AVENAL GENERAL PLAN UPDATE
BACKGROUND REPORT

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CHAPTER ONE - INTRODUCTION

1.0 Project Location and Description

The City of Avenal is located along State Highways 33 and 269 in Western Kings County in the Southern San Joaquin Valley. State Route 33 runs in a general northwest-southeast direction through the southern side of town and State Route 269 starts at State Route 33 and runs through the center of town to the north. Interstate 5 is just north of town and is the main transportation artery in the state. Incorporated as a General Law City in 1979, Avenal is located approximately 33 miles southwest of Hanford, the County seat, and 58 miles south of Fresno. The current population, according to the Department of Finance (DOF), is 15,350 as of January 1, 2003. This includes the Avenal State Prison incarcerated population of 7,062. Subtracting the total population from the institutionalized population gives the City of Avenal a 2003 population of 8,288. Avenal's economy is based on oil, agriculture and the service industry. The City limits currently contains 19.5 square miles of which, 2.5 square miles is urbanized.

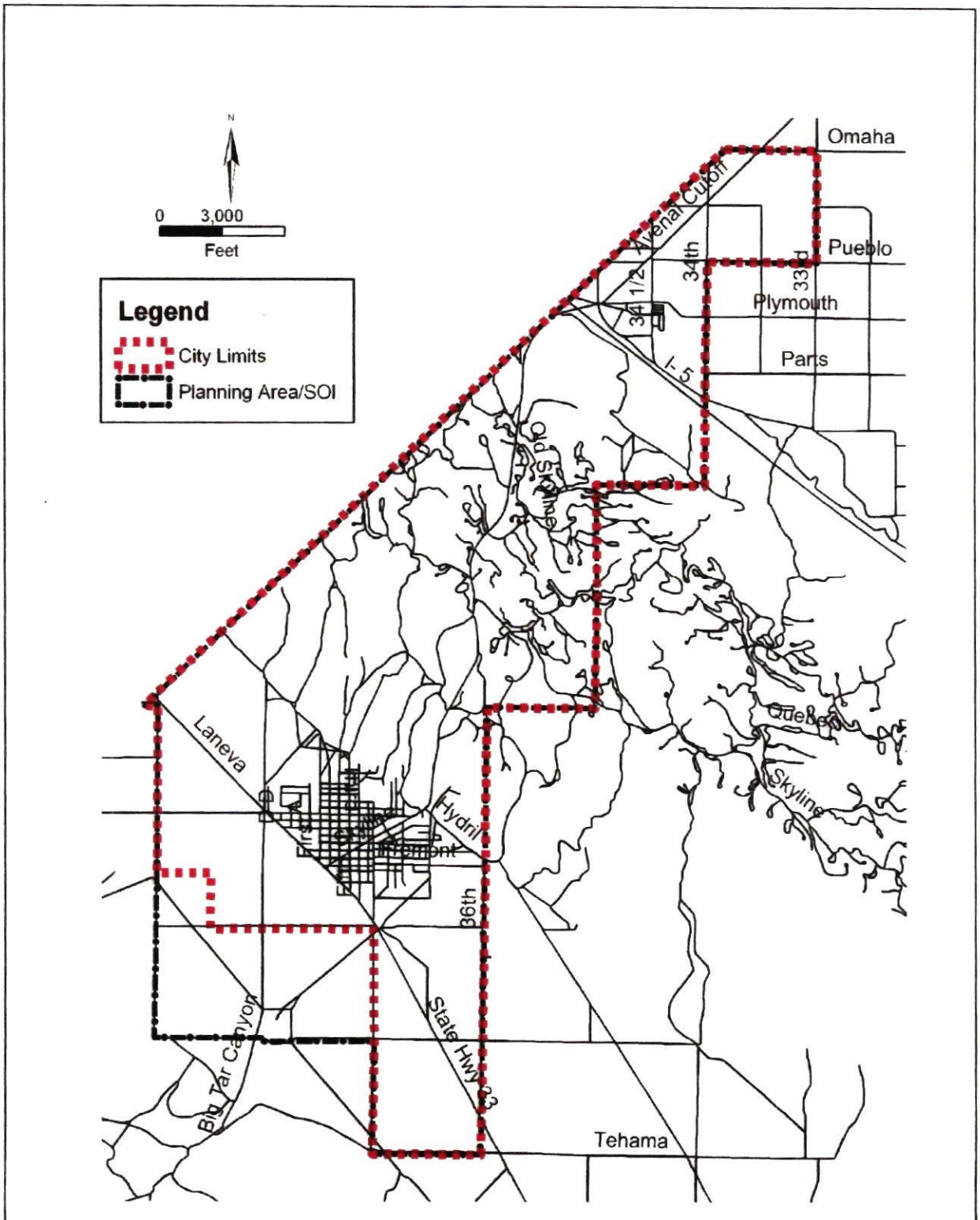
This General Plan Update will cover a 20-year period, from 2005 to 2025. At that time, Avenal is expected to have a population of approximately 16,039 (not including prison population).

While many residents cherish the "small town" character of the City, they also find commercial and recreational opportunities limited because of the City's size. The General Plan Update will include, in addition to more traditional topics and issues, modified land use controls that will focus economic development to capture lost sales tax revenue currently generated by Avenal residents shopping outside of the City, and increase employment and housing opportunities. The City's public infrastructure will also be evaluated and the means to finance its expansion will also be evaluated.

The determination of the Planning Area boundary for the General Plan Update was guided by the following factors:

- Existing extent of development in the area, including unincorporated areas, and contiguous undeveloped parcels.
- Location of agricultural land under the Williamson Act contract.
- Hard edges including major roadways.
- Undeveloped areas necessary to square off the development boundaries.
- Areas within which the City may likely grow over the next 20 years.
- Agricultural areas that are key elements of Avenal's economy.

Figure 1.0-1 shows the City's current growth boundaries including the City limits and the adopted Sphere of Influence (SOI) and Planning Area boundary.



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AVENAL PLANNING AREA

Figure 1.0-1

The Planning Area includes lands within Avenal's city limits and possible SOI. The Planning Area, which is almost co-terminus with the city limits, contains about 20.5 square miles.

Almost one-half of the Planning Area is located in the Kettleman Hills. This area is unsuitable for development because of steep slopes and unstable soils, a lack of services and infrastructure, the existence of rare and endangered plant and animal species, hazardous seismic conditions, ownership of the land by the federal government, and/or the land being under the Williamson Act contract. Another constraint to development in this area involves the extensive ownership of land by the oil companies, approximately five square miles. An extensive system of roads, pipelines, wells and buildings have been constructed on these lands. Dismantling this system for the purpose of developing the property would be cost-prohibitive and environmentally, ill-advisable.

About 40 percent of the Planning Area is located on the Kettleman Plain, west of Kettleman Hills. This portion of the Planning Area contains the urbanized area of the City of Avenal and the Avenal State Prison.

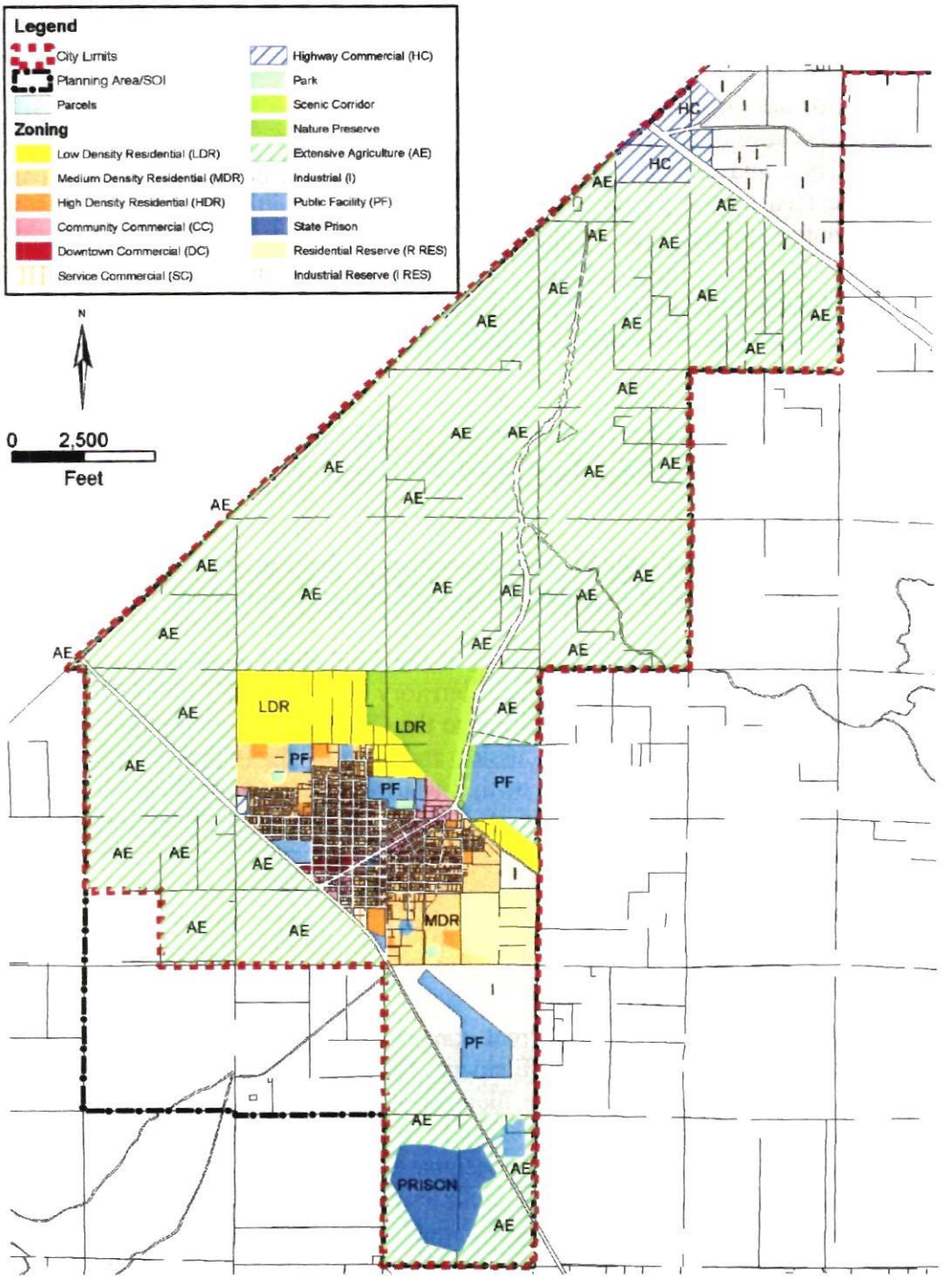
The remaining portion of the Planning Area is located in the San Joaquin Valley, east of the Kettleman Hills. It is traversed by Interstate 5 and the California Aqueduct.

The Planning Area includes sufficient area to meet the City's land development needs over the planning period of 20 years and a geographical territory to enable City review of development proposals that may occur in the County adjacent to the City limits. Its long-range purpose is to serve as the catalyst for future planning discussion and vision. The Planning Area also provides sufficient flexibility to review alternative growth scenarios that would focus growth in either the eastern or western sections of the community, along State Route 33, or other alternatives identified by the community.

1.1 Land Use

1.1.1 PRESENT AVENAL GENERAL PLAN

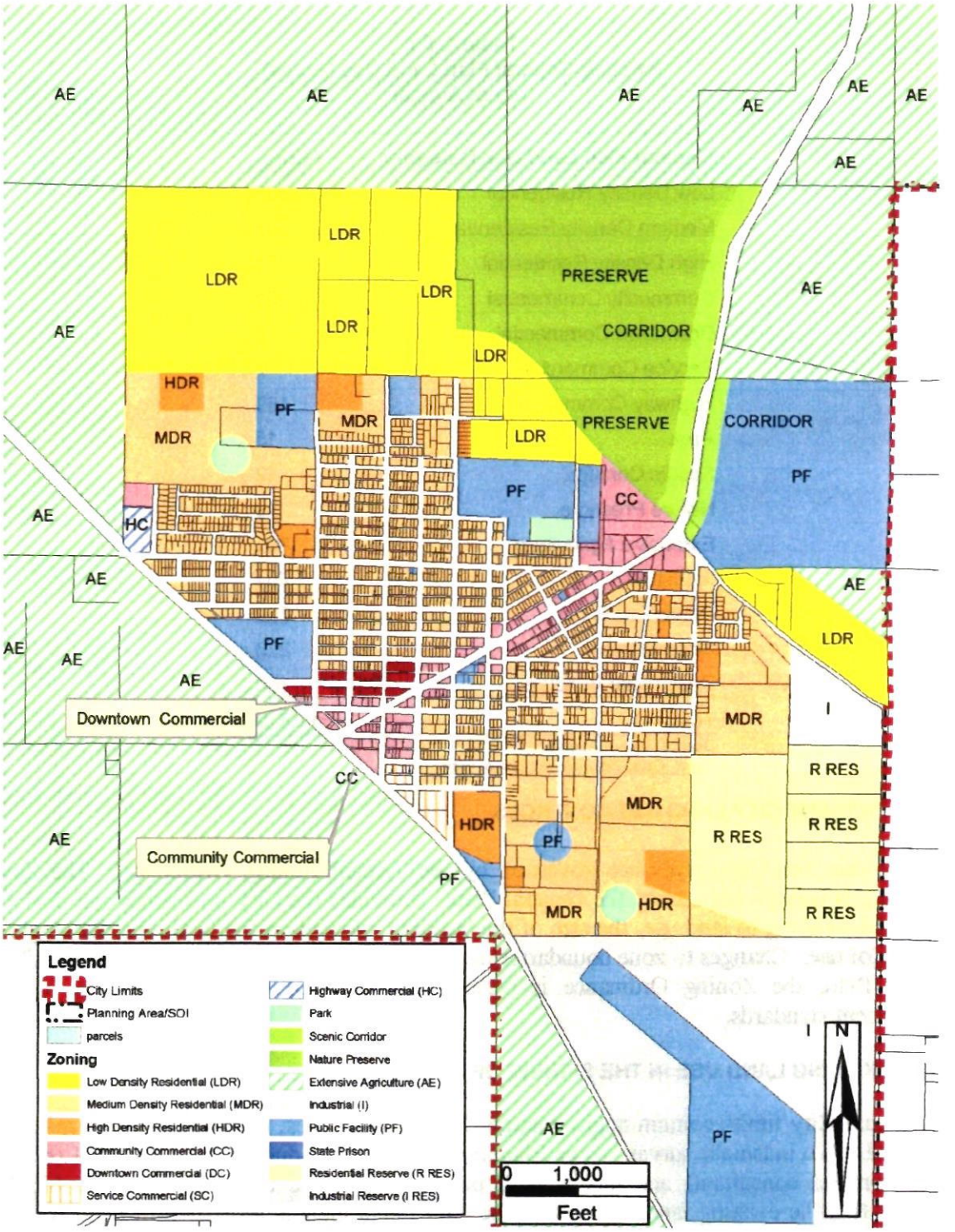
The City of Avenal General Plan is the current comprehensive plan governing the community. The General Plan includes the Land Use Element, Circulation Element, Conservation, Open Space, Parks and Recreation Element, Noise Element, and Safety Element, all comprehensively updated in 1992. The Housing Element was updated in 2004. Used as a guide for orderly development, Avenal's Land Use Element designates the general distribution of land for residential, commercial, industrial, and public facilities needed to serve the residents of the City. The Plan includes land outside the City's boundaries, providing a comprehensive growth and development plan. Figures 1.1-1a and 1.1-1b show the current General Plan land use designations within the Planning Area. Table 1.1-1 shows the distribution of land use as designated in the General Plan.



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GENERAL PLAN LAND USE

Figure 1.1-1a



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GENERAL PLAN AND LAND USE
URBAN AREA

Figure 1.1-1b

Table 1.1-1
Existing General Plan Land Use (Acres)
City of Avenal

General Plan Land Use Category	Acres
Low Density Residential	366
Medium Density Residential	537
High Density Residential	54
Community Commercial	61
Downtown Commercial	8
Service Commercial	7
Highway Commercial	169
Park	15
Scenic Corridor	42
Nature Preserve	243
Extensive Agriculture	7,801
Industrial	1,764
Public Facility	372
State Prison	223
Residential Reserve	150
Total	11,812

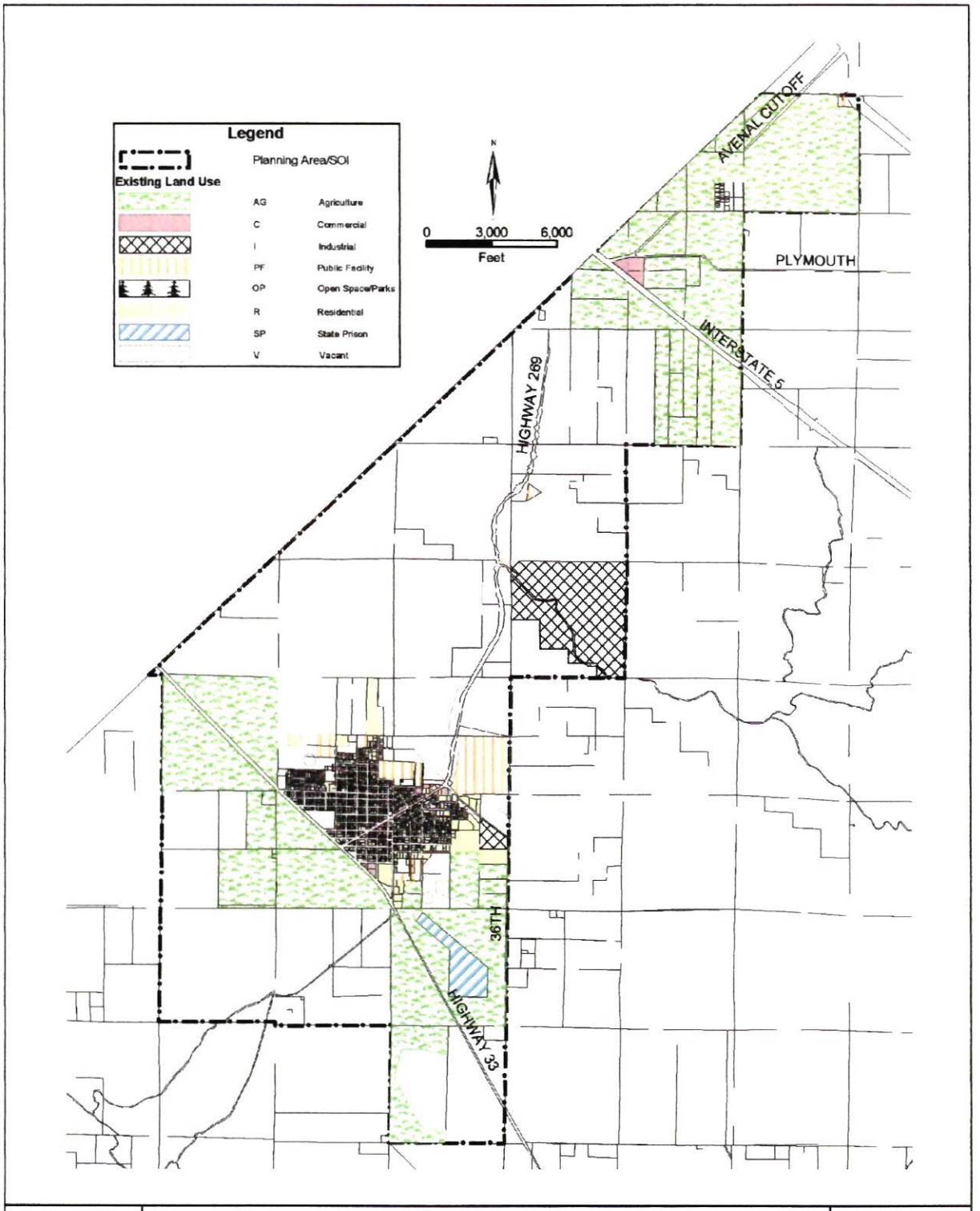
Source: City of Avenal
Note: Does not include right-of-way

1.1.2 PRESENT CITY LAND USE CONTROLS

Lands within the City limits are governed by the Avenal Zoning Ordinance. The Zoning Ordinance is used to implement the General Plan. It divides the City into zones and prescribes regulations relating to land use, the size of the building allowed on the land, and the height and intensity of use. Changes to zone boundaries must be consistent with the General Plan. Like the General Plan, the Zoning Ordinance is periodically amended to reflect changes in urban development standards.

1.1.3 EXISTING LAND USE IN THE SPHERE OF INFLUENCE

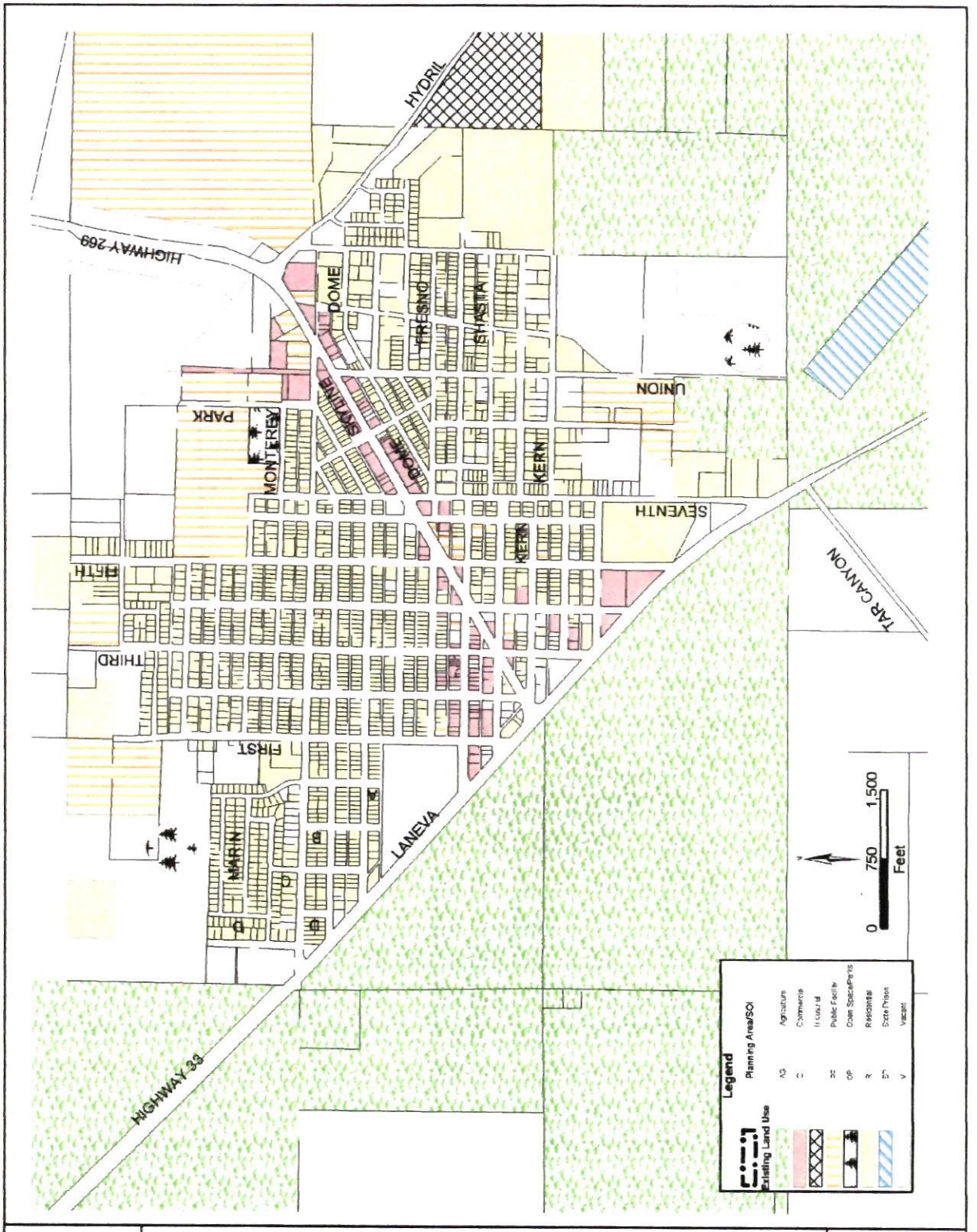
The current City limits contain approximately 19.5 square miles, of which 2.5 square miles is urbanized. A windshield survey of the Planning Area was conducted in April, 2004 (by Quad Knopf, project consultant) and included all parcels within the Planning Area. Table 1.1-2 indicates that the existing land uses within the City limits include 437 acres of residential, 112 acres of commercial, 519 acres of industrial, 15 acres of parks/open space, 298 acres of public facilities/Quasi-public facilities and 5,254 acres of vacant/undeveloped land. The majority of vacant/undeveloped land is in the Kettleman Plains north of Avenal. Figures 1.1-3(a) and 1.1-3(b) illustrate the distribution of these uses.



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EXISTING LAND USE
PLANNING AREA/SOI

Figure 1.1-3(a)



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EXISTING LAND USE
URBANIZED AREA

Figure 1.1-3(b)

As with most cities in the San Joaquin Valley, the detached single-family home is the predominant residential unit in Avenal.

Table 1.1-2
Existing Land Use (Acres)
City of Avenal

Land Use	Acres
Agriculture	4,110
Commercial	112
Industrial	519
Park/Open Space	15
Public Facility	298
Residential	437
State Prison	104
Vacant/Undeveloped	5,254
Total	10,849

Source: Windshield Survey, April 2004.
Note: Does not include right-of-way.

1.1.4 KINGS COUNTY GENERAL PLAN AND ZONING ORDINANCE, IMPLICATIONS

Kings County is responsible for planning and land use control in the unincorporated areas of the County. Urban development is to be directed by County policy towards existing cities and urbanized areas.

The Kings County General Plan uses an urban centered concept to direct urban expansion toward cities and unincorporated communities to accomplish anticipated urban expansion in an orderly manner, based on the ability of the communities to furnish public services along with land needs based on population demands and in balance with employment-generating land uses. As a planning tool, an SOI is intended to accommodate all classifications of urban land use. It is a boundary line that is recognized by the Local Agency Formation Commission (LAFCo) as the ultimate growth boundary of the community over the life of the General Plan, and all land within the SOI is planned for eventual development in a mixture of urban and urban-related uses.

1.1.5 SPHERE OF INFLUENCE

The Sphere of Influence (SOI) is defined in California Government Code Section 56076 as "a plan for the probable physical boundaries and service area of a local agency as determined by" LAFCo. Annexations to the City must be located within the SOI in order to be approved by LAFCo. By State law, the City must be notified of any proposed land use changes within its SOI and be provided an opportunity to comment on the changes. The City is in the process of adopting the Planning Area as the SOI.

The Kings County LAFCo reviews changes to SOI and Planning Area boundaries, annexations to cities and special districts in Kings County, the adequacy of public services to proposed annexations, and the effect of these actions on prime agricultural land. LAFCo has adopted local goals, objectives and policies to guide its decision-making.

Applications to amend City limits, for example, are presented to LAFCo, which then approves, approves with conditions, or denies the applications.

The conversion of agricultural lands to urban uses and the provision of urban services by growing communities are important issues to the County and LAFCo. Potential revenue losses to counties resulting from annexations have created problems in the relationship between cities and counties in California, and Kings County is no different. During the General Plan update, the implications of the post-Proposition 13 fiscal environment to the City of Avenal can be seen as an opportunity to create a more predictable revenue-expenditure model. Avenal's planned growth will, at some time, require annexation to the City. First, long range planning in the Avenal SOI will occur with a vision shared by both parties and with a revenue stream that can be relied on for the duration of the agreement. Second, an agreement will permit both parties to focus their limited resources to other matters; its absence will necessitate that the City and County coordinate their planning programs in a piecemeal fashion.

1.1.6 ESTIMATED DEMAND FOR LAND 2005 - 2025

The number of residential, commercial and industrial acres needed in the City of Avenal through 2025 is based on population projections through 2025 (reference Table 1.1-3). By 2005, the population of Avenal is estimated to be approximately 9,170 with 64 acres of residential land needed, 17 acres of commercial, and 20 acres of industrial. By 2025, the population of Avenal is estimated to be approximately 16,039, with a total of 433 acres of additional residential land needed, 30 total acres of commercial land needed, and 134 additional acres of industrial land needed. Table 1.1-4 shows the estimated added land demand between 2005 and 2025. Some of the projected land needed can be found in existing vacant land within the City. Figure 1.1-4 illustrates the land available for development in the City limits and Planning Area. This includes land that is either currently vacant or undeveloped and agricultural land.

Table 1.1-3
Population and Household Projections, 2000 to 2025*
City of Avenal

	2000	2005	2010	2015	2020	2025
Total Population[1]	7,973	9,170	10,546	12,128	13,947	16,039
Total Households	1,928	2,215	2,547	2,929	3,369	3,874
Average Household Size	4.14	4.14	4.14	4.14	4.14	4.14

Source: 2000 U.S. Census, Department of Finance
*Department of Finance Kings County population projection percentages used for Avenal through 2025.
[1]Does not include prison population.

Table 1.1-4
Community Development Needs, 2000-2025
City of Avenal

Year	Population[1]	Additional Residential Needed	Total Commercial Needed	Additional Industrial Needed
2000	7,973	N/A	N/A	N/A
2005	9,170	64.3	17.3	19.9
2010	10,546	138.1	19.9	42.8
2015	12,128	223.0	22.8	69.1
2020	13,947	320.7	26.3	99.4
2025	16,039	433.0	30.2	134.2

Source: Quad Knopf, Inc.
[1]Does not include prison population.

