The extent and severity of the air pollution problem in the SCAB is a function of its natural physical characteristics (weather and topography) as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall and topography all affect the accumulation and dispersion of pollutants throughout the basin. The interrelationships of these variables with the type and location of pollution generated in the basin are complex and variable.

The SCAB is comprised of a coastal plain with connecting broad valleys and hills that is bounded by the mountains and the Pacific Ocean. It lies in the semi-permanent high pressure zone of the eastern Pacific. The climate is controlled largely by the strength and location of the sub-tropical high pressure cell over the Pacific Ocean. The region has a Mediterranean climate with moderate temperatures (warm summers and mild winters), comfortable humidities, and precipitation limited to the short winter "rainy" season.

The land/sea breeze is the primary factor affecting the region's mild climate. The daytime winds are predominantly onshore sea breezes from the northwest which flow at relatively low velocities. The sea breezes exhibit velocities below 15 miles per hour (mph) approximately 96 percent of the time, and below 4 mph about half of the time, with an average velocity of 5 to 7 mph. During the night, the winds usually slow and reverse direction, traveling toward the sea. These land breezes flow from the southeast at 1 to 2 miles per hour.[5]

During the fall and winter months the basin is subject to moderate and strong Santa Ana winds. These dry warm northerly and northeasterly winds typically last for several days and exhibit velocities which exceed 40 mph at times.

During the spring and early summer, most of the air pollutants emitted daily are moved out of the basin through mountain passes, or lifted by warm vertical air currents produced by the heating of mountain slopes. In this manner, the basin is cleansed by the natural transport of ocean air inland. However, between June and September, lighter wind speeds, a shallow vertical mixing layer, and the earlier appearance of off-shore drainage winds all combine to reduce the dispersion of air pollution vertically and horizontally.

Throughout the SCAB, the vertical dispersion of air pollutants is restricted by the presence of a persistent temperature inversion near the surface (when temperature increases with altitude) that reduces the mixing height. Elevated inversions restrict vertical mixing and trap air pollutants within the mixing layer above the basin. On hot summer days, the inversion layer often remains, trapping pollutants in a limited mixing area until middle or late afternoon (when the inversion layer lifts, erodes, or surface winds are sufficient to disperse the pollutants horizontally). These inversions are partially responsible for the high concentrations of ozone that occur during summer months in the air basin.

4. California Air Resources Board, *The Impact Of Transport From The South Coast Air Basin On Ozone Levels In The Southeast Desert Air Basin*, 1983.
5. Source: SCAQMD, "Air Quality Handbook"; April 1987.

Ground-based radiation inversions are more severe during clear cold early winter mornings. When ground based inversions persist, very little mixing or turbulence occurs and high concentrations of primary pollutants result near roadways and other pollutant sources. Winter inversions frequently weaken and erode by mid-morning, thereby preventing the accumulation of contaminants.

Regional Ambient Air Quality

Southern California, with the lowest summertime mean mixing height, the lowest average wind speed and emissions from the second largest urban area in the U.S., has the worst air pollution problem in the nation. During 1992, the SCAB recorded higher concentrations of ozone, carbon monoxide, nitrogen dioxide and PM10 than any other major urban area nationwide. In 1993, the federal standards were exceeded on 147 days, a decrease of 47 percent compared to conditions in 1976, when one or more of the federal standards were exceeded in the SCAB on 279 days.

Based upon 1992 data, the federal ambient air quality standards were exceeded more often in the SCAB than in any other area of the United States. Ozone causes most federal standard exceedances in the SCAB and Glendora led the nation with 118 days exceeding the federal ozone standard in 1992 and the highest recorded ozone concentration (0.30 ppm).

The Lynwood station recorded the highest carbon monoxide concentration (18.8 ppm) and the greatest number of exceedances (31 days) of the federal standard. The highest annual average PM10 concentration was recorded at Ontario (78.9 ug/cubic meter). The highest annual average NO2 concentration in the nation (0.0507 ppm) was recorded in Pomona.

The SCAB has been designated a non-attainment area because of violations of the national ambient air quality standards for carbon monoxide, nitrogen dioxide, total suspended particulates and photochemical oxidants. All metropolitan areas of the basin contribute to the oxidant levels experienced in the downwind areas, which peak in summer and early fall when the solar radiation exposure of the air mass is the greatest.

2.3 Local Air Quality

Local Climate and Meteorology

The study area is located in the Coachella Valley, an arid desert region with a climate characterized by low annual rainfall, low humidity, hot days and very cool nights. The climatological station closest to the project site is located in Palm Springs.

The annual precipitation monitored during 1992 in Palm Springs was 8.47 inches, which was 3.27 inches above the average annual rainfall total normalized over the past 42 years. The monthly average temperature ranged from a low of 52.6 degrees Fahrenheit during December to a high of 93.0 degrees Fahrenheit in August. Temperature extremes have ranged from 26 to 118 degrees Fahrenheit.[6]

Wind direction and speed (which in turn affect atmospheric stability) are the most important climatological elements affecting the ambient air quality within the study area. As shown in Figure 2-2, the prevailing wind direction in the SEDAB is predominantly from the northwest.

6. NOAA, *Climatological Data Annual Summary*, 1992.

The annual mean wind speed is 7.6 miles per hour. Calm conditions occur 13.6 percent of the time in Palm Springs. Since the dominant daytime onshore wind pattern follows the peak travel period (6:00 am - 9:00 am) in the Los Angeles/Orange County area, during periods of low inversions and low wind speeds, the photochemical smog formed in these areas is transported downwind into Riverside County, San Bernardino County and the Coachella Valley.

Peak oxidant levels occur in the late afternoon and evening (between 4 pm and 8 pm), as pollutants are blown through the San Gorgonio Pass. Oxidant concentrations in the 50-mile long and 20-mile wide Coachella Valley are highest, closest to the South Coast Air Basin, and decrease steadily as the air mass moves east from Banning to Palm Springs and then Indio.

The mountain ranges to the west (San Jacinto and Santa Rosa) and to the north (San Bernardino) form a physical and climatological barrier between the Southeast Desert Air Basin and the South Coast Air Basin. Thus, inversion conditions are less favorable in the study area than in the coastal areas of Southern California.

Inversion conditions are associated with degraded air quality because the surface air is prevented from rising and dissipating the air pollutants that accumulate throughout the day. Surface-based inversions in the SEDAB are prevalent at night throughout the year and usually persist into the day during the winter months.

Four key elements are required to specify the meteorological conditions affecting the transport and dispersion of air pollutants. These include the wind direction, wind speed, atmospheric stability, and mixing height. Although regional meteorological conditions (such as temperature inversions, Santa Ana wind conditions, etc.) will dominate local conditions, wind direction, wind speed, and localized turbulence generated by local topographical conditions can play a key role in determining the ambient air quality within the study area.

Desert regions are generally windy because minimal friction is generated between the moving air and the low, sparse vegetation. This allows the wind to maintain its speed crossing the desert plains. In addition, the rapid daytime heating of the air closest to the desert surface leads to convective activity and the exchange of surface air for upper air which accelerates surface winds during the warm part of the day. Rapid cooling at night in the surface layers during the winter months results in a high frequency of calm winds.[7]

Radiation inversions are prevalent at night throughout the year. They limit the mixing in the lower atmosphere to a height of 200 to 2,000 feet. They persist through much of the day in winter but are destroyed early in the day in summer.

Local Air Quality

The South Coast Air Quality Management District maintains ambient air quality monitoring stations at numerous locations throughout the basin (see Figure 2-1). The project site is located within Source Receptor Area (SRA) 30. The SRA 30 monitoring stations are located in the City of Palm Springs and the City of Indio. The monitoring station in the City of Palm Springs records the most representative conditions. The 1991 through 1993 ambient air quality data (which is included in the Appendix) indicates that only ozone and PM10 have exceeded the relevant state and federal standards.

7. CARB, *Climate of the Southeast Desert Air Basin*, January, 1990.

Ozone

The City of Desert Hot Springs is located within the Coachella-San Jacinto Planning Area, a sub-region of the Southeast Desert Air Basin which often receives pollutant transport from the South Coast Air Basin. Poor ozone air quality in this area is due primarily to transport of both ozone and its precursor emissions from the upwind source region of the South Coast Air Basin.

Ozone air quality trends since 1976 for the South Air Basin and the Coachella-San Jacinto Planning Area indicate a parallel downward trend in the number of days exceeding the federal 1-hour ozone standard, despite the fact that population growth in the Coachella-San Jacinto Planning Area was much greater than in the South Coast Air Basin. Between 1980 and 1990, the population grew in the South Coast Air Basin by an average of 2.2 percent per year, compared to a 5.2 percent per year population growth rate in the Coachella-San Jacinto Planning Area.[8]

The Coachella-San Jacinto Planning Area is designated as a severe-17 federal nonattainment area for ozone. This designation indicates that the attainment date for the federal ozone standards is November 15, 2007 (17 years from the date of enactment of the federal Clean Air Act).

Figure 2-3 depicts the number of days from 1991 through 1993 exceeding the one-hour state ozone standard as well as the maximum hourly ozone concentrations at both stations. Ozone levels exceeded the state one-hour standard (0.09 ppm) on twenty-one percent of the days monitored in Palm Springs and eleven percent of the days monitored in Indio. The maximum one-hour ozone concentration measured was 0.18 parts per million (ppm). This is 50 percent greater than the federal standard and twice the level set as the state standard. The federal one-hour ozone standard (>.12 ppm) was exceeded on six percent of the days at Palm Springs and two percent of the days in Indio. No ozone episodes were declared at either air monitoring station during the past three years.

Inhalable Particulate Matter (PM10)

The Coachella Valley has been designated by the Environmental Protection Agency (EPA) as a Group I nonattainment area for PM10, which means that the valley has a 95 percent chance of violating federal health-based standards for particulate matter. PM10 in this area comes mostly from locally generated fugitive dust produced by both human activities (on-road and off-road vehicles and construction activities) and natural occurrences (wind storms). The highest concentrations are found in the summer, when hot dry weather produces more dust.

Figure 2-4 depicts the percentage of PM10 samples exceeding the state 24-hour standard from 1991 through 1993 as well as the maximum 24-hour PM10 concentrations at both stations. Between 1991 and 1993, PM10 exceeded the California 24-hour standard during eleven percent of the monitoring periods at the Palm Springs station. The maximum 24-hour PM10 concentration monitored at the Palm Springs station was 197 micrograms per cubic meter (nearly four times the state standard). In Indio, PM10 exceeded the California 24-hour standard of 50 micrograms per cubic meter during forty-five percent of the monitoring periods between 1991 and 1993. The maximum 24-hour PM10 concentration monitored at the Indio station was 340 micrograms per cubic meter (more than six times the state standard).

8. SCAQMD, 1994 AQMP Appendix I-B "Air Quality Management Plan for the Coachella-San Jacinto Planning Area, May 1994.

In addition to the air quality data provided by the local air monitoring stations, the SCAQMD has estimated the amount and source of "fugitive dust" PM10 emissions. Fugitive dust is particulate matter emitted from an open "area source" such as: agricultural tilling; building construction activity; and vehicular traffic on paved and unpaved roads. Sources of particulate matter such as manufacturing, mineral processing and electric power generation are "ducted sources" involving air quality equipment that is issued permits by the SCAQMD rather than "area sources".

Table 2-2 below characterizes the open sources of fugitive dust PM10 emissions, in 1987 and in the year 2010. As shown therein, natural/unspecified sources comprised over 65 percent of the open area source PM10 emissions in 1987, followed by paved roads at 14 percent, and construction at 10 percent. By the year 2010, this situation is projected to change dramatically and the primary open area source category is projected to be construction at more than 59 percent.

Table 2-2
PM10 Area Source Emissions[a]
Riverside County - SEDAB

Source Category	Baseline Year 1987 (Tons/Day)	Year 2010 (Tons/Day)
Farming Operations	0.3	0.5
Construction	12.1	157.4
Paved Roads	16.1	5.2
Unpaved Roads	9.0	18.7
Waste Disposal	2.7	7.2
Natural/Unspecified	77.8	77.8
Total	118.0	266.8

a. SCAQMD, *AQMP Draft Technical Report III-F Inventory of PM10 Emission*, December 1990.

Nitrogen Dioxide

The federal annual average nitrogen dioxide standard was not exceeded at the Palm Springs station between 1991 and 1993. Similarly, the state 1-hour nitrogen dioxide standard was not exceeded in Palm Springs and NO_2 was not monitored in Indio. The maximum 1-hour NO_2 concentration was 0.15 ppm, which was 60 percent of the standard value. NO_2 was not monitored in Indio.

Carbon Monoxide

The state and national 8-hour carbon monoxide (CO) standards were not exceeded at the Palm Springs station. There were no exceedances of either the state or federal one-hour CO standard (>20 ppm, and >35 ppm respectively) in Palm Springs. The highest maximum CO concentrations measured during the last three years were 6 ppm (1-hour average) and 2.5 ppm (8-hour average). Carbon monoxide was not monitored in Indio.

Other Criteria Pollutants

Sulfur dioxide and lead are not monitored in SRA 30 because they are not considered significant local pollutants. If these pollutants become a concern to the SCAQMD or the California Air Resources Board (CARB) in the future, ambient air quality data will be collected for them.

Existing Sensitive Receptors

Land uses considered by the SCAQMD to be sensitive receptors include the following:

- residences,
- schools,
- playgrounds,
- child care centers,
- athletic facilities.
- long-term health care facilities,
- rehabilitation centers,
- convalescent centers,
- retirement homes, and

If these receptors are located adjacent to a freeway or major intersection, carbon monoxide "hot spots" may occur during times of peak use. High levels of carbon monoxide are also associated with traffic congestion, and with idling or slow-moving vehicles, depending on the background CO concentration. Therefore, projects that could negatively impact levels of service at major intersections with nearby sensitive receptors must quantify and, if necessary, mitigate potential impacts.