1.1.7 OTHER AGENCIES' RELATIONSHIP TO AVENAL'S GENERAL PLAN (FEDERAL AND STATE PLANS REGARDING PUBLIC LANDS AND FACILITIES)

A number of state and federal agencies' activities have an effect on Avenal's general planning issues. These include, but are not limited to, the Central Valley Regional Water Quality Control Board, Environmental Health Department, California EPA, the San Joaquin Valley Air Pollution Control District, and the Department of Water Resources. These agencies are interested in the interaction of the General Plan with their own long-range resource management activities.

Further, many of these agencies have made technical guidelines available in order to assist the public and private sectors to manage development with natural resources in mind.

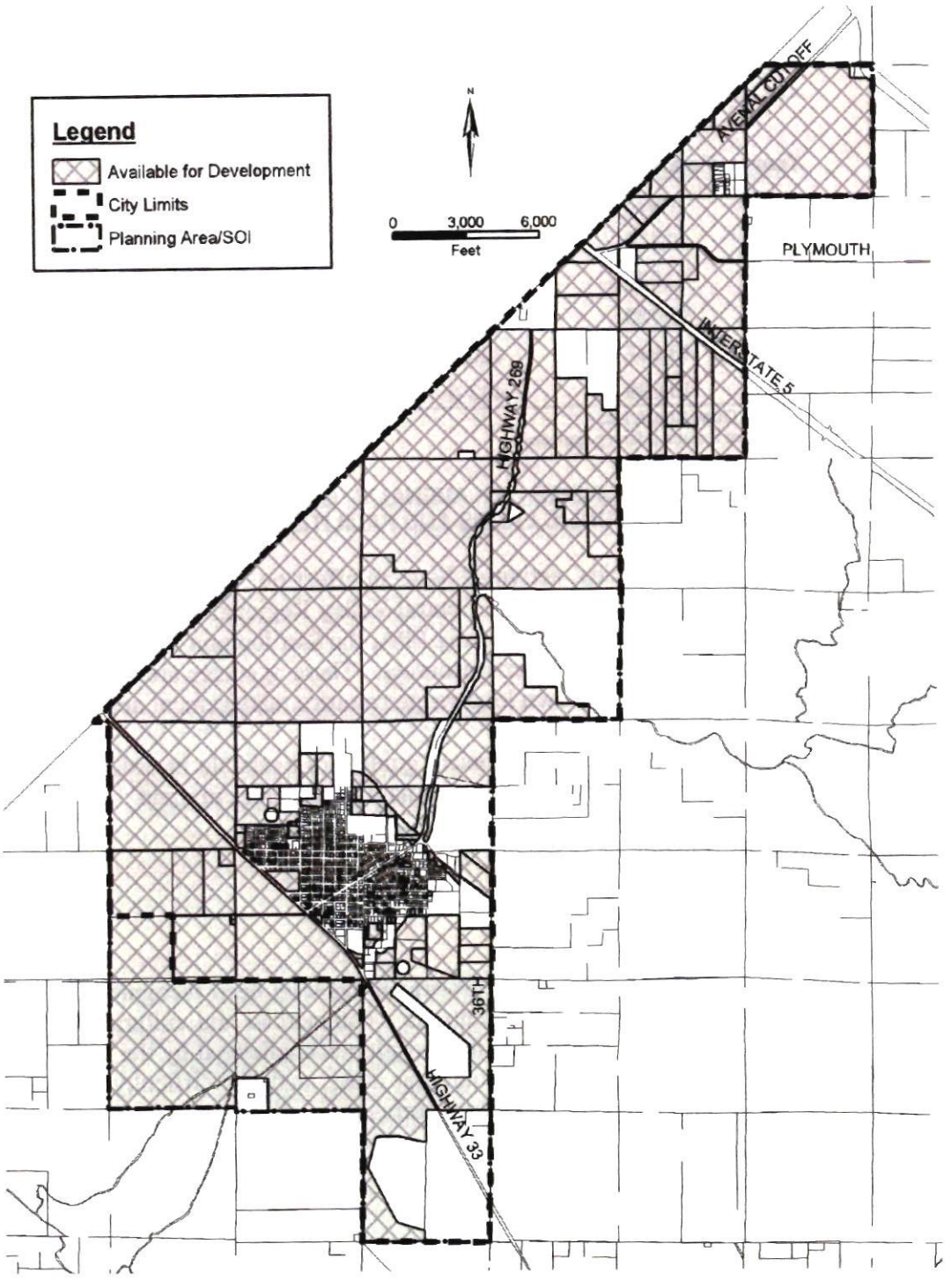
1.2 Urban Design Analysis

1.2.1 DOWNTOWN



Avenal's downtown has long been recognized as a place of opportunity as a commercial and cultural City center. However, this position is challenged by the growth of the City into outlying areas, and the difficulty of attracting and keeping thriving businesses and people in the downtown area. Reasserting the historic relationship of downtown to the growing community will be a matter of much public debate.

The size of Avenal provides its residents with short trip times and distances. For example, the location of City offices, police, fire, and other governmental functions downtown serves to reduce trip duration. The proximity of commercial services in this area, however limited, reinforces downtown's role as a center for government and commerce.



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VACANT/UNDEVELOPED LAND
AVAILABLE FOR DEVELOPMENT

Figure 1.1-4

1.2.2 DESIGN REVIEW

In the City of Avenal, any project requiring a Site Plan Review Permit or Conditional Use Permit for a project that involves significant design issues and/or new construction shall be reviewed by the Design Review Committee prior to approval or denial of the above-referenced permit. Other projects may be reviewed by the Design Review Committee at the discretion of the Zoning Administrator where significant design issues are being considered. Applicants seeking a Site Plan Review permit or Conditional Use Permit, proposing to occupy existing buildings where no significant new construction is proposed would typically not be required to undergo review by the Design Review Committee.

1.3 Population and Housing

Since incorporation in 1979, the City has grown to a population of 8,288 as reported in the 2003 Department of Finance City/County population estimates. In 1980, the population of Avenal was 3,655 and by 1990 the population had increased to 9,770 (including the prison population) (reference Table 1.3-1). This was an increase of approximately 167 percent, which was higher than all other incorporated cities in the County and California's increase in population for the same time period. The explosive increase in population can be attributed to the inclusion of the Avenal State Prison population in the 1990 Census and the prison staff and their families who moved to Avenal. From 1990 to 2000, the City's population increased 50 percent to total 7,973 (14,674 including the prison population). Kings County and California's population increase from 1990 to 2000 was considerably lower at 27.6 percent and 13.8 percent respectively. Corcoran, Hanford and Lemoore's population increase from 1980 to 2000 is included for reference.

Table 1.3-1
Population Growth, 1980-2000
Avenal, Corcoran, Hanford, Lemoore, Kings County and California

	1980 Number	1990 Number	Percent Change 1980-1990	2000 Number	Percent Change 1990-2000
Avenal	3,655	9,770	167.3	14,674	50.2
Corcoran	5,998	13,364	122.8	20,835	55.9
Hanford	20,096	30,897	53.7	41,686	34.9
Lemoore	8,293	13,622	64.3	19,712	44.7
Kings County	73,738	101,469	37.6	129,461	27.6
California	23,668,862	29,760,021	25.7	33,871,648	13.8

Source: 1980, 1990, and 2000 U.S. Census

Table 1.3-2 shows Population Estimates and Projections for Avenal and Kings County for the years 2000 through 2020. The Department of Finance estimates 8,868 persons in Avenal and 149,600 persons in Kings County by 2005 (assuming the same growth percentage for the City as the County). By 2010, Avenal is projected to have a population of 9,799 persons and Kings County is projected to have a population of 165,300 persons. The 2005-2020 figures are based on Department of Finance projections from July 1, 2000.

Table 1.3-2
Population Estimates and Projections, 2000-2020
Avenal and Kings County

	2000	2005	2010	2015	2020	2025
Avenal[1]	7,973	8,868	9,799	10,708	11,768	12,933
Kings County	134,500	149,600	165,300	180,800	198,700	218,400

Source: 2000 U.S. Census, Department of Finance, Interim County Population Projections, July 1, 2000
[1] Assumes the same growth percentage as the County.

Table 1.3-3 shows Avenal and Kings County's Total Households, Population in Households, and Average Household Size for 1990 and 2000. In 1990, Avenal's Average Household Size was 3.46, while the County's Average Household Size was 3.08. Average Household Size in 2000 was 4.14 persons per household for Avenal and 3.18 persons per household for the County, indicating that larger or extended family/households are increasing at a faster rate in Avenal than the County.

Table 1.3-4 shows the age distribution in Avenal from 1990 to 2000. The majority of Avenal's 2000 population falls in the 25 to 34 (15.7 percent) age group. The percentage of the population in 2000 under nine years of age was 23.1 percent and the percentage of the population over 65 years of age was 4.7 percent.

Table 1.3-3
Average Household Size, 1990-2000
Avenal and Kings County

Area	Year	Number of Households	Population in Households	Average Household Size
Avenal	1990	1,590	5,505	3.46
Avenal	2000	1,928	7,973	4.14
Kings County	1990	29,082	89,469	3.08
Kings County	2000	34,418	109,332	3.18

Source: 1990 and 2000 U.S. Census

Table 1.3-4
Household Age Distribution, 1990-2000
City of Avenal

	1990[1]		2000[2]
	Number	Percent	Percent
Under 5 Years	618	6.3%	11.4%
5 to 9	609	6.2%	11.7%
10 to 14	546	5.6%	10.5%
15 to 19	536	5.5%	9.8%
20 to 24	1,211	12.4%	9.0%
25 to 34	3,071	31.4%	15.7%
35 to 44	1,678	17.2%	13.6%
45 to 54	679	6.9%	8.8%
55 to 59	196	2.0%	2.8%
60 to 64	164	1.7%	1.8%
65 to 74	290	3.0%	2.4%
75 to 84	145	1.5%	1.8%
85 and Over	27	0.3%	0.6%
Total	9,770	100.0%	100.0%

Source: 1990 and 2000 U.S. Census
[1]Includes prison population because it is not possible to subtract out this group from 1990 Census data.
[2]Does not include prison population.

1.3.1 RACE/ETHNICITY CHARACTERISTICS

Table 1.3-5 shows the ethnic composition of Avenal's population. Census data from 1990 includes the prison population and census data from 2000 does not include the prison population. The white population totaled 3,367 (42.2 percent) in 2000 while the Hispanic population totaled 6,800 (85.3 percent). The Black or African American population totaled 131 (1.6 percent) while the American Indian and Alaskan Native population totaled 84 (1.1 percent).

Table 1.3-5
Household Race and Ethnicity, 1990-2000
City of Avenal

	1990		2000	
	Number	Percent	Number	Percent
White	4,877	49.9%	3,367	42.2%
Black or African American	1,656	16.9%	131	1.6%
American Indian and Alaskan Native	44	0.5%	84	1.1%
Asian, Native Hawaiian, Pacific Islander	38	0.4%	53	0.7%
Some Other Race	3,155	32.3%	4,090	51.3%
Two or More Races	N/A	N/A	248	3.1%

Total	9,770	100.0%	7,973	100.0%
Hispanic or Latino (of any race)	5,224	53.5%	6,800	85.3%

Source: 1990 and 2000 U.S. Census
[1]Includes prison population because it is not possible to subtract out this group from 1990 Census data.
[2]Does not include prison population.

The Hispanic population is by far the largest ethnic group in Avenal and has the highest birth rate.

1.3.2 HOUSEHOLD CHARACTERISTICS

Household Type

The U.S. Census Bureau defines a household as all persons who occupy a housing unit. This may include single persons living alone, families related by blood or marriage, as well as unrelated individuals living together. Persons living in retirement or convalescent homes, dormitories or other group living situations are enumerated separately and are not counted in household population.

Table 1.3-6 shows household characteristics for the City of Avenal. As Table 1.3-6 indicates, Family Households increased in the City of Avenal from 75.3 percent of total households in 1990 to 85.1 percent in 2000.

Non-family Households decreased from 1990 to 2000 by 9.8 percentage points, and Married-Couple Families increased 2.3 percentage points during the same time period.

Table 1.3-6
Household Type Characteristics, 1990-2000
City of Avenal

	1990		2000	
	Number	**Percent**	**Number**	**Percent**
Total Households	1,590	100.0	1,928	100.0
Family households (families)	1,198	75.3	1,641	85.1
Married-couple families	894	56.2	1,128	58.5
Non-family households	392	24.7	287	14.9
Householder living alone	321	20.2	218	11.3
Householder 65 years and over	137	8.6	91	4.7
Average Household Size	3.46		4.14	
Total Persons in Households	5,505		7,973	

Source: 1990 and 2000 U.S. Census

Household Size

Trends in household size can indicate the growth pattern of a community. Average household size will increase if there is an influx of larger families or a rise in the local birth rate such as may be attributed to more children in a single family or teenage parents living at home. Household size will decline where the population is aging, or when there is an immigration of single residents outside childbearing age.

As shown in Table 1.3-6, Average Household Size in Avenal was 3.46 Persons Per Household in 1990 and increased to 4.14 Persons Per Household in 2000.

Table 1.3-7 identifies total housing units for Avenal and Kings County in 1980, 1990 and 2000. The growth rate of housing units in Avenal was slightly less than that of the County in the last decade. Between the years 1990 and 2000, a total of 285 housing units (U.S. Census data) were added within the City (an increase of 16.0 percent) while Kings County's percentage of housing units increased 18.5 percent to total 36,563 in 2000.

Table 1.3-7
Total Housing Units, 1980-2000
Avenal and Kings County

	1980	1990	1980-1990 Increase (%)	2000	1990-2000 Increase (%)
Avenal	1,410	1,776	26.0	2,061	16.0
Kings County	25,694	30,843	20.0	36,563	18.5

Source: 1990 and 2000 U.S. Census

Occupied Housing Units

Table 1.3-8 shows Total Occupied Housing Units and Owner-Occupied and Renter-Occupied Housing Units for 1990 and 2000. The 2000 U.S. Census reported that the total number of occupied housing units in the City was 1,928 including 984 (51.0 percent) Owner-Occupied Housing Units and 944 (49.0 percent) Renter-Occupied Housing Units.

Table 1.3-8
Occupied Housing Units, 1990-2000
Avenal and Kings County

2000	Total Occupied Housing Units	Owner Occupied Housing Units	Owner Occupied Housing Units (%)	Renter Occupied Housing Units	Renter Occupied Housing Units (%)
Avenal	1,928	984	51.0	944	49.0
Kings County	34,418	19,253	55.9	15,165	44.1
1990					
Avenal	1,590	784	49.3	806	50.7
Kings County	29,082	15,381	52.9	13,701	47.1

Source: 1990 and 2000 U.S. Census

The percentage of Owner-Occupied Housing Units increased 0.7 percentage points from 1990 to 2000, while the percentage of Renter-Occupied Housing Units decreased 0.7 percentage points from 1990 to 2000. As Table 1.3-8 shows, the County's percentage of Owner-Occupied housing units is higher than Avenal's.

Housing Units by Type

Referencing Table 1.3-9, the majority of units built between 1990 and 2000 were single family. However, there were also a significant number of duplexes built during the same time period. The percentage of Single Family Housing Units (both attached and detached) increased from 67.4 percent in 1990 to 70.0 percent in 2000. The percentage of duplexes increased from 5.3 percent in 1990 to 8.2 percent in 2000, and the percentage of Multiple Family Housing Units and Mobile Homes decreased 1.2 percentage points and 3.4 percentage points respectively from 1990 to 2000.

Vacancy Rates

The vacancy rate in a community indicates the percentage of units that are vacant and for rent/sale at any one time. It is desirable to have a vacancy rate that offers a balance between a buyer and a seller. The state uses five percent as a rule-of-thumb for a desirable total vacancy rate. A total vacancy rate of less than four percent could represent a shortage of housing units, which is not the case in Avenal (reference Table 1.3-10). Avenal's total vacancy rate in 2000 was 6.5 percent compared to 10.5 percent in 1990. The vacancy rate in 2004 according to the DOF is 6.44 percent.

Table 1.3-9
Housing Inventory Trends by Unit Type, 1990-2000
City of Avenal

	1990		2000	
	Units	Percent of Total	Units	Percent of Total
Total Housing Units	1,776	100.0	2,069	100.0
1-Unit Detached	1,156	65.1	1,398	67.6
1-Unit Attached	40	2.3	50	2.4
2 Units	95	5.3	170	8.2
3 or 4 Units	124	7.0	134	6.5
5 to 9 Units	52	2.9	33	1.6
10 to 19 Units	44	2.5	93	4.5
20 or More Units	110	6.2	99	4.8
Mobile Home	138	7.8	92	4.4
Boat, RV, Van, etc.	17	1.0	-	-

Source: 2000 U.S. Census

Table 1.3-10
Vacant Housing Units, 1990-2000
City of Avenal

	1990		2000	
	Units	Percent of Total	Units	Percent of Total
Total Housing Units	1,776	100.0	2,061	100.0
Occupied Housing Units	1,590	89.5	1,928	93.5
Total Vacant Units	186	10.5	133	6.5
For rent	98	52.7	52	39.1
For sale only	24	12.9	21	15.8
Rented or sold, not occupied	14	7.5	20	15.0
For seasonal, recreational, or occasional use	6	3.2	11	8.3
For migratory workers	9	4.8	0	0.0
Other vacant	35	18.8	29	21.8

Source: 1990 and 2000 U.S. Census

Age of Housing Stock

As illustrated in Table 1.3-11, in 2000, 44.0 percent of Avenal's housing stock was built prior to 1970. By 2010, nearly 58 percent (1,191 units) of the City's current housing stock will be over 30 years old. This could indicate the potential need for rehabilitation and continued maintenance of these units by the year 2010. The decade with the most new construction was the 1980's with 464 (22 percent of the total) units added to the City's housing stock. Only 150 (7.2 percent) homes in Avenal were built prior to 1939.

Table 1.3-11
Age of Housing Stock
City of Avenal

Year Structure Built	Number of Units	Percent of Total
1990 to March 2000	414	20.0
1980 to 1989	464	22.4
1970 to 1979	280	13.5
1960 to 1969	246	11.9
1940 to 1959	515	24.9
1939 or Earlier	150	7.2
Total	2,069	100.0

Source: 2000 U.S. Census

1.4 Economic Conditions and Fiscal Considerations

This section analyzes the characteristics of the existing social and economic conditions and trends that affect the demand for residential, commercial, and industrial land use in Avenal. An overview assessment of Avenal's current demographic and economic condition allows projections to be adjusted based on various factors. These projections are used to forecast

demand for dwelling units and acreage for residential, commercial and industrial uses for the 20-year period from 2005 to 2025, showing incremental development at five-year intervals and projecting the quantitative and qualitative implications of each land usage. This discussion is intended to be used as a guide in the development of planning options and general plan policies.

1.4.1 DEMOGRAPHIC AND REAL ESTATE TRENDS AND OUTLOOK

Population and Household Growth

According to the U.S. Census Bureau's 2000 population estimates, Avenal had a population of 7,973 residents (does not include institutionalized population) and 1,928 households. This represents a 45 percent growth from 1990, when the census population showed 5,505 residents and 1,590 households in Avenal. The annual growth rate between 1990 and 2000 was approximately 4.5 percent. Much of this growth occurred in the early 90's prior to the onset of the recession, and the opening of Avenal State Prison in 1987 brought a significant number of people into the community.

Kings County as a whole is projected to decelerate its growth from what it has been during the 1990's. The County grew at an annual rate of 3.0 percent between 1990 and 2000; the State Department of Finance (DOF) projects the County to grow at an annual rate of 2.3 percent per year to the year 2020. The projections for surrounding counties are higher. By comparison, between 2000 and 2020, Tulare County is projected to grow at a 2.5 percent rate annually, Kern County at 2.9 percent annually, and Fresno County at 1.9 percent annually.

Avenal's population level of 8,288 in 2003 is projected to increase to 12,933 by the year 2025, as seen in Table 1.1-3. The population projections are converted to numbers of households by using an average household size for each year in the projection. The average household size in Avenal is higher than the County average. In 2000, Avenal's average household size was estimated at 4.14 persons per household, up from 3.46 persons per household in 1990. The County's average household size increased from 3.08 persons per household in 1990 to 3.18 persons per household in 2000. According to the *Forecasts For the Central Valley to 2010 and Beyond* by the Central California Futures Institute, the Central Valley will continue to outpace the state and the nation in size of households. By 2010, it is forecasted that household size in the region will be 3.15 persons versus 2.96 for California as a whole.

Residential Real Estate Growth

According to the 2000 Census, approximately 68 percent of the housing units in Avenal are single-family detached units. Duplexes comprised approximately 8 percent of the housing stock while the 20+ dwelling unit structures represented 5 percent of the housing stock. This latter category has decreased its percentage slightly since 1990, while the single-family category has increased (reference Table 1.3-9). The percentage of mobile homes has decreased from 1990 to 2000 by 4.4 percentage points.

Based on the household projections plus a five percent vacancy rate, the total number of dwelling units is projected to increase from 2,061 units in 2000 to 3,280 units by 2025, (reference Table 1.4-1).

Table 1.4-1
Residential Land Use Demand Projections

	2005	2010	2015	2020	2025
Dwelling Units	214	225	219	257	281
Low-Density	150	158	153	180	197
Medium-Density	32	34	33	39	42
High-Density	32	33	33	38	42

Source: Quad Knopf, Inc.

The distribution of units by density is projected to remain nearly the same as the current distribution. This assumption is strongly affected by the General Plan and zoning policies adopted by the City.

The total acreage demand for housing units is estimated on the basis of the current average density in each residential category. Comparing the unit counts with the total acreage for each residential land use category, the average densities are approximately 5.8 units per acre in the Low-Density category, 10.0 units per acre in the Medium-Density category and 12.3 units per acre in the High-Density residential land use category. Again, these figures could change as a result of the General Plan Update, but they provide the basis for the preliminary estimates of land demand for residential uses.

Economic Trends

In the year 2003, Kings County had a total employment of 39,700, an increase of 8,200 since 1993. This represents a 26.0 percent increase for the period or an annual growth rate of approximately 2.4 percent. This is in contrast to the state, which had a 19.2 percent increase from 1993 to 2003, and an annual growth rate of 1.7 percent (reference Table 1.4-2). The County's performance is indicative of its potential comparative economic advantages versus other regions of the state. The substantially lower labor and land costs in the County could explain to a large extent this performance.

The largest employment industry in 2003 in Kings County was the Government industry at 33.8 percent. The percent change for this industry from 1993 to 2003 was 61.4 percent. This is due in part to the number of prisons that opened in the late 1980's and 1990's in the County and Lemoore Naval Air Station. The second largest industry in Kings County in 2003 was the Total Farm industry. This industry accounted for 18.4 percent of all workers in 2003 and decreased 6.4 percent from 1993 to 2003. The Professional and Business industry increased 85.7 percent from 1993 to 2003 and accounts for 3.3 percent of all employed persons in the County.

Table 1.4-2
Employment by Industry 1993-2003
Kings County and California

KINGS COUNTY	1993	2003	% Change 1993 to 2003	Annual Growth Rate	Employment Distribution 2003 (%)
Total Farm	7,800	7,300	-6.4	-0.6	18.4
Natural Resources, Mining and Construction	900	1,300	44.4	4.0	3.3
Manufacturing	3,000	3,500	16.7	1.5	8.8
Trade, Transportation and Utilities	4,700	4,800	2.1	0.2	12.1
Wholesale Trade	700	700	0.0	0.0	1.8
Retail Trade	3,500	3,500	0.0	0.0	8.8
Finance and Insurance	500	600	20.0	1.8	1.5
Professional and Business Services	700	1,300	85.7	7.8	3.3
Educational and Health Services	2,600	3,300	26.9	2.4	8.3
Government	8,300	13,400	61.4	5.6	33.8

CALIFORNIA	1993	2003	% Change 1993 to 2003	Annual Growth Rate	Employment Distribution 2003 (%)
Total Farm	362,300	375,000	3.5	0.3	2.5
Natural Resources, Mining and Construction	821,200	1,163,800	41.7	3.8	7.9
Manufacturing	1,695,200	1,544,900	-8.9	-0.8	10.4
Trade, Transportation and Utilities	2,337,600	2,722,000	16.4	1.5	18.4
Wholesale Trade	541,000	651,400	20.4	1.9	4.4
Retail Trade	1,355,700	1,589,900	17.3	1.6	10.8
Finance and Insurance	550,200	612,400	11.3		
Professional and Business Services	1,541,600	2,108,100	36.7	3.3	14.3
Educational and Health Services	1,195,800	1,536,300	28.5	2.6	10.4
Government	2,080,600	2,426,500	16.6	1.5	16.4

Source: Industry Employment and Labor Force, Annual Average, March 2003

1.4.2 EMPLOYMENT AND COMMUTING PATTERNS

The countywide economic picture could bring perspective and new opportunities to Avenal. In order to determine what type of industry could be a benefit to Avenal residents, the intent of this section is to give a more precise picture of the employment and commuting patterns of the residents.

According to the 2000 Census, 24.2 percent of Avenal's work force had less than a ninth grade education, compared to 15.7 percent for the County. Table 1.4-3 (which includes the institutionalized population) shows that 30.2 percent of Avenal's 25-year and older population had at least a high school diploma, but only 6.4 percent had an Associate's degree and 3.0 percent had a Bachelor's degree. Avenal's percentage of the population with high school and

college degrees is lower than the County's. This is due to the inclusion of the institutionalized population, which tends to have lower educational attainment levels.

The level of education is reflected in the types of positions attained by the majority of Avenal residents. Table 1.4-4 shows that 24.0 percent of Avenal's labor force in 2000 worked in a management, professional, and related occupations role, which was 1.1 percentage point higher than the County. The percentage of sales and office occupations in Avenal in 2000 was 32.0 percent and 20.7 percent for the County.

Table 1.4-3
Educational Attainment, 2000
City of Avenal & Kings County

City of Avenal	Number	Percent
Population 25 Years and Over	9,415	100.0%
Less Than 9th Grade	2,276	24.2%
9th to 12th Grade, No Diploma	1,858	19.7%
High School Graduate (includes equivalency)	2,847	30.2%
Some College, No Degree	1,447	15.4%
Associate Degree	601	6.4%
Bachelor's Degree	292	3.1%
Graduate or Professional Degree	94	1.0%
Kings County	**Number**	**Percent**
Population 25 Years and Over	77,095	100.0%
Less Than 9th Grade	12,127	15.7%
9th to 12th Grade, No Diploma	11,906	15.4%
High School Graduate (includes equivalency)	22,291	28.9%
Some College, No Degree	16,718	21.7%
Associate Degree	6,059	7.9%
Bachelor's Degree	5,893	7.6%
Graduate or Professional Degree	2,101	2.7%

Source: 2000 U.S. Census

Table 1.4-4
Employment by Occupation, 2000
City of Avenal and Kings County

Avenal		
Employed civilian population 16 years and over, total	2,564	100.0
Management, professional, and related occupations	350	24.0
Service occupations	376	13.3
Sales and office occupations	418	32.0
Farming, fishing, and forestry occupations	838	3.8
Construction, extraction, and maintenance occupations	220	9.8
Production, transportation, and material moving occupations	362	17.0
Kings County		
Employed civilian population 16 years and over, total	39,511	100.0
Management, professional, and related occupations	10,228	22.9
Service occupations	7,777	18.0
Sales and office occupations	9,014	20.7
Farming, fishing, and forestry occupations	3,711	14.8
Construction, extraction, and maintenance occupations	3,378	9.6
Production, transportation, and material moving occupations	5,403	14.0

Source: 2000 U.S. Census

The top employers in Avenal listed in Table 1.4-5, offer many of the agricultural, sales and production occupations worked by Avenal residents.

Table 1.4-5
Top Employers in Avenal

Company	Number of Employees	Product
Avenal State Prison	1,300	Correctional Facility
Paramount Farms	600	Agricultural
Reef Sunset Unified School	306	Education
Pacific Gas & Electric	66	Natural Gas Compressor Plant
Chevron U.S.A. Inc.	25	Gas and Oil
Avenal Rural Health Care	25	Health Services
City of Avenal	22	Government

Source: Kings County EDC

Referencing Table 1.4-6, 52.2 percent of workers 16 years and over in Avenal drove alone to work, compared to 73.5 percent for the County. Workers in carpools in Avenal were approximately 42.2 percent compared to 17.0 percent for the County. Public Transportation use only accounted for 2.1 percent in Avenal and the average travel time to work in Avenal was 33.8 minutes.

Table 1.4-6
Commute Patterns, 2000
Avenal and Kings County

	Avenal		Kings County	
	Number	Percent	Number	Percent
Workers 16 Years and Over	2,478	100.0	41,944	100.0
Car, Truck, or Van-Drove Alone	1,294	52.2	30,817	73.5
Car, Truck or Van-Carpooled	1,046	42.2	7,117	17.0
Public Transportation (Including Taxicab)	53	2.1	678	1.6
Walked	43	1.7	1,398	3.3
Other Means	23	0.9	836	2.0
Worked at Home	19	0.8	1,098	2.6
Mean Travel time to Work (Minutes)	33.8	-	20.8	-

Source: 2000 U.S. Census

1.4.3 AVENAL CITY BUDGET

The City budget consists of a number of funds. The largest fund in terms of its annual revenue is the General Fund ($2.2 million in fiscal year 2003-2004) (reference Table 1.4-7).

These revenues mostly consist of property tax, sales tax, motor vehicle tax, and franchise fees. The General Fund accounts for the majority of discretionary spending by the City Council. The General Fund is a significant area in the budget where the City has some discretion in terms of allocating expenditures to various services. On the other hand, the General Fund is also the most sensitive to the character of development in the community, which affects the strength of the tax base upon which the General Fund depends for its revenue.