Figure 2-5 identifies and locates the receptors that are sensitive to air quality within Desert Hot Springs. Residential developments exist adjacent to numerous intersections within the City of Desert Hot Springs. To evaluate the potential for a CO "hot spot" at these intersections that could affect pedestrians, they were modelled with the California Line Source Dispersion Model (CALINE 4) developed by Caltrans. The results are presented below.

Local Sources of Air Contaminants

Existing Carbon Monoxide Concentrations

Given the number of vehicles at key intersections, appropriate CO emission factors, local meteorology, site geometry and site characteristics, carbon monoxide concentrations can be projected through CALINE 4 computer modeling of intersections located within the study area. Figure 2-6 shows the intersections analyzed.

Because of the relative inertness of carbon monoxide in the photochemical smog formation process (and limitations of knowledge on dispersion characteristics of other air pollutant species) carbon monoxide is the most suitable tracer pollutant for microscale modeling. NOx and HC were not considered because they are unstable and undergo changes to become secondary pollutants; therefore, the roadway's contribution to these pollutant concentrations cannot be accurately assessed.

Nitric oxide (NO) concentrations can be predicted but there is no ambient air quality standard for NO. Nitrogen dioxide (which is the major constituent of NOx) is not directly predictable from conventional non-reactive models. Similarly, an accurate method to determine a roadway's contribution to local levels of SOx and particulate matter is not yet available. Secondary pollutants are a large-scale phenomenon, and should be analyzed on a regional basis rather than a local one.

As shown in Table 2-3, the 1-hour carbon monoxide concentrations (including background concentrations from Palm Springs monitoring data) are currently below the relevant state and national 1-hour carbon monoxide standards. The largest hourly CO concentration 7.5 ppm (1.5 ppm + 6.0 ppm) is expected at 50 feet from the centerline of Palm Drive at Two Bunch Palms Trail. Similarly, this intersection generates the highest 8-hour CO concentrations in the City of Desert Hot Springs (3.3 ppm).

Table 2-3
Existing Carbon Monoxide Concentrations[a]
Adjacent to Key Intersections

Receptor Distances[b] (Feet)	1-Hour Average (ppm) 50[c]	100	200	8-Hour Average (ppm) 50[c]	100	200
Indian Avenue @						
- Mission Lakes Blvd.	0.5	0.3	0.2	0.3	0.2	0.1
Pierson Boulevard @						
- State Route 62	0.9	0.4	0.3	0.5	0.2	0.2
- Indian Avenue	0.5	0.3	0.2	0.3	0.2	0.1
- Little Morongo Road	0.5	0.2	0.2	0.3	0.1	0.1
- West Drive	0.5	0.3	0.2	0.3	0.2	0.1
Palm Drive @						
- Pierson Boulevard	1.1	0.6	0.4	0.6	0.3	0.2
- Hacienda Avenue	1.4	0.7	0.4	0.7	0.4	0.2
- Two Bunch Palms Trail	1.5	0.7	0.5	0.8	0.4	0.3
Hacienda Avenue @						
- Miracle Hill Road	0.4	0.2	0.2	0.2	0.1	0.1
- Mountain View Road	0.5	0.3	0.2	0.3	0.2	0.1
Background CO Concentration[d]	6.0	6.0	6.0	2.5	2.5	2.5
State CO Standard	20	20	20	9.0	9.0	9.0
Federal CO Standard	35	35	35	9.0	9.0	9.0

a. See the Appendix for assumptions and input parameters.
b. Receptor distances are measured from the roadway centerline.
c. This receptor may be located within the roadway right-of-way.
d. Source: CARB, "California Air Quality Data", highest measured value between 1991 and 1993 at the Palm Springs monitoring station.

The comparison of the projected carbon monoxide levels shown in Table 2-3 with state and federal standards indicates the significance of the projected concentrations. Carbon monoxide concentrations adjacent to the intersections modeled are below the current 20 ppm state standard and the 35 ppm federal standard (1-hour average) at all intersections analyzed. Similarly, the state and federal 8-hour carbon monoxide standards (9.0 ppm) are not exceeded at these intersections.

Blowsand Hazard

As shown in Figure 2-7, the project is located within the active blowsand zone of the Coachella Valley Association of Governments (CVAG) "Blowsand Hazard Zone".[9] This zone is defined as ".. all land, by nature of its location or soil characteristics subject to real or potential sand accumulation and/or abrasion, or land which may cause sand damage to adjacent property."

Blowsand is the most severe form of wind erosion, occurring when barren sand or sandy loam soils are exposed to high winds, in the absence of moisture. Blowsand can cause significant property damage and expensive clean-up procedures. It contributes to high suspended particulate levels and associated respiratory problems for sensitive receptors.

Blowsand reduction measures will most likely be required within the City of Desert Hot Springs. Controlling the blowsand problem is intended: (1) to protect the health, safety and general welfare of future residents of the proposed development; (2) to provide for the protection of adjacent property owners who are subject to soil erosion and/or soil accumulation resulting from development activities within the study area; and (3) to minimize the public cost of removing accumulated sand on public roads. Vegetative planting has been the most effective method of direct blowsand control and protection. Other possible methods include: walls, screens, fences, ground covers, soil stabilizers, and watering techniques.

2.4 Regulatory Setting

Federal Clean Air Act Requirements

Section 110 of the federal Clean Air Act (CCA) requires that each State adopt a plan which provides for implementation, maintenance and enforcement of the primary and secondary national air quality standards in that state. That requirement is met by the State Implementation Plan (SIP).

As a severe-17 nonattainment area, the Coachella-San Jacinto Planning Area must demonstrate reasonable further progress and attainment of the national ozone standards according to the provisions of the 1990 federal Clean Air Act. The 1990 federal Clean Air Act requires the Coachella-San Jacinto Planning Area to:

- identify specific emission reduction goals;
- demonstrate reasonable further progress in VOC emissions;
- demonstrate attainment of the federal ozone standard by November 15, 2007; and
- provide contingency measures or actions in the event of a failure to attain or to meet interim milestones.

The federal Clean Air Act (CAA) requires VOC emission reductions of at least 15% by the year 1996 (compared to 1990 VOC emissions) in the Coachella-San Jacinto Planning Area. This requirement will be extremely difficult to meet in the Coachella-San Jacinto Planning Area because of the rapid population growth projected for this area between 1990 and 1996. All increases in VOC emissions caused by growth will need to be fully offset in order to meet both the federal Clean Air Act and the California Clean Air Act requirements. According to the Southern California Association of Governments, by the year 2010,

9. CVAG, *Final SIP for PM10 in the Coachella Valley*; November 1990.

population in the Coachella-San Jacinto Planning Area is projected to more than double (from 231,331 in 1990 to 497,299 in the year 2010).

The CAA also requires that each serious ozone nonattainment area achieve actual VOC emission reductions of at least 3% per year (averaged over each consecutive 3-year period beginning in 1997 until November 15, 2007). Milestone years for VOC emission reductions in this planning area are 1996, 1999, 2002, 2005 and 2007.