The water fund is the next largest in terms of total revenue ($2,215,000 in fiscal year 2002-2003). The water fund is used for the acquisition, construction, administration, maintenance and operation of water facilities, and repayment of federal or state loans or advances, made to the City for the construction or reconstruction of water facilities.

The City's estimated revenue for fiscal year 2003-04 is $15.6 million and the proposed expenditures for fiscal year 2003-04 are $15.1 million. This would leave the City with a surplus of $560,000 for fiscal year 2003-04. Overall, the City is in a sound financial system, with adequate fund balances throughout the budget.

Table 1.4-7
2003-2004 Fiscal Year Budget
General Fund Summary

Description	Proposed Budget FY 03/04
City Council	$29,025.00
City Manager	$9,399.53
City Clerk	$43,789.92
City Attorney	$46,250.00
Finance/Personnel	$41,709.00
General Services	$45,312.86
Community Development	$334,693.20
Planning & Zoning	$32,200.00
Building Inspection	$79,829.07
Code Enforcement	$111,551.22
Recreation	$193,029.68
Parks & Landscaping	$84,488.16
Animal Control	$33,318.28
Public Safety Services	$1,137,915.00
Emergency Services	$3,500.00
Equipment Maintenance	-
General Fund Revenue Totals	$2,247,468.23
General Fund Expenditure Totals	$2,226,011.07
General Fund Revenue Over/Under	$21,457.16

Source: City of Avenal

1.5 Transportation and Circulation

1.5.1 PURPOSE

The purpose of the Circulation Element of the General Plan is to provide guidance, by means of goals, policies, and programs for the achievement of an efficient and effective transportation and infrastructure system within and surrounding the City of Avenal. It is also to provide a transportation plan related with the Land Use Element. The intent of the document is to create a plan that will meet the transportation demands of the future population by improving the circulation system in the Plan Area.

1.5.2 EXISTING ROADWAY SYSTEM

Vehicular circulation in Avenal consists of a network of city streets and roads. Streets and roads are classified by functional classification including freeways, arterials, collectors, and local

roads. A freeway is defined as a divided highway with full control of access and two or more lanes for the exclusive use of traffic in each direction. Freeways provide for uninterrupted flow of traffic. There are no signalized or stop-controlled at-grade intersections and direct access to and from adjacent property is not permitted. Access to and from a freeway is limited to ramp locations.

Arterials in Avenal serve as the principal network for traffic flow. They typically have no less than a 100-foot right-of-way and connect areas of major traffic generation within the urban areas and also with important county roads and state highways. Arterials also provide for the distribution and collection of through traffic to and from collector and local streets serving residential, commercial, and industrial land uses.

Collector streets provide for traffic movement between arterial and local streets; traffic movement within and between neighborhoods and major activity centers; and limited direct access to abutting properties. Collector streets in Avenal typically have a right-of-way that ranges between 60 and 84 feet. They are intended to connect arterials with local streets and activity centers.

Local streets provide for direct access to abutting properties and for localized traffic movements within residential, commercial, and industrial areas. In general, local collectors are local streets designated to connect neighborhoods that are designed to discourage through traffic.

Roadways that provide primary circulation within the City of Avenal include: Interstate 5, State Route 33, State Route 269 (Skyline Drive), Seventh Avenue, Third Avenue, Kings Street, Fifth Avenue, Seventh Avenue, and San Joaquin Street.

Interstate 5 is a major north-south corridor that has statewide significance in that it links northern, central, and southern California. Although a portion of Interstate 5 is located in the city's proposed sphere of influence, it is approximately 5 miles northeast of downtown Avenal. According to the Caltrans website, Interstate 5 carries approximately 31,500 vehicles per day at this location.

State Route 33 is a north-south oriented street that operates as a two lane highway. Based upon the current Avenal Circulation Element, State Route 33 is currently designated as an arterial street. State Route 33 serves as an alternate corridor for interregional north-south travel on the west side of the San Joaquin Valley. The current pavement width of State Route 33 is 29 feet with limited shoulders. Based upon Caltrans' Route Concept Report, this highway has a typical minimum right-of-way of 100 feet.

This highway generally comprises the western border of the City of Avenal. State Route 33 acts as an important arterial for the City of Avenal and as a feeder highway to other major State Routes throughout the area. Access to the Avenal Prison is via State Route 33 south of the City and access to the Avenal Airport is provided west of State Route 33. With a posted speed limit of 55 mph, State Route 33 operates as a thoroughfare with no access restrictions, i.e., stop signs or traffic signals, through the study area.

State Route 269 is an east-west oriented street that generally operates as a two lane highway. However, through the City of Avenal, this roadway operates as, and is considered to be, an arterial street. The current curb to curb width of State Route 269 ranges between 52 and 60 feet with curb, gutter, and sidewalk facilities. Based upon Caltrans' *Route Concept Report*, this highway has a typical minimum right-of-way of 100 feet.

Although this is an odd numbered State highway, which would indicate that it has a north-south alignment, through the study area it travels in an east-west fashion. State Route 269 does have two westbound lanes from Avenal Cutoff as it travels up the hill toward Avenal. This extra lane is also known as a "climbing" lane. West of Hydril Road it becomes a two lane roadway with a two-way-turn-lane that divides the travel lanes. State Route 269, known to the local residents as Skyline Boulevard, acts as Avenal's main corridor that provides access to a variety of local services and to minor collector facilities that intersect this roadway.

Third Avenue is a north-south collector street that extends from State Route 33 to just north of Alpine Street. From curb to curb, Third Avenue ranges between 40 and 50 feet wide. Third Avenue contains two travel lanes with a two-way turn lane in portions of the median, on-street parking, accommodates bicycle travel, and has a posted speed limit of 30 mph. Third Avenue primarily serves residential development with mixed commercial development near Skyline Boulevard. Truck travel is discouraged on Third Avenue and as a result, signs of this nature are currently posted.

Fifth Avenue is also a north-south collector street that extends from State Route 33 to just north of Alpine Street. From curb to curb, Fifth Avenue is 40 feet wide. Fifth Avenue includes two travel lanes, on-street parking, accommodates bicycle travel, and has a posted speed limit that ranges from 25 to 30 mph. Fifth Avenue primarily serves residential land uses and truck travel is discouraged on this facility.

Seventh Avenue is a north-south collector street that extends from State Route 33 to Mariposa Street. From curb to curb, Seventh Avenue is typically 52 feet wide. Seventh Avenue contains two travel lanes, on-street parking, accommodates bicycle travel, and has a posted speed limit of 30 mph. Because Seventh Avenue can be used to travel between State Routes 33 and 269, a large amount of traffic utilizes Seventh Avenue and it acts as a "short cut". Many Avenal Prison workers traveling to or from areas east of Avenal contribute to these cut-through trips.

Kings Street is an east-west collector that extends from State Route 33 to Seventh Avenue. The curb to curb width of Kings Street is 60 feet and it includes two travel lanes, angled on-street parking, and has a posted speed limit of 25 mph. West of Skyline Boulevard, Kings Street serves the downtown area and includes amenities such as street lighting, trees, other landscaping features, and bicycle parking stalls.

San Joaquin Street is a two-lane east-west roadway that intersects with State Route 269 just south of Hydril Road. The San Joaquin Street/State Route 269 intersection is a

skewed "T" intersection. This street primarily serves local residences, with the exception of commercial land uses near the intersection at State Route 269.

1.5.3 EXISTING TRAFFIC VOLUMES

The following intersections were identified as critical intersections for the General Plan Update:

- State Route 33/San Joaquin Street
- State Route 33/State Route 269
- State Route 33/Seventh Avenue
- State Route 269/Third Avenue
- State Route 269/San Joaquin Street
- State Route 269/Kings Street
- State Route 269/Fifth Avenue
- State Route269/Seventh Street

At these intersections, existing weekday AM and PM peak-hour traffic volume counts were conducted by OMNI-MEANS on Tuesday, March 30, 2004.

In addition, the following average daily traffic (ADT) counts were conducted on March 30, 2004 for the following street segments:

- State Route 33 between Seventh Avenue and San Joaquin Street
- State Route 269 between State Route 33 and Hydril Road
- San Joaquin Street between State Route 33 and State Route 269
- Kings Street between State Route 33 and State Route 269
- Third Avenue between State Route 269 and San Joaquin Street
- Fifth Avenue between State Route 269 and San Joaquin Street
- Seventh Avenue between State Route 33 and State Route 269

It should be noted that ADT information related to State Routes was taken from Caltrans' website.

1.5.4 LEVEL OF SERVICE METHODOLOGY

Traffic operations have been quantified through the determination of "Level of Service" (LOS). Level of Service is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to an intersection or roadway segment representing progressively worsening traffic conditions. Levels of Service were calculated for different intersection control types using the methods documented in the *2000 Highway Capacity Manual*. Levels of Service definitions for different types of intersection controls are outlined in Table 1.5-1.

The City of Avenal Circulation Element has designated LOS "C" as the minimum acceptable LOS standard on City facilities in general. In this report, a peak-hour LOS of "C" is taken as the threshold for acceptable traffic operations at all study intersections and roadways. All intersection turning movement volumes and LOS worksheets are contained in Appendix C.

To determine whether "significance" should be associated with unsignalized intersection level of service, a supplemental traffic signal warrant analysis was also performed. The signal warrant criteria employed for this study are presented in the Caltrans *Traffic Manual*. Specifically, this study utilized the Peak-Hour-Volume Warrant-11 (Urban Areas). Though utilization of this warrant may indicate that signalization would be required, the final decision to provide this improvement should be based on further studies utilizing the additional warrants presented in the Caltrans *Traffic Manual*.

This traffic study generally provides a "planning level" evaluation of traffic operating conditions, which is considered sufficient for California Environmental Quality Act/National Environmental Policy Act (CEQA/NEPA) purposes. This planning level evaluation has included, however, a heavy-vehicle adjustment factor and peak hour factors (0.92). Because many of the trips will be heavy duty vehicles, the percentage of heavy duty trucks was applied in the *TRAFFIX 7.6* software.

1.5.5 EXISTING TRAFFIC OPERATIONS

Existing peak-hour intersection traffic operations were quantified applying existing traffic (reference Figure 1.5-1) volumes and existing intersection lane geometrics and control (shown on Figure 1.5-2). Table 1.5-2 presents the existing peak hour intersection levels of service.

As indicated in Table 1.5-2, all of the study intersections are currently operating at LOS "C" conditions or better during the AM and PM peak hour periods. In addition, the two-way stop-controlled intersections do not satisfy the Caltrans Peak Hour Volume Warrant-11 (Urban Areas).

1.5.6 EXISTING ROADWAY OPERATIONS

"Existing" conditions roadway operations were also determined. Table 1.5-3 identifies "Existing" conditions roadway LOS. The average daily traffic (ADT) counts for "Existing" conditions are shown on Figure 1.5-3. Based upon the results presented in Table 1.5-3, all of the study roadway segments are projected to operate at acceptable LOS "C" conditions or better under "Existing" conditions.

Table 1.5-1
Level of Service Criteria
for Intersections

LEVEL OF SERVICE	TYPE OF FLOW	DELAY	MANEUVERABILITY	STOPPED DELAY/VEHICLE (SEC)		
				SIGNALIZED	UNSIGNALIZED	ALL-WAY STOP
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	≤ 10.0	≤ 10.0	≤ 10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10 and ≤ 20.0	>10 and ≤ 15.0	>10 and ≤ 15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20 and ≤ 35.0	>15 and ≤ 25.0	>15 and ≤ 25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35 and ≤ 55.0	>25 and ≤ 35.0	>25 and ≤ 35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55 and ≤ 80.0	>35 and ≤ 50.0	>35 and ≤ 50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	> 80.0	> 50.0	> 50.0

Source: 2000 Highway Capacity Manual

Table 1.5-2
Existing Conditions:
Intersection Levels of Service

No	Intersection	Control Type	AM Peak Hour Delay (sec/veh)	AM Peak Hour LOS	AM Peak Hour Warrant Met?	PM Peak Hour Delay (sec/veh)	PM Peak Hour LOS	PM Peak Hour Warrant Met?
1	State Route 33/San Joaquin Street	TWSC	9.1	A	No	9.1	A	No
2	State Route 33/State Route 269	TWSC	8.8	A	No	9.1	A	No
3	State Route 33/ Seventh Avenue	TWSC	8.9	A	No	9.7	A	No
4	State Route 269/Third Avenue	TWSC	9.4	A	No	9.5	A	No
5	State Route 269/Kings Street	TWSC	9.9	A	No	11.0	B	No
6	State Route 269/Fifth Avenue	TWSC	10.3	B	No	12.5	B	No
7	State Route 269/Seventh Avenue	TWSC	13.9	B	No	13.5	B	No
8	State Route 269/San Joaquin Street	TWSC	11.1	B	No	13.0	B	No

Legend:
TWSC = Two-Way Stop-Control.
AWSC = All-Way Stop-Control.
Average Delay = Average Intersection Delay for Signalized and AWSC Intersections.
Average Delay = Worst-Case Intersection Movement Delay for TWSC Intersections.
LOS = Average Intersection Level-of-Service for Signalized and AWSC Intersections.
LOS = Worst-Case Movement's Level-of-Service for TWSC Intersections.
Warrant = Caltrans Peak-Hour Volume Warrant-11 (Urban Areas).

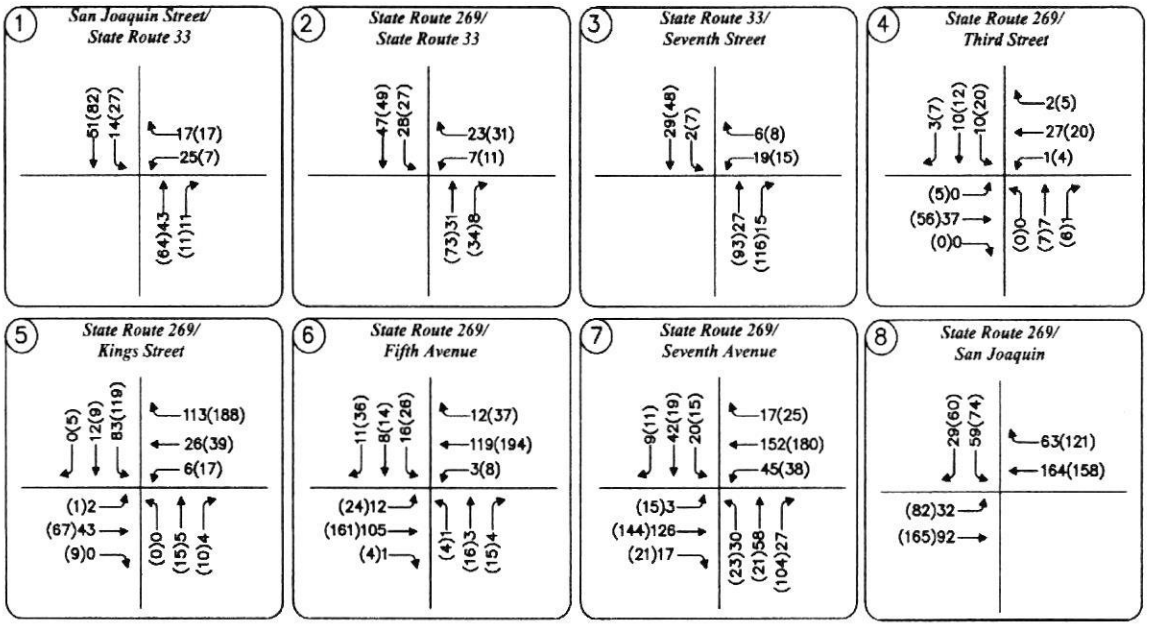
Table 1.5-3
Existing Conditions:
Roadway Segment Level of Service

	From	To	Facility Type	ADT	LOS
State Route 33	Seventh Avenue	San Joaquin Street	2-lane Collector	2,200	A
State Route 269	State Route 33	Hydril Road	2-lane Collector	4,200	A
San Joaquin Street	State Route 33	State Route 269	2-lane Collector	660	A
Kings Street	State Route 33	State Route 269	2-lane Collector	1,850	A
Third Avenue	State Route 269	San Joaquin Street	2-lane Collector	1,650	A
Fifth Avenue	State Route 269	San Joaquin Street	2-lane Collector	1,080	A
Seventh Avenue	State Route 33	State Route 269	2-lane Collector	1,190	A

1.5.7 EXISTING TRANSIT SERVICE

Avenal's transit needs are served by the Kings Area Rural Transit (KART), which is overseen by the Kings County Public Works Department. KART serves the transit needs throughout Kings County and also provides service to its residents and to adjacent counties. The fixed route provides transit service between the cities of Avenal and Hanford, which is the county seat. As shown on Figure 1.5-4, this route is triangular in nature and serves San Joaquin Street, State Route 33, and State Route 269 (Skyline Boulevard).

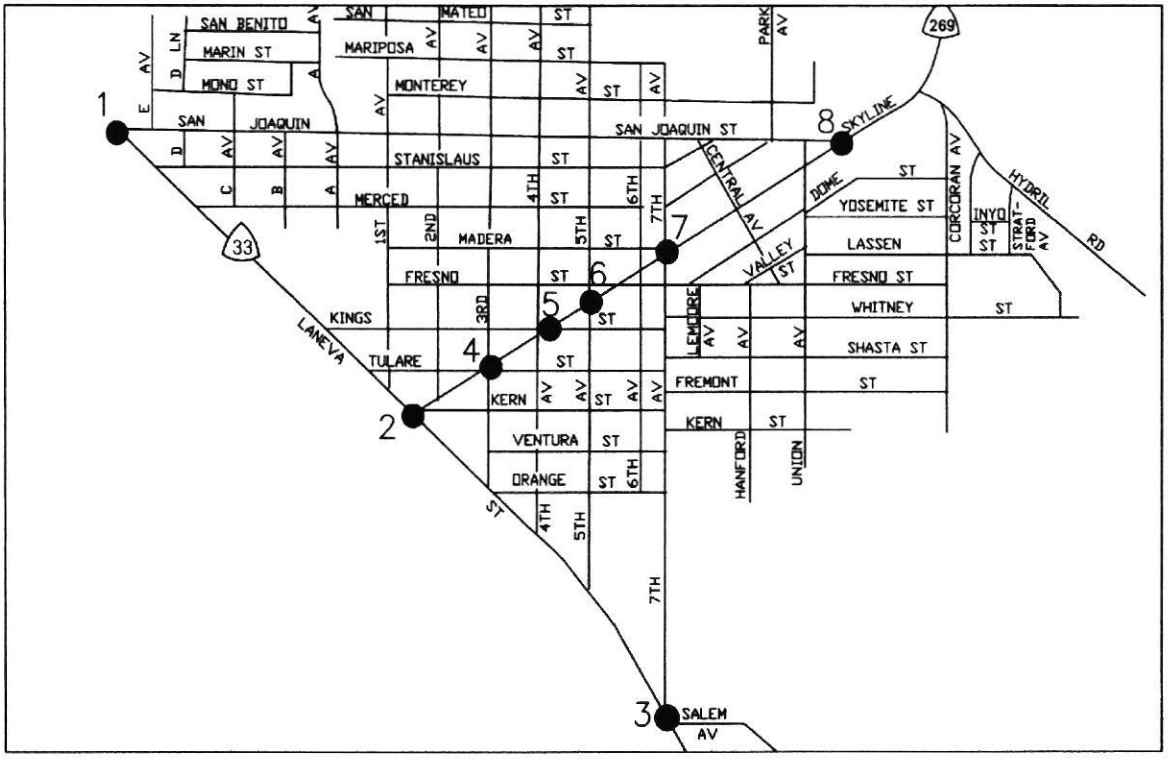
In Avenal, fixed route transit service currently operates Monday through Saturday. KART does not operate on Sundays or holidays. Departures from Avenal to Hanford occur at 7:45 am, 12:45 pm, 2:00 pm, and 5:15 pm; arrivals from Hanford occur at 7:45 am, 12:35 pm, and 5:15 pm. The fixed route service costs $4.00 for adults and $2.00 for youths (ages 7-12). Trips within the city are $1.50. Monthly passes for the Avenal-Hanford route may also be purchased through KART for $60.00.



LEGEND

xx AM PEAK HOUR VOLUMES

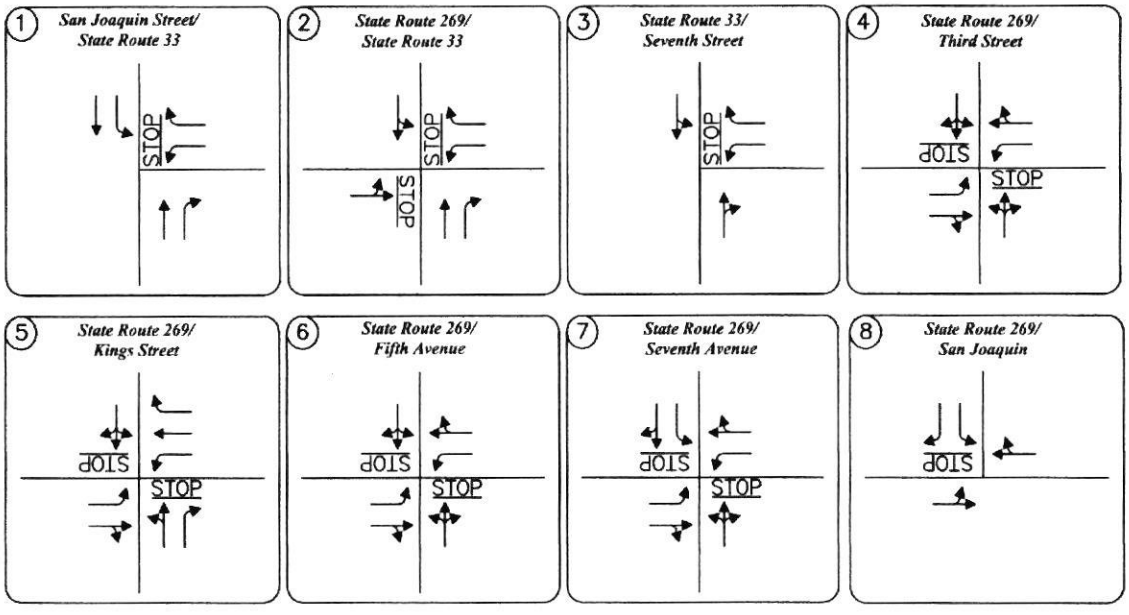
(xx) PM PEAK HOUR VOLUMES



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EXISTING PEAK HOUR TRAFFIC VOLUMES

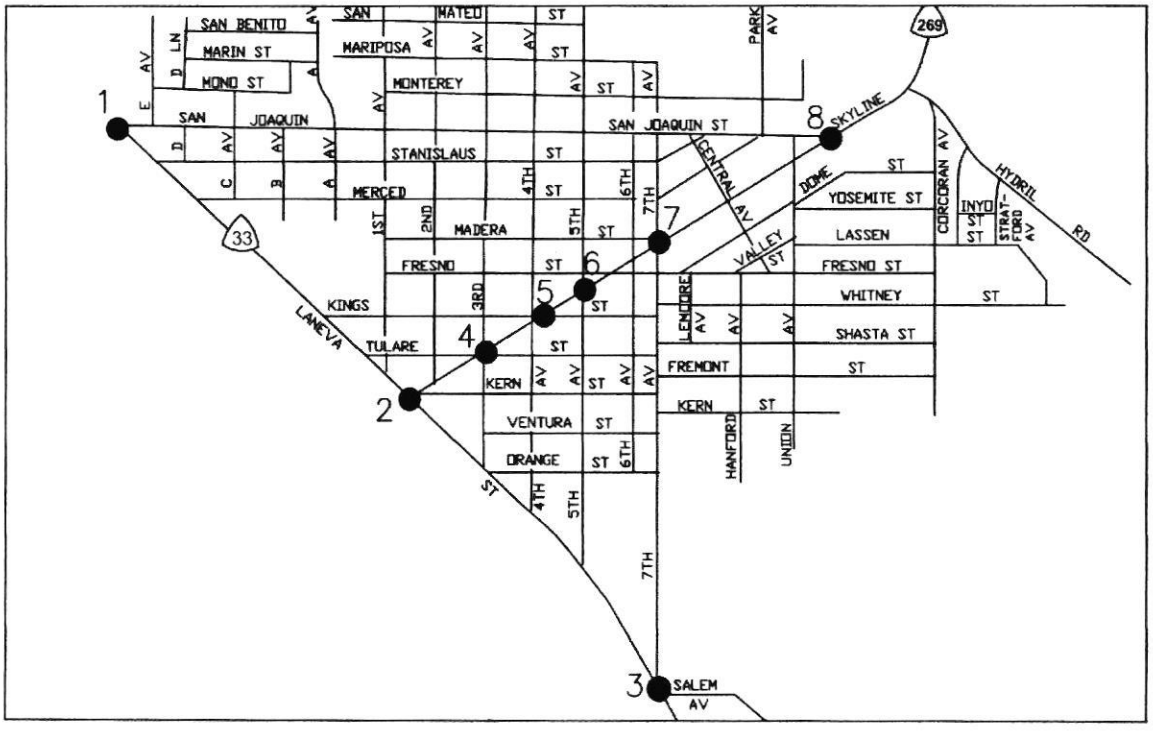
Figure 1.5-1



LEGEND

xx AM PEAK HOUR VOLUMES

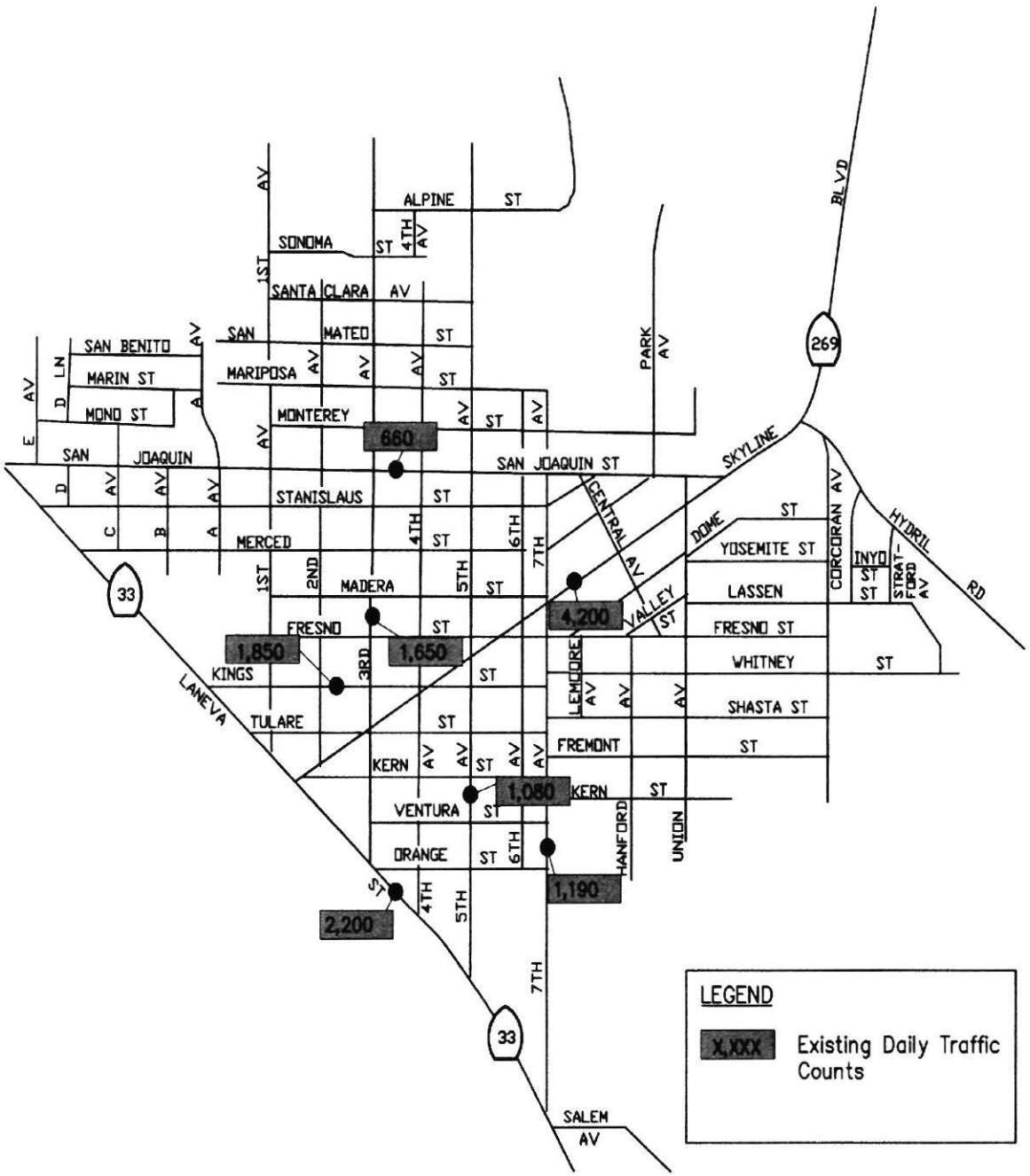
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EXISTING LANE GEOMETRICS AND CONTROL

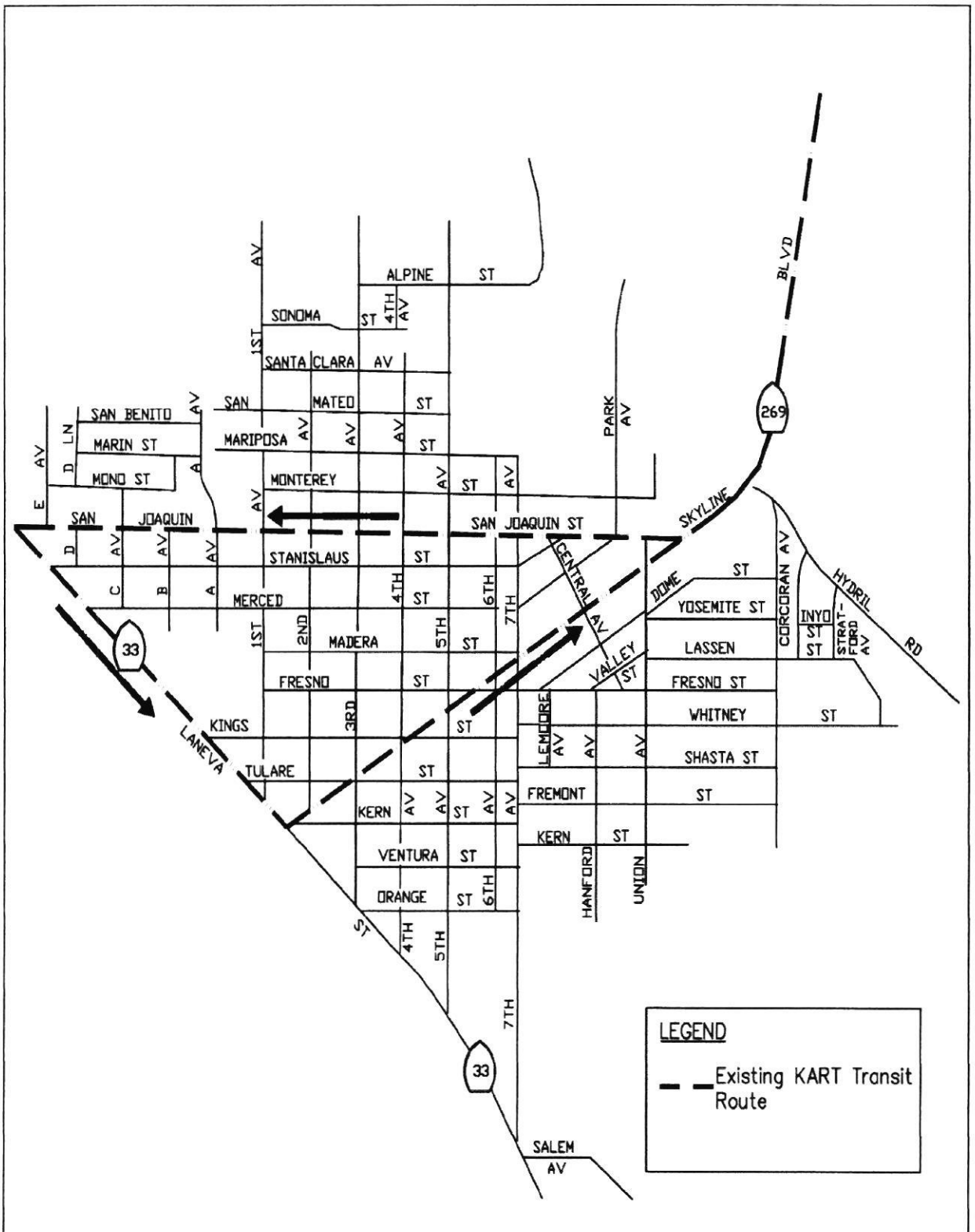
Figure 1.5-2



Quad Knopf

EXISTING DAILY TRAFFIC COUNTS

Figure 1.5-3



Quad Knopf

EXISTING KART TRANSIT ROUTE

Figure 1.5-4

KART also provides Dial-A-Ride services for residents of Avenal traveling more than ½ mile from an existing bus route or for those riders certified by KART as disabled. Dial-A-Ride (door to door) service is available in Avenal on Monday through Friday between 11:00 am and 1:30 pm. All rides from home must be scheduled one day in advance. However, disability service may be scheduled during normal operating hours.