The California Clean Air Act

The California Clean Air Act (CCAA) was amended in 1992 and establishes a legal mandate to achieve health-based state air quality standards at the earliest practicable date that is generally more stringent than the federal CAA. The CCAA divides nonattainment areas into categories based upon the pollutant concentrations therein, with progressively more stringent requirements as the concentrations increase.

The two project sites are located in the Coachella Valley, which is an extreme nonattainment area for ozone (based upon the state 1-hour ozone standard) and also nonattainment for PM_{10} (based upon the 24-hour and annual PM_{10} standards). The ozone standard exceedance is attributed to pollutant transport from the South Coast Air Basin (SCAB). Since the SCAB is a non-attainment area for carbon monoxide, nitrogen dioxide, ozone and PM_{10}, the Coachella Valley may only be able to attain the ozone standard after the SCAB reduces emissions of ozone precursors (VOCs and NOx).

Like the federal CAA, the California Clean Air Act requirements on control strategy development include a rate-of-progress requirement that specifies reductions in pollutants contributing to nonattainment by 5% per year. An average vehicle ridership (AVR) requirement of 1.5 persons per average commuter vehicle by 1999 is included in the CCAA. A substantial decrease in VMT growth and vehicle trips is specified in the CCAA so that no net increase in mobile source emissions occurs after 1997.

Air Quality Management Plan

It is the responsibility of the South Coast Air Quality Management District (SCAQMD) to lead the regional effort to attain the state and national AAQS. The SCAQMD is charged with developing and implementing the AQMP and reducing emissions from industries, some mobile sources, and consumer products.

The *Air Quality Management Plan* (AQMP) for the SCAB was originally adopted in 1979. Subsequent revisions, as required by both state and federal Clean Air Acts, have occurred since that time. The currently adopted revision is the *1991 Air Quality Management Plan*, (adopted by the District Board in July of 1991). The purpose of the 1991 AQMP was to set forth a comprehensive program to lead the SCAB and SEDAB portions of Los Angeles and Riverside Counties into compliance with all national and state air quality standards.

The 1994 revision of the AQMP was released for public review on April 25, 1994 and is scheduled for adoption in late 1994. It includes additional control measures to bring the basin into compliance with the state PM_{10} and ozone standards. The 1994 AQMP must be submitted to the U.S. Environmental Protection Agency (EPA) by November 15, 1994 as required by the federal Clean Air Act. The state Clean Air Act requires that the AQMP be updated every 3 years. Consequently, it must be submitted to the California Air Resources Board (CARB) by December 31, 1994.

The draft 1994 AQMP addresses the following federal Clean Air Act requirements for all nonattainment areas within the SCAQMD's jurisdiction:[10]

- updated 1990 emission inventories for CO, VOCs, NOx, SOx and PM10;
- revised demonstration of 15% reduction in VOC emissions by 1996 to meet rate-of-progress requirements;
- post-1996 VOC rate-of-progress requirements;
- an overall control strategy that meets federal Reasonably Available Control Measures (RACM) and Reasonably Available Control Technology (RACT) requirements;
- Transportation Control Measures;
- attainment demonstration for ozone including contingency measures;
- revised attainment demonstrations for CO and NO_2 including contingency measures; and
- Best Available Control Measures for PM10.

The 1994 *Air Quality Management Plan* (AQMP) addresses the State Implementation Plan requirements under Title I of the federal Clean Air Act while acknowledging that attainment of the national ozone standard in the Coachella-San Jacinto Planning Area is only possible with substantial emission reductions in the South Coast Air Basin. The 1994 AQMP proposes an aggressive control strategy for VOC and NOx emission sources in the South Coast Air Basin as well as control of locally generated emissions via proposed control measures implemented by state and federal actions. The 1994 AQMP concludes that: (1) a control strategy that concentrates on South Coast Air Basin sources is sufficient to demonstrate attainment in the Coachella-San Jacinto Planning Area; and (2) control of local VOC and NOx emissions will have little effect on ozone exceedances in the planning area.

A comparison of the 1990 emission inventories for the South Coast Air Basin and the Coachella-San Jacinto Planning Area (Table 2-4) reveals why aggressive control of VOC and NOx emissions within the South Coast Air Basin is the most effective control strategy for ozone attainment in the Coachella-San Jacinto Planning Area. Locally generated emissions are overwhelmed by upwind emissions generated within the South Coast Air Basin. The South Coast Air Basin emissions of VOC and NOx are nearly 30 times those in the Coachella-San Jacinto Planning Area. Improved air quality in the Coachella-San Jacinto Planning Area clearly depends on reduced emissions in the South Coast Air Basin.

Table 2-4
1990 Regional Emission Inventory Comparison[a]

Area	Emission Rate (Tons/Day) CO	VOC	NOx	SOx	PM10
South Coast Air Basin	6200	1400	1200	120	1100
Coachella-San Jacinto Planning Area	260	48	43	2.2	358

a. Source: SCAQMD, 1994 AQMP Appendix I-B, May 1994.

10. The SCAB and those portions of the Southeast Desert Nonattainment Area (Antelope Valley and Coachella-San Jacinto Planning Area) are nonattainment areas within the SCAQMD's jurisdiction.

Photochemical modeling undertaken by the SCAQMD has demonstrated that the federal one-hour ozone standard will be met by November 15, 2007 in the Coachella-San Jacinto Planning Area, as required by the federal Clean Air Act. The 1995 AQMP control strategy provides sufficient VOC emission reductions to meet the post-1996 rate of progress requirements for the 1999 and 2007 milestone years but falls short in the 2002 and 2005 milestone years. The SCAQMD intends to request a waiver to the post-1996 rate of progress requirements for the Coachella-San Jacinto Planning Area.

Because local government provides the primary focus of land use and growth management decisions, no air quality management plan can succeed without the active participation of local government. Most of the control measures relating to local government are in the areas of trip reduction, energy conservation, and dust control. The Tier I control strategies (full implementation of known control strategies and management practices) from the currently adopted 1991 AQMP that should be considered for adoption by local governments are listed in the Appendix.

Consistent with the need to reduce emissions from mobile sources, many control measures identified focus on alternatives to current transportation strategies. Ridesharing, carpooling, flexible work schedules, parking management and the acquisition of clean-fueled fleet vehicles are a few of the transportation control measures to be considered for adoption by the City of Desert Hot Springs. Also included are measures which call upon local jurisdictions to develop more efficient management programs for solid waste including: (1) recycling programs; (2) energy conservation programs; and (3) programs to reduce fugitive dust emissions. Nearly all of the measures call for the adoption of ordinances within the next five years to implement control programs.

The AQMP control measures will reduce emissions by:

- Maximizing reductions in the use of pollutant-emitting materials;
- Maximizing the substitution of non-polluting or less-polluting materials;
- Maximizing the use of the most efficient pollution control devices;
- Maximizing the compliance and maintenance programs for fugitive dust emissions;
- Maximizing the efficiency of the transportation infrastructure to provide less polluting forms of transportation;
- Maximizing the effectiveness of existing measures through improved administrative practices; and
- Maximizing strong public and private commitments for the required implementation actions.