Current ridership trends, based upon data provided by KART from the previous eight months, indicate that the demand for transit services remains constant. Approximately 860 transit riders utilize KART's Avenal-Hanford route each month. In addition, the Dial-A-Ride service assists approximately 180 patrons each month in the City of Avenal.

1.5.8 EXISTING BICYCLE AND PEDESTRIAN FACILITIES

The Kings County Association of Governments (KCAG) adopted the *Kings County Regional Bike Plan* in July 1998. The adopted bikeway map is depicted on Figure 1.5-5. The current bicycle plan provides for connections between major urban and recreational facilities within Avenal. This plan is expected to be satisfactory for the foreseeable future. In addition to the provision of bikeway routes, KART provides bike racks on transit vehicles in their effort to enhance the use of transit and bicycling within the urban areas. With the onset of air quality attainment strategies and congestion management, bicycling is considered an effective alternative mode of transportation that can help improve air quality and reduce the number of vehicles traveling along congested facilities within cities and communities.

The *Caltrans Highway Design Manual Standards* for bikeway facilities includes the following types of bicycle facilities:

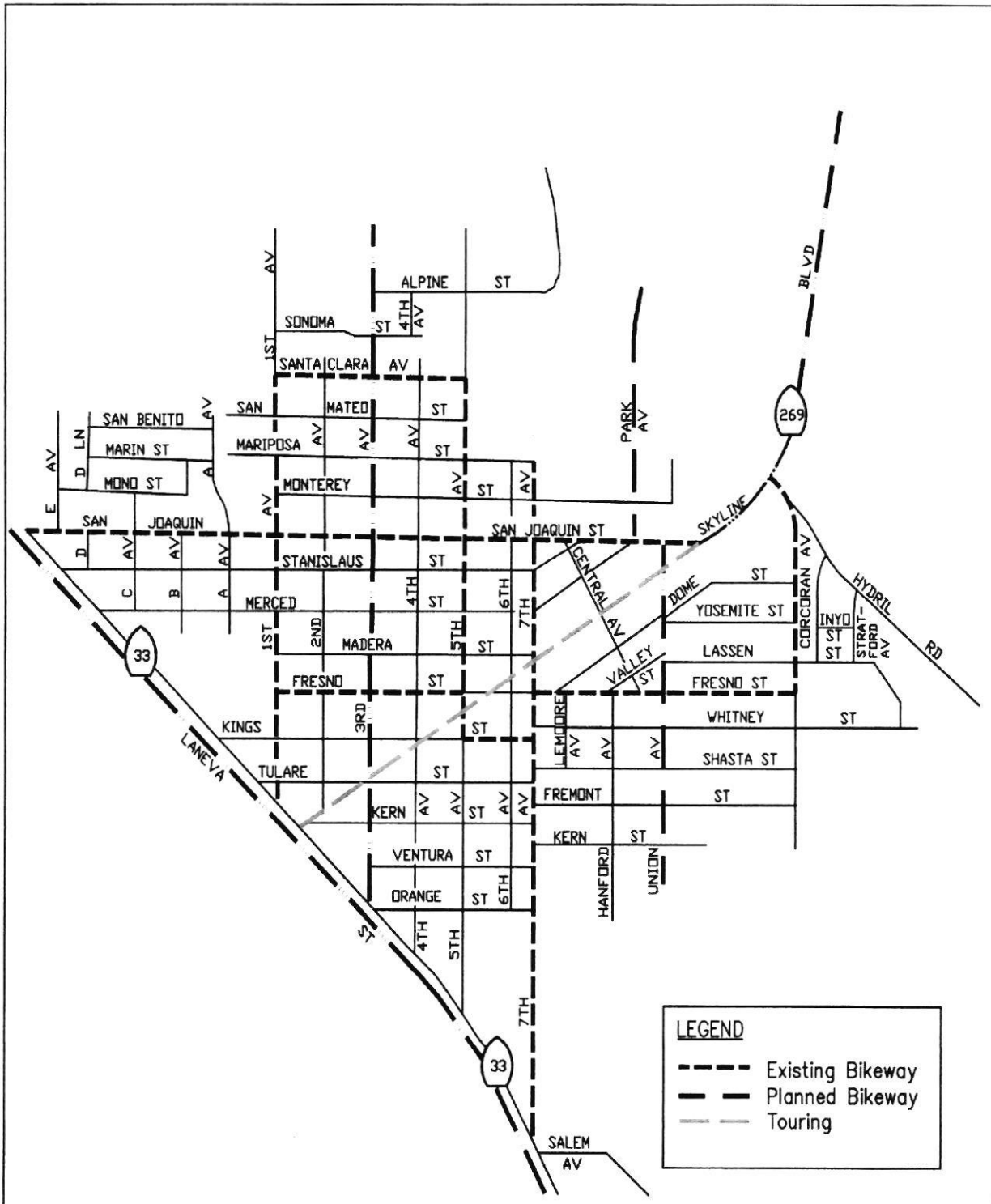
- Class I Bikeway (Bike Path) – Provides a completely separate right of way for the exclusive use of bicycles and pedestrians with cross-flow minimized;

- Class II Bikeway (Bike Lane) – Provides a striped lane for one-way bike travel on a street or highway; and

- Class III Bikeway (Bike Route) – Provides for shared use with pedestrian or motor vehicle traffic (no pavement stripes or bicycle lane designation markers).

In addition to the above classifications, the *Kings County Regional Bicycle Plan* recommends the use of two additional bicycle facilities:

- Class III with Striping – Provides a shoulder stripe but does not include bicycle lane pavement markings. These facilities do include the "Bike Route" signage similar to a Class III facility. This type of bikeway is most appropriate when insufficient pavement width is available to provide a standard Class II facility, but it is desirable to designate a portion of the roadway for bicyclists.



Quad Knopf

EXISTING BIKEWAY MAP

Figure 1.5-5

Touring – This facility designation is used for streets that cannot be given a formal designation (i.e., Class I, II, or III) because of cost, liability concerns, etc., but are used as a primary cycling route by more experienced (and typically long-distance) cyclists. These streets are often narrow, without shoulders, or carry high speed traffic. These streets do not provide the level of protection or comfort necessary for the casual, less experienced cyclists. Therefore, a touring roadway is one on which only experienced cyclists should ride.

According to the *Kings County Regional Bicycle Plan* a total of 5.9 miles of new bicycle routes have been constructed since December 1997. The Plan further indicates that with over 10,600 feet of Class II routes and 20,000 feet of Class III routes in Avenal, the community has made a positive move toward promoting safe bicycle use. Bicycle ridership elsewhere may occur on existing streets as "shared-use" facilities.

Pedestrian facilities within the immediate vicinity of schools and recreational facilities are also important components of the non-motorized transportation system. Pedestrian circulation facilities within and around school and recreational areas are provided where appropriate and enhance the safety of those who choose to use these facilities.

1.6 Public Facilities and Services

1.6.1 WATER SUPPLY SYSTEM

The City provides water service to the urbanized portion of Avenal, the State Prison, and a limited number of connections in the northern portion of the community near Interstate 5. The City's source of water is the San Luis Canal which is part of the State and Federal water project that provides water to the west side of the San Joaquin Valley. The City obtains the canal water through a contract with the U.S. Bureau of Reclamation (USBR).

The USBR contract, which started in 1969 and runs through 2008, allocates a maximum delivery of 3,500 acre-feet per year to the City. However, the actual delivery to the City is subject to the availability of water to the San Luis Project. As a result of dry water years, USBR will reduce the City's allocation to a percentage of historical use. The amount of reduction will depend on snow pack and state reservoir levels.

Treatment/Pumping Plants

Water Plant #2, which was constructed in 1987 by the state so the City could provide water to the Prison, has a capacity of 3.1 mgd (3,400 acre-feet per year). An agreement between the State Department of Corrections and the City of Avenal allocates 1,411 acre-feet per year to the prison.

Water plant #1, which was constructed in 1971 and rehabilitated in 2000 has a capacity of 2.2 mgd giving the City a combined capacity of 5.3 mgd (5,937 acre-feet per year).

The annual production of the treatment plants has averaged 2.6 mgd for the 2003 year. During this period, the production ranged from a high of 4.47 mgd in August to a low of 1.04 mgd in February. The highest production on record, 4.47 mgd, occurred in August of 2003.

Transmission Lines

Water is delivered from the treatment plants to the developed portion of Avenal (and the prison) in a pair of parallel transmission mains. The two mains consist of a 12-inch diameter line that, prior to the construction of the Prison, had served the community; and an 18-inch line that was installed at the time the State constructed the newer treatment plant. The larger main primarily serves the Prison. The two transmission mains run along the Avenal Cutoff Road and then parallels Highway 269 into urbanized Avenal.

Water currently is conveyed in two water mains, a 12-inch line stemming from treatment plant #1 and an 18-inch line stemming from treatment plant #2, to an on-line 2.9 million gallon storage tank located approximately two and one-half miles south of Interstate 5.

From the storage tank, water is conveyed north (by gravity) in the 12-inch main to a Caltrans I-5 rest stop, the PG&E pump station located east of the Avenal Cutoff Road, and a limited number of domestic connections. The 12-inch main delivers water to the developed portion of Avenal while the 18-inch main delivers water to the Prison. There is an interconnection between the 18-inch and 12-inch mains at the 2.9 mg tank. Both lines feed the prison and City.

The 12-inch main feeds into and discharges from a 750,000 gallon storage tank that is located immediately north of the developed portion of Avenal. A lateral line connects the 18-inch main with this tank.

Distribution System

Avenal's water distribution system consists of a network of mains in most of the streets and alleys in the community. The mains generally are 6-inch diameter asbestos cement pipes. To date, there are approximately 1,827 connections to the City's water system.

The City staff reports that the distribution system is adequate to satisfy current demands and provide the required Uniform Fire Code fire flows. The City operates the system with a pressure that ranges from 60 to 105 pounds per square inch (psi).

The 18-inch main that serves the Prison follows Seventh Avenue to Highway 33 and then southeast to the Prison. The City maintains a two million gallon storage tank adjacent to the Prison. Although the 18-inch main was built primarily to serve the Prison, it is interconnected with the distribution system near Seventh Avenue and Orange Street by a valve that is manually operated. This valve is typically closed.

Demand

Water from the San Luis Canal is treated at the City's Water Treatment Plant, which is located east of Interstate 5 (I-5). The current capacity of the Water Treatment Plant is 5.4 million gallons and the current demand is 3 to 3.5 million gallons per day (Duke Energy Avenal, October 2001). Therefore, the City's water treatment plant has an excess capacity of between 1.9 and 2.4 million gallons per day. The major water users in the City include Floyd Rice Park, the schools, and the hospital.

1.6.2 SANITARY SEWER SYSTEM

Collection System

The City of Avenal provides sewer service to its urbanized areas and the Avenal State Prison. The City's sewage collection system includes two major trunk lines in Laneva Boulevard, 8 and 10 inches in diameter, that extend from the urban area to the sewage treatment plant located in southeast Avenal. Within the urban area, the collection system generally consists of 6-inch diameter lines. An 18-inch line connects the State Prison directly to the treatment plant.

The City's collection system drains by gravity to the treatment plant. The system operates without pump stations and there are no force-main lines.

The major trunk lines that service the City are currently not operating at their capacity according to City staff.

Treatment Plant

The existing Avenal treatment plant was constructed in 1987 along with the State Prison, located west of the treatment plant. Avenal's former treatment plant was located approximately one mile north of the existing plant.

Capacity

The existing plant was designed with a hydraulic capacity of approximately 1.8 million gallons per day (mgd). It currently is permitted for a discharge flow of 1.63 mgd by the California Regional Water Quality Control Board (CRWQCB).

Through an agreement with the City of Avenal, the State Prison is allocated approximately one-half of the treatment plant's design capacity. The Prison's allocation includes flows of nearly 0.8 mgd of domestic wastewater and approximately 0.1 mgd of industrial wastewater. The City has reserved the remaining one-half of the plant's capacity for future development in Avenal.

The average biochemical oxygen demand (BOD) loading capacity of the plant is 2,033 pounds per day and the average total suspended solids (TSS) loading capacity is 2,195 pounds per day.

Facilities

The treatment plant, which currently is operated by the City of Avenal, consists of a headworks grinder, an oxidation ditch, two clarifiers, six sludge-drying beds, and pumps and piping to transfer treated wastewater to the effluent storage reservoir.

Treated effluent from the plant is pumped across Highway 33 to two approximately 300 acre-foot storage ponds hooked up in series. The ponds are located immediately south of the prison. The effluent is applied to agricultural lands on the west side of Highway 33.

Flows

Flows entering the treatment plant have averaged 1.097 mgd between January and December of 2003, ranging from a high of 1.268 in September to a low of 0.952 in April. The prison generated an average flow of 0.811 mgd in 2003, which was approximately 74% of the total flow at the plant. The City generated an average flow of 0.288, which was approximately 26% of the total flow at the plant. Based on a 2003 non-prison population of 8,382 and an average flow at the plant from the City of 0.288 mgd, the citywide sewage generation rate is approximately 34.4 gallons per day per person. The average daily generation rate per residential unit is approximately 117 gallons per day (based on a occupancy rate of 3.4 people per unit). In 2003 the average BOD loading was 2,033 lbs per day, while the average TSS loading was 2,195 lbs per day.

Available Capacity

Based on 2003 flows at the plant, 0.701 mgd of the plant's capacity is currently unused. Approximately 0.35 mgd of this available capacity is allocated to the prison, while the remaining 0.35 mgd of the unused capacity is reserved for the City. Based on the 2003 average sewage generation rate of 34.4 gpd per person, the treatment plant's reserve capacity (for the City) is sufficient to accommodate approximately 11,995 additional people or 3,528 new single-family residential units (at an occupancy rate of 3.4 persons per unit). At the projected annual population growth rate, the City's portion of the treatment plant's reserve capacity will not be utilized until beyond the year 2025 under average flow conditions.

Sludge Disposal

Sludge from the treatment plant is currently stock piled on site and is disposed of on an annual basis. The sludge at the treatment plant consistently meets Title 22 levels for Class B sludge.

1.6.3 STORM DRAINAGE

The existing storm drainage infrastructure in Avenal is limited to a collection line on Skyline Boulevard (Highway 269) that is operated and maintained by the State, and a City collection line on San Joaquin between First Street and Highway 33. Both of these collection lines discharge by gravity to open fields on the west side of Highway 33.

In the early 1990's, the City completed a street improvement program in which curb and gutter was installed on all streets in the developed portion of the community. Runoff from these improved areas drains as surface flow in a southwesterly direction toward Highway 33.

1.6.4 EPA "PHASE II" STORMWATER DRAINAGE DISCUSSION

The EPA established a March 2003 deadline for permit application for the Storm Water National Pollutant Discharge Elimination System (NPDES) Phase II Rule implementation. Municipal Separate Storm Sewer Systems (MS4s) serving a population of less than 100,000 and located in an urbanized area or designated by the permitting authority (the local regional water quality control board) are covered by the Phase II Rule. The City is required to submit its application

for a Phase II permit that must include a Storm Water Management Program/Plan addressing the six minimum control measures as follows:

1. Public education and outreach on storm water impacts.
2. Public involvement/participation
3. Illicit discharge detection and elimination
4. Construction site storm water runoff control
5. Post-construction storm water management in new development and redevelopment
6. Pollution prevention/good housekeeping for municipal operations.

The City is responsible for preparing a storm water management program that specifies Best Management Practices (BMPs) for the six minimum control measures. While the regulations do not necessarily require Phase II permits to address industrial discharges, it should be anticipated that the Regional Board will attempt to place this responsibility upon the City.

1.6.5 SCHOOLS



Educational services are provided by the Reef-Sunset Unified School District and serve grades K-12. Avenal is within commuting distance from several Junior Colleges, Universities, and Institutes. These include:

- West Hills College in Coalinga;
- College of the Sequoias in Visalia;
- Chapman University in Hanford;
- San Joaquin Valley College in Visalia; and
- California State University, Fresno

Reef-Sunset Unified School District –The Reef-Sunset Unified School District encompasses the City limits and surrounding areas. The District includes three elementary schools, one middle school, one high school, two continuation schools, and two community day schools. The School District's office is located at 205 North Park Street in Avenal. Reef-Sunset Unified School District student enrollment in 1992 was 1,798 students and increased to 2,422 students (2,061 without Kettleman Elementary, continuation schools, or community day schools) by 2002-03. This was an increase of 34.7 percent. As of 2001-02, Reef-Sunset Unified had 130 teachers, 12 administrators, and 10 persons in pupil services for a total staff of 152.

The District's three elementary schools serve either grades K-5 or K-8 and include: Avenal Elementary located at 400 South First Avenue, with a student enrollment of 646; Kettleman City Elementary with an enrollment of 308, located at 701 General Petroleum Street in Kettleman City; and Tamarack Elementary located at 1000 Union Avenue, with a student enrollment of 400. The schools operate on single-track, traditional school schedules.

Avenal's only middle school, Reef Sunset Middle, serves grades 6-8 and is located at 608 North First Avenue. Reef Sunset's total enrollment in 1998-99 was 444 and decreased 3.2 percent to

total 430 in 2002-2003. The average class size in 2002-03 was 26.1 students per class and the student to teacher ratio was 19.5.

Avenal's public high school, Avenal High, serves grades 9-12 and is located at 601 Mariposa Street. Avenal High's total enrollment in 1998-99 was 560 and increased to 585 by 2002-03. This was a 4.5 percent increase and an annual growth rate of 0.9 percent. The average class size in 2002-03 was 26.1 students per class and the student to teacher ratio was 20.2.

As Table 1.6-1 shows, none of the schools in Avenal are currently over capacity. The school in Avenal which is closest to being at capacity is Avenal High with a 2002-03 enrollment of 585 students and a capacity of 800. Avenal High's student enrollment increased only 4.5 percent (25 students) from 1998-99 to 2002-03. Total enrollment in Avenal in 2002-03 was 2,061 (not including continuation and community day schools) and design capacity was 4,100.

Table 1.6-1
Reef Sunset Unified School District, 2002-03
School Enrollment and Design Capacity

School	Grades	Capacity	Enrollment
Avenal Elementary School	K-8	1,100	646
Kettleman City Elementary	K-8	1,100	308
Tamarack Elementary	K-5	1,100	400
Reef Sunset Middle	6-8	1,100	430
Avenal High	9-12	800	585
Adelante High (Continuation)	9-11	N/A	5
Reef Sunset Elementary (Community Day)	3-6	N/A	8
Reef Sunset Secondary (Community Day)	7-11	N/A	15
Sunrise High (Continuation)	9-12	N/A	25

Source: Education Data Partnership. Reef Sunset Unified School District

Table 1.6-2 shows the school district's enrollment from 1992-93 to 2002-03. The District's student enrollment increased 12.3 percent (265 students) from 1992-93 to 2002-03.

Table 1.6-2
School District Enrollment
1992-93 to 2002-03

Academic Year	No. of Students
2002-03	2,422
2001-02	2,403
2000-01	2,426
1999-00	2,418
1998-99	2,452
1997-98	2,452
1996-97	2,358
1995-96	2,273
1994-95	2,285
1993-94	2,198
1992-93	2,157

Source: Education Data Partnership

1.6.6 POLICE AND FIRE

The Kings County Sheriff's Office provides round-the-clock police services for the City of Avenal. The County maintains a substation located at 501 East Kings Street in Avenal. The substation offers 24-hour police service. The substation is staffed with one commander, nine deputies and two sergeants. At a minimum, there is one deputy on call 24-hours per day.

Avenal has a Justice Court and one court holding cell used only when the court is in session. The Court is in session every Friday. All arrested persons are transported to Kings County jail in Hanford, which is approximately 45 minutes away. The Sheriff's Department maintains a close working relationship with the police departments in Coalinga and Huron.

Fire protection is provided by the Kings County Fire Department augmented with a local volunteer force. The County maintains a station house in Avenal with two professional fire fighters (occasionally three) on duty 24-hours per day and nine volunteers. The fire station maintains four engines and two squad trucks. The County also has a two-man station (four volunteers) in Kettleman City, fifteen miles east of Avenal.

In addition, the County Fire Department works closely with California Department of Forestry (CDF) and the Avenal State Prison Fire Department. The County and CDF have a "dual responsibility" area west of State Highway 33. This means that they will both respond to fires in that area. The Avenal State prison maintains its own fire department at the prison site. The County indicated that they have a mutual aid agreement with the prison for fire services. The prison fire department works closely with the Kings County fire department and responds to almost all fires in the area. Although the Departments work closely together, the prison department cannot be relied on for responses to all emergencies. For security reasons, it is unusual for the County to assist with fires at the prison.

The County Fire Department indicated that grass and brush fires decreased 79 percent from 2002 to 2003 (39 grass fires). These typically occur in areas where onsite water is not available. In these cases, the fire crews fight most grass blazes by starting a "back-burn" fire in the path of the blaze. The two fires are expected to burn themselves out when they meet. Within the urbanized area, onsite water is available for fire use. The County stated that water pressure and quantity within Avenal have been sufficient to meet the demand during fires.

The Kings County Fire Department indicated that all of the urbanized area of Avenal falls within a 3-minute response time. However, a portion of the City limits in the unurbanized area is outside the 5-minute response time. The area near Interstate 5 is an "uphill pull" from the existing station. This area is about 8 to 12 minutes from the station.

The breakdown of calls for service in 2003 is as follows:

- Structures 35 (5%)
- Vehicle 31 (4%)
- Medical Aid (not traffic) 391 (57%)
- Traffic Accidents 115 (17%)

- Grass Fires 39 (5.8%)
- Other 64 (11.2%)

Since the construction of the prison in 1987, the Fire Department has noticed a significant increase in the number of emergency calls, especially for medical aid and traffic accidents. Although the actual City population has not increased as much as anticipated, the number of vehicles traveling to and from Avenal did. This would include prison employees traveling to and from work and prison visitors. This has increased the number of motor vehicle accidents and medical aid calls to which the Fire Department responds. For instance, in 1991 the Department responded to 361 emergency calls. In 2003, total responses were up to 675. The majority of medical aid and traffic accident calls for service were on Interstate 5 and accounted for 74 percent of all calls.

1.6.7 OTHER PUBLIC FACILITIES AND SERVICES

Electricity

The Pacific Gas and Electric Company (PG&E) is the provider of electricity for the City of Avenal. Existing trunk and transmission facilities are adequate to meet present and projected demand in the community.

Natural Gas

Avenal is supplied with natural gas by PG&E. Existing service is good, and company officials indicate no current unforeseeable peak load or pressure deficiencies.

Telephone

Service in and around Avenal is provided by Pacific Bell.

Cellular Service

Cellular telephone service is provided for the City of Avenal by a number of companies including U.S. Cingular, Nextel, Virgin Mobile USA, etc. Calls are placed from cellular phones, which are simply wireless mobile or portable phones that have radio-frequency (RF) transmitters and receivers. The RF signals are received by "cell" sites (hence the name "cellular"), which are RF receiver/transmitter stations situated on towers that are strategically placed to be able to transmit over or around topographic barriers. Signals from cellular phones are transmitted from cell to cell until they reach a mobile telephone switching office (MTSO) in the local calling area that the caller wishes to reach. Here, the call is linked by MTSO from the cellular network to the local telephone office.

From a planning viewpoint, the City must take care in approving cell sites. Planning considerations include flight patterns, visual/aesthetic effects, and possible effects on wildlife. As opposed to other utilities, however, there are no pipelines or cables other than electrical service to the site, which can represent a greater spectrum of potential effects. Also, a specific band of radio frequencies is assigned to each provider. They can be reused to serve a large number of

people, since the signals are not confined to cables to which individual users must be linked. Unless a sufficient grid of towers is approved within a county, cellular phone coverage will be spotty or non-existent.

1.6.8 AVENAL PUBLIC LIBRARY

Library service is provided by the Kings County Library. The Avenal Branch Library is located at 501 East Kings Street. The library is open Monday through Friday and is closed on Saturday and Sunday.

1.6.9 PUBLIC TRANSPORTATION

The City of Avenal has Dial-A-Ride service through Kings Area Rural Transit (KART). KART serves the cities of Armona, Avenal, Corcoran, Grangeville, Hanford, Hardwick, Kettleman City, Laton, Lemoore, Lemoore NAS, Stratford, and Visalia (with connections to buses serving Coalinga). KART's Dial-A-Ride service for Avenal operates 11:00 a.m. to 1:30 p.m. weekdays and 2:30 p.m. to 3:55 p.m. on Saturdays.

1.6.10 OTHER PUBLIC FACILITIES

The Avenal Post Office (93204) is located at 913 East San Joaquin Street.

1.6.11 SOLID WASTE AND HAZARDOUS WASTE COLLECTION, DISPOSAL, AND MANAGEMENT

The City of Avenal has its own landfill site. The 173-acre, WDR Class III site, is in the eastern portion of Avenal at Hydril Road and Skyline Boulevard. As of September 2, 2002, the landfill is being operated by Madera Disposal Systems Inc., a subsidiary of Waste Connections. The landfill property is still owned by the City of Avenal. Waste includes residential refuse, commercial solid wastes, tires, and construction/demolition wastes. The City contracts with Mid Valley Disposal for solid waste collection.

Avenal has initiated several important waste reduction and recycling programs, including passing an ordinance requiring the mandatory use of the City's recycling program for all businesses and residential units, and starting landfill recycling and salvage operations. Avenal is also successfully documenting its progress in meeting diversion goals and improving or expanding new diversion programs. The City diverted 60 percent of its waste in 2000.

The Avenal landfill is inspected on a monthly basis. The permitted capacity is 6.6 million cubic yards and the remaining capacity is 8.2 million cubic yards. The permitted throughput is 475 tons/day and the estimated closure date of the landfill is 2028. The City is currently sending close to 475 tons/day to the landfill, however, there are plans currently underway to expand the landfill to include up to 6,000 tons/day.