State Implementation Plan for PM10 in the Coachella Valley

The SCAQMD'S *Final November 1990 State Implementation Plan (SIP) for PM10 in the Coachella Valley* addresses the EPA'S non-attainment particulate designation for the Coachella Valley and the control measures required to meet state and federal PM10 standards (50 ug/m^3 annual average and 150 ug/m^3 24-hour average, respectively) by 1995, as shown in the Appendix. Large-scale blowsand events, which can produce high levels of PM10 through natural processes, are not targeted for control. This SIP focuses on man-made dust producing activities and the reduction of blowsand intrusion into populated areas.

The implementation and monitoring program of the SIP is dependent on the SCAQMD, CVAG and local governments. Local governments (e.g. the City of Desert Hot Springs) are asked to develop ordinances, monitor progress, and create a County Service Area (CSA) or similar funding mechanism to implement the SIP. Specific actions that local governments will implement are summarized as follows:

- Include PM_{10} analysis and mitigation measures in the CEQA review for new projects;
- Adopt an ordinance addressing emissions from construction activities;
- Adopt an ordinance specifying supplemental development standards for new and existing uses;
- Initiate a clean streets management program;
- Initiate a tree (windbreaks) planting program;
- Adopt an ordinance addressing emissions from agricultural activities; and
- Create a CSA or other similar mechanism to fund implementation of the SIP.

SCAQMD Rules and Regulations

The SCAQMD is responsible for controlling stationary air pollution sources. Therefore, its *Rules and Regulations* address a wide variety of industrial and commercial operations and require operational controls on many processes. In 1992, Rule 403 was amended to tighten controls on blowing dust from construction sites, landfills, open pit mines and other operations. This Rule 403 amendment was projected to reduce PM_{10} emissions in the Coachella Valley by 22 tons per day.

Regulation XV (Rule 1501) requires employers of 100 or more at a single worksite to develop innovative ways to reduce employee trips, both through transportation alternatives (like carpools, vanpools and bicycle facilities) and other techniques (such as 4-day work weeks, telecommuting and subsidizing public transit options) and submit Trip Reduction Plans to the SCAQMD. Rule 1502 defines the term "worksite" as "... a building, or grouping of buildings...which are in actual physical contact or separated solely by a private or public roadway or other private or public right-of-way, and which are owned and operated by the same employer (or by employers under common control)."

A Regulation XV task force has been formed to consider modifications to Regulation XV by exploring alternate and more cost-effective vehicle pollution strategies that are consistent with state and federal mandates. Public workshops are currently being held with the goal of conducting a final adoption hearing before the SCAQMD Governing Board before the end of 1994.

City of Desert Hot Springs General Plan and Municipal Code

The City of Desert Hot Springs has the opportunity as part of their General Plan update procedure to prepare a series of goals, objectives, policies, and implementation programs related to air quality. An Air Quality Element would allow the City to formulate policies such that the level of growth described in the Land Use Element and the demand for mobility served by the Circulation Element can be accommodated in a manner that is consistent with the air quality standards of regional, state and federal agencies.

In addition to policies related to land use, circulation, construction practices and fugitive dust, the City can adopt a TDM Ordinance that applies to new (or change of use) non-residential developments employing 100 or more persons and requires approval of a TDM Plan for new developments to achieve a specified vehicle occupancy rate through strategies

such as: alternate work schedules, telecommuting, bicycle facilities, shuttles, vanpools, etc..

Each TDM plan would demonstrate how a given development will reduce the number of trips and increase the amount of non-vehicular transportation. The TDM plan may specify: (1) capital improvements for inclusion in the site development plans (such as provisions for transit facilities, bicycle facilities and rideshare facilities); or (2) operational standards that must be implemented by the employer to achieve the goals (alternate work schedules, flextime, telecommuting, shuttles, preferential parking for carpools, on-site amenities like restaurants and automated teller machines that reduce the need for additional trips etc.).

Ambient Air Quality Standards

	California		Federal		
Air Pollutant	Concentration	District Method	Primary (>)	Secondary (>)	Method [a]
Ozone	0.09 ppm, 1-hr. avg. >*	U.V. photometry	0.12 ppm, 1-hr. avg.	0.12 ppm, 1-hr. avg.	Chemiluminesence
Carbon Monoxide	9.0 ppm, 8-hr. avg. > [b] 20 ppm, 1-hr. avg. >	Non-dispersive Infra-red Spectrophotometry	9 ppm, 8-hr. avg. [e] 35 ppm, 1-hr. avg.	9 ppm, 8-hr. avg. 35 ppm, 1-hr. avg.	Non-dispersive Infra-red Spectrophotometry
Nitrogen Dioxide	0.25 ppm, 1-hr. avg. > [g]	Gas Phase Chemilluminescence	0.053 ppm, ann. avg. [f]	0.053 ppm, ann. avg. [f]	Gas Phase Chemiluminesence
Sulfur Dioxide	0.04 ppm, 24-hr. avg. > 0.25 ppm, 1-hr. avg. >	Ultraviolet Fluoresence	0.03 ppm, ann. avg. 0.14 ppm, 24-hr. avg.	0.50 ppm, 3-hr. avg.	Para-rosaniline
Suspended Particulate Matter (PM10)	30 ug/m^3, ann. geometric mean > 50 ug/m^3, 24-hr. avg. > d)**	Size Segregated Inlet High Volume Sampling	50 ug/m^3, annual [h] arithmetic mean 150 ug/m^3, 24-hr. avg.	50 ug/m^3, annual [h] arithmetic mean 150 ug/m^3, 24-hr. avg.	
Sulfates	25 ug/m^3, 24-hr. avg. >=	High Vol. Sampling Methylthymol Blue			
Lead	1.5 ug/m^3, 30-day avg. >=	High Vol. Sampling Methylthymol Blue	1.5 ug/m^3, calendar quarter	1.5 ug/m^3, calendar quarter	High Volume Sampling Atomic Absorption
Hydrogen Sulfide	0.03 ppm, 1-hr. avg. >=	Cadmium Hydroxide Stractan			
Vinyl Chloride	0.010 ppm, 24-hr. avg. >=	Gas Chromatography			
Visibility Reducing Particles	In sufficient amount to reduce the prevailing visibility to less than 10 miles at relative humidity less than 70%,1 obs.				

a) Reference method as described by the federal government. An equivalent method of measurement may be used as approved by the federal government.
b) Effective December 15, 1982. The standards were previously 10 ppm, (12-hour average) and 40 ppm, (1-hour average).
c) Effective October 5, 1984. The standard was previously .5 ppm, (1-hour average).
d) Effective August 19, 1983. The standards were previously 60 ug/m^3 TSP, (annual geometric mean), and 100 ug/m^3 TSP, (24-hour average).
e) Effective September 13, 1985, standard changed from > 10 ug/m^3 (>= 9.3 ppm) to > 9 ppm (>= 9.5 ppm).
f) Effective July 1, 1985, standard changed from > 100 ug/m^3 (> .0532 ppm) to > .053 ppm (> .0534 ppm).
g) Effective March 9, 1987, standard changed from >= .25 ppm to > .25 ppm.
h) Effective July 1, 1987. The standards were previously: Primary - Annual geometric mean TSP > 75 ug/m^3, and 24-hour average TSP > 260 ug/m^3. Secondary - Annual geometric mean TSP > 60 ug/m^3, and 24-hour average TSP > 150 ug/m^3.