1.7 *Recreation, Archeological and Historical Resources*

1.7.1 EXISTING PARK AND RECREATION FACILITIES AND PROGRAMS



The City of Avenal currently has two designated park sites totaling approximately 8.96 acres. Floyd Rice Park is a 4.79 acre site located at the intersection of Park Avenue and Monterey Street. Floyd Rice Park is considered a neighborhood park. According to the National Parks and Recreation Service, a four acre park would be categorized as a neighborhood park, which has a service area of approximately one-quarter to one-half mile radius. Facilities at Floyd Rice Park include: passive recreation area, playground equipment, barbecues, 20 picnic tables, restrooms, and a community building with kitchen facilities.

Avenal's second park is the proposed Oasis Park (4.17 acres), which is currently unimproved, except for the skate park in the northeast corner. This site was purchased with 1987 Skate Park funds. Although the Park is not currently improved, a recreation grant for $470,000 has been received to develop this park. Besides these two park sites, other entities which provide open space and park amenities include schools, the horse corrals, the gun club, surrounding agricultural lands, and the open hillsides which border the City.

In addition to maintaining and operating park facilities, the City's Parks and Recreation Department supervises and coordinates a wide variety of programs and activities. Examples include:

Community Events. The Department helps sponsor family-oriented and special community events throughout the year, including the Old Timers Day held in May and the Fourth of July activities.

Sports Programs. The City provides organized men's and women's sports leagues and youth sports leagues, as well as an aquatics program. A strong emphasis has been placed on community participation in the planning, organization, and implementation of these programs. As these programs grow and participation increases, additional fields and facilities will be needed. Existing facilities will need renovations and there will be an increasing demand for additional staffing.

Two other programs that have been quite successful in Avenal are the senior citizen group and little league baseball. Both groups are operated independently of the City Recreation Department and run by private citizens. Below is a brief description of each program:

Senior Programs. Recreational, educational, and nutritional programs are provided for the senior population. The seniors meet at the Veteran's Hall located on Kings Street. The Hall is open from 9:00 a.m. to 1:00 p.m. daily. Pool tables, shuffle board and sewing classes are some of the activities available. In addition, the seniors make occasional trips and outings.

Little League. Avenal Little League is run by private citizens of Avenal. This group enjoys a large annual participation. They are currently using the fields north of Floyd Rice Park. The ball fields are owned by the Reef Sunset Unified School District.

Joint Use of School Facilities

In addition to City-owned park and recreation facilities, Avenal residents have access to grounds and playing fields at Reef Sunset Unified School District (RSUSD) schools. Table 1.7-1 summarizes the sports facilities on school grounds. RSUSD and the City have established an outstanding cooperative relationship encouraging maximum use of public property, facilities, and equipment for the community. Currently the two agencies have a verbal agreement for use of facilities; however, as the City and schools experience continued growth, a more formal joint use agreement would be appropriate.

Table 1.7-1
Existing School Recreation Facilities

School	Acres	Recreation Facilities
Avenal Elementary School	10.5	football field, 1 baseball field, volleyball and basketball courts, 1 dirt track, assorted playground equipment
Reef Sunset Middle School	18	volleyball and basketball courts, assorted playground equipment
Avenal High School	38	50 meter swimming pool, football stadium, 1 baseball field, 1 softball field, gymnasium, 3 tennis courts, 1 dirt track, 2 auditoriums
Tamarack Elementary	10	4 basketball courts, tether ball courts, playground equipment, and 1 future soccer field

Source: Reef Sunset Unified School District, 2004

Other Area Open Space and Recreation Facilities

Avenal Gun Club: The Avenal Gun Club is located on the south end of Corcoran Street. The gun club has lessons for children and adults, skeet, archery, a pistol range, and is lighted. This is also the meeting place of the Avenal Hunting Club.

Veterans Memorial Building: The Veterans Memorial building is located on Kings Street between First Avenue and State Highway 33. This building is not only used by the Veterans, but is also used on a daily basis by the Senior Citizens group.

Horse Corrals: The horse corrals are located north of Avenal Hospital in the foothills. The property is leased from Standard Oil. The corrals and stables have been in operation for approximately 60 years. The foothill area also provides an excellent trail system.

Fishing on the Aqueduct: The California Aqueduct provides water for the City of Avenal. The aqueduct runs along the northern boundary of the city limits. Fishing along the banks of the aqueduct is another recreational opportunity for the community that many enjoy.

Avenal Sand Drags: The Avenal Sand Drags are located on the south side of town just north of the prison. A new track has been built and the site is host to events that draw large numbers of people from across the nation.

Regional Parks Facilities

There are several regional parks that are within driving distance to Avenal. Generally speaking, at a maximum, most people would be willing to travel 30 minutes to get to a regional park facility, and possibly one hour if there was some type of event scheduled there such as a church gathering, family reunion, or school function. According to the Kings County Parks Department there are several parks that are currently visited by persons from Avenal. The park most used by citizens of Avenal is Hickey Park located at Flint and Seventeenth Avenues near Hanford. Hickey park is a 47-acre park site mainly used for picnicking. Other activities include: volleyball, baseball, horseshoes, and playground equipment. The park is located approximately 30 minutes from Avenal. Another regional park facility accessible from Avenal is Burrus Park. This facility is approximately one hour from Avenal and contains 57 acres. Burrus Park not only has all of the typical park facilities, but also contains a historical museum. Kingston Park would be the only other Kings County regional park facility that would be less than one hour drive from Avenal. It is a 26-acre park located adjacent to the Kings River near Laton.

The Polvadero Golf Course is located between Avenal and Coalinga on Sutter Avenue. The golf course is privately owned, but is operated by the City of Coalinga, the City of Avenal and the Coalinga-Huron Parks and Recreation District. The golf course is an 80-acre site. It accommodates a full size 9-hole course, a small pro shop, driving range and training facilities. Maintenance of the course is done by several volunteers and a work crew from the Avenal State Prison.

Fresno County Parks Department also has regional parks facilities in the area. Los Gatos Creek Park is located only 25 minutes from Avenal and is mainly used for picnicking. In addition, the City of Coalinga's parks facilities are located within 15 minutes drive from Avenal and are used quite often by persons from Avenal.

1.7.2 HISTORICAL AND CULTURAL RESOURCES

1.7.3 ARCHAEOLOGICAL RESOURCES

The purpose of this study is to identify known and potential cultural resources in the Avenal area and to evaluate what constraints known archaeological resources might have on the development of a general plan. Research was conducted to identify previously recorded resources in the Study Area and to collect a general background of the prehistory and history in the Avenal vicinity. The background information collected in this section will provide a basis for evaluation of the cultural and historical significance of individual resources of the area.

Research sources employed in this study include:

- California Office of Historic Preservation
- Central California Information Center of the California Historical Resources Information System
- National Register of Historic Places, including listed and eligible properties
- California Inventory of Historic Resources
- California Historical Landmarks
- California Points of Historic Interest
- Other registers (through Information Center)
- Historic maps
- Published texts

Previous Studies

There have been previous cultural resource studies in the Avenal vicinity. None of these have recorded significant cultural resources in the vicinity of the City. It should be noted that there have been no surveys of the built environment in the City, which focused on architectural history or historical relationships with important persons or events. Other than this, the previous studies have involved limited survey areas and, in some cases, an emphasis on archeological rather than historical resources.

There are numerous buildings within the City of Avenal that appear to be more than 50 years old. These structures will necessitate the preparation of a Historic Architectural Survey Report to determine if they are eligible for the National Register of Historic Places.

A cultural records search was conducted by the Center for Archaeological Research at California State University, Bakersfield for the Avenal Planning area on March 25, 2004 (reference Appendix A for the Cultural Resources Records Search letter). The search included the following resources: National Register of Historic Places, the California Register of Historical Resources, California Points of Interest, California Inventory of Historic Resources, and California State Historic Landmarks.

The results of the records search indicated that 14 cultural resource studies have been conducted directly on (and around) portions of the Planning Area. None of these studies reported any cultural resources on or within a half mile of the Planning Area.

A historical resource is defined as a building, structure, object, prehistoric or historic archaeological site, or district possessing physical evidence of human activities over 45 years old. There may be unidentified features in the Avenal vicinity that are 45 years or older and considered as historical resources requiring further study and evaluation by a qualified professional of the appropriate discipline.

Prehistory

The Plan Area lies within the historic territory of the Yokuts people. Members of the Penutian language family that held all of the Central Valley, San Francisco Bay, and the Pacific Coast from Marin County to Point Sur, the Yokuts were a distinct language grouping in California. Yokuts communities had true tribal division with group names, a trait absent among other California Indian people (Kroeber 1925). Each tribe spoke a particular dialect common to its members but similar enough to other Yokuts that they were mutually intelligible (Kroeber 1925). The territorial boundaries of the various Yokuts tribes and their neighbors have been delineated by Cook (1955). The Yokuts held the valley floor from the Tehachapis to Stockton, where they were bordered on the north by the Plains Miwok and on the west by the Saclan (Bay Miwok) and Costanoan, also members of the Penutian family. The Miwok of the foothill linguistic division held the Sierra foothills along the eastern territorial boundary to the Fresno River (Barrett and Gifford 1933). From the Fresno River, south, to the Tehachapis, the Sierra Nevada was the home of members of the Shoshonean linguistic group, with southern territorial limits along the Tehachapis also controlled by Shoshonean people. The various peoples of the Hokan language family held the Coast Ranges on the west from Point Sur southward.

Trade was well developed, with mutually beneficial interchange of needed or desired goods. Obsidian, rare in the valley, was obtained by trade with Paiute and Shoshoni groups on the eastern side of the Sierra Nevada, where numerous sources of this material are located, and perhaps came also from Napa Valley to the north. Shell beads, obtained by the Yokuts from coastal people, and acorns, rare in the Great Basin, were among the many items exported to the east by Yokuts traders (Davis 1961).

Economic subsistence was based on the ubiquitous acorn, with substantial dependency on gathering and processing of wild seeds and other vegetable foods. The rivers, streams, and sloughs that formed a maze within the valley provided abundant food resources, such as fish, shellfish, and turtles. Game, wildfowl, and small mammals were trapped and hunted to provide protein augmentation of the diet. In all, the eastern portions of the valley provided a lush environment of varied food sources, and the estimated large prehistoric population reflected this abundance (Cook 1955; Baumhoff 1963).

Settlements were oriented toward water resources, with major villages situated near waterways that provided not only reliable water supplies but also substantial food sources. Houses varied in size and shape (Latta 1949; Kroeber 1925), with most constructed from the readily available tules found in the extensive marshes of the low-lying valley areas. Housepit depressions, still extant in the protected areas of the San Joaquin valley, range in diameter from three to 18 meters.

The most devastating impacts of the Spanish colonization effort were not the result of military conflicts, but came from Old World diseases newly introduced to the native people. Three major epidemics swept through the missions: a respiratory virus at Mission Santa Clara in 1777, pneumonia and diphtheria that killed children from Mission San Carlos to San Luis Obispo, and the devastating measles epidemic that killed at least 1,600 natives at missions from San Francisco to Santa Barbara (Castillo 1978:103). These epidemics at the missions were followed in 1833 by a severe malaria epidemic that claimed thousands of lives and virtually destroyed many villages and

tribes. Up to three-quarters of the population in the San Joaquin Valley was killed by this contagious disease, which was brought to California by a party of Hudson's Bay Company fur trappers from the Oregon country. In 1834, the Mexican government desecularized the missions and many of the Indian residents returned to their former territories, where they survived by a combination of strategies that included traditional hunting and gathering and livestock raiding (Wallace 1978a:459-460; Wallace 1978b:468-469).

History



Avenal's history dates back to 1850, when American settlers arrived in the area and established settlements east and south of the present town. David Kettleman took squatters rights to the Kettleman Hills and Plains in 1850, and perfected a patent on a parcel of land in 1852. The Sunflower Valley, which lies off Highway 41, was also settled in 1850. The Avenal Ranch, located at the southern end of the Kettleman Plain, was established in 1852. The early settler's engaged in cattle ranching and shepherding, which gradually developed into dry farming. The low productivity of this region kept the population sparse until oil was discovered in the Kettleman Hills.

On October 5, 1928 a gusher blew from the Milham Discovery Well, Elliott No. 1 at a depth of 7,800 feet. The town of Avenal was established shortly thereafter when Standard Oil Company laid out a townsite where drillers could live and supplies could be purchased. Section houses were hauled to Avenal from the oil fields in Taft and a boom town was born. The boom continued through the depression years and came to an end with the coming of World War II.

1.8 Natural and Agricultural Resources

1.8.1 WATER RESOURCES IN THE AREA

Surface Water

Avenal does not have any year-round water courses that traverse the Planning Area, however, numerous intermittent water courses, called arroyos, periodically carry waters through the Avenal area. Avenal is located on the Kettleman Plain, which lies between the Kettleman Hills to the north and east and the Kreyenhagan Hills to the south and west. During intense storms, runoff that emanates from these hills causes flooding along the bottom of the valley floor and adjacent to certain drainage courses. This water ultimately flows in a southeasterly direction to a terminal point in the Tulare Lake Basin, 18 miles to the south. Intermittent creeks, such as Arroyo Curvo and Arroyo Esquinado, are found in several of these drainages, however, they flow only during periods of high rainfall.

Groundwater

The groundwater basin under the Kettleman Plain, which encompass about 29,000 acres, is separate and distinct from the San Joaquin Valley basin. A water study completed by CH2M Hill for the Avenal State Prison in 1984 showed that the aquifer was producing about 23,000 acre feet per year. Recharge from surrounding watersheds only amounted to about 9,000 acre-feet per year – an overdraft of 14,000 acre-feet per year. As a result of this overdraft, depth to groundwater has been dropping by four to five feet per year. (CH_2M Hill, Water Supply Study – California State Prison, Kings County, June 19, 1984).

Average depth to groundwater is 240 feet. Depth to groundwater has been measured at 359 feet at a well site on the high school campus and 365 feet at a monitoring well located at the Avenal Landfill.

1.8.2 GROUNDWATER QUALITY

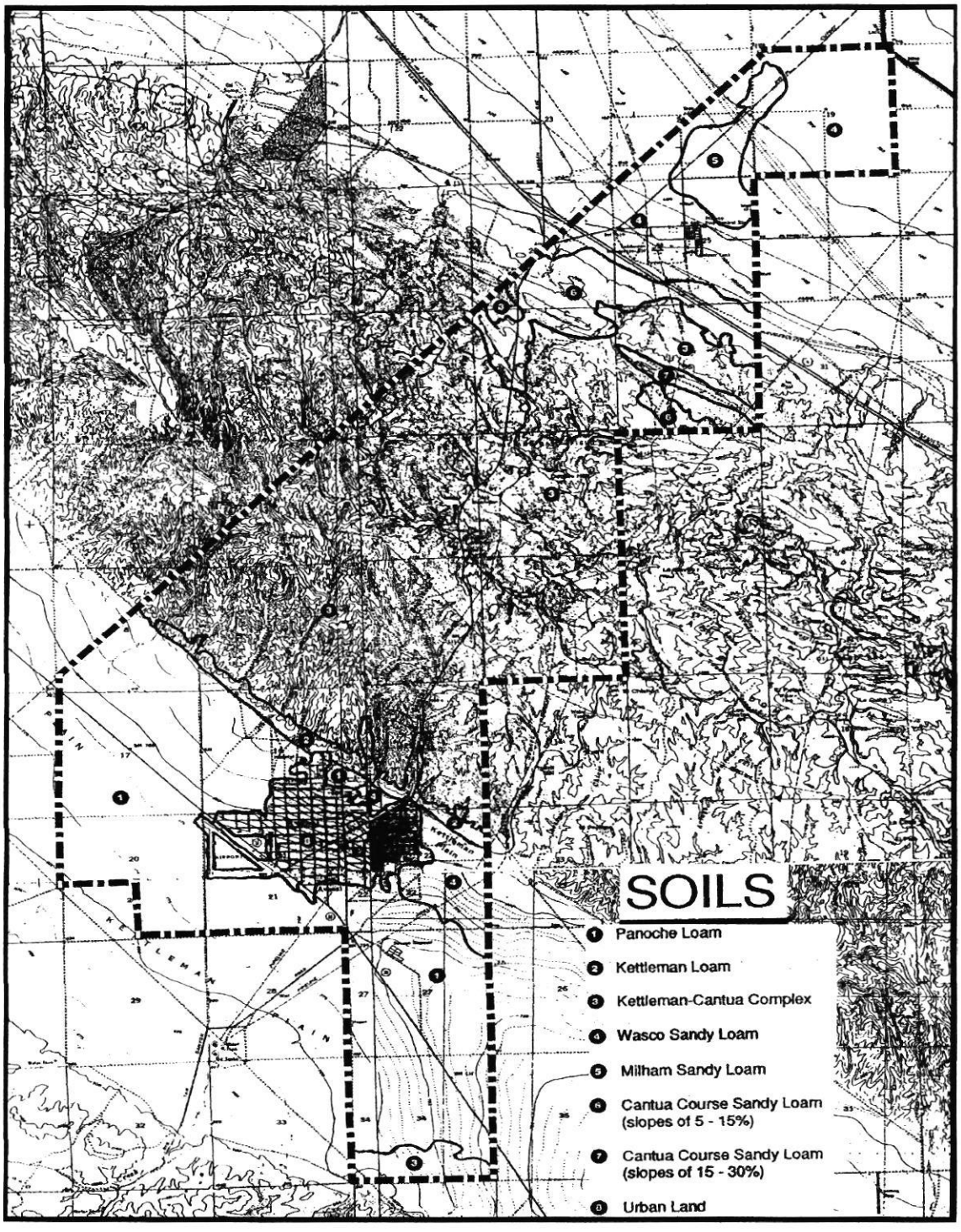
Potential sources of groundwater that can be utilized for agricultural uses do exist within the planning area. The consolidated rocks of the San Joaquin formation and the poorly sorted sediments of the Tulare formation are of such low permeability that recharge from surface water sources is unlikely. Connate water (water which is trapped at the time of deposition) does occur in small quantities within this strata, but is highly saline.

The poor quality of groundwater on the Kettleman Plain makes it unsuitable for domestic uses. High concentrations of dissolved solids, primarily sulfate and sodium, are present in water from the Avenal area. The presence of sulfate is attributed to recharge through the underlying marine and continental deposits. Chemical analyses of a well located approximately three miles south of the planning area (T. 22, R. 17, Sec. 26E) resulted in 1720 parts per million (ppm) total dissolved solids. The sulfate component of this sample was 992 ppm and the sodium component was 232 ppm.

1.8.3 SUMMARY OF EXISTING DESCRIPTIONS OF SOILS IN PLANNING AREA

The soils in the Avenal area are described by the Soil Survey of Kings County prepared by the Soil Conservation, Service, Department of Agriculture (reference Figure 1.8-1). The general soil map of this Survey shows two major soil groups in Avenal: the Kettleman-Cantua-Mercey soils, located in the Kettleman Hills, and the Avenal-Panoche soils, located on the Kettleman Plain. The Kettleman Hills soils are derived from sandstone and shale and are associated with moderate to steep slopes. Soils on the Kettleman Plain are associated with alluvial fans. They are very deep, nearly level and are well drained.

The Kings County Soil Survey identifies five specific soils in the planning area. They are Panoche loam, Kettleman loam, Cantua course sandy loam and Wasco sandy loam, located on the Kettleman Plain and San Joaquin Valley floor, and the Kettleman-Cantua complex, located in the Kettleman Hills.



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SOILS

Figure 1.8-1

Panoche loam is a very deep soil that is well drained and is located on alluvial fans. This soil is suited for urban development as well as agriculture – it has a Class 1 agricultural rating (Class 1 soils have the fewest limitations for agriculture; Class VIII have the most limitations for agriculture) and a Storie Index rating of 100 (A Storie Index rating of 80-100 has the greatest suitability for intensive agriculture; less than 10 has the least suitability).

Kettleman loam is a moderately deep soil that is well drained and is located on the edges of the Kettleman Hills. Runoff from this soil is rapid and hazard of erosion is high. This soil is best suited for rangeland. It has a Class VI agricultural rating and a Storie Index of 63. Limitations for urban development are steepness of slope, moderate depth to bedrock, and hazard of erosion.

Cantua course sandy loam is a deep soil that is somewhat excessively drained. This soil is best suited for rangeland. It has a Class IV agricultural rating and a Storie Index of 73. This soil is poorly suited for urban development, limitations include steepness of slope, shallow depth to soft bedrock, hazard of erosion, and moderately rapid permeability.

Wasco loam is a very deep soil located on alluvial fans. This soil is well suited for agriculture. It has a Class II agricultural rating and a Storie Index of 81. The main limitation to developing on this soil is its moderately slow permeability, which can cause septic tank absorption fields to fail.

Table 1.8-1
Development Potential of Soils
Avenal Planning Area

Soil Type	Res. Dwellings	Comm. Buildings	Streets	Parks	Golf Course	Paths/Trails
Kettleman	severe	severe	severe	severe	severe	severe
Cantua	severe	severe	severe	severe	severe	severe
Panoche loam	moderate	moderate	moderate	moderate	moderate	moderate
Wasco sandy loam	slight	slight	slight	slight	slight	slight
Kettleman loam	moderate	moderate	moderate	moderate	moderate	moderate
Cantua sandy loam	moderate	moderate	moderate	moderate	moderate	moderate

Source: United States Department of Agriculture, Soil Conservation Service

In the mountainous parts of the planning area, erodibility is a critical soil characteristic. Erosion factor "K" is a constant used in soil loss equations to predict sheet and rill erosion by water. K factor values range from 0.02 to 0.69 with the higher values representing greater susceptibility to erosion. Erosion Factor "T" represents the amount of soil (in tons per acre) that can be eroded by wind and water without affecting soil productivity over a sustained period. Wind erodibility groups indicate the susceptibility to wind erosion and the amount of soil lost. The groups are numbered 1-8 with the highest number being the least erodible. The physical characteristics of soils in the planning area are described in Table 1.8-2.

Table 1.8-2
Physical Properties of Soils
Avenal Planning Area

Soil Type	Permeability in/hr	Available H_20 Capacity in/in	Shrink/Swell Potential	Erosion Factor		Wind Erodibility Group
				K	T	
Kettleman	.06-2.0	.14-.16	low-mod.	0.37	3	6
Cantua	2.0-6.0	.09-.12	Low	0.43	2	5
Panoche loam	.06-2.0	.14-.18	Low-mod.	0.43	5	6
Wasco sandy loam	2.0-6.0	.08-.13	Low	0.32	5	5
Kettleman loam	.06-2.0	.14-.18	Low-mod.	0.37	2	6
Cantua course sandy loam	2.0-6.0	.09-.12	Low	0.43	3	5

1.8.4 AGRICULTURAL PRODUCTION PATTERNS AND TRENDS



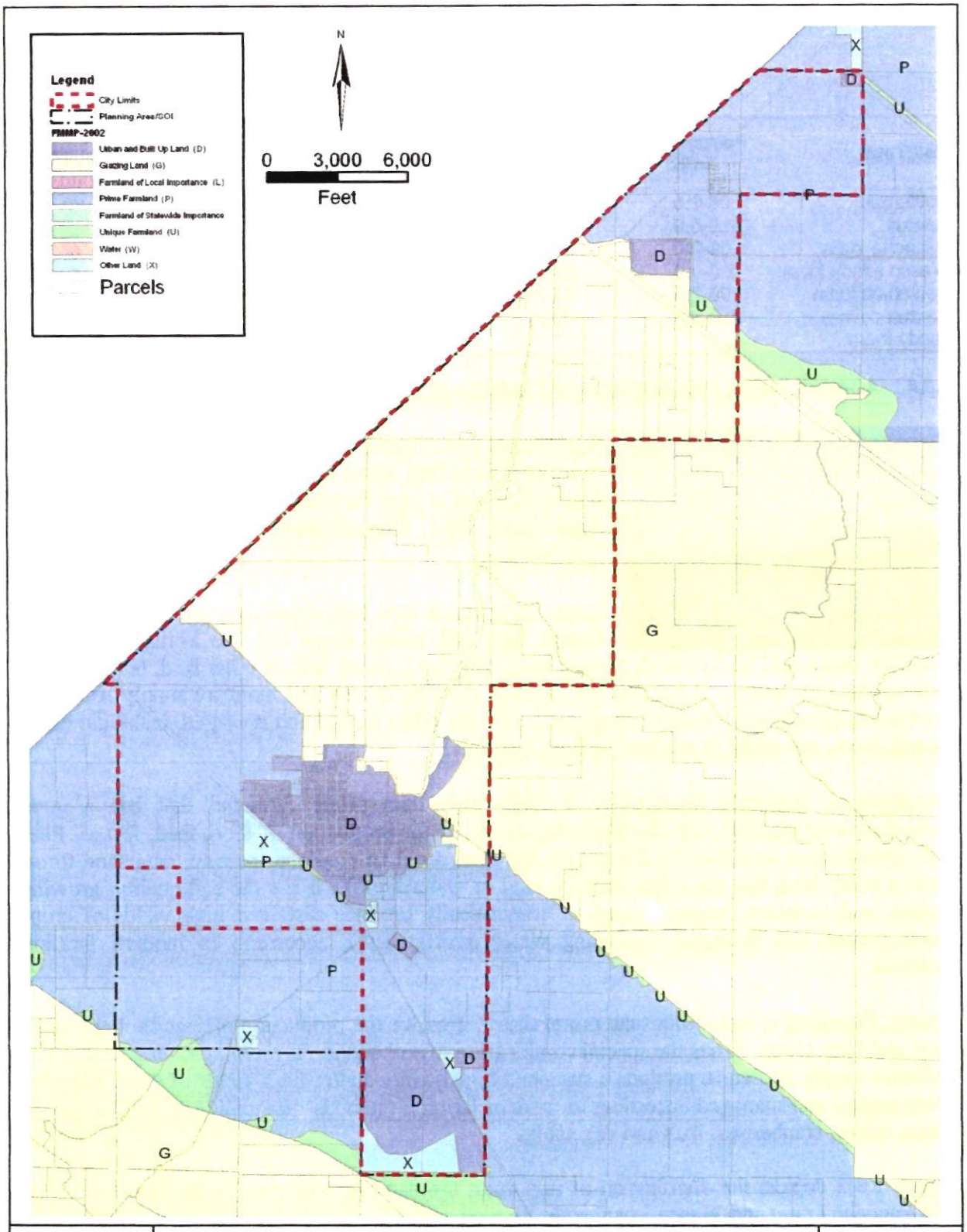
Agricultural soil capacity is classified according to a number of criteria including prime farmland, farmland of statewide importance and unique farmlands. The U.S. Department of Agriculture Soil Conservation Service defines these farmlands as:

Prime Farmland is land best suited for producing seed, feed, forage, fiber and oilseed crops and also available for these uses (the land could be cropland, pasture land, rangeland, forest land or other land, but not urban built-up land or water). It has the soil quality, growing season and moisture supply needed to produce sustained high yields of crops economically when treated and managed, including water management, according to modern farming methods.

Farmland of Statewide Importance is land other than prime farmland that has a good combination of physical and chemical characteristics for production of food, feed, forage, fiber and oilseed crops available for these uses (the land could be cropland, pasture, rangeland forest land or other land, but not urban built-up land or water areas). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed (including water management), according to modern farming methods.

Unique Farmland is land other than prime that is used for the production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season and moisture supply needed to produce a sustained high quality and/or high yields of a specific crop when treated and managed according to modern farming methods. Examples of such crops are citrus, olives, cranberries, fruit and vegetables.

Figure 1.8-2 depicts the distribution of important farmland by soil type in the Planning Area. The Panoche Loam and Wasco Loam soils are well suited for farmland and the Kettleman Loam and Cantua Coarse Sandy Loam soils are not.



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IMPORTANT FARMLAND

Figure 1.8-2

The dominant land use around the City limits is agricultural. Single-family homes occupy many parcels at rural densities. Farm sheds and other ancillary structures are also present. Water for agricultural uses comes from wells exclusively and is delivered via channels.

Kings County, one of the most diverse and productive farming areas in the world, produces over 100 different crops, lumber, nursery stock, livestock, poultry and dairy products. The total value of these agricultural products was approximately $800 million in 2002.

The benefits of a strong agricultural community far outweigh just the gross receipts of the producers. A single dollar generated by agricultural production results in three to four dollars in the County's gross domestic product. One out of every ten jobs throughout the state is directly linked to agriculture.

According to Kings County Crop Reports, milk, cotton, and cattle have consistently been the top grossing crops in the County, followed by alfalfa and turkeys (reference Table 1.8-3). In 2001, the total harvested acreage of all crops in Kings County was approximately 655,132 and total farmland was 749,100 acres.

Table 1.8-3
Kings County's Ten Leading Commodities
2002

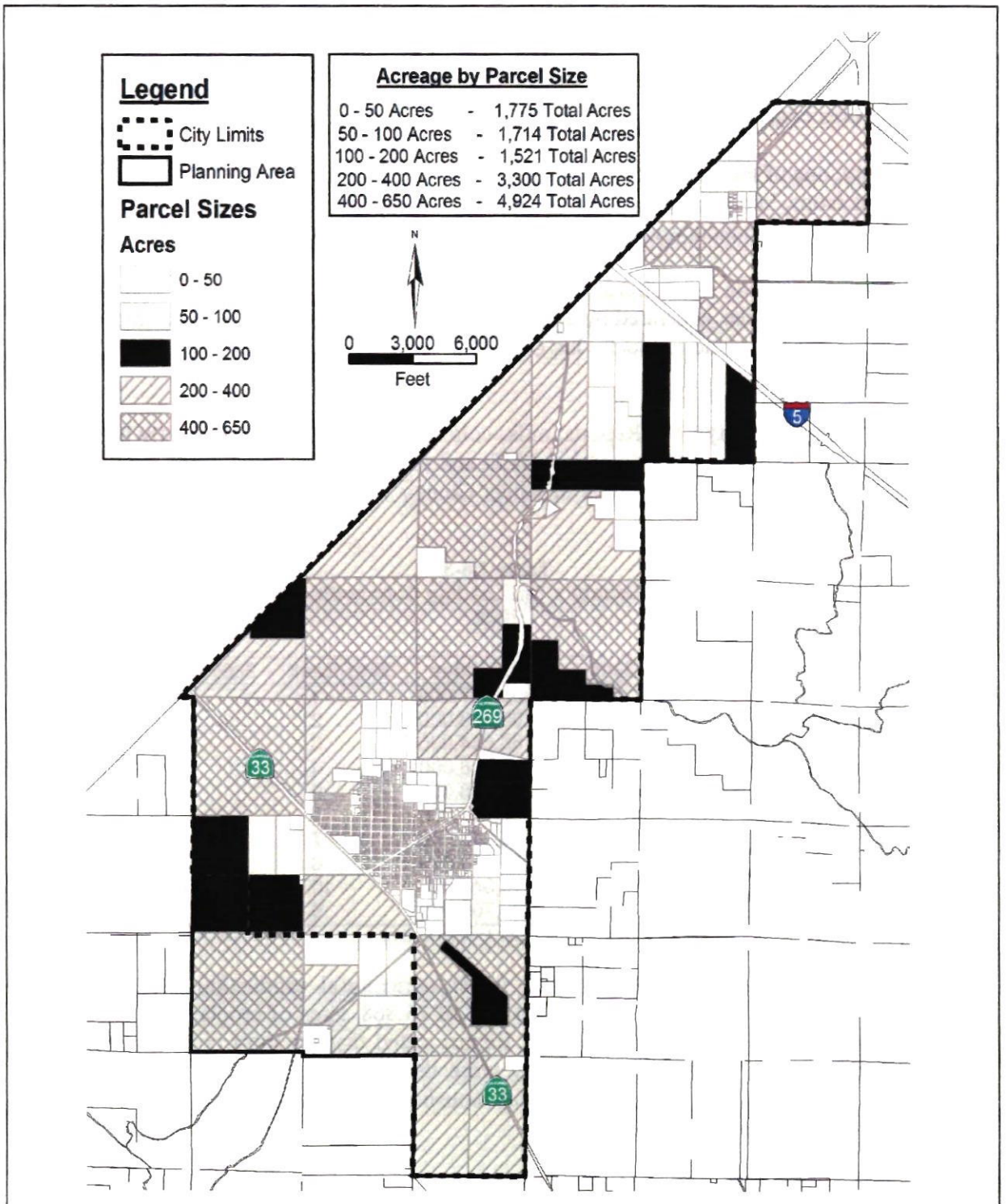
Crop	Rank	2002 $Value	2001 Rank	2000 Rank
Milk, Total	1	303,507,000	1	1
Cotton, Total	2	205,353,000	2	2
Cattle and Calve	3	66,544,000	3	3
Alfalfa, Hay	4	50,186,000	4	4
Turkeys	5	33,388,000	5	5
Pistachios	6	32,237,000	8	11
Tomatoes, Total	7	29,045,000	7	7
Wheat	8	29,039,000	6	6
Peaches, Total	9	26,848,000	10	8
Corn Silage	10	23,709,000	9	9

Source: 2001 and 2002 Agricultural Report San Joaquin County

In 1989, Kings County had 681,000 acres under agricultural production. In 2001, total agricultural acreage was 655,132. This was a loss of 25,868 acres of cropland for the 12-year period. The California Farmland Conversion Report stated that the most common reasons for irrigated farmland loss in the Central Valley were the cessation or idling of irrigated crop production, conversions to low-density rural housing, urban residential and commercial development, and new golf courses.

Parcelization

Figure 1.8-3 classifies properties by parcel size for the Planning Area of Avenal. Parcel sizes are grouped as follows: 0 to 50 acres; 50 to 100 acres; 100 to 200 acres; 200 to 400 acres, and 500 to 650 acres. The white areas reflect parcels less than 50 acres in size. The approximate acreages for each category are included in Table 1.8-4.



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PARCEL SIZES BY ACREAGE

Figure 1.8-3

Table 1.8-4
Avenal Planning Area
Acreage by Parcel Size

Parcel Size (Acres)	Acreage
0 to 50	1,775
50 to 100	1,714
100 to 200	1,521
200 to 400	3,300
400 to 650	4,924

Source: Kings County GIS.

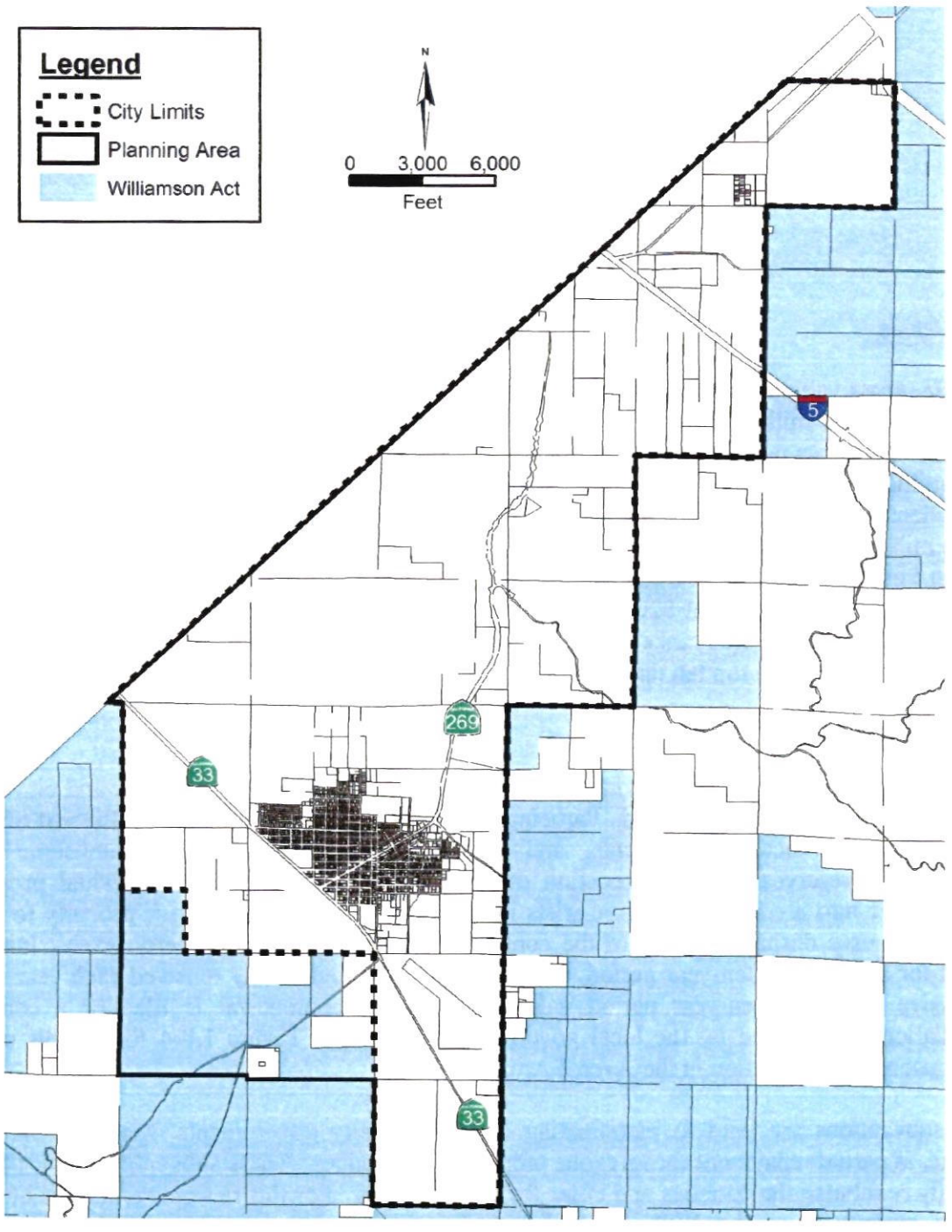
Crop Values

In 2002, gross value of agricultural production in Kings County totaled $1,023,305,000, up 7.5 percent from 951 million in 2001. This was a huge milestone for Kings County since 2002 was the first time gross production value was over a billion dollars. The leading crop was milk at $303 million. Other leading commodities in 2002 were cotton, cattle, alfalfa, and turkeys. Table 1.8-1 identifies leading Kings County crop and livestock commodities for 2002 by dollar value. While milk remains the leading crop in revenue for 2001 and 2002, revenues have dropped $58 million from 2001 to 2002. Cotton was the 2nd ranking crop in 2002 at $205 million, and in 2001 cotton was also ranked 2nd at $205 million. Cattle and calves was ranked third in 2002 at $66 million and alfalfa hay was ranked 4th at $50 million. The top ten crops in 2001 and 2002 have consistently been in the top ten throughout the 1990s.

Williamson Act

The Williamson Act is a non-mandated State program, administered by counties and cities, for the preservation of agricultural land. Participation in the program is voluntary on the part of both landowners and local governments, and is implemented through the establishment of Agricultural Preserves and the execution of Williamson Act contracts. Individual property owners enter into a contract which restricts or prohibits development of their property to non-agricultural uses during the term of the contract in return for lower property taxes. Initially signed for a minimum ten-year period, the contracts are automatically renewed each year for a successive minimum ten-year period unless a notice of nonrenewal is filed or a contract cancellation is approved by the local government. Reference Figure 1.8-4 for parcels under Williamson Act contraction in the Avenal Area.

State subventions are paid to participating county and city governments, based on enrolled acreage, in partial repayment for foregone property tax revenues. These subventions typically do not fully reimburse the counties and cities for lost revenues. For this reason, some jurisdictions do not participate in the Williamson Act program, and others have stopped taking new applications. The current subvention rate is five dollars per acre for prime farmland and one dollar per acre for nonprime land.



Quad Knopf

WILLIAMSON ACT PARCELS

Figure 1.8-4

State law requires that participating counties and cities adopt rules governing the administration of agricultural preserves and the types of uses allowed on land under contract. The uniform rules governing the types of uses allowed on lands under contract in Kings County are contained in the zoning regulations of the Kings County Zoning Ordinance.

State law establishes procedures for cancellation of Williamson Act contracts and requires that all cancellations be carried out in accordance with those procedures. There is no local discretion. State law limits the termination of a Williamson Act contract through the cancellation process to "special" or "extraordinary" circumstances. In contrast to the nonrenewal process, in which a contract is phased out over a nine-year period, approval of a cancellation request results in the immediate termination of a contract once conditions are met. Only the property owner can apply for cancellation, and only the Board of Supervisors can approve such a request after holding a public hearing and making the finding that the cancellation would either be consistent with the intent of the Williamson Act or would be in the public's interest. If a property owner receives approval of cancellation, payment based on a percentage of the current market value of the land is required prior to termination of the contract. In Kings County in 2001, there were 455,997 acres under Williamson Act contract and in 1991 there were 683,254 acres under Williamson Act Contract.

Although implementation of the Williamson Act program is voluntary, once contracts are executed, withdrawal from the program can only be undertaken in accordance with State law. The local entity may, however, impose more stringent requirements for cancellation than those specified under State law. Notices of nonrenewal can be filed either by the property owners or the local entity after adequate notice has been given, as set forth in State law.

In 1998, the State Legislature amended the Williamson Act to provide for the establishment of "Farmland Security Zones." Since the passage of the Williamson Act, it became apparent that owners of prime farmland and land used for high value crops may not realize the property tax reductions under traditional Williamson Act contracts sufficient to justify restricting their land to agricultural purposes. The Farmland Security Zone legislation authorizes landowners to petition the Board of Supervisors to rescind their existing Williamson Act contract in favor of a new Farmland Security Zone Contract (FSZ contract). Land subject to a FSZ contract is valued for assessment purposes at 65 percent of the value of its Williamson Act value or its Proposition 13 value, whichever is lower. The FSZ legislation provides that the FSZ contracts must be one or more of the following classifications, as designated by the California Department of Conservation Important Farmland Series maps: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance. The legislation does not include cancellation provisions ("The Farmland Security Zone: Preserving California's Prime Agricultural Farmland," California Farm Bureau Federation website, http:/www.cfbf.com/land.htm, November 1999). In 2001, Kings County had 242,615 acres under FSZ Contract. Agricultural land in Kings County under Williamson Act and FSZ Contract totaled 698,612 acres.

Mineral Resources

According to the Kings County General Plan Resource Conservation Element, December 1993, there are currently no mineral extraction activities occurring in Kings County. Previously, the only local mineral mining operations were an open pit gypsum mine and a mercury mine. Both have ceased operation. Open pit mining is regulated by the State Surface Mining and Reclamation Act, which requires a local permit and a reclamation plan. These requirements are implemented through the conditional use permit process of the County Zoning Ordinance.

Oil and gas production in Kings County has diminished over the past 35 years. This trend is likely to continue. The county's mild climate and agricultural economy make solar heating and waste-to-energy projects feasible. Sources of biomass, or raw material suitable for conversion to energy, could include manure from dairy operations and municipal waste at landfill sites.

1.8.5 EMPLOYMENT

According to the State Employment Development Department (EDD), total civilian employment in Kings County was estimated to be 49,200 in 2003. The unemployment rate was 14.6 percent for 2003, compared to the statewide unemployment rate of 6.7 percent. Total farm employment in the agricultural sector has decreased from 7,800 in 1993 to 7,300 in 2003. Employment in the goods producing sector has increased from approximately 3,900 in 1993 to 4,800 in 2003. Total farm employment in 2003 accounted for 14.8 percent of the civilian labor force.

Reference Table 1.4-2 for Avenal's labor force by industry for 1993 to 2003. Historically, agriculture and related industries have dominated the County's economy, creating higher unemployment rates partly due to the greater seasonal variations in employment.

1.8.6 MULTIPLIER EFFECT

According to the Kings County Agricultural Commissioner *2002 Agricultural Crop Report,* agricultural production figures only partially reflect the overall measure of the impact agriculture has on the local economy. Field labor, processing, transporting, marketing and other farm-related services significantly multiply the value agriculture has to Avenal.

Income from agriculture at the community level may be classified as primary or secondary income. Examples of primary income are farm operators' and proprietors' net cash farm income, and wages paid to hired labor. The secondary income contribution arises from primary farm income spent as household income. Also, most gross farm income is used to purchase farm business inputs and equipment. Expenditure of these dollars supports local businesses which pay wages and provide income to local proprietors. The impact of both farm household and farm business spending contributes to the secondary income as measured by the income multiplier.

When measuring the multiplier effect, an income multiplier is used to help determine the total effect of each additional dollar earned by a local household. The multiplier ranges in value from one to some value greater than one. Each multiplier has two components: the initial direct income, or primary effect; and the secondary effect, which is caused by two separate forces.

The first force is the ripple effect that occurs when the farmers buy local inputs to use in their production process. The operating budget of the farms is spent either inside or outside the county. Dollars spent locally will generate an indirect effect, resulting in more personal income available to local households. Dollars spent outside the City are lost dollars, and they generate no additional impact.

The second force is the ripple effect that occurs when farm income is paid out to its employees and owners. These dollars go to people in the form of wages, interest, rents, dividends, and profits. If the recipients live locally and spend their household income locally, the dollars will have an induced effect, resulting in more personal income available to local households. If the dollars go to people who do not live or spend in Avenal, the dollars are lost and generate no additional income.

The national earnings multiplier for agriculture is 2.18, meaning that for every primary dollar spent, $2.18 is generated in secondary income. In addition, for every farm job created, 1.97 secondary jobs are also created. This is lower than the multiplier effects of manufacturing (including food processing) and many other industries.

"High Tech" Agriculture and its Potential

New agricultural technologies include agricultural software (applications of computer technology to agriculture), specialty fertilizers, moisture sensing equipment for irrigation control, "precision" farming based on use of geographic information systems, remote sensing, robotics, computer technology, and biorational and sustainable farming practices which will support twenty-first century agriculture. "High tech" agriculture has the potential to produce higher yields at lower costs. Remote sensing has the capacity to detect specific problem areas and treat them with precision. Position sensitive crop management conserves water and dispenses chemicals in a judicious manner, as compared to indirect methods. Biorational techniques can manage insects through the use of non-toxic behavioral chemicals. These techniques are related to integrated pest management, which uses biological controls to control pests with minimum harmful side effects. Biorational techniques are those techniques that are compatible with the use of biological control, or have little impact on natural enemies. Through the implementation of sustainable agriculture, natural resource degradation can be reduced or prevented. Environmental health can be maintained through the use of reduced-volume irrigation systems, reduced tillage, and the efficient use of inputs.

The USDA policy goals and recommendations for small farms (Section 3.6, Role of Small Farms) recommends emphasizing sustainable agriculture as a profitable, ecological and socially sound strategy. Large scale production often requires the use of intensive systems that harm the natural environment, whereas sustainable agriculture can produce higher value products using methods consistent with long-term environmental enhancement and higher returns per acre.

Biotechnology

Agricultural biotechnology can be defined as the use of living organisms, including microbes, plants and animals, or materials produced from living organisms, to produce useful products

such as pest and disease resistant crops, improved foods and animal vaccines. It includes enzymes produced in fermentation processes, biorational and natural pest control products, genetically transformed food and animal products, and the use of plants to produce human therapeutics. The following are opportunities for business expansion in agricultural biotechnology:

- Biotechnology research and development companies
- Animal-oriented agricultural biotechnology companies
- Domestic and international seed companies
- Agricultural biotechnology production companies
- Start-up agricultural biotechnology companies
- Seed and chemical companies
- Advanced agricultural technologies

Non-traditional Agricultural Operations

Examples of non-traditional agricultural operations include aquaculture, hydroponics and tree farms. None of these are mentioned in the annual Agricultural Crop Report issued by the Kings County Agricultural Commissioner, presumably because revenues are below the cutoff point. Other examples of "non-traditional" or specialty operations include:

- Grape rootstock and grape plant nurseries
- Hardy perennial wholesale nurseries
- Specialized nurseries applying advanced genetics and agricultural biotechnology to their plant development programs
- Specialized nurseries for California native and drought-resistant plants
- Fruit tree nurseries
- Regional wholesale nurseries
- Sod farms
- Seed support industries
- Agricultural software
- Specialty fertilizers

Economic Development and Sustainability

Sustainable agriculture is a farming system that is economically sound, reduces the use of chemical pesticides, and/or promotes cultural practices that enhance habitat values to wildlife. Promoting sustainable agriculture in the Avenal area will increase the amount and quality of wildlife habitat while also continuing an industrial use of land that provides economic benefit to the City. There are ways in which existing agricultural production practices can be modified to provide greater wildlife habitat value while allowing crop production to continue.

Sustainability can also refer to maintaining a critical acreage mass in production of a particular commodity to support the infrastructure and processing needs for that commodity (e.g., seed companies, agricultural machinery suppliers, etc). The central location of Kings County with respect to other agricultural counties in the region (Tulare, Kern, and Fresno) and the size of Kings County's agricultural economy help assure that this critical acreage mass will remain.

The American Farmland Trust's projected urban and suburban development and the resultant loss of farmland in the San Joaquin Valley and counties to the north and east will increase the demand for raw materials from prime farmland in Kings County and other areas in the Southern San Joaquin Valley. Thus, the remaining farmland in the San Joaquin Valley will become progressively more important and valuable as a source of raw farm commodities. Kings County is under urbanization pressure from Southern California, however, for now, Bakersfield is receiving most of the pressure.

1.8.7 DESCRIPTION OF GENERAL WILDLIFE HABITAT WITHIN THE PLANNING AREA

Historically, the natural vegetation of the Avenal area was characterized by drought-resistant small shrubs, grasses, flowering plants, and trees such as willows and cottonwoods growing along the stream channels. The range of natural vegetation communities has been significantly reduced from historic levels as a result of conversion of these lands to urban and agricultural uses. Only scant disturbed remnants of these natural communities remain in the Avenal area. Agricultural and suburban developments have all but eliminated most historic natural communities.

The agricultural community surrounding the City of Avenal consists of both large and small farms. Tree and row crops dominate the agricultural land uses with pasture and open land.

Although there is no prime habitat in the Study Area, croplands in the area can provide a source of food, water, and shelter to both native and introduced wildlife species. The lack of hedgerows, shelterbelts, windbreaks, and natural vegetation buffers severely limits the habitat value of these man-made environs. In addition, agricultural practices such as herbicide and pesticide application, monocultural cropping, and intensive tillage further reduces the habitat value of these lands.

1.8.8 SPECIAL STATUS SPECIES THAT INHABIT THE AREA

The distribution of wildlife in the Planning Area is somewhat limited, due to urbanization. Typical of small urban communities surrounded by intensive agricultural uses are various forms

of small mammals, including mice, gophers, moles, ground squirrels, jack rabbits, skunks and opossums, together with medium-sized predators such as gray foxes and coyotes. Robins, finches, sparrows, crow, black birds, valley quail, ringneck pheasants and morning doves are representative of avian species common to the region. Predator avian species, including owls and hawks, are also relatively common in this portion of the County.

The local vegetation associations support a variety of wildlife and plant species and subspecies indigenous to California. However, the conversion of native and naturalized plant communities in the State to urban land uses, agriculture, and industrial facilities has significantly reduced available wildlife habitat. As a result of this conversion, several species of both plants and animals have been displaced from California, or their populations have declined significantly. As a result, the California Department of Fish and Game (CDFG) and the United States Fish and Wildlife Service (USFWS) have listed some species as threatened or endangered.

The Southern San Joaquin Valley is an area of significant historical biological diversity. Existing data were reviewed to determine the historic occurrence of special status (i.e. sensitive) species and habitats in the Planning Area, including California Natural Diversity Data Base (CNDDB) reports, literature records, and local environmental documents. Queries of the CNDDB (2004) for the Avenal, La Cima and Garza Peak 7.5-minute quadrangles were reviewed to determine if special status species have been reported to occur in the planning area. Recent occurrences of these species have been recorded for the area. A brief description of these species is provided below:

San Joaquin Pocket Mouse (Perognathus inornatus inornatus)

The San Joaquin Pocket Mouse is typically found in grasslands and Blue Oak Savannas. The San Joaquin Pocket Mouse is listed on the Federal list as a Species of Concern and is not on the State list. The last recorded update of the Pocket Mouse was in 1989 approximately seven miles west of Kettleman City in Kings County. Very little information is available on this species.

Burrowing Owl (Athene cunicularia)

A small ground-dwelling Owl with a round head and no ear tufts. They have white eyebrows, yellow eyes, and long legs. The Owl is sandy colored on the head, back, and upperparts of the wings and white-to-cream with barring on the breast and belly and a prominent white chin stripe. They have a rounded head, and yellow eyes with white eyebrows. Burrowing Owls are comparatively easy to see because they are often active in daylight, and are surprisingly bold and approachable. The females are usually darker than the males. Burrowing Owls fly with irregular, jerky wingbeats and frequently make long glides, interspersed with rapid wingbeats.

Burrowing Owls are found in open, dry grasslands, agricultural and range lands, and desert habitats often associated with burrowing animals, particularly prairie dogs, ground squirrels and badgers. They can also inhabit grass, forb, and shrub stages of pinyon and ponderosa pine habitats. They commonly perch on fence posts or on top of mounds outside the burrow.

Burrowing Owls feed on a wide variety of prey, changing food habits as location and time of year determine availability. Large arthropods, mainly beetles and grasshoppers, comprise a large portion of their diet. Small mammals, especially mice, rats, gophers, and ground squirrels, are also important food items. Other prey animals include: reptiles and amphibians, scorpions, young cottontail rabbits, bats, and birds, such as sparrows and horned larks.

Burrowing Owls are able to live for at least nine years in the wild and over ten years in captivity. In 2001, a burrow seven miles northeast of Avenal was discovered within the levee bank of the San Luis Canal. Burrowing Owls are listed as a Species of Concern on the Federal list and are not on the state list.

San Joaquin Antelope Squirrel (Ammospermophilus nelsoni)

The San Joaquin antelope squirrel is a small ground-dwelling squirrel with tiny rounded ears and relatively short tail and legs. It is light brown in color with a light-colored stripe on each of its sides. The tail is light gray or whitish on the underside and is usually held in a vertical position when sitting or curled over the back when running.

This species inhabits the arid grassland, shrubland, and alkali sink habitats of the San Joaquin Valley and adjacent foothills. The squirrels are active year-round and live in burrows that are either modifications of kangaroo rat burrows or ones the squirrels constructed themselves. They are omnivores whose diets are dependent on food availability. Items consumed include green vegetation, fungi, seeds, and more commonly, insects.

The life span of the antelope squirrel is usually less than one year, however, several individuals have lived in the wild for greater than four years. Loss of habitat due to agriculture, urbanization, and petroleum extraction and the use of rodenticides for ground squirrel control are the primary threats to the survival of the San Joaquin antelope ground squirrels.

San Joaquin antelope squirrels have been seen near Avenal in the Kettleman Hills. They are listed as a Species of Concern on the Federal list and a Threatened species on the State list.

San Joaquin Woollythreads (Monolopia congdonii)

An annual herb occurring in chenoped scrub and in sandy substrate in valley and foothill grassland. Found at 60 to 800 meters in elevation. San Joaquin Woollythreads have been found 0.7 miles southwest of the intersection of Shell Road and Interstate 5 on the east side of Shell Road. According to the Natural Diversity Database, grazing is a threat to this herb. San Joaquin Woollythreads are listed as Endangered on the Federal list and are not listed on the state list.

Blunt-nosed Leopard Lizard (Gambelia sila)

The Blunt-nosed Leopard Lizard has a blunt nose, short head and round tail. They have Narrow white to yellow crossbars separated by wide gray or brown crossbars containing numerous dark-edged brown spots and their throats are blotched with gray.

Because much of its former habitat in the San Joaquin Valley has been converted to farms and communities, the Bluntnose Leopard Lizard is threatened with extinction. It has shared this fate with other animals of the California grasslands, including the San Joaquin kit fox and the Giant Kangaroo Rat. In addition to agriculture and residential development, mining, oil drilling, road building, and the construction of the water management infrastructure have contributed to the degradation of the once-expansive grassland habitat.

Their habitat includes: sandy areas, alkali flats, canyon floors, and foothills with sparse, open vegetation. The lizards mate from April to June, and two to five eggs are laid in June or July which hatch in August or September.

This lizard usually "freezes" when danger threatens, only to dash for cover if closely approached. Grasshoppers are among its favorite foods. The Blunt-nosed Leopard Lizard is on the U.S. Endangered Species List and is classified as Endangered in California.

San Joaquin kit fox (Vulpes macrotis mutica)

The long-tailed San Joaquin kit fox, has an average body length of 20 inches and stands about 12 inches high at the shoulder. Average weight of an adult male is approximately five pounds. The ears are large and densely covered on the inside with stiff, white hairs. The summer coat is light buff to gray on the back and white on the belly; winter coat is grizzled gray on the back, rust to buff on the sides, and white beneath. The tail is distinguished by a prominent black tip.

The San Joaquin kit fox forages in California prairie and Sonoran grasslands in the vicinity of freshwater marshes and alkali sinks, where there is a dense ground cover of tall grasses and San Joaquin saltbush. Before the 1800s, the grasslands of California were second in size only to the Great Plains. Today only one percent of the state's native grasslands remains. Industry, development, and various types of agriculture (in the forms of row crops, orchards, vineyards, and livestock forage) have taken over many of these lands. Suitable remaining habitats are fragmented, meaning the foxes occur in small and isolated populations.

Tracks, scats and burrows have been noted in the Avenal area. The San Joaquin kit fox is on the U.S. Endangered Species List and is classified as Threatened in California.

California Jewelflower (Caulanthus californicus)

The California jewelflower is an annual herb in the mustard family and has flattened, sword-shaped fruits. Its stems are erect, up to about one foot tall, and produces several flowering branches. The leaves are wavy-margined and most are in a basal rosette. Fruit, stem and foliar hair characteristics distinguish this species from other jewelflowers.

Seeds begin to germinate in the fall, and seedlings may continue to emerge for several months. The seedlings develop into rosettes of leaves during winter months, after which stems elongate and flower buds appear in February or March. Translucent white flowers with purple to green tips may continue blooming as late as May if rainfall and temperatures are favorable.

Known populations of California jewelflower occur in nonnative grassland, upper sonoran scrub, and cismontane juniper woodland and scrub communities. Historical records suggest that it also occurred in the valley saltbush scrub community in the past.

Potential threats to remaining populations include competition from nonnative plants, pesticide effects on pollinators, small population size and development on private land. Cattle grazing may be a threat if the grazing occurs between the rosette stage and seed set.

The California jewelflower is listed on the U.S. Endangered Species List and is also listed as Endangered in California.

Lemmon's Jewelflower (Caulanthus coulteri var. lemmonii)

The habitat associated with Lemmon's Jewelflower consists of pinyon-juniper woodland and valley and foothill grassland. This species has been recorded in Tar Canyon, southwest of Avenal. Lemmon's Jewelflower is listed as a Species of Concern on the Federal list and is not on the State list.

Recurved Larkspur (Delphinium recurvatum)

Recurved larkspur has erect reddish to purple stems that range from 8 to 24 inches in height. Stems are slightly hairy below and glabrous in the inflorescence. Leaves are 0.6 to 1.2 inches long, palmatifid into few-parted divisions, and hairy beneath. The inflorescence supports 15-24 flowers which have light blue sepals and cream to white petals. Sepals are oblong-ovate with incurved tips and are sparsely strigulose.