* ppm = parts per million per volume
** ug/m^3 = micrograms per cubic meter.

Source: SCAQMD, Draft 1994 Air Quality Management Plan

Appendix

Ambient Air Quality Standards
Episode Criteria
Ambient Air Quality Data
CALINE 4 Assumptions
1991 AQMP Tier I Control Measures
PM10 SIP Control Measures

CARB Air Quality Data for Palm Springs

Pollutant	1991	1992	1993	Max Value	%Exceeded
Carbon Monoxide					
Maximum 8-Hour Conc. (ppm)	2.5	[redacted]	2.0	2.5	-
Days 8-Hour Conc. ≥9.5 ppm (Federal)	0	[redacted]	0	-	0
Days 8-Hour Conc. ≥9.1 ppm (State)	0	[redacted]	0	-	0
Maximum 1-Hour Conc. (ppm)	5	[redacted]	6	6	-
Days 1-Hour Conc. >20 ppm (State)	0	[redacted]	0	-	0
Days of Data	365	[redacted]	365	-	-
Ozone					
Maximum 1-Hour Conc. (ppm)	0.18	0.15	0.17	0.18	-
Days 1-Hour Conc. >0.12 ppm (Federal)	22	21	20	-	6
Days 1-Hour Conc. >0.09 ppm (State)	72	69	79	-	21
Days of Data	365	341	364	-	-
Nitrogen Dioxide					
AAM Conc. (ppm) (Federal)	0.0208	[redacted]	0.0195	0.021	-
% >0.0534 ppm (Federal)	0	[redacted]	0	-	0
Maximum 1-Hour Conc. (ppm)	0.09	[redacted]	0.15	0.15	-
Days 1-Hour Conc. >0.25 ppm (State)	0	[redacted]	0	-	0
Days of Data	365	[redacted]	363	-	-
Sulfur Dioxide					
Maximum 1-Hour Conc. (ppm)	NM	NM	NM	NM	-
Days 1-Hour Conc. >0.14 ppm (Federal)	NM	NM	NM	-	NM
Days 1-Hour Conc. >0.25 ppm (State)	NM	NM	NM	-	NM
Maximum 24-Hour Conc. (ppm)	NM	NM	NM	NM	-
Days 24-Hour Conc. >0.05 ppm (State)	NM	NM	NM	-	NM
Days of Data	NM	NM	NM	-	-
Suspended Particulate Matter (PM10)					
Maximum 24-Hour Conc. (ug/m3)	197	175	58	197	-
24-Hour Samples >150 ug/m3 (Federal)	1	1	0	-	1
24-Hour Samples >50 ug/m3 (State)	14	4	1	-	11
AAM Conc. (ug/m3) (Federal)	42.9	29.6	27.0	42.9	-
Conc. >50 ug/m3 (Federal)	No	No	No	-	-
AGM Conc. (ug/m3) (State)	36.6	24.3	23.6	36.6	-
Conc. >30 ug/m3 (State)	Yes	No	No	-	-
Number of Samples	56	60	60	-	-
Sulfate-State					
Maximum 24-Hour Conc. (ug/m3)	NM	NM	NM	NM	-
% Samples 24-Hour Conc. >25.0 ug/m3	NM	NM	NM	-	NM
Visibility-State					
Days Not Meeting Standard	NM	NM	NM	NM	NM
Days of Data	NM	NM	NM	-	-

1. NM=Not Monitored. Italics=No. of days not given.
   Shading=Less than 12 full months of data. May not be representative.
2. Data prior to 1992 reflects state standard of visibility <10 miles for hours with relative humidity <70%.

Episode Criteria

Air Pollutant	SCAQMD and California			Federal		
	Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3
Ozone	0.20 ppm, 1-hr. avg.	0.35 ppm, 1-hr. avg.	0.50 ppm, 1-hr. avg.	-	-	0.50 ppm, 1-hr. avg.
Carbon Monoxide	40 ppm, 1-hr. avg. 20 ppm, 12-hr. avg.	75 ppm, 1-hr. avg. 35 ppm, 12-hr. avg.	100 ppm, 1-hr. avg. 50 ppm, 12-hr. avg.	15 ppm, 8-hr. avg.	30 ppm, 8-hr. avg.	40 ppm, 8-hr. avg.
Nitrogen Dioxide	-	-	-	0.60 ppm, 1-hr. avg. 0.15 ppm, 24-hr. avg.	1.20 ppm, 1-hr. avg. 0.30 ppm, 24-hr. avg.	1.60 ppm, 1-hr. avg. 0.40 ppm, 24-hr. avg.
Sulfur Dioxide	0.50 ppm, 1-hr. avg. 0.20 ppm, 24-hr. avg.	1.00 ppm, 1-hr. avg. 0.70 ppm, 24-hr. avg.	2.00 ppm, 1-hr. avg. 0.90 ppm, 24-hr. avg.	-	-	-
Sulfur Dioxide/ Particulate Matter Combined	-	-	-	65,000*, 24-hr. avg.	261,000*, 24-hr. avg.	393,000*, 24-hr. avg.
Particulate Matter	-	-	-	375 ug/m^3, 24-hr. avg.	625 ug/m^3, 24-hr. avg.	875 ug/m^3, 24-hr. avg.
Sulfates**	25 ug/m^3, 24-hr. avg. combined with ozone > 0.20 ppm, 1-hr. avg.			-	-	-
Actions to be taken	Health advisory to a) Persons with respiratory and coronary disease. b) School officials in order to curtail students' participation in strenuous activities. First steps in abatement plans.	Intermediate Stage. Abatement actions taken to reduce concentration of pollutant at issue.	Mandatory abatement measures. Extensive actions taken to prevent exposure at indicated levels. State can take action if local efforts failed.	Open burning prohibited. Reduction in vehicle operation requested. Industrial curtailment.	Incinerator use prohibited. Reduction in vehicle operation required. Further industrial curtailment.	Vehicle use prohibited. Industry shut down or curtailment. Public activities ceased.

* Product of sulfur dioxide (ppm), particulate matter (ug/m^3) and a factor (2620).
** Episodes based upon these criteria are not classified according to stages.

Source: SCAQMD, 1983

CARB Air Quality Data for Indio

Pollutant	1991	1992	1993	Max Value	%Exceeded
Carbon Monoxide					
Maximum 8-Hour Conc. (ppm)	NM	NM	NM	NM	-
Days 8-Hour Conc. ≥9.5 ppm (Federal)	NM	NM	NM	-	NM
Days 8-Hour Conc. ≥9.1 ppm (State)	NM	NM	NM	-	NM
Maximum 1-Hour Conc. (ppm)	NM	NM	NM	NM	-
Days 1-Hour Conc. >20 ppm (State)	NM	NM	NM	-	NM
Days of Data	NM	NM	NM	-	-
Ozone					
Maximum 1-Hour Conc. (ppm)	0.18	0.14	0.16	0.18	-
Days 1-Hour Conc. >0.12 ppm (Federal)	13	8	3	-	2
Days 1-Hour Conc. >0.09 ppm (State)	48	45	25	-	11
Days of Data	*365*	366	363	-	-
Nitrogen Dioxide					
AAM Conc. (ppm) (Federal)	NM	NM	NM	NM	-
% >0.0534 ppm (Federal)	NM	NM	NM	-	NM
Maximum 1-Hour Conc. (ppm)	NM	NM	NM	NM	-
Days 1-Hour Conc. >0.25 ppm (State)	NM	NM	NM	-	NM
Days of Data	NM	NM	NM	-	-
Sulfur Dioxide					
Maximum 1-Hour Conc. (ppm)	NM	NM	NM	NM	-
Days 1-Hour Conc. >0.14 ppm (Federal)	NM	NM	NM	-	NM
Days 1-Hour Conc. >0.25 ppm (State)	NM	NM	NM	-	NM
Maximum 24-Hour Conc. (ppm)	NM	NM	NM	NM	-
Days 24-Hour Conc. >0.05 ppm (State)	NM	NM	NM	-	NM
Days of Data	NM	NM	NM	-	-
Suspended Particulate Matter (PM10)					
Maximum 24-Hour Conc. (ug/m3)	340	117	125	340	-
24-Hour Samples >150 ug/m3 (Federal)	3	0	0	-	2
24-Hour Samples >50 ug/m3 (State)	37	18	25	-	45
AAM Conc. (ug/m3) (Federal)	69.0	43.4	46.4	69.0	-
Conc. >50 ug/m3 (Federal)	Yes	No	No	-	-
AGM Conc. (ug/m3) (State)	59.8	39.2	40.6	59.8	-
Conc. >30 ug/m3 (State)	Yes	Yes	Yes	-	-
Number of Samples	59	59	61	-	-
Sulfate-State					
Maximum 24-Hour Conc. (ug/m3)	NM	NM	NM	NM	-
% Samples 24-Hour Conc. >25.0 ug/m3	NM	NM	NM	-	NM
Visibility-State					
Days Not Meeting Standard	NM	NM	NM	NM	NM
Days of Data	NM	NM	NM	-	-

1. NM=Not Monitored. Shading=Less than 12 full months of data. May not be representative.
   Shading=Less than 12 full months of data. May not be representative.
2. Data prior to 1992 reflects state standard of visibility <10 miles for hours with relative humidity <70%.

REPORT FOR FILE : EMLS_IND

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	190.0 DEGREES	VD=	0.0 CM/S
CLASS=	6 STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	5.0 DEGREES	TEMP=	7.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A.	Indian Av NL		300	300	300	600	AG	725	5.7	0.0	12.0
B.	Indian Av SL		300	300	300	0	AG	782	5.7	0.0	12.0
C.	Mission L EL		300	300	600	300	AG	223	5.7	0.0	12.0

LINK	*	L (M)	MIXW R (M)	STPL (M)	PCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

	X	Y	Z
RECEPTOR 1	315	315	1.3
RECEPTOR 2	330	330	1.3
RECEPTOR 3	346	346	1.3
RECEPTOR 4	361	361	1.3

RECEPTOR	* PRED CONC (PPM)	*WIND * BRG *(DEG)*	COCN/LINK (PPM) A	B	C
RECPT 1	0.5	186	0.0	0.4	0.1
RECPT 2	0.3	189	0.0	0.3	0.0
RECPT 3	0.2	192	0.0	0.2	0.0
RECPT 4	0.2	195	0.0	0.2	0.0

REPORT FOR FILE : EPIE_SR6

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	190.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	5.0 DEGREES	TEMP=	7.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. SR 62	NL	300	300	300	600	AG	1234	5.7	0.0	33.0
B. SR 62	SL	300	300	300	0	AG	1254	5.7	0.0	33.0
C. Pierson B	EL	300	300	600	300	AG	108	5.7	0.0	12.0
D. Pierson B	WL	300	300	0	300	AG	19	5.7	0.0	12.0

LINK	* MIXW L (M)	R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	315	315	1.3
RECEPTOR	2	330	330	1.3
RECEPTOR	3	346	346	1.3
RECEPTOR	4	361	361	1.3

RECEPTOR	* PRED CONC (PPM)	*WIND * BRG *(DEG)*	COCN/LINK (PPM) A	B	C	D
RECPT 1	0.9	185	0.1	0.8	0.0	0.0
RECPT 2	0.4	190	0.0	0.4	0.0	0.0
RECPT 3	0.3	194	0.0	0.3	0.0	0.0
RECPT 4	0.3	195	0.0	0.2	0.0	0.0

REPORT FOR FILE : EPIE_IND

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	190.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	5.0 DEGREES	TEMP=	7.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. INDIAN AV	NL	300	300	300	600	AG	728	5.7	0.0	12.0
B. INDIAN AV	SL	300	300	300	0	AG	829	5.7	0.0	12.0
C. PIERSON B	EL	300	300	600	300	AG	404	5.7	0.0	12.0
D. PIERSON B	WL	300	300	0	300	AG	211	5.7	0.0	12.0

LINK	* MIXW L (M)	R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	315	315	1.3
RECEPTOR	2	330	330	1.3
RECEPTOR	3	346	346	1.3
RECEPTOR	4	361	361	1.3

RECEPTOR	* PRED CONC (PPM)	*WIND * BRG *(DEG)*	COCN/LINK (PPM) A	B	C	D
RECPT 1	0.5	186	0.0	0.4	0.1	0.0
RECPT 2	0.3	189	0.0	0.3	0.1	0.0
RECPT 3	0.3	192	0.0	0.2	0.1	0.0
RECPT 4	0.2	195	0.0	0.2	0.1	0.0

REPORT FOR FILE : EPIE_LMO

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	190.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	5.0 DEGREES	TEMP=	7.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A.	L MORONGO NL	300	300	300	600	AG	210	5.7	0.0	12.0
B.	L MORONGO SL	300	300	300	0	AG	186	5.7	0.0	12.0
C.	PIERSON B EL	300	300	600	300	AG	548	5.7	0.0	28.0
D.	PIERSON B WL	300	300	0	300	AG	429	5.7	0.0	28.0

LINK	MIXW L (M)	MIXW R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	285	315	1.3
RECEPTOR	2	270	330	1.3
RECEPTOR	3	254	346	1.3
RECEPTOR	4	239	361	1.3