Recurved larkspur grows in subalkaline soils supporting shrubby or grassland habitats of the western Central Valley from Contra Costa County to Kern County and the Carrizo Plain. Co-occurring species include saltbush, brome grass, and wild oats.

Recurved larkspur occurrences are widely scattered throughout Kings County. Records for this species come from the lower slopes of the Kreyenhagen Hills, the Pyramid Hills, the vicinity of Kettleman City, and Avenal Gap. There is an old record from the Guernsey area and a discovered population on the Kings/Tulare County Line just north of Highway 198 and just south of the S.P.R.R. line.

Much of the original habitat of recurved larkspur has been lost to agriculture. Many of the historic populations have either been extirpated or lack current field confirmations of population status. Habitat loss continues to be the principal threat to the continued existence of this species. Recurved Larkspur is listed as a Species of Concern on the Federal list and is not on the State list.

Pale Yellow Layia (Layia heterotricha)

Reference Appendix B (California Department of Fish and Game, Natural Diversity Database) for available information on Layia heterotricha.

Showy Madia (Madia radiata)

Reference Appendix B (California Department of Fish and Game, Natural Diversity Database) for available information on Madia radiata.

1.8.9 CLIMATE AND AIR QUALITY

Climate

The climate of the Avenal area is described as Mediterranean, which is typified by hot, dry summers and mild winters. Temperatures recorded at Lemoore Naval Air Station (LNAS) show the average monthly high temperature for July to be 80.6° F, while the average temperature for January is 45.1° F. It is not uncommon for maximum temperatures to exceed 100 degrees during the summer months; nor for temperatures to drop below freezing in the winter. The highest temperature ever recorded at LNAS was 113° in July of 1975. The lowest temperature of record was 14° in January of 1962.

During the summer, a high pressure ridge develops over the Sierra Nevada blocking the penetration of moist air from the Pacific. This high pressure system tends to weaken during the winter months thereby opening the door to Pacific storms. Approximately 90 percent of all rainfall in Avenal occurs between November and April. Average rainfall measured at Kettleman City is 6.5 inches per year compared to 7.8 inches at Coalinga and 7.6 inches at Lemoore. Avenal's rainfall is probably somewhere between these figures. Rainfall can vary widely from year to year.

Air movement through the San Joaquin Valley is in a southeasterly direction. Wind enters the Valley over the passes east of the San Francisco Bay and exits through mountain passes at the southern end of the San Joaquin Valley, principally Tehachapi. Meteorological data from LNAS indicates that the average wind speed is 4-6 knots with maximum gusts 40-50 knots recorded from October to May. Wind direction records measured between 1967 and 1971, indicate that winds blew out of the northwest quadrant 64 percent of the time. The prevailing wind direction is from the north and north-northwest, except in December and January, when the winds blow from the southeast or east-southeast.

Federal Air Quality Regulations

The Federal Clean Air Act of 1970 (FCAA) was the first major piece of federal air quality regulation. Amended in 1977 and 1990, the Clear Air Act required the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for several pollutants. These standards are set by law at levels that protect public health and welfare, with an adequate margin of safety. Areas exceeding the federal standard more than two times per year are designated "non-attainment" areas under the Clean Air Act, and as such are subject to more stringent planning and pollution control requirements.

Under the 1990 amendment to the Clear Air Act, non-attainment areas are divided into five categories depending on future dates identified for meeting the standards. "Marginal" or

"moderate" violators only slightly exceed the NAAQS, whereas "serious," "severe," or "extreme" violators exceed the standards by a much higher margin. Marginal areas are required to do little beyond what they are already doing to attain clean air, but areas designated "moderate" through "extreme" must adopt gradually tighter regulations. Areas designated "moderate" or worse for ozone non-attainment are required to show a three percent per year reduction in emissions of volatile organic compounds.

Areas close to meeting Carbon Monoxide (CO) standards are required to start a wintertime oxygenated fuels program and to correct problems with existing vehicle inspection programs. Areas with higher levels of CO must also start an enhanced vehicle inspection program, and those areas with the highest CO levels must adopt transportation measures.

Table 1.8-5 shows emission inventory for the year 2002 in tons per day for Kings County. Carbon Monoxide (CO) is by far the largest category of pollutant in Kings County, and mobile sources account for approximately 84 percent of the 68 tons per day emitted. Area-wide sources such as unpaved road dust account for 92 percent of the PM_{10}.

The FCAA requires an air quality control plan referred to as the State Implementation Plan (SIP). The SIP contains the strategies and control measures California will use to attain the NAAQS. The Federal Clean Air Act Amendments of 1990 require states containing areas that violate the NAAQS to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is to be periodically modified to reflect the latest emissions inventories, planning documents, rule and regulations of air basins as reported by the agencies with jurisdiction over them. The EPA reviews SIPs to determine if they conform to the mandates of the FCAA and will achieve air quality goals when implemented. If the EPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan (FIP) for the non-attainment area and may impose additional control measures.

State Regulations

In 1988, the California Clean Air Act (CCAA) (AB 2595) was passed. The act contains more stringent guidelines for the attainment of air quality goals than the FCAA. The California Air Resource Board (ARB) is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the CCAA. The CCAA classifies non-attainment areas as moderate, serious, severe, and extreme based on severity of violation of state ambient air quality standards. Both the State of California and the federal government have established a variety of ambient air quality standards. The state 1-hour ozone standard is 0.09 ppm (parts per million, by volume), not to be equaled or exceeded. The federal 1-hour ozone standard is 0.12 ppm, not to be exceeded more than three times in any three-year period.

Table 1.8-5
2002 Emission Inventory
Tons Per Day for Kings County

Stationary Sources	ROG	% of Total	CO	% of Total	NOX	% of Total	SOX	% of Total	PM_{10}	% of Total
Total Fuel Combustion	0.19	1.0	2.05	3.0	7.67	35.2	0.70	90.8	0.33	1.2
Total Waste Disposal	0.15	0.8	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
Total Cleaning and Surface Coatings	0.61	3.2	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
Total Petroleum Production and Marketing	0.31	1.6	0.00	0.0	0.01	0.0	0.00	0.0	0.00	0.0
Total Industrial Processes	0.95	5.0	0.00	0.0	0.00	0.0	0.00	0.0	1.20	4.1
Subtotal Stationary Sources	2.21	11.7	2.05	3.0	7.67	35.2	0.70	90.8	1.53	5.3
Area-Wide Sources										
Total Solvent Evaporation	2.69	30.3	0.00	0.0	0.00	0.0	0.00	0.0	0.00	N/A
Total Miscellaneous Processes	5.70	44.6	8.65	12.8	0.31	1.4	0.00	0.5	26.69	92.2
Subtotal Area Wide Sources	8.39	44.6	8.65	12.8	0.31	1.4	0.00	0.5	26.69	92.2
Mobile Sources										
Total On-Road Motor Vehicles	3.71	19.7	41.90	61.9	8.51	39.1	0.06	7.5	0.23	0.8
Total Other Mobile Sources	4.50	23.9	15.02	22.2	5.29	24.3	0.01	1.2	0.49	1.7
Subtotal Mobile Sources	8.21	43.6	56.92	84.1	13.80	63.4	0.07	8.6	0.72	2.5
Natural Sources										
Total Natural Sources	0.02	0.1	0.03	0.0	0.00	0.0	0.00	0.0	0.01	0.0
Subtotal Natural Sources	0.02	0.1	0.03	0.0	0.00	0.0	0.00	0.0	0.01	0.0
Grand Total For Kings County	18.83	100.0	67.65	100.0	21.78	100.0	0.78	100.0	28.95	100.0

Source: California Air Resources Board
Note: Percentages may not equal 100 due to rounding

San Joaquin Valley Air Pollution Control District

The City of Avenal lies within the Kings County portion of the San Joaquin Valley Air Basin (SJVAB). The San Joaquin Valley Air Pollution Control District (SJVAPCD) was organized in 1991 by a Joint Powers Agreement of eight Valley counties (San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and Kern). The District is the local lead agency for formulating Federal and State Air Quality plans, promulgating rules that affect a variety of air pollution sources, and reviewing local governments' land use plans and development proposals in order to estimate projected air quality impacts and suggest methods to reduce those impacts. Headquartered in Fresno with regional offices located in Bakersfield and Modesto, the SJVAPCD has jurisdiction over air quality matters in the San Joaquin Valley Air Basin.

The SJVAPCD has adopted several attainment plans in an attempt to achieve state and federal air quality standards; the adopted *2003 PM_{10} Plan, San Joaquin Valley Plan to Attain Federal Standards for Particulate Matter 10 Microns and Smaller,* June 2003; the *Carbon Monoxide Redesignation Request and Maintenance Plan for Ten Federal Planning Areas,* (April 1996); and the *Amended 2002 and 2005 Rate of Progress Plan for San Joaquin Valley Ozone,* December 2002. The draft schedule for the *Ozone Attainment Demonstration Plan* is expected to be adopted in 2004.

1.8.10 AIR QUALITY MONITORING DATA

The San Joaquin Valley Air Basin (SJVAB) is classified "severe non-attainment" for the state and federal standard and "serious non-attainment" for PM_{10} by federal standards. As of February 2004, the EPA is proposing to grant a request by the State of California to voluntarily reclassify, under the Clean Air Act, the San Joaquin Valley Ozone Nonattainment Area from a severe to an extreme one-hour ozone nonattainment area. The Urbanized areas of Fresno, Bakersfield, Stockton, and Modesto are classified attainment and all the non-urbanized areas of the SJVAB are classified as "unclassified" for federal carbon monoxide standards. Air quality in the Planning Area is best represented by air monitoring data collected by the State of California Air Resources Board at the closest monitoring stations to Avenal the Corcoran (Patterson Avenue) monitoring station and Hanford (S. Irwin Street) monitoring station.

Oxides of Nitrogen (NOx) and Nitrogen Dioxide (NO_2)

NOx is a family of gaseous nitrogen compounds and are precursors to ozone formation. The major component of NOx, nitrogen dioxide (NO_2), is a reddish brown gas that is toxic at high concentrations. NOx results primarily from the combustion of fossil fuels under high temperature and pressure.

Health effects associated with NOx are an increase in the incidence of chronic bronchitis and lung irritation. Chronic exposure to NOx may lead to eye and mucus membrane aggravation, along with pulmonary dysfunction. NOx can cause fading of textile dyes and additives, deterioration of cotton and nylon, and corrosion of metals due to production of particulate nitrates.

Ozone (O3)

Ozone is a highly reactive secondary gas pollutant which is toxic, colorless and has a pungent odor. Ozone is photochemically produced through complex chemical reactions of certain hydrocarbons and oxides of nitrogen (primary pollutants) in the presence of sunlight and temperatures above 59 degrees Fahrenheit. In high concentrations, ozone and other photochemical oxidants are directly detrimental to humans causing respiratory irritation and possible alterations in the functioning of the lungs and inhibit vegetation growth.

Ozone is a regional air pollutant. It is generated over a large area and is transported and spread by wind. The worst ozone concentrations tend to be found downwind from emission sources in Valley metropolitan areas. Ozone has been the San Joaquin Valley's most obstinate air quality problem.

Table 1.8-6 shows the number of days the state and federal standard exceeded one-hour and eight-hour ozone concentration for the Hanford (S. Irwin Street) monitoring station. It also shows the maximum concentration in parts per million (ppm). In 2003, the state one-hour standard was exceeded 19 days, the federal eight-hour standard was exceeded 15 times and the federal one-hour standard were not exceeded once. In 2000, the state one-hour standard was exceeded 48 days, the federal eight-hour was exceeded 51 days, and the federal one-hour was not exceeded once.

Table 1.8-6
Ozone Data Summary 1999-2003
Hanford S. Irwin Street
San Joaquin Valley APCD

	Exceedance Days**			Maximum Concentration (ppm)	
	State	National			
Year	1-hr.	1-hr.	8-hr.	1-hr.	8-hr.
2003	19	0	15	0.120	0.100
2002	29	1	27	0.125	0.105
2001	21	1	18	0.127	0.107
2000	48	0	51	0.124	0.110
1999	28	2	25	0.140	0.111

Source: California Air Resources Board. Ozone Trends Summary
**The number of exceedance days equals the number of distinct days on which the relevant standard was exceeded at any monitoring site in the region. If the standard was exceeded at more than one site on a given day, it only counts as one exceedance day for the broader region.

Particulate Matter (PM_{10})

PM_{10} refers to particulate matter equal to or less than ten microns in diameter. This material, as opposed to dust, cannot be adequately filtered by the human respiratory system. Inhaled atmospheric particulates can, therefore, be harmful to humans by directly causing injuries to the respiratory tract and lungs or by the reactive gases which were absorbed by the inhaled particulates. Suspended particulates scatter and absorb sunlight, producing haze and reducing visibility. In areas close to major sources including industrial and agriculture operations, PM_{10} are generally higher in the winter when more fuel is burned and meteorological conditions favor buildup of directly emitted contaminants.

The actual composition of PM_{10} varies greatly with time and location. It depends on the sources of the material and meteorological conditions. Primary man-made sources of PM_{10} in the San Joaquin Valley are agricultural operations, agricultural burning, demolition and construction activities, entrainment of dust by motor vehicles on paved and unpaved roads, and residential wood burning. Wind erosion of agricultural land also represents a significant source of air borne dust in the Valley.

Based on air quality data for 2003 at the Corcoran (Patterson Avenue) monitoring station (reference Table 1.8-7), PM_{10} pollutants exceeded state standards 162.5 days and did not exceed federal standards. Note however, because PM_{10} is monitored only once every six days rather than continuously, actual exceedences of the standards on a daily basis may be up to six times higher than the numbers shown. In 2002, the state standard for PM_{10} was exceeded 165 days and the Federal standard was not exceeded once.

Table 1.8-7
PM_{10} Air Quality Data Summary, 1999-2003
Corcoran – Patterson Avenue
San Joaquin Valley Unified APCD

	Est. Days > Std.		Annual Average		3-Year Average		High 24-Hour Average		Year
Year	National	State	National	State	National	State	National	State	Coverage
2003	0	**162.5**	47.2	**52.2**	0	**55**	66	**150**	100
2002	0	**165**	0.0	**55.4**	0	**55**	**168**	**174**	85
2001	0	0	0.0	0.0	0	**53**	**165**	**221**	51
2000	0	**131.8**	46.6	**51.3**	0	**53**	128	**137**	95
1999	**9.2**	**134.5**	**53.0**	**53.1**	0	**53**	**174**	**185**	100

Source: California Air Resources Board
Notes: All concentrations expressed in micrograms per cubic meter.
State and National Exceedences Shown in Bold. An exceedance is not necessarily a violation.

No standard violations were observed in Kings County for nitrogen dioxide from 2001 to 2003.

1.9 Safety

1.9.1 IDENTIFICATION OF GEOLOGIC AND SEISMIC HAZARDS

The San Joaquin Valley is a geologic structural trough with its axis oriented northwest-southwest. The valley is bounded to the east by the granitic and metamorphic rocks of the Sierra Nevada, and to the west by the folded and faulted sedimentary, volcanic, and metamorphic rocks of the Coast Ranges. The crystalline rocks of the Sierra Nevada extend westward beneath the valley. These rocks are overlain by a westward-thickening wedge of marine and continental deposits about 10,000 feet thick in the Avenal area. The marine deposits are siltstone, shale, and sandstones. The thicker continental sediments overlie the marine deposits. These consist of unconsolidated alluvium, lacustrine, and flood plain sediments derived from the Sierra Nevada.

Earthquakes originate as movement or slippage occurring along an active fault. These movements generate shock waves that result in ground shaking. Structures of all types, if not designed or constructed to withstand ground shaking, may suffer severe damage or collapse. Likewise, some slopes will collapse due to the soil or geological characteristics resulting in hazard both in terms of collapse of structures located thereon, or collapse of structures within the path of resulting land slides.

Avenal lies within a seismically active area. An earthquake measuring 6.7 on the Richter scale (Rs) occurred in the Coalinga area in 1983, while a quake of 5.5 on the Rs occurred in the Avenal area in 1985. This quake had its epicenter five miles northeast of Avenal in the Kettleman Hills. This quake caused widespread cracks in buildings and pavement and broke numerous windows. Structural failures did not result from this event.

Seven potentially active faults are located within 70 miles of Avenal, including a thrust fault lying 6-8 miles below the central axis of the Kettleman Hills anticline. This thrust fault appears to have caused the Coalinga and Avenal earthquakes.

A study prepared by Golder Associates for the Chemical Waste Management, Kettleman Hills facility, determined that the thrust fault in the Kettleman Hills poses the greatest seismic threat to the area. Maximum credible earthquakes (MCE's) from this fault have been predicted to range from 6.5 to 7.0 on the Richter scale. Peak ground accelerations at the Chem Waste facility, located approximately seven miles southeast of Avenal, are predicted to be .43 gravities (g). This figure represents the maximum force of ground motion caused by a MCE. A probabilistic assessment of ground acceleration determined that the peak acceleration of .43g had a two percent chance of being exceeded in a 20-year period and a five percent chance of being exceeded within a 50-year period. This assessment also determined that, within a 50-year period, there is a 50 percent probability of ground accelerations exceeding .16g and a ten percent chance of accelerations exceeding .34g. These figures should be used in building design criteria to prevent structural failure from groundshaking.

The San Andreas Fault, located approximately 15 miles southwest of Avenal, also poses significant seismic risk. The Slack Canyon – Highway 58 segment of this fault is capable of producing an MCE with a magnitude of 7.2 at a recurrence interval of 140 years. The Slack Canyon – Cholame segment is very active and can produce an MCE with a magnitude of 6.3 at a recurrence interval of 22 years. Ground acceleration from earthquakes occurring along the San Andreas Fault are not predicted to exceed .21g at the Chem Waste Facility.

The Five Counties Seismic Safety Element places Avenal within the C1 Seismic Zone, characterized by firm to hard sedimentary rocks. Primary hazards due to groundshaking are "moderate" to "high" because of the proximity to the San Andreas Fault. Landslides are the only significant secondary seismic hazard. They pose a "moderate" to "high" threat for development located on steeply sloping topography. The Seismic Safety Element recommends that the Uniform Building Code, Zone III building standards be required for all structures and that a 2x factor be used for public structures.

New buildings in Avenal are constructed to prevent loss of life as a result of an earthquake. Older buildings, however, especially un-reinforced masonry buildings could collapse causing injury and loss of life. According to a report in 1979 to the California Seismic Safety Committee, a building should be considered hazardous to life in the event of an earthquake if the building:

A. Was constructed prior to the adoption and enforcement of local building codes requiring the earthquake resistant design of buildings;

B. Is constructed of un-reinforced masonry;

C. Lacks an effective system for resisting lateral forces; and

D. Exhibits <u>any one</u> of the following characteristics:

   1. Has exterior parapets and ornamentation that may fall on a public way;

   2. Is constructed of un-reinforced masonry;

3. Has exterior walls of un-reinforced masonry that are not anchored to the floors or roof;

4. Has sheathing or roofs that is not capable of withstanding lateral loads or uniformly transferring horizontal loads to walls; or

5. Has large openings in walls that may result in damage due to torsional (twisting) forces.

In order to eliminate these problems, reconstruction is necessary to at least provide for the adequacy of: (a) un-reinforced masonry bearing walls, (b) the anchorage of exterior parapets and ornamentation, (c) the anchorage of un-reinforced bearing walls to the floors and roof, (d) floor and roof diaphragms, and (e) the development of a complete bracing system to resist horizontal wind and earthquake forces.

Enforcing the retrofitting of buildings to meet earthquake standards is a difficult task. First, Avenal would have to commit staff to the project. In addition to being costly, this would require a policy decision on the part of the City Council that the potential problems were of such dimensions that the cost, both to the City and to the landowner, is warranted. Second, the cost to the property owner might be prohibitive, at the very least causing construction impacts on the existing tenants, possibly relocation and rent increase. The report referenced above stated that it was unlikely that building owners could feasibly afford the cost of making the necessary improvements and that some sort of grant funds would be needed.

Aside from structural damage, earthquake activity can produce three other types of adverse effects. The first is ground failure, which itself is a factor in making some lands unsuitable for development. The area in and around Avenal is composed of geological formations susceptible to such failure. The second adverse effect would be from a seiche (an earthquake induced wave in a lake, reservoir, or harbor). As stated earlier, there are no bodies of water within the Avenal Planning Area large enough to be subject to a seiche.

The third effect would be caused by damage to a dam that results in dam failure. There are a number of dams on upper reaches of rivers that traverse the County that could produce flooding should they fail. There are requirements that the owners of dams prepare maps showing areas that would be flooded should a dam fail. Dam failure inundation maps are available for these dams. These maps indicate that the City of Avenal would not flood if these dams failed. Areas in the northern part of the County would be affected if Pine Flat/Terminus Dam failed. Information regarding the depth of the water should flooding occur is no longer available. It is the policy of the Corps not to list depths since such a calculation depends on too many variables (amount of water stored, location of the failure, extent of the failure, etc.).

1.9.2 IDENTIFICATION OF STRUCTURAL HAZARDS AND CRITICAL FACILITIES

Critical facilities include: underground utilities, schools, hospitals, transportation systems, etc. There are active faults in the Avenal vicinity which could result in strong ground shaking in the event of an earthquake. Impacts to critical facilities by seismic events therefore could be significant.

A critical facilities analysis would be helpful in determining the vulnerability of individual facilities in the community. The analysis would include an inventory of critical facilities, the hazard risks associated with the critical facilities and a vulnerability assessment based on the various hazards.

1.9.3 WILDLAND AND URBAN FIRE HAZARDS

Both structural and wildland fire hazards threaten life and property within the Avenal vicinity. Wildland fires resulting from both man-made and natural causes can occur in brush, or grasslands, primarily in sparsely developed or existing open space lands. Structures and urban development may also be threatened or destroyed in the area of wildland fires. Structural fires usually result from man-made causes and threaten industrial, residential and commercial structures, especially those built before building and fire codes were established. These substandard structures represent the highest potential for injury, death, or loss of property.

1.9.4 AREAS SUBJECT TO FLOODING AND DAM FAILURE INUNDATION

Portions of Avenal are within the 100-year floodplain as identified by the Federal Emergency Management Agency (FEMA) on their Flood Insurance Rate Map (reference Figure 1.9-1).

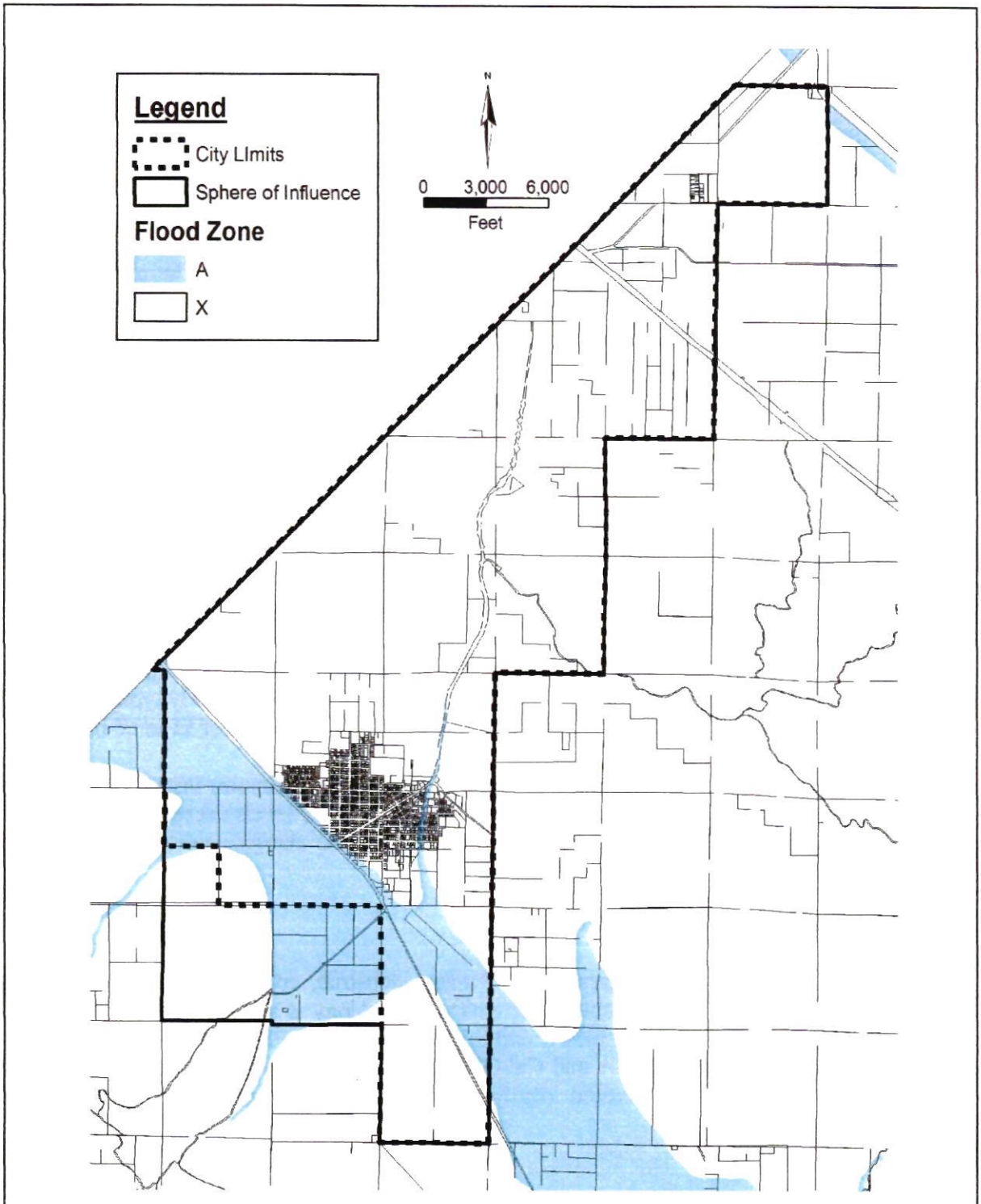
During major storm events several arroyos upstream from Avenal are subject to flash flooding. Numerous accounts of flooding along Santa Clara Street below Arroyo Esquinado have been reported by Avenal residents. Arroyo del Camino is identified as a flood hazard on the FEMA flood insurance rate maps. This flooding, however, may be attributable to poorly maintained culverts and drainage ditches.

At least ten distinct watersheds drain into the urbanized portion of Avenal. These drainages flow through or near the City of Avenal and onto the Kettleman Plain. A 1979 study of the drainage problem by McKee-Zumwalt and Associates calculated the potential runoff from these watercourses during a 10-year and a 100-year storm event. The findings of this study are listed in Table 1.9-1. The drainage of Camino Esquinado poses the greatest flood threat to the City. This watershed is capable of producing flows of 102 cfs during a 10-year storm and 155 cfs during a 100-year event.

Table 1.9-1
Watershed Data

Drainage Unit	Drainage Area	Peak Flows	
		10-Year Storm	100-Year Storm
#1	306 ac	N/A	N/A
#2	148 ac	N/A	N/A
#3	265 ac	N/A	N/A
#4	436 ac	97 cfs	149 cfs
#5	160 ac	N/A	N/A
#6	177 ac	44 cfs	66 cfs
#7	74 ac	23 cfs	36 cfs
#8	23 ac	N/A	N/A
#9	507 ac	102 cfs	155 cfs
#10	69 ac	22 cfs	35 cfs
#11	577 ac	87 cfs	126 cfs

Source: McKee-Zumwalt, 1979



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FLOODING

Figure 1.9-1

As stated earlier, the City of Avenal would not flood if the Pine Flat Dam and Terminus Dam failed. However, areas in northern Kings County would be affected.

1.10 Noise

1.10.1 INTRODUCTION

The principal noise sources in the City of Avenal are traffic on State Route 269 and on local roads. The other existing noise source is the Avenal Regional Landfill. The existing noise environment in the City of Avenal was determined by a combination of noise level measurements and noise modeling. Following is a discussion of the background noise level survey results in residential areas of the City, and a description of the studied noise sources in the City.