RECEPTOR		PRED CONC (PPM)	WIND BRG (DEG)	CONC/LINK (PPM) A	B	C	D
RECPT	1	0.5	96	0.1	0.0	0.4	0.0
RECPT	2	0.2	100	0.0	0.0	0.2	0.0
RECPT	3	0.2	102	0.0	0.0	0.1	0.0
RECPT	4	0.2	105	0.0	0.0	0.1	0.0

REPORT FOR FILE : EPIE_WES

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	190.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	5.0 DEGREES	TEMP=	7.0 DEGREE (C)

2. Link Description

LINK	DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A.	WEST DR NL	300	300	300	600	AG	366	5.7	0.0	18.0
B.	WEST DR SL	300	300	300	0	AG	335	5.7	0.0	18.0
C.	PIERSON B EL	300	300	600	300	AG	552	5.7	0.0	28.0
D.	PIERSON B WL	300	300	0	300	AG	598	5.7	0.0	28.0

LINK	MIXW L (M)	MIXW R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	315	315	1.3
RECEPTOR	2	330	330	1.3
RECEPTOR	3	346	346	1.3
RECEPTOR	4	361	361	1.3

RECEPTOR		PRED CONC (PPM)	WIND BRG (DEG)	CONC/LINK (PPM) A	B	C	D
RECPT	1	0.5	264	0.1	0.0	0.0	0.4
RECPT	2	0.3	260	0.1	0.0	0.0	0.2
RECPT	3	0.2	258	0.1	0.0	0.0	0.2
RECPT	4	0.2	255	0.1	0.0	0.0	0.1

REPORT FOR FILE : ETWO_PAL

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	190.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	5.0 DEGREES	TEMP=	7.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. PALM DRIV NL		300	300	300	600	AG	1877	5.7	0.0	28.0
B. PALM DRIV SL		300	300	300	0	AG	2061	5.7	0.0	28.0
C. TWO BUNCH EL		300	300	600	300	AG	671	5.7	0.0	18.0
D. TWO BUNCH WL		300	300	0	300	AG	608	5.7	0.0	28.0

LINK	*	MIXW L (M)	R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	315	315	1.3
RECEPTOR	2	330	330	1.3
RECEPTOR	3	346	346	1.3
RECEPTOR	4	361	361	1.3

RECEPTOR	*	PRED CONC (PPM)	*WIND BRG (DEG)	COCN/LINK (PPM) A	B	C	D
RECPT 1	*	1.5	* 186 *	0.1	1.2	0.2	0.0
RECPT 2	*	0.7	* 190 *	0.0	0.6	0.1	0.0
RECPT 3	*	0.5	* 192 *	0.0	0.4	0.1	0.0
RECPT 4	*	0.5	* 195 *	0.0	0.4	0.1	0.0

REPORT FOR FILE : EHAC_MIR

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	190.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	5.0 DEGREES	TEMP=	7.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. MIRACLE H NL		300	300	300	600	AG	99	5.7	0.0	12.0
B. MIRACLE H SL		300	300	300	0	AG	38	5.7	0.0	12.0
C. HACIENDA EL		300	300	600	300	AG	638	5.7	0.0	18.0
D. HACIENDA WL		300	300	0	300	AG	583	5.7	0.0	18.0

LINK	*	MIXW L (M)	R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.		0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

		X	Y	Z
RECEPTOR	1	285	315	1.3
RECEPTOR	2	270	330	1.3
RECEPTOR	3	254	346	1.3
RECEPTOR	4	239	361	1.3

RECEPTOR	*	PRED CONC (PPM)	*WIND BRG (DEG)	COCN/LINK (PPM) A	B	C	D
RECPT 1	*	0.4	* 96 *	0.0	0.0	0.4	0.0
RECPT 2	*	0.2	* 99 *	0.0	0.0	0.2	0.0
RECPT 3	*	0.2	* 103 *	0.0	0.0	0.2	0.0
RECPT 4	*	0.2	* 104 *	0.0	0.0	0.1	0.0

REPORT FOR.FILE : EPIE_PAL

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	190.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	5.0 DEGREES	TEMP=	7.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. PALM DRIV NL		300	300	300	600	AG	1049	5.7	0.0	28.0
B. PALM DRIV SL		300	300	300	0	AG	1455	5.7	0.0	28.0
C. PIERSON B EL		300	300	600	300	AG	518	5.7	0.0	28.0
D. PIERSON B WL		300	300	0	300	AG	699	5.7	0.0	28.0

LINK	* MIXW L (M)	R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

	X	Y	Z
RECEPTOR 1	285	315	1.3
RECEPTOR 2	270	330	1.3
RECEPTOR 3	254	346	1.3
RECEPTOR 4	239	361	1.3

RECEPTOR	* PRED CONC (PPM)	*WIND * BRG *(DEG)*	CONC/LINK (PPM) A	B	C	D
RECPT 1	1.1	174	0.1	0.9	0.0	0.2
RECPT 2	0.6	170	0.0	0.5	0.0	0.1
RECPT 3	0.4	168	0.0	0.3	0.0	0.1
RECPT 4	0.4	165	0.0	0.3	0.0	0.1

REPORT FOR FILE : EHAC_PAL

1. Site Variables

U=	0.5 M/S	ZO=	100.0 CM
BRG=	190.0 DEGREES	VD=	0.0 CM/S
CLASS=	G STABILITY	VS=	0.0 CM/S
MIXH=	1000.0 M	AMB=	0.0 PPM
SIGTH=	5.0 DEGREES	TEMP=	7.0 DEGREE (C)

2. Link Description

LINK DESCRIPTION	*	LINK COORDINATES (M) X1	Y1	X2	Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. PALM DRIV NL		300	300	300	600	AG	1879	5.7	0.0	28.0
B. PALM DRIV SL		300	300	300	0	AG	1867	5.7	0.0	28.0
C. HACIENDA EL		300	300	600	300	AG	601	5.7	0.0	28.0
D. HACIENDA WL		300	300	0	300	AG	338	5.7	0.0	28.0

LINK	* MIXW L (M)	R (M)	STPL (M)	DCLT (SEC)	ACCT (SEC)	SPD (MPH)	NCYC	NDLA	VPHO	EFI (G/MIN)	IDT1 (SEC)	IDT2 (SEC)
A.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
B.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
C.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0
D.	0	0	0	0.0	0.0	0	0	0	0	0.0	0.0	0.0

3. Receptor Coordinates

	X	Y	Z
RECEPTOR 1	315	285	1.3
RECEPTOR 2	330	270	1.3
RECEPTOR 3	346	254	1.3
RECEPTOR 4	361	239	1.3

RECEPTOR	* PRED CONC (PPM)	*WIND * BRG *(DEG)*	CONC/LINK (PPM) A	B	C	D
RECPT 1	1.4	354	1.1	0.1	0.2	0.0
RECPT 2	0.7	350	0.6	0.0	0.1	0.0
RECPT 3	0.5	348	0.4	0.0	0.1	0.0
RECPT 4	0.4	345	0.3	0.0	0.1	0.0