1.10.2 BACKGROUND NOISE LEVEL SURVEY

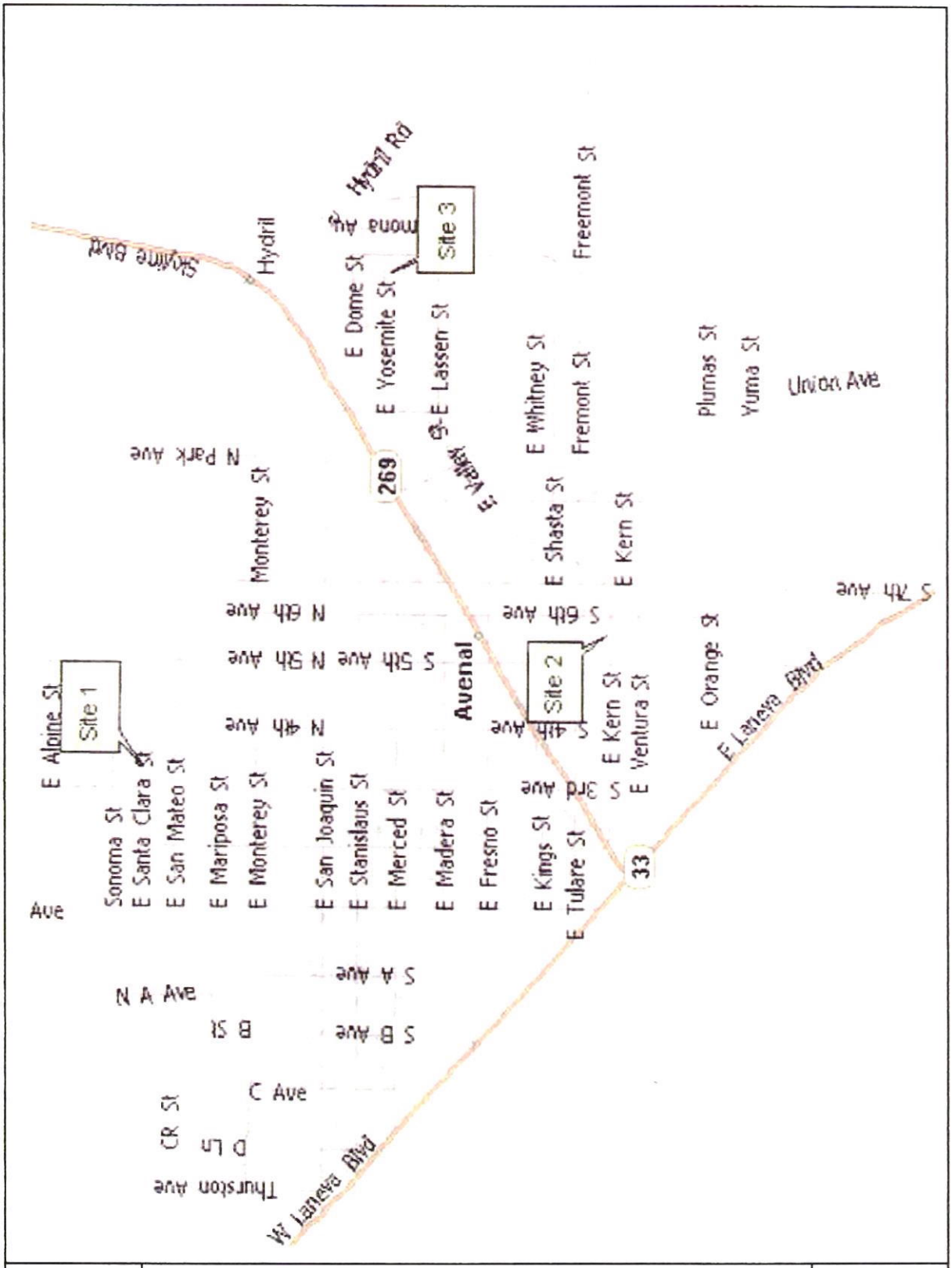
The purpose of the background noise level survey was to determine the baseline noise environment in those parts of the City that are removed from obvious noise sources. Three residences were selected for the survey. Their locations are shown in Figure 1.10-1. Noise measurements were conducted continuously for 24 hours using unattended sound level analyzers. The results of the monitoring are shown in Figures 1.10-2 through 1.10-4.

The background noise levels in terms of the Day/Night Average Level (L_{dn}) at the three residences ranged from approximately 51 to 59 dB. These noise levels are fairly typical of small communities, which generally have background noise levels near the range of 55 to 60 dB L_{dn}.

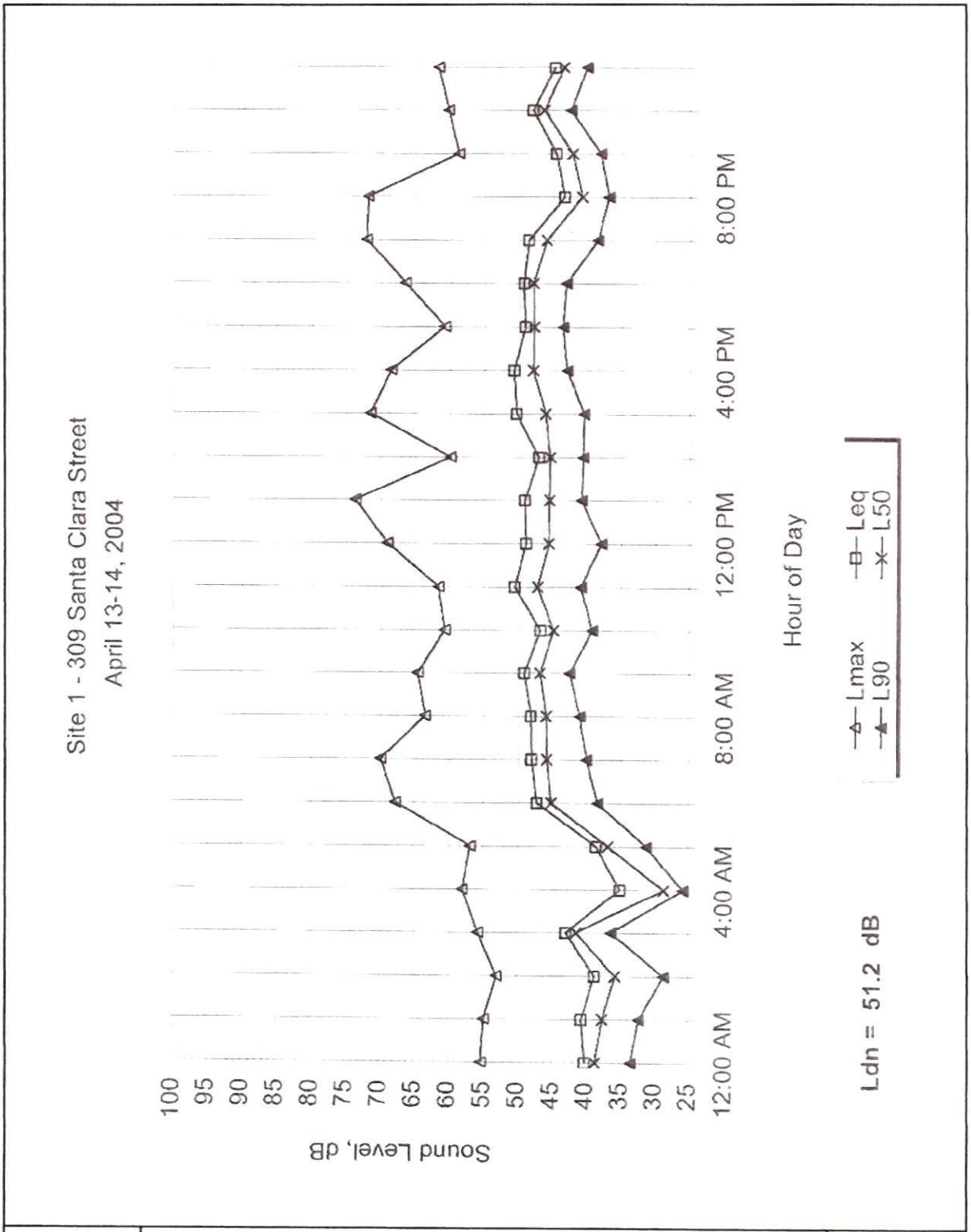
In Figures 1.10-2 through 1.10-4 the L_{max} represents the highest (maximum) instantaneous noise level occurring during an hour. The L_{50} and L_{90} values are the noise levels exceeded for 50% and 90% of the time during an hour respectively, and the L_{eq} is the energy equivalent or average noise level during the hour.

1.10.3 MAJOR STATIONARY NOISE SOURCES

The production of noise is an inherent part of many industrial, commercial and agricultural processes, even when the best available noise control technology is applied. Noise production within industrial or commercial facilities is controlled indirectly by Federal and State employee health and safety regulations (OHSA and Cal-OSHA), but exterior noise emissions from such operations have the potential to exceed locally acceptable standards at nearby noise-sensitive land uses.



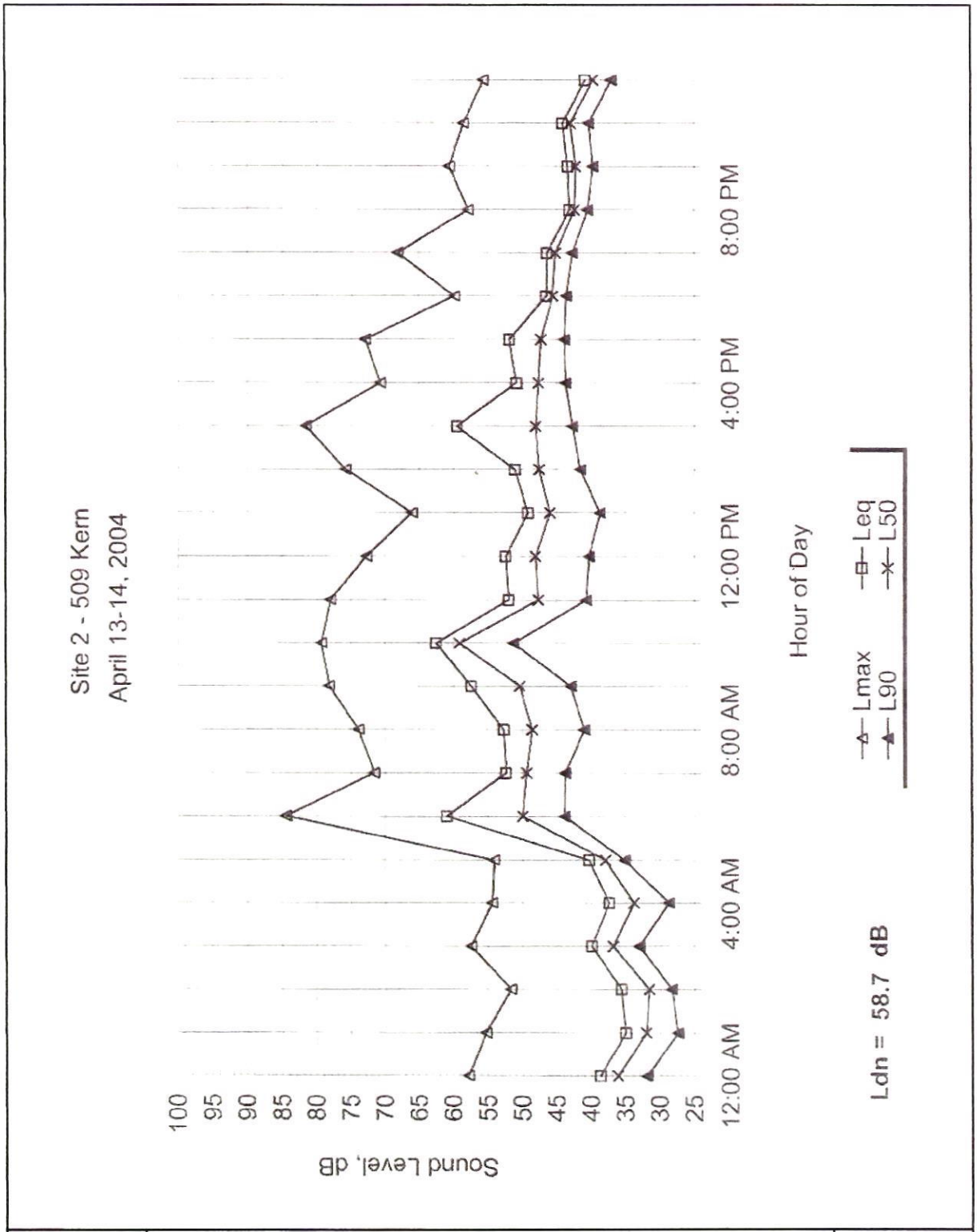
Quad Knopf	**BACKGROUND NOISE MEASUREMENT LOCATIONS**	Figure 1.10-1



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MEASURED HOURLY NOISE LEVELS

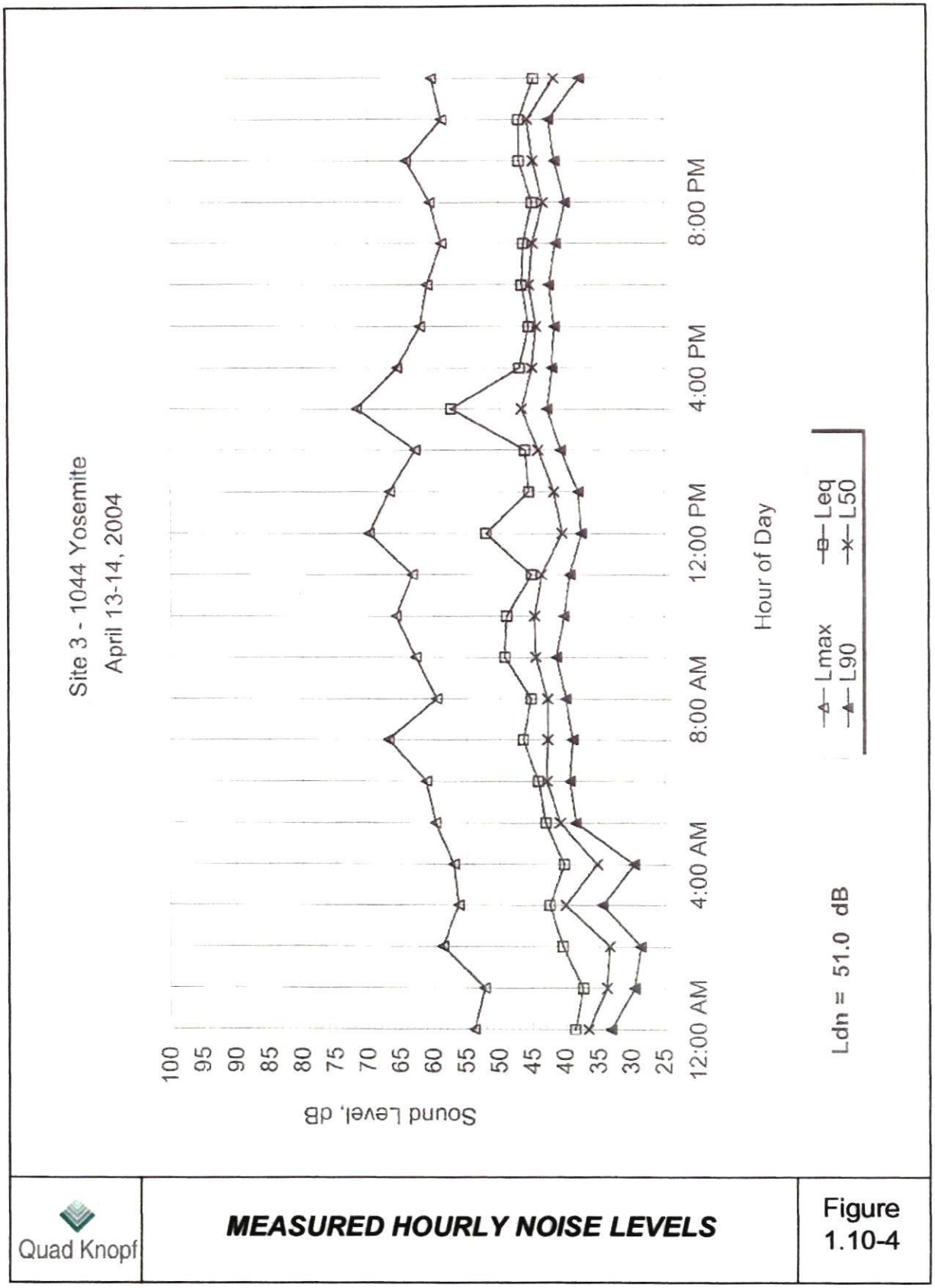
Figure 1.10-2



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MEASURED HOURLY NOISE LEVELS

Figure 1.10-3



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MEASURED HOURLY NOISE LEVELS

Figure 1.10-4

The following discussion provides generalized information concerning the relative noise impacts of the one major industrial noise source in the City of Avenal currently in operation. Other industries or other major noise sources may exist. Worst case 50 and 55 dBA hourly L_{eq} noise contours were prepared for the major stationary noise source. These contours are included in Figure 1.10-5 of this document. The property located east and northeast of the landfill is zoned as a nature preserve and a scenic corridor. The generalized contours contained within Figure 1.10-5 should be used as a screening device to determine when potential noise-related land use conflicts may occur, and when site-specific studies may be required to properly evaluate noise at a given noise-sensitive receiver location.

Avenal Regional Landfill:

This landfill facility is located at the intersection of Skyline Boulevard and Hydril Road. During the visit to the site there was no noise being emitted from landfill operations. The landfill's hours of operations are:

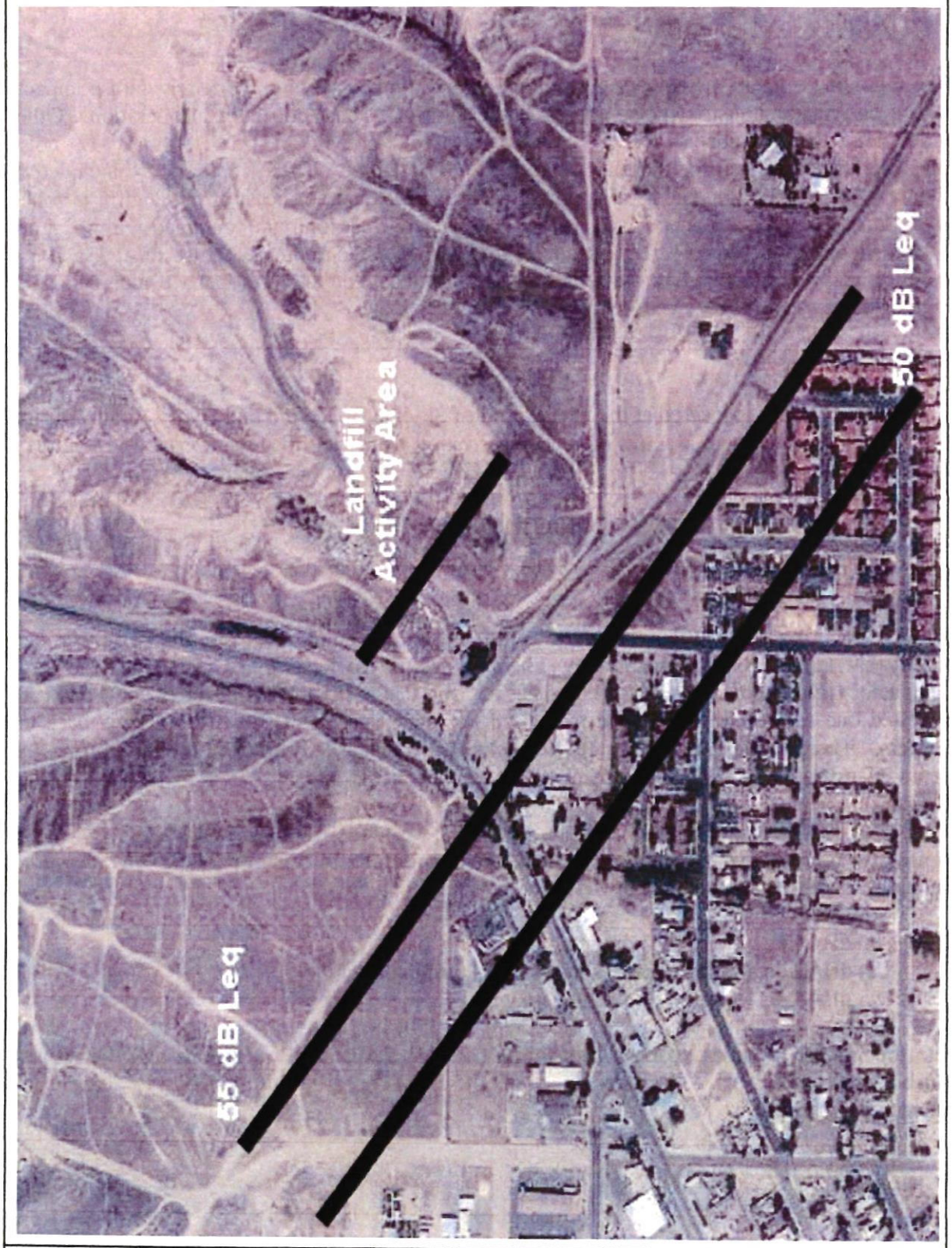
Monday through Friday – 7:00 a.m. to 5:00 p.m.
Saturday – 7:00 a.m. to 4:00 p.m.
Sunday – closed

The noise sources noted at the plant were a trash compactor, bulldozer, water truck, scraper, and trucks that operate to/from the facility. The plant employee interviewed stated that the trash compactor typically operates 4 to 5 hours per day and that either the bulldozer or compactor are operated one at a time. All of the motorized equipment (vehicles) on the site have back-up beepers. There are approximately 30-40 trucks that operate daily to/from the site during the hours of operation. The predominant noise source on the site appeared to be the back-up beepers.

Noise measurements were taken on site while the compactor was being operated. The measured noise levels at a distance of 50 feet were:

80 dBA Leq - Compactor moving forward no load
84 dBA Leq - Compactor moving forward pushing dirt
85 dBA Leq - Compactor backing up with beeper

Site topography provides acoustical shielding between the landfill operations and the nearest noise-sensitive receivers. Therefore, a -10 dB offset was used during modeling to account for the natural attenuation.



Quad Knopf	**AVENAL REGIONAL LANDFILL** **WORST CASE 50 AND 55 DBA LEQ NOISE CONTOURS**	Figure 1.10-5

Traffic Noise:

Traffic noise exposure was calculated using the Federal Highway Administration Highway Traffic Noise Model (FHWA Model). The FHWA Model is the analytical method currently favored by most state and local agencies, including Caltrans, for highway traffic noise prediction. The Model is based upon reference energy emission levels for automobiles, medium trucks (2 axles) and heavy trucks (3 or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within ± 1.5 dB. The Model assumes a clear view of traffic with no shielding at the receiver location.

To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume. The Calveno traffic noise emission curves were used as recommended by Caltrans to more accurately calculate noise levels generated by California traffic.

The CALTRANS Traffic and Vehicle Data Systems Unit provided the existing traffic conditions used in FHWA Model preparation. Truck traffic volumes were also obtained from the Traffic and Vehicle Data Systems Unit. Existing traffic noise levels were calculated for State Route 269 and Route 33 at three locations in the City of Avenal. The Avenal Cutoff Road, which leads from Interstate 5 into the City, and the Avenal Junction with Route 33 carry the majority of traffic within Avenal. Traffic at the Avenal junction with Route 33 carries commuter traffic to/from the Avenal State Prison. Table 1.10-1 shows the traffic data used in the Model. Table 1.10-2 shows existing traffic noise level contours in tabular form. Figure 1.10-6 shows the approximate location of the 60 dB L_{dn} traffic noise contours graphically.

Table 1.10-1
FHWA Highway Traffic Noise Prediction Model Inputs
Existing Traffic

Location	ADT	Day/Night %	% Medium Trucks	% Heavy Trucks	Speed (mph)
SR269 at the I-5 Avenal Cutoff Road	4,900	85	7	3	45
SR 269 at the Route 33 Junction	4,200	85	4.6	3.4	35
Route 33 at 7th Street	4,400	85	6	2	45

*Acoustically "soft" site assumed.

Table 1-10.2
Existing Traffic Noise Levels And Contours
Existing Traffic

Location	Predicted L_{dn}, dB (at 50 feet)	Distance to Noise Contour (feet)*	
		60 dB L_{dn}	65 dB L_{dn}
SR269 at the I-5 Avenal Cutoff Road	65.9	124	57
SR 269 at the Route 33 Junction	63.0	79	37
Route 33 at 7th Street	64.9	105	49

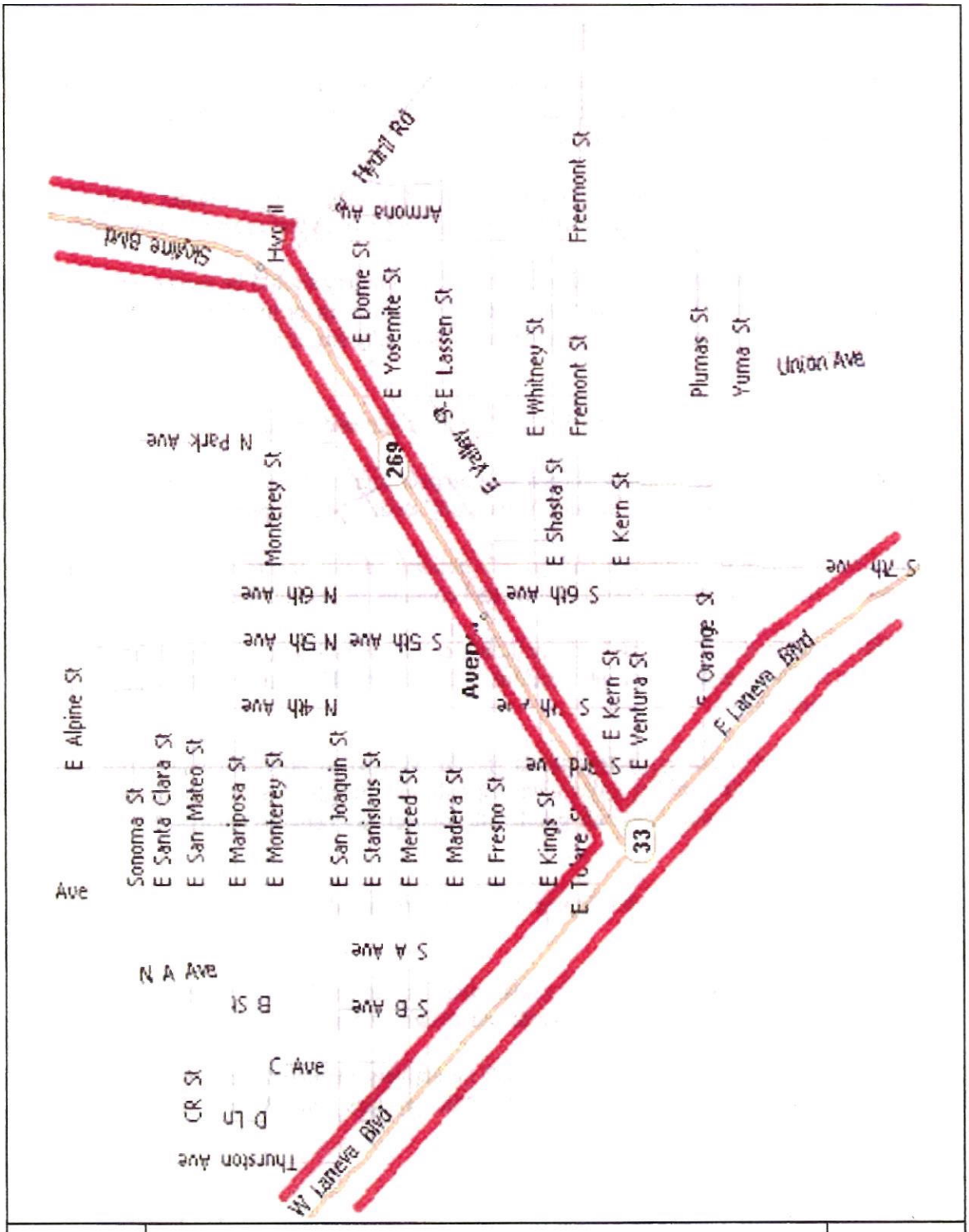
*Distance is measured from the centerline of the roadway.

In general, existing traffic noise levels on local roadways through Avenal range from about 60-65 dB L_{dn} at the nearest receivers on most roadways. Along Route 269, existing noise levels are about 63-66 dB L_{dn} at the nearest receivers. Along Route 33, existing noise levels are about 65 dB Ldn. Traffic noise levels that are 60 dB L_{dn} or less usually are considered to be fully compatible with noise-sensitive uses, which include residences, schools, churches and hospitals. Levels between 60 and 70 dB L_{dn} are marginally acceptable, and levels over 70 dB L_{dn} usually are considered to be unacceptable.

1.11 Issues, Opportunities, and Constraints

In its broadest context, the General Plan is a way of problem solving; it is a process for making informed decisions about a community's future and establishing priorities and action plans to achieve development objectives. For example, a City may choose to fund parks rather than streets because of the need for more open space, or it may construct an improved water system rather than building a new fire station, or vice versa. It may decide to grow to the north, south or both. As an exercise in community involvement and an examination of a city's resources, the General Plan update is an attempt to foresee the consequences of possible courses of action and select the best one.

This General Plan update process has so far included several important steps to identify local preferences. Visioning workshops have been conducted and public and civic leaders have expressed their opinions about the City and its growth issues, opportunities, and constraints. Planning Commission and City Council General Plan Advisory Committee meetings have been held to discuss existing conditions, community visioning, development alternatives, comments and expectations about the General Plan process.



Quad Knopf

APPROXIMATE LOCATION OF THE 60 DB LDN TRAFFIC NOISE CONTOURS

Figure 1.10-6

The planning principles are summarized as follows:

- Avenal's friendly, small town atmosphere should be preserved by ensuring diverse, appropriate scale retail services; citizen participation in decision making; quality of public schools and adequacy of public services.

- Additional services and facilities should be planned so that Avenal provides a full range of medical, office, retail, convenience and entertainment services that are needed by residents.

- The role of the downtown as a focal point for the community should be preserved. Adequate expansion area should be planned so that it will grow in proportion to the rest of the community. Sites for more retail, entertainment, specialty stores and medical services should be identified.

- The commercial opportunities afforded by Skyline Boulevard should be capitalized on.

- Development in the community should be compact and contiguous to existing developed areas. New development areas should "square off" existing developed areas.

- The City's Sphere of Influence and growth policies should ensure that the community is physically distinct from other communities and contains an agricultural buffer area.

- Traffic conflicts should be resolved, including connectivity between neighborhoods, access to industrial areas, and critical intersections. Growth should be allocated with accessibility constraints in mind.

- Local streets and minor collector streets should be used to provide connectivity between neighborhoods while limiting cross-town trips through neighborhoods. Collector and local roads should be designed to provide good, safe connectivity between neighborhoods, services and facilities.

- The City shall encourage the development of more organized sports areas with easy access to those areas.

- Enhance Avenal's physical diversity, visual qualities and small-town characteristics through stricter landscaping and building standards and design review.

- The Industrial area north of Interstate 5 will be actively marketed for new industries, have sites which are functional, have adequate public services and adequate access to I-5 and Highway 269.